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The
SHORTWAVE
Magazine



**EXCLUSIVELY FOR THE
RADIO EXPERIMENTER &
TRANSMITTING AMATEUR**

VOL. V No. 8 OCTOBER 1947

WEBB'S RADIO

EDDYSTONE '640'

Communications Receiver

An efficient general purpose short-wave receiver, designed to meet the exacting requirements of Amateur-Band Communications



THE "SHORT WAVE MAGAZINE"
(June 1947) said :—

"The Eddystone '640' is a beautiful receiver and no operator who understands the amateur band requirement could fail to be impressed by it from every point of view. Because it is so good and the first British design worthy of the British amateur, we are glad to devote so much space to it."

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The Eddystone '640' Receiver may be seen and heard at Webb's
AND IS AVAILABLE FROM IMMEDIATE STOCK

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31 to 1.7 mc/s

Electrical Band-spread
throughout range

Eight Valves

(plus rectifier)

One R.F. and

two I.F. Stages

Efficient Noise-limiter

10, 20, 40, 80 and

160 metre Amateur
Bands Calibrated

Crystal Filter

Beat Frequency

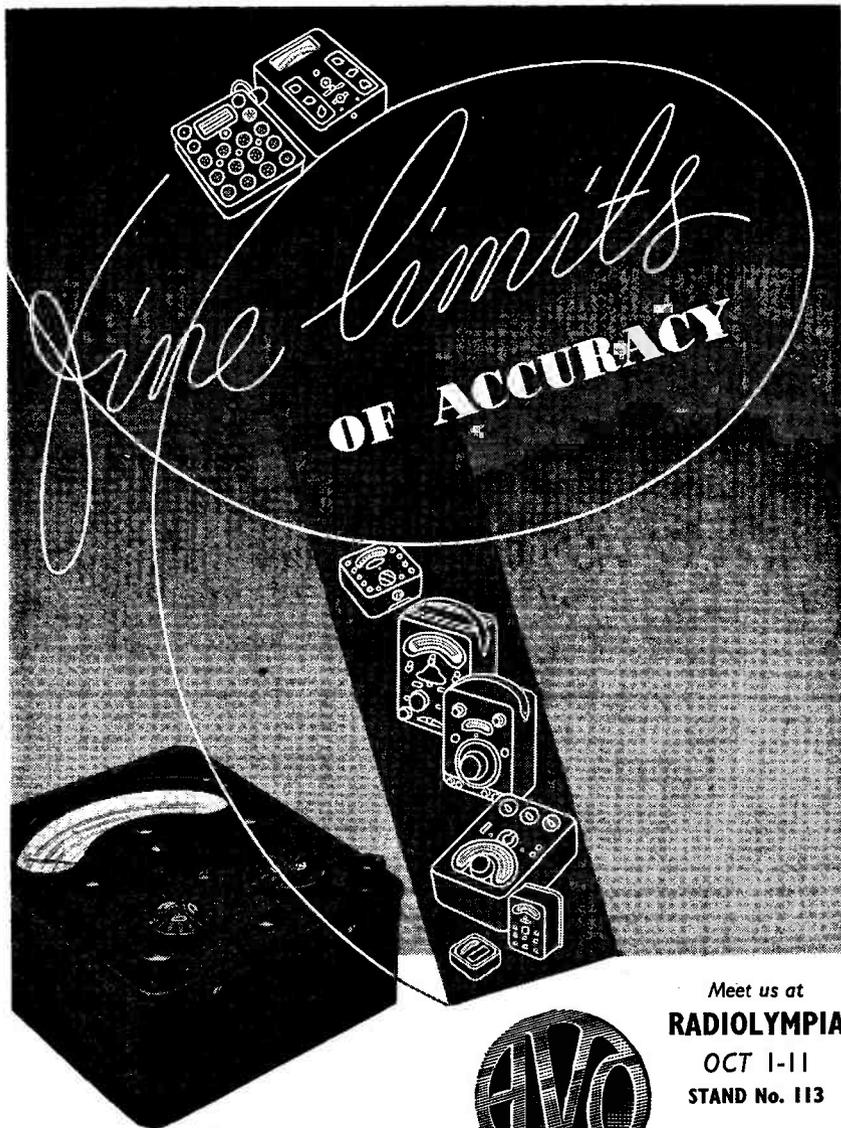
Oscillator

Fly-wheel Control

on Band-spread

The "640" has outstanding signal/noise ratio and extremely good image rejection. Provision for external connection of "S" Meter.

WEBB'S RADIO, 14 SOHO STREET, OXFORD STREET, LONDON, W.1
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C O I L



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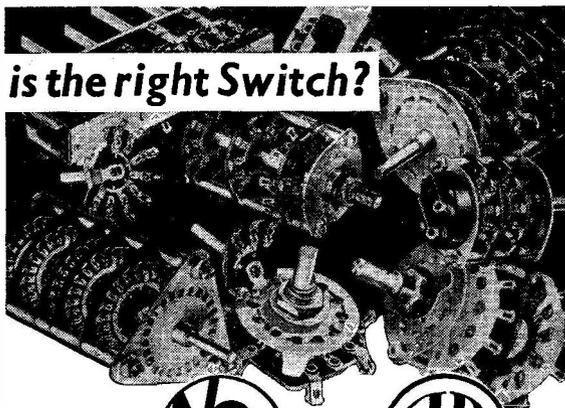
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3. One combined 90v H.T. and 7.5v L.T. battery, size $7\frac{1}{2}'' \times 3'' \times 2\frac{1}{4}''$.
4. Pair of balanced armature light-weight headphones.
5. Coil packs, size $2\frac{1}{2}'' \times 3\frac{1}{2}'' \times 1''$.
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 - (b) Tunes from 2.5-5 mc/s. 60-120 metres.
 - (c) Tunes from 4.5-8 mc/s. 38-67 metres.
 - (d) Tunes from 8-15 mc/s. 20-38 metres.
6. Aerial and earth wire with paxolin former and earthing clip.

This receiver can be used when out walking, as it can be easily carried in your overcoat pocket. The battery will give approximately 30 hours' continuous use, and 2 to 3 months' when used intermittently. The power pack is, of course, operated in the shack to conserve the batteries for outside use. Should you require further batteries we can supply, while stocks last, at 19/3 each, post free. Sufficient power is available for working a smaller loudspeaker, 2" or 3" in diameter, if required.

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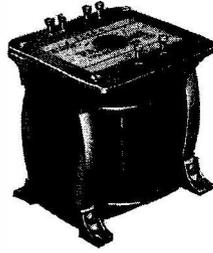
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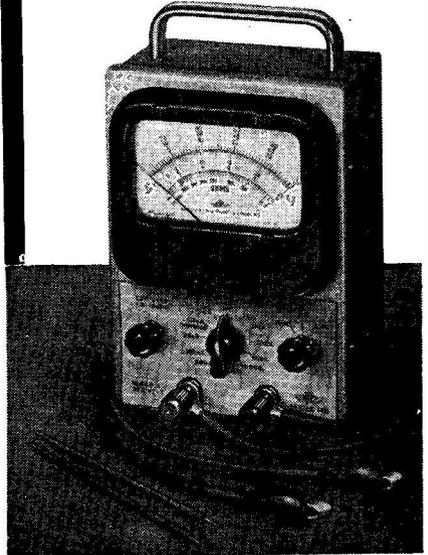
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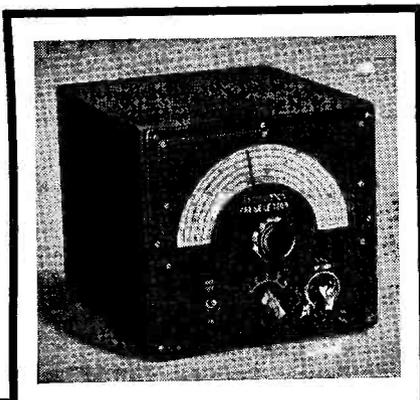


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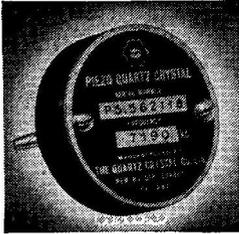
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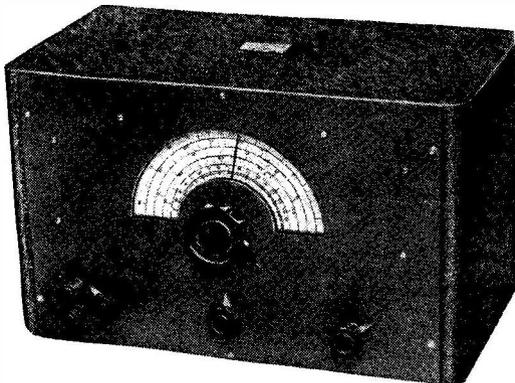
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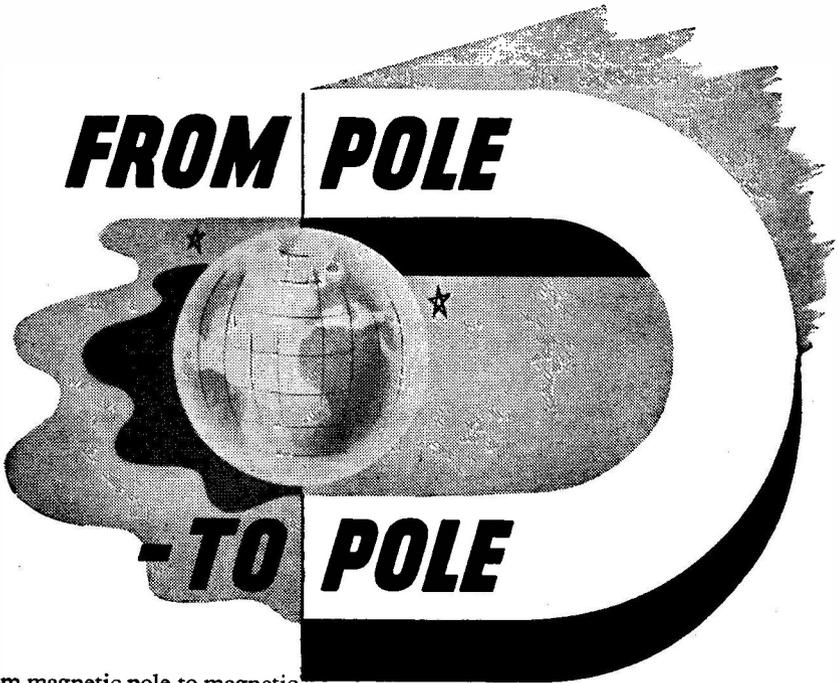
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FOR THE RADIO AMATEUR AND AMATEUR RADIO

Vol. V.

OCTOBER 1947

No. 51

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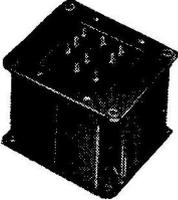
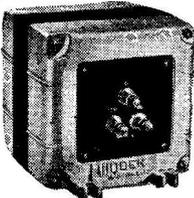
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EDITORIAL

Reflection

We are at the turn of the year in the Amateur Radio calendar, since this is the month which heralds a new DX season and fresh endeavour on all bands. As this wonderful summer passes—and the end of basic petrol draws gloomily nearer!—so we look forward to our Amateur Radio activity with a new interest.

This space has frequently been used to moralise on this and that—with what effect it is hard to judge—and it may be that there has been too much moralising. But there are those of us who are now growing old in this great game of Amateur Radio and to whom it all means far more than the mere achieving of a new DX record or the building of a beautiful station, satisfying though these things are.

Many years ago, some lines were written which were intended to help, enthuse and inspire the beginner—“Money, on which most of us base our hopes and fears in everyday life, is of secondary importance in Amateur Radio, because an amateur is not judged by the cash he spends or the power he uses, but by the signal he radiates.” This is as true now as it was then, though like all fundamental truths, it is sometimes in danger of being supplanted by false values.

Our immediate purpose is to remind all who have a real interest in the art of Amateur Radio of the obligations and responsibilities which the holding of a callsign entails. The code of conduct and the standard of behaviour; tolerance, unselfishness, and the willingness to help others who may be lacking either in knowledge or experience and who need advice and guidance. Though these sentiments may seem trite and even unsophisticated, nevertheless those who have had long service in the cause of Amateur Radio know that they require to be re-stated from time to time.

So with the opening of the new season, let us in our several ways conjure up again the spirit of Amateur Radio, and it may perhaps be that we shall get a little nearer that universal understanding upon which the whole future of mankind now so urgently depends.

Austin Foxgill G6FO.

Pulsed MCW Transmission on VHF

High Peak Powers with Low Input

By A. G. CHAMBERS, A.M.Brit.I.R.E. (G5NO/ZB1AB)

(Pulse transmission in the accepted sense is not permitted to amateurs. The system of transmission suggested by our contributor, while employing pulse technique, is different in that a keyed pulsing modulator working at a high pulse repetition rate is used to switch a PA operating at a low mean DC input. The radiated output of the PA is thus relatively of very high peak power, the signal characteristic being a keyed musical note of about 1000 cps. Under actual test conditions, a PA running at a mean input of 2 watts produced 1 kW on peaks for a pulse-width of 2 microseconds and a bandwidth of 2 kc at 56 mc.—Ed.)

EVER since the writer has been concerned with naval radar, he has looked forward to the day when the principles used in a radar transmitter could be applied to Amateur Radio. This article discusses one possible application.

In radar, the transmitter is pulsed, because it is necessary to have a space of time during which the radiated signal can return in the form of an echo. Now, since the final valve is only working over a very small portion of the cycle, much greater power than can normally be used in Class C operation is permissible. In other words, a valve with a normal continuous anode dissipation of, say, 25 watts, when pulsed for a very short period, can be made to dissipate a kilowatt or more. Special valves designed to work under these conditions are now available, and it is with a pair of such valves that a simple crystal-controlled pulse transmitter will be described, capable of delivering into the aerial a *kilowatt of peak power*, at the rate of 1000 cycles per second. A 1000 cps note, as heard in the receiver, will not be a pure sine wave, but is quite a smooth, readable signal and very pleasant to copy. Moreover, the bandwidth, as measured 3 miles from the transmitter, was only 2 kc wide.

The writer has been asked whether anything is gained by using this system and that surely it is the *mean* power that counts. It is a debatable point. A kilowatt will travel through the ether as such, even if the mean power arriving at the receiver is only 2 watts; this is better than nothing at all, which is what would result if only 2 watts of mean power were radiated in the first place.

Equipment

The whole outfit consists of three main units as follows:

(a) The pulse forming unit—which generates 2 microsecond pulses 1000 times a second.

(b) The modulator—which switches the transmitter on and off 1000 times a second.

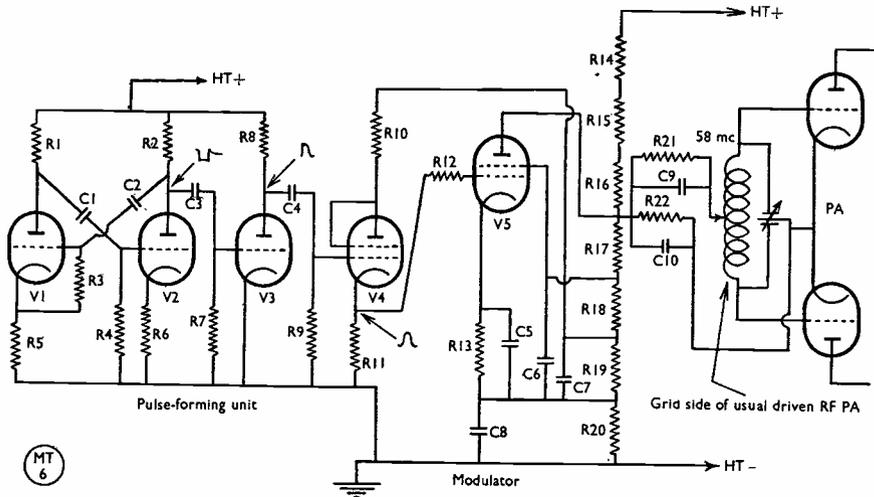
(c) The crystal oscillator and doubling unit.

(d) The final RF amplifier.

Commencing with the simple side, (c), the crystal oscillator and doubling unit. This was borrowed from an existing 28 mc 150-watt transmitter and consisted of a 7 mc crystal oscillator (KTW63), 14 mc doubler (807) and 28 mc doubler (807). The existing PA was disconnected and the 28 mc doubler was made to quadruple down to 56 mc, giving an output of about 2 watts for driving the 56 mc final. This was built first of all as a normal 56 mc push-pull Class-C amplifier. The drive was reduced to about 1 watt and 300 volts of DC from a receiver power pack was utilised for testing. The usual precautions of making leads short and using a common earthing point were kept in mind.

Needless to say, the amplifier under these conditions worked first time. For an input of 12 watts a 6-watt lamp could be lit to full brilliancy giving an efficiency of 50 per cent., which was considered about normal considering the frequency and valves used. No doubt, if more time had been spent on the design the efficiency would have been improved. One point is important: HT negative is not taken to chassis, since series or cathode modulation is used.

All that is required for the pulse forming



Circuit of ZB1AB's pulse-forming unit and modulator (V5) or "switching valve." This is the heart of the system. V5 pulses the 56 mc PA at a p.r.f. of 1,000 cps. If this tone is keyed, say in the cathode of V4, the signal radiated by the PA will be ICW in character and of considerable peak power. High voltages, up to 2,000 or more, must be used on V5 and the PA.

unit is a multivibrator and an amplifier. A suitable arrangement is shown in the circuit and makes the natural resonant frequency occur at 1000-cycle intervals.

This frequency was roughly calculated by the formula :

$$f = \frac{1}{R_3 C_2 + R_4 C_1}$$

where f is in cycles, R in ohms and C in farads; this in turn was checked by a double-beam oscilloscope, a standard 50-cycle trace being put on one pair of plates and the 1000 cps signal on the other. The frequencies were then checked by counting the number of 1000 pulses which occurred in one 50-cycle wave and multiplying up.

V3 together with its input circuit C₃R₇ is a differentiating amplifier. The values of C₃ and R₇ were chosen to have a short time constant, so that a short pulse could be obtained.

V4 and V5 constitute the modulator, V5 being the modulator proper, and V4 an amplifier. Although V5 is commonly known as the modulator, it is better to think of it as a switch in series with the cathode of the final.

Although a switch is the best analogy, the action of switching on and off at 1000 times a second produces a musical note which might be looked upon as modulation; thus, V5 is the valve which produces the audible note, and is keyed in the normal way producing the MCW type of signal.

Table of Values

Pulse Forming Unit and Modulator	
C1	= .0002 μF
C2, C3	= .0001 μF
C4, C6, C7, C10	= 0.1 μF
C5	= 0.55 μF
C8	= 2.0 μF
C9	= .0005 μF
R1	= 8,000 ohms
R2	= 10,000 ohms
R3, R11	= 100,000 ohms
R4	= 5.6 megohms
R5	= 220 ohms
R6, R18	= 470,000 ohms
R7	= 22,000 ohms
R8	= 11,000 ohms
R9	= 1 megohm
R10, R12	= 47 ohms
R13	= 470 ohms
R14, R15, R16	= 33,000 ohms
R17	= 170,000 ohms
R19	= 680,000 ohms
R20	= 39,000 ohms
R21	= 20,000 ohms
R22	= 330 ohms

Action of the Circuit

In order to get a clear picture of what is happening, regard V5 as the "switching valve."

This valve, in its quiescent state, is biased to cut-off by the resistance R20.

When a positive pulse arrives at its grid, strong enough to overcome the bias, it conducts, and in turn allows the push-pull final—under drive and with high voltage on its plates—to radiate. During this time C5 in the cathode of V5 is charging up due to the cathode current. When the voltage across this condenser, which constitutes extra grid bias, reaches a certain critical value, the valve stops conducting, the PA stops radiating and the pulse terminates. Thereupon, the condenser C5 discharges through R13 and, by the time V5 is required to conduct again, this condenser is discharged and the cycle is repeated.

As indicated, V5 behaves purely as a switch. It is a special type of valve which is capable of carrying a high current with comparatively low anode voltage. In order for it to function efficiently it requires considerable drive; hence a small power valve (6V6) is used for V4 which again is just an amplifier.

The measurement of power output was considered at first quite a problem. The writer was fortunate in procuring a peak watt-meter already calibrated, but a simple and quite accurate measurement can be made by measuring the mean power and then applying the following formula:

$$P = \frac{10^6 W}{xt} \text{ Watts}$$

where P = Peak power
W = mean power
x = repetition rate, i.e. number of pulses/sec.
t = pulse length in microseconds.

In this application,

$$P = \frac{10^6 \times 2}{1000 \times 2} = 1 \text{ kW.}$$

It will be noticed from the above formula that increasing the repetition rate decreases the peak power output; thus, a choice had to be made between a rough, low note, or a nice musical note with a certain decrease in power. Hence the decision to use 1000 cycles.

When testing the transmitter, the neutralising of the final was first done in the usual manner under the DC condition, but it was found that when the pulsed HT was applied it was necessary to reneutralise with the HT pulsing, because when the drive was removed, a neon could still be struck from the tank coil. Final neutralising was thus accomplished by removing the drive and adjusting the condensers so that the neon, when shown to the tank, did not strike.

PORTABLE POWER SUPPLY

In America, one of the primary reasons for encouraging field-day or outdoor operation is to ensure readiness for the sort of disaster in connection with which Amateur Radio can be of immediate and practical assistance. But with the advent of the cheap P/E sets, which can provide enough AC power to operate a big station, the essential feature of mobility has been overlooked; rather, the idea is to run the biggest transmitter and the most elaborate receiving equipment which the power unit can feed—so the tendency is for the American /P's simply to take the fixed station outside. Going portable thus means nothing more than operating the home station with the public mains supply disconnected. As a writer in August CQ points out, this is the negation of portable operation in the strict sense, as field-day working should imply at least a reasonable degree of mobility.

ANYTHING ON THE TR9 OR T.1154F?

G8JC, Brookhill Farm, Ladywood, Droitwich, Worcs., would like to hear from anyone who could provide him with circuit diagram and full modification details of the two equipments mentioned above. Anything loaned would, of course, be returned after use.

★ ★ ★

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Weak-Signal Receiver Design

Points for the Constructor

By G. MERRIMAN (G6NC)

(Read this article. It will be of particular interest to those who have never handled a quiet receiver and will remind old-timers of sound principles, now forgotten, which were accepted as axiomatic twenty years ago.—Ed.)

ANYONE who starts reading this article hoping to learn of new excuses to add more valves and more complex circuits to his receiver will be disappointed. But he is offered the balm that instead he may find reasons in it for removing some of what the receiver now has!

When the writer started the fascinating game of working DX some twenty years ago, receivers really were weak-signal affairs—and they certainly needed to be, for in those days there were a lot of weak signals to be read. But those old receivers had something else, namely quietness of background, to a degree with which no modern receiver can compare.

Receiver design went astray when amateurs delegated their manufacture to someone else. It need not have, of course, for if they had with one voice shouted for what they really wanted, they would have got it instead of getting what other designers wished to sell them.

Now, having made some rather provocative statements, let us see how they can be defended in the light of modern practice. In order to do this we will first agree to make the reception of weak signals our main consideration.

Noise v. Gain

The best illustration of what a weak signal receiver should *not* be is adequately illustrated by any modern, really up-to-date communications receiver, so we will take any one of these with which the reader may be familiar and analyse it, starting at the output end.

How does one use a communications receiver? Answer, about three feet from the operator, which makes it difficult to enthuse about its three watts of audio output. Audio output of that kind is excellent for dancing on the lawn, but has no place in an amateur's DX receiver. Audio amplification is proportional to the first power of the incoming signal, and for

some perverse reason prefers noise to signal!

Strange and paradoxical as it may seem, in a weak-signal receiver one cannot afford the luxury of audio amplification, for it provides too much noise with its easily obtained gain. In the reception of weak signals the 'phones should be worked out of the second detector or demodulator valve and the input to that valve increased by RF and IF amplification, *plus* any other device possible that will increase the pre-demodulator gain.

Efficient Detection

What of this demodulator valve? Have we much choice in its selection? Well, if we are still keen on weak signals we must use the most sensitive device known, and that is a grid-leak type detector, preferably a triode. Triodes are more easily matched to a pair of headphones and in general are quieter in operation.

We know your communications receiver uses a diode; so does ours, so we never use it on weak signal DX. The designers put it there because they wanted the receiver to be able to handle really powerful signals without distorting that three watts of audio.

Of course, if you are interested in pure reproduction and the entertainment value of incoming telephony a diode is a good idea, for it also allows you to ensnare and side-track some of the precious RF input so that it can be used for AVC, all of which is out of the question if weak signal reception is our goal.

A diode has about the same sensitivity as a crystal detector and with weak incoming signals one will be fortunate if the output is proportional even to the input. A grid leak type detector, known for years to be the most sensitive detector on earth, has for weak signals an output proportional to the square of the incoming signal. This is why we *must* keep the

amplification before the demodulator stage and not after it.

The IF Section

The trend in IF amplifier frequency selection is delightfully simple. When superheterodynes first appeared 175 kc transformers were used with all the attendant gain and selectivity. Then someone found that it was cheaper to increase the IF in order to combat image signals than to do it the right way by increasing the selectivity of the signal frequency circuits—so they made the IF 465 kc or thereabouts. Later someone else discovered that even better image rejection could be obtained at an IF of 1600 kc—and if the gain and selectivity went down, well, couldn't that be disguised by another watt or so of audio? One shudders to think what the next step might be, but when we are designing a weak signal superhet there is little justification for going in for IF much higher than 465 kc.

One stage of IF amplification is superior to two or more for the simple reason that one stage gives greater gain proportionally than do two or more, and with less noise. Therefore, we must endeavour to get the gain with the minimum number of valves.

As for the type of valve to use in this position, a high-gain pentode working full out is the best choice at present, for although all pentodes are noisier, gain for gain, than triodes the latter are not at the time of writing sufficiently developed in this connection. It is interesting to note however that RCA are developing triodes for RF and amplification, all because triodes can do the job more quietly.

FC Stage

The first detector, mixer, or frequency-changer next comes up for inspection. Here the utter enslavement of all designers of superheterodynes to the American combined mixer-oscillator is again because it is the *cheapest* way to do the job. Lately, however, there seems to have been some new ground broken, for at least one designer has gone in for twin-triodes, using one for the oscillator and the other for the mixer.

The infinite-impedance detector triode circuit has also been suggested as the quieter type of mixer. The chances of it being quiet in operation are quite good, but inevitably it will fall into the category of mixers which have no conversion gain and need additional IF amplification to overcome insensitivity. Naturally, this is

a case of getting what we want on the one hand and losing it on the other.

However, as far as one can see at this moment, these new departures, though obviously in the right direction (the reduction of noise) have not as yet produced anything radical and the writer's preference is still for a high-gain pentode and a separate triode oscillator.

The RF stages, of which there ought to be as many as the user can control, should, of course, be RF pentodes and, to help them, have their circuits designed so as to give the highest possible LC ratio.

LC Ratio

Now this business of LC is not one of the things that can be laughed out of court as unimportant. We have only to compare the difference in gain in a receiver at the HF end of the tuning scale with that at the LF end to see that there is considerable gain due to the higher LC ratio. Now, since this point *is* so important, let us look at some of the relevant facts.

The frequency ratio of a tuning circuit—that is, the ratio of its highest to its lowest frequency reached on the condenser tuning scale on any one range—is equal to the square-root of the condenser's capacity ratio. If, therefore, we want a frequency spread on the dial as wide as, say, 2 to 6 mc, or 3 : 1, the condenser must have a capacity ratio of the square of this, or 9 : 1. Then, since with incidental circuit capacities *plus* trimmers and padders, the lowest capacity figure is initially high from an amateur's viewpoint, it is readily discernible that a capacity of nine times this value is quite unthinkable for weak signal reception.

This most disheartening state of affairs is sold to us in our communication receivers because, to be popular among the non-transmitting members of the radio fraternity, it has to cover a large range of frequencies without too many coils.

Thus one often sees a tuning condenser with an absurdly high maximum tuning capacity and covering two amateur bands on one coil, a thing which even the most elementary DX-hunter of some years ago would not have tolerated for one moment in his home-built receiver.

So in our weak signal receiver we must tune the signal circuits with as little tuning capacity as possible, and then only enough to tune from end to end of the band in use.

Designers, who are, of course, quite aware of all these things but have a

public to serve, sometimes comfort themselves with the observation that the above two-band-in-one-coil operation is excusable, if the more important of the two bands is the one at the HF end of the scale. This is only a half-truth, for any condenser with a capacity ratio of 9 : 1 will have an unpleasantly high minimum

capacity which will detract from the high LC ratio we are seeking.

Some day, no doubt, we shall find weak-signal receivers being sold in the marketplace for the price of not too many sparrows. Until then, however, one is forced to the conclusion that they will have to be made at home.

RADIOLYMPIA

This year's Radio Show at Olympia, London—the first since the war—will be held during the period October 1-11.

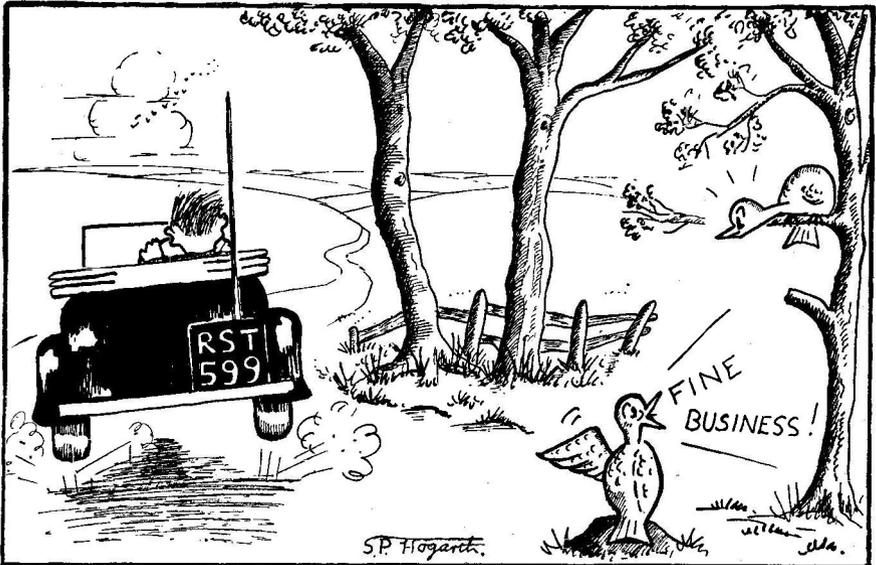
It will be worth well a visit by all who are interested in any branch of communications, radar or television. This time Radiolympia is on a more ambitious and comprehensive scale than the exhibitions held in the immediate pre-war period. The 1947 Show will cover, as it should, the whole field of radio and many developments of the war-time years will be disclosed for the first time.

We who are concerned with a particular aspect of wireless should always remember that the British can lay claim to great achievements in the world of radio: The development of the thermionic valve itself, from which all else springs; the short-wave beam system, which revolutionised long-distance communication; television technique—and we are still the

only country in the world providing a regular television programme service; the invention of radar; the magnetron, to radar the counterpart of the thermionic valve, making possible most of the more important radar applications; and the pulse navigational aid systems.

All these were originated and developed in this country by British scientists and technicians. Though the credit for much of this work has been attributed, mistakenly, to America, the indisputable fact remains that the British not only produced the ideas but led the way in their application.

Though it cannot be said that radio alone won the war, what is now clear beyond all doubt is that without this vast radio effort and its application to all our warlike operations, we certainly would not have come within even measurable distance of winning.



Ground-Plane System For Twenty

Space-Saving Aerial Giving Good Results on 14 mc

By L. RICHARDS (G3YM)

THE purpose of this article is to give some idea of the construction and results which can be obtained on comparatively low frequencies with an aerial system which for some years has been tried and proven on the very high frequencies.

First, it might be as well to tabulate the advantages and disadvantages of the ground-plane aerial in order that those who may care to construct it will have some idea as to what to expect. The advantages are: (a) Small space requirements, (b) Very low angle of radiation, (c) Omnidirectional polar diagram. Disadvantages are: (a) Very noisy for reception, (b) Slightly lower performance than horizontal half-wave, but only in the optimum direction for the horizontal wire, and then only when the band is wide open with high-angle skip prevailing.

Under average conditions the ground-plane job will hold its own with anything other than a beam; many reports have been received from VK, ZL, W6 and W7 that signals with this aerial were coming through a considerable time before other Europeans were getting across. This tends to confirm that the vertical angle of radiation is in fact much lower than average.

Design

Basically, the aerial is a Marconi, in that it is a quarter-wave vertical worked against ground, the difference being that ground is simulated by quarter-wave *resonant* wires arranged in the horizontal plane in such a manner as to give the vertical section maximum capacity to ground, and also to present a fairly low impedance at the base of the vertical element with the consequent simplification of feeding.

The calculations for determining the dimensions and feed-point impedance of the ground-plane aerial are a little more involved than are required for the normal horizontal half wave, and for those interested are discussed in *QST* of May 1947.

The aerial in use at G3YM was cut for a frequency of 14,200 kc and operates quite well over the entire 14 mc band. The

dimensions are as follows:—

Vertical Section 15 ft. 8½ in.

Radials 17 ft. 2 in., each.

Impedance at the feed point approximately 24 ohms.

Matching Stub. The quarter-wave stub of 35/50 coaxial cable is 11 ft. 4 in. in length. This stub length will vary in accordance with the particular type of cable used, and the "cut and try" method should be employed in order to obtain a proper impedance match.

Mechanical Layout

The layout of the ground-plane aerial is shown at Fig. 1 and any convenient method of construction may be employed. In the writer's case a flat roof was available, but no chimney stacks or other convenient projections to which the vertical section could be bolted. So a wooden box about two feet square was obtained, plus a three-foot length of "three by two" timber which was then screwed to the bottom of the box and held in the vertical plane by means of wedges. These wedges were in turn screwed both to the sides of the box and to the upright. Details are indicated in Fig. 2. Three stand-off insulators were then screwed to the upright and the ¾-in. dural tube, of which the radiator was made, was then fitted into clamps, which were in turn held by the two upper stand-off insulators. The lowest insulator was used as a collection point for the radials. The box was filled with ballast, in the form of sand and any old iron which could be found. . . . haywire, but it has withstood many very high winds, and looks as if it will take many more.

Radials

With regard to the radials, the optimum angle for their positioning is 90 deg. but due to space considerations that was not possible at this location. They were therefore arranged as and where they could be fitted in; this made an angle of at least 135 deg. between two of the radials, but if this has affected the performance of the ground-plane system it is not noticed. The radials should of course be insulated at the ends, and should be firmly tensioned

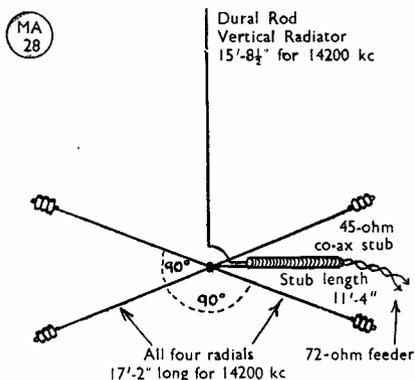


Fig. 1.

in order to prevent sag or sway. If the wire used for the radials is insulated, it is permissible to lay them along the ground or roof. This is not recommended, but it will work with a slight loss of efficiency.

On no account should the positioning of the radials be altered after the matching stub has been trimmed and connected. An alteration in positioning will bring about an impedance change at the feed-point, with a consequent mis-match if the stub has already been tuned. The dimensions of the radiator and radials are variable within wide limits, and combinations can be worked out to give feed-point impedances varying from a few ohms to several hundred ohms; but whatever combination is chosen some form of stub or matching transformer is still required, for if the elements are cut in such a manner as to give a feed impedance of 72 ohms the aerial then becomes inductively reactive, and a matching stub in *parallel* with the 72-ohm feed line is then required in order to add capacity and cancel the inductive reactance.

Results

The aerial used at this station, and for which the dimensions have been given, has proved quite simple to adjust, and it can be recommended as a "going concern." The results have been most encouraging: WAC within 12 hours of its erection; VK, ZL, PY, LU, CE, VU, VS1, VQ4, ZD6, MD5, HK, TG, TI, XE, HI, HH, YN, ZC1, VP2, VP4, VP5, VE, OA, HC, VR6, YV and all W districts have been worked on 'phone during July and August. Many other stations have also been worked at all points of the com-

pass, and this ground-plane system has proved itself to be truly omni-directional.

Acknowledgments are due to G3AWG for his help in the construction of the aerial, and to G8PO, whose signal from a half-wave dipole was used as a basis of comparison when working three-way with various DX stations.

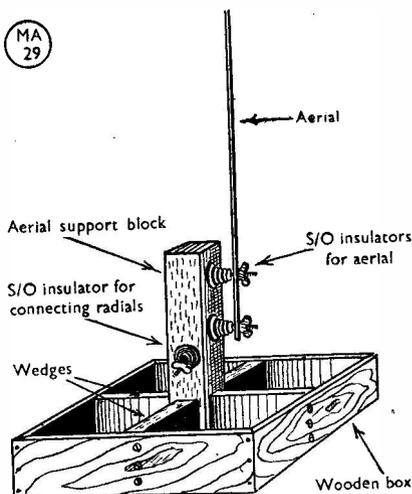


Fig. 2.

LOOK THROUGH THIS LIST

If your call appears here, it is because there are cards waiting for you in our QSL Bureau, and we have not got your address. Please send a large stamped addressed envelope, with name and callsign, to BCM/QSL, London, W.C.1, when the cards will be forwarded.

- G2BPS, 2CCO, 2CFK, 2COU,
- 2CWW, 2DBP, 2DBW, 2DH, 2FFX,
- 2FQH, 2HAV, 2HN, 2HZF, 3AAF,
- 3ACP, 3AEF, 3AGV, 3AHH, 3AJL,
- 3AKL, 3AMC, 3AMR, 3ANF, 3ANX,
- 3AP, 3APV, 3AWK, 3AZS, 3BEY,
- 3BFN, 3BGL, 3BIE, 3BIP, 3BLR,
- 3BMJ, 3BMV, 3BMY, 3BPW, 3BQC,
- 3BRE, 3BUD, 3BZK, 3CAF, 3CCO,
- 3CCY, 3CDR, 3CLG, 3FBC, 3FW,
- 3OD, 4CM, 4IS, 4RJ, 5BS, 5LW, 5NP,
- 5PZ, 6KL, 6PW, 6SB, 6SP, 8CJ, 8DJ,
- 8FC, 8IB, 8MM, 8OQ, 8WB, G16FB,
- GM3BGA, 3BLJ, GW3BHA, 3BYZ.

The Maximum Usable Frequency

Seasonal Variations in Usable Frequency for a Given Transmission Path

By T. W. BENNINGTON

THE measured critical frequency of the F layer—which is mainly responsible for long distance propagation of short waves—as obtained at any one place in the Northern Hemisphere, is much higher during the daytime in winter than in summer, and somewhat lower during the night in the former than the latter season. Consequently, the Maximum Usable Frequency (MUF) for long-distance transmission, so far as this one ionospheric point is concerned, is much higher during the daytime in winter than in summer, and somewhat lower during the winter night than during the summer night. A glance at the curves—which show the MUF for 2,200 miles obtained from the monthly average of measured critical frequencies as obtained at one place in these latitudes during the months of December and June—should make these seasonal variations quite clear. Their nature has often caused some surprise in amateur circles, where experience has not always led people to expect changes of such a character or of such magnitude as between the seasons. A few explanatory words on this subject may therefore prove helpful.

Factors Involved

There are, in fact, several circumstances arising which may modify the magnitude, if not the nature, of the seasonal differences shown in the curves, when the ionospheric measurements are applied to real transmission paths.

These may be summarised as follows:—

- (1) The MUF for a transmission path will usually be lower and never higher than that for one specific ionospheric point on the transmission path, owing to differences in the local time.
- (2) The MUF for a transmission path will often be lower and never higher than that for one specific ionospheric point on the path owing to geographic changes in the ionisation, apart from those due to differences in the local time.
- (3) The MUF at any particular time may differ from the mean MUF for the month by as much as 30 per cent.

It should be explained that the values given in the curves were obtained around sunspot maximum and are, as is usual, the mean of all the measurements obtained during the particular months mentioned above.

We will consider (1) and (2) together, there being two essentially differing cases, namely (a) paths running in substantially North-South directions and (b) paths running in substantially East-West directions.

(a) *Path running in North-South directions.*
In this case there will be little difference in local time over the path, and the actual MUF for the Northern Hemisphere point as shown in the curve may well be the MUF for the whole transmission path. In other words, the MUF at the first point where the wave enters the ionosphere is often the lowest encountered over the whole path, observing that the MUF will increase more or less steadily towards the low latitudes at any one time of day. In such cases the working frequency for the path will vary seasonally according to the variation shown in the curves. But if the path runs a long way into the Southern Hemisphere, where the MUF starts to fall again, it may well be that the MUF at the far end is lower than at the near end, and therefore is the controlling MUF. And, of course, it is summer in the Southern Hemisphere when it is winter here, and *vice versa*. The net result of this is that working frequencies for such paths undergo relatively little change the year through, being in fact, highest around the equinoxes, somewhat lower in the Northern Winter and lowest in the Northern Summer. Thus, the winter daytime MUF shown in the curve is seldom reached, it being modified by the summer conditions at the other end.

(b) *Paths running in East-West directions.*
In this case the MUF for the transmission path is profoundly modified by the changes in local time. In winter day it can hardly ever be so high as that shown in the curves, because, if the MUF for the first iono-

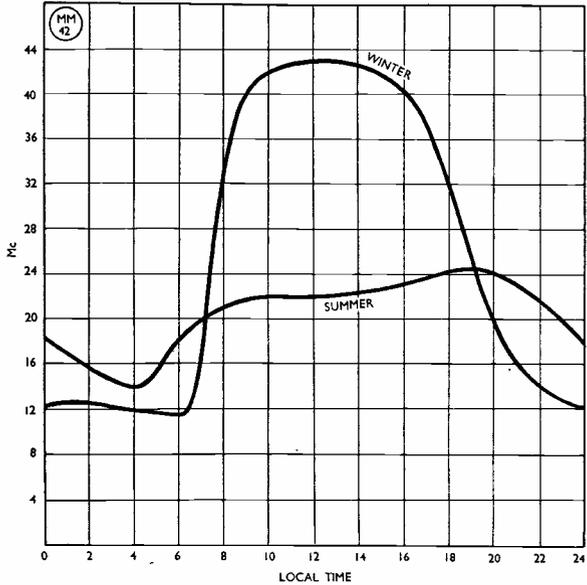
spheric point is as shown there, and the wave enters the ionosphere at a local time when the MUF is high, then, because the local time changes along the path, it is almost certain to encounter the sharp downward variation in MUF further along the path. This causes the MUF for the path to be considerably lower than that for any one point in the ionosphere. In summer day this effect is much less marked, because the curve is broader (the MUF does not vary so much with local time) and the downward changes are far less acute.

Change with Longitude

Apart from MUF variations due to changes in local time there is a geographic change of MUF with longitude (the so-called longitude effect) due to the effect of the geomagnetic field. This is such that the MUF's are, generally speaking, lower in the western zone of the Northern Hemisphere than in the eastern zone, on the same parallel of latitude. So here is a further effect which tends to lower the MUF for the path when transmitting in a westerly direction from this country. All this seems very complicated, but the net result is that working frequencies for East-West directions are generally higher in the winter day than in the summer day and lower in the winter night than in the summer night, but the changes as between summer and winter daytime frequencies are far less marked than would appear from the curves.

Finally, point (3) should always be borne in mind, and particularly so during the evening hours. If on individual days the MUF can be 30 per cent. above the mean for the month, and at least 15 per cent. below it even when no severe ionosphere storm is in progress, it is obvious that, from the point of view of the amateur, a large element of variability becomes evident in the actual utility of any particular waveband. In this respect there is a difference between amateur and professional techniques, for the professional engineer, in planning a service which must operate on every day has, in the first place, to take account of this variability, and,

MUF for one point in Northern Hemisphere



discarding frequencies which may be of utility on many days of the month, fix his working frequencies below the zone through which the variability extends.

A study of the two curves here given will, however, even as they stand, show up many interesting points with reference to the possibilities of the amateur 28 mc, 14 mc and other proposed allocations, particularly in respect of the local afternoon and evening periods.

THE R.C.M.F. BULLETIN

No. 4 of this interesting publication once again gives ample evidence of the value and volume of work undertaken by the various technical committees within the industry to arrive at agreed standards and specifications.

Current discussion centres round the mechanical dimensions and electrical values of wire-wound and carbon-track variable resistors; the dimensions, ratings, terminations and finish of fixed resistors; and the insulation resistance of and the test conditions for toggle switches. An account of the work of the Panel on transformer laminations is also included in this issue.

More On Crystal Grinding

Another Practical Method

Described by E. J. WILLIAMS (G2AKY)

(Hundreds of thousands of crystals were produced during the War for a wide variety of Service requirements, but for frequencies mainly outside our bands. Numbers of these crystals are becoming available and it is an easy matter to grind them on to useful frequencies.—Ed.)

CRYSTAL grinding has been a thing which has usually been left to the experts by the average amateur. In the article following, the writer will outline his own experiments; these have proved very successful, and with a little care could be repeated by anyone choosing to adopt the same methods.

First, it must be explained that these methods have only been applied to crystals already cut and ground to a specified frequency. The work done refers only to crystals obtainable from some dealers in ex-Service radio equipment. The cutting of the crystals in the first instance is a job best left to the manufacturers equipped for it.

In the writer's own case, crystals were obtained with frequencies between about 5 and 6.6 mc, these being the best and easiest to start off with as they can be ground into the 7 mc band. Moreover, the majority of these crystals are "X" cuts which give a reasonable output and stand quite a lot more abuse when being handled by the amateur.

The only tools required are a carborundum stone, some carborundum powder, a piece of hard rubber or cork, some water—and a lot of patience.

Additionally, some means of calibrating the finished crystals must be provided. As this item is perhaps the most important, it will be dealt with first.

Calibration

The choice of such equipment will depend upon the requirements of accuracy. The writer had available a frequency standard for checking to .0001 kc. But if it is required only to grind crystals into the 7 mc band (without special regard to a particular frequency) reasonable accuracy can be obtained with a calibrated receiver, bearing in mind the fact that other crystal-controlled transmitters are available as check points. Alternatively, a 100 or

1000 kc sub-standard may be available, which is a feature of some amateur transmitting stations.

The method of grinding the crystals is quite simple. First obtain a brand new carborundum stone, preferably coarse one side and fine the other; these are standard and can be purchased from most good ironmongers. It is important to use a new stone as this will be perfectly flat. The writer's was 4 in. long, 2 in. wide, and 1 in. thick, coarse one side and fine the other. The coarse side was used throughout.

Grinding

Take the crystal from its holder and mark one face with a pencil; this is important, as it is easier to grind one side, and to keep the other flat. Wet the stone with water, then sprinkle on about as much fine carborundum powder as will cover a 2BA cheese-head screw and on this place the crystal, marked side uppermost. Cover the crystal with the piece of hard rubber or cork cut to the same size as the crystal and half to a quarter of an inch thick; this will serve to keep the surface of the crystal pressed evenly against the stone.

Now, with a circular motion, proceed to grind the crystal face; press fairly hard but evenly, and rub for about 50 revolutions, assuming that the crystal was originally far removed in frequency from that which is desired.

Take the crystal out and drop it in a cup of clean warm water, rinse it round, wipe it very dry and placing it in the previously prepared crystal holder, tune for resonance in the usual way. Locate the heterodyne on the receiver and note how much the crystal has altered in frequency. This will serve as a good guide as to how much can be taken off the crystal for a given number of revolutions when grinding.

Carry on with the grinding, taking great care to keep the crystal on the stone all the time; do not let it overlap the edge or with the pressure you apply to the crystal it may fracture and become a total loss.

After another 50 revolutions or so, do exactly the same as before, washing and drying the crystal carefully, and trying it in the oscillator. If you find that the crystal has ceased to oscillate, do not be dismayed but take out the crystal and wash it once more, return it to the holder and try again. If this treatment fails, a very light rub on the stone, pressing lightly on the centre of the crystal with the forefinger, will often restore the crystal to its proper condition. This treatment has been tried quite successfully with old crystals which "tire" and refuse to oscillate.

From time to time the powder on the stone should be renewed and more water sprinkled on to keep the stone wet all the time. Do not remove the greyish sludge which forms on the stone as this will greatly assist the abrasive action.

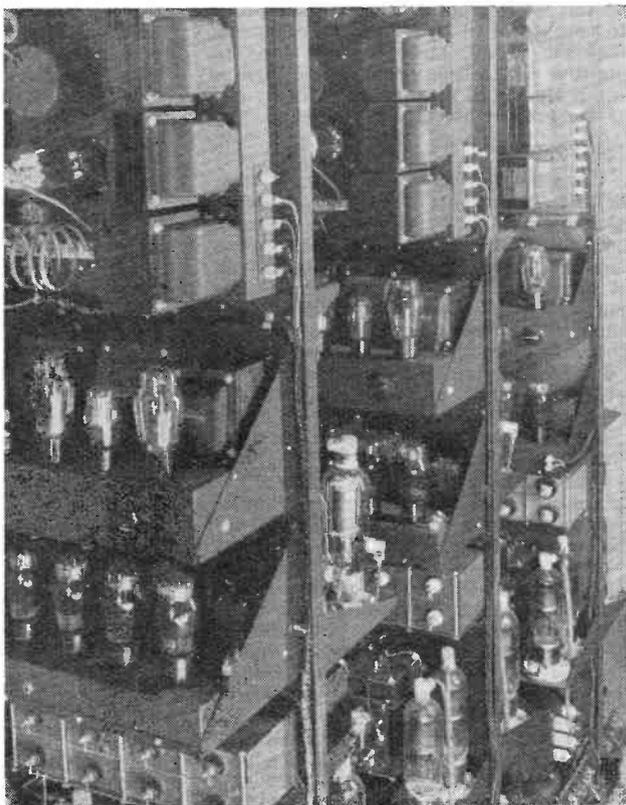
Approaching Frequency

When approaching somewhere near the desired frequency the checking should be done more often, and as it is desirable to have a polished surface, the pressure on the crystal should be reduced accordingly. It is during this period that the greatest patience will be required, since the process will not respond to hasty action if the best results are to be obtained.

The writer has successfully ground more than 30 crystals, using the methods described above, and of that number only two have been failures in the early attempts. Crystals have been successfully brought to within 100 cycles of the band edge. Incidentally, it

should be noted that some crystals tend to drift higher in frequency and some lower, depending upon their original characteristics, and the amateur is advised when grinding near the edge of the bands to check whether a crystal drifts up or down by placing a warm soldering iron near it when in the oscillator. The direction of the drift will be at once apparent on the heterodyne in the receiver.

One further point in connection with the crystals themselves: Often it may be found that some crystals grind easier than others and this fact should be borne in mind when grinding more than one crystal, as what might do for one may on another cause the experimenter to overshoot the frequency required. So always make those initial few revolutions on the stone to see how the crystal is going to respond.



Not, as you might suppose, a commercial speech amplifier system nor the main distribution frame of a GPO repeater station, but an edgewise view of three of VE3HC's transmitters, each complete for one band.

Why Not "G" Districts?

Suggesting Order in our Callsign System

By J. W. SWINNERTON (G2YS), Major, Royal Signals

(Practically every country in the world has adopted a rational plan in the allocation of amateur callsigns. Not so the British. Starting 'way back with the G2, G5 and G6 prefixes used indiscriminately, the two letters allotted were often suggestive of the owner's name or initials. This particular feature is a characteristic of many old-timer callsigns. The G3's, G4's and G8's were much later allocations, starting in the mid-1930's, followed by the three-letter G2's and G3's in the present post-war era. The net result is that beyond the G country designations, we have just no callsign system.—Ed.)

"G" DISTRICTS? Let me catch anyone trying to muck about with my call," was the abrupt reply which greeted my tentative suggestion at the local club meeting. No argument would bear fruit on this stony ground, but I hope to prove to you, if not to my "diehard" clubmate, that much can, and *must* be done to improve our callsign system while there is still a chance to produce some order out of the present haphazard allocation.

The "System"

Our callsign system, like so many other British institutions, has "just grown." The original call numbers were adequate until all combinations of two letters were used up. But with the enormous growth of licences and the advent of three-letter calls, the old business of "think of a number" has ceased to serve a useful purpose. This was clearly implied when GM, GW and the other G country designations were introduced by popular demand—obviously they give their owners a better chance of working DX than if they are "just another G."

Where has this typically British compromise led us? In the first place, many of our calls are too cumbersome. The cry today is all for slick operating and less QRM—how much do you help with a call like GC6NBG? If you are working portable or from an alternative location two more characters must be added. An "oblique stroke A" friend of mine calculates that in a recent week-end contest these two characters cost him in all 25 extra minutes of operating time!

Secondly, longer calls make identification more difficult, especially when you are QSB or QRM'd.

In the third place, we are losing a golden opportunity of helping our own experiments. The British Isles are not large when we consider the distance separating W1

from W7, but the very density of our amateur population creates the opportunity for study of comparatively "local" propagation, in which the five-metre man, the "freak conditions on ten" expert, and the 160-metre DX'er might be glad of a quick check on the location of stations heard. One feels too, that local conditions never before suspected might come to light if a call *zoning plan* were adopted.

Working It

To forestall the protests of the diehards it can be said at the outset that it might not be necessary for them to change their calls completely—perhaps only the number. Then if by chance G9BF has a G7BF in his district, the change of one callsign might be made by mutual consent, or, for example, by one adding a letter to the existing call.

This suggestion is bound to rouse the ire of those who consider their calls as theirs by right, instead of by courtesy of the GPO.

Briefly the plan is this—scrap the two-letter prefixes and divide the British Isles into numbered Districts conforming to the main groups of population. If the 234568 series is to be kept, it might be rearranged as follows:—

- G2—London and Southern England, South of a line approximately Ipswich-Bristol.
- G3—From North of G2 to a line approximately Chester-Hull, excluding Wales.
- G4—Wales.
- G5—From North of G3 to the Border.
- G6—Scotland.
- G8—Northern Ireland.

What of the Channel Islands? If no additional number is available the suggestion is that they remain GC2 (or become GF2) plus a two-letter call only. An alternative might be to allot them calls in the series G2E—if G2EC does not object!

Twenty-Metre DX Forecast

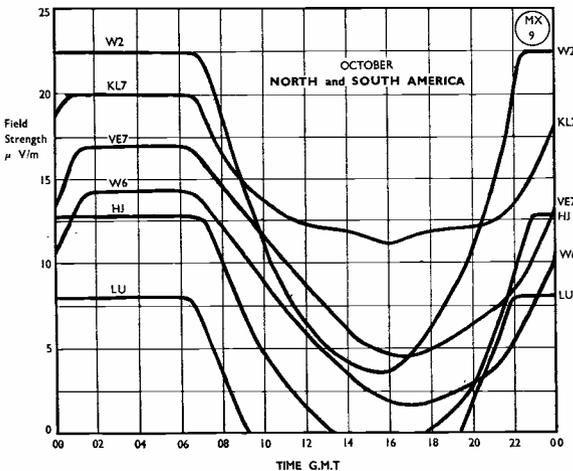
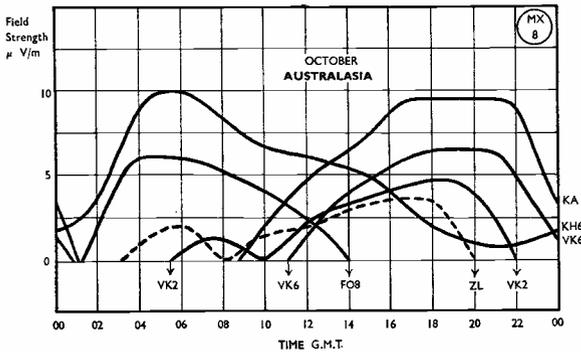
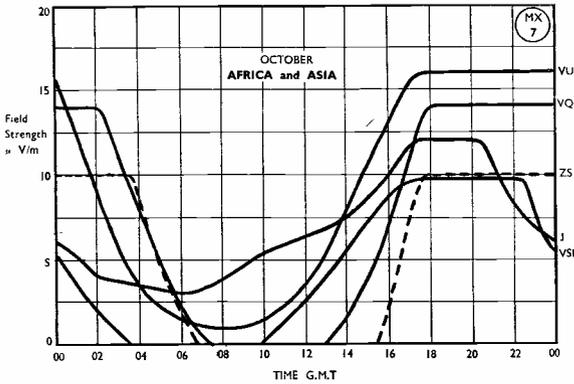
Predictions for October

By I. D. McDERMID,
A.R.T.C. (G3ANV)

COMPARISON between the October charts and those published previously shows that the signal areas in Easterly and Westerly directions are most affected by the monthly cycle at this time of the year. For example, it will be seen that whereas signals from ZS and LU have hardly altered in strength and time factor, those from the other extremes such as J and KL7 have been showing large alterations, and this month is no exception. North American signals have increased in strength still further, and VU is now shown to be completely above the zero strength line, together with changes in J and VS1. It might be noted here again that two curves have been made broken lines to avoid confusion with so many nearly parallel lines.

Many of the curves, particularly on the American chart, show a flat top; this means that the signal has reached its maximum theoretical strength; but do not lose sight of the fact that during winter-time, the band is usually dead for activity during the late hours of darkness, as mentioned in August.

A question has been raised about the time of day when local static in the various areas is at a maximum, which factor might hinder successful communication. Calculations indicate that with few exceptions, this period corresponds in the United Kingdom roughly with the period during which the areas concerned, *i.e.*, Equatorial areas, show their *minimum* field strength in the curves.



DX COMMENTARY

ON CALLS HEARD, WORKED & QSL'd

The general pace of DX seems to have increased somewhat since last month—not so much from an improvement in conditions as from the appearance on the bands of large numbers of new and interesting stations. In other words, the country-chasing half of the DX fraternity have had a good month of it, whereas the more stolid rag-chewing brigade have noticed little difference.

Pirates, spivs and other pests continue to pursue their nefarious practices, but on the whole things have not been too bad. The 14 mc band continues to provide surprises, chief of which has been its ability to stay open all day long—including what has until recently been the rather dull period during the earlier part of the afternoon. Tune round the band after lunch nowadays and the chances are that you will hear C1DK, C1JC, C6HH and C9JW all coming in, to say nothing of VS6, VS1, PK6 and other Far Eastern signals. In the early mornings it seems to run right through the range of DX from W6 to VK and ZL, sometimes tailing off (after the fading out of the latter) with a burst of signals from VR2, VR5, ZK and ZM.

We recently called a tentative CQ on a rather dead band and were quite amazed to hear VR2AR and ZM6AF both coming back on the same frequency! But we remain convinced that CQ's on a lively band are a waste of time—for G stations, at least.

WAZ and All That

The appearance of the top part of the list has not changed much; G2PL, however, has confessed to using 'phone in his spare moments, and accordingly emerges at the head of the "Phone Only" list. G8IL (Salisbury) has submitted cards for his all-time WAZ, and they do check beautifully. We still can't place the letters "WAZ" against him in the table, because CQ, who issue the WAZ Certificates, at present insist on all cards being sent to them for check purposes. We are, however, maintaining our scheme of awarding "40" to those who claim to have worked all 40 zones; CQ holds everyone at 39 until the cards have been submitted.

By L. H. THOMAS, M.B.E. (G6QB)

They have awarded three post-war WAZ certificates over there—to W2BXA, W6VFR and W6OMC. The first British station to make a post-war WAZ will be the first of our "40" men to submit all his cards to CQ, having sent them to us for checking *beforehand* (see this space p. 350, August issue). All the same, we are very glad to know that we have acquired this all-time WAZ in the shape of G8IL, even though we can't give him full credit as yet.

VFO's

There are two sides to every question, and we welcome a letter from G5LP (Wellingborough), who speaks up for the VFO. He says, "Surely you remember the old days when everybody who wanted to work DX had to get a crystal within 5 kc of the band edge. Don't you remember the tremendous mass of stations that used to crowd the edges, all trying to get nearer than the other bloke? I do, and I also remember the deserted portions of the band as a consequence. One thing that VFO working has done is to spread the stations out, especially on 14 mc. There is nothing fundamentally wrong in calling a station on his own frequency—it saves time searching and you know where to look." And we must quote another thought from the same letter, because we couldn't agree more: "I am not a rabid DX worker—all this wonderful stuff was done nearly twenty years ago by you and me and lots of others. I still get a thrill out of a DX contact, but I am not prepared to stand in a queue for goodness knows how long, just for an exchange of reports with a station whose operator is sometimes a striking example of bad operating but who, because of his location, is able to dictate just who he is going to contact. No, Sir, not me—you can have 'em every time."

We quite agree about the VFO business, and we *would* like to make it quite clear that we don't apply the term "Spiv" to anyone with a VFO who calls on the DX station's frequency, but only to those who



Another old-timer rig—G5VS, of Southend-on-Sea, Essex. The *Wireless World* of April, 1931, described this as the photograph of an "unusually ambitious amateur radio installation." The CC Tx ran DESB-LSSB-LSSB-P650 and the Rx was an 0-V-1.

swish round the band with the power on, call in the middle of a QSO, remain on the DX station's frequency and call CQ after a QSO, and use all those other endearing tricks that we know so well. A VFO used with common sense and regard for the feelings of others is no trouble to anyone. We heard a prime example of "how not to" very recently. A ZK station called CQ; a G replied at great length dead on his frequency. By the time the G had signed, the ZK—unknown to the G, of course—had come back to a snappy call from someone else, given his report and was listening once more. So our G, hearing nothing, promptly started off all over again! During his next long transmission, the ZK had finished his quick QSO, sent QRZ? and was all set to work someone else. Actually we thought all this very funny, but one realises that others sitting on that frequency were probably getting hot under the collar. (Yes, we *did* send a QSL to the G, telling him exactly what happened; and if a few others would spare a 2d. stamp occasion-

ally we feel that we could clean up some of this sort of stuff. Be polite, though!)

G2AJ (London, N.W.4) has now acquired his 40th Zone, and has also had his DXCC confirmed. New ones for him include ZK1AB, AR8AB, KV4AB, KS4AF and G5UB/FO8 (Tahiti). His list of routine DX is too long to mention, but seems to include everything. 'AJ makes some uncomplimentary remarks about the spivs, and adds that some of them are perfect gentlemen when they haven't got a VFO knob in their hands! (We've found that, too; VFO-knobs and fast cars transform the most charming people into teeth-gnashing demons on occasions.)

G5ZT (Plymouth) sends a list of 28 mc DX (all 'phone) that is a startling tribute to the excellence of that band, even in the summer. Most numerous are VK's and ZL's and VU's, but there is a good collection of stations like AR8, CR9, CE, VQ2, VQ4, VQ5, VS9, PK1, ZD4 and so on. Who says 28 mc goes dead in the summer?

G2FXW (Manchester) queries three "funny ones"—YO5J, SK1EU and

VN3VA—all worked on 14 mc. And others heard include W9CYH/W2/J, ML3AA, VS8AU and UVØKA/SM. We hand the lot to our curio department!

G6PJ (Sheffield) has joined the ranks of Window-fanciers, having erected a 33-foot sloping wire fed VS1AA-fashion (*i.e.* with the tap one-third from the end and the feeder of thinner wire). It has certainly

WORKED ALL ZONES LISTING

Maximum Possible 40

Total Prefixes 220

Station	Post-war		All-time	
	Zones	Countries	Zones	Countries
'Phone and CW				
G6ZO	40	176	40	183
G2PL	40	173	40	189
G5DQ	40	151	?	?
G2WW	40	143	40	143
G6QB	40	142	40	164
G5YV	40	141	40	152
G2AJ	40	135	40	135
G5BJ	40	126	40	159
G5VU	40	124	40	139
G3DO	39	134	39	146
G3FJ	39	132	39	135
G2CDI	39	132	39	132
D2KW	39	131	39	131
G5RV	39	126	?	?
G5WM	39	120	39	120
G3QD	39	114	39	114
G3AAM	39	109	39	109
G8IL	38	123	40	146
G2VD	38	122	38	129
G8RL	38	115	38	132
ON4JW	38	110	?	?
G3ZI	38	107	38	115
G5CI	37	113	37	114
G3TK	37	109	37	111
G4AR	37	108	37	108
G4CF	36	101	37	110
G6PJ	36	69	36	117
G2CNN	35	109	35	109
G5LP	35	96	?	?
G5MR	35	84	36	96
G3BDQ	35	74	35	74
MD5AK	35	?	?	?
G8QX	34	99	34	99
G2AO	34	84	38	116
GW4CX	34	84	34	84
G8RC	34	72	34	72
J4AAK	34	66	34	66
G8KU	33	91	33	96
G8IP	33	88	36	103
G2LC	33	85	38	104
G3AAE	33	82	33	82
G8VR	32	85	33	95
G5OQ	31	78	33	104
G6BB	31	70	32	84
G6XX	30	80	31	87
G2VV	30	74	32	91
G5HH	30	67	38	107
G3AGN	30	63	30	63
'Phone only				
G2PL	36	113	36	118
G3DO	36	106	36	116
G6WX	36	102	37	118
G3FJ	35	109	35	111
GM2UU	35	97	36	118

brought him luck—or results—for his list of August and September DX is most striking! The bottom end of this rather amazing aerial is only six feet from the ground—in a northerly direction. 'PJ has worked G5UB/P, who was ship-board near Tahiti at the time, bound for N.Z. G5UB was on 14100 and wants G's to look for him daily.

G3BFC (Ferndown) would like to know whether HZ2BY was genuine or a phoney. He and G3AAE both worked him, but no cards have turned up. G4CL (Shipley) has had a report on his signals from the Carabella Listeners' League in Sydney; the said listeners have got a new slant on things by holding a QRP receiving contest! They are using receivers with one valve—a 1Q5GT—and 45 volts on the anode. Nice kind of report to have—from one of those midgets.

G3AKZ (Cheltenham), with one or two others, points out that Swan Island, as well as appearing on the Zone Map in Zone 5 instead of Zone 8, is given the prefix KD4 instead of KS4. This mistake has persisted since CQ first published the List of Contents, so to speak. It is now generally accepted that Swan Island (KS4) is in Zone 8*. So far as we can find out, the "other" Swan Island (said to be near Bermuda) just doesn't exist.

G2AIS (Loudwater) sent a nice list of DX which just missed last month's issue. Interesting points were that he worked G2BMJ/VS7 (aboard H.M.S. *Glasgow* in Trincomalee), and that ZS1T has reported hearing G2CDI on the air from VP6MR.

3.5 mc Interlude

If you admit that DX is a relative term, you must agree that the feat of working every country you can hear on a band is at least *some* sort of DX achievement. G4QK (South Croydon) has done just this on 3.5 mc—17 countries heard, 17 worked, since June 23. The best so far is OH, but 'OK is patiently waiting until the W's arrive again, so that he can try his 9 watts on them. (Incidentally, we received a long list of W Calls Heard from a 3.5 mc listener quite recently—all between 0300 and 0500.) G4QK also pleads for standardisation on a few small points: "73" means "best regards," so *don't* say or write "Best 73's"; try writing the month on USA QSL's instead of using the number, as we put the day and month "wrong

(* September QST gives Swan Island as 2 miles long by $\frac{1}{2}$ mile wide, location 17° 24' N, 83° 56' W, 90 miles from Grand Cayman. The station is KSAAE and is a community affair running 800 watts.—Ed.)



W2IXY, Springfield, Long Island, has a cup of coffee with her QSO. She runs the full kilowatt and has a very fine outfit. An article by W2IXY on her European visit appears in the current issue of our *Short Wave Listener*

way round" for them; and how about keeping logs and filling up QSL's with GMT for the time?

The 3.5 mc band, as a matter of fact, shows signs of being good this coming autumn and winter, although unscrupulous 'phone merchants show little regard for the rights of the CW fraternity to some space at the LF end. But, in our opinion you hear better notes and better operating on 3.5 than anywhere else—and not by any means entirely confined to FOC members.

More 14 mc DX

G2PL (Wallington) has added to his score with J9SIR (Marshalls), AR1YL, ZD3B and ZM6AF. 'PL asks how many of the "MD" series count as separate countries—a rather thorny one. We are of the opinion that MD5 (Suez Canal Zone) should count as separate from Egypt; but MD1 and 2 are the same as the old LI, MD6 the same as YI, and so on. He also brings up the question of some of these ZS4 stations. Certain Americans are known to be counting them as a separate country, which is all wrong unless

they are genuinely in the Bechuanaland Protectorate (which, so far as we know, none of them are). All those we have heard, worked or seen cards from are in British Bechuanaland, which is part of the Union of South Africa.

New ones for G6ZO (Totteridge) are J9SIR, ZM6AF, EA8AR (no details), ZD3B, VU2RW (Pakistan) and HV1AC. Other DX includes PK6FS, 6EE, 6TO and 6WS; ZD1WB (QTH in list), CP1AL, VP8AI, ZS3G and TA3SO. The latter is now authorised and uses 1 kW; his U.S.A. address appears in the list.

G6BB (Streatham) is rebuilding and will eventually be "QRO" with 807's in push-pull. He has been working VE7, VR6AA, UAØKAA, KL7's and lots of W6's much as usual; he continues the "early bird" technique but can't do much in the evenings.

G8NY (London, N.8) has replaced his rotary 14 mc dipole with a two-driven-element electrically-rotated beam. This comprises two folded dipoles of 1 in. dural, and we are hoping that he will be describing it in detail. Before completing the rotating mechanism, he tried it out

in a fixed position, and his list of DX worked in three days fairly makes one's tongue hang out—and most reports were S9 or better!

G3TK (Leigh) has been stirring up the DX with VP4TL, VS7DR, VK7NC, VS9AF, PK5LK, J9SIR (believed first G QSO), OA4U, W2WMV/C9 and quite a load of other good stuff. G2WW (Penzance) has also been knocking them off, and made a two-hour WAC on 14 mc in August. He is another one who is now "QRO" with parallel 807's in the final

instead of a single one (look at his position in the WAZ List and ask whether QRO is worth the trouble!) His Zone 19 card from UAØKQA has arrived, so he only awaits KH6, KL7 and OX or TF for a post-war WAZ. 'WW has a card inscribed "One of the Pirates of Penzance," but he remarks that Gilbert and Sullivan are so well known that it has never yet been misunderstood!

GM2UU (Stranraer) hopes to add more countries to his score in the 'Phone Only list now that 28 mc is wide open again. He has worked 118 and has 107 cards—a marvellous proportion which seems to indicate that 'phone pays for QSL's. On the subject of VFO's he remarks, "When J9CRP comes on, the howls and squeaks swoop down like vultures from all over the band, and from then on behave as expected." And, we presume, he doesn't expect much. Our friend Arabackle Oblifork has now signed the pledge (crystal only in future) and is thinking up something really nasty in the way of epithets for swoopers.

G5MR (Bognor Regis) is climbing the ladder rapidly, and has recently added FM8AD, ZS3D, VP8AD, ZD3B, FQ3AT and other useful ones. An unusual one was LF2Z, near Oslo. The "LF" prefix, he says, is allotted to radio manufacturers, who are given a special licence and allowed to use the amateur bands. 'MR asks us to give vent to a grouse about the increasing number of people who "CQ" about ten times or more, add "DX" once or twice and multiply the whole thing by three or even more. The good old "three-times-three" is quite long enough these days—why clutter up the air by dragging it out? After all, *you* (the gentleman with the long CQ) suffer from QRM as much as anyone else—and it's the likes of you who cause it.

G3DO (Sutton Coldfield) has now moved to the house next door, where he has more room for aerials and has already erected a 14 mc rotary. His total, hitherto, of 39Z and 133C has all been worked on a 33-foot Zepp, so watch 'DO when that beam starts swinging. He will also have a 28-mc rotary and a 132-foot Zepp. G3DO has received cards from UAØKQA, FQ3AT, K6ETF/KC6 and ZK1AB—so cheer up, some of you patient waiters!

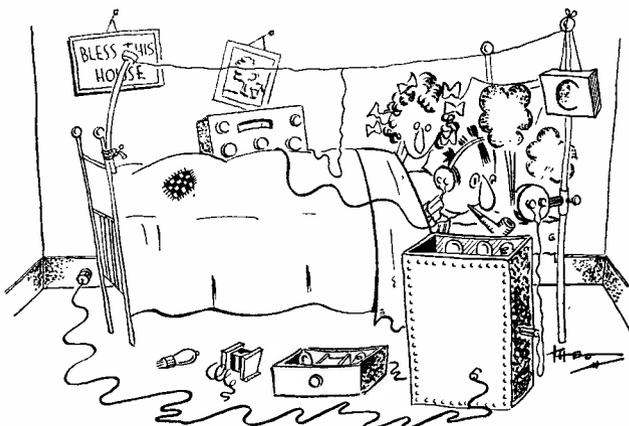
G3AAE (Bournemouth) remarks on the odd times at which some of the DX has been coming in; for instance VE8AW at 2200, and W7's in Nevada and Idaho at about the same period. His best DX

DX QTH'S

FM8AD	E. Midas, Lycée Schoelcher, Fort de France, Martinique.
J2AJA	APO 226, c/o PM, San Francisco, Calif.
J9CRP	Box 18, Navy 824, FPO, San Francisco, Calif. (<i>Station on Marshall Islands.</i>)
LF2K	via NRRL, Post Box 898, Oslo.
MD1A	c/o Wireless Troop, Cyrenaica Signals Regt., Benghazi, MELF.
MD2A	P. Joubert, Albergo del Mehari, Tripoli, Libya.
MD2C	c/o BOAC, Tripoli, Libya.
MD5HJ	RAF Spinney Wood, Ismailia, Egypt, MELF.
OQ5BR	Box 400, Leopoldville, Belgian Congo.
OX3BC	QSL to 68 New Street, Aabenraa, Denmark.
PK6FS	Box 190, Batavia, Java, N.E.I.
PY7QG	Box 4353, Rio de Janeiro.
ST2MP	c/o Posts and Telegraphs, Anglo-Egyptian Sudan.
TA1ZLF	Alashir Nemu 13, Ankara, Turkey.
TA3SO	QSL to WØSO, c/o TWA, Kansas City, Kansas.
TG9JK	J. W. Knoth, Box 118, Guatemala City.
VP4TU	APO 869, c/o PM, Miami, Fla.
VQ2WR	Box 121, Luanshya, N. Rhodesia.
VR2AR	RNZAF, Waucala Bay, Suva, Fiji.
VS1AC	G. R. A. Wright, c/o British Far Eastern Broadcasting Service, PO Box 434, Singapore.
VU2DY	G. S. Danbice, Tekdi Road, Nagpur, Central Provinces, India.
XZ2HP	S/L H. Pain (<i>ex-ZB2A</i>), Officers' Mess, RAF Mingaladon, Burma
ZC6RG	RAF Aqir, British Forces in Palestine.
ZD1WB	Post Office, Waterloo Airport, Freetown, Sierra Leone.
ZD2KC	G. F. Keene, Posts and Telegraphs, Lagos, Nigeria.
ZM6AF	Box 90, Apia, Samoa.

recently has been ZK1AB, PK5LK, KA6FA, KL7LM, ZD2KC, HP4Q, VS6AA and a few more—all *without* a VFO. Five crystals and a Zepp have done this, with 75 watts input.

More for the curio department: G2DDM (Romiley) asks which of these are genuine—SUIARM, HZ2TG, SHF1, FB3AC, FT4AN, OY7NL, D5FF and FSBG. We back SHF1, FT4AN and possibly FB3AC, but put the others away in a drawer.



It's this smoking in bed that gets me down, Nigel . . .

News from Overseas

If you hear G8XY/VO or G8XY/P, it is the call-sign of the Public Schools Exploring Society's Expedition to Newfoundland. They will be on the air until about October 15, using 40 watts on a variety of frequencies in the 3.5, 7 and 14 mc bands. The main frequencies are 3520, 3597, 7050 and 14100. One aerial system will be directed towards the U.K. for 14 mc working. A special card will be used to confirm all contacts, and QSL's for G8XY should be sent to White Barn, Old Oxted, Surrey. *N.B.* VFO's keep off! G8XY/VO will *not* work anyone within 5 kc of his own frequency.

XZ2HP (Mingaladon) has accumulated a lot of cards for stations formerly out there, who have gone without leaving behind their new QTH. So he would like to hear from VU2PB (ex Port Blair, Andaman Islands), XZ2AN and VS7RR. If they will drop a line to XZ2HP (full QTH in list this month) they will hear of something to their advantage!

W6OJW (Dixon, Calif.) suggests that some of the lesser-known DX fraternity might tack their zone number on to their calls now and then, and he would also like to see this number displayed on QSL cards. As far as some of the Russian stations are concerned, we heartily agree; as a matter of fact, UAØKQA's card has "Zone 19" prominently on it, and he used to tell people in QSO that he was in that zone.

J4AAK (Miho, Japan) says that all J4 call-signs have three letters, and all begin with "AA" at present, the only exception

being J4WWP. All others are pirates—certain Europeans suspected! G. R. A. Wright, who was G2YD before the war, is now on the air as VS1AC on 14 mc. He wants G contacts and his QTH is in the list; the details come from G2NH (New Malden).

ST2MP (see list) is on 28205 kc 'phone daily and also wants to work G's. Our old friend Harold Owen, ZD4AM of Tafo, Gold Coast, is now active (we've heard him), although he can only use 18 or 20 watts and suffers from bad mains regulation. Look out for him round the low end of 14 mc.

G3CDR (Sheerness) is expecting to be on the air from VS6 before very long, and will spend his time looking for G's. He has been logging nice DX on 7 mc in the early mornings from Sheerness, which may well entice him on to that band from VS6, which would be very interesting.

Incidentally, we would welcome more news from overseas readers on their DX activities. Our WAZ list is not confined to G's!

DX Marathon for 1948

CQ is running a DX Marathon, on a Zonal basis, for the whole year commencing on January 1, 1948, and asks us to pass this on to the British DX fraternity. The contest will be world-wide and the top scoring station in each Zone will be given an award. There will be two classifications—"CW and 'Phone," and "'Phone Only." Claims for Zones and Countries worked must be sent in each month, and an Honour Roll will be pub-

lished in *CQ*. As things stand at present, claims must go in to *CQ*, but we are discussing with them the practicability of G claims being vetted by us so as to save time and labour. In any event, we shall publish a list showing the British and European scores month by month. More of this later; this is advance warning, just to remind you that you'll have to work those difficult zones all over again if you want some good sport in 1948!

Stop Press

G2VV (Hampton) is now on 3.5 mc and says exactly what we said about the band earlier on . . . G5WC (London, S.E.19) comments on the terrific number of Empire stations to be heard nowadays. *A propos* our remark last month, he says he has heard UF6AB, so there's a new one waiting for somebody. . . . G3BDQ (Hastings) has worked another stack of DX on his "curly Windom" but is just

pulling the big switch for some months. . . G3CEI (abroad S.S. *Chrysanthemum*) has been listening to G's at Newark, N.J., and sends a list of Calls Heard; he says it's no fun through the W QRM. . . . MD5AK (Suez Canal Zone) has been working KL7, J9, J2 and UAØ with an input of 7 watts to an EF50! He remarks that 247 G QSO's have only produced 27 cards. . . . G5LP (Wellingborough) has worked TA1ZLF on 7 mc, who gave a full address. G5LP also worked OX3BG in Greenland on 7 mc.

Next month's deadline for correspondence, WAZ claims and all that intended for this column is first post October 16. Please note that to keep your call in the WAZ list you must report at least once in three months. Those who have not been heard of for the last three months have been temporarily struck out this time.

So Good Hunting for October—and tell us all about it. 73.

CALLS HEARD

Please arrange all logs strictly in the form given here, in numerical and alphabetical order and on separate sheets under appropriate headings, with call sign and address on each sheet.

14 mc

G3CEI, s.s. *Chrysanthemum*, Newark, N.J.

CW: G2BQC (55), 2DVD (55), 2FDF (56), 3AGF (55), 3BLG (55), 3BUU (55), 4GI (55), 4KI (57), 5DQ (57), 6IC (56), 6KP (56), 8GP (45), 8SI (56), 8QW (46), 8QZ (55).

***Phone:** G5YO (55), 6XP (56), GMBMN (56/8). (1820-2100 GMT September 10; Rx: 1-V-1: RS in brackets.)

FIVE METRES

SWL, Stuttgart-S, Christophstr. 27, Germany.

G2AVV, 2BJY, 2BMZ, 2DCY, 2FBU, 2GU, 2NH, 2XC, 2YL, 3BW, 3BY, 3DA, 3TN, 3YH, 5BD, 5BY, 5MA, 5MQ, 5PY, 5RF, 5WP, 5ZT, 6LC, 6LK, 6MN/A, 6NB, 6XM, 8JO, 8LY, 6M3OL, 6WL, GWSUO, ZB1AB, 1E.

G2KF, Havencroft, Edenbridge, Kent.

Worked: F8QL, G2AJ/P, 2BJW/P, 2WS/P, 3BWS/P, 3CQ/P, 3CU, 4NT/P, 5SD, 5VB, 6KB, 6LX/P, 6NB/P, 6NF. (Month ending September 15.)

G3ABA, 41 Manor Road, Rugby, Works.

Worked: F8SM, G2ADZ, 2AK/P, 2AOK/P, 2ATK/P, 2BJY/P, 2CKR/P, 2MR, 2OI, 2RI, 2XC, 3APY/P, 3HW/P, 3MY/P, 3PZ/P, 3WD, 4AP/P, 5BY, 5JU/P, 5LO, 5MQ, 5RP/P, 5VM, 6HB/P, 6HY, 6MN/A, 6VD, 6XM, 8WL, GW4LU/P.

Heard: G2HQ/P, 4OS/P, 5BM/P, 5MA/P, 5RS, 6NB/P, 8BP. (All on September 7, 1000-1800 BST, when portable at Honey Hill, Welford, Northants.)

G4RO, 7 Blakemore Road, Welwyn Garden City, Herts.

Worked: G2CIW, 2FKZ, 2MR, 2NH, 3CQ/P, 3FD, 3NR, 4KD, 4NT/P, 5AS, 5MA, 5VB, 6LK, 6LL, 6NB/P, 6UH, 6VC, 8KZ, 8NV/P, 8SK, 8SK/P, 8WV.

Heard: G2AJ, 2KF, 2MV, 2XC, 3AAT, 3BLP, 3BXE, 3IS, 4DN, 4IG, 5BD, 5JU, 5PY, 5RD, 5UM, 6DH, 6JI, 6JJ, 6KB, 6YX, 6XM, 8GX, 8QX, 8SM, ON4DJ, 5G. (August 17-September 15.)

G4IG, 49 Woodbastwick Road, New Beckenham, Kent.

Worked: G2ATK (110), 2BMZ (165), 2RI (100), 2TK (205), 2XC (68), 3ABA (90), 3AAT (68), 3BXE

(50), 4AP (80), 5JU (110), 5MQ (190), 6OS (160), 8QM/A (75), 8UZ (135), 8WL (90), ON4DJ, 4IF,

Heard: F8NW, 8ZF, G2AOK, 2IQ, 4LU, 5BY, 11AY, ON5G, PAØPN. (All during August; distances in brackets.)

G6OH, Farthings, Earleydene, Sunninghill, Ascot, Berks.

G2ADZ, 2BMZ, 2BK, 2IQ, 2TK, 3BK, 3HW/P, 3APY/P, 3BY, 3YH, 5JU/P, 5LO, 5MQ, 5SD, 6OS, 6XJ, 8QM/A, 8UZ, ON4IF. (Heard or worked, month ending September 15.)

SWL, 18 Allderidge Avenue, Hull
G6HY, 6YQ, 8FW, 8QM/A, 8SH, ON4DI, PAØPN (August 29-31), G2ADZ, 2AJ/P, 2AK/P, 2ATK/P, 3PZ/P, 4OS/P, 5LJ, 5PI/P, 5RP/P, 8JV. (September 7.)

G2XC, 34 London Road, Widley, Portsmouth.

G2ADZ (160), 2AK (130), 2AK/P (130), 2ATK (120), 2IQ (180), 2RI (130), 2TK (240), 3ABA/P (110), 3APY/P (160), 3BK (130), 3BXE (110), 3BY (190), 4LU (160), 5IG (105), 5IU (120), 5MQ (190), 6CW (145), 6DH (115), 6YU (110), 8JV (145), 8KL (130), 8QM/A (115), 8UZ (160). (All over 100 miles, heard or worked August 22-September 13.)

G2ADZ, Lloft Wen, Ardmillan Lane Oswestry, Salop.

Worked: G2AK/P, 2ATK, 2ATK/P, 2BJY, 2BJY/P, 3ABA/P, 3BY, 3BY/P, 3DA, 3IS, 3MY/P, 3PZ, 3PZ/A, 3PZ/P, 4AP/P, 5BM/P, 5JU, 6HY, 6LC, 6YU, 8KL, 8SH, 8UZ. (Over 50 miles distant.)

FIRST CLASS OPERATORS' CLUB

PRESIDENT : GERALD MARCUSE, G2NM

HON. SECRETARY : CAPT. A. M. H. FERGUS, G2ZC

With another 18 new members since the appearance of last month's notes, the total active post-war membership of the F.O.C. now exceeds the pre-war figure of some 70 members. Several of the new entrants are from overseas, denoting the spreading interest in the ideals and standards of the Club.

All matters affecting the well-being and management of the F.O.C. are discussed with the members collectively through the secretary's periodical Circular Letters, as it is thought that this gives them a more direct interest in the Club's affairs.

Contests

The marathon, mentioned in these notes in the August issue of the *Short Wave Magazine*, will have started by the time this appears. Members will have to QSO 66 stations to reach the qualifying figure of 95 per cent. of the Club membership worked. As this contest is for members only, other operators will understand it if the F.O.C. is busy with its own business for the next few weeks!

However, as announced on p. 359 of the August issue, another F.O.C. contest, open to all comers, commences on November 1; non-F.O.C. operators who would like to take part with the Club in a QSO party calling primarily for snappy operating are asked to read the rules in that issue and join in.

The SWL aspect of this contest was

mentioned on p. 275 of our *Short Wave Listener* for August; a reminder, notifying a slight change in the rules for the SWL section, will appear in the November issue of that journal.

Election Notice

In accordance with the Rules of the Club, the following have been elected to active membership of the F.O.C.:

T. F. Herdson, G6ZN (Horbury); W. N. Craig, G6JJ (Hillingdon, Middx.); G. H. Billison, G6GB (Hampton, Middx.); E. Larsen, LA3VA (Kristiansand, Norway); E. A. Heaton, G4IF (Fareham, Hants.); J. R. Perry, G2FTU (Warsop, Notts.); J. E. Catt, G5PS (Kings Langley); H. O. Sills, G8QZ (Long Eaton, Notts.); L. H. Thomas, G6QB (Bexhill); R. W. Rogers, G6YR (Southport); H. A. Savage, G2SA (Burnham-on-Crouch); L. P. G. Wormer, OZ1W (Odense, Denmark); E. Huber, HB9AG (Zurich, Switzerland); R. Holden, G15HU (Belfast); C. J. Morris, G3ABG (Cannock, Staffs.); Sub/Lt. E. Ludwig, PAØLU (Volkel, Holland); D. P. Urquhart, G4DR (Thurnby, Leics.); F. C. Dickinson, G3AJO (Cheltenham).

Applications for membership and all correspondence regarding the F.O.C. should be addressed to the Honorary Secretary, Capt. A. M. H. Fergus, G2ZC, 89 West Street, Farnham, Surrey. (Tel: *Farnham Surrey* 6067).

Worked: G2AJ, 2AJ/P, 2MR, 2NH, 2XC, 3BLP, 3BXE, 5BY, 5MA, 5MA/P, 5PI/P, 5PY, 5RP, 6OH, 6VX, 6XM, 8GX, 8NV/P, 8SM. (Over 150 miles.) (All worked August 20-September 14.)

G3YH, 24 Hall Street, Bristol, 3.

Worked: G2XC, 3PZ/P, 4AP, 4AP/P, 5BM/P, 5MA, 5RP, 5RP/P, 5XV, OK2MV.

Heard: G2BJW/P, 2MR, 2NH, 2ZG, 3ABA/P, 3BLP, 3BWS/P, 3BXE, 3MA, 4NT/P, 5BY, 6NB/P, 6VX, 8KZ, 8SM, IIDA, HB9CD, SM5KD.

G8KL, 3 Broome Road, Wolverhampton, Staffs.

G2ADZ, 2AJ, 2AJ/P, 2AK, 2AK/P, 2ATK, 2ATK/P, 2BJY, 2BJY/P, 2FKZ, 2MC, 2MR, 2NH, 2OI, 2XC, 3ABA, 3ABA/P, 3ABP, 3APY/P, 3ASC, 3BLP, 3BXE, 3IS, 3NR, 3PZ, 3PZ/A, 3PZ/P, 3WD,

4LU, 4OS/P, 5BM, 5LJ, 5JU, 5JU/P, 5MA, 5MQ, 5PY, 5RS, 6CW/P, 6KB, 6LK, 6OH, 6SQ, 6VX, 6XM, 8JV, 8QX, 8QX/P, 8SM, 8WL, G4WLU/P, SM5FS. (Heard or worked, two months to September 11.)

G2CIW, 23 Tower Hill, Brentwood, Essex.

Worked: G2AJ, 2BJW/P, 2FKZ, 2FZR, 2JU, 2KF, 2MC, 2MR, 3BK, 3BTC, 3BWS, 3BXE, 3CO/P, 4IG, 5JU, 5MA, 5PI/P, 5PY, 5RS, 5SD, 5VB, 6GR, 6JJ, 6LX/P, 6LL, 6MN/A, 6OH, 6UH, 6VC, 6VX, 6XM, 8QM/A, 8RC, 8SK, 8SM.

Heard: F8ZF G2IO, 2KG, 2MV, 2NH, 2OY, 2XC, 2YL, 3AAT, 3BLP, 3FD, 3NR, 3PZ/A, 3WS, 4DN, 4GD, 4KD, 4RO, 5BD, 5MQ, 5RD, 5UM, 5WP, 6DH, 6NB/P, 6NF, 6YU, 8GX, 8KZ, 8WL, 8WV, ON4IF. (August 15-September 13.)

G4LU, Avalon, Pant, Oswestry, Salop.

Worked: G2ADZ, 2AK/P, 2ATK/P, 2BJY/P, 2CKR/P, 2HO, 2OI, 3ABA/P, 3AHX, 3APF, 3APY/P, 3ASC, 3BY/P, 3DA, 3MY/P, 3PZ/P, 4AP/P, 4OS/P, 5BM/P, 5BY, 5JU/P, 5LJ, 5MQ, 6HY, 6LC, 6TL, 8BP, 8KL, 8UB.

Heard: G2AOK/A, 2XC, 3WD, 4NT/P, 5VM, 6XM, 8WL. (All for G4WLU/P on September 7, at *Lechrydau, Denbighshire*.)

HB9CD, Neumuhlequal 6, Zurich 1, Switzerland.

G3BW, 4MH, 5BY, 5MQ, 5XV, 6LC, 6LK, 6LU, 6MN, 6NB, 6XC (C), 6XM, 8KK, SM5AI, 5SI.

Thoughts From VK

DX Comment, And a Useful Radiator

By D. B. KNOCK (VK2NO)

SEEN from the early-morning Australian viewpoint, the 14 mc band is fairly lively these days, with G's holding the fort in good style. Many entirely satisfactory QSO's can be obtained, both on CW and 'phone, but there are certain pointers that quickly indicate whether or not the "session" is going to be worth it. First, the 'phone signal from G6XR. If, down here, we only hear his signal on the weak side (seldom the case of course) the conclusion is that it won't be much use calling "CQ G" on 'phone, because all other G stations will be weak in comparison. The possible exception is G8PO, who seems to run 6XR pretty close in S readings. Then there is that exasperating condition, not immediately apparent at this end, when G's are romping in solidly, but call after call from here goes apparently unheeded. Finally a hook-up brings the explanation. . . . "short skip" the D's, ON's, OZ's, PA's and whatnot are full strength across in G-land, and a VK has a tough time to get through a chink in the curtain of strong signals.

Then, of course, there are the mornings (your nights) when the W's show up in force at your end, and again the competition seems too solid for comfort here. With such obstacles to hurdle from the 'phone viewpoint, my own reaction is immediate—over to another crystal to put me between 14 and 14150 kc and on to the good old key. It has seldom failed to produce results, and one feels that those VK's who are solely 'phone exponents don't know what they are missing by having virtually "thrown away their keys." It is amazing how old pre-war G friends show up out of the blue on CW, much more so than on 'phone. The liking for brass-pounding dies hard with the Old Timer.

And talking of that—here in VK a new Departmental ruling abolishes the probationary period, whereby a new licensee was obliged to use CW only for 6 months, and to produce proof of a certain number of QSO's before being permitted to use telephony. My guess is that a time will come when that decision will be regretted.

If a shindig ever occurs again, there won't be the imagined pool of *proficient* operators on hand to fill Service needs at short notice. It will be the old story—the tortuous 3 months of hammer-and-tongs Morse Code class training and a harassed look on the faces of instructors. I feel that in a few years' time CW will be in far less proportion to 'phone. . . . Oh well. . . . it's an ill wind. . . . maybe the CW man will have less QRM in *his* part of the bands maybe!

Aerials at VK2NO

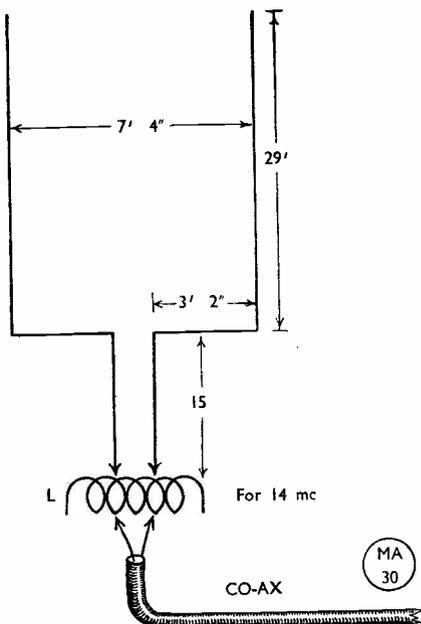
The QTH at VK2NO is but the average suburban garden lay-out, and space is not too generous—nevertheless I have managed in 120 by 60 feet (including the house) to get in quite a few aerials. What happens to the radiation patterns is the thing I suspect. There must be *some* interaction! With 6 poles at odd points (one in the next door neighbour's garden), there are in the sky the following: A 134-foot end-fed wire for general use on 3.5 mc and points higher; a 66-foot centrefed 7 mc dipole; a special single section 14 mc 8JK for work with G's; a twisted-pair dipole for casual contact with W's on 14 mc; a quarter-wave earth potential ground plane system for 50 mc; and also a 3-element horizontal rotary as a DX alternative for that band, with a small vertical Sterba rotary curtain for 166 mc. The birds have to watch where they fly around this location. . . . and the neighbours. . . . well, they have been used to this kind of scene for two decades now.

Every conceivable form of radiator has been tried at some time or other for various purposes, HF and VHF. Although the QTH may be considered a good one from the jump-off viewpoint, strangely enough it has always been a difficult matter to evolve a really consistent system for 14 mc work with Europe, (not considering a one-band rotary). The new 8JK type is by far the most satisfactory yet tried, and details may be of interest to those similarly placed. A span of 30 feet and placement of two poles in the right direction is all that is needed to get going.

The 14 mc Pitchfork

The sketch shows the type used and it will be seen that it is the usual "pitchfork" affair for bi-directional work, used horizontally, but with inductive coupling for an efficient match between stub and coaxial feed-line. The strong signal that most G's report is due to this aerial, placed an average of 30 feet above sandy soil. The dimensions given are for the 14 mc band, and flexibility over the band depends upon adjustment in the first place of the inductance at the end of the stub. If you work to the dimensions given, and use for L, 8 turns of $\frac{1}{2}$ -in. copper tube 2 in. in diameter, the system can be resonated where you want it in the 14 mc band. The coil is arranged on a strip of good insulation material (perspex will do nicely) and placed at the end of a stub shortened from the usual 17 foot quarter-wave length to about 15 feet. The stub wires are connected temporarily by clips to the coil, and the system excited either from another aerial or by linking the coaxial line via a two-turn loop around the centre of L. A thermo-couple meter can be connected *pro tem* in series with one side of the stub to indicate resonance, or the usual field strength meter placed adjacent, or a sensitive meter-indicating absorption wavemeter may be used.

Once the maximum point for resonance has been found, remove the clips and solder good solid leads permanently in position at those points. The next move is to adjust the coaxial line for correct match by clipping either side of the centre of L until standing waves are at the minimum, and when that process is finalised, permanently to solder those connections also. You will find the system applicable to lines of impedance between 50 and 120 ohms, or of course, for 300-ohm twin-lead such as the Telcon material made in Britain. Two lightweight wooden spreaders are used to



The dimensions of VK2NO's pitchfork for 14 mc. which is giving him excellent DX into Europe.

give the eighth-wave spacing between the two out-of-phase elements and with this handy little beam slung for the preferred directions, there is about a 4 dB advantage over the usual half-wave dipole. It is worth a shot for the lad without the yen or room for a rotary.

Which reminds me. . . I fancy two such 8JK's in opposite directions for 28 mc would be handy. But where the heck can I put them?

DX MAP

Have you ordered your copy of the wall-mounting version of the Great Circle DX Zone Map described in the May issue? It gives all the information required on the Zones, and beam alignments, times and distances with London as the centre. All these values are applicable to the whole of the British Isles. The price of the Map is 3s. 9d. post free, size 21-ins. by 35-ins. for wall mounting.

SUBSCRIPTIONS

Direct subscriptions, at 20s. for 12 issues of the *Short Wave Magazine* starting with November, can still be accepted if addressed to the Circulation Manager, The Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1. A direct subscription ensures despatch of a copy by post on the day of publication, the first Wednesday in the month.

FIVE METRES

By A. J. DEVON

*VHF in the Future
Changing Conditions
Survey of Activity
Panel Positions*

THE flavour of the story for this month is a clear indication of the expected change in conditions. There has been little or no sporadic-E (the last recorded date is August 28), and things have been fair only for GD_X operation, with but a few lively patches. Nevertheless, a great deal of useful and interesting work has been done, and though actual activity may have fallen off somewhat, enthusiasm for the band is ever increasing if our mail is anything by which to judge.

Preparations for F-layer working and the opening of 28 mc account for the slackening of activity on the part of some of the regulars, but many new stations have appeared to make their "first steps on five."

VHF in the Future

Though no official statement is yet forthcoming in regard to the immediate prospects of retaining 58 mc itself, it now seems probable that not only should we have the use of the band for some time to come (perhaps another year), but that we may after all have some space permanently assigned to us in this region.

We are indebted to the RSGB for the latest information that a new and very useful exclusive band will be forthcoming at 144-146 mc—2 megacycles at 2 metres. This will without doubt be of the greatest value and interest to the experimentally-minded, and should give very satisfactory results. Other VHF allocations also proposed for the U.K. are shown in the table herewith. In effect, we have two new bands, 146 and 420 mc, on which standard valve techniques can be employed. This should give a great filip to VHF work, and once more it will be *en avant, mes amis!*

If our own earlier suggestions with reference to the possible loss to G's of the present 58 mc band should after all prove wrong, nobody will be happier than A.J.D., whose comments are always based on the most reliable information available at the time—but the situation does keep changing! Anyway, the whole future for amateur VHF working in this country looks much brighter than it did two

months ago—and are we looking forward to the release of that new 2-metre territory!

Points on Sporadic-E

While thus keeping the record straight as regards the band itself, we should also tidy up on the means by which it gives results. One of the foremost professional authorities on VHF propagation holds that a misleading statement appeared in this space last month regarding the incidence of spor-E. Our remarks on p.432 implied that spor-E is directly related to the sunspot cycle. The contention is that in fact there is little evidence to show that spor-E responds in any way to the sunspot cycle; and that what there is seems to suggest that spor-E is more prevalent at sunspot *minimum* than at the maxima. From this, it is argued that spor-E—coming sharply into

FIVE-METRE COUNTIES WORKED LIST Starting Figure, 14

Worked	Station
29	G3BXE, G5BY
28	G2MR, G5MQ
27	G2XC (194), G6XM 138)
26	G6LK (208), G2NH (170) G5MA, G6VX, G8UZ
24	G5BD, G8SM
23	G6OH (129), G3BLP, G3PZ
22	G5PY (120), G2ADZ, G2RI, G6YU
21	G4IG (154), G3IS, G4LU
20	G3DA, G5JU
19	G2YL, G5BM, G5IG
18	G4AP, G6MN
17	G2KF, G6CW, G8QM/A
16	G2NM, G3AAK, G8KZ
15	G3ABA, G6FO, G8KL
14	G2ATK, G3MY, G6KB

Note: Figures in brackets after call is total of different stations worked; starting figure, 100.

evidence in May, peaking in June and July, and fading away in September, just as we found these last two seasons—can be expected to occur year after year, during summer only, and *irrespective of variations in the sunspot cycle.*

The actual cause of spor-E is still unknown. There is a poorly defined diurnal variation in its incidence, such that two broad peaks occur—one at local noon and the other at local sunset. This effect is also borne out well by experiences on five metres during the last few months.

And also for the record, we might add that with last reported occurrence of spor-E this year (August 28), G6XM worked SM5KD, and G5BY had a contact with SM5FI at 2115 BST.

Changing Conditions

This same ionosphere authority confirms all our discussion and predictions in the last two issues with reference to the probability of F-layer working during the months now upon us. Quoting him:

“The sunspot maximum is fast approaching and is expected before the end of 1947. During the coming winter conditions will be at their best for DX contacts on 58 mc. Even so, they cannot be regarded as good, and 58 mc will be the extreme frequency limit for such contacts. Conditions will be considerably better on 50 mc, and more favourable in the North-South path than East-West. For E-W working, November, early December, late January and February should be the best periods. On N-S circuits, conditions should become favourable in late September or early October and remain so till March, with the exception of the mid-winter period due to a decrease in day-time ionisation. The best times of day should be 1400-1800 GMT for the North American route and 0800-1600 GMT for South Africa.”

Well, there it all is. Let us see what begins to happen any time now, and above all, please flash us the details as soon as anything does happen.

Individual Results—North

G2ADZ (Oswestry), already suffering from the annoyance of having his call pirated, has got away to an unusually good start on five. With his 0-V-1 and 6V6-DET19-KT8c Tx he has set a new line in records by having no trouble at all in working some very creditable GDX from the beginning! *See Calls Heard.* His first CQ on August 20 raised G8SM (168 miles) and since then G2ADZ has knocked up 22C, with G2AJ/P at 200



The 3-element beam at G2ATK, Shirley, Birmingham. A fourth member has been added since this was taken.

miles as the best DX. The aerial is a 3-element beam, and he is there on 58.7 mc every evening from 1900, looking for contacts and asking for reports.

Up in Scotland, they have heard nothing from Europe since August 8, but the GM's keep at it and G3BW has been worked by GM2DI, 3BDA and 6WL. On September 7 at 1545 GMT, GM6WL heard G3MY/P being called by an unidentified station signing G5O?/P or G6O?/P; GM6WL would very much like to know who and where he was, as the only G portable heard in Glasgow on that day. SWL A. H. Bower (Hull) should be a “G3-plus-3” ere this, since he had completed the formalities by September 16 and was busy trying to squeeze the right harmonic out of the tritret end of the new 6V6-807-832 transmitter; he fears he may be one of the *last* G's to get going on five! A. H. B. has in hand a 4-element beam to G5BY's recipe and the Rx has been finalised at EF54-EF54-6AK5-6J5; this receiver seems to be doing its stuff and brought in PAØPN on the first try-out. Good luck to you, OM.

An interesting letter from G3MY

NEW VHF ALLOCATIONS

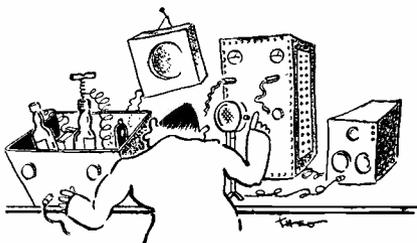
144-146 mc	Exclusive
420-460 mc	Shared
1215-1300 mc	Exclusive
2300-2450 mc	Exclusive
5650-5850 mc	Exclusive
10000-10500 mc	Exclusive

Note: These bands are those now proposed for the U.K. but permission to use them will not be promulgated till after final ratification. It is hoped that the 58.5-60 mc band may be retained for a time, and that agreement will be secured for a new allocation in the 60 mc region.

(Sheffield) who says his 58 mc results have to come the hard way; most of his operation is /P on Burbage Moors, 1,400-ft. a.s.l., where it is chilly after midnight, with only rabbits for company! However, one evening recently G2HQ joined him, and then G2MF appeared with ZC6MF—so a party ensued, with G5MQ and G5BY as two of the contacts. The latter was R5 S8 on 'phone at 2330 and was worked twice at 240 miles in the course of the evening. G3MY has narrow-band FM with a 20-watt mobile rig, phase modulation of a 7 mc crystal being used, with EF50's and 6L6 PA. The receiver is TRF EF54-EF50-EL52 which gives very satisfactory results—better than any superhet tried on 58 mc—and of course has an excellent signal/noise ratio. A 3-element rotary completes the outfit, which is mounted on his car. With this, he has worked some excellent GDX and also ON4DJ on ducting. G3MY/P had a fair day on September 7; G5BY was very consistent, with other signals from the south generally poor, though G2FKZ, G2MR, G2XC, G3HW, G5BM/P, G5MA/P and G6LX/P were either heard or worked. The only thing G3MY now needs to keep him happy in his /P work is a tiny drop of basic petrol—don't we all!

G3DA (Handforth) found GDX particularly good on August 19, working seven southerly GDX stations at one sitting. He suggests we pass on the information that a station signing MZJ on a 59.44 mc harmonic calls CQ, followed by UCO and then code groups relating to weather forecasting, at H plus 20 mins. throughout the period 0615-1745 on week-days and 0745-1745 on Sundays. The transmissions last five minutes, emanate from Ringway (Manchester) and should be a good check on conditions, receiver sensitivity and also a help in finding the band.

G8KL (Wolverhampton) shows up



Just put in a coupla new bottles, OM.

with his first report after two months' activity. He has got to 15C with a 4-stage Tx using an 829 PA, into a 3-element close-spaced rotary 30-ft. high, the receiver being a converter using EF54-EF50-EC52 with an 8-valve super, the whole outfit being entirely home-built. G8KL is there on 59 mc spot each evening from 1900 until everyone else has gone to bed, and is the only 5-meteorite in his locality.

G4LU (Oswestry), now well-known on the band, also writes us for the first time. He has a very reasonable grouch about the people who do not QSL as they should on 58 mc; he QSL's 100 per cent, but so far has only had half the cards back. G4LU always has a look round every morning at 0730-0800 (while the shaving water is boiling, as he puts it) and was rewarded with PAØPN on August 28. He uses a simple aerial arrangement—either a 33-ft. doublet or an indoor dipole—and he has come to the conclusion that a bent pin will hook the DX at a good location. True, OM, but unquestionably you would do much better with a good beam, which would make signals both ways a great deal more positive. G5BY is outstandingly consistent with G4LU, too, often coming up at S7 out of what seems a dead band. September 7 was something of a disappointment for GW4LU/P in Denbighshire, though G2XC was heard on 'phone, with G5BY again a remarkable signal at S9.

Westwards

G3PZ (Gloucester) thinks that it is time we had a little news from his *locale*. He and G3MA are getting out well and find that the Cotswolds are really not the barrier one might suppose them to be; G3PZ has rolled in 23C from the home QTH. They were /P on September 7 from a Cotswold site 1,000-ft. a.s.l. and made 27 contacts in 17 counties. G3PZ has a modified Type 27 converter with an SX-24, and in the transmitter uses a Bliley 29 mc "harmonic crystal" with RK34-815. The aerial is a wide-spaced 3-element beam which gives markedly superior results over the old close-spaced job. During September 8-11, G3PZ went /A in Northampton and gave a number of stations a new county. Before basic petrol is extinguished, he hopes to journey over the border into the jungle tracts of Herefordshire to provide yet another new county. He will surely be the only operator who can give three counties on one callsign! Well done, OM, and if you could penetrate into the fastnesses of Wales, you could give us another country, too! Both

G3PZ and G3MA would like more contacts with the South London district.

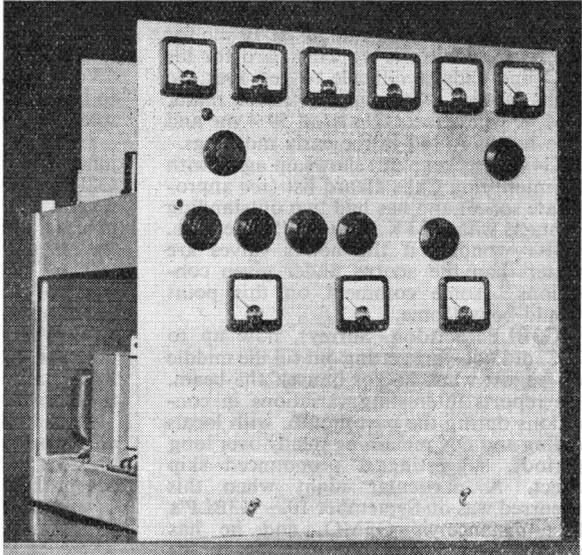
G4AP (Swindon) was also /P on September 7 and had a good day, working 37 stations. He gets very little joy from stations to the west.

G5BY (Bolt Tail, S. Devon) found GDX poor during the month but managed 18 good contacts between 1030 and 1800 for the field exercise on September 7, a number of them being with /P stations who no doubt appreciated the points. These contacts brought Hilton three new counties; stations heard but not worked were G3BY/P, G3CQ/P, G4OS/P, G5VM, G5XV, G6NB/P and G6UH. G5BY asks us to mention that he is temporarily out of QSL cards, but does make a practice of QSL'ing for every card received.

South and South-West

G8SM (East Molesey), having found the going rather hard with indoor arrays, has plunged on a new 3-element outdoor beam with greatly improved results; for one thing, he finds it very pleasant to be called instead of having to put out endless CQ's! G6VC (Northfleet) has been on since August 24 and has G5BD as his best DX; his transmitter is probably unique in that he starts with a 1.7 mc crystal, all the way down through a chain of doublers to an 829 in the final; he is trying to clean up that T7 note, too. Rx at G6VC is a 3-stage converter. G2FWA (Croydon) is back on the band, after a trip to HB where he met one or two of the 5-metre boys out there. G6UH (Hayes, Middx.) has now worked 105 stations from his difficult location and was glad, as we were, to hear OT G6LL putting out a nice signal from Cuffley, Herts.

G2AJ (Hendon) has been doing a lot of very successful /P and has worked 43 different stations from home since his "return to duty" on July 25. He was one of the outstanding portables on September 7, as many readers will have noted, working 44 stations in 22 counties. The Rx was an S-27, with a 3-element beam and



General view of G4NT's self-contained 5-metre CW/Phone transmitter. All the equipment—modulator, RF section and power supplies—is accommodated in the double-decker aluminium frame, built of $\frac{1}{4}$ in. sheet. All circuits are metered.

4-stage transmitter using an 832 in the final.

G2CIW (Brentwood) has now joined the masses on five and is quite busy with 20 watts into a 35T. G4NT/P (High Wycombe) enjoys the distinction of having worked 81 stations in 18 counties as the result of two field operations; G4NT hopes to be regularly active henceforth from the home QTH.

G2XC (Portsmouth) heard G2TK (Scarborough, 240 miles) for the first time on September 10, and finds G2ADZ (Oswestry) very consistent. G2XC has evolved a most ingenious cure for BCI—a quarter-wavelength of wire suspended from the earth terminal of the offending receiver. This has worked in two cases where all else failed, presumably because the receiver chassis was not effectively earthed for VHF, allowing RF voltages to develop; adding the quarter-wave wire (for the transmitting frequency) shifts the point of maximum voltage to the end of this wire and away from the chassis. So we have had two useful BCI suppression ideas in two months. Anyone else with anything to offer on the same subject?

G4RO (Welwyn), another new one to report, has been there since August 17 with a KT8 in the final, and a 2-EF54 wide-

band RF amplifier into an EF54 mixer with a 6C5 oscillator and IF at 10 mc for the receiver. He is working hard for his 14C but finds it difficult to get over the high ground to the north—never mind, OM, it will come. He is on 59.4 mc and also listens round in the early mornings.

G4IG (Beckenham) shows up again with an interesting Calls Heard list (see appropriate space) and has had two outstanding contacts with G2TK, with 589/588 reports. G4IG wonders if the newer valves are better than the acorns under given conditions; some comment on this point would be welcome.

G3BLP (Selsdon, Surrey), now up to 23C, did not start getting out till the middle of August when he got himself the beam. He reports interesting variations in conditions during the past month, with locals fading and DX remaining steady over long periods, suggesting a pronounced skip effect. A particular night when this occurred was on September 10. G3BLP's best distance is G5MQ, and he has worked over 50 different stations for his 23 counties. The receiver is an ex-German navy 14-valve superhet with a g.g.t. pre-amplifier, and the transmitter a modified Type 37 oscillator delivering 8 watts RF into the aerial.

SWL L. Boedo-Yanez (Banwell, Soms.) describes some interesting "walkie-talkie" experiences on September 7, when using a Type UF-1 Transceiver at G3KX/P, on the Mendips near Weston. With less than $\frac{1}{2}$ -watt input, G2CKR was worked at Malvern, Worcs., using a rotatable Windom aerial on the UF-1. SWL P. J. Towgood (Bournemouth), having done very well with the old receiver, now reports himself as a dead loss on five because of getting tangled up with a new double-super, the local oscillators of which produce fat beats every megacycle or so round the band, and refuse to be tamed. A QSL card from OK4IDT is some recompense, however.

Countries, Counties and 100-Up

The panels have undergone a considerable change this month, reflecting progress all round. G5BY remains at the top of Countries, but there are no less than nine amendments lower down, with several new callsigns in.

In Counties Worked, we have the remarkable performance of G3BXE (West Wrating, Cambs.) who has brought in ten more and now shares the top seat—always the hottest one, incidentally!—with G5BY, who has gone three better this time. Of G3BXE's new ones, five were /P, the

sixth G3PZ/A, the four new fixed stations worked being G2XS (Norfolk), G5XV (Wiltshire), G8JO (Durham) and G8QX (Worcestershire). So it is congratulations to both G3BXE and G5BY on a very fine total.

Other stations to make spectacular jumps are G5MQ (22-28), G6OH (18-23), G2RI (14-22), and G5PY (16-22), while several more have gone up two or three places; eight new callsigns also appear in the current list.

The /P's are of course responsible for much of this, and several portable station operators—as reported already in these notes—have been very sporting in seeking out new counties from which to give the fixed stations an opportunity to improve their positions.

And, by the way, in regard to the portable working by G4LU and G4OS when located in Denbighshire (GW), we do accept them as representing a new country as well as an additional county.

Quick Ones—

G3MY is always in Derbyshire when signing /P, and so may be claimed for that county . . . G6FO, in the painful process of moving to a new location, will be on again as soon as he can get his bit of gear transplanted . . . G3ABA (Rugby) was another who went /P on September 7 and from his eyrie in Northamptonshire was handing out a new county to many operators . . . G2RI (Leicester) says we did him wrong here last month by alleging he uses an 813 in the PA; it is actually an 815. Sorry, OM . . . G2ATK (Birmingham) noticed signals peaking sharply on August 23, accompanied by a rushing sound in waves, and at 2342 a comet (or meteor?) was observed in the N.N.E., travelling north. He also remarks that since having his tonsils out he can work 'phone much more comfortably. Good show, OM! . . . OK1AW reports that several G's were heard in Czechoslovakia over the period August 13-27; they particularly ask for QSL's from the G's worked and SWL reports on their signals over here . . . EI8P (Dublin) will be on by the time this appears, with a 4-element and an 815 in the final; he can keep schedules between 1800-2200 daily or all day on Sundays. Who will be the first to jump the Irish Sea from a fixed location? It was done before the war (from Snowden!) . . . MD5AK (Suez) is QRX daily between 1700 and 1800 GMT, and has heard OK's; he will have a Tx with an RK34 in the final, into a 4-element beam, in operation ere this,

and should be workable when the F-layer wakes up . . . HB9CD (Zurich) has now worked 30 different stations on five . . . IIDA reports the reception of a number of G's in the period July 16-August 3 . . . Outstanding event in the Pacific area was the 50 mc contact on August 27 between VK5KL (Darwin) and W7ACS (Pearl Harbour), and we hear from Don Knock, VK2NO, that great things have been happening on their 6-metre band, with a wonderful spell of DX conditions . . . G2KF (Edenbridge) has no difficulty in maintaining the regular schedule with F8ZF (Boulogne); G3NR and G5MA are in on these contacts, and F8QL (Beauvais) has also been worked . . . G6OH (Ascot) has put up a 50-ft. pole to hoist his beam above the tree-tops, and looks forward to better things in consequence . . . G2MR points out that G4OS/P should have been signing GW4OS/P when portable in Denbighshire . . . G6XM

(Farnborough) is busy getting ready for F-layer conditions, and puts in a useful activity list.

—And One for the Road

The Calls Heard section in this issue again contains a number of very useful reports, since many correspondents are good enough to include Calls Heard lists when writing, which are always of interest to us, and well worth a glance through by you.

But your A. J. D. has a plea on this matter of Calls Heard, which is—do please set them out as requested in that panel we print under the Calls Heard heading each month; in other words, make your lists as much like they appear in print as you can. It took a solid afternoon of what A. J. D. modestly suggests may be his valuable time to produce the lists for that quite nice-looking setting on which the Editor insists. If your list comes in on a piece of paper separate from your letter, and set out as it will appear in print, then the whole lot can be pasted down in half-an-hour; it might take you ten minutes to get your own list in order, which becomes several hours if we have to cope with the whole pile.

FIVE-METRE COUNTRIES WORKED LIST	
Starting Figure, 3	
Worked	Station
12	G5BY (F, FA, G, GW, HB, I, OK, OZ, PA, SM, ZB1, ZB2)
11	G2XC (F, FA, G, HB, I, ON, OK, PA, SM, ZB1, ZB2) G6LK (F, FA, G, GW, HB, I, OK, ON, PA, SM, ZB1) G6XM (F, FA, G, GW, HB, I, OK, ON, PA, SM, ZB2)
10	G5BD (F, FA, G, GW, I, OK, ON, PA, SM, ZB2)
9	G2NH (F, FA, G, GW, HB, OK, ON, PA, ZB1) G5MA (F, FA, G, GW, HB, I, OK, ON, PA)
8	G2MR (F, FA, G, GW, I, ON, PA, SM) G3YH (F, G, GW, HB, I, OK, OZ, ZB2) G5MQ (F, FA, G, GM, GW, HB, I, OK) G6DH (F, FA, G, I, OK, ON, PA, SM)
7	G3BW (F, G, GM, GW, HB, I, PA)
6	G3DA (F, G, GM, GW, HB, I)
5	G2KF (F, FA, G, ON, PA) G3IS (F, G, I, ON, PA) G3BXE (F, G, GW, ON, PA) G5IG (F, FA, G, ON, PA)
4	G4IG (F, G, ON, PA) G4LU (F, G, HB, OK) G6MN (F, G, HB, I) G8UZ (G, HB, I, ZB2)
3	G5BM (FA, G, I) G5PY (G, GW, I)

Reports—November

Well, that looks like all for this month, so once more we close with grateful thanks for your interest and support, which is what sustains this column and keeps your earnest conductor up to the mark. Material for next month by October 20, *certain*, please, though really hot news of the late-flash character can be taken by wire or 'phone up to the 28th. But that does *not* mean county claims or run-the-mill news letters, as "Five Metres" must be in type long before that date! Write A. J. Devon, c/o *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. (ABBey 2384). 73, BCNU.

BEAM AERIAL COMPONENTS

It is now possible to obtain, in the range of "Q5R9" products, all the materials required for the construction of 14, 28 and 58 mc rotary beams. These include not only elements and frames in various materials, but also rotating mechanisms, remote indicators, and masts, fittings and all the associated ironmongery.

Write Messrs. Emdo, Ltd., Ace Works, Moor Lane, Staines, Middlesex.

Simplified Formula for Oscillator Tracking

Calculating Oscillator Coil and Padder Condenser Values

By R. F. WOOD

It has been noticed that in any article in which the superhet is mentioned, the method of obtaining tracking of the oscillator circuit is either completely omitted or else passed by with the comment that it is too difficult for the amateur to comprehend.

The first requirement in a superhet is that at any position of the tuning control the oscillator frequency should differ from the signal frequency by the intermediate frequency; it is usual for the oscillator to work on the high side.

To maintain this difference it is necessary for the oscillator inductance to be less than that of the signal frequency circuits and also to have inserted in series with the oscillator section of the gang condenser a padding condenser, as shown in Fig. 1.

The usual formula for tracking gives exact tracking at three points in the band covered, one near each end and one in the middle, the whole calculation being based on these three frequencies and requiring a great deal of time to work out. The result is illustrated by the curve of Fig. 2.

In an endeavour to simplify the calculation, the author tried substituting one frequency in the middle of the band and has found that it is possible to get the value of oscillator inductance required to within about 2 per cent. The value for the padding condenser is obtained to between 5-10 per cent., but as this is usually made variable this error is unimportant.

The additional trimmer capacity required in parallel with the oscillator coil has been ignored as it is always small

and is provided for in all usual circuit arrangements.

Method

The method of calculation is as follows :

Let F = Signal frequency in middle of band,

C = Capacity to tune with L to F ,

L = Inductance of coil ($L = \frac{25330}{CF^2}$),

f = Intermediate frequency, expressed in $\mu\mu F$, microhenries and megacycles.

Required to find, L_o the oscillator inductance, and C_p the oscillator padding capacity.

$$\text{Let } l = \frac{9F^2 + 6(F^2f) - 3F}{2f}$$

$$m = 1 + f^2 + 6F^2 + 6Ff$$

$$n = \frac{F^2(3F + 2f) = f^2 l}{m}$$

$$\text{Then } L_o = \frac{L \cdot l}{m}, \text{ and } C_p = \frac{3 \cdot F^2}{n}$$

Results

This formula has been used to calculate the values required at varying frequencies and the table indicates the degree of accuracy which can be obtained compared with the exact formula.

Band mc	Mid. Freq.	IF mc	L	L _o	C _p	Correct Values	
						L _o	C _p
14-5-7-0	10	1.6	4.05	3.3	570	3.26	594
3.8-1.6	2.7	1.6	52	26.2	170	25.9	182.3
1.5-.54	1.0	.465	170	87	450	85	450

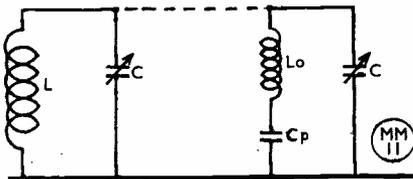


Fig. 1. C, C, equal sections of gang condenser, plus trimmer and circuit capacities; L, signal frequency inductance; L_o, oscillator inductance; C_p, oscillator padding condenser.

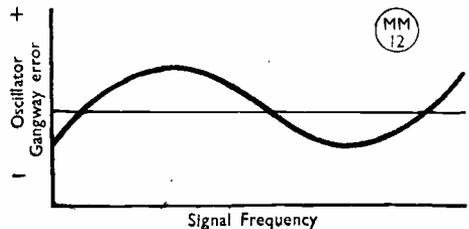


Fig. 2. The usual formula gives exact tracking at three points on the frequency coverage of the coils.

Here and There

Export Note

It is nearly twelve months since we first began to expand our export sales as a matter of business policy. An agency-survey covering the whole of Europe was undertaken on our behalf and contacts were also established in all the English-speaking countries.

The result now is that the *Short Wave Magazine* is earning its full share of foreign exchange, and export sales show a steady increase.

The Club Contest

The second annual *Magazine* 1.7 mc Club Transmitting Contest is announced in "Month with the Clubs" in this issue. As before, Club stations competing will call "CQ MCC" and will be looking for contacts with all 1.7 mc operators. Last year's affair was a great success, with 20 Clubs entered and G2YS (Coventry Amateur Radio Society) the winner by a narrow margin over G3LP of Cheltenham, with G3AFT (Grafton) third. The period of this year's Contest is November 15-23.

Unlicensed Operator Fined

At Birkenhead on August 28, Reginald C. J. Maude, 40 Raeburn Avenue, West Kirby, was fined £10 for operating a transmitter without a licence.

For the Post Office, Mr. Roger Lewis said it was the first case of its kind in the Wirral area. For some time there had been complaints of interference with the BBC by rather strange broadcasts. These were on 160 and 200 metres, and the latter transmissions were usually prefaced by the announcement "This programme comes from the Radio Broadcasting Company." On the 160-metre band the culprit actually used the callsign G5BT.

PA DX Contest

The PA's announce the "First European DX Contest" for the periods 1800 November 28-2359 November 30 (CW section), and December 12-14, same times GMT, for the 'Phone section. Operators must assign themselves a 3-figure group as a suffix to the RST report given in the CW section, or the RS report in the 'phone contest. The number chosen remains constant throughout the period.

The general idea is that Europeans should work three different stations in outside-European call areas on as many different bands as possible in the time allowed. All bands may be used, but cross-band working disqualifies and only one operator is permitted in the station.

A completed QSO counts 3 points (giving a maximum possible of nine for each country worked) and the same station may only be worked once on one band, but can be QSO'd again for points on another band. The score in terms of points is multiplied by the total number of country prefixes worked on all bands. The American and Canadian call districts count as separate "countries."

The CW and 'Phone sections of the Contest are entirely separate and operators with the same prefix are in effect competing with one another; hence, there will be certificate awards to the leading stations in each country, in both sections.

Logs, showing date, time, station worked, country, band used, serial numbers sent and received, total QSO's and countries worked on each band with points claimed, and the callsign, name and address of the competing station must reach "QSL Bureau, V.E.R.O.N., Box 400, Rotterdam, Holland" by December 31, 1947. Entries must also be accompanied by a signed declaration that the rules have been observed.

German Amateur Radio

The Americans have permitted the formation of the Deutscher Amateur Radio Club (D.A.R.C.) in their Zone of Germany, but transmitting licences are not yet being issued to German nationals. The HQ address of the club is D.A.R.C., Amerikanische Zone, Stuttgart-S., Christophstr. 27, Germany.

Crystal Exchange

G3COL, 42 Temple Fortune Hill, London, N.W.11.
Has 7110 kc QCC crystal in holder. Wants
3505-3515 kc.

Swiss Mountain Day

The three leading stations in this event, mentioned on p. 371 of our August issue, were HB1CE (operating from a height of 5,500 feet), HB1BW (4,300 feet) and HB1DK (4,900 feet).

NEW QTH's

This space is available for the publication of the addresses of all holders of new call signs, or changes of address of transmitters already licensed. All addresses published here are automatically included in the quarterly issue of the Call Book in preparation. QTH's are inserted as they are received, up to the limit of the space allowance. Please write clearly and address on a separate slip to QTH Section.

D2HJ	Lt. J. Crerar, Cameronians (SR), c/o 2 RSF, BAOR.	G3AXC	F. C. Mayoh, 76 Rocky Lane, Monton, Manchester.
G2ACK	M. T. Aitken, 22 Arundel Road, Eastbourne, Sussex.	G3AYI	W. F. Knowles, 310 Brodie Avenue, Liverpool, 19.
G2AJF	W. J. Ridley, Kawila, Beehive Lane, Chelmsford, Essex.	G3AZE	H. N. Horrocks, 86 Manley Road, Sale, Cheshire.
G2AJS	W. Maddock, Caterham School, Caterham, Surrey.	G3BCI	V. F. Cotton, 31a Christchurch Road, Bournemouth, Hants.
G2ALH	H. W. Haynes, 16 Headstone Gardens, Harrow, Middx.	G3BEG	P. Bond, 26 Aylward Road, Merton Park, London, S.W.20.
G2ALN	E. W. Taylor, 76 Sidney Road, Blackley, Manchester.	G3BFZ	D. S. Cheeseman, 77 Wood Lane, Kingsbury, London, N.W.9.
G2ALN/A	E. W. Taylor, 34 Boggart Hole Crescent, Blackley, Manchester.	G3BJJ	J. R. Dawson, 72 Arbutus Drive, Coome Dingle, Bristol, 9.
G2AOW	P. Whittle, 3 Seaton Mansions, Shaftesbury Avenue, London, W.C.2.	G3BLO	G. Sargent, 5 South Devon Place, Ridgeway, Plympton, Plymouth, Devon.
G2APP	G. E. Lawson, 55 Kirk Lane, Yeadon, Leeds.	G3BMX	G. H. Greenwood, 1 Gordon Drive, Leeds, 6.
G2AUZ	O. H. Owen, Fernleigh, Leynceys, near Oswestry, Salop.	G3BOM	P. D. Ridgers, 116 Cazenove Road, Stoke Newington, London, N.16.
G2BIU	197 Walm Lane, London, N.W.9.	G3BQJ	P. F. Lucas, 32 Brougham Street, Darlington, Co. Durham.
G2BJF	J. Fletcher, 40 Southfield Road, Gloucester.	G3BQM	J. F. Winter, Tudor Lodge, Station Road, Broxbourne, Herts.
G2BLC	D. B. Black, 150 Tolworth Rise, Surbiton, Surrey.	G3BRD	J. A. Lunn, 35 Church Road, St. Leonards-on-Sea, Sussex.
G2BMI	J. Bramhill, 27 Oakleigh Road, Hillingdon, Middx.	G3BRU	W. Priestnall, 213 High Street, Marske-by-Sea, Yorks.
G2BRH	579 High Road, Ilford, Essex.	G3BTI	P. V. Hazeldene, Broadgate, Weston Spalding, Lincs.
G2BXJ	A. F. Thompson, 45 Blake Road, Great Yarmouth, Norfolk.	G3BTS	H. Wittam, 84 Ladyfield Road, Chippenham, Wilts.
G2CNM	R. D. Morrison, 79 Lyttelton Road, Finchley, London, N.2.	G3BTV	R. Sumner, 8 Brookfield Crescent, Headington, Oxford.
G2DLX	A. J. Mitchell, 167 Southbury Road, Enfield, Middx.	G3BXN	E. A. Welling, 121 Kingshill Drive, Kenton, Middx.
G2DWN	S. Hibbert, 110 Barnfield Road, Adswold, Stockport, Cheshire.	G3BYC	E. H. Major, 16 Albert Road, Hendon, London, N.W.4.
G2HHV	J. Spivey, Loughrigg, 29 Langdale Road, Dewsbury, Yorks.	G3BYF	P. Sawyer, 193 London Road, Maidstone, Kent.
G3AAS	M. D. Glynn, 40 King's Mount, Leeds 7, Yorks. (Tel.: Leeds 66486.)	G3CAJ	R. Prince, 61 Chichester Road, Portsmouth, Hants.
G3ABJ	E. R. Coleman, Highfure Cottage, Billingshurst, Sussex.	G3CAL	D. B. O'Donoghue, 28 Shelley Avenue, St. Mark's, Cheltenham, Glos.
G3AGY	I. C. Dalrymple, 63 Salisbury Road, Cressington Park, Liverpool 19.	G3CAL/A	A. R. Poulston, 68 Kipling Road, St. Mark's, Cheltenham, Glos.
G3AIL	85 Halewood Drive, Woolton, Liverpool.	G3CDN	G. W. Laurence, 2 Briar Drive, Huyton, Liverpool.
G3AKY	A. J. Lloyd, 425 Hastilar Road South, Sheffield, 9.	G3CEG	B. King, 5 Byron Road, St. Mark's, Cheltenham, Glos.
G3AQF	29 Fellows Road, Hampstead, London, N.W.3.	G3CFO	G. F. Painter, 3 Diamond Terrace, Greenwich, London, S.E.10.
G3AQQ	J. Kelsall, 83 Manor Road, Barnet, Herts.	GM3CFT	D. J. Pratt, Orchard Bank House, Glamis Road, Forfar, Angus.
G3ATR	P. R. Knox, 20 Westmacott Street, Newburn-on-Tyne, Northumberland.	G3CGM	F. B. Singleton, 3 Ravenscroft Road, Beckenham, Kent.
G3AVE	F. Flanner, 194 Aston Brook, Birmingham, 6.		

- G3CHB** C. E. Davies, 7a The Hill, Groomsport, Co. Down, N.I.
- G3CHF** E. P. Buckley, Queens Road, Redcliffe Bay, Portishead, Som.
- G3CHY** H. Hunter, 144 Broadoak Road, Ashton-under-Lyne, Lams.
- G3CIM** S. Denny, 35 Melford Avenue, Barking, Essex.
- G3CJJ** P. E. Leventhall, 6 Rookwood Road, Osmondthorpe, Leeds, 9.
- G3CJQ** W. J. P. Hayes, 129 Althorpe Avenue, London, E.6.
- G3CKK** N. F. Hobbs, 1 Langdon Park Road, Highgate, London, N.6.
- GM3CKN** D. T. Walker, 9 Park Avenue (Top Flat), Dundee, Angus.
- G3CKO** I. Morris, Cambridge House, Uxbridge Street, Burton-on-Trent, Staffs.
- G3CKV** A. Sissons, 23 Gamble Street, Nottingham.
- GW3CLF** Capt. D. J. O'Connor, Ycragen, Borth, Aberystwyth, Cardigan.
- GW3CLF/A** Capt. D. J. O'Connor, 1 Beech Terrace, Abercarn, Mon.
- G3COL** H. Collins, 42 Temple Fortune Hill, London, N.W.11.
- G3DO** D. A. G. Edwards, 25 Pilkington Avenue, Sutton Coldfield, Warks.
- G3GG** G. Mortimer, 16 Kirkby Road, Rugby, Warks.
- G3QW** No. 1 Belle Vue, Millbrook Road, Millbrook, Southampton.
- G3SB** T. C. Bryant, 29 Lower Park, Minchhead, Somerset.
- G4MX** H. B. Davis, 5 Church Street, Nuneaton, Warks.
- G4OZ** D. E. Burgess, 8 Banger's, Osborne, Sherborne, Dorset.
- G4RG** Amateur Radio Society, Queen Mark College, University of London, Mile End Road, London, E.1.
- G6BQ** H. J. M. Box, 52 Cobham Street, Gravesend, Kent.
- G6PQ** 37 Siddeley Avenue, Coventry, Warks.
- G6XD** J. J. G. Taylor, 188 Beaumont Road, St. Jude's, Plymouth. (Tel.: Plymouth 60716.)
- G6XM** W. James, 67 Osborne Road, Farnborough, Hants.
- G8IA** E. C. Sutton, 37 Davison Road, Darlington, Co. Durham.
- G8KS** S. L. Hill, 36 Redburn Road, Northenden, Manchester.
- G8NC** H. H. Lugg, 67 Bustleholme Lane, West Bromwich, Staffs.
- G8QD** F/O J. Douglas, Officers' Mess, RAF Debden, Saffron Walden, Essex.

THE AMATEUR BANDS

Following are the bands now open for British amateur operation:

- | | |
|-----------------|---|
| 1715-2000 kc | 10 watts (A) and (B) |
| 3500-3635 kc | } 25 watts (A)
150 watts (B) |
| 3685-3800 kc | |
| 7000-7300 kc | 25 watts (A), 150 watts (B) |
| 14000-14400 kc | 25 watts (A), 150 watts (B) |
| *28000-30000 kc | 25 watts (A), 150 watts (B) |
| *58500-60000 kc | 25 watts (A) and (B) |
| 460.5 mc | 5 watts (for radio control of models and only by special application) |
| *2300-2450 mc | 25 watts (A) and (B).
*FM permitted. |

"A" licences are all three-letter calls issued post-war, and are for CW operation only; licensees in this category are not normally allowed the use of telephony and full power till they have had twelve months' experience. Class "B" licensees are holders of reissued pre-war two letter call signs, and are allowed the unrestricted use of CW, MCW and 'phone with power as given above.

THE NEW BANDS

We are informed by the Radio Society of Great Britain that it is expected the following bands will in due course be made available to British amateurs under the Convention signed at Atlantic City.

- | | |
|----------|---|
| 1.7 mc | 200 kc, shared, with 10 watts power limitation. |
| 3.5 mc | 3500-3800 kc, shared. |
| 7 mc | 7000-7100 kc, exclusive.
7100-7150 kc, shared S/W BC. |
| 14 mc | 14000-14250 kc, exclusive.
14250-14350 kc, shared Russian fixed internal services. |
| 21 mc | 21000-21450 kc, exclusive. |
| 28 mc | 28000-29700 kc, exclusive. |
| 146 mc | 144-146 mc, exclusive. |
| 420 mc | 420-460 mc, shared. |
| 1215 mc | 1215-1300 mc, exclusive. |
| 2300 mc | 2300-2450 mc, exclusive. |
| 5650 mc | 5650-5850 mc, exclusive. |
| 10000 mc | 10000-10500 mc, exclusive. |

Notes: It is hoped that frequencies around 60 mc may be allotted later on a purely national basis.

There is a strong possibility that permission may also be forthcoming to use the 11-metre band, known as the I.S.M. (Industrial, Scientific and Medical) band.

The Short Wave Magazine covers the whole field of Amateur Radio

The other man's station ZL3AW



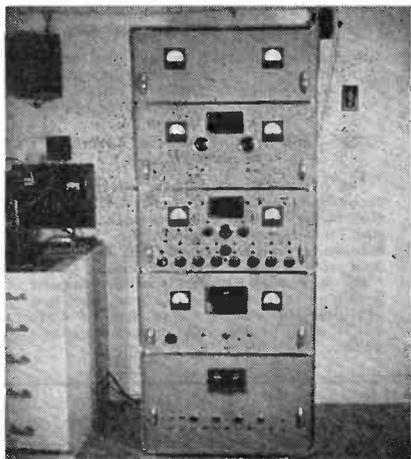
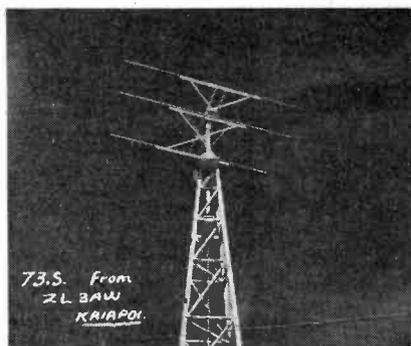
Here is an impression of ZL3AW, H. O. Hills, Kaiapoi, New Zealand, an amateur station conforming to modern standards of design and construction. In the rack-panel transmitter, units are so arranged as to draw out without having to fiddle with wiring at the rear of the assembly, as plugs are fitted behind all trays for making connections.

The bottom of the rack carries the power units for the 813 final and the modulators, the low-voltage HT for the CO and doublers, with the relay, bias and filament supplies. The second panel up contains the speech amplifier, modulator and HV relays; the third chassis is the band-switching exciter unit, comprising CO and 6L6 frequency multipliers for 7, 14 and 28 mc, and the 813 final.

On the fourth panel there is a P/P PA with 812's, usually kept on 14 mc, but arranged for band-switching with the exciter. The band-change switch makes all the necessary change-over motions, including reducing drive output and altering all indicator lights.

The circuits are fully metered, with indicator lamps and inspection windows provided on each panel. The transmitter cabinet is mounted on wheels and plugs are provided for all leads, so that the unit as a whole can be easily moved.

The Oregon pine tower carries a 3-element 28 mc Yagi, rotatable through 360 degrees, with slip-ring feeder connection. The beam is rotated by a $\frac{3}{4}$ -in. pipe up the centre of the tower, operated through a hand-controlled gear-train.



THE MONTH WITH THE CLUBS

FROM REPORTS

Reports are rather scarce this month, no doubt partly because of the unfortunate necessity for holding last month's story over. It was not your secretary's fault, but the Editor's, that Club doings were not recorded in September! And even he had good reasons for taking the space. There is a certain amount of holiday spirit still in the air, and many Clubs are getting under way for the winter season.

The reports sent for the September issue have been included here if they are still of current interest and not too severely out of date. Club Secretaries may be assured that we shall continue to welcome their reports as usual in the future; we want to see this section of the *Magazine* doing its full share in promoting the interests of the Club movement, always regarded by the *Short Wave Magazine* as being of the greatest importance.

"CQ MCC" Again!

So here we go with the formal announcement of the second 1.7 mc Club Transmitting Contest. This will not actually be news to any of the clubs on our "active" register, as secretaries will by now have had their copies of the rules and the entry form. But *Please Note*: The rules have gone only to those Clubs from whom we have heard in the last few months, as these are the only addresses of which we can be certain. There will be a

number of organisations recommencing activities for the new season; so any secretary who has *not* had the rules is invited to write us for them forthwith.

The period of the Contest is November 15-23, 1.7 mc CW, a total of 30 hours' operation only being allowed in this period. As before, Clubs without callsigns are permitted to nominate a member station as their official entry. Country prefixes count as zone multipliers and otherwise the rules are similar to those for last year's successful event. The leading stations in 1946 were G2YS (Coventry), G3LP (Cheltenham) and G3AFT (Grafton), when 20 Club stations entered. This year we hope for a greater number, as there are many more Clubs active and with their own callsigns than at this time last year.

Will those secretaries who have already received the rules please let us have the entry form back by October 16, with the callsign to be used and the name of the Club filled in, as we want to list the Clubs taking part in the next (November) issue. But again as before, we are accepting entries up to November 14, as many secretaries will be seeing this notice for the first time.

So when you 1.7 mc types hear the ether rent with "CQ MCC" on November 15, you will know the party is in full swing again.

Reports for November

The dead-line is first post on October 16, and any sliding in after this will definitely miss the boat! Address them to "Club Secretary," *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. And photographs of Club interest will be very welcome, too.

Wanstead and Woodford Radio Society.—The main event during the month was the Club field day on 1.7 mc, held on Woodford Green, in conjunction with the local fete. Stations were operated from a tent, and signed G2BCK/P and G3AGL/P. Membership here is on the up-and-up, and an interesting evening is expected on September 30, when the first annual dinner and election of officers take place.

West Bromwich & District Radio Society (G3BWW).—Meetings are held at 7.30 on alternate Mondays at the Gough Arms Hotel, Jowetts Lane, West Bromwich; but on the other Mondays practical work is done at the Udall Engineering Co., Ltd., Great Bridge, where the club transmitter is installed. New members will be welcomed; active members already include eight licensed amateurs.

Coventry Amateur Radio Society.—A party of members recently visited Birmingham, at the invitation of M.A.R.S., to meet Dorothy Hall, W2IXY. The society hopes to have its own transmitter on the air shortly. Topics for future meetings include a demonstration of the Eddystone 640 receiver, and a talk by G2LU on his wartime experiences in the Navy. A local motor manufacturer is footing the bill for QSL cards for club members.

North West of Ireland Amateur Radio Society (GI3CFH).—Three members recently obtained their full licences, including the Hon. Secretary. Two more were unearthed at

the local Service Establishment, and the crowning triumph was the acquisition of the club licence, with the result seen above! There is now much activity in the district, with nine call-signs in London-derry as compared with two last February. It is hoped that the Club station will be on the air by the time this appears in print.

Liverpool and District Short Wave Club.—This club is now flourishing after a certain amount of reorganisation; the club transmitter is on 'phone on 3.5 mc and Morse classes are held nearly every week. G3BHT, the Hon. Sec., also transmits slow Morse on 3562 kc every Monday at 1900 BST, and would be glad to know whether anyone outside Liverpool makes use of these transmissions. Recent meetings have comprised an auction, a talk by G4PF on 28, mc, and one by G8AZ on Propagation. Talks will be given on October 14 and 21, and on October 28 the Annual General Meeting is being held.

Bradford Amateur Radio Society.—They are well under way already with the winter programme. The first October lecture, by G6KU, is being given on October 6 at 7.30, and subsequent meetings follow on alternate Tuesdays at Cambridge House, as usual. Visitors and prospective members will be sure of a warm welcome.

Surrey Radio Contact Club.—The September meeting took the form of a Junk Sale, although much of the gear put up was too good for that description. There was an attendance of 77. Next meeting is on October 14—Blacksmith's Arms at 7.30.

Oswestry and District Radio Society.—All those interested in this club are asked to note the change of secretary; the new QTH appears in the panel.

Wirral Amateur Radio Society.—Activities were resumed at the end of August with a meeting at which G2AMV gave a talk on the T.1154. The Annual General Meeting is to be held on October 8 at 7.30, the venue being the Y.M.C.A., Whetstone Lane, Birkenhead. The following meeting will be on October 22, same time and place.

Worthing & District Group.—The A.G.M. was held on September 4, when a new committee was elected and the necessary rules approved. This club runs a news sheet called *Rag Chew*, and the copy we have seen contains much interesting information on such diverse subjects as "Pirates" and "Atlantic City"! The next meeting, on October 2, will be held at Oliver's Cafe, Southfarm Road, and will take the form of a lecture on Radar by Mr. Merriman. All enquiries welcomed by the Secretary.

Grimsbly Amateur Radio Society.—This club has moved to new premises at 115 Garden Street, Grimsby. Meetings will in future be held at 7.45 every Thursday. The club transmitter, a T.1131, will soon be ready to go on the air. All visitors and prospective members will be welcomed.

Stourbridge & District Amateur Radio Society.—At the September meeting 33 members and five visitors enjoyed an instructive talk on Transformers, given by Mr. N. B. Simmonds. Meetings are held on the first Tuesday of the month—details from the Secretary. And please note the new QTH for the latter, in this month's panel.

Harrogate & District Short Wave Radio Society.—At an August meeting, Mr. C. A. Norman, of the G.E.C., lectured on "Recent Developments in Radio Valves and Cathode Ray Tubes," with a demonstration of 10-cm. waves. Future activities will include a visit to the B.B.C. transmitter at Moorside Edge during September.

Reading & District Amateur Radio Society.—During the holiday season no set lectures have been organised, but the President has given some interesting chats which have led to discussions and general "ragchews." It is hoped to hold another Hamfest during the early autumn, and there are also the Annual Cup Competitions to be judged. Meetings are held on the second Wednesday and last Saturday of each month.

Catterick Amateur Radio Club (G3AKF/A).—This club is now established in a fine new Headquarters at Mame Lines, Catterick Camp. A club licence is on the way; meanwhile they are operating with the call shown above. The operating position is in the club room and members can watch operations from their armchairs! The gear collected includes two 75-foot masts, an HRO, an AR88, two CR 100's and a double-beam 'scope. Meetings are held every Tuesday at 7.15 p.m., but the club-room is nearly always open. All are welcome.



Members of the Worthing Group with their guests from Brighton at H.M.S. *Peregrine* on July 3.

North East Amateur Transmitting Society.—The officers and committee for the forthcoming season were elected at the Annual General Meeting; a Deputy Chairman (G2PN) was also appointed. The club has arranged a visit to the GPO Coastal station at Cullercoats in the near future.

Skyways Amateur Radio Club.—Welcome to this newcomer, which hails from Dunsfold Aerodrome, near Godalming, Surrey. At this location they have three rooms available for their 36 members, and they hope to have a club licence before long. One room is to be a workshop, one a library and quiet room, and the third the "shack." It is hoped to make a start on the club transmitter before next month.

Birmingham and District Short Wave Society.—At the September meeting the members were given full details of the Radio Amateurs' course to be held at the Central Technical College on Wednesday evenings. A grand auction sale is being organised for November, and the October meeting, on the 6th, will include as its main item a Quiz Contest.



The crew (with helpers) on G4NT/P, High Wycombe, Bucks., on the occasion of a recent 5-metre portable outing. G4NT is looking for the sugar in his tea. G6JK is standing on the extreme left, and G2RL is in the tent, on the left.

Worcester and District Amateur Radio Club.—At the September meeting, in the Victoria Institute, G8QX of TRE and the Malvern Radio Society gave an interesting talk on aeriols. The Secretary has been forced to resign owing to pressure of business (new Secretary's name in panel), and the Treasurer is about to be called up, but the club carries on successfully and is due to be visiting Droitwich BBC station later in the month. First October meeting is on October 2.

Warrington Radio Society.—This club has had a successful summer season, during which a station was erected at the town's Centenary Exhibition working with the club call G3CKR. Between two and three thousand spectators saw the activity on 7, 14 and 58 mc. The coming winter season will be taken up with a series of talks for the beginner and also an advanced series of lectures by members of the Research Staff of Salford Electrical Instruments and other manufacturing concerns.

Following are the names and addresses of the Secretaries of the Clubs whose reports appear in this issue. They will be pleased to give all possible assistance and advice to prospective members.

- BIRMINGHAM.** N. Shirley, 14 Manor Road, Stechford, Birmingham, 9.
BRADFORD. J. H. Macdonald, G4GJ, Mayfield, Wagon Lane, Bingley, Yorks. (Tel.: Bingley 965.)
CARLISLE. J. Ostle, G2DYV, 2 Outgang, Aspatria, Carlisle.
CATTERICK. Cpl. Hall, c/o 2 Sqn., 1st T.R., Royal Signals, Catterick Camp.
COVENTRY. J. W. Swinnerton, G2YS, 118 Moor Street, Coventry. (Tel.: Coventry 4578.)
EASTBOURNE. D. C. Tompsett, 39 Western Avenue, Polegate, Sussex. (Tel.: Polegate 388.)
FARNBOROUGH. P. R. Burkett, G4PS, Park View, Priory Street, Farnborough, Hants.
GIFFNOCK (HI-Q). J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4. (Tel.: Merryrie 4060.)
GODALMING. R. C. Murden, Skyways Amateur Radio Club, Dunsfold Aerodrome, near Godalming, Surrey.
GRIMSBY. R. F. Borrill, G3TZ, 115 Garden Street, Grimsby.
HARROGATE. K. B. Moore, Spinney Cottage, 2a Wayside Crescent, Harrogate.
LIVERPOOL (G3AHD). B. G. Meaden, G3BHT, 10 Alfriston Road, West Derby, Liverpool, 12.
NORTH-EAST. J. W. Hogarth, G3ACK, 4 Fenwick Avenue, Blyth, Northumberland.
NORTH-WEST IRELAND. D. R. J. Adair, G13VBV, Cosy Lodge, Culmore Road, Londonderry.
OSWESTRY. G. H. Banner, G3AHX, 6 Coppice Drive, Oswestry, Salop.
READING. L. A. Hensford, B.E.M., G2BHS, 30 Boston Avenue, Reading, Berks. (Tel.: Reading 60744.)
ROMFORD (G4KF). R. C. E. Beardow, G3FT, 3 Geneva Gardens, Whalebone Lane North, Chadwell Heath, Essex.
STOURBRIDGE. W. A. Higgins, G8GF, 35 John Street, Brierley Hill, Staffs.
SURREY. L. C. Blanchard, 12 St. Andres Road, Coulsdon, Surrey. (Tel.: Uplands 3765.)
WANSTEAD. R. J. C. Broadbent, G3AAJ, 24 St. Margarets Road, Wanstead Park, E.12.
WARRINGTON (G3CKR). J. H. Thomas, G3AWC, 510 Stockport Road, Thetnall, Warrington. (Tel.: Lynn 384.)
WEST BROMWICH. R. G. Cousens, G3BCS, 38 Collins Road, Wednesbury, Staffs.
WIRRAL. B. O'Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Cheshire.
WORTHING. G. W. Morton, 42 Southfarm Road, Worthing, Sussex:

Meetings will be held on alternate Mondays at the Technical Institute, Palmyra Square, beginning at 7.30.

R.A.E. & Farnborough District Amateur Radio Society.—An interesting and varied programme is "laid on" for the coming season. Meetings will be held in the R.A.E. Assembly Hall on alternate Mondays at 7.30. The September lecture was on the subject of "Centimetre Waves," and was given by Mr. A. L. Cullen, B.Sc. (Eng.), A.C.G.I., of University College. The Hon. Secretary, G4PS, maintained contact with other members during his holiday, using a 3-watt portable rig on 7 mc !

Hi-Q Club, Giffnock.—Here is an idea for other clubs in search of useful items: The Hi-Q Club members have been carrying out extensive tests on suppression of harmonics—particularly 14 mc harmonics heard in the 28 mc

band. GM3AR has collated a considerable amount of information on the subject. GM3AKK and GM2KP are starting a series of tests on 2500 mc. GM2FZT, the Scribe, has been touring, and visited more than twenty shacks in the course of a fortnight and 2000 miles ! GM3ANV has now moved to Bristol, and would appreciate a note from any amateurs in that city, *via* GM2FZT.

Carlisle Amateur Radio Society.—They now meet on the first and third Fridays of the month at 7 p.m. in the YMCA, Richmond Hall, Fisher Street, Carlisle. A programme is being organised for the winter months, and new members will be welcomed.

Romford and District Amateur Radio Society.—The weekly meetings during October include a Sale on the 6th, a lecture on Future Television

Design on the 13th, a continuation of the lecture on Micro-Waves on the 20th, and "Maths. applied to Receiver Design (Part IV)" on the 27th. All these meetings are at 8 p.m. at Mawney's Road School, Romford.

Eastbourne Group.—This newly-formed Group is meeting on October 4, at 7.30 in the Friends Meeting House, Wish Road, Eastbourne. All interested are invited to attend or to get into touch with the Secretary, whose name and address appears in the panel herewith.

All interested in the formation of a Club in the Chippenham, Wilts. area are asked to get in touch with F. Whittam, G3BTS, 84 Ladyfield Road, Chippenham. Considerable interest is being shown in the district, and it is hoped to get an organisation going.

ARTICLES FOR PUBLICATION

Those aspiring to see their articles in print in the *Short Wave Magazine* are asked to note the following points when submitting material:

Use typescript (or very clear handwriting without affectations), on one side only of quarto or foolscap sheets, with well-spaced lines and wide margins; the abbreviations employed should be strictly in accordance with *Magazine* convention (e.g. PA and not P.A., μF and not mfd., mA, dB and mc rather than ma, db's and mc/s) which can be followed by a study of the presentation of any technical article in it.

Drawings and diagrams *must* be on separate sheets, with the title of the article and numbered only Fig. 1, Fig. 2, and so on. Photographs should be marked up on their backs. A list of captions should appear on a separate sheet; tables of values must not be included in the text but also be listed separately. These tables should be laid out in close conformity with those to be seen in any issue of the *Magazine*, as well as using the same signs and conventions.

Though all sketches and diagrams are re-drawn by our draughtsman, they must come in to us clear and electrically correct. Do *not* put values in the circuit diagram,

but use the C1, R1, L1 numerical indication.

We are always glad to see material, from writers known or unknown, on any subject connected with Amateur Radio. The best advice we can give to aspiring contributors is—study the layout and presentation of any technical article in the *Magazine* and prepare your work on the same lines; check and re-check all your values and quantities and the accuracy of your drawings; try to make your work look as finished as it will appear in print.

In the Amateur Radio field, we pay the highest rates in the world for good material—and the less time the Editor has to spend in preparing the article for publication, the more it makes. We give quick appearance to worthy material and at the moment are particularly interested in constructional articles on auxiliary equipment (with which good photographs are essential), economical transmitter design, the practical application of the CR tube in Amateur Radio, and the new theories dealt with in simple language without resort to heavy mathematics.

Articles accepted for publication are paid for on appearance, at a rate previously notified to the contributor.

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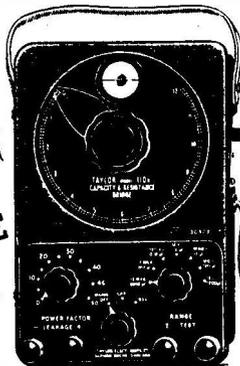
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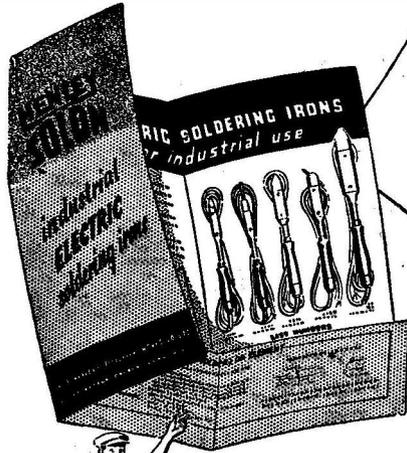
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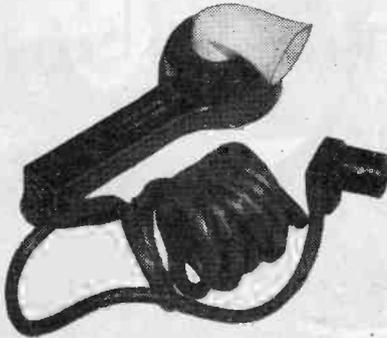
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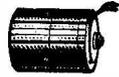
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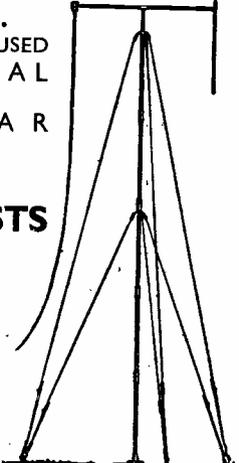
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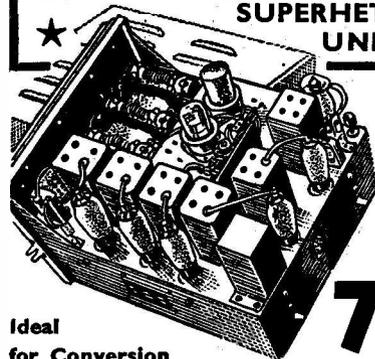
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40 v.	2 in.	8 K	Flush	M.C. D.C.	7/6
2½ a.	2 in.	—	Flush	Thermo. H.F.	7/6
4 a.	2½ in.	—	Port.	H.W. H.F.	3/6
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20 a.	2 in.	—	Flush	M.C. D.C.	7/6
40 a.	2 in.	—	Flush	M.C. D.C.	7/6
25 a.	3½ in.	—	Flush	M.C. D.C.	7/6
25 a.	3½ in.	—	Proj.	M.C. D.C.	7/6
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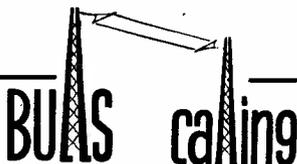
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FOR Sale.—Pair 813's, 50/- each. 808's (4) 40/- each, 807's (4) 15/- each. Numerous 6·3v octal valves, including SP41's, all at 4/- each. All tested and guaranteed.—G3BZD, 54 Chaddlewood Avenue, Lipson, Plymouth, Devon.

SALE.—R.M.E. DM36 EXPANDER, RANGE 28 and 58 mc. COMPLETE AND EXCELLENT CONDITION. WITH FULL INSTRUCTIONS.—£15. TAYLOR T20—15/-. G.E.C. 8 WATT, 10 INCH SPKR. WITH O/P TRANS. AND WALNUT CABINET—PERFECT—90/-—J. CLARKE, 16 HARCOURT HOUSE, CAVENDISH SQUARE, LONDON, W.1.

HAM QRT. AR88 in new and perfect condition, 50 watt Phone/CW Tx. RF 6V6-807. Mod. 6SJ7, 6J5, PP 6L6. Complete Xtal and Coils for 80, 40, 20, 10, in enclosed steel rack. £75 or would separate. Enquire for other gear, New Tx valves, 1000v power packs, meters etc. Write, "Octa," Vicarage Road, Winton, Bournemouth.

COMMUNICATION Receiver Hammarlund Crystal Pro 8 to 250 metres, also Preselector, with self-contained Power Pack. What Offers?—G2NA, Shrubbery, Wood Road, Codsall, Staffs.

HAM set for the drawing room. R1155 with power pack, speaker in polished walnut cabinet. Drop front over panel—£30 or near.—Houghton, 17 Crawford Avenue, Wembley.

R.C.A. AR77 Communications Receiver. Fully Band Spread, Crystal Filter as new, £47.—Phone Pinner 7733.

HALLICRAFTER S.20. -55-43·5 mc, revalved, re-realized recently, £25 or near offer, or will trade for DC/AC Garrard auto-changer model RC5 or later.—G8QD, R.A.F., Debden, Saffron Walden, Essex.

PROFESSIONALLY modified R.1155; perfect condn. S/R switch phone jack internal KT61 OP. Stage £18.—G3B0I, 1 Raleigh Avenue, Hayes, Middx.

SUPER-PRO with Power Pack. Very hot 20 and 40. 1941 model. First £55. AR77E perfect order. 250 AC £37 10s. VHF Super, 19 in. Panel New, Tuning Meter. Iron Cored IF's. 10 valve. Partly modified for 5. Circuit, and parts, valves on case. £12 10s. Consider offer for lot.—Box No. 165.

SALE.—Lightweight Phones New Unboxed 8000 Ohms. Impedance 15/-, New electrolytics 4 µF 50 volt 1/-.—Box No. 166.

BC.348N Fully modified 6F6 and tuning indicator, separate power supply. New cabinet with service manual £35 or near offer.—Poole, 11 Bisham Gardens, Highgate.

FOR exchange, Transmitter T.1154N in new condition with valves. Also Eddystone "All World Four" battery receiver complete with valves and coils. Wanted in good condition B2. Transmitter-Receiver with coils.—Box No. 164.

G3DI. COMPLETE phone TX for sale. 6L6GX CO. HY25 B.A. TZ40's P.P. final plate, mod. 4 stage, premod., triodes P.P. to TZ40's class B.4 power packs. Rack 8 ft. D104 mike. M.E. 12 in. L.S. Many valves. What offers? AR88 with "S" meter. £55.—Phone 4030. Write 122 Hillmorton Road, Rugby. Going abroad.

SALE.—Brand New Eddystone 5-10 Converter Unit. Used only one hour. £12. Complete.—W. G. Johnson, Pinchbeck Hall, Spalding.

EDDYSTONE All-Dry 4. Constructed as in Eddystone Manual No. 5. With new Eddystone components. What Offers?—E. Hougham, 4 Broad Street, Ramsgate.

RADIOVISION V55R. Receiver 10 & 20 metre Converter, with Loudspeaker to match. Cost over £50. Fitted with co-ax input and output. First offer over £30.—Box No. 168.

TAYLOR 65B, All-Wave Signal Generator. 100 kc to 46 mc. 30% Modulation. Almost new and unused. £13 or near.—No. 2 Grove Flats, Lynton, Glos.

R1155 GENUINE Model N. Covers 1·7, 3·5, 7, 14 mc. Condition as new. FB performance. £16.—G4GJ, Mayfield, Wagon Lane, Bingley, Yorkshire.

POWER Pack, 350v, 100 mA; suit 25-watt C.W. transmitter. £7 10s. Also Portable All-dry 1·V-1 S.W. receiver £9.—O'Dwyer, 760 Barking Road, London, E.13.

R.M.E. 69 £45, Eddystone H.C.R. £35 with speakers. R1132 modified for 45-80 mc £11. Offers considered.—135 Lichfield Road, Four Oaks, Warwickshire.

BC-342 COMMUNICATIONS RECEIVER, 1·5 to 18 mc, continuous in six bands, 10 valves, 2 RF's, 2 IF's, 6V6 Output, Xtal Filter, Xtal Phasing, BFO Tuning, Antenna Alignment controls, AVC, etc. Used for many FB contacts. Suitable 230v. A.C. with auto trans.—£24 10s.—G3AEP, 36 Market Street, Whittlesey, Peterborough.

HALLICRAFTER S20—Offers over £20. "Wireless World" June 1942 to December 1945. 3 missing, 30/-.—R. Garner, 81 St. Paul's Road, Peterborough.

HRO coils complete set LF to 20 mc, for sale. £2 each or near offer.—Box No. 169.

COMMUNICATION Receiver, Radiovision V55R, 9 Octal Valve Super, Calibrated dial, 100/1 slow motion, B.F.O., A.V.C., 3½ watts output, Chrome handles and fittings, Bargain £24 10s. (Cost £29 few weeks ago.) Also Radiovision Expander 28 mc; and 14 mc; Comprises 4 valves, full bandspread, built in Power Supply, Cracked case matches V55R. £12 10s. (Cost £18.) Will accept £35 10s. for both, Carr. Paid.—G8UA, 406 Brunshaw Road, Burnley Lancs.

TX for sale. 6L6G co. Tritet link coupled 809 P.A. 500-0-500 power pack, 200/240 volts A.C. Modulator: 6J7, 6C5 pair 6L6G's. 3 xtals. Metal chassis; crackle panels; Weston meters; D104 mike; pair Promax elements, coils for 14 mc. Good running order. Worked 75 countries. Best offer over £22.—Ex-G4FL, 49 Sunray Avenue, Tolworth, Surrey.

DENCO CT3 and CT2 Turrets, 2 1·6 IFT's. Drives, Dials, Complete, Brand new. Offers.—GW3AHK, 153 Old Castle Road, Llanelly, Carm.

EXCHANGE or Sale. H.R.O. Senior, M.C.R.1. with Power Pack etc.; Symmonds Band Pass 300 cycle Xtal filter 465 kc; 2 new 805's, 2-813's, 3-807's, 1-TZ40, 2 IF Transformers 465 kc and 4 at 1700 kc all air trimmed.—Box No. 170.

EDDYSTONE 504 Receiver in new condition, Xtal, Noise Limiter etc. £55 or near offer.—Synge, Ardwyn, Border Road, Heswell.

EDDYSTONE 504 for sale, with speaker, also Eddystone 5-10 converter, offers. Owner going abroad.—Symons, 5/6 Bedford Place, London, W.C.1.

HAMS, the Voltmeter you have been looking for. Ferranti Electrostatic calibrated 0-2000 volts. 3½ in. dial, ideal for the high power rig. Brand new, boxed. Only 21/- each.—G6JQ, Oak Lodge, Wanlip Road, Syston, Leicester.

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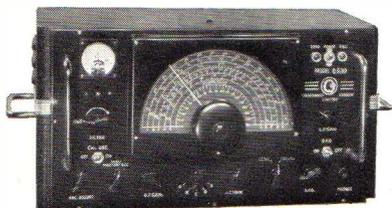
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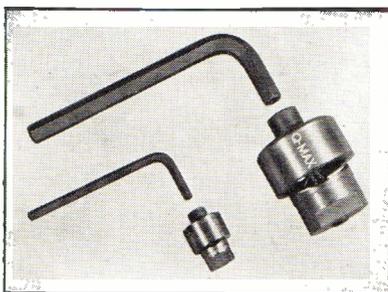
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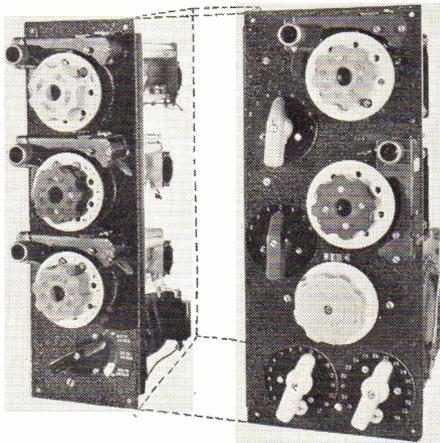


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