THE T&R

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RADIO EXPERIMENTERS

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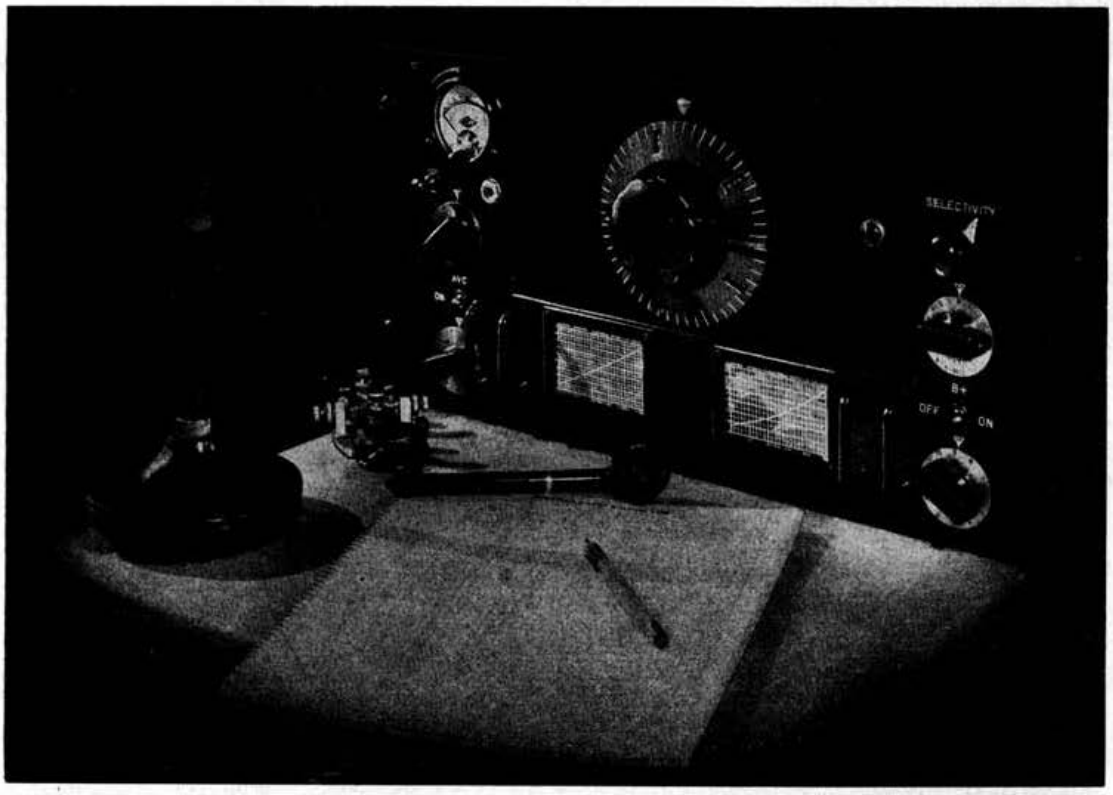

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THE T. & R. BULLETIN

OFFICIAL JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

Hon. Editor: ARTHUR O. MILNE

Secretary-Editor: JOHN CLARRICOATS

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Vol. XV. No. 12

JUNE, 1940

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MAINTAIN CONTACT

FROM the very first day of the war it has been an important duty of Headquarters to maintain the closest possible contact with members in the fighting services. The value of such contacts is already well known in certain quarters, but this aspect of our activities must for the time being remain a closed book. Suffice it is to say that many of those now engaged upon tasks which their pre-war amateur training has fitted them to undertake, would not be doing that work unless they *had* maintained contact.

With the quickening of the war there may be a tendency to forget that Headquarters needs news from those in H.M. Forces. We do not expect long letters, but as the opportunity arises we urge all who are serving at home and abroad to send in a few lines from time to time. In particular, we desire that our " Khaki and Blue " pages shall continue to provide a link between all who are on active service. The interest which has been shown in this feature convinces us that it is greatly appreciated, especially by Service members, most of whom tell us frankly that they turn to it first before delving into things technical!

In this issue we publish a consolidated list of those who have generously offered to extend hospitality to any service member who finds himself in their locality. The list, whilst reasonably comprehensive, falls far short of our aspirations, for we wish to see *every* town of importance in the British Isles represented by the name of at least one host. That our civilian members will answer our call we have no doubt, for assuredly everyone *now* realises that a friendly greeting means much to the service member on strange terrain.

It is the intention of Headquarters to prepare a complete list of those offering hospitality, so that a copy may be sent to all who enlist. We feel sure we shall not have to ask in vain for the fullest possible support to our request for co-operation.

The past month, in spite of the gravity of the war news, has seen excellent attendances recorded at service gatherings. That at Sleaford was an outstanding success, for, in addition to providing an " excuse " for hams of all ranks and ages to meet together on the common ground of their hobby, it enabled Headquarters to impart a little information concerning Society activities in war-time to some 40 Service members.

So long as it is possible, Council will continue to foster organised gatherings of members in the Services, but even if that ideal method of maintaining contact is denied us, we trust that members everywhere will remember to keep in touch with Headquarters by letter.

J. C.

THE RANGE OF THE ULTRA-HIGHS

By "VALCURVOL"

An old contributor under a new name gives some interesting information on a subject of increasing importance

Early History

IT is true to say that waves of extremely short lengths were the first on which experiments in radio communication were conducted. For instance in the pioneer days of Heinrich Hertz, it was known that the newly discovered radiations were electro-magnetic vibrations of a character similar to light waves but of much lower frequency than the latter and, in consequence, it was assumed that, like light, the waves could only travel in a straight line, at least in the normal atmosphere.

In later years, interest was directed towards the lower frequencies but even then it was still thought that wireless waves could only traverse a visual path, until Marconi, in his historic Transatlantic experiments, proved otherwise.

The Present Position

In recent years, attention has again been concentrated on the very short wavelengths, or, in modern parlance, on the ultra-high frequencies. At the beginning of this second period, it was still thought that the range was restricted to the visual distance but it has since been proved, over and over again, that ultra-high frequency signals *can* be transmitted direct over a much longer path than the distance represented by the optical range.

Many uncontrollable factors, such as reflection from low level ionised layers, and from the troposphere, enter into the question of long-distance transmission and it follows that it is very difficult, if not impossible, to predict what distance beyond the visual path a signal may be transmitted. What is definite, however, is that ultra-high frequency radiations, given sufficient power, and in the absence of intervening obstructions, will cover the visual range. The remainder of this article will be devoted to the methods by which it is possible to ascertain this range and to the interesting points which come to mind in connection therewith.

Calculations of Optical Range

Among the readers of this article there will be many who have taken great interest (and, it is to be hoped, continue so to do) in the ultra-high frequencies but how many could have given, off-hand and previous to the paragraph on the subject which appeared in the March BULLETIN, even a rough figure of the optical distance—that is to say, the distance to the horizon at sea-level—of a station situated at any given height above sea-level ?

Here it is well to point out that both the formula and the chart published in that issue gave results in *nautical miles*, not statute miles, as might be assumed (a nautical mile is not to be confused with the *knot*, which is a measure of speed, not distance). A fresh chart is therefore given herewith showing the distance to the horizon in *statute* miles from various heights.

Two formulae are available for computing distances from other heights, the more accurate one being :

$$S = 1{\cdot}32^{*} \sqrt{H}$$

where S represents distance in miles and H the height of the observer's eye in feet.

The distance may be more quickly determined, and with sufficient accuracy for all practical purposes, by using the formula

$$S = \sqrt{H} + \sqrt{\frac{H}{3}}$$

That is to say, the square root of the height, in feet, plus one-third of the figure so arrived at.

Those who take a special interest in the subject and who expect one day to be using wavelengths of the order of $2\frac{1}{2}$ and $1\frac{1}{4}$ metres (and who knows, even lower) would be well advised to prepare a graph, employing the figures shown in the chart. They would then be in a position to read off very quickly the minimum range to be expected from any particular height.

Complicating Factors

Of course, the problem is not quite so simple as all that. For one thing, the figures given assume a surface conforming exactly to the curvature of the earth, as, for example, the sea. If employed for distances involving the sea, in whole or part, the figures can be taken as they stand but in many cases it will be necessary to make allowance for other factors. As an example, a transmitting station near the coast may be 440ft. above sea-level with the aerial erected on a mast 60 ft. high. In the direction of the sea (which, in such a case would be visible), the optical range would extend to a distance of nearly 30 miles, but inland unless the ground sloped away considerably it would be a great deal less, depending on the topography of the land.

Again, land beyond the normal horizon may rise to a height sufficient to bring it again within the optical range. A typical example is shown in the figure, in which, for the sake of clarity, the curvature of the land masses are drawn greatly exaggerated.

It will be at once obvious that the calculation of the length of the optical path is more complicated, and it must not be assumed that raising the aerial by a certain amount at the point C, which represents the horizon as visible from point A, will have the same effect as raising the transmitting aerial by an equal amount. In actual fact, raising the aerial to a height of 100 ft. would enable it to receive signals (over the optical range) from points up to 13 miles away. It follows that point C can be moved roughly 13 miles further from point A and still receive signals from the latter. The effect of increasing the height at the point A will depend entirely on its

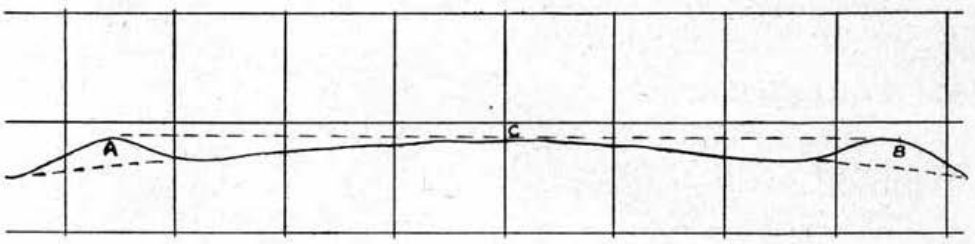
* *Some authorities quote a figure of 1·22 in place of 1·32, but the difference is negligible for practical purposes.*

height above sea level. In passing it should be said that we are not concerned here with the effect on angle of radiation brought about by varying the height of the aerial above ground, since, for the present purpose, we are considering truly horizontally polarised waves. For instance, if the ground is 480 ft. a. s. l., the range given by an aerial on a mast 20 ft. high will be 29·5 miles. Raising the aerial by an additional 100 ft. would only increase the range by about 3 miles, instead of the 13 miles increase derived by the station at sea level. These arguments will apply when the aerial is used for both transmission and reception. The point to realise is that it is important to raise the aerial as much as possible at sites near sea level but little advantage is gained when the site is on high ground. Of course it is well even in the latter case to raise the aerial as high as possible in order to overcome any screening in the vicinity.

In cases where communication takes place entirely over land, the range is naturally reduced owing to the fact that the horizon will not be at sea-level, except in very rare cases. Due allowance will have to be made for this factor which will generally be unpredictable.

Non-Radio Applications

The chart should also prove useful to those who live by the sea, to those who intend to visit a seaside resort and to those who ascend in aeroplanes, since it will enable an observer to judge the distance to any object on the sea, or, in the latter case, on land. For instance, an amateur who is lucky enough to possess a house built on the edge of a cliff 500 ft. above the sea will know that a ship actually on the horizon is nearly 30 miles away, but if the cliff is only 100 ft. high, that particular ship would have to come in to a distance of 13 miles before it would become visible.



Illustrating the manner in which two distant points may still be within optical range of each other, providing their heights are sufficient.

Further Practical Examples

When endeavouring to discover whether two points such as A and B in the figure, both at considerable height, are within optical range, one cannot simply add their individual heights together and take the result from the chart. If, for the sake of argument, each site was 500 ft. a. s. l., it might be thought that the optical range would be the same as if one were at sea-level and the other at a height of 1,000 ft., giving a visual distance of 41·6 miles. Actually, however, each station has an optical range of 29·5 miles to an horizon situated at sea-level, and allowing for a certain amount of clearance at point C, the two points would still be within the optical range of each other if the distance between them was as much as 55 miles.

Height of aerial above ground feet.	Limit of optical range miles.	Height of aerial above ground feet.	Limit of optical range miles.
5	2·9	1,000	41·6
20	5·9	2,000	58·9
50	9·3	3,000	72·1
100	13·2	4,000	83·3
500	29·5	5,000	93·1

Limit of optical range in statute miles computed from the formula quoted.

An Actual Case

It may interest readers to give yet one more example and to show how the figures can be applied to a practical case—one in fact, in which the writer has, in the past, been actually interested. Two certain towns facing each other somewhere on the coast of England are 30 miles apart approximately. The ground on the Northshire side rises much higher than on the Southshire side, but it is practicable to set up a fixed station on the latter side at a height of 100 ft. Well and good! The optical range on the seaward side will be 13 miles. Allowing a safety factor, the Northshire station must have a range of at least 20 miles, and this range is secured if the site is 250 ft. above sea level. These heights can be reversed and an almost infinite number of other heights would also be equally suitable. Communications by ground wave should therefore be possible between any two stations, situated as suggested on even the very shortest wavelength it is practicable to use, provided sufficient power, efficiently radiated, is employed, together with a sensitive receiver.

Finally it is of interest to note that u.h.f. communication is possible between two stations beyond the visual range if a suitably designed aerial system is erected at a high point which is within the optical range of each station. Such an aerial will act as a reflector and it is known that this method has actually been employed with success in America.

AUTOMATIC VOLUME CONTROL WITH PLATE AND GRID DETECTORS

By S. A. G. Cook (G5XB)

The quest for a suitable detector or signal rectifier has interested every receiver designer. The suggestions put forward by the author of the article here published deserve the fullest consideration.

EACH new development in the design of detectors has been heralded as the final answer to the problem, but finality does not even yet appear to have been reached. Historically it can be recorded that the first serious attempts to provide efficient rectification were obtained by the use of grid detection, followed later by the anode-bend or plate arrangement which has now given place to the diode method common to the majority of modern receivers of the broadcast and communications type.

Limitations of Present Methods

Each one of these systems has its good points. Power grid detection for example has a good weak-single response and a fairly good power-handling capacity; the anode-bend system gives a lower response to weak signals but has the ability to accept larger inputs and higher levels of modulation. The diode system appeared to be the last word, for its linearity, ability to take even larger inputs than the triode, and its production of D.C. for A.V.C. bias circuits, dwarfed its low sensitivity into being a minor disadvantage. Low sensitivity is of secondary

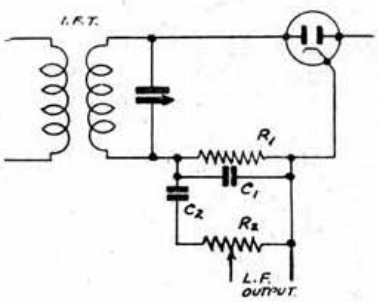


Fig. 1.
Fundamental diode circuit. Loading of the tuned circuit occurs during every alternate half-cycle, the diode impedance being quite low. Component values as Fig. 5.

importance to-day because of the high gain obtained in R.F. and I.F. amplifiers. The more serious limitation is however the loss of selectivity in the I.F. transformer feeding the diode, in particular the tuning of the secondary often being very flat. Reference to Fig. 1 will explain why this is so. The diode load resistance R1 is, in effect, shunted across the whole of the I.F. transformer secondary, reducing its possible high *dynamic* resistance to a value slightly above that of the load resistance. Such an effect is not serious in a broadcast receiver where the slightly lower overall selectivity often results in wider frequency response, but in a short-wave super-heterodyne (and especially in the smaller types with only one I.F. stage), this flattening of the response curve is most undesirable.

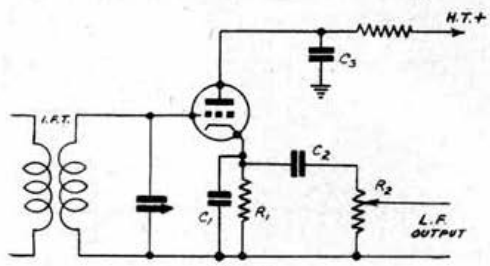


Fig. 2.
Infinite impedance detector. Component Values as Fig. 5.

Recent Developments

With the foregoing points borne in mind, it is not surprising to learn that there has been a great deal of research into the question of triode and pentode detectors, with the plate version as the chief focus of attention.

The outcome has been what is known as the Infinite Impedance Detector which, as its name implies, has theoretically infinite input impedance. The simplest form is shown in Fig. 2 from which it can be seen that the cathode bias resistor R1 is also

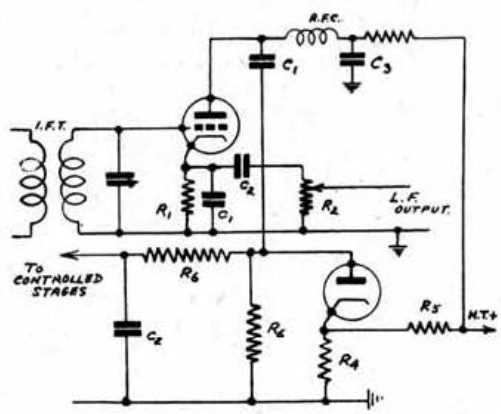


Fig. 3.
Diode A.V.C. rectifier used with infinite impedance detector. Note change in anode circuit (R.F.C. and C1). Component values as Fig. 5.

the load resistor which automatically adjusts the bias for varying carrier levels.

The low frequency component in the circuit is taken out *via* the condenser C2 to the audio amplifier, and the anode is by-passed to earth, so far as audio frequencies are concerned, by C3. (Reference may here be made to the articles which appeared in *QST* dated October 1939, and *Electronics* dated November 1939.)

Inclusion of a diode at this point, as shown in Fig. 3, will make available a D.C. supply for A.V.C. purposes from radio frequency currents which have been amplified by the detector valve working as a form of Class B amplifier. In addition an electronic tuning indicator may be used or, if A.V.C. is not of primary importance, an 0–1 milliammeter can be introduced at the " earthy " end of the load resistor circuit to give readings in " S " units or any other suitable calibration as required. The load resistor should, in this case, be in the order of 50,000 ohms.

If this method of connecting the signal meter is compared with the more usual bridge circuit, which is wired into one or more of the R.F. or I.F. anode supply leads, it will be found to provide a very much more sensitive indication of signal level and carriers well below the delay voltage of the ordinary arrangement will give some movement on the meter—a very valuable feature when tuning a transmitter for harmonic elimination by means of receiver measurements.

The principle described may be applied to all detector circuits of the triode and pentode type which do not employ reaction. Consider for example the conventional grid detector of Fig. 5, in this case it will be necessary to disconnect the anode by-pass condenser from the earth line and take it to the diode in the manner shown in Figs. 3 and 4. The result will be similar to the cathode-coupled arrangement of the first type.

It may also be used with a grid detector such as that found in the regenerative superhet receiver described in recent editions of the A.R.R.L. *Radio Amateur's Handbook*. This receiver uses a 2A5 (the American version of the AC/PEN), as a power grid detector-output valve and the anode circuit has the usual I.F. filter, C1 and R.F.C., as in previous cases; the first filter condenser feeds the diode. As an example of the results which may be expected under these conditions, an 0–1 milliammeter in series with a 50,000 ohm load resistor gives a reading of 0·7 to 0·9 mA. on what are aurally judged to be S8 to S9 signals in the 14 Mc. band. It is possible, with the diode working into a 200,000 ohm. load, to obtain a current of 0·15 mA. which provides a D.C. voltage of 30 volts for A.V.C. purposes.

It occurred to the writer, that there might be a possibility that some of the higher modulation frequencies would be accepted by the diode rectifier, but tests with a modulated oscillator indicated that this was not the case in respect of frequencies within the aural range, unless C1 is made too large, or the detector load resistor is of a higher resistance than is usual.

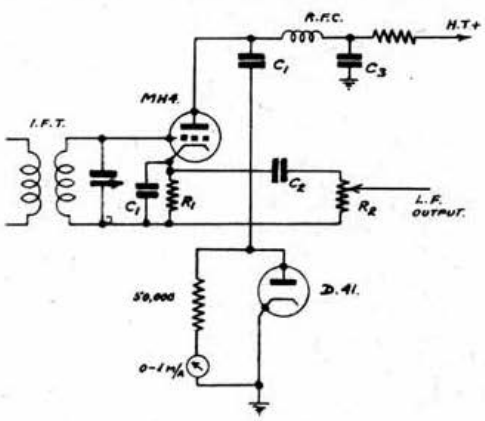


Fig. 4.

Diode feeding " S " meter. Component values as Fig. 5.

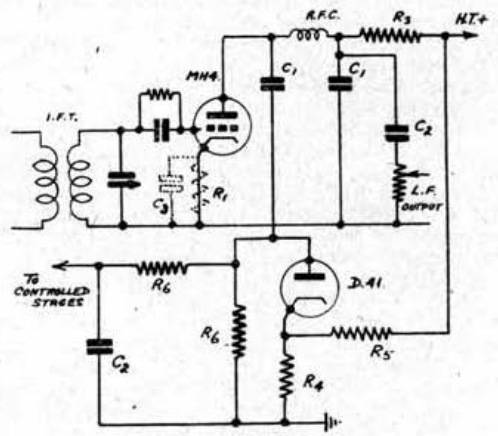


Fig. 5.

Adaption of previous circuits to plate or grid detectors.

C1 ·0002 μF. R2 500,000 ohms.
C2 ·1 μF. R3 75,000 ohms.
C3 2 μF. R4, R5 Potentiometer to give delay volts.
R1 100,000 ohms. R6 100,000 ohms.

Where a high value of load resistor is required, C1 may be as small as 50 μμF, but the most suitable values are best left to individual experiment.

Another possible disadvantage which suggested itself was that there would be a decrease in detector efficiency, particularly at high modulation levels. In practice however this has not proved to be the case and no deterioration has been noticed even on broadcast transmissions.

None of the circuits described introduce any awkward complications and in many cases a change to one of them may be made without the need for any extra components. Receivers using a double-diode triode may be modified by converting the triode audio amplifier section into the detector stage, thereby freeing the diodes for the job of A.V.C. rectifier.

In cases where receivers are already using grid or anode detection it will become necessary to add a double-diode valve (such as the Osram D41) with a few extra resistors, and possibly make a slight alteration to the R.F. and I.F. circuits to permit

(*Continued on page* 488.)

A BROADCAST-BAND ADAPTOR FOR THE E.C.R. RECEIVER

By L. TRANMER (G6TG)*

THE *Eddystone* E.C.R. receiver, as supplied performs very satisfactorily on wavelengths between 10 and 180 metres, but no provision is made for the reception of higher wavelengths Therefore on the outbreak of war, it was decided to carry out some experiments with a view to extending the range to include both the long and medium broadcast bands. The tests proved very successful for it is now possible, by the movement of a single switch, to tune from 160 metres to well above 2000 metres, with the exception of a small gap centred around the intermediate frequency of 465 kc. (645 metres). This has been accomplished without disturbing the existing ranges and without the necessity of additional ganged condensers, coils and tuning controls.

The unit is applicable without alteration not only to the E.C.R. model, but also to other communication receivers, provided the aerial input circuit is not connected to earth. It should, however, be noted that the method outlined is not to be compared with the reception obtainable from a properly designed, high-class broadcast receiver, since there is usually some Morse interference present on the weaker stations. Nevertheless the addition of the unit is well worth while, especially since it in no way affects the performance of the receiver on the normal short wavelengths.

The unit is designed for the utmost simplicity and its satisfactory performance is indicated by the fact that S9+ readings (subject to the usual fading) are obtained from the Home Service stations and from many of the stronger Continentals. Admittedly, there is some loss with the aperiodic aerial input circuit and with the mismatch which is almost bound to occur between the anode circuit of the 6K8 valve and the input circuit of the receiver but, judging by the results, these losses are not very serious in practice.

Principle Employed

Briefly, the principle employed is the conversion of all received signals to a " pre-intermediate " frequency, which varies as the receiver is tuned; a triode-hexode valve of the 6K8 type being used for the purpose. Usually this would require a tuned aerial circuit and a ganged oscillator circuit employing switched coils wound to cover the medium and long-wave bands. Such an arrangement would give superior results, but would require several additional controls. The elimination of the latter is accomplished by the use of an aperiodic aerial circuit employing a high-inductance R.F. choke in association with a fixed frequency oscillator. It is necessary to pick a band 2000 kc. wide which will be reasonably free from interference due to broadcast, commercial and amateur stations. The space between 1·5 and 3·5 Mc. would serve, apart from possible shipping interference, whilst there are several bands available above 7 Mc. A sufficiently high frequency might enable all tuning to be carried out on the bandspread dial instead of on the main tuning dial, but this was considered a doubtful advantage since it would tend to make it more difficult to check frequencies. The frequency chosen for the oscillator is 7400 kc. Other frequencies could be employed, but in practice this particular one has proved entirely satisfactory.

The output from the combination is applied to the normal input circuit of the receiver. This output, of course, covers a very wide range of frequencies and, by using the normal receiver tuning controls, the desired frequency is selected. Tuning over quite a small portion of one of the ranges renders it possible to receive stations on wavelengths between 160 and 2000 metres.

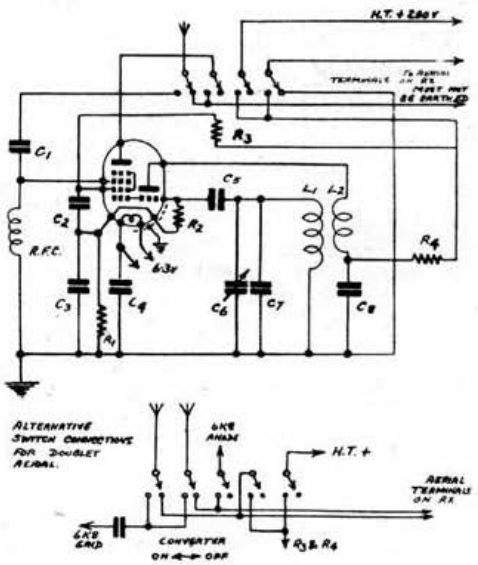


Fig. 1

Circuit of adapter for E.C.R. receiver.

C1, C5.	100 μμF Mica Tag Type.
C2, C3, C4, C8.	·1 μF Tubular Paper Type.
C6.	3—30 μμF Trimmer.
C7.	50 μμF Mica Tag Type.
R1.	300 ohms ½ watt.
R2.	50,000 ohms ½ watt.
R3.	30,000 ohms ½ watt.
R4.	20,000 ohms ½ watt.
R.F.C.	200—2,000 metre choke.

Clix Octal Valveholder.
Bulgin Switch, 4 or 6 pole, 2 position.
Bulgin Octal Adapter, type A52.
6K8 valve.

* *Member Experimental Section.*

Construction

The adaptor has been built inside a box measuring 4½ in. by 6½ in. by 2 in. deep, constructed of heavy gauge copper, reinforced at the corners with small pieces of ¼-in. square brass. The latter are drilled and tapped to enable the lid to be screwed down and the details are clearly visible in the accompanying photograph. A box of the dimensions given will fit easily into the E.C.R. cabinet but, if found necessary, some reduction in size is permissible.

The circuit, given in Fig. 1, is practically self-explanatory. The valve is mounted horizontally and the components forming the input circuit are mounted close to the grid top-cap, the others, associated with the oscillator, being grouped around the valve-holder.

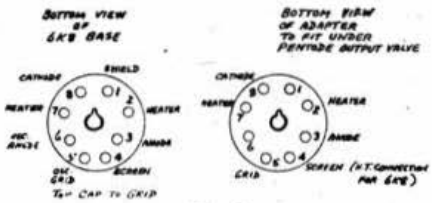
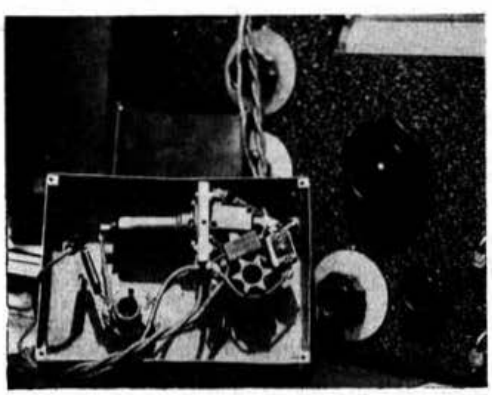


Fig. 2

A series heater connection must be employed with an A.C./D.C. Receiver.

The actual coil used is wound on a 1-in. diameter ribbed former, but this would not appear to be essential and a plain former may be substituted if desired. Both coils are of 20 s.w.g. enamelled wire, close wound, L1 having 18 turns and L2 9 turns. A space of ¼ in. is allowed between the two windings. The coils are wound in the same sense so that the top connection goes to the oscillator grid and the lowest to the oscillator anode.

Naturally the frequency must be kept as stable as possible. This is ensured by the employment across the tuned circuit of a fixed condenser (C7), in conjunction with a trimmer condenser (C6), by means of which the final tuning is carried out. A refinement might be to use crystal control at this point, but the stability secured was sufficiently good to render this course unnecessary. In any case the writer now has no crystals with which to experiment!



A close-up view of the adapter before the switch was fitted. A plain former can be used in place of the ribbed type illustrated.

When a single wire aerial is employed, a four pole-two position switch is suitable. In the case of a doublet aerial, a five pole switch will become necessary if the change-over is to be accomplished in one operation. Its action is simply to connect both ends of the doublet together and, if preferred, this may be carried out externally. The connections to the switch are illustrated in Fig. 1. The switch should be mounted in a manner which will allow the spindle to project through a hole made for the purpose in the side of the receiver cabinet when the complete unit is fitted therein.

Power supplies are taken from the socket of the output pentode by means of a *Bulgin* octal adapter. Only three connections are made to the latter, two for the heater supply and one for the H.T. supply. The voltage of the latter should be in the region of 200 volts and is taken from the screen grid of the pentode, not from the anode.

The two short leads to the receiver aerial terminals may be screened to reduce pick-up, but they must be well insulated as they carry the full H.T. voltage. It is advisable to use a separate earth lead rather than to rely on the connection to the octal plug.

Adjustment and Operation

The setting of the oscillator to its allotted frequency is accomplished by first of all tuning the receiver itself to 7400 kc. On adjusting the trimmer condenser C6 a point will be found at which the "S" meter on the receiver will be thrown hard over. A signal on 200 kc. (1500 metres) should then be found to come in when the receiver is tuned to either 7200 or 7600 kc. Similarly a signal on 1500 kc. (200 metres) will be heard with the receiver set to 5900 or 8900 kc. At first sight there would seem to be little to choose between tuning the receiver above or below the initial frequency of 7400 kc., but it will soon be found that at frequencies below 6470 kc. (arrived at by deducting twice the intermediate frequency from the initial frequency of 7400 kc.) image response is encountered and bad second channel interference results. This effect will occur with any degree of image rejection owing to the strength of the local oscillations, although it will be less troublesome on receivers with high intermediate frequencies. By keeping to the higher frequency side of 7400 kc. the trouble is obviated. Some trouble does occur from second and third harmonics beating with other signals, but this effect cannot be eliminated in an adapter having no input selectivity at all. Reception will not be possible near the frequencies 6935 and 7865 kc. since these will correspond to the intermediate frequency.

Two alterations have been made to the E.C.R. receiver in use by the writer. The send-receive switch has been moved to the centre of the panel and a control to match the A.V.C. switch fitted to it. In the place it previously occupied, a 100,000 ohm variable tone control has been mounted, after filing the aluminium chassis slightly. This takes the place of the former fixed tone control resistance. Two new mounting brackets will be necessary to make these alterations possible.

Bulgin plain dial lights (similar to the red lamp supplied) have been fitted on each side of the dial and these illuminate a large part of the scale. This alteration renders the red lamp more or less useless and it can therefore be disconnected.

WORKSHOP PRACTICE*

By "SHACK"

PART VI.

In this article the author gives valuable advice on hardening and tempering metals, in addition to practical hints concerning the use and construction of many handy workshop tools.

Reamers

REAMERS, or rimers, are used in engineering practice to produce more truly circular holes than can be obtained by drilling. The hole produced by an ordinary twist drill is far from circular and it is customary to drill out the hole slightly smaller than required and then to insert a parallel reamer. These reamers are similar in appearance to twist drills except that there are five or more flutes which twist very slightly and in the opposite direction to a drill. The cutting is of course done by the flutes and not by the point, which is blunt. Parallel reamers can be obtained in sizes from about $\frac{1}{8}$-in. in diameter up to $1\frac{1}{2}$-in. or over, the prices ranging from a few shillings to a few pounds. For the amateur constructor they are a luxury tool, but a $\frac{1}{4}$-in. parallel reamer can be very useful for cleaning out condenser bearings.

Taper reamers are much more useful and are intended for tapering a hole to take a taper pin. Both parallel and taper reamers have a square head so that they can be rotated with a tap-wrench, but the taper reamers can also be obtained with a square head to fit a joiner's brace. They are only made in the smaller sizes and cost three or four shillings each. A set of three or four reamers taking from $\frac{1}{8}$-in. to $\frac{1}{2}$-in. are invaluable for enlarging holes in sheet metal. The fact that the hole is taper is of no consequence as the material is rarely thicker than $\frac{1}{8}$-in.

Broaches and Braces

Broaches are a cheap form of taper reamer and are made in smaller sizes than reamers. They are taper pieces of steel with five flats ground as cutting edges instead of the flutes of the reamer. Broaches cost but a few pence and can be obtained as small as $\frac{1}{64}$-in. diameter.

When purchasing a joiner's brace choose one with a ratchet and if in doubt about the sweep, select the largest. A ratchet brace is not often wanted but when it is it can save many hours of time. Holes in a corner can quite easily be drilled with a ratchet, an operation which is practically impossible with a plain brace.

Home-made Tools

With so many excellent tool shops carrying a wealth of stock the amateur of to-day does not realise that only a few years ago it was the practice of fitters to make many of their own tools. Drills, scrapers, punches, special taps, scribers and squares were all hand-made. Old files were often the material used and with a few lengths of silver steel a capable man could produce a very fine kit of tools. The writer has often found his early training of great assistance when a tool has been required for some special job. To take one instance, it was required to tap half-a-dozen holes in an $\frac{1}{8}$-in. aluminium chassis where an ordinary tap was not long enough to reach. A piece of silver steel of the next largest size to the tap was selected and filed down in the lathe till the micrometer measurement showed that the first inch was of the required diameter. (Actually, the "lathe" was a jeweller's polishing head with a $\frac{3}{8}$-in. chuck mounted on a scrap sewing machine treadle.) Having filed the silver steel to the correct size one end was threaded for about an inch with a button die. The three flutes were cut with a very small half-round file taking great care not to damage the threads next to the cutting face and to leave the cutting face square. The next operation was to harden and temper the tap as will be described later in this article. From start to finish it took under half-an-hour to make this special tap and the result was well worth the time taken as the alternative would have been six brass nuts on an otherwise clean panel.

Silver Steel

Silver steel is a high-grade of carbon steel which is much used for making small hand tools.

It does not contain silver, the designation being given to it because of the highly polished finish of the ground bar. Silver steel is sold in square and circular bars 12-in. long in sizes varying from $\frac{1}{16}$-in. to 1-in. the sizes being true to ·0005-in., the pre-war price of the $\frac{1}{4}$-in. diam. size being about 6d. per foot.

Hardening and Tempering

As supplied, silver steel is soft and easily cut with a file, drill or hacksaw, but before it can be used as a cutting tool it must be hardened and tempered. Softening (or annealing), hardening and tempering are all heat processes. If steel is heated to a dull cherry red and allowed to cool very slowly, as, for instance, when covered with ashes it will be very soft, but if the cherry red steel is plunged into cold water the steel will be very hard, yet too brittle to be of any use as a cutting tool (except as a scraper). To make the tool fit to cut, some of the hardness must be "let out" and this process is called "tempering."

Different classes of tools require different degrees of hardness and fortunately it is possible to tell this hardness by the colour of the oxide scale which forms when the tool is being heated for tempering.

As an example, let us assume we have made a special screwdriver and wish to harden and temper it. The table tells us that the colour for a screwdriver should be dark blue. Having forged and ground our screwdriver to shape we should first harden it by heating the tip to a bright cherry red and plunging it into cold water. As we only require the tip to be hard, only the tip should be heated. There will be sufficient metal in the body of the blade to take the

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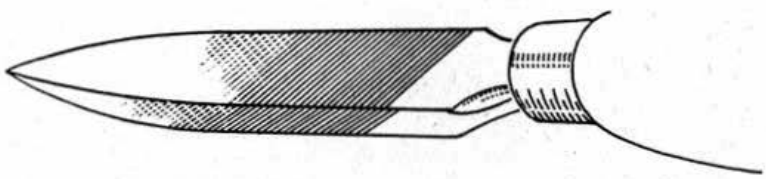
* *Previous Articles in this series appeared in Vol. 15 (Pages 269, 328, 392, 506 and 651)*

stress without hardening. If we now try to file the tip we shall find that the file slips over without cutting, showing that the tip is very hard, but if we were to use it in this state it would break at the first attempt, consequently it must be tempered. Take a piece of emery cloth and polish the tip. Now hold the screwdriver blade a few inches above a medium gas ring or bunsen burner so that the tip of the flame (but not the flame itself) plays on the body and watch for the colours forming on the polished steel. First comes a very light straw colour which deepens to a light brown, then to a purple brown, light purple, dark purple and finally a dark blue. Just *before* the correct colour is reached the screwdriver must be plunged into cold water as quickly as possible before any more heat can reach the tip and soften



One of the author's useful home-made tools—a triangular file, ground as a scraper. This tool is of particular use in cleaning metal parts prior to soldering.

it further. All this process takes less time to do than it does to read and with a little practice is quite easy. If the tool is found to be too soft, it can be hardened and tempered again but this should not be done too often otherwise the steel will spoil.

Forging and Grinding Tools

Small flat drills, screwdrivers and flat scrapers can be forged in any kitchen fire, the only tools required for forging are a hammer (about 1 lb.), a block of iron and a pair of large but old pliers to hold the work. Heat the steel to a dull red and with a few deft blows hammer it out to a little larger than the required size. Any superfluous metal can be removed with a carborundum or emery wheel.

It should be remembered that the group of materials called " mild steel " are hardly true steels at all but are more nearly iron. Mild steel cannot be hardened in the same way that a tool steel can be treated although heating has some effect on mild steel.

Materials

The heat treatment of silver steel has already been mentioned but it is not always realised that the non-ferrous metals like brass, bronze, copper and aluminium can have their physical characteristics altered by heat treatment. Briefly, to harden steel, it is heated and cooled rapidly, whilst to soften or anneal it the heating is carried out slowly. The non-ferrous metals can be softened by heating and cooling but the speed of cooling has not the same effect on their ultimate hardness as it has on steel. The only way to increase the hardness of the non-ferrous metals is to " cold work " them and in the case of sheet metal this is achieved by rolling the sheets cold. In the same way hard-drawn wire and tubes are drawn through dies whilst cold. If they are ordered " soft " then the metal is heated in a furnace and allowed to cool. Brass, copper and bronze can be heated to a dull red but great care must be taken not to overheat aluminium (or its alloys), as its melting point is below a visible red heat.

The action of rolling a sheet of metal imparts what is called a " grain " and if the hard metal is to be bent it must be bent across this grain, otherwise it is almost sure to crack. As the grain runs lengthwise down the sheet it can be considered as parallel to the minute scratch lines which are to be found on a sheet of hard rolled metal. If in doubt cut a strip of metal and try bending it in two places at right angles when it will be almost sure to crack along the grain.

Brass and bronze should be cut without any lubricant and the drilling speed can be fast. Copper should be drilled carefully as the swarf is inclined to stick to the drill causing it to bind and break. A special lubricant is usually used for cutting copper, but as a makeshift a thick oil can be used. Turpentine is the best lubricant for aluminium, but it leaves a sticky resinous deposit which is difficult to remove and for work where this deposit cannot be tolerated, paraffin oil should be used as a substitute. Alternatively thin sewing machine oil can be tried.

Hardness	Colour	Use
Very hard	Cherry red ..	For preliminary hardening only
Soft	Pale blue ..	Too soft for any practical purpose
Elastic	Dark blue ..	Springs. Screwdrivers, circular saws (metal), wood chisels
	Dark purple	Cold chisels (metal), axes
	Light purple..	Wood drills and bits
	Yellow purple	Plane irons, metal drills
	Brown yellow	Gouges, reamers, punches
Hard	Dark straw ..	Taps and screw-cutting dies.
	Medium straw	Machine tools
	Light straw ..	Machine tools
	Very pale straw	Hammer faces and scrapers for brass

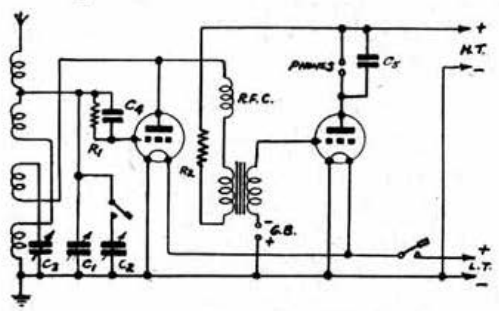
* *Taken from " A Text-Book of Mechanical Engineering," by Wilfrid J. Lineham—Chapman & Hall, 1918.*

ULTRA-LONG WAVE RECEPTION AS AN AID TO MORSE PRACTICE

By J. P. HAWKER (G3VA) and T. C. BRYANT (G3SB)

A POPULAR form of morse practice is the copying of commercial schedules, but the difficulty usually arises of finding a station transmitting at regular intervals, sending at the required speed and free from fading or other interference; further the station should be sending something of interest in plain language. This latter point is of importance, for although code may provide good practice, there is little check upon the accuracy of the copy, and it takes a very keen enthusiast to keep at it for long. For these reasons the most suitable matter is that provided by stations transmitting news messages in English.

On the short-wave band the only stations which meet the above requirements are unfortunately those supplying propaganda bulletins from Germany. Like their telephony counterparts, the constant and obvious perversion of the truth tends to become



A simple Two-Valve Receiver suitable for long-wave reception

C1, 3.	.002 μF Preset.	C5.	.005 μF.
C2.	.002 μF.	R1.	2 Megohms.
C4.	.0003 μF.	R2.	20,000 Ohms.

tedious. The remedy is to desert the short-waves and listen to the British Official Press transmitted from Rugby on 18,750 metres.

A Suitable Receiver

The chief reason why few amateurs listen on this wavelength is the difficulty of winding the necessary coils, especially by hand. The authors have overcome this obstacle by making use of a pair of quench coils of the type most amateurs possess. While the efficiency of a receiver using such coils is undoubtedly low, the circuit of the two valve receiver shown is capable of receiving Rugby at a strength which is perfectly readable. Most of the components required are invariably found in broadcast receivers and since they need not be of high grade, few amateurs will have to look further than their junk-box !

The grid coil consists of the two quench coils in series, care being taken to see that they are connected so that the coil thus formed is continuously wound in the same direction. The reaction coil comprising 350 turns of fine wire is wound in the gap between the two sections.

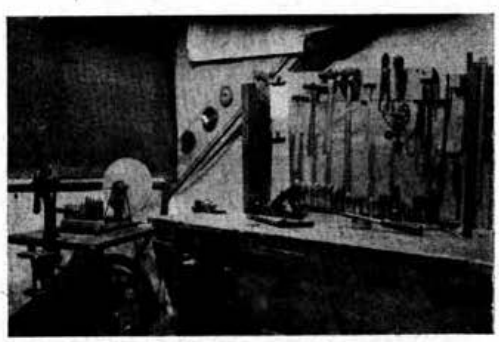
To tune the receiver a ·002 μF maximum preset condenser is connected across the coil, in parallel with a fixed condenser of ·002 μF. The wave-range may be extended by the use of a switch to disconnect the fixed condenser. These values will be found perfectly satisfactory if *Eddystone* coils are used, but may have to be slightly altered if some other make is employed. The coil shown in the aerial lead is of the 200-turn variety and can be of the plug type. Although not essential this is particularly useful if the set is used close to powerful medium-wave broadcast transmitters. It may be found that when the receiver is tuned to Rugby, a high pitched whistle is heard, this can be obviated by the use of a fixed condenser of about ·004 μF connected across the headphones. The remaining connections are orthodox and require no explanation.

GBR Schedules

The following information although taken from publications issued before the war by the Bureau of the International Telecommunications Union, Berne, is believed to be substantially correct :—Rugby Radio, GBR, transmits pure C.W. on a wavelength of 18,750 metres (16 kc.) with a power of 350 kilowatts. Official press bulletins are sent out at 12.00 G.M.T. daily except Sundays, 20.00 G.M.T. daily and 23.30 G.M.T. daily except Saturdays. Time signals are radiated for five minutes prior to 10.00 G.M.T. and 18.00 G.M.T. daily. The speed of sending varies, but the average is 20 w.p.m.

While there should be no difficulty in tuning in GBR, the following list of stations, which are frequently heard, may be of some help :—Ruiselede Radio ORU, a Belgian coast station on 18,250 metres; GBV Rugby and GIX Oxford, fixed service stations.

News-agency bulletins are frequently radiated from GBR, but it must always be remembered that such transmissions are strictly copyright.



Many of the tools described by "Shack" can be seen in this photograph of a corner of his workshop. The jeweller's polishing head mounted on the sewing machine has a disc grinder assembled on the spindle. A rack at the back of the bench holds the files and large screwdrivers, whilst the hammers, saws, steel rules, tinsnips and hand drill hang from the upper rack.

EXPERIMENTAL SECTION

Manager: A. M. H. FERGUS (G2ZC)

WE are reluctant to admit it, but it would seem that, as far as E.S. is concerned, all work in connection with Aerials and Transmitters has ceased. Whilst agreeing that the practical aspects are at a standstill, we feel that much useful data could be published, based on recent developments reported from abroad.

As proof of this contention we note the following important articles from American sources :—

Electrical Communication, April 1940

1. *Ultra high frequency loop antennæ.*
2. *Harmonic voltage generation.*

QST, May 1940

1. *Extended variable frequency crystal control.*
2. *Narrow-band constant-level speech amplification.*

Radio, May 1940

1. *Feed system for the four-element beam.*
2. *New X-H array dimensions.*

Although it is not possible to devote a great deal of space to contemporary articles we are of the opinion that references to salient features would be welcomed in British amateur circles.

Mr. Williams has again produced some valuable notes based on reports published in *The Observatory*, whilst Mr. Heap gives us food for thought in his contribution on behalf of the Receiver Group.

G2ZC.

Propagation Group

The 28 and 56 Mc. Sub-Groups are circulating full-size letter budgets and it is suggested that to economise paper and to reduce postage costs letters be written on both sides of the paper. No report has been received from the Aurora Sub-Group for some months, and as letters to the G.C. have been unanswered, will all active members of this sub-group write to the G.M. direct ?

The Observatory for December 1939, publishes an article by H. W. Newton of the Royal Observatory, Greenwich, on the subject of " Sunspots, Bright Eruptions and Magnetic Storms." The author has given permission for the article to be freely quoted in this Journal. The following are extracts from it.

" From statistical studies of the records of sunspots and magnetic storms, the following facts are known :—

(1) There is a general similarity between the frequency curves of the two phenomena in the 11-year cycle.

(2) The biggest sunspots near their central meridian passage of the disk are associated with magnetic storms more often than can be ascribed to chance, and similarly,

(3) Great magnetic storms are associated with big sunspots.

(4) The most favoured position of the associated sunspot with respect to the time of commencement of the magnetic storm is about one day past the central meridian (the effective range is about two days before C.M.P. and four days afterwards). This time-lag of about one day appears to indicate the time of travel of the assumed stream of corpuscles from Sun to Earth.

" The individual relationship between a sunspot and a magnetic storm is apparent only in the case of the major and least frequent phenomena—say, sunspots that are clearly visible without a telescope and magnetic disturbances with ranges at Greenwich of one degree or greater in declination and 300 γ in horizontal force or vertical force. As we proceed to the smaller sunspots and smaller magnetic storms the relationship becomes more and more obscure.

" While the smaller storms do not give any conclusive evidence of their solar origin (if spot areas are considered) they possess a characteristic from which that origin is inferred. This is a marked tendency to recur at intervals of about 27 days which is the period of the Sun's rotation with respect to the Earth. We may sum up by saying that a sunspot is evidently not essential to the occurrence of a terrestrial magnetic storm ; but if the initial solar disturbance is intense enough to produce a great magnetic storm, then it will also probably produce a big sunspot."

Regarding the possible relationship between bright chromospheric eruptions on the Sun and terrestrial magnetic storms the article mentions that since 1892, 29 eruptions of greatest intensity have been recorded and " we note that 21 out of the 29 cases were followed within 4·0 days by a magnetic storm, and that half of these storms were ' great ' storms." (The description " great " is given by Greenwich to any storm whose range is larger than that given above.)

Further, " during the recent period of more intensive solar observation (1395 to 1938), six out of the eight ' great ' storms that occurred have had bright eruptions of intensity three, or three plus, recorded within two or three days earlier, the mean time interval being 1·0 days. (The mean time interval derived from all cases 1892–1938 in which a magnetic storm occurred within a period of 4·0 days after the eruption, is 1½ days.) " Thus, " while it cannot be claimed that a direct relationship between intense bright eruptions and magnetic storms has been well established the available data seem to show that such a relationship is very probable."

Finally, the article summarises the relationship between bright eruptions and ionospheric irruptions (sudden fade-outs).

In last month's notes reference was made to the tendency of magnetic storms to occur around the equinoxes. " Terrestrial Magnetism and Electricity " for March 1940, gives details of the frequency of auroras observed at Blue Hill Meteorological Observatory, Mass., U.S.A., from 1885 to 1939. The figures for the 12 months (January to December) are as follows :—13, 23, 34, 33, 23, 13, 21, 21, 32, 31, 13 and 14 showing maxima in March and September and minima in November and June. Figures are also given showing the tendency for magnetic storms to occur about 24 hours after the central meridian passage of a sunspot.

* *

It was with great regret that the 28 Mc. Sub-Group learned of the death of G8MH. He was an extremely keen member of the Propagation Group and the letter budget of his group always contained a very full report from him.

G2XC.

Receiver Group

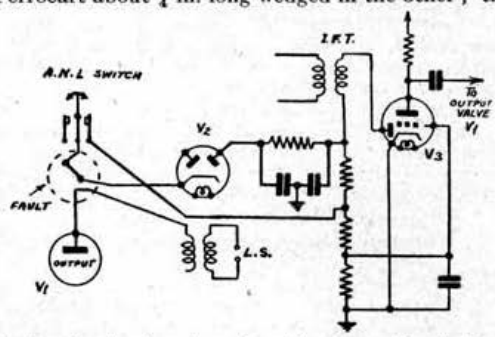
Low frequency howls in superhet receivers can usually be quickly traced to feedback, due to insufficient screening or bad design, or possibly to microphonic valves, but a rather unusual form of howl was experienced recently by R. P. Brett (G4IG).

A very bad howl was produced when the L.F. gain control was turned up with the automatic noise limiter valve working. The fault was finally traced to the anode lead of the output valve running close to one of the tags on the A.N.L. switch. When this lead was moved about ¼-in. the difficulty was overcome. The circuit is shown in the accompanying sketch with the components in their approximate positions, and it is interesting to note that although the anode lead of V1 did not run parallel to the cathode lead of V2 there was sufficient feedback at the switch tag to cause instability. This example shows very clearly the importance of examining every possible source of feedback when trying to track down instability in receivers, and it must be remembered that every wire, tag, nut and bolt may play its part in assisting the trouble.

Another point which should be borne in mind is that two receivers of identical construction, even though they may be commercially built, do not necessarily exhibit the same characteristics with respect to fault-finding. This is specially true when amateurs make alterations and adjustments to such receivers for it is usually insufficient merely to copy the design from another amateur, because each instrument requires individual attention if optimum results are to be obtained.

* *

For the benefit of amateurs who are in the habit of experimenting with superhet receivers, mention might be made of a very useful gadget known as the "magic wand." This consists of a piece of laminated bakelite or hard Acetate tubing about 12 in. to 18 in. long, $\frac{3}{16}$-in. in diameter and ¼-in. bore. A 2 B.A. brass bolt is firmly wedged in one end and a piece of Ferrocart about $\frac{3}{4}$-in. long wedged in the other; the ends may be sealed with wax. The brass end should be painted blue and the Ferrocart end red.



A sketch showing how low frequency howls in a superhet receiver were caused by the anode lead of an output valve running close to an A.N.L. switch.

The "magic wand" is invaluable for lining up and tracking superhets as it indicates immediately whether a given coil is on the high or low frequency side of resonance by inserting one end or the other inside the coil. The Ferrocart end increases the inductance whilst the brass end reduces the inductance of the coil by a very small amount. By noticing the effect on the signal the circuits may be quickly aligned without the necessity for trying out various values of trimming condensers.

G5HF.

Cosmic Notes

By E. J. Williams, B.Sc. (G2XC)

THE period for which data is available from the U.S.A. is March 24 to April 13. The first part of this period was covered in the report from Greenwich published last month, but a few additional details obtained from the American report are given below. It is regretted that under present circumstances data published in these notes is at least two months old. This is due to the erratic postal service from North America.

Sunspots

The provisional mean daily sunspot number for March, 1940, is given as 84·7. Comparative figures in recent years are: 1937, 83·9; 1938, 86·5; 1939, 64·6. The large spot responsible for the magnetic storms at the end of March this year was in part responsible for the unexpectedly high number.

Magnetic Elements

The severity of the March magnetic storms is well shown by the magnetic character figures issued by the U.S. Coast and Geodetic Survey as a result of observations at seven of their observatories at various places in North and South America, the Pacific and Australia. During the period May, 1938, to February, 1940, the maximum figure of 2·0 had been recorded once only, on April 17, 1939, from midnight to 12.00 G.M.T. Yet during the short period from March 23 to April 1 this figure was recorded no less than four times, viz., March 24, 12.00 to 24.00 G.M.T.; March 25, 00.00 to 12.00 G.M.T.; March 29, 12.00 to 24.00 G.M.T.; March 30, 00.00 to 12.00 G.M.T. The K-index reached a value of 9 (*i.e.* maximum on March 24, 15.00 to 18.00 G.M.T.; March 25, 00.00 to 03.00 G.M.T.; March 30, 00.00 to 06.00 G.M.T.

Following this disturbed period the magnetic elements became quiet on April 5, and continued so until the end of the period for which data is available.

Radio Conditions

Measurements at Washington, U.S.A., show that critical frequencies for the F2 layer extraordinary ray have been as follows: March 27, uncertain owing to ionospheric storm; April 3, 6,200 kc.

During May little has been heard of WGEO in the 9 Mc. band, and it is not known whether this station is still operating on schedule. WGEA has been an extremely good signal in the 15 Mc. band on most evenings during the past month. Dates on which it appeared to be below normal were May 1, 12, 15 (generally poor conditions), 24 (flutter on many signals), 28 (very fluttery).

KHAKI AND BLUE

A topical feature in which we publish information concerning our members serving in H.M. Forces. Items for inclusion in future issues should reach the Secretary-Editor not later than the first day of the month preceding date of publication.

R. F. B. Udall, 2HKS, stationed with the R.A.F. in the Cambridgeshire area, is but one of hundreds who have written us in appreciation of this feature. He has had the good fortune to meet several hams, including G3GK of Spalding (a real old-timer in that town), 3PX of Shrewsbury, and 8RC. 2HKS expects to be transferred to No. 2 E. & W. S. at an early date. Letters can be sent to him c/o "Gorton," Longdon, Nr. Rugeley, Staffs.

* * *

Eric Trebilcock, VK5TK, tells us that the local gang at Aeroradio, Liverpool, N.S.W., were pleased to welcome recently Tel. S. Garnett, G4AW. From the same correspondent we learn that several hundreds of VK amateurs have enlisted, VK5TK confirms that VK2AKE, 2AMA, 2EAU, 2HY, 2AMS, 2TQ, 2IP, 3DG, 3BG, 3YF, 3KR, 3OR, 3YS, 3GW, 4CW, 5HR, 5ZZ, 5LK, 6MN are with the R.A.A.F.

* * *

News at last from a VK ham in this country. Charlie Miller, VK2ADE, writing from a south-west coast town, tells us that he and VK3XE are serving as Air Gunner/Wireless Operator with the R.A.A.F. VK2ADE hopes to meet local hams, and anticipates a visit to London shortly. Charlie was a prominent entrant in B.E.R.U. contests, and is, we believe, one of the few VK DX C.C. certificate holders. He tells us that about 75 per cent. of the operators in the R.A.A.F. are amateurs.

Members in the Edinburgh area will be interested to hear that old-timer R. W. H. Bloxam, GM6LS, who served as a Pilot in the Great War, is now in training at No. 2. E. & W. School for Signals duties. He wishes to be remembered to his ham friends everywhere.

* * *

Congratulations to H. A. M. Whyte, G6WY, and Ian Orr-Ewing, G5OG, upon their promotion to the rank of Squadron Leader, R.A.F.V.R.

* * *

J. D. Morris, G2RR, of Stockport, who has joined the R.A.F. as a Radio Mechanic, sends greetings to 2BKO and G4HK, who he believes are serving in a similar capacity as himself. Letters may be sent *via* Headquarters.

* * *

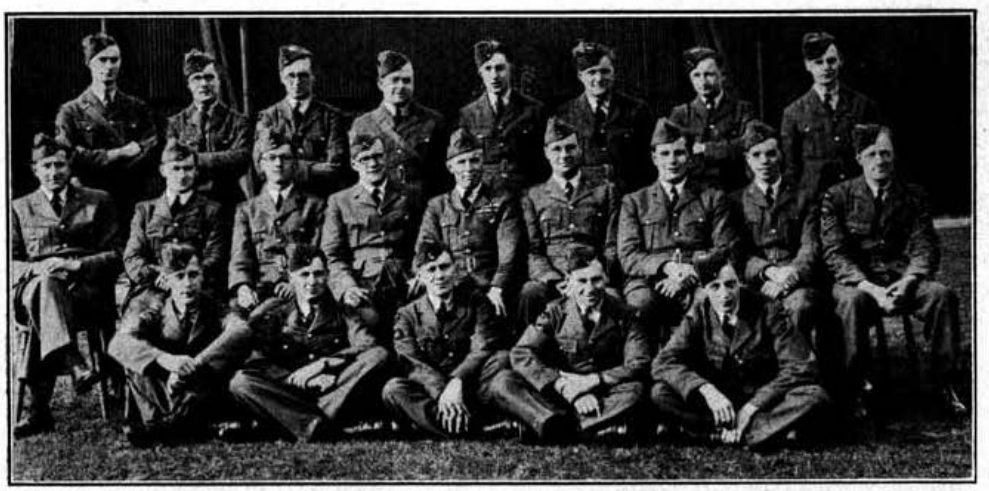
Lt. D. Macdonnell, who is with the R.C. of Signals in Egypt, wishes to be remembered to old friends who worked him under any of his pre-war calls. These included G6ID, XU4DI and SU1DA. He tells us that QSL's are still trickling through.

* * *

Flt.-Lt. N. Best, G5QN, will be pleased to meet any member located near to his present QRA, the Hurlingham Hotel, Surrey Road, Cliftonville, Kent.

* * *

A little bird whispers that a well-known North London ham, who is serving with a North Sea Patrol



Back to School!

A group photograph taken last month at No. 1 Electrical and Wireless School, R.A.F.

Back row: 2CVA, BRS.2949, G4HP, 2CMR, 2AMV, BRS.3739, G2YZ, G4NA.

Middle row: G2MF, G6DC, G8VC, G5JU, Sq.-Ldr. H. W. St. John (Chief Instructor), G6NZ, BERS.301, 2BGN, ZB1O.

Front row: ——, 2FZU, 2FXS, 2FIX, BRS.3747.

as an Engineer Lieutenant, has been causing mild consternation by his ability to flick an Aldis lamp at a nice 20 per. Rumour hath it that a Yeoman of Signals aboard a destroyer had an apoplectic fit when the aforesaid ham capped the final " R " to his message with " okedoke." The mainbrace was immediately spliced !

* * *

L.A.C. Hall, BRS1637, whose home address is now 51 Lyncroft Gardens, Hounslow, has met a great many hams since joining the R.A.F., including a VU and YI. He made a personal QSO with a G4 who was whistling " Test " in the breakfast queue !

* * *

Ken Smith, G3RB, who is now a Signalman in the 2nd Army Signals, wishes to convey greetings to G3II, 6ZN and 8KP. Letters should be sent via his home address, " Sunroyal," Broomscroft, Ossett, Yorks.

L.A.C. O. Read (G2FP) of Exeter is serving with the B.E.F. in France.

Writing from France on May 29, Cpl. Brian Lagden (G3GX) of Whetstone reports that all the gang with him are alive and kicking and most of them are more enthusiastic than ever about ham radio. In personal strain he writes " For myself I am now keener than I was at the beginning of the war and that's saying something." He has oftimes heard " nifty DX " and his hand has reached out for the key that wasn't there !

Brian sends greetings to old pals in District 12 and reports that Fred Ingleton (G6FI), who is still with him, dreamed of N.F.D. during the night of June 1 and 2 !

* * *

Welcome News from ON4UU

The many hundreds of British friends of M. Paul de Neck, ON4UU, Past President of Reseau Belge, will be relieved to hear that he and his family escaped successfully from Brussels when their country was invaded. M. de Neck is now located at Salies de Bearn, Basses-Pyrenees, France, and letters may be sent via G6CL.

We have received no news from other Belgian amateurs except M. Hunninck, who is working in a French war factory.

Naval Casualties

Among the names of those reported by the Admiralty on June 3rd as having been wounded on active service, appeared the names of the following Royal Naval Volunteer (Wireless) Reservists :—

Ldg. Tel. R. W. H. Applebee, C/WR137.
Tel. H. P. Newman, C/WRX348.
Tel. J. Turnbull, C/WRX565.

Although not members of R.S.G.B. we take this early opportunity of wishing them all a speedy recovery.

Canada's Response

The publication on another page of the first list of Canadian amateurs who have answered the call to service will bring a feeling of pride to all members in the Old Country. It is to be hoped that the VE's who have yet to reach these shores will give us the same opportunity of making and maintaining contact with them as did those of the First Canadian division.

Back Safely

As we go to press news reaches us that Monty Campbell (G8MK) and Frank Adams (G2YN) have returned safely to England. Monty had the unenviable distinction of hearing the Germans announce the capture of Arras whilst sheltering in the cellars beneath the museum. Frank says, to quote his own words, " I managed to get away with my life (and little else). All I need now to complete my happiness is my BULLETIN."

On the left J. H. Brazzill, G3WP, on the right T. C Littlemore, G8AX, whose frequent meetings in strange places provided the subject for Ham Coincidence No. 4. Both are serving as Telegraphists in the R.N.V.(W.)R.

ON ACTIVE SERVICE

NINTH LIST

WE publish below our ninth list of radio amateurs on active service. Additional details and corrections should be advised to Headquarters as early as possible. The present list contains information received up to June 3, 1940.

Rank and Name	Regiment or Branch	Pre-war Call or B.R.S.
Cpl. W. M. Beattie ...	R.A.F. ...	GM8AT
P./O. R. W. H. Bloxham	,, ...	GM6LS
Maj. G. F. Carpenter ...	R.E. ...	G8ZD
A.C.2 F. P. Cawson ...	R.A.F. ...	2ART
L.A.C. L. J. Cooper ...	,, ...	3788
A.C.1 C. Davies ...	,, ...	2HCQ
Stf./Sgt. A. Dowdeswell	R.A.O.C. ...	G4AR
Maj. E. L. Ellis ...	R.C. of S. ...	ZB1LS exG5LS
Gnr. J. Garner ...	R.A. ...	2BGO
L.A.C. A. Giddy ...	R.A.F. ...	3760
Sub-Lt. K. A. Goudge	R.N.V.R. ...	3329
L.A.C. D. C. Hall ...	R.A.F. ...	1637
L./Boy D. M. Hanwell	R.N. ...	3804
A.C.2 A. J. Herridge ...	R.A.F. ...	2DRK
F./O. A. Hibbins ...	,, ...	3787
P./O. E. Hosey ...	,, ...	3786
P./O. H. B. Jefferies ...	,, ...	GM8HJ
Gnr. T. N. Lloyd ...	R.A. ...	G3SL
Sgt. H. B. Lymna ...	R.A.F. ...	3802
Lt. D. A. Macdonnell ...	Egypt Command Sigs.	ex-SU1DA
L.A.C. H. Mee	R.A.F. ...	G5MY
F./O. J. E. Mills ...	R.A.F. ...	EI8P
L.A.C. F. C. Moore ...	,, ...	G3ZM
L.A.C. J. D. Morris ...	,, ...	2DRR
Cpl. T. W. Moss ...	R.E. ...	1711
Mid. F. A. Moyle ...	R.N. ...	3277
Tel. H. Pilbeam ...	R.N.V.(W.)R.	G8MP
L.A.C. R. P. Pohlmann	R.A.F. ...	2DOR
— W. J. Prestidge ...	Grenadier Guards.	2BXP
F./Sgt. E. S. Sellek ...	R.A.F. ...	3785
F./Sgt. A. E. Seymour	,, ...	ZB1Q
Sig. K. Smith	R.C. of S. ...	G3RB
—M. Steed	R.A.F. ...	3793
F./Sgt. R. Stride ...	,, ...	BERS. 232
2nd Lt. R. S. Trevelyan*	R.C. of S. ...	2CKQ
Ft./Lt. A. F. Trinder ...	R.A.F. ...	G4MT
A.C.2 R. T. Trull ...	,, ...	3797
Cpl. J. Turner	,, ...	G6LU
P./O. D. M. J. Tyre* ...	,, ...	GM5TY
P./O. T. Vickery ...	,, ...	G2VI
2nd Lt. J. E. Walford	South Wales Borderers.	2FVN
L.A.C. A. Whatley ...	R.A.F. ...	3790
Pte. F. E. Wingfield ...	R.A.O.C. ...	G3CX
Tel. D. C. Woodford ...	R.N. ...	3635

* *Non-Members.*

Blue—But No Blues—at Sleaford

The early afternoon of Sunday, May 19, found nearly 50 amateurs foregathered at a quiet country inn situated in the midst of typical Lincolnshire scenery. The majority of those present were drawn from the Services, and various means of locomotion had been employed to reach the venue.

The day being a very fine one, it was only natural that the " ordeal " of facing innumerable cameras should be endured before the proceedings proper commenced. After a brief introduction by G6NZ, " Clarry " (G6CL), who was a very welcome visitor to the meeting, held forth on many matters appertaining to the amateur radio movement, past, present and future. He was able to clear up several items of interest regarding licences, subscriptions, etc. The necessity for keeping the Society strong was appreciated by all present, two new members enrolling on the spot.

The question of rank is a difficult one when amateurs in the Services meet together, since " ham spirit " is essentially one of fraternity. The old Toc H motto, of Poperinghe days, quoted by Clarry, " Abandon rank all ye who enter here," is one worth bearing in mind under such circumstances.

A well served up high tea was followed by a display of films, commencing with District 17 N.F.D. (and including some excellent shots of Lincoln) and finishing with a thrilling " melodrama " produced by the B.T.H. Amateur Ciné Society, the plot bringing in the use of amateur radio.

Among the well-known amateurs present were Geoff Hudson (G6GH), Leon Newnham (G6NZ), and Jerry Walker (G5JU). A special vote of appreciation was accorded to Norman Davies (G6TV) for his efforts in organising the meeting, and also for all he has done in the past in furthering the welfare of amateur radio, both through the R.A.F. Amateur Radio Society and through R.S.G.B.

J. N. W.

Publications Received

We have received from the A.R.R.L. a copy of their Publication No. 8, entitled *How to Become a Radio Amateur*, and priced at 25 cents. This is a simple introduction to the art, and includes descriptions of a suitable receiver and transmitter for the beginner. There is also descriptive matter on aerials, procedure, Morse, and " interpreting what you hear."

T. P. A.

CANADIAN AMATEURS ON ACTIVE SERVICE

LIST No. 1

IT is with particular pleasure that we give the fullest publicity in our power to the following list of Canadian Amateurs who have answered the call to service.

We are indebted to Mr. Fred Saxon, VE2SG, President of the Canadian Operators Association for the list which will be studied with interest by British and Canadian amateurs everywhere.

Those who have attended the Farnborough meetings will already have made the personal acquaintanceship of a great many of those whose names appear below.

Additional details and corrections should be advised to Mr. Saxon, 302 Lee Avenue, Toronto, Ontario, as soon as possible. This list contains information received by him up to April 1, 1940.

Rank and Name	Regiment or Branch	Pre-war Call.
Sig. C. W. Acton	R.C.C.S	VE5SP
Tel. H. Alexander	R.C.N.	5AIY
A.C.2 J. A. Alexander	R.C.A.F.	3AYP
Tel. B. Anderson	R.C.N.	4AMK
Sig. E. G. F. Anderson	R.C.C.S.	2OZ
A.C.2 E. Antoine	R.C.A.F.	4AGM
A.C.2 A. Arnold	,,	4AKI,
A.C.2 B. W. Arnold	,,	3AXJ
Tel. H. G. Atwood	R.C.N.	3AEG
Tel. L. Bate	,,	3AGN
A.C.2 E. J. Bavington	R.C.A.F.	3ANI
A.C.2 H. L. Bennet	,,	4SD
A.C.2 C. A. Bertrand	,,	2PG
Tel. B. Best	R.C.N.	3ZQ
Tel. J. A. Betts	,,	5EB
A.C.2 F. Bissett	R.C.A.F.	3AIU
Tel. H. Bolduc	R.C.N.	3AYC
Cpl. C. Boughner	R.C.A.F.	3IM
A.C.2 Ed. Breau	,,	1DS
Sig. P. Brodribb	R.C.C.S.	3AON
Sig. F. S. Brough	,,	2GF
A.C.2 Ted. Buller	R.C.A.F.	3CO
A.C.2 F. Burgin	,,	3AUI
A.C.2 D. W. Burke	,,	4VJ
Sig. Cam. Burrows	R.C.C.S.	3AGC
Tel. C. Christie	R.C.N.	3AZW
Tel. G. Clark	,,	5AAZ
Sig. F. G. C. Craft	R.C.C.S.	1DG
A.C.2 K. O. Cromwell	R.C.A.F.	3KD
Tel. R. L. Crooker	R.C.N.	3HG
A.C.2 G. W. Davis	R.C.A.F.	4UO
Tel. M. Diamond	R.C.N.	3ABU
Tel. L. G. Dixon	,,	4AGN
Tel. N. Doughty	,,	4AGQ
A.C.2 R. E. Draper	R.C.A.F.	5KO
Maj. Art. Driver	R.C.C.S.	4CM
Tel. W. H. Drysdale	R.C.N.	5HO
Sig. F. Dudley	R.C.C.S.	3AAT
A.C.2 Ray Duffy	R.C.A.F.	1ND
A.C.2 D. M. Duncan	,,	4JC
Sig. R. Dunn	R.C.C.S.	3ATK
A.C.2 A. J. Earle	R.C.A.F.	4RT
Tel. B. Edwards	R.C.N.	3PD
Sig. L. G. Eon	R.C.C.S.	2LE
A.C.2 R. Erb	R.C.A.F.	3VY
A.C.2 N. F. Farr	,,	3ANQ
A.C.2 G. W. Fulton	,,	1OX
Tel. H. L. Geary	R.C.N.	4ABE
Cpl. R. N. Gladstone	R.C.C.S.	3APG
A.C.2 J. Gordon	R.C.A.F.	3AVN
Tel. J. H. Greaves	R.C.N.	5AGJ
Sig. Norm. Green	R.C.C.S.	3PV
A.C.2 L. Guerette	R.C.A.F.	2RG
A.C.2 Jack Hamilton	,,	3KV
Cpl. C. L. Harris	R.C.C.S.	3AQI
Pte. Jas. Harris	S. Sask. Regt.	4UZ
A.C.2 J. E. Hawkins	R.C.A.F.	4AJ
Sig. W. H. Hawkins	R.C.C.S.	5NR
Sig. F. E. Haughin	,,	1DP
Sig. W. G. Haymond	,,	5AFH
Sig. Tom. Henderson	,,	3AII
Lt. R. D. Heustis	,,	2BU
Sig. J. H. Holloway	,,	3AMY
Tel. L. W. Holmes	R.C.N.	3HV
Ft./Lt. N. Irwin	R.C.A.F.	3LW
Tel. J. A. Jinks	R.C.N.	4ZC
A.C.2 W. Johns	R.C.A.F.	5SD
Sig. W. D. Johns	R.C.C.S.	3APW
Sig. F. Johnson	,,	3CM
A.C.2 Stan. Jones	R.C.A.F.	5ADD
A.C.2 T. T. H. Jones	,,	4ABD
A.C.2 J. Keen	,,	3ADU
Sig. E. K. Kelcey	R.C.C.S.	5EK
A.C.2 F. Keys	R.C.A.F.	4VG
A.C.2 J. Knight	,,	3YX
A.C.2 R. E. Knightly	,,	3ES
Sig. K. Knowlton	R.C.C.S.	3ACQ
Sig A. Kufluck	,,	3SS
A.C.2 A. I. Lawrence	R.C.A.F.	4GX
A.C.2 S. W. Lawrie	,,	4IN
A.C.2 L. W. Leutchford	,,	3AAD
A.C.2 Bob Lorch	,,	3AXD
A.C.2 A. J. McAleese	,,	3AVM
A.C.2 I. F. McArthur	,,	4MD
Sig. L. R. C. McArthur	R.C.C.S.	2EM
Sig. B. C. McCallum	,,	5AT
Sig. F. B. McCallum	,,	4AIW
Tel. R. R. McCrindle	R.C.N.	4AEU
A.C.2 P. MacDonald	R.C.A.F.	4LV
A.C.2 G. A. McGregor	R.C.A.F.	3VT
Sig. J. S. MacKay	R.C.C.S.	5AFN
Tel. D. L. McKnight	R.C.N.	3KC
Sig. A. M. McPherson	R.C.C.S.	3AGK
A.C.2 Wilfred Marnie	R.C.A.F.	3AED
Tel. N. Marquis	R.C.N.	3AOT
A.C.2 R. E. Matthews	R.C.A.F.	5AEB
A.C.2 S. B. Mauchel	,,	4JD
A.C.2 D. W. Meakin	,,	5RV
Tel. N. Melnyk	R.C.N.	4AEY
A.C.2 D. Mendham	R.C.A.F.	3AWX
A.C.2 Bill Michael	,,	3AD
Sig. H. Miller	R.C.C.S.	2MI,
Tel. R. C. Miller	R.C.N.	4AFH
Tel. C. E. Misner	,,	3AYF
A.C.2 B. Morgan	R.C.A.F.	3ACS
Capt. W. C. Morgan	R.C.C.S.	3WM
A.C.2 J. Musselman	R.C.A.F.	4ANM
Sig. B. R. Nayell	R.C.C.S.	5RM
A.C.2 L. O. B. Neff	R.C.A.F.	4APD
Sig. E. Newnham	R.C.C.S.	5ABO
A.C.2 H. B. Newton	R.C.A.F.	5HI
A.C.2 Tony Page	,,	3BBV
Tel. E. V. Penny	R.C.N.	5AIZ
Tel. P. Poulton	,,	5AGN
A.C.2 J. L. Reid	R.C.A.F.	4OZ
A.C.2 N. G. Reidford	,,	4ANH
Sig. J. Richardson	R.C.C.S.	ex3AI,H
A.C.2 Al. Riddell	R.C.A.F.	5DU
Capt. C. L. Roach	R.C.C.S.	2BT
Sig. V. L. Robbins	,,	5ABV
A.C.2 A. J. Robertson	R.C.A.F.	1EM
A.C.2 J. Romanchuck	,,	4ABC
Sq./Ldr. A. H. Keith Russell	,,	9AL
A.C.2 Bob Sangster	,,	3FB
A.C.2 E. C. Sass	,,	3ARS
Sig. H. E. Savage	R.C.C.S.	5FB
Tel. David Scholes	R.C.N.	5DY
A.C.2 H. J. Simpson	R.C.A.F.	4AHE
A.C.2 G. Sleeth	,,	3ALR
A.C.2 A. A. Southall	,,	5OR
Tel. H. G. Stark	R.C.N.	3UH
Sig. W. J. Stauffer	R.C.C.S.	3DF
A.C.2 G. Stevens	R.C.A.F.	3RI
A.C.2 Geo. Stiles	,,	3BZ
Tel. S. Suggett	R.C.N.	3BAW
Tel. H. W. E. Swonnell	,,	4AFD
A.C.2 V. E. Tapp	R.C.A.F.	3ANT
Sig. H. Tattersall	R.C.C.S.	3RF

Rank and Name	Regiment or Branch	Pre-war Call
A.C.2 Bruce Taylor	R.C.A.F. ...	3OZ
A.C.2 J. H. Thoms	,, ...	3ARU
A.C.2 W. Townsend	,, ...	3ALP
A.C.2 F. H. Toy	,, ...	5HE
Tel. C. F. Underwood	R.C.N. ...	4AFG
A.C.2 J. T. Usselman	R.C.A.F. ...	4JK
A.C.2 W. N. Veale	R.C.A.F. ...	4OQ
Sgt. Al. Venning	R.C.C.S. ...	3ST
A.C.2 F. E. Vincent	R.C.A.F. ...	4KV
A.C.2 T. F. G. Voege	,, ...	3AEK
Sig. D. Wade	R.C.C.S. ...	2AM
A.C.2 E. F. Wadsworth	R.C.A.F. ...	5AAD
Gnr. W. D. Wadsworth ...	R.C.A. ...	5ZM
Tel. D. A. Wale	R.C.N. ...	3WZ
A.C.2 J. Walmsley	R.C.A.F. ...	4AEM
Sig. J. H. Walton	R.C.C.S. ...	2KY
Tel. R. Watson	R.C.N. ...	5DS

Rank and Name	Regiment or Branch	Pre-war Call
A.C.2 Gordon Webster	R.C.A.F. ...	2BB
Tel. N. Whitton	R.C.N. ...	3AUD
A.C.2 J. H. Widdop	R.C.A.F. ...	4AGW
Tel. C. E. Wigle	R.C.N. ...	3WI,
A.C.2 C. E. Wilde	R.C.A.F. ...	4ALW
A.C.2 J. W. Wilkes	,, ...	3HR
A.C.2 J. A. Earl Williams ...	,, ...	4ALE
A.C.2 R. Williams	,, ...	4ASE
Sig. V. J. Williams	R.C.C.S. ...	3KE
Sig. W. R. Willing	,, ...	3ANL
Sig. Al. Wilson	,, ...	3AMB
A.C.2 J. W. Wittman	R.C.A.F. ...	4OC
Tel. R. R. Whyte...	R.C.N. ...	4RP
A.C.2 Frank Wood	R.C.A.F. ...	3AGH
A.C.2 J. Young	,, ...	5PV
A.C.2 V. H. Young	,, ...	3ALX
Tel. W. Young	R.C.N. ...	4ASD

Royal Army Ordnance Corps.

We have been asked by the Director of Ordnance Services to draw the attention of members to the fact that storemen and clerks (including supervisory personnel) are required for the R.A.O.C.

The problem of receiving, storing, issuing and maintaining the vast variety of technical and general stores used by the Army is a very big one, and the only way it can be dealt with successfully is by the employment of specially selected personnel who have had the necessary experience and training.

The assistance of the Society has been solicited because the Director of Ordnance Services considers that within our ranks can be found many men between the ages of 20 and 50 who could undertake this work.

Rates of pay are quite good, and immediate promotion can be expected for specially selected men.

Society members would prove particularly adept in dealing with the receiving and checking of wireless and telephone parts.

Clerks are needed for numerous tasks, including clerical duties, keeping of accounts, preparation of shipping schedules, shorthand and typing.

Headquarters holds a supply of application forms, but direct application can be made to the Chief Ordnance Officer, Central Ordnance Depot, Woolwich Arsenal.

An Urgent Appeal

A number of good wireless operators are urgently required for Government work.

Requirements: sound technical knowledge of telegraphy apparatus and operation of low-power transmitters; operating speed about 20 w.p.m. Applicants should state nationality, age and experience. For further details please apply *via* the Secretary-Editor, R.S.G.B., as soon as possible

Service Honours and Awards

The Secretary-Editor will be glad to receive particulars of honours or awards made to radio amateurs. Frequently names appear in official lists which we believe refer to members, but unless authentic advice is given to Headquarters, we do not feel justified in assuming that the honour or award applies to the member whose name and initials are the same as those recorded in the official announcement.

Air Defence Cadet Corps

Since attention was first drawn to the organisation known as the Air Defence Cadet Corps, information has been received that several Squadrons are now operating a Signal Section under the direction of R.S.G.B. members. Within the past few months additional squadrons have been inaugurated bringing the total to nearly 200. As each Squadron carries at least 100 cadets on its strength, some idea of the magnitude of the A.D.C.C. can be obtained.

The purpose of the present notice is again to draw the attention of members to the movement with particular reference to the question of giving instruction in signals work.

G6CL will be pleased to give further information to any interested member, whilst arrangements can be made to loan the notes which he has employed for tuition at the Southgate (No. 85) Squadron.

It should be pointed out that the primary purpose of the A.D.C.C. is to make the youth of the country air-minded with the ultimate idea of enlistment in the R.A.F. Since last September nearly 20 per cent. of the cadets on the strength at that time have joined the R.A.F.

In addition to Signals, most Squadrons are giving tuition in Aero-Engineering, Theory of Flight, Model Aeroplane Construction, First Aid, Gas and other subjects.

The following is a list of Squadrons which are known to be receiving signals instruction from R.S.G.B. members:

Lewisham	...	R. M. Owen, G5RB.
Potters Bar	...	J. W. Mathews, G6LL.
Southgate	...	J. Clarricoats, G6CL.
Tunbridge Wells		L. J. Checkemian, G6ML.
Worthing	...	E. H. Paulton, G4IT.

Any member who is in a position to donate miscellaneous wireless receiving components for the use of the Southgate or any other local Squadron, is invited to write to G6CL in his private capacity.

Members on Active Service

Acknowledgment of the receipt of details from members on active service will, in future, be made only through the medium of the official lists published in this JOURNAL.

Such members are urged to allow Headquarters to send THE T. & R. BULLETIN to their home address.

Ham Hospitality.

The "Ham Hospitality" lists have now been consolidated and the information given below will it is hoped provide a basis for a more complete list which will cover *all* the chief towns in the British Isles. It is intended later to issue a circular to all members joining the services giving the names, addresses and telephone numbers of those willing to extend hospitality.

We appeal to all who are in a position to assist in this work to send a post card without delay to Headquarters.

London.—W. V. Champion (G8CY), 12 Bedford Road, Tottenham, N.15 (Amhurst 2066). Dr. C. G. Lemon (G2GL), 46a Flanders Road, Chiswick, W.4 (Chiswick 3097).

Alton, Hants.—J. Goodlad (G5LT), The Doreys, Medstead.

Ashford, Kent.—F. H. Cooper (G2QT), Fairbank, Smeeth (Sellindge 92).

Beeston, Notts. J. G. Treece (G3QD) 95 High Rd. (Beeston 54481).

Belfast, N.I.—F. A. Robb (GI6TK), 60 Victoria Avenue, Sydenham. J. N. Smith (GI5QX), "Ben Venuto," 19 Hawthornden Drive (Belfast 633323). City of Belfast Y.M.C.A. Radio Club. Club night, Wednesdays (Belfast 259451).

Birkenhead and Wirral.—G. Russell Lee (G6GL), 25 Boundary Road, West Kirby (Day, Birkenhead 322; Night, Hoylake 732).

Birmingham.—T. Martin (G2LB), 3 Gladys Road, South Yardley. G. A. Swinnerton (G6AS), 23 Hawthorn Croft, Quinton (Woodgate 2315).

Boston, Lincs.—Dr. A. C. Gee (G2UK), 150 Freiston Road (Boston 3172).

Bromley, Kent.—A. O. Milne (G2MI), 29 Kechill Gardens, Hayes (Hurstway 1877).

Cheltenham, Glos.—L. W. Lewis (G8ML), 117 Fairview Road.

Churchill, Somerset.—Capt. B. Wallich (G6BW), "White Orchard" (Churchill 263).

Fife, Scotland.—A. W. Lawson (GM2NQ), "Makora," Kinghorn.

Great Yarmouth, Norfolk.—D. E. Davy (G3RW), 59 East Road, Maygrove.

Heathfield, Sussex.—R. J. Lee (2HLF), 9 Theobalds Green.

Ipswich, Suffolk.—S. G. Keeble (G2AN), 139 Sidegate Lane.

King's Lynn, Norfolk.—H. W. Sadler (G2XS), Warren Farm, South Wootton (Castle Rising 233).

Leicester.—L. Ridgway (G2RI), 90 Romway Road (Leicester 24295).

Lowestoft, Suffolk.—L. Firmin (G5QO), 2 Hall Park Villas, Oulton Road (Oulton Broad 168).

Middlesbrough, Yorks.—G. A. Kenyon (G3YK), 32 Emerson Avenue (Linthorpe 8557).

Minehead, Som.—C. Bryant (G3SB), Beaconwood Hotel (Minehead 32).

Northampton.—R. R. Waite (G3PZ), 61 Broadway.

North Waltham, Hants.—Miss C. Hall (G8LY), North Waltham Rectory (Dummer 56).

St. Margarets-on-Thames, Middlesex.—J. N. Roe (G2VV), 27 Riverdale Gardens (Popesgrove 4781).

Scarborough, Yorks.—E. Mitchell (G5MV), 40 North Marine Road.

Stockton-on-Tees, Durham.—R. J. Bradley (G2FO), 36 Raby Road.

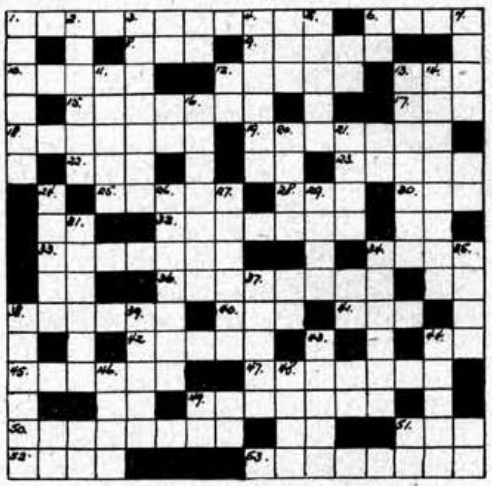
Swansea, Glam.—R. F. Armstrong (2HDX), 21 Walter Road (Swansea 4765).

Wallington, Surrey.—A. B. Willsher (G3IG), 14 Lytton Gardens (Wallington 5672).

Worksop, Notts.—A. Cartlidge (BRS2939), 261 Carlton Road. E. R. Martin (G6MN), "Castlemount" (Worksop 2190).

"HAM-RADIO" CROSSWORD No. 4

Prepared by R. E. WOOD (G3TK)



CLUES

ACROSS.

1. "Buffer" State between VU and U.
6. A Persian province.
8. ½ of Rheidt.
9. A well-known city in Nebraska.
10. A tributary of the Ganges, runs past Lucknow.
12. River in VP3.
13. Mountain between Dead Sea and Gulf of Akaba.
15. Town and irrigation headquarters on River Kistna, VU2.
17. Its.
18. Seaport at mouth of River Douro, CT1.
19. Province in EA.
22. ½ of the Swiss town Saanen.
23. You may be this short of W.A.S.
25. Group of islands between Tahiti and New Hebrides.
28. Territory on west coast of VU belonging to CT.
30. Hardly DX, just a river in EI.
32. An island in the River St. Lawrence, or a city in F.
33. Eastern European country near U, SP, HA and YU.
34. Group of islands belonging to J.
36. VK, but not Australia.
38. Town in VU2.
40. Township near Melbourne, or famous London gardens.
41. Town on Slave Coast, ZS3.
42. French Indo-China.
45. River flowing through Carinthia, joins Danube.
47. Is this I? ?
49. This looks like CP.
50. Town on River Waal, PA.
51. Watering place near Liége ON.
52. Town and river in HA.
53. Town in New Mexico, near Santa Fé, 3, 5.

DOWN.

1. One of the CR's.
2. British colony in Africa with river of same name.
3. Good W DX.
4. Island in the B.W.I. Was christened Assumption.
5. Textile town in ES.
7. City in Georgia, Transcaucasia.
11. A big W5.
13. Mexican State.
14. Another name for Tahiti.
16. Town in Oregon noted for salmon-canning.
20. Latvian seaport.
21. Island belonging to PA. West of Sumatra.
24. If the prefix for Bahrein Is. is VU, its strange that this isn't.
26. F.B. W7.
27. A cold K.
29. Upon Belgium.
31. You will find this town at the end of Bolan Pass, on road to Kandahar.
34. A city of the Syrian Decapolis.
35. Arabian State under G. & F. supervision.
37. Was a free port.
38. Seaport of Bali.
39. Town in Luzon, KA.
43. TA Province.
44. Territory in centre of LU.
46. British coaling station at entrance of Red Sea.
48. Same as 20 down.

(SOLUTION NEXT MONTH.)

THE MONTH "OFF" THE AIR—May, 1940

By ARTHUR O. MILNE (G2MI)

Navy Comforts

MEMBERS will be pleased to know that 12 receivers have now been supplied to the Navy Comforts Depot, and seven to the Army. Our note last month produced but one reply, a cheque for £5 from a Notting-Ham ! Very many thanks, o.m. This anonymous donor will be glad to hear that, due to the kindness of G8IG, his gift has enabled us to despatch a portable receiver to one of the Navy's loneliest outposts.

G6PR, who has done a magnificent job building many of the sets from parts supplied by other members, says he has had a number of appreciative letters from the actual recipients. This is splendid work, and the need is still very great. If you can't afford a sixpenny P.O. or the time to build sets yourself, drop a card to G2MI giving particulars of any battery gear you have spare which could be used up in this very excellent cause.

Here and There

BERS451, writing from the North-West Frontier of India, yearns for a transmitter in his superb location nearly 7,000 ft. above sea level. He describes the magnificent panorama of sandy desert and mountain peaks, with the Russian frontier away in the dim distance.

Those members who met Jack Shirley, ZL2JQ, last year will be glad to know that, after an eventful journey, he is safely back in New Zealand. Eric Trebilcock, VK5TK/BERS195, is now in Liverpool, N.S.W. and says his BULLETIN comes through as much as 50 days late. He spent his holiday touring by air in VK2, 3, 5 and 7, and met, amongst others, VK7BQ, 7CS and 7CW. He offers to send copies of his logs to any transmitter who requires reports on his signals prior to the war, and emphasises that reply coupons are not required. This is, in fact, all part of the Trebilcock service !

The Lithuanian Amateur Magazine, just to hand, together with a number of QSL cards, discloses the surprising news that these boys actually ran a contest in February of this year and got 43 transmitting entries besides a number of listeners. You just can't keep the Ham spirit down ! Five new LY calls have recently been granted.

G2NJ reminds us that the sinking of the 3,000-ton Swedish vessel S.S. " Monark " by a British submarine brings back memories of pleasant contacts with SM7QD on 7 Mc. when he was aboard this ill-fated ship. Using an input of about 3 watts, he put out a remarkable signal. S.S. " Monark " was seized by the Germans at Bergen as a prize, and she was later intercepted by a British submarine in the North Sea. The Germans were captured and the Swedish crew safely landed.

Who's Who

BRS3766 reports hearing ZP6AB, and also KA7SV, who lives at a place called Iloilo ; as there must be a variety of ways of pronouncing it, we leave it to you ! OQ5BF was heard at 06.25 G.M.T., a most unusual time.

CT2AM, on 7 Mc., gives QRA as San Michels. G8UO reports many " phoneys," including VP9TJ, HV1DE and LA9UX, and says D4UAS is in Vienna. The QRA of KA1RV given last month should be Caradad Cavite, P.I., not Canada as printed.

BRS3747 has been collecting queer calls, and adds TK5F, OR1LQ, CC7C and HB9VZ (phone) to our dossier. AC4AZ and AC4MI have also been heard, but nothing is known of these stations.

BRS3607 reports YVAC9 and FI1P.

BRS2098 says EK1AF is still active, and other good phones are HH2HB, HI3N, HI6Q, TG9BA and OA4R besides many other South Americans.

G4FH says conditions were not good during May, and this is confirmed by 2CDT. The only outstanding feature was OQ5AB, heard on 28 Mc. 3·5 Mc. produced a few W's in the early mornings.

TG9BA has been up to S8 with BRS3724 on 14 Mc. phone, and CR6AF has been heard working U.S.A. on c.w. In answer to 3724, yes, cards continue to arrive and the bureau is still active.

G8JR, on sick leave, sends a list of 12 K6's heard on 14 Mc., also KB6RWZ, KE6SRA, KF6JEG, MX3B, ZP6AB and HK2BD. Conditions were evidently not so bad with *him !* ZB1B is a pretty obvious pirate, and for that matter so is AR6KC.

CR8AA is on 14,350–390 not 14,250–290 kc.

American News

G6WX has sent us a very interesting letter from W2IKV, who recently sold out his gear since most of his pals have been taken off the air. " DX is my life's blood," he says and appears to take a very

DX PERSONALITIES No. 12

Ralph Thomas (W2UK). Famous top score man in A.R.R.L. DX Contests.

gloomy view of things radio. He considers the licence position in the States needs tightening up a lot and that many people who do not understand the traditions of Ham radio are being given tickets. His sell-out was a half W.A.C. The HRO went to W1MCJ, and the other receiver was shipped to Hawaii. The big transmitter went to South America, where it is to be converted into a broadcasting station !

BRS3766 has heard KC4USC on phone working a W9, and KE6SRA on Johnstone Island, on 14,340 kc. Cards for KC4USC may be sent *via* the Bureau, but don't expect a speedy reply. W2IXY is now up to 104 countries on telephony, 33 zones, and is keeping schedules with the Byrd Expedition. KC4USA comes in there around midnight E.S.T. at S9 with 300 watts to a V beam.

A Plea from Uruguay

CX2AJ wants a card from the following stations : G2MA, 2XD, 2QB, 2CX, 2ZC, 3OP, 3YQ, 4AR, 5BJ, 5ND, 5VN, 5TG, 5CD, 5HF, 5JU, 5HZ, 6QX, 6OZ, 6RH, 6NF, 6CJ, 6XX, 6OT, 6LL, 6WN, 6UN, 6FB, 6OS, 6ZS, 8DA and 8MD.

This is certainly a queer mixture of people who were not active on the DX bands and those who were very active and always QSL. Anyway, if anyone cares to help this lad with another card they can be forwarded by the QSL Bureau. Incidentally, CX2AJ is a stamp collector.

[Looking through the above list we cannot help thinking that CX2AJ has seen a title page of this journal !—ED.]

Friends and Allies

Much as all of us deplore the present state of affairs, it has given us further proof, if proof were needed, of the soundness of the Ham spirit throughout the world. Numerous cases have come to our notice of meetings between our own lads and amateurs in the armed forces of our Allies. In our own forces the G's, GM's, GW's and GI's have earned themselves a great reputation for enthusiastic and unstinted devotion to duty. As one well-known amateur, now in charge of important radio work, recently said : " My outfit, which is largely composed of ex-hams, seems to regard this show as a prolonged N.F.D. Nothing is too much trouble, and they work like demons. They will stick at a job until they drop for sheer love of radio. They're a great bunch ! "

This is splendid news, and we have no doubt that our Allies are also finding the value of this natural enthusiasm.

Many of those who were fortunate enough to experience the wonderful hospitality of the Belgian amateurs in 1935 will be thinking of them now in their great ordeal. If any of our Belgian or Dutch friends have reached our shores we would like to have word of them.

G3YL mentions meeting a Canadian soldier who was staying with neighbours, and in course of conversation discovered that he was VE2OZ.

Well, keep your peckers up. See you again next month.

Down Zummerzet Way

By " GRANFER "

" T 'WAS fust Satturday in June and I thought as 'ow t'was N.F.D. So I goes an' tells James to go to Trap'ouse and get trap ready as t'was gwain on a journee. Well I zets orf like as I dun fur many a long day parst an' arter a time I cumz to yield wur us 'as 'eld thickee Nashnul Vield Day fur near on this twenny yer. And thur wadn't nobody thur, zave fur a vlock of zheep. Zo I sez to me'self sez I " Zhurley I abn't maide a mistook, tiz fust June orlright."

Well I waits until it be a getting dimpsey thinking they'll be a coming zoon, then I lights up they candles in the lamps of me trap and I zets of fur the zity. I was joggin' along the road nicely when 'oo do 'ee think I runs into but old Jarge, 'ee knows orl about Hamater Radio, 'ees 'ad 'is call fur this last thurty yer. Well I sez to 'un " Wur be the lads to-day " and 'ee sez to me "Don't 'ee know thur be a war on " and I sez " Old Queen will be surprised when zhe gets 'ear about it orl." Then 'ee tells as 'ow they coves from up Porst Ovice as cum 'an taken zum of 'is gear, 'is Coheerer and Spark Gap what 'eed 'ad zince afore I be born.

Then as us be a taaking like, up cums a feller with a zorspan lid on 'is 'ead, proper daft 'ee did luke, an' 'ee tells I that me candles on me trap be too bright. I axed 'un 'oo the zo an' zo 'ee thinks 'ee be an' then I zees it be old 7AZ an' when 'ee zees as 'ow tiz me 'ee axes me 'ome to 'is 'ouse.

When I gets thur 'ee tells me zame ztory 'bout a war an' I tells 'im I baint gonner zwaller thickee one twize in one day, but 'ee zhows me a QSL card 'ee's 'ad all a mucked over with gurt blue pencil proper zhamed me like, zo I sez " Them fellers up at QSL burrow be careless don't 'ee think." Then 'ee tells I thit I can't ztay no longer as it be zupper time and 'ee baint got me butter rasher or zummit (I don't know what things be a coming to serving up butter in rashers, us always used to 'ave it in purty lil pats).

Well as t'was clear I wadn't gwain to get nort to eat out of 'un, I gets in me trap and trapses orf to mother to tell 'er all about thickee thur war. When I 'ad told 'er, 'er sez to me " Tidn't vair to go 'aving wars without telling anybody about it. I should 'ave thought that Mr. Gladstone would 'ave zent us a Porst Card or zumm'at to tell us 'ee was gwain to 'ave a war." I'm zhure I don't know what things be a coming to."

Malta

Like the rest of the British Empire, the Malta group is doing its bit towards the great task ; in fact, 90 per cent. of us are either on full or part-time service.

We recently had the pleasure of receiving a visit from G5KA and ex-2BKL, both of whom are on active service. We offer our best wishes for happiness to BRS981, who has just been married at Malta.

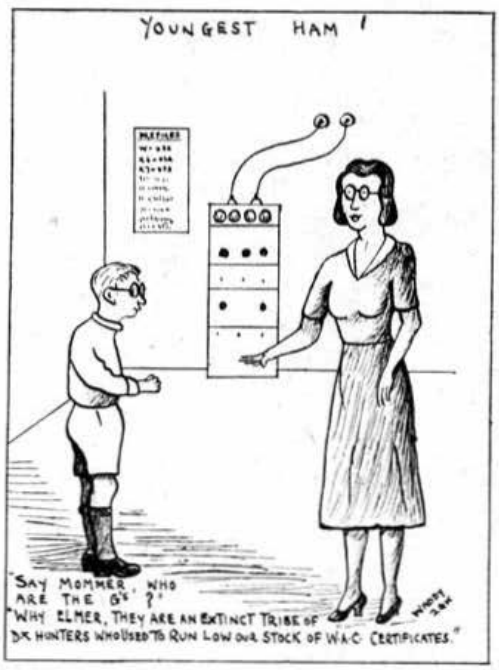
Although the holding of regular meetings has been impossible since the outbreak of the war, interesting informal gatherings are frequent. ZB1E.

The 28 Mc. Band

By NELLY CORRY (G2YL)

DURING May amateur signals were reported on eight days, but weak carriers were heard on several other days, and commercial harmonics often indicated that the band was open even though no amateurs were audible. Nothing at all was heard from Oceania, Asia or Europe, except EAN2/EAM2 and occasional other European harmonics, showing summer short-skip conditions.

From Africa, OQ5AB was logged by BRS.3003 at 17.40 G.M.T. on May 20, and at 19.17 G.M.T. on May 23, but on both days his signals were weak and QSB. Only three W signals were reported during



May 1939, so it is not surprising that W2ISL, heard by 2BVU, S6/2 at 19.53 G.M.T. on May 19 was the solitary representative of his continent reported this year.

South Americans came through on six days between 17.00 and 20.30 G.M.T. Those reported by BRS.3003 were CE2BX on May 1, CX2CO on the 4th, LU1DA on the 6th, LU1DJ and LU8AB on the 19th, and a PY2 on the 26th. G4MR heard PY2HC and PY7VB around 19.00 G.M.T. on May 5, and also reports that LSA, 31·5 Mc., and LSA2, 27·5 Mc. were logged on many days.

Reports from G4MR, 2BVU, BRS.3003 and BRS.3179 are acknowledged with many thanks.

Mr. E. H. Conklin, N9BNX, Mr. G. A. Fredricks (U.S.A.), G3YY and BRS1151 are thanked for their reports. Perhaps after the June full moon further reports will be received ! Thank you in anticipation, and good luck to you all wherever you may be

The writer's QRA is now North Waltham, *Basingstoke*, Hants, not " near Winchester."

The Ultra-High Frequencies

By CONSTANCE HALL (G8LY)

Home News

G3YY continues to keep this column alive by hearing *and* reporting signals heard, around 56 Mc., using HL2/Pen22 receiver and 16 ft. indoor aerial. On May 17 at 10.20 he heard a commercial harmonic S7, on 54 Mc. and on May 25 finding commercial harmonics at good strength on 28 Mc. promptly changed to 56 Mc. and from 16.20 to 16.40 heard a fine quality transmission, modulated by music, S5 peaking S8 with fading to zero and up to normal again over a period of five minutes; by 16.40 it was a " phones on the table " signal. A carrier was also audible during this time on 57 Mc. with 20 per cent. A.C. ripple, fading and had " whistles " on each side of its carrier. At 16.32 high speed morse on 57 Mc. S5 and at 16.45 another commercial harmonic on 54 Mc. S4/5 completed his patrol of the band. BRS1151 reports static very severe on 56 Mc. in late May.

G6DH reports that at 17.15 G.M.T., May 31, signals were heard between 28 and 62 Mc., including an Italian harmonic on 56 Mc. The harmonic of HBH was also logged, as was Italian television and sound on 41 Mc., the latter at S9 plus.

Concentric Lines

The following idea by Mr. Falor, operator at WBCM may save some concentric line constructors a headache. Mr. Falor states that he uses 28 gauge copper sheet for the outer conductor and standard sizes of wire or tubing for the inner one. To bend the sheet for the pipe, clean and cut it *square*, leaving about a quarter of an inch overlap when bent; then bend it evenly along its entire length, around a rolling pin, and it can be tied down with string until the seam is spotted with solder at several points. Should the available rolling pin not be the required size, then roll the sheeting, gradually compressing it and feed through a round hole in a board, soldering as the pipe comes through.

U.H.F. Superhets

For those constructing superhets for the Ultra-Highs, *Radio* publishes several helpful hints. The fact that unwanted oscillation may be caused by poor lay-out and shielding, inadequate by-passing or use of a poorly by-passed cathode resistor may be obvious to most people, but seems well worth mentioning. If the stage oscillates it can usually be stopped by tapping down on the tuned circuits, or by using a resistor of a few thousand ohms placed across them. Oscillation can be checked by plate current when the grid is touched, if there is a high resistance leak placed in the grid circuit. The effect of a cathode by-pass condenser can be checked by lowering the plate and screen voltage, shorting the cathode resistor and observing if the undesired oscillation stops.

A check on poor earthing, is to disconnect the aerial, turn on a local oscillator, and touch the by-passed points with a screw-driver; an increase in received signal shows up poor earthing.

(*Continued in previous column.*)

BRITISH ISLES NOTES AND NEWS

DISTRICT 1 (North Western)

Although reports have for some time been few and far between it is believed that there is no lack of interest in this District and that the absence of news is due to the impracticability of holding regular meetings and maintaining personal contacts under present conditions.

Is there sufficient interest to enable us to hold a successful Provincial District Meeting this year? Several members are anxious to do so and it has been suggested that Manchester would be the most convenient centre, or possibly Chester; the meeting to be held towards the end of July.

Will all those who are prepared to attend such a meeting please send a post card to the District Scribe G6CX "Sandleas," Eddisbury Road, West Kirby, so that a decision can be made. The organisers must know what support they can expect and time is very short, so please do it now.

It is believed that if a good attendance can be secured we shall have the pleasure of our Secretary's company, who will bring his little black book!

There is only one report this month, namely:—

Cumberland.—G6WR and 2AUM spent a pleasant afternoon at 8RZ on May 5 but were disappointed to find that 6JZ, who was expected on leave, was unable to be present. There is no news of 3HJ or of 2DWG (Whitehaven) but 8RZ has had the pleasure of meeting 2AYH (Carlisle) who is to be congratulated on his recent engagement.

G6TW *via* G6CX.

DISTRICT 3 (West Midlands)

With a view to showing that the District is still alive our Shrewsbury T.R. sends along news of local activities. Three meetings have been held since January at which the opportunity has been taken of welcoming new Society members.

Local activities centre around experiments with receivers, gramophones and audio amplifiers. The feeling is that the older hands had better get busy on speech equipment ready for the day when our licences are restored, as the code speed of the ex-Service operators will doubtless be beyond our modest abilities! Two members, G3PX and 2DAQ, are with the R.A.F. on radio duties.

The D.R. again asks that members in the District should endeavour to give him news for publication. Our Service members especially look forward to reading local gossip—please co-operate, everyone.

G5VM.

DISTRICT 4 (East Midlands)

Since our last notes appeared things have been moving at an incredible pace and, although it was hoped that a District Meeting might be arranged, present conditions have made it seem inadvisable. A large number of members are in the various A.R.P. services and are expected to stay fairly near home. Sunday working for the national effort claims a further number, so for the time being it is suggested we should restrict meetings to the town groups.

Leicester meetings continue to be held each week at 2CFC's office address. G6VD is now with the Air Ministry, BRS3588 has gone to Palestine, 2HBG has been transferred to No. 2 E. & W. School, R.A.F. It had been intended that some sort of a field day should be held during the month of June, but recent restrictions on mobile receivers has upset the programme.

From Nottingham we learn that G8JV, who has been transferred to a new ship, is in urgent need of papers, books, etc., any age, any type. It is whispered that 6CW may soon be in the Navy, and 5VU in the R.A.F.; 8QZ is somewhere in France. The Nottingham T.R. (G8DZ) is giving Morse lessons to recruits intending to join the R.A.F.V.R., and two have already passed. 8DZ complains there is a great shortage of news from local members; his new QRA is: 17, Newstead Avenue, Westdale Lane, Mapperley, and he will be very glad to see members in the Services who happen to pass through Nottingham. Will local members please get in touch with him so that rag-chews can be arranged.

A year ago this month District 4 won N.F.D. by a very convincing margin, and will hope to do it again in the very near future. In the meantime keep smiling, keep it going, and *keep in touch.*

G2RI.

Forthcoming Events

June	16	Scotland A District, 2.45 p.m. at the Y.M.C.A. Residential Club, 100 Bothwell Street, Glasgow. Lecture by D. Niven (2CHN)
,,	16	District 12, "Garden-Party" at G6LL, "Woodlands," Tolmers Road, Cuffley, Herts.
,,	18	District 14 (Southend Section), 8 p.m. at G6NB, "Park Ville," Sherbourne Gardens, Prittlewell, Southend-on-Sea.
,,	22	District 15, 3 p.m. at The Excelsior Hotel, 1 Ladbroke Gardens, Notting Hill, W.11.
,,	22	District 13 and S.L.D.R.T.S., 3 p.m. at Brotherhood Hall, West Norwood.
,,	23	Ham Gathering of Service and Local Members 2.30 p.m. at Y.M.C.A. Lynchford Road, North Camp, Farnborough, Hants.
,,	27	District 14 (Ilford Section), 8 p.m. at G6HU, 63 Aintree Crescent, Barkingside.

DISTRICT 6 (South Western)

As usual there is very little to report regarding the Torquay area. Those who are left at home are maintaining interest in reception, whilst the receiver at 5SY is doing well.

A welcome report from Plymouth shows that the members there are in some respects more fortunate in that there is still a sufficient number to be able to hold informal meetings. These are held at 3TX and some very earnest discussions take place. Regular patrons are 8PN, 8HF, BRS3182, 3464, and

2FKO. They have also had visits from 2HLS and 2CJB. Both 2FKO and BRS3182 are occupying their time building bug keys. We are informed that 2FKO's is something exceptional, and we are wondering whether the Bull could run to an article on the subject. [Yes, please.—ED.]

The Plymouth members were thrilled to have a visit from VK6NP, and one can well imagine the informative talks on comparative conditions in VK and G that resulted.

The DR has received a long and interesting letter from 2CWR (Torquay's TR), who is now seeing, and apparently enjoying, life in Egypt.

The D.R. would very much like to hear how the Groups in other parts of the District are getting on.

G5SY.

DISTRICT 7 (Southern)

Aldershot and Farnborough.—Owing to unforeseen circumstances the talk on Amateur Radio in British Columbia which was to have been given by Bill Wadsworth at the May Ham Gathering, and also another arranged to take its place, had to be cancelled. However, 35 members and friends, realising that such disappointments are only to be expected in times like these, settled down to the usual rag-chew. As mentioned before, this series of meetings will be continued all the time there are Hams stationed locally. The next gathering will be at the Y.M.C.A., Camp Road, North Camp, at 2.30 p.m. on Sunday, June 23. *All* are welcome.

Portsmouth and Southsea.—Attendance at recent meetings has been a little smaller owing to pressure of duties keeping some of the regulars away. It is proposed to organise a trip to one of the Farnborough meetings shortly. Will interested members please get into touch with 8WC? The next meeting will take place at 2.30 p.m. on July 7, at "Troon," Burrill Avenue, Cosham.

Croydon.—A talk was given by G2IG on Aerials at the June meeting of the S.R.C.C. Monthly meetings are held on the first Sunday of each month at 3.30 p.m., at the Café Royal, North End, Croydon. The Editor of *QRX*, G5GQ, has been laid up, but the *Croydon Tabloid* made its usual appearance last month.

G5WP.

DISTRICT 8 (Home Counties)

There is little to report this month. The speeding up of the war has made inroads into the leisure time of many members, and is making contact more difficult.

From Cambridge we learn that 5DR is still in the A.F.S., 5BQ is a Warden, whilst 5JO, 8SY, and 5PC are particularly busy on war work. 5DQ expects to be called for service soon.

St. Ives.—G5RL has been in hospital with appendicitis, but is now home again, and making satisfactory progress. (Best wishes, o.m.) 4AZ recently registered for military service.

Peterborough.—G2NJ thinks the District should run a listening contest for the Granfield Cup. We are prepared to organise such a contest if there is sufficient demand, but it is for members to say. The probability is, however, that they are too pre-occupied at the moment.

No news is to hand from Bedford, Luton, and March. What about it boys?

G5BQ.

DISTRICT 10 (South Wales & Monmouth)

The response to the appeal for news from outside the Cardiff area has met with some success, reports having been received from GW3QB, 5FI and the Newport group.

Once again we invite any amateur resident in Cardiff to attend our monthly meetings, details of which can be obtained from the T.R. or the District Scribe. These meetings are still being well supported.

We are pleased to welcome G3GW to the district.

G5FN.

DISTRICT 13 (London South)

The first joint meeting of the R.S.G.B. and S.L.D.R.T.S. took place at West Norwood on May 25, and was well attended. It is hoped to be able to arrange talks and discussions for future meetings, and G2JK has kindly consented to give a talk at the next meeting, which will be held on June 22. May we again remind members of the S.L.D.R.T.S. that they will in future receive no notification of meetings? These will be held on the fourth Saturday in each month, at 3 p.m.

It appears that most members of the District are very busy in one way or another, and there has been no item of special interest during the last month.

G2WV.

DISTRICT 14 (Eastern)

Owing to the latest crisis and the seven-day week, affecting many of those who would otherwise have attended the Eastern Counties Provincial District Meeting at Chelmsford on June 2, it was reluctantly decided to postpone this function until a more suitable opportunity arises. Although several applications for ticket reservations were received, only one sent the necessary 5s.!

G5RV thanks all those who helped with the arrangements, especially G6LB, who took over while he was away on a Government job just at the

critical time when the Great Day was drawing near and no applications for tickets had yet been received !

Brentwood.—G3LA is taking his R.A.F. Morse test shortly. 3MV is also well ahead with his training. 8RC shortly comes of age and hopes to join the R.A.F. 2DRI is carrying on as a service engineer and doing St. John Ambulance work. 2WG is now in uniform as a War Reserve Special and " beats " on the country roads. 3JW who is with the G.P.O. occasionly " looks over the bands " when times permits.

Ilford.—The April meeting held at G6AH was attended by nine members. G6AH, who will be pleased to forward to G3MV any radio literature sent in, is looking forward to N.F.D. 1941 and has notified the D.R. that he will attend at Abbess Roothing !

The May meeting held at G3MD was attended by eight members including two newcomers (2BRH and BRS3791) who were made welcome. 2BRH has offered an oscillator to line up the superhet being built by local members. G2XP has made a nice job of a D.C. mains " super " which will no doubt be demonstrated at the next meeting to be held at his QRA. Code practice was made by those present and from comparison of the results obtained it would appear that more practice is needed ! G8TL outlined some of his experiences while operating his " portable mobile," afterwards old-timer G2XP told the company about the 1,000 metres days.

Southend.—At the May meeting held at G2KH seven members were present including 2CMF who came in from Laindon Hills.

General.—The D.R. asks that District members both in and out of the Services should send along notes for inclusion in this Journal. G6UT.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

An attendance of 19 was recorded at the May meeting when our guests were G3SU and 8QH. Five letters from serving members were read and passed on to others for answer as agreed. Those who wrote welcomed the idea of " Written Skeds " and we hope they enjoyed receiving a reply with perhaps some surprise in it. To those who are serving the country we would say " Send us your letters and we will see you get a reply." Letters should reach home members by about the 15th of the month and the reply will leave us within the next 10 days.

High Wycombe held a local meeting on May 25 when five members spent an enjoyable evening assisted by G2RL who demonstrated his new Defiant receiver. A welcome was given to 2CZM (a new member) while 2AKZ attended for the first time since his marriage.

Members are referred to the announcement contained in this issue regarding the Edgware Society social afternoon and evening. We hope all who can will support this venture.

A letter was received recently by the D.R. from Major Carpenter of the R.E.'s who wishes to be remembered to all. Letters sent *via* his home address will be forwarded, as his whereabouts are unknown. G6WN.

DISTRICT 16 (South Eastern)

Although G3WR, the energetic T.R. for Brighton and Hove, is the only one to send notes of a meeting this month, it is known that many individual members are still keen and active.

G3NQ, T.R. for Canterbury, writes to say that there is no corporate activity in that area at the moment, but he hopes to have more news next month. He will be very pleased to welcome members to his new home at Ashley Cottage, 1, Seaway Cottages, West Beach, Whitstable. Members either resident or on holiday in the area are invited to call.

Brighton and Hove.—At the meeting held on May 2, 13 members attended, including G8AC, who was on leave.

At this meeting Mr. Hudson gave a very interesting and instructive talk, in which he explained the methods used by the Post Office in combating interference from the time the complaint is received until it is cured. He described the methods of suppression used to overcome interference, ranging from that caused by the ordinary electric light switch to high-frequency apparatus used for medical purposes. Several interesting exhibits were on view, including high-frequency chokes in all sizes from ½ to 50 amps., and the special Post Office 5-valve superhet with hand loop aerial, used for tracing the interference source. Mr. Hudson, ably assisted by Mr. Clark (who was in charge of the practical demonstrations), then showed how a D.C. motor was suppressed, the motor mains input being wound round the loop aerial and noise effects noted, with and without the suppression device in use —rather a searching test, but suppression was complete with the device connected.

Mr. Hudson closed his talk with the highly specialised methods used to suppress interference on the ultra-short wave and television bands, and stated that an absolutely different technique had to be used. The talk was highly appreciated by all present, as was shown by the hearty vote of thanks recorded.

Captain Houghton will, circumstances permitting, give his lecture in June.

G2WS.

DISTRICT 18 (North Eastern)

The D.R. has received a cheery letter from G8KU in which he reports himself fit again after a spell in hospital. His present location is Freetown, B.W.A. An enjoyable rag-chew took place with 2CP when he returned home for a well-earned leave from the Navy.

No reports are to hand from Hull or Bridlington, although many members are known to be actively engaged on the receiving side of radio. What about it om's ?

Welcome to Charlie Kirk, G4CL ex-ZB1A, at present stationed at York. He is interested in U.H.F. and would like to contact members in the District. To quote his remarks " I am at home to all Hams should they be passing through York. QRA, No. 1 W.O.'s Qtr., Fulford Road."

All members are earnestly requested to keep in touch with the D.R. whether in or out of the Services.

G5MV.

(*Continued on page* 488.)

HEADQUARTERS CALLING

The V.R.'s were There

Such information as has trickled through to Headquarters up to the time of closing for press, indicates that the majority of the R.A.F.V.R. (C.W.R.) personnel who were in Northern France and Belgium are safe.

Countless deeds of daring will be told later, but for the moment we can refer only to two examples standing to the credit of amateurs—both C.W.R. men.

The first concerns a South London member who, finding himself without a driver and in a very advanced position, packed his transmitting and receiver gear into a lorry and trailer and drove through a bottleneck in the German lines. Although bombed and machine-gunned all the way by hedge-hopping aircraft, he got through safely and destroyed everything before seeking safety for himself.

The second story concerns a Manchester amateur who performed such splendid work under fire that his exploits have been brought to the notice of the powers that be. In the words of one who has recently returned from France, "his deeds would have done justice to any veteran."

Congratulations

To our Executive Vice-President and Mrs. Gay on the safe arrival of a son and heir. Master Neville came to town on April 30.

A.R.R.L. (QST) Subscriptions

Due to the alteration in sterling exchange, the annual A.R.R.L. subscription rate is now 15s. per annum. Members who have, in the past, subscribed direct to the A.R.R.L. or have purchased copies of QST from booksellers would be well advised to pass their renewal instructions through the Society in view of the present difficulty of sending money out of the country.

"Radio" Subscriptions

Members who wish to obtain *Radio* the West Coast U.S.A. technical Journal may forward their subscriptions direct to Headquarters. The subscription at the present rate of exchange is 17s. 6d. for one year or 30s. for two years.

Kilocycles-Metres Conversion Tables

Copies of this very useful 64-page publication, in vest pocket booklet format, are available from Headquarters, price 1s. 4d. each, post free.

C.O.D.

Due to the fact that Headquarters is being operated by a greatly reduced staff, it is regretted that Society publications and Sales Dept. items can no longer be sent C.O.D.

New Postal Rates

With the introduction of new postal rates it now becomes even more important than hitherto, that unnecessary correspondence with Headquarters should be avoided. Members will be assisting the Society in a practical manner by paying subscriptions promptly on receipt of their statement of account. This will obviate further applications being made, thereby preventing a waste of Society monies.

Back Issues of "The T. & R. Bulletin"

In the past members have allowed their subscriptions to lapse for several months and then asked to be brought up to date. This has generally been possible, but under present conditions, Headquarters cannot hold big stocks of back issues.

Members will greatly assist by renewing their subscription promptly thereby making sure that their copy of THE T. & R. BULLETIN arrives regularly each month.

Civil Defence

In order to effect economies it is not proposed in future to send formal acknowledgment to members advising us that they are engaged in Civil Defence work. The information will, as hitherto, be recorded at Headquarters against future possible use.

Returned Bulletins

Readers are asked to assist us in tracing the present whereabouts of the following members who have moved from the address given below without advising Headquarters :—

P. Davie (BRS3457), Falkeners, Liphook, Hants.

I. Parry-Edwards (BRS3570), Devon Constabulary, Axminster.

R. D. Pettigrew (G4BQ), 164 Princes Gardens, West Acton, W.3.

C. Wrigley (G5WR), 14 Durham Avenue, Heston, Middlesex.

ZQI

We have been advised by Mr. John Grinan that the call of the broadcast station which was originally operated under his amateur sign, VP5PZ, has been changed to ZQI. The station works on 4.75 Mc. with an input of 250 watts. Reports will be greatly appreciated and will be acknowledged over the air and by mail. ZQI is on the air every Friday from 5.30 p.m. to 6.30 p.m. (local time).

Mr. T. Myers, Hon. Secretary, Jamaica Amateur Radio Club, also sends us information concerning the activities of ZQI, and says that certain members of his club are very busy in unspecified directions, whilst others are building and experimenting with receivers.

The J.A.R.C. greatly appreciates having been granted affiliation with R.S.G.B.

A.R.R.L. Neutrality Policy

Mr. R. Buckstone (G5JR) informs us that the following advice was broadcast to all U.S.A. amateurs at 20.45 B.S.T., May 23, by W3UA.

1. American amateur stations should abstain from working European countries.
2. There should be no " war talk."
3. No " pirate " stations should be worked.
4. No code or cypher should be used.
5. F.C.C. laws should be strictly adhered to.

Any station operator not observing the foregoing rules is to be reported to A.R.R.L. Headquarters so that he can be made conversant with them.

Technical and Topical Articles Wanted

The Secretary-Editor will be pleased to consider for publication articles of a technical or topical nature.

SILENT KEY

LESLIE MELLARS (ZL1AR)

It is with deep regret we record the death through accident of Leslie Mellars (ZL1AR) of Auckland, New Zealand. Old-timers will remember that ZL1AR was responsible for suggesting the idea of Annual B.E.R.U. Contests, events which in past years have always found him an active participant.

Mr. Mellars was for some time a B.E.R.U. Representative and a prominent Empire Link station. During the years when the Loyal Relay was operated he could always be depended upon for several messages from the Australasian and Asian Continents.

We understand Mr. Mellars lost his life whilst yachting off the shores of New Zealand. In attempting to ride a fierce storm the yacht capsized causing the death of ZL1AR and his three companions.

Our deepest sympathies are extended to his relatives and friends. J. C.

A.V.C. WITH PLATE AND GRID DETECTORS—

(*Continued from page* 463)

access of the A.V.C. voltage to the grids of the controlled stages.

At present the writer employs the diode with a grid detector for use as an " S " meter only, but a new receiver is now under construction in which the A.V.C. voltages will be obtained by the anode detector-diode method described.

In conclusion, the writer would be pleased to hear from anyone who has tried the scheme which he has outlined and in particular he would be glad to have the benefit of any suggestions or criticisms which may be forthcoming.

New Members

HOME CORPORATES

A. K. WALL (G2YZ), 69 Goodwin Drive, Sidcup, Kent.
F. J. HARRIS (G3LT), 89 Sandhurst Road, Kingsbury, N.W.9.
I. H. AULTON (G3UJ), " Jesmond-Dene," Shawhurst Lane, Hollywood, Near Birmingham.
F. R. CLEMENT (G4KC), 311 Broad Lane, Coventry.
L. M. GUNNELL (G8HB), 30 Gordons Way, Oxted, Surrey.
F. F. RUTH (2BRH), 579 High Road, Ilford, Essex.
R. A. PITTOCK (2CDB), 21 Radcliffe Road, Winchmore Hill, N.21.
F. J. RUTTER (2FMF), 324 Wigan Road, Standish, Wigan, Lancs.
C. W. DAVIES (2HGQ), 27 Conway Gardens, Clay Hill, Enfield, Middlesex.
J. S. WHEATLEY (2HMJ), 49 Prospect Mount Road, Scarborough.
E. S. SELLEK (BRS3785), 110 Drove Road, Swindon, Wilts.
P./O. E. HOSEY (BRS3786), 8 Court Hey Road, Liverpool 16.
F./O. A. HIBBINS (BRS3787), R.A.F.
L. J. COOPER (BRS3788), 57 Hagley Road, Rugeley, Staffs.
J. D. KAY (BRS3789), 24a Walcombe Road, Southbourne, Bournemouth.
A. V. C. WHATLEY (BRS3790), 42 High View Gardens, Potters Bar, Middlesex.
F. E. GARNER (BRS3791), 85 Lansdowne Road, Seven Kings, Essex.
J. C. MCNEIL (BRS3792), Winchester House, Beach Lawn, Waterloo, Liverpool, 22.
M. STEED (BRS3793), R.A.F.
A. C. PEACHEY (BRS3794), 16 Cedarcroft Road, Hook Rise, Surbiton, Surrey.
S. J. BROUGHTON (BRS3795), " Cereza," Chertsey Road, Ashford Common, Middlesex.
K. W. WISEMAN (BRS3796), 6 High Street, Chelmsford, Essex.
R. T. TRULL (BRS3797), 2 Myrtle Cottages, St. Michaels, Tenterden, Kent.
J. G. FINBERG (BRS3798), 28 Manor House, Marylebone Road, N.W.1.
R. W. DUNN (BRS3799), 18 Fairfield Drive, West Monkseaton, Northumberland.
T. R. GRAVENALL (BRS3800), 5 Malvern Road, Worcester.
J. S. TEMPEST (BRS3801), Old Hall, Hutton Henry, Castle Eden, Co. Durham.
Sgt. H. B. LYMNA (BRS3802), R.A.F.
F. BOARDMAN (BRS3803), 39 Lord Street, Fleetwood, Lancs.
D. M. HANWELL (BRS3804), Seymour Cottage, Winkfield Road, Windsor, Berks.
R. A. COATES (BRS3805), 5 Park Terrace, Whitby, Yorks.
C. A. STANDING (BRS3806), 53 Priory Crescent, North Cheam, Surrey.
J. WILLIAMS (BRS3807), 52 Church Road, West Kirby, Cheshire.

DOMINION AND FOREIGN

F./O. J. E. MILLS (EI8P), at The Manor House, Northgate, Sleaford, Lincs.
T. G. E. POWELL (VE3ZE), 43 Blantyre Avenue, Toronto, Ont., Canada.
A. B. HUME (BERS487), Seorahi P.O., Gorakhpur District, United Provinces, India.

From our Post Bag

" I should like to take this opportunity of saying how much I appreciate the way that Headquarters, and especially the BULLETIN, has carried on under the strain. We still " get our money's worth " and that is more than many of us expected."

G8ON.

BRITISH ISLES NOTES & NEWS—

continued from page 484.

Scotland

" A " District.—" A " District had a most enjoyable meeting when D. Niven, 2CHN, gave a lecture on the application of Mullard Red " E " valves to amateur superhets. This lecture will be continued at the June meeting, when it is hoped to give a practical demonstration of a receiver incorporating the valves. We look forward to a good attendance. There is little other news of interest to report, except that the D.O. had a visit from G6OQ of the R.N.V.(W.)R. The next meeting is on June 16, at the usual place and time.

INDEX TO DISPLAYED ADVERTISEMENTS

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