

THE T&R

# BULLETIN

A JOURNAL FOR  
**RADIO EXPERIMENTERS**

Vol. 15 No. 3

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Price 1/6

## 'ADVERTISING IN WAR TIME'

*READ WHAT MR. PERCIVAL MARSHALL (EXECUTIVE CHAIRMAN OF THE PERIODICAL TRADE PRESS AND WEEKLY NEWSPAPER PROPRIETORS' ASSOCIATION) SAYS ABOUT THIS VITAL MATTER.*

"IT is a remarkable thing that one of the most unexpected reactions on the outbreak of war should have come from those whom we regard as level-headed business men. I refer to the wide-spread rush to stop advertising in both the periodical and the trade and technical press, which marked the first few days of the new regime. That rush soon showed signs of subsiding, and in a number of cases cancelled appropriations have been resumed, and even new business has been placed. This is only common sense.

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THE T. & R. Bulletin is published on or about the 15th day in each month, and a copy is despatched free of charge to each member. Changes of address should be communicated promptly to the Headquarters of the Society.

THE Secretary-Editor will be pleased to consider for publication, articles of technical



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or general interest. Intending contributors are requested to indicate in advance the scope to be covered by the article under consideration.

ALL matters relating to Advertising should be addressed to:—  
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# THE T. & R. BULLETIN

OFFICIAL JOURNAL  
OF THE  
RADIO SOCIETY  
OF GREAT BRITAIN

Hon. Editor: ARTHUR O. MILNE



DEVOTED TO THE  
SCIENCE  
AND ADVANCEMENT  
OF AMATEUR RADIO

Secretary-Editor: JOHN CLARRICOATS

Advertisement Manager: HORACE FREEMAN

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## CONTENTS

SEPTEMBER, 1939

|                                    | Page |                        | Page |                               | Page |
|------------------------------------|------|------------------------|------|-------------------------------|------|
| A Message to You from the Council  | 139  | Royal Corps of Signals | 152  | Contemporary Literature       | 164  |
| Crystal Band-Pass Filters, Part II | 141  | Experimental Section   | 157  | British Isles Notes and News  | 165  |
| The Production of Copper Wire      | 144  | The Month on the Air   | 159  | British Empire Notes and News | 169  |
| Propagation Mysteries              | 146  | The 28 Mc. Band        | 162  | An Historic Document          | 170  |
| The 1939 56 Mc. Field Day          | 147  | The 56 Mc. Band        | 162  | Headquarter's Calling         | 171  |

### A MESSAGE TO YOU FROM THE COUNCIL

**W**AR or no war, it is our intention to carry on the work of the Society to the very best of our ability. The pillars on which the Society stand must not be allowed to crumble or decay, for it is essential that when Peace returns, the organisation must be strong and virile, fully prepared to safeguard the interests of its members.

Already every member will have received a personal letter from us outlining the decisions which we have reached unanimously.

An important factor is to keep THE T. & R. BULLETIN in existence, and this we shall do with the co-operation of our many advertisers who have promised their support. That its size must be reduced will be obvious to all, but we shall continue to publish articles and news of general interest. Topical information will be welcomed, as will personal letters from our members in the services, provided of course nothing of a secret nature is divulged. We hope THE BULLETIN will more than ever become the connecting link between our members *everywhere*. As time passes the scope of material may have to change, but for the next few months we shall offer at least two full length technical articles in each issue.

It is anticipated that the number of QSL cards reaching the Society will gradually diminish, although for a fortnight after War was declared a large number of Home members thought it a good plan to make up for lost time! The Society will continue, to the best of its ability, to distribute cards to Home members, whilst cards for most overseas amateurs will also be forwarded.

With the suspension of London meetings we have decided to discontinue for the War Period, the special London fee of £1 ls. and to institute a flat rate subscription of 15s. per annum for the whole country; the Overseas subscription remaining unchanged at 12s. 6d. In order that the Society may carry-on, it is essential that all outstanding subscriptions be cleared promptly.

Our decision to continue the work of the Society has necessitated rigorous economies, including the reduction of our paid staff by 60 per cent., therefore we shall be obliged if members will reduce their correspondence to Headquarters to an absolute minimum.

The registered address of the Society will continue to be 53 Victoria Street, London, S.W.1, but the business of the Society will be carried on from 16 Ashridge Gardens, London, N.13 (Telephone: Palmers Green 3255). Correspondence may, as hitherto, be addressed to the Society's registered address, but members should not call.

During the months of strain which lie ahead we recommend that members should, as far as circumstances permit, carry on with experimental work within the terms of their normal broadcast licences. In particular we hope that members will endeavour to correlate information concerning general conditions so that a monthly summary may be recorded. Numerous amateur signals will still be heard, and we know of no reason why details of such reception should not be published, whilst experimental work on the bench, particularly with regard to receivers, valves, measuring gear, and components is still possible.

As mentioned earlier, the co-operation which has been promised by BULLETIN advertisers encouraged us to carry on, and we believe that members at home and abroad will see to it that those who have offered their support in the important field of advertising will have no reason to regret their decision. Experimental amateur radio must not be allowed to die in Great Britain; let each one of us to-day pledge to keep it alive by supporting to the best of his or her ability, the National Society in Great Britain, your Society and ours.

Finally, a word to our members who are serving with the armed forces. The news that your subscription "for the duration" is to be 10s. per annum will, we hope, make it possible for you to continue in membership. If circumstances prevail against it, we ask that you will write to us stating very briefly the position. To you in particular we extend our best wishes and offer you individually good luck and God Speed. May the "ham spirit" which you have helped to create, see you through your darkest moments.

ARTHUR E. WATTS (*President*),  
ON BEHALF OF COUNCIL.

\* \* \* \* \*

### THE B.B.C. HOME SERVICE

The congratulations of radio amateurs are extended to the British Broadcasting Corporation for the brilliant way in which they put into operation their Home Service. The calm and dignified manner in which announcements of the gravest nature were made, must have impressed itself upon the whole British nation.

When the history of British Broadcasting in War-time becomes available, we have little doubt that even we hardened enthusiasts will raise our hats to those who planned so well.

"Let Nation speak truth unto Nation" is the motto of our own B.B.C. May that motto live long in the hearts of all who have at their command the control of broadcasting.

\* \* \* \* \*

### OUR CALL SIGNS

Although the *London Gazette* notice determined our licences, we feel that until peace returns it will be a link with old times to use our Call Signs in correspondence. Habits of a dozen or more years are hard to lose, and we can see no particular reason why we should drop a habit which has grown up with us.

J.C.

### The Impounding of Amateur Transmitting Apparatus

It is our understanding that the G.P.O. will give an official receipt for any transmitting apparatus impounded by order of H.M. Postmaster General. If a receipt has not been obtained the member concerned should write to the local G.P.O. sectional engineer responsible for the collection, or if his address is unknown, to the Radio Section, G.P.O., Armour House, London, E.C.

It is not sufficient to possess a receipt only for apparatus left behind.

### With the Services

As from our next issue we hope to publish lists of members serving with H.M. Forces. The following information should be given:—Rank, name, regiment or branch of the service, and pre-war call sign.

Members in the Services who wish to communicate with old friends can write *via* the Society.

**IF YOUR SUBSCRIPTION IS DUE  
PLEASE HELP THE SOCIETY TO  
CARRY ON BY PAYING PROMPTLY**

# Crystal Band Pass Filters

By E. L. GARDINER, B.Sc., (G6GR).

## PART II

### The Double-Crystal Band-pass

SUPPOSE two exactly similar crystals are available, but differing in frequency by about the width of bandpass required. Let them be connected in parallel in the usual circuit of Fig. 3, and the phasing condenser adjusted to compensate for the total parallel capacity of the two crystals and their holders. The circuit will now behave as two complete crystal gates in parallel, and will give a response curve having two sharp peaks, somewhat as sketched in Fig. 9. Each curve will have the phase relationships described when considering Fig. 5, and in the region between the two crystal frequencies it is clear that the voltages through one of them will be in opposite phase to those through the other. At the output point D they will therefore be in opposition, and their combined effect will be very low.

This is unfortunately not of much practical use as a bandpass arrangement, but might become so if the phase of one crystal response curve could be completely reversed, so that the phases in the middle region became additive. Fortunately an extremely simple way of doing this exists, and it is surprising that so many years elapsed before the practical advantages of the arrangement were realised. The second crystal is merely moved to the opposite arm of the bridge, being joined in parallel with the condenser K. It now receives input from the opposite end of the coil AB, which is in opposite phase to that applied to the original crystal, and so delivers an output in reversed phase at D. At first sight it would seem necessary to provide the second crystal, X2, with its own balancing condenser K2

in the other arm of the bridge, as shown dotted in Fig. 10. but since the action of these condensers is purely differential, the effect of K2 would be to reduce the balance setting of K. It can therefore be omitted, K being set to a value that is lower than its original setting by the capacity of K2. Practically, the two balancing condensers necessary with two similar crystals would tend to be equal, and so K might be omitted; but as small differences in capacity between the two arms of the bridge are generally present, K will be joined across whichever arm has in fact the lowest residual capacity. A good arrangement is to join a fixed condenser of a few micro-micro-farads capacity across one crystal, and a variable condenser of somewhat larger maximum capacity across the other. By varying this condenser it is then an easy matter to introduce a predominance of capacity into either arm as required. We can still talk of the balance condition, just as when only one crystal is used, for in this condition the response curves of both crystals will be symmetrical.

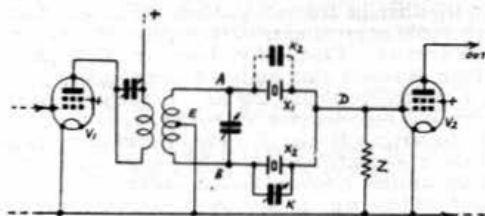


Fig. 10.

Placing a second crystal X2 in the opposite arm of the bridge as shown above will produce a band-pass characteristic.

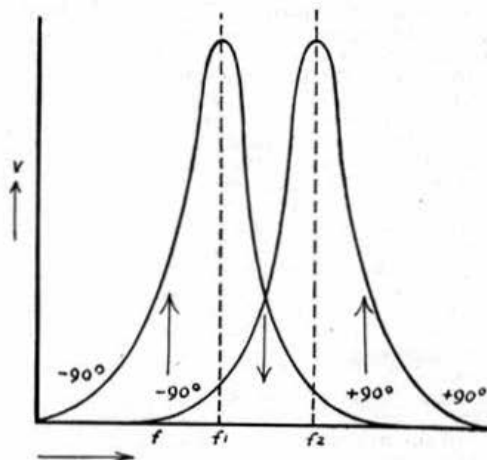


Fig. 9.

Response curve obtained by the use of two crystals of slightly different frequencies connected in parallel in the bridge circuit of Fig. 3.

The phase conditions are now different from Fig. 9, since those of one curve have been reversed. Let it be the right-hand curve. Then in the region between  $f_1$  and  $f_2$  both crystals will be contributing voltages in the phase  $+90^\circ$ , which will assist each other over most of that region, resulting in a larger output at D than from either crystal alone. At the peaks, each crystal is approximately  $90^\circ$  out of phase with the response due to the other at that frequency, which is in any case comparatively small. There is thus little interaction, the peak voltages being perhaps reduced by a few per cent., and similar conditions occur for the limited region just around each peak frequency, where rapid phase changes are occurring. The resultant curve is of the bandpass form as shown in Fig. 11, and has an effective width slightly greater than the frequency difference between the two crystals. Response is high over the band  $f_1$  to  $f_2$ , but is very low outside this region, where the phases due to each crystal remain in opposition. Before considering just how low the response is we must treat separately the two cases when the difference  $f_2 - f_1$  is large or small.

### Filters for C.W.

It will be simplest to consider firstly the case when the two crystals are quite near together in frequency, say 300 cycles (0.3 kc.) at an I.F. of about 465 kc. The response curve of Fig. 11 will now be very high and narrow as in Fig. 13, and at the mid-frequency half-way between  $f_1$  and  $f_2$  there will be considerable response from both crystals, in approximately additive phase. Thus the central dip between the crystal frequencies will be slight, and no special measures need be taken to eliminate it. We can now afford to operate each crystal at high effective selectivity, and as was explained when discussing variable selectivity from a single crystal, the load impedance  $Z$  of Figs. 3 and 6 can be low in value. In practice a resistance of between 5,000 and 50,000 ohms is suitable, and the simplest possible circuit can be used (Fig. 10) with a resistance in the position  $Z$ .

It is important to realise that the slope of the curve outside the crystal frequencies, namely the cut-off slope of the filter, will be greater than that of a single crystal used alone. At any outside point, say near the skirts of the curve on the left hand side, there will be the response of the crystal  $X_1$ , just as there would be in an ordinary crystal gate. There is, however quite an appreciable response at that point also, from the crystal  $X_2$ , which is only a few hundreds cycles different in frequency, and this response is in phase opposition to that through  $X_1$ . The resulting response must therefore be less than that through either crystal alone. If the crystals were infinitely near together in frequency, then the slope of the curve would approximate to the square of that for a single crystal. Practically, however, it is intermediate between this and the slope given by a single crystal, becoming less as the spacing between the crystals becomes greater, but being always better than the latter. If selectivity be defined as the ratio between the wanted signal and a signal sufficiently different in frequency to be outside the band-pass, then it will be true to say that the double crystal arrangement will always be more selective than a single crystal used alone.

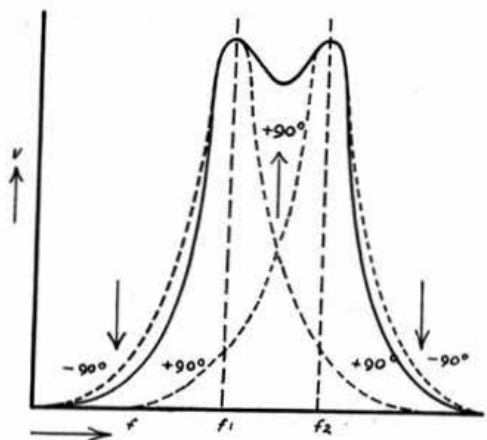


Fig. 11.

The effect upon the response curve of moving the second crystal into the opposite arm of the bridge, as shown in Fig. 10.

### Balancing the Band-pass Filter

What now will happen if the balancing condenser  $K$  of Fig. 10 is varied from the setting which gives the symmetrical curve of Fig. 11? In the single crystal gate we have seen that if the balancing or phasing condenser be increased, a "zero" point occurs on the high frequency side of the crystal frequency, as explained when discussing Fig. 7. Now  $K$  is connected to act as a balancing condenser for the crystal  $X_2$  in the band-pass circuit, so if it be increased in capacity, a zero point is to be expected on the high-frequency side of  $X_2$ , as shown at  $P_2$  in Fig. 12. The position of this point can be moved about by the operator to dodge interference just as if he were using a single crystal gate.

But in increasing  $K$  something else has occurred. The capacity in the arm of the bridge containing  $X_1$  has been increased, which exactly corresponds to a reduction in value of the imaginary balancing capacity  $K_2$  which completes the bridge circuit for that crystal. This introduces a zero point  $P_1$  on the low-frequency side of  $X_1$  (because the conditions are the exact reverse of those pertaining at  $X_2$ ) and therefore falling outside the pass-band on low frequency side. Two symmetrical zero points thus occur simultaneously, giving the condition shown in Fig. 12. The position of each point will vary with the balancing condenser. Thus it becomes possible to reduce interference on both sides simultaneously. This produces a very real improvement over the single crystal arrangement in which a zero on one side is necessarily accompanied by an increased response on the other, probably bringing in interference from signals on that side of resonance.

### Advantages

We can now understand the reasons why a narrow band-pass obtained from a pair of crystals is much more useful to the practical amateur that the older form of crystal gate. The latter has been found very valuable for a number of years, but it has a few defects which often prevent its full use, and which are overcome by the band-pass.

First there is the question of ease in handling, coupled with tuning drift. The single crystal has a very sharply peaked response, and signals must be tuned in "on the nose" of this curve in order to gain the full benefit from the filter. If it is highly selective, the proportion of detuning permissible is very slight indeed. This means that with the majority of receivers it is a distinctly tricky matter to tune in a signal accurately through the crystal, and in the stress of a DX competition, for example, valuable time is often lost. Once the signal has been tuned, however, quite a small trace of oscillator drift in the receiver will lose it again, and this or any other slight disturbance may demand fresh searching at each changeover during a QSO. Admittedly these difficulties have been reduced by careful design in the more perfect commercial receivers, but they are seldom entirely absent, particularly in amateur built equipment.

A second group of difficulties arise at the transmitter. A perfectly stable c.c. transmission may be received through a crystal satisfactorily, but unfortunately there seems little prospect of all signals coming under this category. Not infrequently a transmission will drift, through gradual heating of the transmitting crystal, and it may become difficult to hold at the receiver without constant retuning.



Then there are self-excited transmissions, signals possessing a violent chirp, and the numerous rough or modulated notes to be heard on any crowded band. These will often belong to the most sought-after DX stations, who may perhaps be working under very unfavourable conditions. Such signals can seldom be received at all through a normal crystal gate, or if selectivity can be broadened to an extent which will deal with them, a considerable residue of interference will also be heard.

The use of a double-crystal band-pass having an effective width of perhaps half a kilocycle completely overcomes all but the worst of the difficulties mentioned. The receiver need now only be tuned so that the signal falls *between* the frequencies of the two crystals, and there is a certain amount of latitude in adjustment which makes searching comparatively simple. Drift in either receiver or transmitter is unimportant provided that it does not exceed the width of the pass-band, whilst a chirping or modulated signal will be well received if it does not vary materially by more than the band-width. The increased strength of modulated or unsteady signals in com-

creased. The degree is said to be proportional to the square root of the band-width, and the area within the response curve of the receiver provides a measure of its susceptibility to noise from outside sources. Now it will be seen that whereas the single crystal curve is very narrow at the peak, it widens more rapidly than the corresponding band-pass curve, whilst towards the skirts it is considerably wider. The total area beneath it will be somewhat greater. Hence whilst the improvement in signal-to-noise ratio on switching in a single crystal filter may be about 40 dB. in a typical case, the improvement effected by a band-pass filter some 300 cycles wide has been estimated at 60 dB., showing a 20 dB. advantage in favour of the latter. It must, of course, be realised that the above figures are relative, and will not apply exactly to all cases. For example when the band-width of a double crystal filter is increased, a point will be reached at which its noise-rejecting properties become equal to a single crystal filter adjusted to its maximum selectivity, whilst a band-pass of sufficient width for telephonic use will be still less effective against noise. It is, however, likely to remain superior to an ordinary crystal gate which has been widened out to give telephony of comparable quality.

In the reception of C.W. by means of a crystal filter adjusted to maximum selectivity, criticism is often levelled against the unpleasant ringing effect imparted to the signals. This effect is inherent in the single crystal arrangement, and is a manifestation of the exceedingly low damping of the crystal. The same effect can also be obtained from other circuits in which damping is very low, such as a reacting detector adjusted critically just below the oscillation threshold. Unfortunately the better a crystal-gate is working, and the higher its response to the wanted carrier above all others, the lower will be the effective damping of the crystal, and the more noticeable will be the ring. The crystal is thrown into oscillation by a signal impulse, and remains in vibration for an appreciable time after this impulse has ceased. Code signals tend to run into each other, forming nearly a continuous sound, and at the worst, high speed sending becomes almost, or even quite, unreadable. Atmospheric noise or interference also acquires a ringing tone of the same pitch as the signals, which become in consequence very difficult to copy.

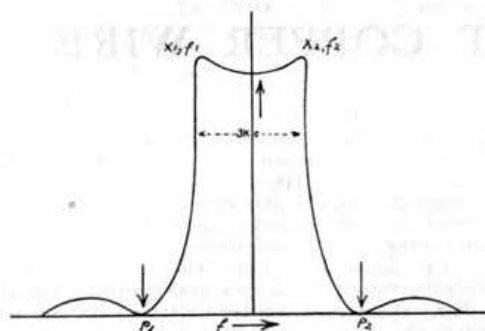


Fig. 12.

The effect of increasing the balancing capacity is to introduce two "zero" points at P1 and P2, at the same time raising the central region.

parison with the single crystal is very striking. As has been explained, the actual rejection of outside interference, from whatever cause, is greater with the band-pass system, except in the infrequent case where an interfering signal falls within a few hundred cycles of the wanted transmission. In such a case there will seldom be two such transmissions equally close on each side of the one required, consequently, it will be possible to clear the interference by tuning the wanted carrier near to one edge of the pass-band. This is probably the only penalty to be paid for the improved utility of the band-pass filter, all the advantages of which have not yet been mentioned.

Careful measurements have indicated that in the vital matter of signal-to-noise ratio the band-pass filter shows an improvement of about 20 dB. over a typical single crystal filter. The reason for this is indicated in Fig. 13, where the dotted curve represents the type of response to be expected from the latter. The curves are of course drawn on a somewhat wide scale, for if represented in the more usual proportions, they would be so steep and narrow as to be contained with difficulty in the sketch. It is well known that the response of a receiver to untuned noises, such as atmospheric, or ignition interference, will be reduced in proportion as selectivity is in-

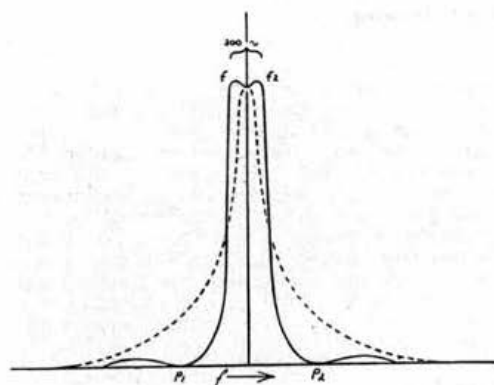


Fig. 13.

A comparison between the response of a narrow band-pass filter, and that of a single similar crystal used alone.

Here again the band-pass filter provides a solution to the problem, for it is found that when a pair of crystals are used, ringing is almost absent. The probable explanation of this improvement lies in the fact that whereas in the case of a single crystal the carrier wave is carefully adjusted to resonance with the crystal (and is thus ideally placed to excite ringing) in the band-pass arrangement the carrier will normally lie about midway in frequency between the two crystals used. Being a hundred cycles or more away from the resonant frequency of either, it is not able to excite such violent oscillation in them. Energy is being applied to the filter at a substantially different frequency from that of either crystal, whilst in the previous case it is applied at the exact crystal frequency. It is incorrect to say that there is no ringing with the double crystal filter, but the effect is so slight that it is hardly noticeable in normal use, and the writer has never known a case where signals have become unreadable from that cause. As

would be expected, increasing band-width by the choice of crystals more widely separated in frequency, still further reduces the effect, until at band-widths of several kilocycles ringing cannot be detected.

To sum up the reasons why a pair of crystals should be used in preference to a single crystal when receiving telegraphic signals, we may place first, higher effective selectivity accompanied by a greater reduction of noise, followed by considerably improved ease of tuning, elimination of the effects of drift in both receiver and transmitter (unless this is initially very bad), ability to read chirpy, modulated or unsteady signals, and the absence of any unpleasant degree of ringing. To obtain these advantages the cost of an additional crystal and slight changes in circuit wiring are all that is required, and it will be shown in the next article, which describes the practical side of the subject, that neither of these need be very serious.

(To be continued.)

## THE PRODUCTION OF COPPER WIRE

By H. R. B. GAUTBY (G6GA).

**S**INCE so much wire is used in radio work, it may, perhaps, interest readers to know a little about its manufacture.

The raw metal is first obtained in the form of ore, the actual copper being either smelted or separated from the ore by direct electrolysis. In some cases, where a large rock has been found to contain liberal quantities of copper, a vat has been built around the rock and the copper electrolysed direct from it. Since the electrolytic method produces a much purer metal than any other, it is now used almost exclusively for the production of copper.

The copper so produced is melted into ingots of about 250 lbs., and these are afterwards rolled into rods varying between 2 in. and  $\frac{1}{2}$  in. in diameter. From this stage onwards the rods are no longer rolled but are drawn through dies to smaller sizes.

### Wire Drawing

The process of drawing the wire through the die is interesting. Firstly, the rod is reduced to such a size at one end as to allow it to pass through the die, then with the die held rigid, the rod is drawn through on to a drum about 20 in. in diameter, which is revolved by a powerful motor. This process is continued on progressively smaller dies until the rod has been reduced to a diameter of about  $\frac{1}{8}$  in.

The 250 lbs. ingot has now become a coil of wire of considerable length, and from this stage onwards it is drawn continuously from one drum through a die on to another drum on which it takes two or three turns before passing through a smaller die on to another drum.

### Annealing

Before being drawn to smaller sizes it is necessary to soften the wire by heating. This process, known as annealing, is carried out by

placing the wire in a steel or copper drum and heating in a furnace until the correct temperature has been reached. The sudden withdrawal of the wire from the drum whilst still red hot would cause the wire to oxidise, and to exclude air from the drum during the cooling process coal gas or carbon dioxide is passed through it. The gas is forced into the drum through one tap and escapes through another, where it is lighted. During its passage through the drum any air that might have filtered in, is forced out with the gas.

After cooling, the wire is found to be bright and soft and can be drawn to a very fine size on one machine without intermediate drawing; up to seventeen dies are often used on this one machine.

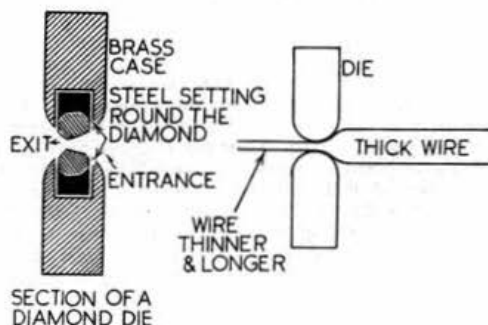


Fig. 1.

A modern diamond die is set in steel in order to prevent the stone splitting. The whole is then mounted into a brass case. On the right is shown an enlarged view of a wire being drawn. The action of the die on the wire is similar to that of a rolling-pin on a piece of dough.

## Dies

Before leaving the subject of the actual drawing of the wire the reader will probably be interested to learn something about the dies through which the wire is drawn. These were formerly made of hard tough steel with a conical hole in the centre. As the hole got larger due to wear, the smaller end was hammered up and then adjusted to the correct size by means of a hard steel punch. Nowadays, modern metallurgy has produced a material called tungsten carbide, which is the hardest metal alloy known, and dies made of this material will last for a long time before the hole becomes too large. Tungsten carbide dies are used for all the larger sizes of wire but when gauges below about 20 s.w.g. are being drawn it is found more economical to use diamond dies. These are diamonds through which a conical hole has been drilled and the whole mounted in a brass disc. Diamond dies will last about six

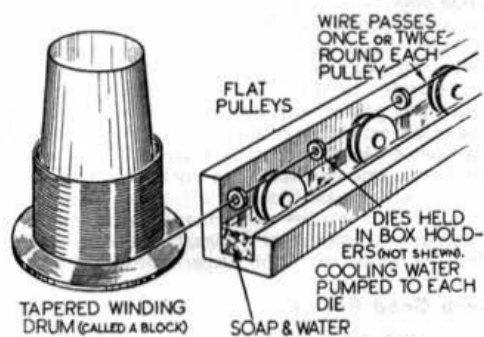


Fig. 2.

A simple wire-drawing machine shewing the principle of continuous wire-drawing.

months when drawing fine copper wire at a speed of 4,000 ft. a minute, and as they wear out they can be reground to some larger size. The subject of diamond dies is intricate and it would be impossible to discuss them fully in this article, but it is interesting to note that diamonds are never cut in the true sense of the word, but are ground, using the dust from broken diamonds as the grinding paste, mixed with olive oil. Though the diamonds are very hard they are also very brittle and if placed on a piece of metal and given a light tap with a hammer will shatter into fragments. They are only prevented from splitting when being used for wire drawing by the steel or brass case in which they are set.

The average Wire Drawing factory possesses thousands of pounds worth of diamonds in the form of dies for drawing the finer sizes of wire.

## Insulating

The insulation of wire is just as complex as the actual drawing, though this might not appear to be the case. The method of insulating wire with cotton is done by lapping five or six threads around the wire as it travels through the machine, and then lapping a second layer of cotton around the first but in the opposite direction. A new method of cotton insulating, which has many advantages

over the old system, has just made its appearance, and consists in the knitting of a spiral covering around the wire.

Enamel insulated wire is probably the most universally used in radio work, since the insulation is so thin that much more wire can be wound on to a given space. The wire is slowly run through troughs containing an enamel, made with a rubber gum base to give pliability. After drying, further coats are applied until the wire has the necessary thickness of insulation.

## Wire in General

It is interesting to note that copper wire can and has been drawn through small dies with speeds up to ten thousand feet a minute. When drawing wire through the die it is cooled and lubricated by a solution of soap, water, and oil or sometimes just soap alone.

As soft copper is a better conductor than the hard variety, aerials should be made from the former wire in preference to hard copper, provided such wire is of sufficient thickness to carry the weight of the feeders, etc.

A length of copper wire which is too thick or too soft can be made thinner, and at the same time harder, by drawing it through a hole in a piece of steel. This hole should be drilled smaller than is actually required in any fairly hard piece of steel and then opened out and tapered by using a steel punch. If the hole becomes too large it can be made smaller by hammering the reverse side, and so forcing the metal back inside. The final adjustment and setting of the die can be carried out with a tapered steel punch; the taper of the point being about 20°.

A knot in a piece of wire can be removed by heating to a red heat before attempting to straighten. This, of course, is only necessary if the knot or kink has been pulled tight.

When handling a coil of wire that has become tangled, it is always a good practice to sort out the turns first and to refrain from threading the ends through, because when a coil is dropped and becomes tangled it is not often that the actual turns become knotted. What usually happens is that the turns become crossed and look far worse than is really the case. A little sorting of individual turns will often clear up the mess.

Old telephone wire should never be used for an aerial, since this often will not be copper but an

(Continued on Page 163.)

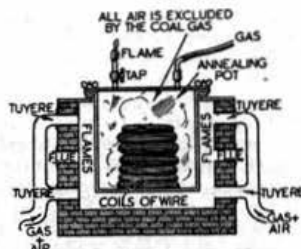


Fig. 3.

A gas-fired annealing furnace using coal gas to occlude the air.

# PROPAGATION MYSTERIES

By T. C. WHIMSTER (G8UJ)

*Although written before the war the information given in this contribution is of special interest to-day.*

**A**T last the long awaited radiating licence has arrived and the newcomer makes his debut. Contacts are established and verified until the walls of his shack resemble a patchwork quilt, a card from America, a rare card from a Far East station and then—

In due course he gets somewhat tired of just working DX and his radio interest wanes a little. He looks for fresh worlds to conquer and assiduously studies text books and magazines for a new field in which he hopes to contribute something for the benefit of the art.

New transmitting circuits are designed, and wonderful receivers built (which somehow do not quite perform as they should), he works out some ideas for aërials and then, is told that nothing he has done is new. He hears the word "propagation," but his reaction is similar to that of the Duke of Wellington, who, after inspecting some reinforcements sent to him during the Peninsular War, and which obviously came from the prisons and slums, turned to his staff and exclaimed, "Well, gentlemen, I don't know how they'll strike the enemy, but by God they frighten me!"

## Some Unsolved Problems

A study of the propagation of radio waves is, in the writer's opinion, the most interesting phase of our work for the least informed or non-technical among us may hit on something new. For instance, many of us have heard the 14 Mc. station who says, "Stand by whilst I increase power." Upon examining the carrier strength meter we find that the strength is down possibly 3 S points. On rarer occasions the signal has been known to disappear altogether and has only reappeared when power is again reduced. What has happened to cause this phenomena? Has the signal skidded to increase the skip over which it is transmitted, or has the extra power made a hole in the reflecting layer and taken through it some of the lower power thereby reducing the received signal strength?

Observations carried out since 1919 show "dead areas" in certain parts of the world. The majority of seagoing operators will remember that the nearest "dead area" to England is off Cape Finisterre (North coast of Spain) where at distances between 50-100 miles from the radio station at that point signals are inaudible, but reappear again beyond 100 miles. At 15 miles seaward the mineral content of the earth can hardly be the explanation. The true cause is still to be discovered.

Some time ago experiments were made with a 4 element rotary beam. It was found that a deviation of as much as 20° to the North from the Great Circle path was required to obtain the maximum signal strength when receiving stations in the W2 district. On the other hand signals to the W2 district were received most strongly there when transmitting over the Great Circle route. This phenomenon was observed for about one hour after which signals took the same course over the Great Circle path. Why?

GCC, the Cullercoats D.F. station, obtains a

different reading of the true position of GNF (North Foreland) at different states of the tide. What then is the true effect or relationship of the moon's influence on radio waves?

The writer also finds, consistently, that with a really directional beam directed West to North-west, U.S.A. stations can be contacted with regularity and the cut-off points are sharply defined. Turning the beam exactly through 180° or using a bi-directional beam, reports are received from ZL—VK 2, 3 when according to theory these parts should be missed by 20°. The signal to the East has apparently deviated northwards. Is this due to the effect of land masses, remembering that to the West there is little land, and 2,000 miles of ocean, whilst to the East there is little sea, and 2,000 miles of land in Europe alone and more in Asia? High power European stations at certain times of the day are received in parts of the U.S.A. as much as 40° to the North of the usual direction in which low power stations are being received. Does power alone cause refraction of the radio wave? Further, to what extent does aerial design help this condition and to what extent can aerial design overcome these problems?

These are but a few of the many questions that the amateur can answer or at least collect information about and pass on to the Experimental Section.

## Keep Good Records

The next time any unusual effect is observed note carefully the frequency, time, conditions, power, aërials in use at the time for transmission and reception, in fact every detail. Watch for the effect again and if possible try the experiment yourself (if it was an experiment which was observed) and keep looking out on all bands for the same effect.

There are very few Epsteins or Termans among us, but who knows, it may be an amateur who will supply the link between knowledge and surmise? At least the amateur in this country can by his observations justify the possession of that which is so dear to his heart; a transmitting licence for experimental purposes.



G3BY operating his 56 Mc. portable station near Glossop during the GW Cup Contest held in July.



# THE 1939 56 Mc. FIELD DAY

By J. N. WALKER (G5JU)

**D**ESPITE the poor weather which universally prevailed, good support was forthcoming for the third annual 56 Mc. Field Day held on Sunday, July 9. Sixteen transmitting and ten receiving entries or check-logs were submitted, this number being well up to the average. In case the numbers appear small, it should be pointed out that the event is restricted to those possessing portable licences. In practically every case, each station was manned not by one but by a group of operators and assistants and it is further noted from the lists of stations worked that there were quite a few portable stations taking part who, for unknown reasons, did not submit an entry or even a log. This state of affairs is to be deplored since, to the casual observer, activity apparently taking place would appear to be much lower than is actually the case.

It is estimated that the number taking part in portable operations must have been close on one hundred. In addition, the fixed stations who were active from their home addresses on this day are too numerous to list and, altogether, a very satisfactory proportion of the Society's membership were demonstrating their enthusiasm for experiment in the 56 Mc. band. One of the several benefits arising from an event of this nature is, of course, the comparatively intense activity which reigns. As a result, in a good location many more stations are to be heard whilst even in a poor location the probability of some signals being heard is greatly enhanced.

It is proposed to write up this year's 56 Mc. Field Day in a somewhat different fashion to that which has been employed in the past, for two reasons. The first is that the majority of the entries contain such a wealth of information of a varied nature that it is quite impossible to do proper justice to them in the limited space available. Secondly, to give specific details of the various contacts made conveys little that is useful and would inevitably result in duplication. Items and occurrences of unusual interest will, of course, receive due attention.

For the sake of conciseness, two tables are set out herewith and from these alone, a good deal of information can be gathered. The logs of the event are available from the writer to those whose major interests lie in the ultra-high frequencies and it is hardly necessary to state that a study of the logs will well repay the time devoted to it, in view of the valuable data which is given concerning circuits, both transmitting and receiving, aërials, propagation and conditions generally. Particularly should it be noted that the apparatus described is, practically without exception, of a very modern type and proven efficient in actual operation. A separate article will be prepared dealing solely with the equipment employed, from the technical aspect.

## General Observations

It is gratifying to observe that the policy of the Society in encouraging the use of crystal-controlled transmitters and modern types of receivers is bearing fruit in a most satisfactory manner. Of the sixteen portable transmitters in operation during Field Day no less than eleven employed crystal control, three of these using 28 Mc. crystals, two 14 Mc. crystals, five

7 Mc. crystals and one a 9.3 Mc. crystal. Two transmitters used ECO circuits and of the two remaining, one was of the long-lines type and the other an ultra-audion. Both undoubtedly gave rise to frequency modulation and the writer is thankful to observe that the owner of the ultra-audion is building a c.c. transmitter to take its place—it is hoped the other transmitter will also be replaced by one of more modern design.

On the receiving side, straight receivers are to the fore, no less than twenty-one of this type being used. Five were fitted with radio-frequency stages and it is noteworthy that most of these utilised *Acorn* valves. Obviously, it is generally realised that the ordinary type of R.F. amplifying valve is too much of a "passenger" and that, although expensive, the use of an *Acorn* R.F. pentode is definitely very much worth while. The day was windy and many participants in the event mention that difficulty was experienced in "holding" signals because of aerial sway. This occurred even with some of the 1—v—1 receivers and the writer would suggest that, in these cases, the trouble was due to insufficient screening of the detector stage, allowing some signal to reach the latter directly instead of passing through the first valve.

Five superhet receivers were in use, generally in conjunction with a straight receiver as a stand-by. In four instances, the superhet was found definitely to be superior in sensitivity to the straight type, whilst in all cases the additional stability and signal holding capabilities proved a distinct advantage.

Very few quench receivers were used—only two were permanently super-regenerative, whilst others had optional quench, evidently very rarely used.

It is interesting to look back on the records of the two previous 56 Mc. Field Days. In the first (1937), self-excited transmitters were the order of the day, only one being crystal-controlled (that one, as might be expected, belonging to G5CD). Receivers were



G8LY's rotatable 56 Mc. beam aerial

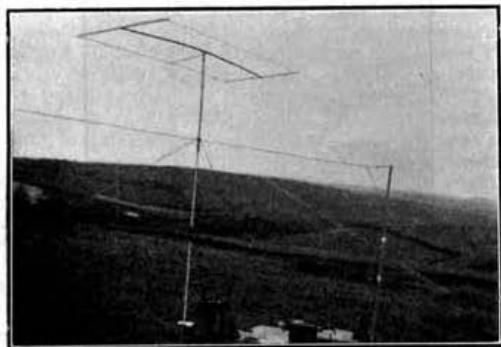
universally of the quench type, with but one exception—a superhet (again G5CD!)—although, with interest being aroused in the use of c.w. a number of stations possessed straight receivers, but as stand-by's and not for regular use.

In the following year (1938) a good deal of progress was recorded, although too many still hung on to obsolete equipment. Let us hope that by next year, quench receivers and self-excited transmitters will both be completely defunct.

The foregoing remarks apply to the portable equipment employed by actual participants. The state of affairs existing at many fixed stations and particularly among newer licencees, is not quite so satisfactory. This angle is well illustrated by remarks made by GW6AA who made a point of ascertaining as accurately as possible, details of the type of equipment employed at each station worked or heard. He found that 56 per cent. were using only quench receivers and only 44 per cent. were in a position to receive c.w. signals. It is interesting to note that only about 40 per cent. of the stations heard on Snowdon would have been audible on a super-regenerative only, as was proved by frequent changes over to a straight type. It is evident, therefore, that there is still room for considerable improvement in this direction and it is hoped that those to whom these remarks apply will endeavour to improve the state of affairs existing.

### Telephony versus C.W. Operation

Those 56 Mc. enthusiasts who stick exclusively to telephony are proving hard nuts to crack. The indisputable fact that c.w. will give an *identifiable* signal at a much greater distance than is the case with telephony is taking a great deal of driving home. Nevertheless, slowly but surely, the fact is being realised and the proportion of c.w. operation in the 1939 event was much higher than in any previous one. Many of the entrants employed transmitters designed essentially for c.w. use and very few operated exclusively on telephony. However, many of the fixed stations who participated keyed their carriers seldom or not at all and on a number of logs remark is made of the fact that several weak carriers were heard which, if keyed, would have been completely identifiable. The moral is obvious and, for the sake of emphasis, it is reiterated—key your carrier at some period of each QSO and the reward, in the shape of reports from unexpected places, will soon be forthcoming.



The 56 Mc. portable station set up on Devil's Dyke, near Brighton by 2BIL.

There is also another side to this problem. A telephony transmission takes up a much greater band width than a telegraphic signal. In areas where operation is somewhat congested—and this word applies even to the 56 Mc. band in some centres at certain times—a number of telephony stations spread over the band (more usually only part of it) renders it practically impossible to receive weak c.w. signals emanating from comparatively great distances. Many listeners around London described conditions on the band during this event as being almost similar to 7 Mc.—a state of affairs which serious 56 Mc. operators will wish to avoid at all costs. May it then be urged that during events of this nature, telephony operation be reduced to the absolute minimum in order to give those who desire to study propagation over long distances a chance to record some worth-while observations.

### Conditions

During June, prevailing conditions were good, many long distance contacts, both between British stations and between this country and Italy, taking place, the former presumably on extended ground wave or low level bending and the latter from sporadic E and F layer reflections. In view of the possibility of the continuance of such conditions, a number of those taking part considered it worth while to set up their stations on the Saturday evening, thus making a weekend of it. In point of fact, conditions appear to have varied considerably during the period of the Field Day but the majority taking part agree that they were, on the whole, about average or slightly above and definitely better than those obtaining during last year's event, although nothing like so good as existed during the latter part of June.

Extended ground wave propagation was poor and many operators who had been successful in making contacts over distances exceeding 100 miles from their home QRA's and who hoped for still better results when operating from more or less ideal situations were disappointed. One of these was G2ZV, who was fully expecting to make contacts up to possibly 200 miles (G6CW, 160 miles, had been worked from home) but actually the longest distance covered was 52 miles. The only contacts over distances exceeding 100 miles were those made by GW6AA on Snowdon with G8UBP, G2MFP and G6CW.

Three near-European stations were heard—F8AA, F8NW and ON4DJ—but none of them were worked by any of the portable stations. No sign of the Italian stations was heard by anyone.

G2ZV and 2DDD kept careful observation throughout the day on variations of signal strength. Stations within the 45–50 mile range were consistent, with but very small variations in strength. Many of the participants are in agreement that conditions were fairly good at the commencement but deteriorated during the mid-day period from 11.30 to 13.30, both in regard to distance and signal strength. During this time the noise level increased. After 16.00, a definite improvement set in and continued up to the close of the Field Day period. The majority of the portable stations closed down at this time—20.00 B.S.T.—and it is likely that many contacts over greater distances were thereby missed. G2ZV considers from long term observations that the best time for extended ground wave propagation is from

22.00 to 24.00 B.S.T., with occasional good periods between 16.00 and 20.00. It is during this latter period that commercial harmonics are most often audible.

BRS3101 advances some interesting data regarding conditions on the 56 Mc. band. He maintains that when an increase of atmospheric noise level occurs, it is always followed, sometimes immediately but in any case within a day or two, by a period of high speed fading and often by flutter. The greater the rate of increase of noise level and the higher its intensity, the more severe are the effects which follow. Further, during such periods, the band invariably goes dead after 23.00. BRS3101 quotes numerous occasions on which such phenomena have been observed and wonders whether they have any connection with phases of the moon, sunspots and magnetic disturbances. He would be glad to hear from any other 56 Mc. enthusiasts who agree with his findings and are endeavouring to correlate them.

### The Entries

Since further space will later be devoted to them, no details, other than those appearing in the tables, are given of the equipment. Particulars of the contacts made are also brief.

C. J. Rockall (G2ZV) and his partner, E. Cosh (2DDD), have been adjudged the joint winners of the Mitchell-Milling Trophy, not so much on the actual performance of the station or number of contacts made, but for the clear, concise and extremely interesting log which they submitted and upon which they are to be congratulated.

The actual number of contacts made was only eight, but this is explained by the fact that the operators concentrated on endeavouring to make long distance contacts. Many stations within normal ground wave range were heard and many more contacts could have been effected but no really useful point would have been served by so doing. At the same time, as previously mentioned, close observation was kept on all signals heard. During the contacts, many aerial experiments were carried out and conclusively demonstrated the advantage of employing a beam aerial. The radiation from the three element array used was found to be in close accordance with the theoretical polar diagram.

As a matter of fact, aerial tests were the order of the day and much care and time was expended in laying out the aeriels. Indicating lines were laid out on the ground, spaced 10° apart on a circle 8 ft. in diameter and, with their aid, it was possible to direct the radiation to the predetermined compass points at which DX stations were known to be operating. Unfortunately, none of these were heard, although ON4DJ was logged RST339 at 14.08 B.S.T.

The great difficulties encountered by David Mitchell (GW6AA) and his partner, Crowley-Milling, who jointly qualified for an Award of Merit, were well described last month and will therefore not be commented upon here, except to commend the tenacious spirit shown by the operators in carrying on in circumstances under which the majority would probably have lost heart completely.

As the table shows, GW6AA was successful in making a good number of contacts with only the simplest of aeriels. All but five stations heard were contacted. Two harmonics from 14 Mc. stations 45 miles away were logged, which speaks a lot for the

sensitivity of the receiver—or else for the poor adjustment of the distant transmitters! The fact that no signals were audible from a distance exceeding 130 miles is put down to poor extended ground wave conditions.

Constance Hall (G8LY) was another participant who qualified for a transmitting Award of Merit, again not so much for the number of contacts made but for the interesting report which accompanied her entry, including, as it did, a plan showing the direction and distance of each station heard or worked. This latter idea is commended to the notice of participants in future events of this nature. It is not drawn to scale and therefore would not take long to prepare but it does enable one to see at a glance just what results were achieved, especially if two colours are used—one for stations worked and another for those only heard.



A group of operators at G2ZVP during the 56 Mc. National Field Day.

The equipment used by G8LY was of a truly portable type, being contained entirely in one cabinet, with the exception, of course, of the 12-volt battery. The beam aerial, of which more anon, was fixed to the car and was rotatable from the rear seat, from which position all operating was carried out. G8LY found conditions good and remarks on the "7 Mc. QRM effect" on the L.F. end of the band. It is amusing to read, to quote her own words, "My usual method of listening on 56 Mc. is to prop up a book, reading and twiddling the knobs—on Sunday I took a book but never opened it, my ears fairly flapped!" C.W. was used entirely and it is noted with interest that many carriers were identified because the operators very sensibly keyed the transmissions at some time or another.

The third transmitting Award of Merit goes to Ernie Dedman (G2NH), partly for his interesting report but more particularly for the consistency with which contacts were made during the whole Field Day period. Twenty-one QSO's (not including second contacts) were made in ten hours—how many 56 Mc. enthusiasts there must be who wish they could equal this performance! In addition, many more



signals were heard. G2NH, in sympathy with GW6AA, considers that the majority of receivers in use lagged behind in design that of the transmitters.

G3CU's results are commendable in view of the fact that the power used was only 2 watts on telephony, rising to a maximum of 6 on c.w. His entire station can, if necessary, be transported on a carrier tricycle.

G5CD unfortunately met with trouble through his batteries (thought to be fully charged but actually the reverse) quickly running down, thereby severely curtailing both the time of operation and the scope of his activities.

G3BY achieved excellent results, due undoubtedly to the very modern equipment employed. No trouble was experienced in holding weak signals, despite the high wind prevailing. The Ashton-under-Lyne A.R. Society co-operated with him in setting up the station.

G5MA's station is another capable of being operated entirely from the rear seat of a car. An excellent number of contacts were made, the greatest distance covered being 52 miles. Seventeen additional stations were heard, including G6CW (167 miles), and G6DH (92 miles). It is interesting to note that these two stations were heard during the mid-day hours, when others found conditions poorest.

G2WS did well considering that only 5 watts input, from batteries, was used. Local interference caused much trouble.

In addition to the contacts made (see table) G2QY's efficient equipment and beam aerial put signals to G2XC (70 miles), G8DM (76 miles) and G6CW (100 miles). The best contact was with G5TX. Many stations heard were not worked. The Edgware S.W. Society rendered valuable assistance to G2QY, who compares this field day with one in which he participated in 1933, when the DX accomplished was 6 miles with a self-excited ICW transmitter, quench receiver and simple dipole aerial!

G8JV's entry is another showing excellent consistency, again doubtless due to modern equipment. The latter was powered by vibratory convertors, with very satisfactory results.

### Receiving Entries

Two receiving entrants, G. F. Keen (2BIL) and J. Cymerman (BRS3101), qualified for Awards of Merit, both for general excellence of results and well written reports.

2BIL's log is most complete and is highly commended. It gives the fullest details of all signals heard and includes a useful summary. The band was evidently absolutely alive to 2BIL, signals being received continuously throughout the test period and it is estimated that practically every transmitter active in the southern and south-eastern parts of the country was logged at some time during the day. Two aeriels were employed, one a dipole with reflector, the other a long wire carrying sixteen half-waves, the latter proving the better. It is worthy of note that neither aerial exceeded 10 ft. in height.

If further proof of the greater carrying power of c.w. is required, it is readily forthcoming from a study of 2BIL's log. He heard three c.w. stations over 100 miles away and eleven over 50 miles, but none over 50 miles distant were received on telephony. The average distance of telephony stations was 26 miles, but it was 44 miles for c.w.

BRS3101 was only able to listen for a comparatively short period but found conditions fairly good.

Of the twenty-six stations heard, nineteen were using c.w.—an excellent percentage.

H. W. Parker (2ADZ) heard practically all stations within a radius of 30 miles (many non-portable) and, in addition, G6CW (125 miles) and G6DH (75 miles) were logged. The quality of all signals (except two) is commented upon. The L.F. end of the band was congested and only four stations were heard between 57.5 and 59 Mc.

In contrast to most participants, 2BVU deplors the fact that so many stations used telephony exclusively. Many weak carriers were heard but could not be identified. Only four of the seventeen stations logged were heard using c.w.

BRS3003, in company with BRS3179, did well with a simple two valve receiver. G6QZ (116 miles) and G5TX (61 miles) represented good DX, both being heard at good strength.

BRS1173 was another who heard ON4DJ, F8AA and F8NW, amongst many more. Others who participated and who are thanked for their logs were BRS2481, G5AX (near Preston), G6UT (Little Hallingbury) and 2BVD (near Bristol).

### Aerials

As one would expect, many different types of aerial systems were employed but it is a striking fact that dipoles, usually with reflectors and/or directors, were in the great majority. The reason is probably to be found in the fact that a dipole lends itself both to portability and to forming part of a simple but effective beam array. In this connection two schools of thought are observable—those who advise the use of a beam aerial to concentrate the radiation in a given direction, thereby rendering it possible to cover much greater distances with low power, and those, chiefly listeners only, who advocate the use of an omni-directional aerial, so giving wide coverage and allowing receiving stations more opportunity of hearing them.

A synopsis of the outstanding aerial designs, together with novel ideas incorporated in them, will be given at a later date.

### Effect of Height above Sea Level

When a portable station is set up, it is usual to go to some pains to ensure that the height above sea level is as great as can conveniently be managed. Many entrants comment on the superior results secured with the aid of the additional height but a few definitely state that practically no advantage was forthcoming. The latter, however, appear to have been comparing results during *peak* conditions at home with the only average conditions appertaining during the field day.

To give specific instances, G8LY's home QRA is 400 ft. above sea level—the Field Day location, 2 miles away, was 684 ft. above sea level. The portable gear was that normally used at home and more stations were heard during the period of Field Day than during 19 months listening at home. Considerable fading is always present on G8LY's signals at G6XM (18 miles) but the latter reported them absolutely steady during Field Day.

G8JV comments on the astonishing field strength reached by many stations, rendering it difficult to hear weak signals. G3BY mentions that the increase of strength resulting from operation at a height of



## TRANSMITTING ENTRIES

| Call   | Location                  | Crystal Frequency | Transmitter Line-up | Receiver       | Aerial Systems                          | No. of QSO's | No. of Stns. Hrd. | Max. Dist. Wrkd. Miles |
|--------|---------------------------|-------------------|---------------------|----------------|---|--------------|-------------------|------------------------|
| G2ZVP  | Bury Hill, Sussex         | 7                 | 6L6/6L6             | Acorn Superhet | $\frac{1}{2}$ wave beam two long wires  | 8            | 29                | 52                     |
| G8LYP  | Near Basingstoke          | 14                | 6L6/RK39            | 0-v-2          | $\frac{1}{2}$ wave beam                 | 4            | 16                | 46                     |
| GW6AAP | Snowdon ...               | 28                | 6J5/807/35T         | Acorn 1-v-1    | $\frac{1}{2}$ wave zepp fed             | 25           | 31                | 124                    |
| G2NHP  | Near Dorking ...          | 9.3               | 6L6/6N7             | Superhet       | $\frac{1}{2}$ wave dipole               | 20           | 39                | —                      |
| G8JVP  | Near Leek ...             | 28                | RK34/RK34           | Acorn 1-v-1    | $\frac{1}{2}$ wave dipole               | 14           | 18                | 70                     |
| G5MAP  | Near Storrington, Sussex. | 14                | 6L6/6N7             | Superhet       | $\frac{1}{2}$ wave dipole               | 18           | 35                | 52                     |
| G2QYP  | Near Elstree ...          | 7                 | 6L6/6L6/T20         | 1-v-1          | $\frac{1}{2}$ wave beam                 | 10           | 32                | —                      |
| G2RDP  | Woldingham, Surrey.       | ECO               | 6L6/6L6             | 0-v-1          | $\frac{1}{2}$ wave                      | 5            | —                 | —                      |
| G2WSP  | Woldingham, Surrey.       | ECO               | 89/6L6              | 1-v-1          | W8JK $4 \times \frac{1}{2}$ wave dipole | 9            | —                 | —                      |
| G5CDP  | Amersham, Bucks.          | 7                 | (See July BULLETIN) | Acorn Superhet | $\frac{1}{2}$ wave                      | 3            | 18                | —                      |
| G5CMP  | Billingshurst, Sussex.    | ECO               | 89/6V6              | 0-v-2          | $\frac{1}{2}$ wave beam                 | 7            | —                 | —                      |
| G3CUP  | Epsom ...                 | 7                 | 6L6/6N7             | 0-v-1          | $\frac{1}{2}$ wave dipole               | 15           | —                 | —                      |
| G3APP  | Grays, Essex ...          | 7                 | 3 stage             | 0-v-1          | $14 \times \frac{1}{2}$ waves           | 4            | 7                 | 61                     |
| G3BYP  | Hartshead, Pike...        | 28                | 6J5/6V6             | Acorn 1-v-1    | $2 \times \frac{1}{2}$ wave in phase    | 7            | 11                | —                      |
| G2JBP  | Warlingham, Surrey        | —                 | Long-line           | 0-v-1          | $\frac{1}{2}$ wave reflector            | 7            | 12                | 35                     |
| G8AAP  | Near Birkenhead           | —                 | S. excited          | Transceiver    | $\frac{1}{2}$ wave                      | 2            | 6                 | —                      |

1,000 ft. above sea level was amazing—"It seemed to be 1 ft., 1 decibel gain!"

On the other hand, G5CD often hears G6CW S7/8 at home but at 550 ft. above sea level no sign was heard of G6CW, although several stations were heard calling him. G2ZV's portable station was located 500 ft. above sea level—his home QRA is only 10 ft. above sea level. Yet, practically every station heard during the event has been heard and/or worked from the home QRA. There was, however, a definite increase in signal strength in most cases, this fact undoubtedly indicating the difficulty which has to be surmounted by stations located with screening in the directions in which it is desired to work. It further indicates (considers G2ZV) that reliable communication over distances of 45-60 miles depends on a number of factors, including the concentration of the signal in the direction which is most suitable for propagation (not necessarily a direct line between the two stations), the method of concentration, i.e., the

desired angle between the earth and the fundamental angle of radiation from the aerial system employed, the sensitivity of the receivers used, and lastly the aid of some natural medium by which the radiation is reflected or assisted. This last factor is a variable and is never likely to be of much help in establishing consistent communication.

## Definite Experimental Value

One outstanding feature of this year's 56 Mc. Field Day is the tendency of competitors to make good use of the great activity natural to the event to carry out definite experiments and not just to make as many contacts as possible.

In the first place, it is evident that much thought had been given to the design of portable equipment. Greater than this is the fact that practically everyone taking part used more than one type of aerial and conducted numerous tests to ascertain their general effectiveness, their radiation patterns and the effect

## RECEIVING ENTRIES

| Call    | Location                           | Receiver | No. of Stations Heard | Types of Aerial              |
|---------|------------------------------------|----------|-----------------------|------------------------------|
| 2BIL    | Devil's Dyke, near Brighton ... .. | 0-v-1    | 50                    | $\frac{1}{2}$ wave dipole    |
| BRS3101 | Golders Green ... ..               | 0-v-1    | 23                    | $16 \times \frac{1}{2}$ wave |
| 2ADZ    | Near Leatherhead ... ..            | 0-v-1    | 42                    | $\frac{1}{2}$ wave dipole    |
| 2BVU    | Frodsham, near Warrington ... ..   | 0-v-1    | 17                    | $\frac{1}{2}$ wave dipole    |
| BRS2481 | Near Leek ... ..                   | 0-v-0    | 14                    | $\frac{1}{2}$ wave dipole    |
| BRS3003 | Walton Heath, Surrey ... ..        | 0-v-1    | 30                    | $9 \times \frac{1}{2}$ wave  |
| BRS1173 | Heathfield, Sussex ... ..          | 0-v-1    | 28                    | 66 ft. Windom                |
| G5AX    | Leyland, near Preston ... ..       | 0-v-1    | 12                    | 50 ft.                       |
| G6UT    | Little Hallingtree ... ..          | 3 valve  | 3                     |                              |
| 2BVD    | Near Bristol ... ..                | 0-v-1    | —                     | $4 \times \frac{1}{2}$ wave  |

of intervening country in deflecting signals. More clement weather would have enabled such experiments to have been carried to a greater degree of finality.

## Concluding Remarks

Previous Field Day write-ups have concluded with suggestions for future events but such would hardly seem to be necessary this year. Most participants thoroughly enjoyed themselves and were satisfied with the results. The general view is that there is still much scope for improvement in the design for U.H.F. receivers and, with the present policy of British valve manufacturers to introduce receiving valves specially designed for U.H.F. work and selling at reasonable prices, there is little doubt that a considerable advance in receiving technique will take place before the 1940 Field Day.

It appears that many newcomers to 56 Mc. start off with a quench type of receiver and possibly they do not realise the severe interference a receiver of this type can cause to others situated a considerable distance away. Quench receivers are now definitely obsolete and it is hoped that all mention of them will be absent from next year's record.

Greater concentration on the use of c.w. is still necessary. Telephony should be restricted to local and semi-local contacts and even then the call should frequently be given on the key.

On reading through this article, it might seem that the writer has been inclined to "lay down the law" in places but please remember that the views given are those of the majority of serious workers on the U.H.F. They are intended solely to enable the advancement in this particular field of amateur radio and their adoption will undoubtedly lead to this highly desirable goal.

## VS7RA and VS7RP

Due to an error in filling up their B.E.R.U. Contest Entries, Messrs. R. P. Walker-Alexander, VS7RA, and R.E.M. de la Pole, VS7RP, were recorded in the report of the Contests as non-members of the R.S.G.B., whereas both are members.

## LZ Stations

HB9CE has asked us to state that LZ1ID is the only amateur station operating in Bulgaria. QSL's should be sent via HB9CE.

## Correction

Due to a printers error the call sign appended to the letter published in our last issue on page 107, was recorded as G8GI instead of G8CI.

## Royal Corps of Signals

We have been asked by The War Office to bring to the notice of members, the advantages offered by a career in the Royal Corps of Signals. Formed in 1920 the Corps is the direct descendant of the Signal Service of the Royal Engineers, better known as "R.E. Signals."

The rapid development of electrical signalling has caused a great expansion of Royal Signals and there is every indication that the establishment of the Corps will continue to increase.

Wireless operators form about half the Corps establishment, the remainder consisting of kindred technical "tradesmen."

A new illustrated pamphlet depicting various phases of life in the Royal Corps of Signals will shortly be available.

During the recent Radio Exhibition at Olympia the Royal Signals exhibit was the centre of much interest.

## WHATEVER HAPPENS during the next few months—

it is absolutely imperative that every amateur in this Country should not only continue his activities but actually INCREASE and EXPAND THEM WITH ALL HIS EFFORTS. On the face of it this may seem ridiculous, but when we examine the position—our transmitting licenses withdrawn—our ranks thinned by enlistments and the inevitable loss of those whose courage for radio has been killed, if we, the few who are left, lose heart where will we be in another few months when hostilities cease and we require our tickets again? We must remain a solid body of live active men who can demand our rights at the earliest moment. If we "don't watch out" there will be no "rights" we can claim!!!

NOW, with everything against us, is the time to prove our worth, to devote every possible moment to the improvement of our own and the World's knowledge of that science for which the radio amateur is mainly responsible.

Many of us have wasted time continually while the Tx could be used, in transmission of jargon mainly concerned with antenna (which we did not understand). With the Tx off the air we *can* and *must* devote those hours to fathoming the why and wherefore of the whole science—must go forward to an age where we really understand the reason behind everything radio.

Who dares to say that the British amateur with all local QRM silenced cannot solve the problem of UHF reception and prove, once again, the impossible, by discovering how to receive W's on 224 Mc.s.?

How many of us can still gain experience from the construction of even a straightforward super-regen, and if we DO know how to use a soldering iron most of us can still gain in knowledge from the operation and the vagaries of the super-regen, on 56, if we only discover how little is really to be heard down there.

Even though we have no inclination to construct—even though we may be just glorified

operators—then let us make certain that when those tickets are returned we will at least be better operators. Remember those jerky signals with which we filled the ether a few days ago and called it morse? Remember the times we have been unable to understand the other fellow and the many times we were compelled to reply—Sry om QRM—Pse Rpt!!!

Let's get back to the key and buzzer and be prepared with a vengeance for the return of our "watts" by the P.M.G.

When we are once again on the "air" we must be in the position to take all we can receive and we can only do this by devoting a few minutes every day to neglected morse.

Other countries, if any of them do remain neutral, will continue with developments. "QST" and "Radio" will still be published, but we in England may not see the issues for many months. Restrictions on the importation of literature will almost certainly keep developments in other countries from us unless we eavesdrop through the "air" and listen to friends abroad telling the tale.

Why not despatch some of those belated QSO's and on every one request a brother "ham" abroad to keep a one-sided QSO once a week with us, to tell us of developments in amateur and commercial radio in their Country.

Send a note to R.S.G.B. advising of these skeds so that we may all share. Make a point of reading every scrap of radio literature. Keep your mind up-to-date—and pass on interesting items to your own circle of friends.

Get back to the text books and the buzzer. Get back to the days of doing things for ourselves—and knowing why we do them—then when the time comes we will be able to get back into the ranks of transmitting amateurs without hesitation and to build the transmitter around the world's latest developments. *Between us all let us put amateur radio in Great Britain on top of the World—NOW—while some of our activities are suspended.*

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**WEBB'S RADIO** WILL CONTINUE TO IMPORT AND STOCK EVERY COMPONENT AND RECEIVER OF INTEREST TO SHORT-WAVE MEN, AND TO GIVE WHOLEHEARTED CO-OPERATION IN A PRACTICAL OR TECHNICAL MANNER. SEND YOUR ENQUIRIES TO:—

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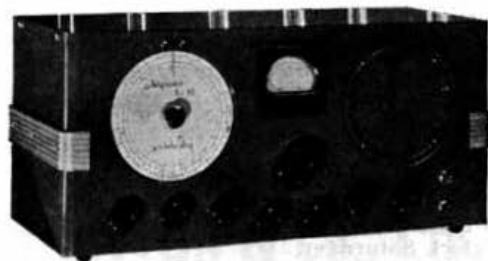
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**THE SKYRIDER SX23** communication receiver sets a new standard for high frequency stability, selectivity and noise reduction. It introduces a brand new method of stabilising tuning circuits to reduce frequency drift. An improved wide range variable selectivity circuit is used. Selectivity is controlled by a switch in four steps from needle-sharp crystal action to broad high fidelity. The signal to noise ratio is remarkably high, and together with an improved noise silencer makes for very quiet operation.

**MODEL SX23**, with specially tested HALLICRAFTERS 455 kc. crystal, £33 - 10 - 0. Matching Speaker, £4 - 0 - 0.

### SKYRIDER SUPER SPECIAL

Though now 12-months old the **SKYRIDER SUPER SPECIAL** still stands supreme above all others. Leading features: TWO R.F. STAGES; COMPLETE COVERAGE—4.5 TO 550 METRES; BUILT-IN NOISE SILENCER; ELECTRICAL BAND SPREAD; R. METER; DIE CAST ALUMINIUM CHASSIS; 13 VALVES; and VARIABLE B.F.O. INJECTION. Price for 110 to 250-volt A.C., including valves and crystal, £39 - 10 - 0. (Speaker, £4.)



### SKYRIDER 5-10. The Finest U.H.F. Receiver

This receiver is designed for the amateur who needs and wants the exacting performance required for superior ultra high frequency reception. It covers the radio spectrum from 68 mc. to 27 mc. (4.4 to 11.1) in two bands with a degree of sensitivity and selectivity that offers unparalleled reception of the ultra high frequencies. Price, complete with valves and speaker, £20. (Carrier Level Meter, £2 - 15 - 0.)

Special model available for **POLICE WORK**. Full details to officials only.



## NEW SKY CHAMPION

**THE SKY CHAMPION** is an 8-valve Receiver with Pre-Selection and Built-in Speaker, complete in every respect, offering the amateur a quality of performance never before available at this low price—Leading features: **COMPLETE COVERAGE—6.8 to 550 METRES; FOUR BANDS; SEPARATE BAND SPREAD DIAL; INDIVIDUAL COILS FOR EACH BAND; INERTIA TUNING MECHANISM; BEAT FREQUENCY OSCILLATOR; AVC SWITCH; EXCELLENT SENSITIVITY AND SELECTIVITY; A.F. GAIN CONTROL; BAND-SWITCH; SENSITIVITY CONTROL.** Price for 110 to 230-volt A.C., complete with Speaker, £15 - 15 - 0.

**S.M. "S" METER.** This signal strength indicator has been designed as an accessory to the **SKY CHAMPION**. All that is necessary to connect the meter is to plug it into its socket on the back of the receiver chassis. Price, complete, 55/-.



*Prices of all American receivers as quoted in this advertisement are subject to an increase of 15%.*



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How can it be done? Here's a new **SKY BUDDY**, designed to include the 10-metre band and with the same Electrical Band Spread used in higher-priced Hallicrafter models, with better all-round performance than ever before—but still selling at an amazingly low price! This **NEW SKY BUDDY** has sensitivity, image ratio, signal-to-noise ratio and all-round performance that excels many receivers sold at twice its price. **Leading features:** 6 valves, with 8-valve performance; four bands; complete coverage—9.4 to 550 metres; covers 10-metre band; electrical band spread; separate band spread dial; built-in speaker; AVC switch; beat frequency oscillator; pitch control; send-receive switch; phone jack. Price for 110 to 250-volts A.C., £10.



## NATIONAL HRO HIGH FREQUENCY

Two preselector stages give remarkable image frequency suppression, weak signal response and high Signal-to-Noise Ratio. The two high-gain I.F. stages employ Litz-wound coils and are tuned with air condensers. The usable sensitivity and selectivity are exceptional. Other circuit details are: automatic and manual volume control, a vacuum tube voltmeter calibrated in "S" units for carrier intensities, a phone jack, a Send-Receive switch and a Lamb Single-Signal crystal filter. This filter makes selectivity adjustable over a wide range and the circuits are so precisely balanced that heterodyning signals may be completely phased out. Standard model—2½-volt A.C. or 6-volt battery—complete with valves (but without speaker), £49 - 15 - 0.



## NEW HAMMARLUND HQ120

This new amateur communications receiver includes many outstanding features. 12 valves, cover a range from 9 to 545 metres. New and revolutionary crystal filter circuit; special R.F. and detector circuits providing uniform gain throughout the amateur bands; entirely new design in tuning condensers providing extreme accuracy; **CALIBRATED BAND-SPREAD DIAL** as well as main tuning dial; new vacuum tube voltmeter circuit for accurate logging—meter is calibrated in "S" units up to "S-9" and also up to 40d b. above "S-9." Antenna compensating control; noise limiter; phone reception. Possible by a flip of the switch to employ the crystal filter for the reception of voice or music. Price, complete for 230 volts, £38 - 10 - 0.

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WITH the suspension of transmitting licenses for amateurs you will welcome the special interest provided by world-wide short-wave listening to world opinions on the situation of to-day—and by analysing one report against another finding the deep-seated truth in the veiled news of the moment. This Eddystone E.R.A.7 4-band Receiver (supplied in chassis or in complete built-in Console form) will enable you to listen to all parts of the earth—Warsaw, Berlin, Paris, Moscow, Rome, Australia, America, etc., providing a never-ending, never-palling interest and entertainment. Write to Eddystone for one for yourself now.

### SPECIFICATION.

A 7 VALVE SUPERHETERODYNE circuit for A.C. mains 200/250 volts, 40/100 cycles, 60 watts consumption.

WAVE RANGE. 13-33 metres; 31-85 metres; 200-555 metres and 900-2100 metres with switch selector.

SPECIAL CHASSIS CONSTRUCTION. The chassis is a one-piece aluminium alloy die-casting which gives extreme rigidity to the assembly. Its construction ensures complete freedom from alignment drift.

SPECIAL COIL UNIT CONSTRUCTION. The coil box is also a one-piece aluminium alloy die-casting. Every coil is rigidly held and cannot move. Maximum screening due to die-cast construction. High coil efficiency and reliable switch.

SPECIAL INTERMEDIATE FREQUENCY STAGE. Again enclosed in die-cast box for rigidity and good screening. Band-pass circuit with Litz wound coils and air dielectric trimmers, the latter are positively locked so that the preselected frequency of 465 K/cs. is constantly maintained.

SPECIAL TUNING DIAL. The wavechange switch rotates an illuminated cylinder some 10" long providing a separate scale for each frequency range. Calibrations are in megacycles and metres for the short wave bands and in metres and Station names for the medium and long waves.

SENSITIVITY. The sensitivity is constant and high over the entire wave range. It requires no more than 4 to 6 microvolts to obtain a 50 milliwatt output. Even with this high gain the level of background noise is low.

SENSITIVE AUTOMATIC VOLUME CONTROL specially arranged for efficiency on short waves.

H. F. AMPLIFIER stage which operates on all wave bands. Including this stage there are nine tuned circuits in all.

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A SEPARATE OSCILLATOR VALVE eliminates frequency drift.

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LOUD SPEAKER. This is a 12" auditorium model moving coil fitted with a special bell diaphragm and has an extremely flat response curve. It is in a class considerably above the average and gives correspondingly good reproduction.

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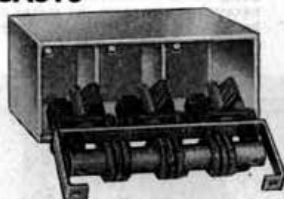
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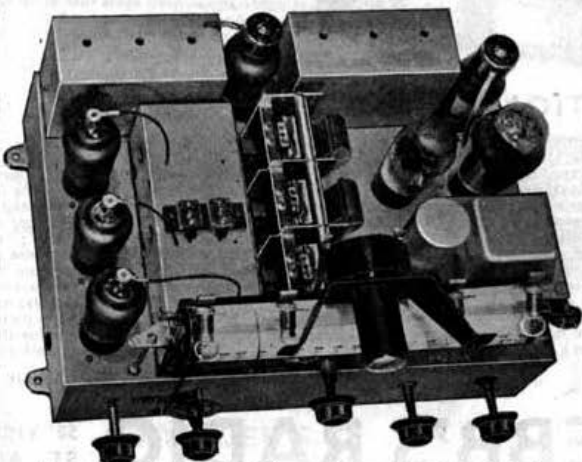
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The diecast I.F. unit with integral cast screens, band-pass Litz coils, air trimmer condensers.



The diecast coil unit giving perfect screening, coil rigidity and switch alignment.



The top view of the completed diecast chassis. I.F. units at the back, coil unit to left of tuning condenser, Magic Eye and dial lights above revolving roller wavescales. Complete rigidity is a strong feature.

# EXPERIMENTAL SECTION

## Manager:

A. M. HOUSTON FERGUS (G2ZC),  
Churt House, Churt, Surrey.



IN spite of present difficulties it is hoped that it will be possible to continue the work of the Experimental Section in certain directions, notably in connection with reception and propagation experiments.

The E.S. manager will shortly take stock of the position with a view to advising members of war-time plans.

The various Group reports have been curtailed, particularly those relating to the Aerial Group, but in future months we hope to publish news concerning many phases of experimental work still open to members—meanwhile "Carry-on" must be our motto.

G2ZC.

## Aerial Group

*Sub-Group 1* have formed the opinion that for 56 Mc. work a 66 ft. radiator fed with 600 ohms. transposed line is far superior to an 8JK beam. Furthermore, protracted tests convince them that 600 ohms. feeders are best for U.H.F. work a view which is supported by *Sub-Group 4*.

It has been found that by crossing over the corners of a square beam, greater gain is obtained, which makes it compare favourably with a 3 element close spaced array. The increase is approximate 3dB.

*Sub-Group 2* carried out comparison tests between an 8JK centre-fed beam and the end fed type. The sub-group have also tested vertical half-waves with reflectors, whilst excellent results have been obtained using a full-wave horizontal with another full-wave placed one half-wave below but left unconnected.

*Sub-Group 4* which deals with 56 Mc. receiving aerial problems confirm the views of *Sub-Group 1* in that 80 ohms. feeders are inferior to the 600 ohms. types.

G2IM.

## Propagation Group

*Aurora* contains a report that an American meteorologist claims that the true sunspot cycle is one of 89.36 years, and this period is divided into eight "seasons" to account for the present approximate cycle of 11 years. According to this new method of prediction, the next sunspot maximum will occur in 1949.

The members of the 1.7/3.5 Mc. *Sub-Group* take into account all the following in their watch on the lower frequency bands:—ultra-violet radiation, barometric pressure, temperature, humidity, cloud, rainfall, amount of sunshine, general weather, static and fading.

## Aerial Group Manager:

E. R. RADFORD (G2IM),  
1 Gibbs Green, Edgware, Middx.

## Receiver Group Manager:

H. R. HEAP (G5HF),  
404 Victoria Avenue East, New Moston,  
Manchester, 10.

## Propagation Group Manager:

P. MALVERN (G8DA),  
10 Selkirk Street,  
Cheltenham, Glos.

## Transmitter Group Manager:

J. N. WALKER (G5JU),  
4 Frenchay Road, Downend,  
Bristol, Glos.

As a result of the good conditions prevailing recently, the 56 Mc. *Sub-Groups* have much to discuss in their letter budgets. The daily temperatures at ground level and at 5,000 ft. are available for comparison with the logs. 2AAH finds that more signals from 50-200 miles are heard during warm than cold weather, and that the evening hours seem better than the day, but this may be due to greater activity. In general, the requirements for good conditions over distances of 50-200 miles are summarised as follows:—

1. Dry, cloudless weather.
2. Sudden rise or fall in temperature.
3. Large pressure or temperature differences between stations.
4. A possible cycle of 26/28 days.

From a graph published by E. V. Appleton in *Nature*, it appears that F2 critical frequencies for Latitude 39° North are greatest in February/March (12.5 Mc.) and October/November (14 Mc.). 28 Mc. conditions are therefore best during these periods, and any DX of more than 1,500 miles on 56 Mc. will occur in the autumn, i.e., October/November.

G8DA.

## Receiver Group

It is generally stated that the noise level (internal) on a S.W. Superhet receiver is due almost entirely to the first stage of R.F. amplification, or where this is non-existent to the frequency changer. Whilst this is true in the majority of well-designed receivers, it is not always so, and examples have been found even in commercial receivers where the noise was generated in the I.F. stages. In this connection excessive I.F. amplification should be avoided and the number of I.F. stages reduced to the barest minimum. Experience has shown that good pre-selection is of more value than I.F. amplification, specially when operating conditions are bad, and in the properly designed receiver 99 per cent. of the noise at full sensitivity should arise from the first stage of the receiver.

The modern tendency in U.H.F. receivers seems to be towards the straight and superhet types, but many amateurs fight shy of the latter in fear of largely imaginative difficulties. On all accounts it is an unsound principle to try and adapt present short-wave receivers to U.H.F. work and a separate receiver must be built. A 5 metre superhet need not be a complicated piece of apparatus as extreme gain is not required and selectivity must be of a low order; in fact a simple 5 metre superhet is no more difficult to build than a normal super-regenerative receiver. The key to design of such a superhet is in

the choice of frequency changer valve and R.F. stage if used. The *Acorn* valves appear to be most satisfactory but the much cheaper television pentodes are not far behind in performance and the 1852 has proved very satisfactory in performance. Ganging troubles should not be encountered provided the circuit is properly designed and many suitable circuits have been published during the last six months. A tip for those who find that selectivity is too sharp is to place a 5,000 ohms. resistance across all the I.F. transformers, primary and secondary if necessary. This will reduce the gain but will render the receiver more suitable for 5 metre work and will simplify lining-up and operation. Excessive gain should be avoided in a U.H.F. receiver unless an excellent noise silencer circuit is fitted otherwise the receiver will be unpleasant in anything but a "wilderness" location.

To those constructors who have built I-V-1 receivers incorporating choke coupling between the R.F. stage and the detector, comes the following warning. When building a published design, constructors should be sure and use the same type and make of choke as recommended by the author, or failing this the method of coupling should be altered. Many chokes are quite unsuitable for use in these receivers and the inclusion of just such a choke will cause fierce reaction, lack of sensitivity and selectivity.

G5HF.

### Around the Trade

*Messrs. Webbs Radio*, whilst retaining their Soho Street address for business between 10 a.m. and 4.30 p.m., have taken new premises at 58 Victoria Street, St. Albans, Herts. (Telephone St. Albans 4924). We are informed by Mr. Adams that it is his Company's intention to issue regular monthly circulars to all those whose names are recorded in their mailing list. This service will, we know, prove of great value to all members.

*Peto Scott* advise us that owing to increasing labour, material and manufacturing costs, the price of Trophy Communication Receivers has been increased by 10 per cent. The new list prices are as follows:—

|                    |     |     |          |
|--------------------|-----|-----|----------|
| Trophy 8           | ... | ... | £13 17 3 |
| Trophy 6           | ... | ... | £10 19 6 |
| Trophy 3 (A.C.)    | ... | ... | £6 18 9  |
| Trophy 3 (battery) | ... | ... | £6 6 6   |
| Preselector        | ... | ... | £7 8 6   |

The additional cost of coils for the Trophy 3 for complete coverage from 6.2 to 550 metres is 18s. 6d.

Mr. Peter Bradley advises us that *Hamrad Wholesale* has gone into voluntary liquidation for the duration.

Mr. H. R. Pope (G3HT) has joined the staff of *Webbs Radio* and is on duty daily at the Soho Street offices.

The publishers of the following radio journals inform us that they are continuing publication:—*The Wireless World*, *Wireless Trader*, *Television and Short-Wave World*, and *Practical Wireless*. The publishers of the weekly journal *Radio Marketing* are incorporating that journal into their monthly publication, *Electrical Trading*.

### Trade Notice

*Holiday and Hemmerdinger Ltd.*, 74-78 Hardman Street, Manchester 3, have sent us a leaflet describing the Premax Rotamount which has been designed for use in conjunction with Premax Rotary Beam Aerial Elements. The Rotamount is a sturdy well-made turntable which will support the largest of beams and permit complete rotation of 360 degrees in either direction. The price is £4 17s. 6d.

Further details are available from the above address.

The 1940 Catalogue of the *Premier Radio Co.*, 167 Lower Clapton Road, London E.5 is now available, price 6d. Its contents range from a complete station, down to the smallest component and experimenters will find listed in it practically every item they could possibly require.

The value of the catalogue is increased by the inclusion of a Valve Section, which gives complete details, including base connections, of both British and American valves. Readers will be well advised to secure a copy without delay.

### How the Membership Responded

Only a few days elapsed between the despatch of the circular entitled "The R.S.G.B. in War Time" and press date, but in that time dozens of letters reached us from members offering congratulations to the Council in making its decision to carry on.

Space limitations prevent full justice being given to all the sentiments expressed, but the following brief extracts from a few letters will serve to illustrate that the Ham spirit lives more strongly than ever.

"Just a line to wish you all the very best of luck in your efforts to keep the flag flying."—Pilot Officer H. C. Page, R.A.F. (G6PA).

"Wishing the Society all the best and hope it can continue on with our interest as it has done so well in the past."—E. Lawden, R.A.F. (G3SS).

"Very pleased to know that at least we shall have the benefit of the BULLETIN though other things are denied us."—(Mrs.) G. Hough (2DYN).

"May I congratulate the Council on their decision to keep the amateur flag flying. The Society leads so I am sure all the boys will follow."—J. Russell (BRS. 3671).

"It is good to know the Society is making the effort to carry on. I hope everyone will rally round."—C. R. Thompson (G8WI).

"I wish the Society a safe journey through these troubled times."—G. Dixon (2DQL).

"I am certain that all members in the South Wales area will be glad to know that R.S.G.B. is to continue to function. It is also good to know that the BULLETIN will be coming along, for whatever happens it is essential that all should keep in touch with headquarters."—E. A. Hayward (GW2UH).

To all who have written to us in connection with the circular we say "Thanks a lot!"

### Stray

Mr. Frank Adams (G2YN), latterly of *Webbs Radio*, has rejoined the R.A.F. and sends greetings to old friends.



# THE MONTH ON THE AIR



A COMMENTARY OF AMATEUR RADIO CONDITIONS  
FOR THE MONTH OF . . . . . AUGUST, 1939

by ARTHUR O. MILNE (G2MI)

## Editorial Comment

**T**HIS contribution was prepared a week before the war commenced, therefore readers will appreciate that a good deal of the material is now irrelevant. In future we shall, in addition to commenting upon conditions on the amateur bands, include information regarding the reception of short-wave broadcasters. Members are especially asked to send to Mr. Milne any technical details, including times and frequencies of such stations heard.

It has been said that "good" conditions are an indication that amateurs in various parts of the World have stayed out of their beds rather later than usual. This cynical remark has some justification if applied to the early part of August, 1939. It would be safe to say that conditions were good, if not phenomenal, for the time of year. ZL1 at mid-day, HH and KB4 at 10.30 a.m., J's at 3 p.m. for example, to say nothing of the host of other DX which has been rattling in at all hours of the day and night. Whatever we may say about August weather (and those whose holidays were taken during the first two weeks said a mouthful), we certainly cannot grumble about poor conditions on the amateur bands.

It pays to advertise in the columns of THE BULL! W5GGX has already provided G2MI with his new Mexico QSO and the cards are on their way to the A.R.R.L. for W.A.S. There is little doubt that ZK1AG, heard by 2BXJ and others, with an S9 signal on 14 Mc. is a pirate. Apart from the signal strength he sounds just a little too mid-European to be true, if you know what we mean. Pity the first genuine Turkish ham who comes on the air for no one will believe him! G5HH offers another one in TA3PX on 14350 and considers the "joke" has been carried far enough. SUIWM has worked PK5KF who is genuine in Dutch Borneo (14346 at 14.30 G.M.T.). Bill Marsh tells us that XUOA is not in zone 23 but gives his QRA as Box 172, Chungking.

Our remarks about QSL's brings a letter from ZB1E who, himself a rare country to most people, says it is surprising how many of the stations he works will beg for a card over the air, yet do not themselves QSL. Bob Galea is 100 per cent. QSL but has tried, without result, to obtain a card from ZS1, ZS6, VP5 and ZL3, so if anyone has a guilty conscience here is their chance to make amends. G18TS would like to raise a ZC6 whilst G3DO writes to say he has just made the final contact for W.A.S. on telephony. BRS3319 reminds us that 7 Mc. still has its surprises and cites HK2BL at 06.03 G.M.T. together with many W's who may reward the early riser. BRS3663, of Southport, says VP9L is active

again between 23.00 and 01.00 B.S.T. on about 14,080 kc. G15TK asks for OQ5AV's QRA. It is Maurice Derungs, 6 Av. Comite Urbain, Leopoldville, and he QSL's. Look for K7AZS on 14 Mc. phone around 06.45 G.M.T. is the advice of BRS3416, while G2AT solves the mystery of YHPLZ who turns out to be K6PLZ using a special Hawaiian brand of morse code! 2AT also exposes one of the worst cases of call-sign snatching that has come our way. He heard CQ de CT3AB and replied. The "CT" did not reply but a station signing HA8Y did on the same frequency, making some reference to his frequency being the same as CT3AB. 2AT put some pertinent questions to him but lost him, judge of his surprise when a few minutes later he heard the HA bird going through the same formula with a G3. Later he raised him again and asked him point blank whether he was calling as CT3AB and then switching to the HA call, to which he replied that this was so, and added "please excuse"! The difficulty is that CT3AB is a particularly nice chap who always QSL's but has been getting a bad name recently for his failure to do so. It would seem that we have found the explanation.



Commander Gatti operating the Expedition transmitter OQ5ZZ in Belgian Congo. Several British stations have worked the Expedition including G5LU who kindly supplied this photograph.

G3CY has worked W10XDA, the schooner "Morisey" off the north coast of Greenland, this cannot count as a new country, however. ZX1A, another queer one, M.C.W. at 20.25 G.M.T. on the h.f. end of 14 Mc. said QSL via A.R.R.L. 3CY thought perhaps he was a ship's operator, fed up with the QRM on 600 metres. G3ZC has been working portable in the Scilly Isles but as the islands are part of the Duchy of Cornwall, Century Club fans meet with another blow! Concluding his letter, 3CY mentions a very loud hiss on 14 Mc. at 20.40 G.M.T. on August 3rd lasting for five minutes. This, together with the complete fade out on August 22-23 may interest our R.E.S. members.

G3UP sends in a good list which includes the following: FA8BG on 7 Mc. at 17.10 G.M.T. PZ2FB working E.C.O. in the D.J.D.C. on 14 Mc. T5, VS6AH, 14280, XU6ST 14330 (QRA last known was Canton). W6PFL, Arizona, 14300 and ZC6NC 14200, Box 309, Haifa. G4AJ provides a different selection with VS6AF, 14380, 2145 G.M.T. KA7EC

### D.X. PERSONALITIES—No. 3.



"Bill" Marsh, SUIWM, President of the Experimental Radio Society of Egypt.

14375, 2250, XU8HM 14390, 1810 and VO1B, 14370, 2245. He also tells us that T4TWO is at large again with m.c.w. on 7 Mc. 1.f. end.

G8IG had a phone QSO with XU6FL, 14100, QRA Box 15, Kweilin City, South China, who is looking for G contacts. He also reports hearing a station signing VR1UX on 14 Mc. phone at 1810 G.M.T. and giving QRA as Gilbert and Ellice Islands. He was coming in the right way of the beam but is not in the call book. G6GO and G6WT have both worked this station and the latter elicited the information that the operator is a Frenchman named Tunert on Tarawa Island in the Gilbert group. This island actually exists, its position being 1° 25 min. north, 173° east, nearly as far as you can go! So now we must wait for the promised cards. G3ZJ deprecates the use of the h.f. end of 14 Mc. phone stations but this does not seem to have adversely affected his dx, judging by the following which are only a few from his list. K6CGK 14370, K5AP 14300, OA4I 14420, J5DC 14420 (most of the Japanese stations operate outside the band). U8IB (who quite straightforwardly says "here no QSL") and VU2WW 14365 who is under cover in Waziristan.

G5XC made W.A.C. in successive contacts and also does not approve of the h.f. phone merchants. It would be interesting to know how many stations worked HBICE, those boys certainly put in a wonderful job. G6MC who worked them on the first day also has a very creditable bag with HH2CM and VS1AP at the h.f. end of 14, PJ3CO (QSL via N.V.I.R.) and FB8AD on the H.F. end who evidently will not QSL. 6MC uses a rotary beam on a 22-ft. tower. BRS.3525 says he has difficulty in obtaining cards from VK and mentions that he always encloses return postage. Usually it is not much good sending reports to the loud VK's because they work this country regularly, but some of the weaker ones would no doubt be glad of a comprehensive report. He forwards a remarkable list of calls of which it is possible to give only a small selection, all times are B.S.T. CP1AA, 14300, 23.10; VE5AHU, 14095, 06.30; TG9AA, 14105, 06.45; VP5IS, 14105, 06.45; HR5C, 14140, 08.30; PK4AV, 14180, 19.20; HK1AG, 14015, 06.20; W10XDA, 14265, 18.00, all on telephony.

VK5TK conceals the identity of our old friend B.E.R.S. 195 who, having received his call and planning to put northern territory on the map, has had to move QRA to Sydney; still you can't keep a good man down and no doubt we shall hear from him, although he will be very busy for some time to come. He is training as an airport radio officer and may be sent anywhere in the Pacific, so perhaps we may hear him yet from one of the South Sea Islands.

G6QX who is erecting a rotatable and tiltable beam is busy with slide rule and book of logs working out stresses, strains and other whatnots. He has had his card returned from LZ1HL, marked "inconnu" so that is that, but to balance his disappointment had cards from both CR4HT and CR4MM by the same post. G8II, G6MF and G2MI have all worked KB4FCS on 14310, QRA is U.S. Naval Radio Station, St. Thomas, Virgin Islands. 8II wonders if he will ever receive a card from U9, U9ML has been contacted six times, has acknowledged receipt of his card over the air but still has not reciprocated.

Bad notes are on the increase just now, three stations in particular, all near London, are offenders in this respect. One of them, in North London, has one which would look well served up with cream. There was a time when Great Britain was World renowned for its good signals but now, alas, the E.C.O. has much to answer for. Some of our stations almost sound like commercials!

We have received some interesting letters from B.E.R.S. 474, one of the operators at ZB2B. He tells us that they QSL 100 per cent. and that recently three of the lads spent one whole afternoon making out cards! Stout work!

The rig is housed in a hut, 1,400 ft. above sea level on top of the rock, at present they have a 20 metre zepp with a tritet C.O. link coupled to a 6L6 P.A. grid modulated with power supply from a motor generator. The receiver is a broadcast 8-valve affair. They seem to have had some difficulty in convincing people of their bona-fides but those QSL's will change all that.

By the way, this is the only genuine ZB2 station on the air at present, so beware of imitators. OXVC is genuine of course but he is on a ship. B.E.R.S. 474 is returning shortly to this country and hopes to take out a G-call but assures us that ZB2B will be kept on the air by the other members of the Royal Corp. of Signals Radio Club.

G4FL has worked and received a card from OK3NZ, of Trnava, Slovakia, who uses E.C.O.; this will count as Czechoslovakia for Century Club of course. He heard TI2RC say he had just worked VK9VG on 'phone and the frequency of the VK9 was 14100 kc.

G3JR does not think we should ban mention of the off-frequency dx as it would not make things any better. He is probably right. He reminds the wayward G's that DFU is on 14410, whilst GMR is 14415. The month's turnover includes: 17AA, 14365, 20.00 B.S.T.; HP1X, 14360, 05.00; J2OV, 14410, 22.50; VP9R, 14050, 02.15; UX1CP (Franz Josef Land), 14425, 01.30; J8CL, 14375, 20.00; and a number of others already mentioned. Cards have been returned unknown from all YA2UR'S, QRA's and also from U8AC. HX2GK is a Swiss pirate who QSL's, but is too young to sit for his ticket! TA5CC (still they come), gave a comic QRA but we do not propose to waste space on any more of this "TA" rubbish until someone actually produces a card. GI5TK has worked HS1XR who promised to QSL from Tanga Siam. The only Tanga we can find is in Tanganyika territory but there may be another; on the other hand there may not! Frequency was 14350, T9 at 19.54 G.M.T. 5TK has 66 countries to his credit with 10 watts.

G6BW says that conditions have been erratic due to magnetic storms. This was particularly so towards the end of the month. W's told him that on August 11, the Aurora was seen brilliantly in New York, Pennsylvania, Massachusetts and North Carolina; it has never been seen so far south before at this time of year. Schedules with W2IKV have proved that 28 Mc. is not yet open for transatlantic work but ZS1AX, ZS1T, SU1MW and F8KI have all been worked. He has contacted I7B who promises a QSL from Eritrea, said he was working from a car. Italian stations when asked, confirmed that he is genuine but unlicensed for political reasons, so we must wait and see.

G5LU wants Arizona for his W.A.S. Any offers? He made Nevada with a new one W6GSB in Boulder City, and has his card.

G5CI has been active on 7 Mc. and has logged the following: HK5ED, XE1EX, ZL3IS, K6NXD, J1XX and KA2AA. G3AH suggests K7RO, 14260, 07.00 G.M.T. and VP9H, 14400, 21.00 for our consideration while on the other hand G6GH has had his card returned from U8IR and wants New Mexico and Nevada.

G6KS wants New Mexico and South Dakota, W9USI on 28 Mc. is good for a card from South Dak. W4EDQ, 28300, in South Carolina; W7AFS, 28200, Montana; W7E2C, 14350, Wyoming, and W9AGS, 14357, in Nebraska are all known to QSL. G5XB says his 8JK beam has started to fire off its ends and sends in a long list of DX worked in consequence.

G3IQ who nearly missed the boat through reporting to HQ's, states that EA7BA can be QSL'd via Sagasta 33, Cadiz. After waiting 14 months for a British Asian contact he worked VS6AF and VS6DG (ex G3QT), within a few days. The latter uses 300 watts and will be pleased to work G's.

This month the special crystallised raspberry, kindly presented by the Fifth Rate Operators' Club is divided between the North London G aforementioned and the KA 'phone recently heard to say "If you're getting QRM on this crystal O.M. I have another on 13980!"

Please send reports to 29, Kechill Gardens, Hayes, Bromley, Kent, not to Headquarters. Those sent to Victoria Street have to be forwarded and may arrive too late for press.

## British Isles Calls Heard

A. Tomlinson (ZD2H-G2QN), Posts and Telegrams, Buea, Cameroons, British Mandate. 14 Mc., July 3 to 31, 1939.

G2AS (5); 2DF (7); 2IM (5); 2NN (6); 2SY (7); 2TR (6); 2XV (6); GM2JF (5); 3IB (4); GW3JI (5); 3JR (5); 3LL (4); 3QV (6); 3ST (6); 4IC (3); 4IQ (6); 5DV (5); GM5IR (5); 5IV (6); 5LP (7); 5LY (7); 5MY (6); 5PP (8); 6AG (7); 6KU (6); 6MK (8); 6NF (5); 6OQ (7); 6RH (6); GM6RV (5); 6TD (7); 6ZO (5); 8GO (6); 8IP (5); 8JR (5); 8KK (7); 8OB (6); 8PS (8); 8RL (5); 8RQ (5); 8TD (5); 8US (6). (QRK in brackets.)

BERS.446, August 1-11, 1939, at Cyprus.

14 Mc.: g2av (5, 5); 2cg (5, 5); 2dv (3, 4); 2hk (4, 6); 2mq (5, 5); 2vq (4, 6); 2wz (4, 5); 2xn (6, 5); 2zp (5, 6); 2xx (3, 4); 3fu (5, 5); 3gq (5, 6); 3hx (4, 3); 3qk (5, 5); 3ri (5, 5); 5bj (5, 4); 5dt (5, 6); 5ll (5, 6); 5ml (5, 8); 5xa (5, 5); 6bc (5, 5); 6jl (5, 4); 6pc (5, 5); 6px (4, 4); 6wx (5, 4); g8tx (4, 6). (RS in brackets.)

HAVE YOU OBTAINED YOUR  
COPY OF THE AMATEUR  
RADIO HANDBOOK ?

## The 28 Mc. Band

By NELLY CORRY (G2YL).

**T**HERE was a slight improvement in conditions during August and the band often opened from about 17.00 to 20.00 G.M.T. The most outstanding days were August 6, 8 and 20, and the band was at its worst during the periods August 1-5, 12-13 and 21-25.

As usual there is no record of any Oceanic stations having been heard, but one Asiatic signal came through on August 6, viz., VU2FO, heard by G5BM. VU2AN reports working VU2FS and hearing VS7MB 11.25-12.30 G.M.T. on August 13. On Sundays, July 23, 30 and August 6 he heard only a few commercial harmonics, and on August 13 and 20 a Russian B.C. harmonic on 30 Mc. Skeds with G6DH, "well and truly kept," were unfruitful.

African signals were heard on at least 12 days in the month, thanks to SU1MW, who could be heard working Europeans on 'phone on many evenings, and to ZS1AX, who was not quite so consistent, but was an excellent signal at times. The only other

### The 28 and 56 Mc. Bands

**A**LTHOUGH much of the information contained in these articles is now out-of-date we feel that members will appreciate having a record up to the end of August, 1939, of work carried out on these frequencies. Hence our decision to publish.

African stations reported were OQ5AB, heard by G6JL and others on August 26, and ZE1JR and VQ2WP, heard by BRS3003 on the 27th.

## The 56 Mc. Band

By CONSTANCE HALL (G8LY).

**T**HE thanks of all Southern England stations are extended to the few Midland operators who remained on the air late at night, in order to give them semi-DX contacts, during the spell of good conditions up to about August 17.

### General Reports

G2OD from his new QRA near Worthing, set up a fresh inter-G record by working G8KD in Sheffield. The distance is 187 miles and the report received was 579. The contact took place at 11.55 G.M.T., August 20. G2BI has been using a horizontal aerial with good results; best report was from 2ZV (78).

G8OS although without mains has a nine element rotary horizontal beam. With this and an input of 10 watts he has had many good contacts. Power is derived from vibrators, whilst an Austin 7 engine is used for charging accumulators.

Several observers mention that the periods of good conditions coincide with the new moon.

### Foreign Activity

SM5SN, located in the laboratory of Aktiebolaget Hammarbylampan (The Luma Lamp Works), is in operation daily between 07.30 and 16.00 G.M.T., including Sundays. The frequency is crystal-con-

South American signals were audible on about 12 days and included 9 LU's, 5 PY's, CE3AG and YV1AP. LU1EP was the most outstanding Argentine station, and on August 10 G5BM worked him for 2½ hours solid, followed by a further ¾-hour on 14 Mc. after 21.20 G.M.T. when they faded out on 28 Mc.!

Central American and West Indies stations were reported on three days as follows:—On August 6 G6BM heard VP6FO and VP6MR, on August 8 BRS3179 heard VP6YB, and on the 20th signals were heard from CO, HI, K4EJR, K4FOW, VP6YB and TI3AV.

From North America BRS3179 heard W2 on August 8, and SU1MW worked W's on August 15. Easily the best day, however, was August 20, when a considerable number of W's in Districts 1 and 6 were heard and worked, and BRS3179 also logged W4 and 5, and BRS3003 heard VO1Y.

European amateurs were audible on most days, as well as a large number of British Isles stations. On several evenings when both Short-skip Europeans and DX were coming through distant G stations could also be heard, usually marred by high-speed fading, e.g., G6WT heard at G2YL on August 20, and G5QY was heard at G2YL and G5BM the same evening. G6DH logged signals on 50 Mc. or higher on August 17, 21 and 30, and heard SPW as late as 22.15 G.M.T. on August 15.

The Hissing Phenomenon was heard by G5BM at good strength at 19.05 G.M.T. on August 15, and by G2YL at 16.08 and 16.32 G.M.T. on August 18.

Reports from G2XC, 5BM, 6DH, BRS25, 3003, 3179 and VU2AN are again acknowledged with thanks.

**NOTE.**—News of 28 Mc. activity will be welcomed by Miss Corry.

trolled on 57 Mc. Dr. G. Silteholm (SM5SI) who is in charge of the laboratories will appreciate reports on reception of SM5SN.

### First G—PA Contact

What is believed to be the first 56 Mc. contact between England and the Netherlands took place at 21.15 G.M.T. on August 17 when G2AO, Eastbourne, Sussex, worked PA0PN, Middleburg. Reports were:—PA0PN 459, G2AO 446X. G2AO was using a 33-ft. Windom, end-on to Holland and an input of about 40 watts to an HK24. Receiver was an Ultra Skyriders with an 1851 in place of the normal 6K7 and preselector.

### Log Extracts

July 29.—G8OS worked G6CW for the first time.

August 2.—I1ZU reported via G2JD hearing G6DH (539). 5BY (579) and 6CW (449) on this day.

August 7.—G8OS contacted G6GS for the first time, and on the next night 5KH, also a first contact.

August 8.—G8IX heard GFA6 throughout the evening at 569. Frequency around 58.4 Mc. (is this a harmonic?).

August 14.—2ADZ noted weather changing from cool to hot and sultry with cloud. Heard five stations at 100 miles or more, conditions remaining good until August 17. G8IX heard G6CW 18.00-23.00 and G8KD who was peaking S7-8 on 'phone at 22.15; both were heard again on August 15, but



8KD was only S6 at 18.00. He worked 6CW, whilst 8OS contacted 8JV.

August 16.—G8OS worked 8KD (then believed to be the inter-G record); 5BM contacted 6CW, and was heard by 8KD (100 57).

August 17.—G5BM was heard S6 by 5KH (London), 8KD worked 2MV (5 8/9 9 both ways) at 18.45, and 6LL (439) at 19.25.

August 18.—G8OS contacted 2UJ for the first time.

July 31.—G5CD heard ON4NA calling at 589 on 57.3 Mc., 21.25–21.55, he replied but the ON came back with the wrong call and when repeated, he faded out. 5CD is awaiting confirmation.

July 28–30.—G2NH having listened to 6CW for months, in despair erected a new directional dipole, and like G6XN, worked him at once.

The following contributors are thanked for sending reports:—G2BI, 2JD, 2NH, 2QV, 2UJ, 2XC, 2ZV, 3YY, 5BM, 5CD, GW6AA, 6YL, 8DM, 8IX, 8KD, 8OS, 8ML, 2AAH, 2ADZ, 2BIL and 2HLF.

\* \* \*

### American Jottings

Mr. E. Conklin, W9BNX, who sends the following news from the U.S.A., reports that the 56 Mc. band has been open for fewer days than in 1938, but has been definitely better than all previous years.

May 16 proved a big day for W4, 51 DX stations were worked, and hundreds were heard at S8 or less. On May 23 after five blank days (one of three such

periods up to early August), W8 broke through to W4.

May 26 when 28 Mc. skip to the West was short, W6DNS received W5AJG. On this day 28 and 56 Mc. opened in New Jersey to W4. W4DRZ heard it open at the same time (in his case to W1, 2, 3, 8) and shortly afterwards the first 9th district station of the season came through.

July 27 was the best day of the summer, in fact one of the best in 56 Mc. history. Several contacts took place between W6 and W3 and 8, and between W4 and VE3 and W9 (S. Dakota). Many "regulars" had given up work on the band, feeling that there would be no more good days, but W3BZJ worked seven consecutive U.S.A. districts and W5AJG raised Canada for a first contact.

On July 31 W8CVQ worked and heard many stations, but signals became progressively more mushy and fading was bad. W8NZ 20 miles away was heard at twenty different places in the band with no beat note, whilst W8QDU, 200 miles away was coming in like a local. Similar conditions have occurred with Aurora display.

### Late American News

Information has come to hand via Mr. Conklin, that Mr. V. Dawson, W9XJB, was the first to work all U.S.A. Districts on 56 Mc. His final contact in making this record was with W7GBI of Great Falls, Montana, contact being established at 12.27 a.m. Central time on August 18.

Note.—News of ultra-frequency work will be welcomed by Miss C. Hall.

### THE PRODUCTION OF COPPER WIRE—(Continued from page 145).

alloy of 99 per cent. copper with 1 per cent. tin. This combination is called silicium bronze, and has a conductivity of only just over half that of pure copper. Modern telephone lines are being wired with cadmium copper which is as strong as silicium bronze but has about 80 per cent. the conductivity of copper. Outwardly it is difficult to distinguish between the two, therefore it is a good rule never to use any telephone or bronze wires. Copper-weld wire for aërials is excellent although rather difficult to work with.

For the average amateur aerial 12 s.w.g. soft copper is best since it is fairly strong and has a low resistance, though when using a heavy feeder such as the co-axial type, it is advisable to use 10 s.w.g. soft copper which is sufficient to support the relatively heavy weight of the feeders.

### British Isles Calls Heard.

BERS.469, July, 1939, on m.v. *Ernebank*, receiver O-v-1, 14 Mc. CW.

Buenos Aires: g6ks.

Rosario: g2th, 2or, 3bi, 3fj, 3ib, 3or, 3rn, 3xf, 3zj, 5my, 5zt, 6qx, 6vc, 6wn, 6zs, 8jr, 8hn, 8na, 8oh, 8rq, 8tv, 8uk, gm3rl, 5ut, 6zp, 3qn, 8ct, gi5ur, 5wd, ei6g.

### VK2YC

Mr. J. B. Corbin asks us to mention that he has now moved to 78 Maloney Street, Eastlakes (Via Mascot), New South Wales, Australia.

## IMPORTANT NOTICE TO ADVERTISERS

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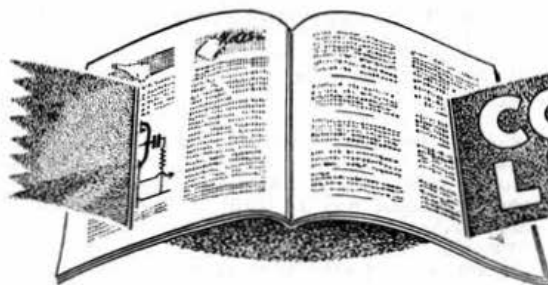
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# CONTEMPORARY LITERATURE

BY L. FRYER (GM2FR)

**LONG FEEDERS FOR TRANSMITTING WIDE SIDE-BANDS, WITH REFERENCE TO THE ALEXANDRA PALACE AERIAL-FEEDER SYSTEM.** E. C. Cork, B.Sc. (Eng.), A.M.I.E.E., and J. L. Pawsey, Ph.D. Proceedings of the Wireless Section I.E.E., No. 41, June, 1939.

This paper is concerned with reflection phenomena in long feeders used to transmit modulated high-frequency carrier waves, such as television signals, in which the time of transmission of a wave along the feeder is comparable with the time periods of the modulation frequencies.

The nature of the various impedance irregularities giving rise to reflection is discussed, and their effect on a received television picture is indicated. Methods for reducing the effect of these irregularities are considered.

The vision aerial feeder system of the London Television Station is described, including the aerial-to-feeder matching arrangements and a device for reducing the residual mismatch due to the variation of the aerial impedance over the frequency range of the carrier and side-bands.

**OUTPUT AND EFFICIENCY OF THE SPLIT-ANODE MAGNETRON OSCILLATING IN THE DYNATRON REGIME.** A. F. Harvey, B.Sc. (Eng.), Graduate I.E.E. Proceedings of the Wireless Section I.E.E., No. 41, June, 1939.

An account is given of the performance of the split-anode magnetron when working at frequencies such that transit time can be neglected.

An accurate and convenient method is described of determining this performance from the measurement of valve resistance at power frequencies.

**THE DESIGN AND CONSTRUCTION OF A SHORT-WAVE FIELD-STRENGTH MEASURING SET.** F. M. Colebrook, B.Sc. and A. C. Gordon-Smith. Proceedings of the Wireless Section I.E.E., No. 41, June, 1939.

The paper contains a discussion of the principal features of the design of apparatus for the measurement of field strength, at very short wavelengths, by means of a loop aerial. The apparatus consists of a high-gain intermediate-frequency amplifier (about 1 Mc/sec.) associated with a signal-frequency and frequency-change unit of constant conversion efficiency. The e.m.f. of thermal agitation in the input tuned circuit of the intermediate-frequency amplifier is used as a standard signal for setting the amplifier to a known gain. The combination of intermediate-frequency amplifier and signal-frequency unit is calibrated over its signal-frequency range by means of a radiator which gives a horizontally-polarized radiation of calculable intensity.

The set can be used for the measurement of field strengths down to the order of microvolts per metre at wavelengths from 7-11 metres with the frequency-change and aerial units described.

**THE DEVELOPMENT OF A SMALL VARIABLE AIR CONDENSER COMPENSATED FOR RAPID CHANGE OF TEMPERATURE.** H. A. Thomas, D.Sc., M.I.E.E. Proceedings of the Wireless Section I.E.E., No. 41, June, 1939.

Various methods are discussed of obtaining compensation for temperature variation in air-dielectric condensers of small capacitance value suitable for radio-frequency purposes. It is found that appreciable air-gap spacing is necessary for high stability and a high degree of compensation.

It is concluded that a parallel plate system affords the most satisfactory means of achieving high stability.

A description is given of a variable air condenser of small dimensions and weight which has a capacitance range of 17-68  $\mu\text{F}$ , and a high degree of temperature compensation; the overall dimensions are  $2\frac{1}{2}$  in.  $\times$  2 in. and the weight is  $5\frac{1}{2}$  oz. The temperature-coefficient of capacitance can be adjusted to have any value within the range zero to -120 parts in 1 million per degree centigrade, and the compensation is effective at any rate of temperature variation not exceeding  $5^\circ \text{C}$ . per minute.

When the system is used in association with a ceramic-former coil, its frequency coefficient can be made as low as 1 part in 1 million per  $^\circ \text{C}$ ., and the frequency stability over long periods with large temperature-change is of the order of 10 parts in 1 million.

**DESIGN OF "FLAT-SHOOTING" ANTENNA ARRAYS.** W. W. Hansen, Non-member I.R.E., and L.M. Hollingsworth, A.M.I.R.E. Proceedings of the I.R.E. February, 1939.

In a recent paper by Hansen and Woodyard it was pointed out that there are an infinite number of arrays that radiate mostly along the ground and which do not (necessarily) involve high radiating elements. Methods of design were given for two classes of such arrays. The present paper completes the solution of this design problem and gives approximate formulas for the gain and number of array elements of all these arrays not treated in the previous paper. It is concluded that the two classes previously treated are superior to the intermediate types here considered.

# BRITISH ISLES NOTES AND NEWS

## District Notes

Members will appreciate that much of the information contained in these notes is now null and void.

Only those notes which had been set up by our printers at the beginning of September have been included.

In future issues we hope to include brief reports from all Districts.

J. C.

## DISTRICT 6 (South Western)

There is very little of general interest to report this month. Naturally many members have been occupying their spare time with work other than radio, and the D.R. finds himself very much in the same position. The 56 Mc. Field Day arranged for August 27 had to be postponed.

Two interesting reports have come in. The first is from G4ABP, who has been carrying out portable investigations in Gloucestershire. He has come to the conclusion that the sandy subsoil forms a much better radio reflector than expected. The other is from G3ZC on St. Martin's, Scilly Isles who is proud to have W.A.C. with a 10-watt battery-operated transmitter. He has had 450 contacts in 42 countries in four months which is very good going. He is shortly leaving the Scilly Isles for Calstock.

**Torquay.**—There is very little to report, except that the local 56 Mc. contacts are still carried on to some extent. G5SY is building a 56 Mc. converter to go in front of his regular receiver.

**Plymouth.**—Seven members were present at the August meeting at G3TX, when some time was spent in trying to master the intricacies of a bug key which G8HF brought along. Electric storms and their effect on DX formed the other topic. 2HLS and 2FKO have passed their Morse tests and are awaiting calls. G3TX, 8HF, and 8PN are active on 14 Mc.

**North Devon.**—The bi-monthly meeting was held at 2DOW, Torrington, the attendance being average. All stations are known to be active, with the exception of G3AM, who is temporarily QRT owing to pressure of business.

The local group have again welcomed many members from other parts who have been holiday-making in North Devon. This year they seemed more numerous than ever!

## DISTRICT 7 (Southern)

Hearty congratulations to Miss C. Hall (G8LY), on being awarded the Courteney Price Trophy for 1939-40 and also to the staff of our 3.5 Mc. NFD station G6GSP on winning a replica. These achievements coupled with our Senior B.E.R.U. success, and the confidence with which we await the official results of the ARRL C.W. and 'Phone Contests indicate that stations in District 7 take more than a small share of honours this year.

**Oxford.**—Best wishes for the future to G2DU and

his wife on their recent marriage. Active stations are G3HC, 5HS, 5LO, 8LV, and 8PX.

**Kingston.**—Kingston and District Radio Society entertained the New Malden and Thames Valley Societies on September 3. G5LC is raising good DX while 8SM is busy with beam aerials. Active or reporting stations are: G2GK, 2NH, 3OR, 3VK, 4CI, 5LC, 5MA, 6NK, 8SM, 2DLX, and 2DOK.

**Portsmouth.**—South Hants R.T.S. Annual General Meeting saw the election of G8WC as hon. secretary with 3WZ as assistant; 8JB as chairman and 2XC as president. A field day arranged for August 12 and 13 had to be cancelled owing to a motor-cycle accident whilst 8LO was transporting some of the gear. Fortunately he did not suffer serious injury.

2AHA and BRS 3182 have been out on the South Downs with a portable receiver and 2AWC has been similarly engaged in the Isle of Wight. Active stations are: G2ZR, 3WZ, 4DI, 4FA, 5TX, 5UI, 5XY, 6YK, 8BD, 8JB, 2AWC, 2HLA, BRS3182 and 3594.

## DISTRICT 8 (Home Counties)

Owing to the holiday season, and the fact that many members have been otherwise occupied, in connection with the International situation, no monthly meeting was held during August.

**Cambridge.**—G5BQ, and 5JO after visiting ON4SW in Antwerp, report a wonderfully good reception from the many Belgian amateurs, they met including ON4AA, president of Réseau Belge. 2XV, and 4AZ were contacted from ON4SW, and both had outstanding signals on 7 Mc. 5DQ is steadily adding to his list of new countries contacted on the key. 5DR is heard occasionally on 14 Mc. 'phone, while 2DT is also using 'phone on 7 Mc. 3CY has been on holiday in Norway.

**Peterborough.**—G5NP and 2NJ are experimenting with suppressors in an effort to reduce the motor QRM which has recently spoiled many of 2NJ's contacts. 3BK and 3WW (March) having completed a cathode ray oscilloscope. The former reports at length on their experiments to obtain correct matching. The ultimate result was that 3WW made his first trans-atlantic 'phone contacts—nearly a dozen during one evening. 3BK and 3DY are active on 14 Mc.



A group taken at the District 5, 14 Mc. station, during National Field Day. G6GN, T.R. for Bristol in the centre, G5JU, D.R., on the extreme right.

**Bedford.**—G2MD and 5CX report active. 5PA is temporarily off the air. 6HB is homeward bound from VE. 5FO has had a successful spell on 14 Mc. 'phone, having worked a number of W's, VE's, VP1, and K4. 2BFN is trying his hand at crystal grinding, while 2FFG is experimenting with oscillators. Congratulations to 2CAP, who is now G4OL. The Bedford group are pleased to have won the 1.7 Mc. N.F.D. replica for District 8. Congratulations!

**Luton.**—No reports to hand this month.

**Other Areas.**—A hearty welcome is extended to Mr. N. Hobourn, of Wisbech, now BRS3685.

### DISTRICT 9 (East Anglia)

As a result of these notes being written in the midst of the holiday season only very brief details of local happenings have been available. Only one written report has been received and presumably general activity has not been of a very high order.

**King's Lynn.**—G2XS, about whom we have heard very little lately, has now erected five aeriels and is obtaining some interesting results on 14 Mc. 'phone; 5UD, on the same band, is busy studying the results obtained with a doublet as compared with those when using a Zepp. 6FB has been putting in some all-night sittings during his vacation. Congratulations to Rev. T. G. Geddes, North Tuddenham, whose call 2BIY has been superseded by that of G4PO, he is operating on 7 Mc. C.W.

**Lowestoft.**—G5QO using grid modulated 'phone transmitter, has been successfully keeping schedules with Malta. 2CPL is constructing a high quality amplifier and a 1,500-volt power pack to operate same; 3RK has completed a W8JK beam.

There are several members from whom no reports have been received for months, and in some cases, years. An account of their respective activities would prove helpful to other amateurs, and thus tend to add to the interest of these notes. All reports should be sent to G3RK, Smallgate, Beccles, by the 25th of each month.

### DISTRICT 14 (Eastern)

**Chelmsford.**—W9MH while on his biennial visits entertained some of the Chelmsford members at his Essex residence. Active stations include: G6LB, 5RV, 4AC, 3OX, and 2SA. G2KG is also again active after returning from his R.E. unit camp.

**Ilford.**—A meeting will be arranged shortly it is hoped when all local members will be given an opportunity to attend. The area is large enough in membership to form a section, so possibly a T.R. will be appointed.

**East London.**—No August meeting was held in the area, but an informal Sunday meeting took place at Little Hallingbury, when 11 members attended.

**Romford.**—The Romford and District A.R. Society took part in the Essex societies joint day and on Bank Holiday turned out in full force at the Romford fete. At a recent meeting Messrs. Everett Edgumbe gave an interesting talk on meters.

**Brentwood.**—3LA is working on television receivers and is particularly interested in overcoming ignition and other interference.

**East Essex.**—G5XI, BRS2625 and 2622 have been called up by the R.N.V.R. While 5XI is away, 2SO has agreed to act as T.R. 2LC is again rebuilding. 5UK remains active on 56 Mc. 2GU is on 7 Mc. and 2SO on 1.7 Mc. The latter asks for reports; he is also using a 133-foot aerial on 14 Mc. working his first DX when contacting VU7DR.

**Notes.**—The D.R. wishes to record that those telephony stations in the district who were using 1.7 Mc. quickly responded to the instructions issued to close down immediately on Sunday, August 27.

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

Probably the present situation and summer holidays were responsible for only ten members attending the August meeting held in West London. Again hectic argument monopolised the meeting. Our thanks to Mrs. Price and Mrs. Crowe for their hospitality.

Apparently our efforts during N.F.D. fell a little short of the mark but finishing fifth is no disgrace to the District.

This month we say goodbye to one or two of our members who have joined the colours. 2BAJ has entered the R.A.F. while G4LG was called up and sent east. By good fortune Mr. and Mrs. G2UV happened to meet him when on holiday and were able to see him off at Southampton. 2FUX would be glad to see visitors at 42 Mount Avenue, Ealing, W.5, any Friday evening after September 16, while 2DZN will be "at home" on Sunday mornings at 80 The Heights, Northolt, Middlesex.

**West London.**—G3UQ, 5CI, and 6CO are active, the former is building a superhet.

**Ruislip.**—2BRF would like to get in touch with local members who belong to the radio branch of National Service.

**High Wycombe.**—Congratulations to BRS3292, now G2NT. G6JK, 8VZ, 2BAO, 2AKZ, and 2HFY are active.

### DISTRICT 16 (South Eastern)

**Ashford.**—G2QT, 2JV, 3SL, 8RK and 2CJT report active.

**Eastbourne.**—G6UB is welcomed as a new member of the group. 2AO has worked two French stations on 56 Mc. in addition, to making the first G-PA contact. We regret to learn that 5BW is closing down owing to illness, and we all send him our best wishes for a rapid recovery. 3CX is active on 14 Mc. The TR would like to have reports from outlying members.

**Heathfield.**—The following are active: G2QV has worked two French stations on 56 Mc., 4GW, 5PR is on 14 Mc. with a modified 3JR aerial, 5JZ, 2BGU, 2BRI, and 2HLF.

**Horsham.**—On August 16 at 23.00 B.S.T., G8OS worked G8KD of Sheffield on 57 Mc., a distance of 180 miles. This has been confirmed, and is believed to be the record for an inter-G contact (see also "The 56 Mc. Band"). 2DCT is also active on 56 Mc.

**Maidstone.**—BRS2834, the TR, together with 6FV and 8GR, have just returned from camp with the A.A.F. in Dorset.



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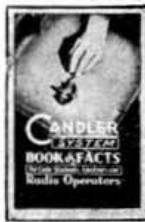
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| (a) 1.75 Mc.                         | 16/6 | $\pm 1$ kc.   |
| " 3.5 and 7 Mc.                      | 15/- | $\pm 2$ kc.   |
| " 14 Mc.                             | 30/- | $\pm 5$ kc.   |
| (b) 100 kc.                          | 15/6 | $\pm 0.1$ kc. |
| Temp. Coeff. (a) $-(23 \times 10^6)$ |      |               |
| (b) $-(5 \times 10^6)$               |      |               |

Enclosed Holders, plug-in type, suitable all bands, 12/6

**BROOKES MEASURING TOOLS,**  
51-53 Church Street, Greenwich, London, S.E.10

Tel.: Greenwich 1828

**INDEX TO DISPLAYED ADVERTISEMENTS**

|   | Page          |
|---|---------------|
| Bernard Jones Publications, Ltd.            | 168           |
| British Mechanical Productions, Ltd. (Clix) | Cover ii      |
| Brookes Measuring Tools                     | 168           |
| Candler System Co.                          | 168           |
| Denco                                       | Cover ii      |
| Electradix Radios                           | 167           |
| G5NI (Birmingham) Ltd. (Radiomart)          | 137           |
| Oliver Pell Control Ltd. (Varley)           | Cover ii      |
| Peto-Scott Co., Ltd.                        | Cover iv      |
| Quartz Crystal Co., Ltd. (Q.C.C.)           | 167           |
| R.S.G.B. Sales                              | Cover iii     |
| Stratton & Co., Ltd. (Eddystone)            | 156           |
| Taylor Electrical Instruments, Ltd.         | 167           |
| Webb's Radio                                | 153, 154, 155 |
| Woden Transformer Co.                       | Cover ii      |

**Tunbridge Wells.**—G4AY, 4IB and 5OQ are active on 14 Mc. 4IB has a two-section W8JK beam which is working well, while 5OQ remains faithful to the sloping Windom, a faith not misplaced, incidentally, judging from his log. 6ML, the local beam expert, has further improved his array by erecting an almost vertical two-element beam in front of his main horizontal three-element aerial. The vertical is fed from the aerial of the horizontal array by a 600 ohm line half a wave-length long with a delta match at each end. By adjustment of the angle of the vertical while working with a station, it has been found possible to continue a contact long after a fade-out has occurred on the horizontal beam as used alone. 2UJ has erected a rotary di-pole and reflector beam with special feeder coupling for 56 Mc., which is a scale model of one of 6ML's 14 Mc. arrays. This has worked out exactly "according to the book," and has produced contacts with G8OS, Billingshurst, at S7, and 6DH, Clacton, at S5.

**Whitstable.**—G3NQ is getting good results on 14 Mc. 4BY, 4FI and 5CI are active.

### Scotland

The lack of news this month is easily explained in view of the International situation at the time of writing.

**"A" District.**—For the above reason no arrangements have been made to resume meetings which were due to commence at the end of September, however when the position is clarified an individual notice will be sent to each member. The D.O. wishes to express his thanks to all who rendered assistance during N.F.D. and no doubt members will be gratified to note the high position the District attained in the final results. We desire to thank Mr. Eric Trebilcock

(BERS195), for his report on GM6JDP received via GM6MD. Mr. D. A. MacQueen is now GM4PW.

**"B" District.**—Mr. G. W. McDonald (GM2OX), has been forced to tender his resignation as D.O. due to pressure of private business. The name of his successor has not yet come to hand. We thank 2OX for his services during his term of office.

**"C" District.**—At a meeting on August 15 GM5SC intimated that as he had been appointed to take charge of a local territorial unit, he would be unable to continue as D.O. He moved the appointment of Mr. T. Reay, GM3IX, as his successor and this was carried unanimously by the meeting. Mr. Candow is thanked for his services during the brief period he was in office.

**"D" District.**—The D.O. and GM6SR were pleased to welcome G5RI during his holiday in Edinburgh. The following are active: GM3GG, 3YN, 4FT, 4GR, 4HB, 5GK, 6SR. GM3UM is training with the R.N.V.W.R.

**"E" District.**—Mr. H. McConnell, Jr., 2ACQ, has been forced to tender his resignation as D.O. owing to increasing business interests. We thank him for his services which have resulted in establishing the District on a firm basis. The name of the new D.O. is not yet available.

**"F" and "H" Districts.**—General activity continues at a high level.

### Channel Islands

By 2AOU.

**Jersey.**—A welcome is extended to 2AAO, who has applied for membership. G3GS reports very erratic conditions on 7 Mc. for G working, although 2AOU has heard ZL, PY, LU, and K5 on that band recently. Very little has been heard on 28 Mc. G8NS and BRS3588 have visited the island. G4LI and 2CNC have been active with CWR training.

## BRITISH EMPIRE NOTES & NEWS

### Australia (Queensland)

By VK4GK

The chief item of recent interest amongst local B.E.R.U. members has been the visit of VK5TK (Ex. B.E.R.S. 195) who arrived by plane from Melbourne on the evening of August 9. VK4WH and VK5TK are amongst the 18 successful candidates out of 500 odd for Aeradio Trainee work in Sydney. Our congratulations to both.

We also extend our congratulations to VK4JP who has qualified for what is probably the first B.E.R.T.A. on phone.

He ran up an excellent score in the W/VE Phone Contest but was rather late with his log so to make certain of its arrival on time sent it by China Clipper at a cost of 10s.!

### Australia (Western)

By VK6WZ

The U.H.F. Section of the W.I.A. has announced

a programme for the year ahead which includes "Home QSO Days" to extend the use of telegraphy on 56 Mc. An attempt at the DX record will also be made.

28 Mc. activity seems to be nil these days and 14 Mc. operation patchy although several report interesting contacts. 7 Mc. is mushy after about 12.00 G.M.T. and mostly populated by oriental broadcasting and code signals. 3.5 Mc. is open most evenings and should be a good channel for inter-VK working but VK6 activity is almost nil on this band.

The W.A. Division of W.I.A. will be in new headquarters in Colonial Mutual Buildings, St. George's Terrace by the time these notes are published. The Division's postal address is now Box N.1002, G.P.O., Perth.

### British West Africa

By ZD2H

European signals generally have been rather good lately with G's well represented. Singularly enough

after several months' silence, South American stations are being heard again in this part of Africa.

**Gambia and Sierra Leone.**—Inquiries are being made to ascertain how many current licences are held by amateurs in these colonies.

**Nigeria.**—No reports have been received from ZD2G and BERS440. Using about six watts from H.T. batteries ZD2H worked CR6AF for the first amateur QSO between Cameroons and Angola.

**Gold Coast.**—No report has been received from ZD4AA. ZD4AB is still on leave in G.

### Jamaica

We have been informed by Mr. Thomas Myers, VP5AD, 10 Temple Lane, Kingston, that he has been appointed QSL Manager for Jamaica. Mr. Myers is founder and Secretary of the Jamaica Amateur Radio Club.

We understand from Mr. Myers that the following calls are unlicensed:—VP5AM, VP5ENH, VP5PD, VP5PO, VP5PQ and VP5SS.

We understand that Mr. E. Metcalfe, President of the Jamaica Amateur Radio Club, is now VP5EM, whilst Messrs. B. H. Brown, VP5MU, and T. Bailey, VP5JC, have recently been granted call signs.

### Malaya and Borneo

By VS1AA

VS1AE has been putting in some good work of late and has already qualified for his W.A.C. 2AL has worked all W districts on CW, no mean feat from Malaya. We welcome IAC, Chong Foong of Penang.

### Northern India

By VU2AN

Activity during August appears to have been rather low, no doubt due to the effects of the hot weather and the unusually poor conditions, but September should find more VU stations on the air. The 56 Mc. letter budget has apparently been held up, but we hope that activity has not been curtailed as a result. VU2DR reports hearing XU5TS on 56 Mc., confirmation and details are being sought. VU2AN has had reports on his signals from BERS371 in Loralai, which is 60 miles of mountainous country away, and work is going on at both stations in an endeavour to obtain more consistent results. No long-distance reception of 56 Mc. signals has yet been reported. The 28 Mc. band opened on August 13 for a contact between VU2AN and VU2FS, while VS7MB was also heard at the former station, it is interesting to note that VU2AN had contacted both VK and G at the same date in 1938.

VU2LJ is pleased with his latest Vee beam which has given him W6 contacts using only low-power grid-modulated telephony. He is also experimenting with an arrangement of the Franklin master oscillator circuit.

VU2LK complains that he has over 1,000 QSL cards in the bureau awaiting envelopes from active members. Make sure that you claim yours before November 5, or if you do not want them let us know, and also the stations you work.

VU2AN requires Canadian 1, 2, and 3 districts for B.E.R.T.A., and would be very pleased to contact them before the end of the year. Best time around 13.00 G.M.T.

## An Historic Document

For the sake of posterity we are reproducing the text of the *London Gazette* notice, No. 34661, dated Thursday, 31 August, 1939, which determined all British Isles transmitting licences.

### WIRELESS TELEGRAPHY ACTS, 1904 to 1926.

TO ALL HOLDERS OF LICENCES FOR EXPERIMENTAL WIRELESS TELEGRAPH TRANSMITTING STATIONS.

I, Major The Right Honourable George Clement Tryon His Majesty's Postmaster General hereby give notice that in pursuance of the provisions therein contained all licences for the establishment of wireless telegraph sending and receiving stations for experimental purposes are hereby withdrawn.

Dated this thirty-first day of August 1939.

G. C. Tryon,

His Majesty's Postmaster General.

N.B.—This Notice has no application to the ordinary wireless receiving licences issued to the general public at Post Offices throughout the country.

### WIRELESS TELEGRAPHY ACTS, 1904 to 1926.

TO ALL HOLDERS OF LICENCES FOR EXPERIMENTAL WIRELESS TELEGRAPH TRANSMITTING STATIONS.

I, Major The Right Honourable George Clement Tryon His Majesty's Postmaster General hereby give notice that in pursuance of the provisions therein contained all licences to establish wireless telegraph receiving stations for experimental purposes and to use wireless sending apparatus in conjunction with "artificial" aerials are hereby withdrawn.

Dated this thirty-first day of August 1939.

G. C. Tryon,

His Majesty's Postmaster General.

[Members wishing to obtain a copy of the Notice should write to H.M.S.O., Kingsway, London, W.C.2, sending 7½d. in stamps.]

## QSL BUREAU

ALL CARDS AND COMMUNICATIONS SHOULD NOW BE SENT TO  
MR. A. O. MILNE, 29 KECHILL GARDENS, HAYES, BROMLEY, KENT



## HEADQUARTERS CALLING

### Changes of Address

Members, particularly those serving with H.M. Forces, are requested to furnish us with changes of address as promptly as possible in order that our records may be accurately maintained.

### Bankers Drafts

We would remind members that subscriptions can at any time be paid by means of a bankers draft. The necessary order form can be obtained on request from Headquarters.

This facility may prove useful to members serving abroad.

### Society Trophies, 1939-40

The Council has been pleased to award Society trophies to the following members:—

*Rotab Cup*.—To Capt. Ben Wallich (G6BW), of Churchill, Somerset, in recognition of outstanding long distance experimental work on the higher amateur frequency bands.

*Wortley-Talbot Trophy*.—To Mr. E. Shackleton (G6SN), of Ilkley, Yorkshire, in recognition of his

### N.F.D. Replicas:

|         |                          |
|---------|--------------------------|
| 1.7 Mc. | chief operator of G5PAP. |
| 3.5 "   | " " " " G6GSP.           |
| 7 "     | " " " " G5BJP.           |
| 14 "    | " " " " G15QXP.          |

### Certificate and Trophy Winners

All members who have qualified for Contest Certificates or Awards of Merit will receive them from headquarters.

The winners of the Rotab, Wortley-Talbot and B.E.R.U. Trophies will receive miniatures. The actual trophies have been placed in a London safe deposit.

### The "GW Trophy" Contest

Although somewhat poorly supported, some very excellent results were achieved in this year's contest. The winner of the trophy is G. Henderson (G8JV), who is congratulated on an outstanding performance. It is hoped to publish full details of the contest in the October issue.

G5JU thanks all those who have written him in connection with this contest and regrets that it is

**FOR THE SOCIETY TO CARRY ON  
SUBSCRIPTIONS MUST BE PAID  
PROMPTLY. DO YOUR BIT TO HELP.**

many valuable contributions to THE T. & R. BULLETIN.

*Courteney-Price Trophy*.—To Miss Constance Hall (G8LY), of North Waltham, Hants, in recognition of her outstanding work during the R.S.G.B. 1938 International 56 Mc. Contest.

*1930 Committee Cup*.—To Messrs. David Mitchell (GW6AA) and M. C. Crowley-Milling (GW6MX), of Colwyn Bay, North Wales, in recognition of their outstanding experimental work on 56 Mc. over a period of many years.

*Mitchell-Milling Trophy*.—To Messrs. C. J. Rockall (G2ZV), of Rustington, and E. C. Cosh (2DDD), of Angmering, for outstanding work during the 1939 R.S.G.B. 56 Mc. Field Day and on previous occasions.

*B.E.R.U. Senior Trophy*.—To Capt. Eric Cole (ZC6EC).

*B.E.R.U. Junior Trophy*.—To Mr. J. Drudge-Coates (VU2FO).

*B.E.R.U. Receiving Trophy*.—To Mr. E. Trebilcock (BERS195).

*Colonel Thomas Trophy*.—To Mr. W. E. Russell (G5WP), leading British Isles station in the Senior B.E.R.U. Contest.

*Somerset Trophy*.—To Messrs. David Mitchell (GW6AA), and H. A. M. Whyte (G6WY), winners of the January 1939 1.7 Mc. Contest.

*N.F.D. Shield*.—To District 4 (East Midlands).

not possible to acknowledge every communication individually.

### War-time Stories

The Secretary-Editor will welcome for publication war-time anecdotes with a radio theme. Members are reminded that nothing of a secret nature may be divulged.

### I.E.E. Meetings

The autumn and winter meetings which are normally held at the Institution of Electrical Engineers, London, will not take place during the war period.

### New Members

#### HOME CORPORATES

E. H. HOPKINS (G2XD), "Allandale," Birchfield Road, Headless Cross, Redditch, Worcs.  
K. M. SMITH (G3RB), "Sunroyde," Broomcroft, Ossett, Yorks.  
S. HUNT (G3YQ), 16 Warwick Avenue, Grimsby, Lincs.  
H. F. BRIGGS (G4GF), 74 Westborough, Scarborough, Yorks.  
S. J. HOPPER (G4HS), 41 Carisbrooke Road, Brighton, 7, Sussex.  
H. HEIGHINGTON (G4JB), 17 Groveville, Hipperholme, near Halifax, Yorks.  
J. A. WARD (G4JJ), 14 Grenville Place, Barnsley, Yorks.  
C. SMITH (G4LP), 88b Cleveland Road, Crumpsall, Manchester, 8, Lancs.

- J. F. FISH (G4MH), "Thornleigh," Station Road, Thornton, Blackpool, Lancs.  
 K. BASTFIELD (G4MJ), 361 Ridgacre Lane, Quinton, Birmingham, 32.  
 K. A. SLY (G4MR), 16 Buckland Avenue, Slough, Bucks.  
 A. EVANS (GW4MZ), "Bloomsbury," Rhuddlan Avenue, Llandudno, Carnarvonshire.  
 S. NICHOLSON (G4NC), 31 Peddar Street, Morecambe, Lancs.  
 W. M. GRAY (G4NK), 43 India Drive, Inchinnan, Renfrewshire.  
 J. BOWERS (G4NY), Alpine Nursery, Durrington, Worthing, Sussex.  
 T. DICKINSON (G6DI), "South Sands," Salcombe, South Devon.  
 F. RABONE (2AFA), 83 Farquhar Road, Edgbaston, Birmingham, 15.  
 R. D. G. JOHNSON (2AJX), "Drove House," Ditchingham, Norfolk.  
 R. WILKINS (2ALM), "Angleside," Cleveland Road, Paignton, Devon.  
 G. HANSON (2BIT), 7 Welbeck Road, Rochdale, Lancs.  
 C. D. METCALF (2CFV), "Chelhurst," Hemphall, Norwich.  
 P. GOUDEME-LEVKOVITSCH (2DCV), "Little Lyncham," Wentworth, Virginia Water, Surrey.  
 A. E. CORNISH (2DOW), Crowbear Cottages, Torrington, Devon.  
 R. J. M. HARVEY (2DRP), 13 Effingham Crescent, Dover, Kent.  
 L. GOODALL (2DWC), 22 Mid Street, Kells, Whitehaven, Cumberland.  
 R. H. YOUNG (2HNI), 27 Bark Place, London, W.2.  
 T. SHACKLETON (BR83688), "Delamare," High Green Road, Altofts, Normanton, Yorks.  
 J. C. WHITEHOUSE (BR83689), 325 Wells Road, Bristol, 4, Gloucestershire.  
 J. H. SHIELDS (BR83690), 35 Backmarch Road, Rosyth, Fife.  
 W. M. MARTIN (BR83691), 18 High Street, Dover, Kent.  
 G. M. HINDLE (BR83692), "The Highlands," 1 Wynnastay Grove, Fallowfield, Manchester, 14.  
 F. T. KILLEN (BR83693), 369 Rochdale Road, Bury, Lancs.  
 A. H. JOHNSON (BR83694), "Harley Thorn House," Hanchurch, Stoke-on-Trent.  
 J. A. HUNT (BR83695), 2 Park Hill Road, Chingford, E.4.  
 C. H. KENNEDY (BR83696), 23 Trinity Road, Gillingham, Kent.  
 J. B. PARKER (BR83697), 5 Fir Road, Fareham, Hants.  
 S. N. PAIN (BR83698), "Honeyden," Longueville, Jersey, C.I.  
 In the August issue the owner of G3XV was recorded as T. L. Stephens instead of T. L. Stevens.

## DOMINION AND FOREIGN

- RAG. V. TURLETTI (IIMG), via Avogadro, 26, Turin, Italy.  
 B. NIELSEN (OZ2PX), Norregade 93, Esbjerg, Denmark.  
 CAPT. G. TRUSS (VU2KK).  
 H. G. BAKER (VU2BM).  
 E. LONGTINE (W1IOZ), 29 Melville Street, Springfield, Mass., U.S.A.  
 R. N. SOLLY (ZB2B).  
 WM. ALLAN (BERS476), at 46 Townhead Gardens, Whitburn, West Lothian.  
 SUB/LT. K. A. CRADOCK-HARTOPP, R.N. (BERS477), H.M.S. "Selkirk," c/o G.P.O., London.  
 A. BASSIOUNTI (FRS48), at 7 Alexandra Court, Wembley Park, Middlesex.  
 K. A. JOSEPH (FRS49), at Marconi School of Wireless Communication, Chelmsford, Essex.

NOTE—The addresses of New Members serving with H.M. Forces have been omitted. Letters for these Members can be sent via Headquarters.

## Sales Dept. Circular.

The response to the special Sales Department Circular was very gratifying but our stock of R.S.G.B. Handbooks is still considerable. We ask all members, particularly those in the signal services, to introduce this publication to their friends. Numerous members have already assisted splendidly in this direction. Remember we can send by post ten copies for 1s., whereas single copies cost 6d. for postage.

We apologise to those members who applied too late for certain items listed in the circular. The rush for copies of the "Radio Antenna Handbook" surpassed all expectations. A few copies of the Summer Call Book and "Radio" Handbook are still available, price 4s. and 5s. respectively.

## Romford Radio Society Carrying On.

Mr. A. J. Hallett, G3CQ, informs us that the Romford and District Amateur Radio Society is to carry on. Meetings will be held in the shack at G3CQ every Sunday morning until better arrangements can be made. Several members, including G3FT the secretary, have been called to the colours, and many of those remaining are concentrating on Morse practice to enable them to qualify if needed for the Signal Corps.

## Have we a Cartoonist?

Numerous humorous incidents occur daily, have we amongst us a cartoonist who can create a character typifying the British "ham" in war-time? Offers should be made to the Secretary-Editor.

## In Search of B.E.R.T.A.

| Call.     | Dominion Districts. | Colonies. | Total. |
|-----------|---------------------|-----------|--------|
| G3BS ...  | 25                  | 14        | 39     |
| G6ZO ...  | 25                  | 14        | 39     |
| G5OJ ...  | 25                  | 13        | 38     |
| G2HX ...  | 25                  | 13        | 38     |
| W1WV ...  | 23                  | 15        | 38     |
| LA2B ...  | 24                  | 14        | 38     |
| G6QX ...  | 24                  | 13        | 37     |
| GM8HA ... | 25                  | 11        | 36     |
| G2UX ...  | 22                  | 14        | 36     |
| G6BW ...  | 22                  | 15        | 36     |
| ZS6DM ... | 21                  | 14        | 35     |
| ZB1E ...  | 23                  | 12        | 35     |
| G5ND ...  | 24                  | 10        | 34     |
| G3BI ...  | 24                  | 10        | 34     |
| VU2AN ... | 20                  | 14        | 34     |
| VU2FO ... | 23                  | 11        | 34     |
| W9YNB ... | 25                  | 9         | 34     |
| G3DO ...  | 20                  | 14        | 34     |
| ZS6BT ... | 18                  | 15        | 33     |
| VS7RP ... | 18                  | 15        | 33     |
| G2GK ...  | 25                  | 8         | 33     |
| G5LU ...  | 19                  | 14        | 33     |
| G2LC ...  | 24                  | 8         | 32     |
| W1APA ... | 25                  | 7         | 32     |
| W1IKT ... | 22                  | 10        | 32     |
| GM8MQ ... | 21                  | 10        | 31     |
| G4AS ...  | 18                  | 13        | 31     |

**PUSH THE AMATEUR RADIO HANDBOOK  
FOR ALL YOU ARE WORTH.**

## EXCHANGE AND MART.

### Advertisement Rates

**MEMBERS' private advertisements** 1d. per word, minimum 1s. 6d.

**TRADE advertisements.** One inch Semi-Display (max. 50 words), 10s., half inch (max. 25 words), 5s. **TERMS:** Cash with Order. All copy and payments to be sent direct to Advertisement Managers, Parrs Advertising Ltd., 121 Kingsway, London, W.C.2, by not later than the 30th of the month for the following month's issue.

**FOR SALE,** complete station. For details see August Bulletin. Further details if required.—WARREN, G8WW, 152 Bishop Road, Bristol, 7.

**FOR SALE.** Hammarlund Super pro. Model SPIOX. XTAL. with pack and loudspeaker. As new. Rack fitting. Cost £70 10s. £35 or nearest. Box 109, "Parrs," 121 Kingsway, London, W.C.2.

**FOR SALE.** 1939 (Jan.) National N.C.44, 230 volt A.C. with two-stage commercial Preselector and ten inch speaker. As new, cost £24, will accept £12 for quick sale.—2BGG, 60 Croxteth Road, Liverpool, 8.

**G5KT.**—Outstanding QSL's. Trial order will convince you cannot do better. Samples. State AA, G, BRS, SWL.—33 Howard Road, Westbury Park, Bristol, 6.

**G6DS.**—Known the world over for quality. QSL Cards and Log Books. Send for samples.—QRA, 14 Lambley Avenue, Mapperley, Nottingham.

"**HAM-AID**" QSL's. "Be like the Rest, QSL with the Best." Samples from G6XT.—TILLOTSON BROTHERS, Commercial Street, Morley, Yorks.

**NATIONAL NC100X** new condition complete £16. Hammarlund HQ120X new and unboxed with speaker £30.—T. PATERSON, Carlisle.

**OLDTIMER-G6MN** for 1st Grade Clear Type QSL's and Log Books. Send for Samples. G, AA, BRS.—G6MN, Worksop.

**10 METRE Sky Buddy** or similar receiver wanted cheap. Please state valve numbers.—KNIPE, 24 Capthorne Avenue, Harrow.

**WANTED.** Communication receiver in good condition, must be cheap. Write full details.—54 Ridgeway Drive, Bromley, Kent.

**WANTED,** Large Receiver such as RME 69, SX17, HRO, in good condition.—Write J. FORBES, Newtownforbes, Longford, Eire.

**WANTED,** High-grade receiver, S.W. only, maximum width 18½ in. Chassis and phones sufficient.—J. H. REEVES, Rosetor, Torquay.

### Patent and Trade Mark Agents

**GEE & CO.** (H. T. P. Gee, Mem. R.S.G.B., etc.), 51-52 Chancery Lane, London, W.C.2 (two doors from Govt. Patent Office). Phone: HOLborn 4547 (2 lines). Estd. 1905. Handbook free.

**KING'S PATENT AGENCY, LTD.**—B. T. King, A.M.I.E. (2BKT), Mem. R.S.G.B., Regd. Patent Agent, etc., Wardrobe Chambers, 146a, Queen Victoria Street, London, E.C.4. Handbook and Consultations on Patents and Trade Marks free.—Phone: City 6161. Fifty years' references.

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ALL-WORLD' RADIO RECEPTION

**TROPHY 8** 8 valves. 5 Bands, 7-550 metres (43 mc. to 545 kc., continuous). Continuous bandspreading. Illuminated scale engraved in kilocycles, with divisions permitting of settings of 800 deg. in 1 deg. steps. R.F. on all bands. Separate oscillator. Beat frequency oscillator with separate pitch control. Send/Receive switch. A.V.C. and B.F.O. on/off switches. Self-contained smoothing circuit. High impedance output sockets are provided for use of separate P.M. speaker and jack incorporated for alternative headphone use. Pleasing black crackle-finish steel cabinet, size 16½ in. long by 9½ in. high by 10½ in. deep. For use on A.C. 200/250 v. 40/100 cycles supplies. Despatched accurately aligned and aerial tested. **Cash price £13 : 17 : 3.** **TROPHY 8 SPEAKER.** Balanced permanent magnet moving-coil speaker, housed in celotex-lined steel cabinet, finish and design to match TROPHY 8. **£2 : 6 : 3 extra.**

**PRICES.** As readers will appreciate, on account of increased labour, material, manufacturing costs and war risk insurance, it has been necessary for us to increase slightly all TROPHY list prices. **Order as soon as possible because further increases may be required.**

**TROPHY 6** Six international octal-type valves. Four frequency ranges, providing a continuous coverage from 6.5 to 545 metres. Directly calibrated frequency scale. Independent electrical bandspread with separate illuminated dial. Automatic volume control and beat frequency oscillator on/off switches. Send/Receive switch. Pitch control. Provision for using doublet input. Headphone jack. Built-in speaker. Cabinet in steel, pleasing black crystalline finish. Overall dimensions : 17½ in. wide by 10 in. high by 9 in. deep. Despatched accurately aligned and ready for operation on A.C. 200/250 v. 40/100 cycles supplies. **Cash price £10 : 19 : 6.**

## New 2 - Stage PRESELECTOR

This R.F. amplifier represents unbeatable value in perhaps one of the most useful of acquisitions. For use with any kind of set. Increases signal strength, selectivity and range and reduces second channel interference to a minimum. Selector and send/receive switches and inputs for single-wire or doublet aeriels. Dimensions : 12½ in. by 12½ in. by 9½ in. deep. **Cash price £7 : 8 : 6.**

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41 HIGH HOLBORN, LONDON, W.C.1  
Telephone HOLborn 3248

## TROPHY S/W 3

Regenerative 3-valvers for A.C. and battery use (A.C. model, 2 plus rect.), with a really amazingly high degree of sensitivity. Wave-range, using self-locating coils for external insertion, 6.2 to 550 metres. Metre and band calibrated scale. Built-in speaker and phone jack. *Wireless World* and many users have confirmed the capabilities of the TROPHY 3, recommended with every confidence for all-world short-wave contact.

**BATTERY MODEL.** Complete with coils for 12 to 52 metres but less batteries. **Cash price £6 : 6 : 6.**

**A.C. MODEL.** Complete with coils for 12 to 52 metres. **Cash price £6 : 18 : 9.**

If extra self-locating coils required for complete coverage 6 to 550 meters, add 18/6 to TROPHY 3. **Cash Prices.**



Complete TROPHY  
technical specifications  
free on request.  
Write NOW

# PERFORMANCE AND PRICE UNEQUALLED