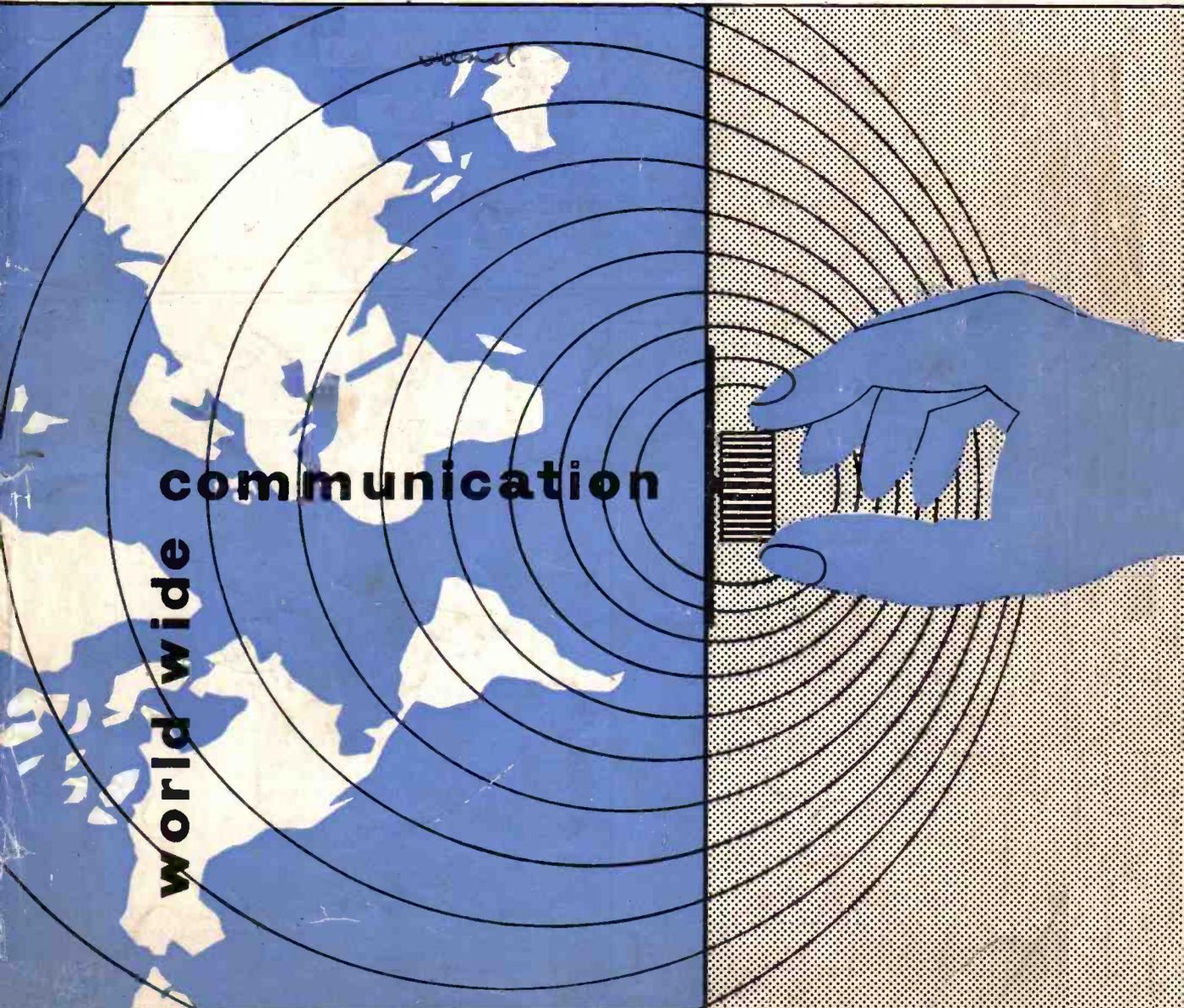


# The SHORT WAVE Magazine

VOL. XVI

APRIL, 1958

NUMBER 2



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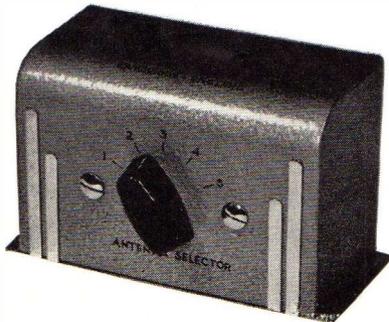
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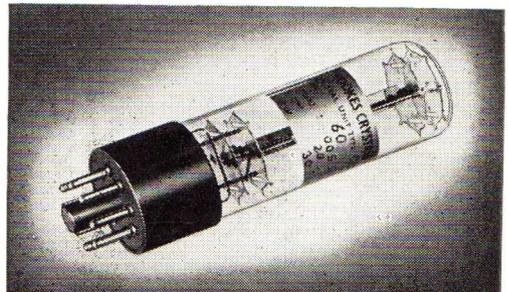
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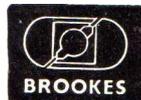
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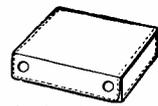
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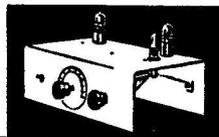
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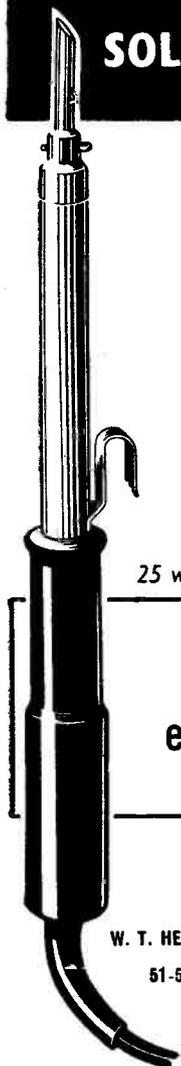
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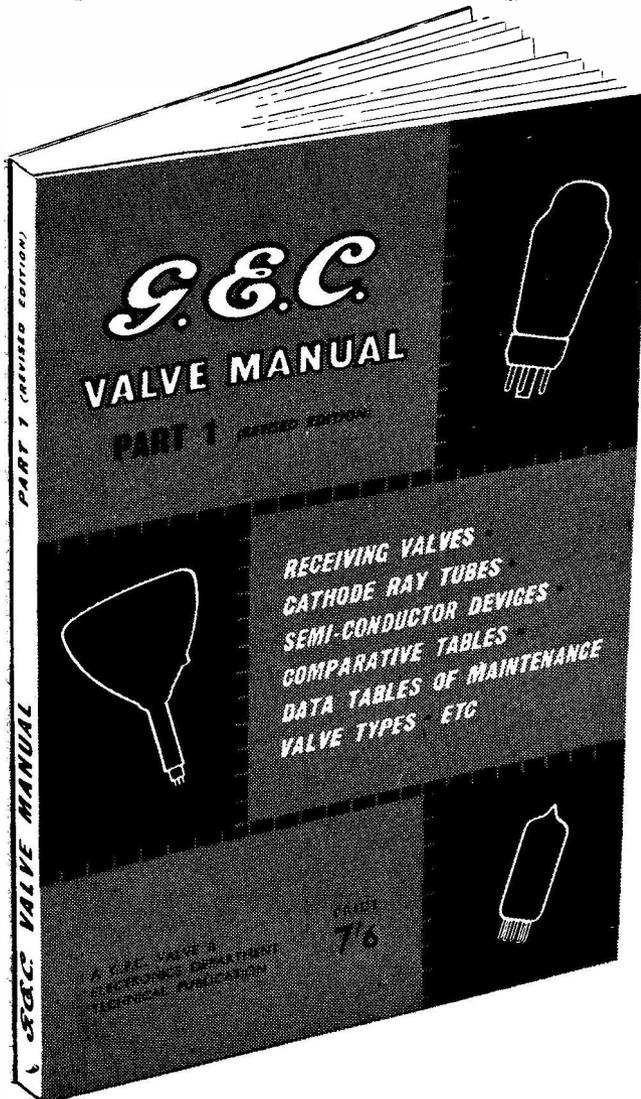
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**Equity** *There is, and always has been, a great deal of confused thinking as to the status of the radio amateur, and how he stands when it comes to considering his share of the ether. Let it be said straight away that — though the ether is free for all to use, subject to reasonable safeguards — there are, nevertheless, “powerful influences” who would, if they could, eliminate amateurs and Amateur Radio entirely, simply because they are amateurs and are there, taking up (so it is said) valuable space in the radio frequency spectrum.*

*But in the last ten years, radio amateurs have become far more potent a force than they themselves probably realise. In the first place, in the world of the West the total of amateur stations far exceeds the total of all other licensed radio stations — civil, commercial, mobile, marine, aeronautical, broadcasting and so forth — put together! In the U.K., we have a virile, and vigilant, Amateur Radio press and an indigenous industry which, though small and still in the early stages of development, is already capable of doing its fair share of export business.*

*While in theory all this could be eliminated by the stroke of somebody’s pen in Whitehall, in practice it would not be quite so easy! In the first place, there are now too many people with too big a stake in Amateur Radio — either as individuals who have invested a lot of money in equipment, or as representatives of those interests, Service and otherwise, who realise the value of radio amateurs in the world of radionics in which we now live.*

*Secondly, to withdraw licences or impound equipment would not in the slightest degree deprive the individual amateur of his vital know-how, which is what keeps the whole fabric of Amateur Radio in being. Nor would it paralyse his essential urge to go on the air. In peace-time, the immediate effect of a wholesale limitation of licences would, one fears, be an outburst of uncontrolled, and uncontrollable, piracy. In war, people will readily accept restrictions they can see to be essential in the public interest. But in peace, they will react violently against regulations which seem to have no justification. To cancel, or seriously to restrict, Amateur Radio licences in peace-time would be analogous to a ruling by, let us imagine, the Ministry of Transport to the effect that there was to be no private motoring on early-closing days because of the congestion on the roads. It would take years to get the cases through the courts!*

*The whole point of the argument is not to throw bricks about, but to emphasise that future allocations for amateurs in the radio frequency spectrum are a matter for reasoned negotiation in the light of their interests and requirements. These are not subject to the diktat of “a somebody in Whitehall” — or in St. Martins-Le-Grand either, for that matter.*

*Austin Foley  
G6FO.*

# Amateur Station Oscilloscope

DESIGN AND  
CONSTRUCTION

A. A. MAWSE

*Our well-known contributor is stirring again. He offers here a very useful piece of test equipment, having many practical applications in the amateur station—what these are, will be explained in a succeeding article.—Editor.*

SOONER or later the serious amateur finds the need for a cathode-ray oscilloscope amongst his test equipment—and there is no doubt that an instrument of this kind is extremely useful, as it makes possible, or at least simplifies, the measurement and observation of a host of electrical functions.

Probably the most usual amateur application is in respect of modulation checks, but there are many other valuable uses. Amongst these may be mentioned receiver alignment; frequency and impedance measurements; amplifier distortion and so on. As in the use of the slide-rule, however, it is necessary for the operator to be familiar with the various applications in order to make the greatest use of the facilities available, and the reader is well advised to read up the material published on this subject, both in *Short Wave Magazine* and in such references as the *A.R.R.L. Handbook*.

The price of a commercially-built 'scope is in many cases beyond the pocket of the average amateur, but the cost of building a perfectly satisfactory and very useful piece of equipment need not exceed more than a few pounds—indeed, it can be less should the station junk-box be of reasonable dimensions. Moreover, the actual work of construction and testing can be of absorbing interest for its own sake.

For the benefit of the uninitiated, the heart of an oscilloscope is a cathode-ray tube, working on electro-static deflection; it can present a "picture" of modest size if cost is a factor—3-inch being quite convenient.

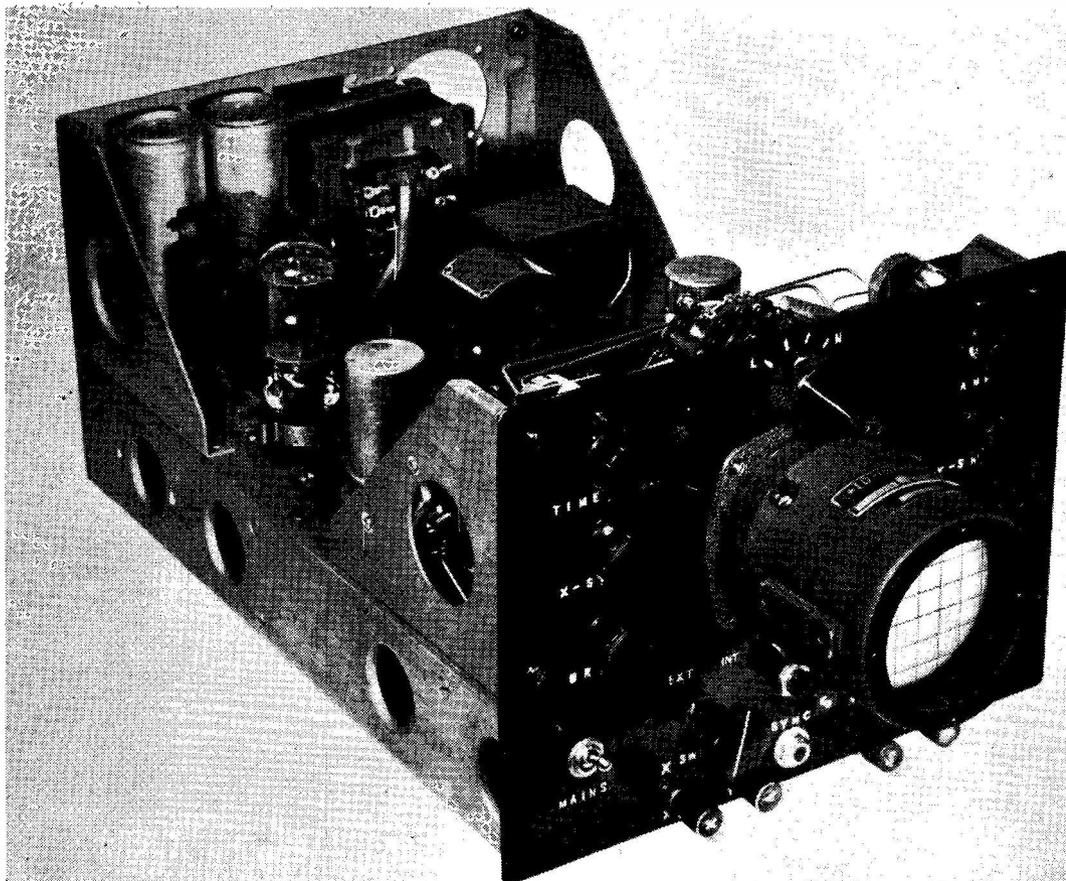
## Tube Action

The basic circuit is shown in Fig. 1. In the simplest terms the stream of electrons emitted by the heated cathode impinges upon the viewing end of the tube, the inside of which is coated with a fluorescent material which glows as the electrons strike it. In their passage

through the tube, however, the quantity of electrons allowed to reach the screen, and consequently the brilliance, is controlled by the degree of negative bias applied to the grid. The action of the first anode, usually operating at moderate positive potentials, can be likened to an optical lens, bunching the electron stream into a narrow pencil-like beam, thus controlling the focus of the spot appearing on the screen. The final anode, running at a high positive potential, accelerates the speed of the beam. Finally, before striking the screen the electrons pass through two pairs of plates arranged in opposition at right angles to each other and known as the deflector plates. These are normally held at the same potential as the second anode and therefore have no effect. But as will be seen from Fig. 1, provision is made for varying this potential as well as for adjusting the potential on the grid and first anode.

Now, if a DC voltage is applied to one or other of the deflector plates, the pencil beam will be correspondingly deflected, by an amount proportional to the voltage applied, and the spot will take up a new position on the screen, which will be off-centre. If, instead of a DC, an AC potential is applied, the spot will move, or oscillate, backwards and forwards across the screen at a frequency corresponding to that of the supply. If the material with which the screen has been coated has a long enough "persistence" — that is, a tendency for the material to fluoresce after bombardment has ceased — and the supply frequency is high enough, then this oscillation appears as a "trace," or straight line of light.

Suppose now that instead of applying mains AC to one pair of plates, we impress a voltage having a "saw-tooth" waveform. As the term implies, that is a voltage which builds up in linear fashion relatively slowly, collapses suddenly in a very short space of time, and then repeats the cycle, all at a steady repetitive rate. Suppose also that we apply this voltage to the pair of plates which will give a horizontal trace on the screen and at the same time a sine wave of the same frequency to the vertical pair; it will be seen from Fig. 2 that the spot will then trace out a graph, or the actual electrical shape, of the sine wave. Since the frequency has been synchronised, the spot will repeat the same trace each cycle and the wave will have the appearance of remaining stationary. Fig. 2 also illustrates, in exaggerated form, the effect of the fly-back voltage. Since this is very much faster, the result on the screen is only a very faint trace, if anything at all. In fact, in the instrument described here provision is



The finished instrument, as described in the text. This Oscilloscope is designed to cover a variety of practical applications, to be discussed in a later article. Standard parts and normally-obtainable valves are used throughout, and the chassis itself is fabricated from a piece of "surplus" apparatus. Considerable latitude is possible in layout and the mechanical design generally; it could be reduced in overall size by the use of miniature valves and components.

made to impress a proportion of the forward-going voltage on to the grid of the CRT, which has the effect of brightening the forward trace, and by contrast very considerably reducing the fly-back trace.

The horizontal plates are known as the "X" plates and the vertical as "Y," after standard graphical nomenclature, and the apparatus producing the saw-tooth voltage is called the Time Base or Sweep Generator. The manufacturer's published data on these CR tubes always include sensitivity figures for the two pairs of plates, usually expressed in *volts per centimetre*; thus, it is possible to determine the degree of deflection voltage applied by direct measurement of the length of trace with a ruler.

There is one further point to remember: Since the deflector plates are normally operated at relatively low voltages with respect to earth,

it is customary to earth the positive end of the EHT supply.

\* \* \* \*

The instrument now to be described has been built by the writer to the general design by G2XX and published as a very excellent article in *Short Wave Magazine* of November and December, 1952. Whilst the present article is complete in itself, those readers possessing these back-numbers are recommended to refer to them for additional detail.

The tube chosen is the 3BP1, a 3in. type giving a green trace of medium persistence, which is still obtainable on the "surplus" market at a very reasonable price. Although rated at 1500-2000 volts EHT, it will give quite satisfactory results at much lower HT, although, of course, the deflection sensitivity figures will then be proportionately reduced.

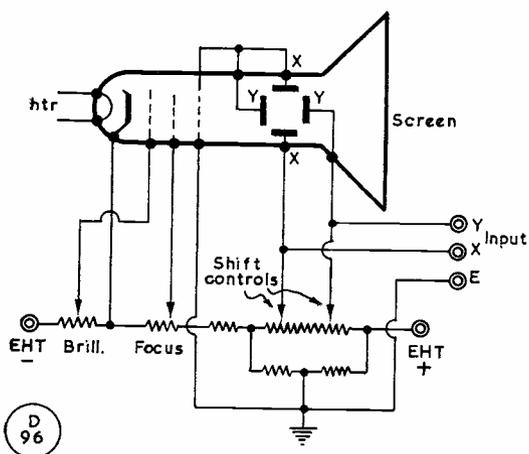


Fig. 1. Essential circuitry for the cathode-ray tube in an Oscilloscope, the final arrangement being as shown in Fig. 7.

### Lay-Out

One advantage of building an instrument of this kind is the great freedom of choice given the constructor as regards layout — so that much existing “surplus” equipment can readily be modified to suit. In the writer’s case, use was made of an odd piece of equipment designated 1D-15/APA-1, which after being operated upon very drastically with a hack-saw, resolved itself into a chassis 15in. by 10in. by 2½in. deep, with a front panel 8in. deep, the whole being enclosed in a louvered case measuring 15in. x 10in. x 8in.

The space available is ample for everything that is required, using octal-based valves, without any serious worries about where to fit in the various components.

The length is also sufficient to accommodate the tube together with its *mu*-metal casing and the mains transformer(s), placed centrally behind the base of the tube. This is quite an important factor because instances are by no means infrequent where distortion of the trace occurs due to the magnetic field of the transformer. For the same reason a *mu*-metal screen should be provided for the tube itself.

Fig. 3 is a guide in plan view to the distribution of the main components, and Fig. 4 the layout of the controls on the front panel. Both these arrangements can be adapted to suit individual requirements, the only point to watch being that of distortion of the trace.

### General Circuitry

The design falls somewhat naturally into several individual and fairly self-contained groups. First, the power supply; next, the CR tube and its associated resistor network

and controls; then the Sweep Generator with its coarse and fine adjustments, and finally the two-stage vertical deflection amplifier. The last two items are best constructed in sub-chassis form, along one side of which a tag-board is provided. This serves as a convenient anchorage for many of the components and as connecting points for the necessary external leads. These sub-chassis should be designed to be adequate in size to accommodate three valves each, together with the associated components, having regard to the amount of space available on the main chassis for their installation. Suitably-sized panels are cut out of the latter and in due course each complete sub-chassis, after being tested, is bolted into the space provided for it, and permanently wired up to the remainder of the circuit. This form of construction is strongly to be recommended as, after all, there is a considerable amount of wiring to be done, and fault finding is greatly facilitated if this is dealt with step-by-step before final installation, when things tend to become somewhat cramped.

We can now deal with the various units in greater detail and in the order of importance.

### Power Supply

The requirements for this are:

- (1) 6.3 volts at 1 amp. for the CRT heater.
- (2) 6.3 volts at 2 amps for the valve heaters.
- (3) 5.0 volts at 2 amps for the rectifier heater.
- (4) 400 volts at about 60 mA for the amplifiers.
- (5) 800-1000 volts at 1.5 mA for the CRT network.

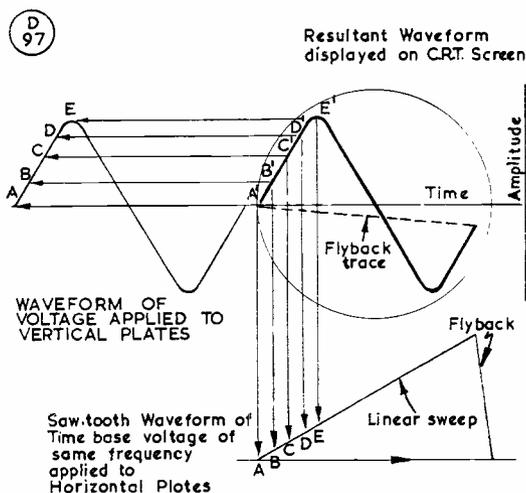


Fig. 2. Showing how a sine wave is traced out on the screen of a cathode-ray tube, when connected into the appropriate circuit. The picture can be made to “stand still” by proper adjustment of the controls.

There may be some difficulty in obtaining one single transformer having this combination of windings and the writer compromised by using a small 6.3 volt 1 amp. heater transformer for the CRT, situating this on the underside of the main chassis immediately beneath the main transformer; the latter consisted of a 350-0-350 volt 100 mA winding together with the remaining heater windings.

Fig. 5 illustrates the power supply wiring from which it will be seen that 400 volts of smoothed DC is made available from the 5Z4G rectifier, and the EHT is provided from the voltage doubling circuit employing two Sentercel K8-40 rectifiers. The filter R2, C8, C9 was found to be very necessary to prevent distortion of the trace due to AC ripple. To check and determine the EHT voltage, connect resistors to the value of the voltage dividing network—about 1.41 megohm—in series with the output terminals and a low reading milliammeter. This should give a reading of somewhere in the region of 0.6 to 0.8 mA, and the actual voltage available can then be worked out from Ohm's Law. The CRT draws virtually no HT current, and if a voltmeter of a type other than an electrostatic one is used to read it, a totally false reading will be given. From the figure obtained, the voltage drop across the various sections of the resistor network can be worked out, and hence the variations possible on the brilliance and focus controls. These should be proportional to the published data, although they are by no means critical. It will be seen that from the same power supply provision is made for obtaining an adjustable source of AC volts (R3) which is used, if required, for calibration purposes. The potentiometer R3 controlling this voltage can be of the pre-set type, mounted conveniently on the main chassis; once adjusted, it need not be disturbed again.

### Front Panel

This is the next point requiring attention, together with the installation of the *mu*-metal screen, tube holder, and the associated resistor network. Note that a number of the controls operate at rather high voltages above earth. For this reason it is desirable to mount the two vertical sets of controls on paxolin strips, held off the front panel with stand-off insulators, and fitted with long-spindled controls which project through holes of ample width in the front panel. As additional precautions, short lengths of rubber tubing (or the outer casing of 72-ohm co-axial cable) are slipped over the spindles to prevent accidental contact

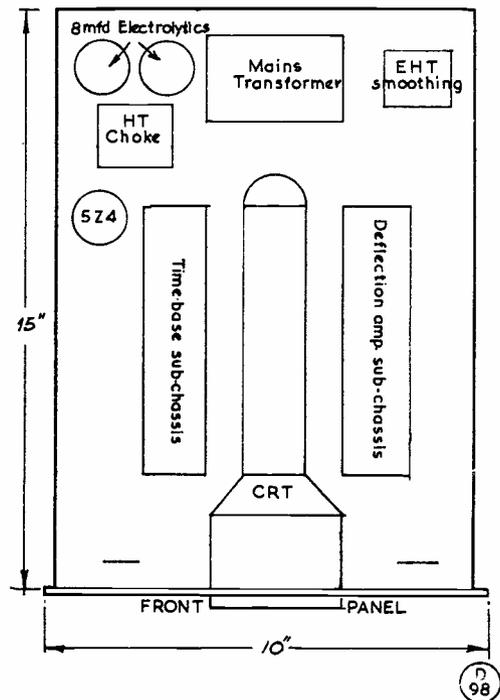


Fig. 3. Main chassis layout (top view) adopted for the Oscilloscope described in the article—compare with the photograph of the finished instrument.

with the front panel; the set-screw holes in the control knobs are plugged with wax to prevent any finger contact.

Proceed with all the wiring, with the exception of the deflector plates, which should be temporarily connected to the second anode. It is now time to test to see if all is well so far. The rectifier valve need not be connected to its socket for this, so long as that circuit has previously been passed. Insert the CR tube into its holder, switch on the mains and standby on the brilliance and focus controls. After a brief period for warming up a spot should appear on the screen, and it should be possible to reduce this almost to *nil* by manipulation of the brilliance control, or get it focussed into a clearly defined spot with the aid of the focus control. It should be centrally placed on the screen and round in shape. If it is distorted, the indications are that there is interaction from transformer windings or AC wiring. The latter should, in any case, be kept well to the corners of the chassis, and if needs be the wiring will have to be run in earthed shielded cable. In bad cases it may even be necessary to try altering the alignment, or the placing of the mains transformer(s) to neutralise any field. Be careful *not* to retain a bright spot on the screen

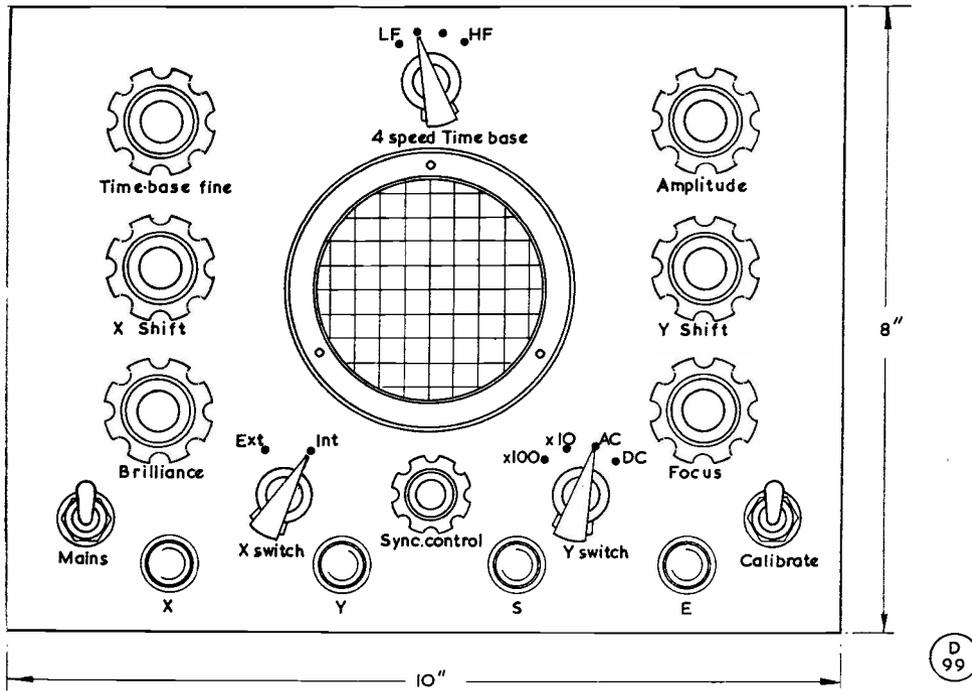


Fig. 4. Front panel layout adopted by the author for the instrument described in the article. On a panel 10 ins. wide by 8 ins. deep, the knobs can be arranged symmetrically round the tube face, and placed for convenient operation. The experienced constructor need not be bound by this layout, which can be varied to suit individual convenience, or the panel and chassis that may be available

for any length of time, or else burning of the latter may result. Assuming that all is well so far, complete the wiring of the X and Y plates to the shift controls. In this connection make sure that each pair of ganged potentiometers work in opposition—that is, that whilst one plate of a pair receives an increasing

potential, the opposite one receives a potential of opposite polarity. Check the working of the tube once more and see whether the shift controls operate in a satisfactory manner. It should now be possible to place the spot anywhere on the screen, by adjustment of these two controls.

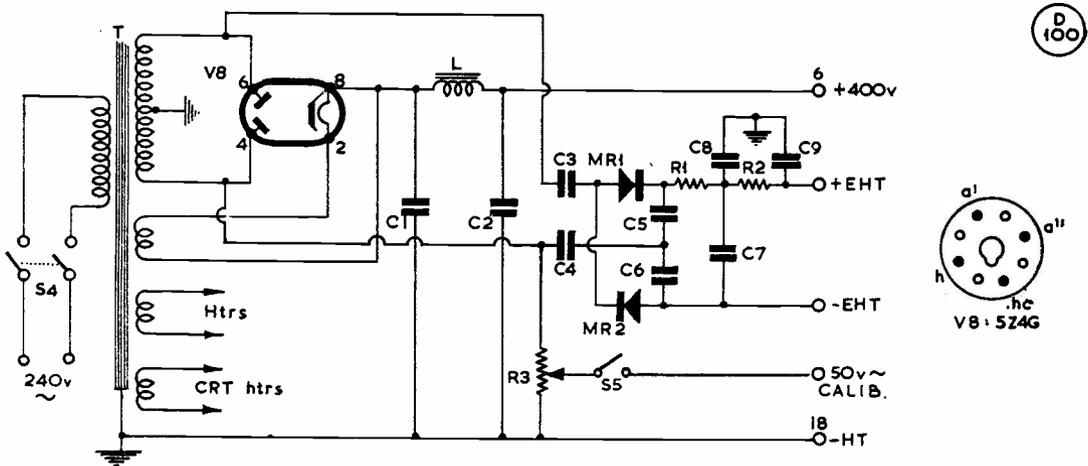


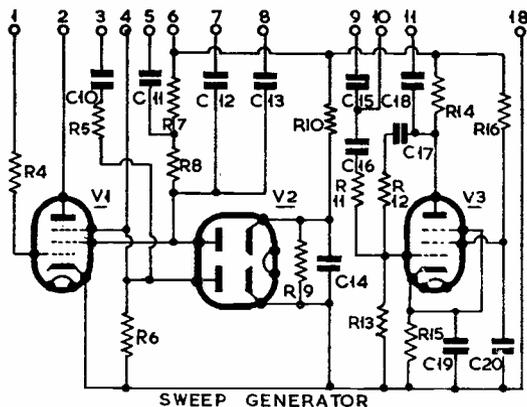
Fig. 5. The power supply section for the Oscilloscope, built as a separate unit. The R3, S5 combination provides a 50-cycle calibration voltage, and the tube EHT is derived from metal rectifiers, R1, R2, being the smoothing resistors. All values are given in the table opposite.

**Table of Values**

Fig. 6. Sweep Generator and Deflection Amplifier

C10, C14,	R5, R6,
C15, C18,	R16, R25,
C21, C23,	R32 = 110,000 ohms
C26, C28,	R7 = 10,000 ohms
C30, C32 = 0.1 $\mu$ F 450v. paper	R8, R19,
C11, C16,	R23, R30 = 30,000 ohms
C17, C24,	R9 = 47,000 ohms
C27	R10 = 120,000 ohms
C29 = 0.01 $\mu$ F mica	R11, R12,
C12 = .001 $\mu$ F 500v.	R13, R17 = 1 megohm
silver mica	R14, R20,
C13 = 300 $\mu$ $\mu$ F 500v.	R27 = 27,000 ohms
silver mica	R21, R22,
C19 C22,	R26, R29 = 270,000 ohms
C25, C31 = 25 $\mu$ F 25v.	R28 = 240,000 ohms
electrolytic	V1, V3,
C20 = 0.25 $\mu$ F 450v.	V5, V6 = EF50
paper	V2 = 6H6
R4, R15,	V4 = 6C5
R18, R24,	
R31 = 2:0 ohms	

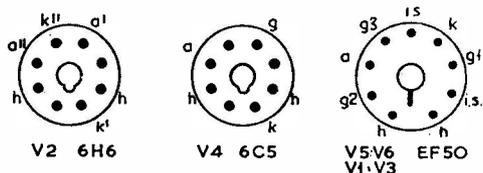
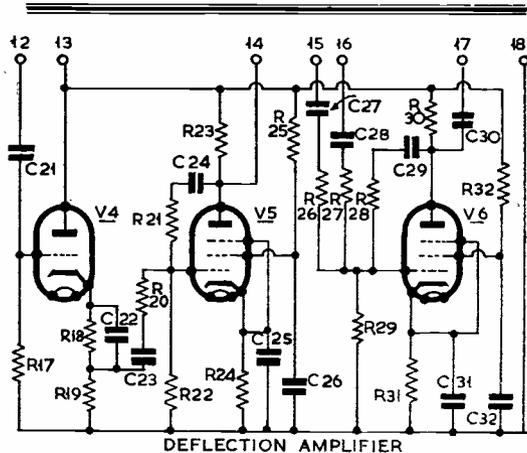
(Note: All resistors rated  $\frac{1}{2}$ -watt)



**Sweep Generator**

This comes next in order of importance and it consists of a Miller-transitron oscillator, Fig. 6, having four speed ranges of approximately 16 to 200 c.p.s.; 160 to 2000 c.p.s.; 1600 c.p.s. to 20 kc; and 16 to 200 kc. Each range is selected by means of the 3-pole 4-way wafer switch on the front panel. Fine adjustment over the whole range is obtained by means of the potentiometer control, R33 in Fig. 7. A double diode, V2, is included, the function of which is to assist in stabilizing the fly-back period, and to prevent variation in the brilliance of trace, and a paraphase amplifier, V3, which provides symmetrical time base deflection and shift voltages, which is of value in preventing or minimising deflection defocusing. Provision is also made for the introduction of a synchronising external voltage, fed to G3 of V1 in Fig. 6, and also for switching out, by S2 in Fig. 7, the internal time base should the X-plates be required for external application. The amplitude control is R38 in Fig. 7.

The top section of Fig. 6 shows the wiring of the whole of this sub-chassis unit, from which it will be seen that 12 wiring points are brought out to the tag board for subsequent external connection. These points are num-



(D 101)

Fig. 6. These important units are constructed on small sub-chassis, and can be fitted after testing through. The top diagram shows the sweep generator, and below is the deflection amplifier. The inter-connecting wiring and control switching are given in Fig. 7.

**Table of Values**

Fig. 5. Power Supply for the CRO

C1, C2 = 8 $\mu$ F 450v.	R3 = 500,000 ohms,
electrolytic	variable
C3, C4 = 0.05 $\mu$ F 500v.	MR1, /
mica	MR2 = Sentercel type
C5, C6 = 0.1 $\mu$ F 600v. mica	K4-80 rectifiers
C7 = 0.25 $\mu$ F 2000v.	T = see text
mica	L = 5-10 Hy. smooth-
C8 = 2 $\mu$ F 450v. paper	ing choke
C9 = 0.5 $\mu$ F 450v. paper	S4 = DP on-off toggle
R1 = 47,000 ohms, $\frac{1}{2}$	switch
watt	S5 = SP on-off toggle
R2 = 220,000 ohms, $\frac{1}{2}$	switch
watt	V5 = 5Z4G

bered and correspond to those given in Fig. 7, which covers the front panel wiring. It is now possible temporarily to connect these 12 points, and to test out the correct functioning of the time base. To do this, switch on the calibration voltage and adjust its control until a vertical trace covering about two-thirds of the screen is obtained. With the time base valved and connected for internal operation, a rapidly changing pattern will be seen on the

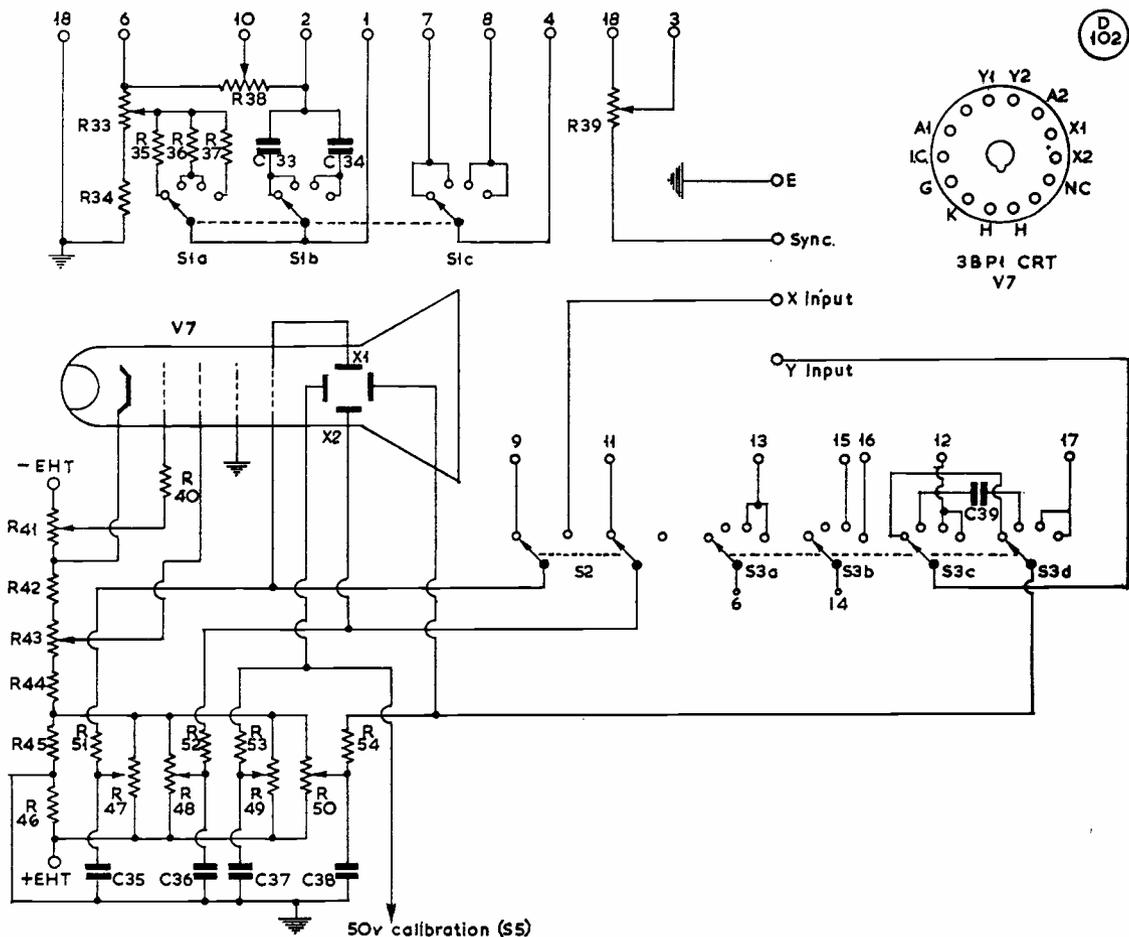


Fig. 7. Diagram of the connections to the CR tube itself, with all control switching. The numbered points refer to the inter-connection between the various units of the assembly, the general appearance of which is shown in the photograph. The tube used is a commonly-available "surplus" type, 3BP1, with a three-inch face.

screen, becoming more complex and less distinct, the greater the speed. At certain speeds, also, it is probable that a high-pitched audio whistle will be heard from one of the condensers. On the lowest speed setting, and by careful adjustment of the fine control R33, it should be possible to bring the pattern to a standstill and to observe the sine wave shape of the calibrating voltage. Once satisfied that this is working correctly, remove the temporary connections, instal and bolt down the unit in its final position, rewire permanently — and just check again that it still works !

### Deflection Amplifier

We are now coming towards the end of our labours. This amplifier follows G2XX's original recommendations and consists first of a cathode follower, V4, leading in to two

### Table of Values

Fig. 7. Switching and inter-connection

C33 = 500 $\mu$ F 500v. silver mica	R42 = 166,000 ohms
C34 = 50 $\mu$ F 500v. silver mica	R44 = 360,000 ohms
C35, C36, C37, C38 = 0.5 $\mu$ F 500v. paper	R45, R46 = 500,000 ohms
C39 = 0.1 $\mu$ F 500v. paper	R47, R48 = 2x2 megohm ganged variable
R33 = 2 megohm variable	R49, R50 = 2x2 megohm ganged variable
R34 = 86,000 ohms	R51, R52, R53, R54 = 2 megohm
R35 = 10 megohm	V7 = 3BP1 cathode ray tube
R36 = 1 megohm	S1 = 3p. 4w wafer switch
R37 = 100,000 ohms	S2 = 2p. 2w wafer switch
R39, R43 = 500,000 ohms variable	S3 = 4p. 4w wafer switch
R40 = 10,000 ohms	
R38, R41 = 50,000 ohms variable	

(Note: All resistors rated  $\frac{1}{2}$ -watt)

resistance-coupled amplifiers, V5, V6, both designed to provide a gain of 10. Thus with the aid of the 4-pole 4-way wafer switch, S3,

Fig. 7, the input to the Y terminal can be arranged for either DC or AC, and for gains of 10 and 100. The lower half of Fig. 6 gives the circuitry and in the same manner as the Time Base, connections are brought out for tying-in with the remainder of the wiring. And as previously these numbered connections correspond to those given in Fig. 7. This sub-chassis should be temporarily connected in the same manner as for the Time Base and checked for correct operation by applying a small known voltage to the Y plate and measuring the gain obtained by means of a ruler, with the control switch in the different positions.

### General

There is no doubt that the over-all size of the instrument could be almost halved by the use of miniature valves and components. There is no reason why this should not be done using valves of the appropriate replacement types.

### BRITISH AMATEUR LICENCES IN GERMANY

The British authorities having surrendered their right to issue DL2 licences to Service personnel (and British civilians entitled to a DL2 permit by virtue of holding a U.K. licence), this right will in future be exercised by the German Bundespost (corresponding to our G.P.O.). Thus, holders of U.K. permits will be issued with *German* licences, and must give a written undertaking to observe the *German* Amateur Radio regulations. There are two types of DL licence: Class-A, 20w. anode dissipation in the PA, and Class-B, 50w. Either licence costs Dm.1 on issue, plus Dm.24 for the Class-A, and Dm.36 for the Class-B, annually. (The current exchange rate is roughly Dm.12 to the £ sterling.) A concession made by the Bundespost to German amateurs is that fees may be paid monthly, in advance.

British personnel, Service or civilian, in Germany who do not possess a U.K. licence can qualify by

But on the score of cheapness the larger size was chosen as most amateurs (the writer included) have a much larger selection of the octal-type valves to choose from, and it seems as good a way as any of putting them to work! Both the 'scope and the appearance of the finished instrument can be improved by fitting a suitable graticule to the front of the screen. These may be obtained in celluloid, finely ruled, and very cheaply from advertisers in these pages. They can then be cut to the correct diameter with a pair of scissors and fitted to the front of the tube.

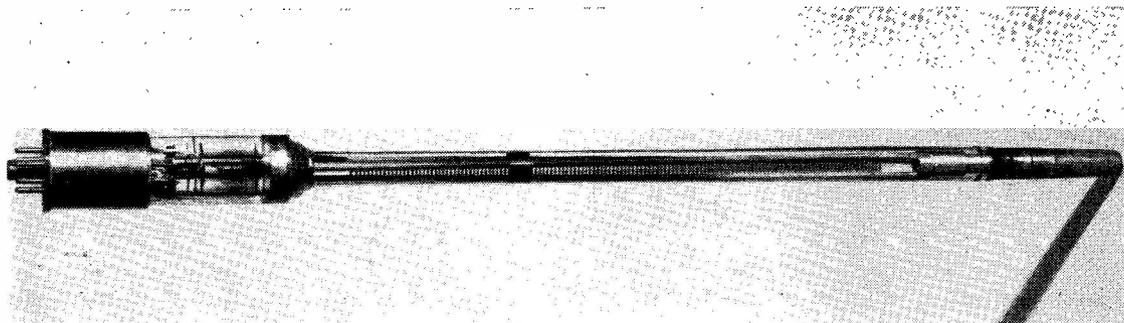
In conclusion, the writer would like to pay tribute to G2XX for saving him a great deal of trouble in having to work out laborious circuit details, and for the inspiration to build a most interesting and satisfactory piece of equipment.

It is hoped in a later article to deal in some detail with the practical application of this particular instrument in the amateur station.

taking the usual R.A.E. of the City and Guilds; this will be accepted *in lieu* of the German radio amateur examination. Enquiries concerning DL2 licences should be addressed to: The Secretary, Joint Communications-Electronics Board, c/o Headquarters, British Army of the Rhine, B.F.P.O. 40, Germany. We are indebted to DL2UY for having forwarded this information.

### COURSE IN HI-FI

We are asked to announce that a Course of 10 lecture-demonstrations on various aspects of High Quality Reproduction has been arranged by the Northern Polytechnic. The lectures, followed by discussion, will be given each Tuesday evening, 6.30 to 8.30 p.m., commencing on April 29. Full details are available on application to: J. C. G. Gilbert, Department of Telecommunications, Northern Polytechnic, Holloway, London, N.7.



A new type of valve, of which we shall hear much more in the future — the G.E.C. (M.O. Valve Co.) Type TWS-1 travelling-wave tube, which gives an output of 38 watts, with a power gain of 26 dB, in the 1500-3000 mc frequency range. The TWS-1 is convection-cooled, and is suitable for broad-band amplifiers.

# A Simple CO-PA Circuit

FOR PHONE AND CW ON  
FORTY

**T**HE diagram shows the circuit arrangement for what is probably the simplest efficient low-power transmitter for 40-metre operation, CW and phone.

A crystal oscillator V1, using an EF91, drives a PA, V2, which is a 6AQ5; since there are no tuned circuits, other than L1 in the PA, there is no possibility of any self-oscillation. The transmitter can only work if the crystal takes off correctly. For CW, the key goes in the cathode of the PA, at J, at which point total PA current can also be measured. A pi-section tank circuit is used in the RF amplifying stage.

## Modulation

For telephony, the switch assembly S2 brings in the modulator, and S1 the (carbon) microphone. Do not sneer at carbon microphones! The crystal type is undoubtedly better from the quality point of view, but would require far more LF amplification, while the carbon species is capable of quite acceptable speech quality if carefully used—and this transmitter is not, in any event, offered as anything more than a useful practical arrangement for talking round the U.K. And if you are a good operator (and have a good aerial) you may work European stations as well.

The system of modulation is what used to be known as "choke control"—it is still employed in commercial broadcast transmitters. In our circuit, on phone the audio choke LFC is common to both PA and modulator valves; the latter is also a 6AQ5, and is connected through the switching S2A-S2B to modulate on the plate and screen of the PA, V2. While over-modulation is almost impossible with this circuit, under-modulation is likely unless there is plenty of swing at the grid of V3. This is affected not only by the ratio of the microphone transformer T, but also by the excitation of the microphone, *i.e.*, the voltage on it, and therefore the current through it. (The vigour with which the microphone is addressed is also a factor!).

To adjust the transmitter for phone working, the first thing to do is to find out what it is actually radiating. The best way to do this is to tune in the *second harmonic* on the receiver, *i.e.*, the 20-metre signal, using headphones.

Adjust the receiver so that the transmission is at a comfortable headphone level and listen to the modulation and the quality of the transmitted speech; switch in the BFO, and judge how much of the carrier is "filled with speech."

What one aims for is a transmission in which only the HF and LF edges of the carrier can be heard as the receiver is tuned through it with the BFO on, while speaking. Anything more than this is over-modulation; anything less, and the transmitter is under-modulated.

If the microphone sounds noisy, reduce the excitation voltage. If the speech is only just above a whisper at carrier zero-beat, increase the microphone voltage and/or the ratio of transformer T—or talk louder at the microphone.

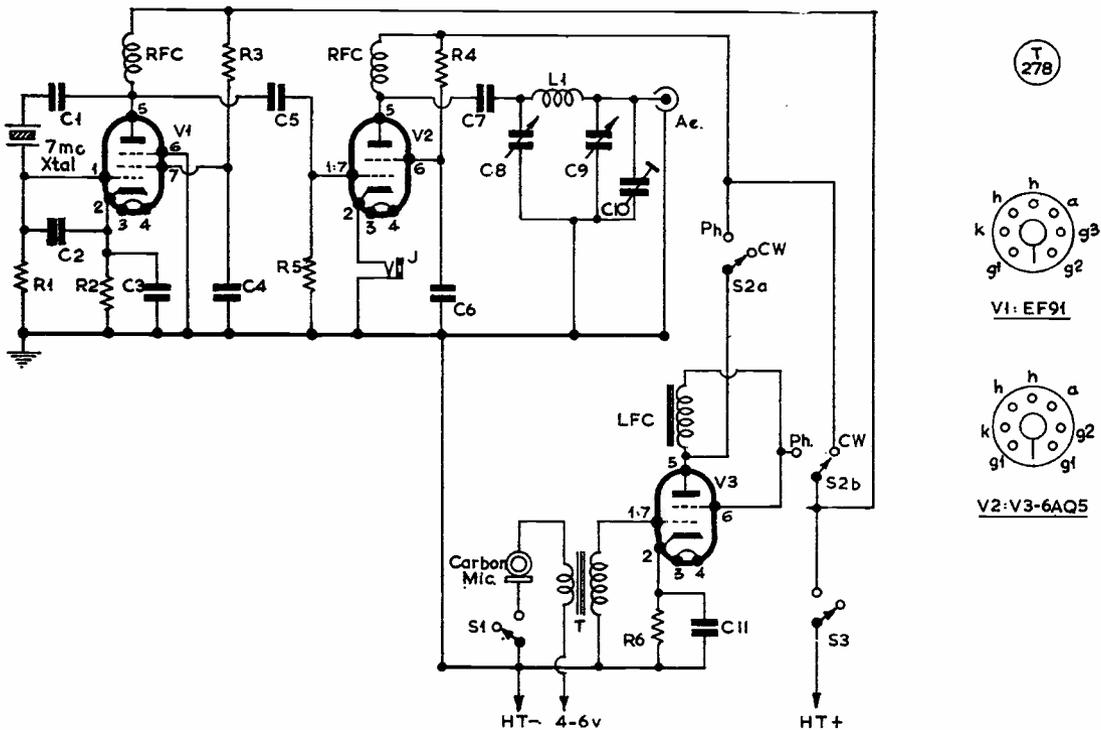
Should it not be possible to get enough modulation by these adjustments while using a natural speaking voice at the microphone, there is one other thing you can do: Put a resistor of 5-10,000 ohms, rated 5 watts, in series with the lead between the arm of S2A and the junction of LFC with the plate of V3; this resistor should have a condenser of at least 2  $\mu$ F in parallel with it.

The effect is, of course, to reduce the voltage on V2, and hence the power in that stage; this automatically increases the modulation capability of V3, and the depth of modulation will be increased considerably. (This is not a case of "ninepence for fourpence," however, for the increased modulation is very definitely at the expense of some carrier power). The values of the series plate resistor and the microphone energising voltage can then be experimented with until the desired "carrier full of speech" (but not too full) is obtained. Without the resistor-condenser combination in the plate of V2, about 60% modulation should be obtainable.

## CW Working

Switch S2A-S2B is moved to CW, the key plugged in at J and, on monitoring the signal (again, on the 20-metre harmonic) the note should be clean, sharp and steady. In the monitor, or receiver, a "spacer" will be heard—that is, the pick-up from the crystal oscillator direct. This will probably not be radiated very far; distant stations will not hear it at all, and it may even be inaudible to the locals.

The transmitter can be run from a well-smoothed HT supply of 200-250 volts capable of supplying at least 80 mA; the PA input will be found to be about 6-7 watts for full modulation.



Circuit of the CO-PA CW/Phone transmitter discussed in the text.

**Aerial System**

Fully to describe aerial systems suitable for this transmitter hardly comes within the scope of this article, but it can be said that the design shown on p.568 of the January 1957 issue of *Short Wave Magazine* will work very well with it. An alternative, and simpler, arrangement is a 99-ft. length of wire, measured from the transmitter to the far end. This will ensure matching at low-impedance (current feed) for which the pi-section coupler is best suited. To tune up the rig, an RF meter reading 0.0-0.5 amps should be put in series with the aerial, near the transmitter terminal, and condensers C8,C9 carefully adjusted for maximum aerial current; the setting of C9 is, of course, dependent on C10, which is a "semi-variable" capacity; that is, it is set at some value which, with C9, enables resonance tune to be obtained on C8 at maximum aerial current.

Construction? Well, this being a description of a circuit which is as "sure-fire" for small transmitters as almost anything can be, all that need be said is that the circuit can be built up on a small box chassis, with the parts laid out and the wiring done to follow the circuit diagram. The jacks and switches can be along

**Table of Values**

For the CO-PA Phone/CW Transmitter above

C1 = .005 $\mu$ F	RFC = 2.5 mH RF choke
C2 = 50 $\mu$ F	LFC = 10 Hy., 100 mA choke
C3, C4, C6, C7 = .001 $\mu$ F	T = 40:1 mic. xformer
C5 = 50-100 $\mu$ F	S1 = SPST toggle, mic. on-off
C8, C9 = 100 $\mu$ F, variable	S2A-S2B = DPDT toggle, CW on-off
C10 = 100 $\mu$ F, semi-var.	S3 = SPST toggle, main on-off
C11 = 50 $\mu$ F, 25v. elect.	Xtal = 7 mc crystal
R1, R3 = 47,000 ohms, $\frac{1}{2}$ -w.	Mic. = Carbon microphone
R2 = 150 ohms, $\frac{1}{2}$ -w.	J = Key and meter jack
R4 = 15,000 ohms, 1-w.	V1 = EF91
R5 = 20,000 ohms, 1-w.	V2, V3 = 6AQ5
R6 = 400 ohms, 1-w.	
L1 = 24 turns 18g. spaced wire diam. on 1-in. former	

(Note: Except C11, all fixed condensers can be Cascaps, or similar miniature type).

the front drop, and the variable condensers either mounted above the chassis, with the coil across them, or the coil can be underneath, with the condensers along the side drop of the chassis. HT/LT inlets and the earth connection can be along the rear chassis drop, and the crystal in its holder mounted either above chassis, or on the side drop opposite the PA end.

Your receiver will soon tell you whether the rig is working or not, the first test being to make sure that the crystal not only oscillates freely,

but picks up immediately the transmitter is switched on. Do not attempt to resonate the PA until the CO is functioning properly; V2 can be held dead by putting a blanking plug

into its cathode jack, which will cut off plate current and safeguard the valve. There should be a good dip in PA plate current when the CO is driving and resonance tune is found in V2.

## An 8-foot Aerial for all Bands

VERTICAL SYSTEM FOR THE  
RESTRICTED LAYOUT

J. D. PEARSON (G3KOC)

*This is another of those ingenious approaches to the aerial problem where there is just no space for a horizontal span. There is no reason why results should not be at least as good as with a resonant whip of equivalent length.—  
Editor.*

THIS article is offered in the hope that it may be of interest to those in the same situation as the writer, whose chances of erecting any sort of horizontal wire out-of-doors are precisely *nil*. The basic idea of the aerial described here is certainly not new; many amateurs, it seems, have had thoughts along similar lines at some time—based, of course, on the principle of the loaded whip. At G3KOC the idea had to be crystallized into reality with some urgency when the transmitter was re-installed at the home QTH after a period of working /A with a 300ft. long-wire!

The first essential was a radiator which would provide sufficient inductance and self-capacity to present a reasonable load on the pi-output circuit of the transmitter on 160 metres, to enable G3KOC to rejoin the local phone net on that band. The most obvious solution—a loaded whip—was rejected for the simple reason that no whip type of aerial was immediately available. The only wire to hand in any quantity was a coil of 3/.029 VIR of the sort used by electrical contractors where the cable has to be run in conduit.

As there is no mast at G3KOC it was evident that whatever aerial was evolved would have to be suspended from a point just below the eaves of the house (and consequently quite near to the wall) giving an overall space in the vertical plane of only 20ft. It may be noted here that the actual aerial as finally produced is only 8ft. long and works all bands 160-to-10 metres!

### Dimensions

An ordinary clothes-line was soaked in creosote for about 24 hours and then left out in the open for a couple of days to "weather." It was then hung up horizontally between two convenient support points which happened to be about 4ft. 6in. above the ground. These points can be any distance apart providing they are greater than about 10ft. The important thing is to have the rope absolutely taut before winding is commenced.

The coil of 3/.029 cable was next unwound in a straight line to the extent of about 25 paces. Next, 60ft. exactly was measured off, *but not cut* and a piece of insulating tape stuck on as a marker. A further 6ft. was then measured off (this will form the "lead-in") and another piece of tape stuck on. (Keep the side-cutters in your pocket, they are not required yet!)

The whole measured length, with markers at the 60-and-66ft. positions, was then rewound on to the spool; a few inches were left free to enable winding on to the rope to be commenced. After securing this free end of the spool of cable to the rope, winding was accomplished by rotating the spool around the rope, whilst at the same time allowing the rims of the spool to rest on the rope. After a little practice this method ensures that an even and maximum tension is maintained throughout the winding process.

On reaching the first marker—tape the winding is made secure; the spool is then unwound to the second marker and the cable finally clipped off at this point with the side-cutters.

The piece of rope on which the aerial is wound was then cut to leave just sufficient at either end of the cable to permit of securing to egg insulators. Although the winding is close-spaced the thickness of the insulating material on the 3/.029 cable gives a resultant conductor spacing of approximately one diameter. The writer was surprised to find that the 60ft. of cable when close-wound occupied a winding-length of less than 8ft.

The foregoing explanation of the *modus operandi* may appear to be rather superfluous but is offered as being ultimately the quickest way of making a tedious job somewhat less irksome. Having made the aerial it is mounted

as shown in the sketch—or in some such similar manner.

### The ATU

Like the aerial, the ATU is a lash-up affair but, as with the aerial, appears to function very well so has not been modified. It utilizes the auto-transformer principle, and is fed with 80-ohm co-ax direct from the pi-output circuit of the transmitter. The variable-condenser C1 is a 250  $\mu\mu\text{F}$  "surplus" item and the coil L1 is the aerial loading coil taken from an 80-metre Command Transmitter.

The dimensions for L1 are as follows: 45 turns of 26 SWG tinned copper wire, spaced one diameter to a winding length of approximately 3ins., on a 2in. diameter ceramic former.

The same coil and condenser combination can be used on *all* bands due to the principle of operation, eliminating switching and coupling coils. The only variable factor (apart from the condenser, of course), is the aerial tap. For 160-metre operation this should be positioned at the "hot" end of the coil, *i.e.* so that the whole of the coil is in circuit. For 10 metres the tap should be made some three or four turns "up" the coil from the tap formed by the centre conductor of the co-ax (*see* sketch). The other bands, of course, will require the aerial tap at various intermediate positions.

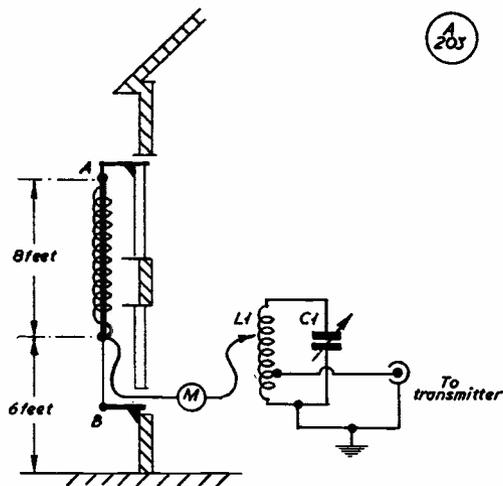
### Bandchanging

The transmitter at G3KOC is bandswitched 160-10 metres and is never run at an input greater than 25 watts, with a power reduction to 10 watts on 160 metres. The variable condenser in the ATU is fitted with a direct drive knob scaled 0-180 degrees. If the dial readings of the three controls are noted for each band (that is ATU, PA tuning and PA loading) band changing can definitely be accomplished in a matter of seconds. This facility was found most useful for obtaining rapid checks on the transmission on various bands, when testing the aerial described.

### Results

After about 12 months' operation on all bands, the writer feels confident he has found what must be the smallest multi-band aerial having some measure of efficiency that one could hope to achieve. It would be possible to quote numerous call-signs referred to bands used and reports received, but a general statement must suffice.

On 160 metres, S9 reports are regularly obtained during daylight within a radius of 25 miles, in spite of the fact that the aerial is



The G3KOC multi-band aerial system, as described in the text. Its construction is explained in the article, and resonance can be obtained on all bands from 160 to 10 metres; the RF meter should be an 0-0.5 amp thermo-couple, and A and B are two brackets fixed into the brick-work beside the window. The general arrangement is well worth a trial by those who have no space for any sort of horizontal aerial.

completely screened to the west by the house. During darkness contacts up to 200 miles have been made on CW.

Approximately 150 inter-G and European contacts have been made on 80 and 40 metre CW during the test period. In particular instances (UA1 and UQ2) better and more consistent reports have been received than were obtained with the 300ft. long-wire! As might be expected, as with any aerial of this type it does perform exceptionally well on one particular band—in this case 20 metres. To quote just one example: At 0030 GMT one morning W4FU was overloading the writer's receiver with a CQ at 599+, and naturally was called by most of Europe and a number of Asian stations. After listening for a short time and discovering that he was in Kentucky (a State from which the writer has not yet managed to obtain a card) he was given a quick two-by-two call and came back immediately with a report of 579! Considering the highest point on the aerial is only 14ft. above ground, that it is only 6 inches away from the house wall and completely screened in that particular direction, and that the transmitter input was only 25 watts, this result seemed most encouraging.

On 21 mc CW, a short test was conducted with OH6OH, the aerial as described here being given as one S-point down on the report obtained using a 15-metre indoor dipole as a

direct comparison. On 10 metres, the first QSO was with W6KNM, from whom an S7 report was obtained.

### Some Further Points

It is, naturally, not suggested that this aerial—christened by the writer the “Multi-Midge”—will equal the performance of orthodox types erected at correct heights. He is, however, convinced that for those un-

fortunates who, like himself, lack space or require a radiator for all bands entailing the minimum effort in band-changing, the suggestions made here are certainly worthy of consideration. The basic idea could be pursued further by mounting, say, a 12ft. mast at chimney-stack height wound with 138ft. of wire (including downlead), with the knowledge that it should be possible to improve considerably on the results obtained at G3KOC.

## HISTORY IN A SHOE-BOX

NOSTALGIA FOR OLD TIMERS

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

NOTHING is more certain to hold up the spring-cleaning of the shack than the discovery of a large cardboard box full of pre-war QSL cards. The old joke, beloved of humorous artists, of the housewife on hands and knees reading an old newspaper at the bottom of a drawer, was probably invented long before the QSL card, but how true it is—the past seems much more interesting than the present at such times.

So here we were, with a few thousand QSL's dating from 1923 and running up to the late 'thirties, simply asking to be examined, and what could we do? Spring cleaning is still in abeyance, the spiders crawl about undisturbed, and History wins the day.

### The Home Stations

The very large batch of G and “pre-G” cards comes first, and we note the red penny stamps (or even green halfpenny ones) on nearly all of them. Yes, you could mark them “Printed Matter” and get away with halfpenny postage in those days.

Sad to relate, the U.K. cards revealed a depressing number of Silent Keys, starting with the original G2AO (Owen Relly, of Eastbourne) and finishing up with GM6LS (Ralph Bloxam, of Edinburgh, who was 5LS back in 1922). In between these two were no fewer than 22 cards from old friends no longer with us.

However, there were some hundreds who are still not only with us but very active indeed—and, of course, the only calls concerned are of the two-letter variety, for this box was strictly pre-war.

Most of the cards showed very complete details of the equipment; in the early 1923's they invariably quoted the input in volts and milliamps! The great majority of stations were then licensed for only ten watts, but some of the fortunate ones managed to obtain special high-power licences for 50, 100, 250 and even 500 watts. Success bred success in those days, and a Trans-Atlantic contact would possibly lead to a high-power permit and the loan (or gift) of a large “bottle” from one of the well-known manufacturers.

### Power Inputs

Thus we find the redoubtable 2KF (first across the Atlantic in 1922) using, according to his QSL, an 0/150 valve with 1500 volts at 75 mA, with an aerial current of “1 to 2 amps.” on 110 metres. He, of course, is still active, as is G2LZ, who went one better with an 0/250 and 1400 volts, 100 mA—on 100 metres!

G2UV, who started all this QSL business in the first place, announced on his card of March 2, 1924, that he was using “10 watts of tonic train” (ICW to you!) But he also ran CW with 40 volts of dry cells on 200 metres. A later card indicated that he had gone QRO with 300 volts of dry cells.

In 1927 G6MN boasted “17 watts of pure DC” and an aerial current of 0.2 amps. on 45 metres—but two years later he was running 2000 volts at 150 watts, from a generator. Our own note, we observe, was reported on his card as “AC, T9”!

G6WG, then in Scotland but a plain G all the same (he is now a GI) derived his power from 250-volt DC mains. These were a convenient source of supply for many of us, but there were some queer notes about, since no one bothered to smooth the incoming DC. Even queerer was the note from a TVT Unit, which was a thousand-volt transformer with a vibrator in the primary—a sort of glorified Ford coil. G6XG was using one in 1924 . . . he was Don Knock, and has been VK2NO for many years now.

G6YQ, still a keen DX-chaser, seems to have had access to 800 volts of 500-cycle chemically-rectified AC in 1926. Furthermore, he told us on his card that we had “a back-wave like bubbles popping”—but these did *not* come from chemical rectifiers, as we didn't even have AC laid on in those days.

We could ramble on at length about power supplies and inputs, but there is more of interest.

### Aerials and Earths

In the days when one could buy 100 feet of 7/2 stranded copper for about 1s. 3d., there was no need to be economical about the aerial department. A certain G2SH propounded, in public, his theory that “the less sky visible from the garden, the greater the DX worked,” and so we find masts groaning under the weight of “twins,” cage aerials, sausage aerials, fans and all sorts. Here, for instance, is G6NF (1926) with a four-wire cage, 4-in. ebonite rings, 80 feet long and 56 feet high, and a 6-wire fan counterpoise, 80 feet long and 10 feet high (and all written

out in full on his QSL card).

G5XD was in Douglas, I.O.M., without an exotic prefix, and described his aerial as "60 by 40," which would mean something quite different to-day. G6CJ seems to have had an aerial farm even in 1926, but on "10-50 metres" he used "10-ft. vertical and 10-ft. vertical counterpoise." Perhaps he can now tell us how this wide-band gadget used to work?

And who remembers G6PG, the man with the Underground Aerials? He used to get out with them, too, and his 1925 QSL says the one in use was 70 feet long and buried 18 ins. The "earth," by the way, was a water main. And, of course, we had G6UV, describing his earth as "Three Rounds round grounds." This does *not* mean a spiral of wire all round the estate, but implies three "buried devices," spherical in shape and ascribed to Capt. H. J. Round, of the Marconi Co. and B.B.C.

### Circuitry

Most transmitters in the 'Twenties were single-stage affairs—meaning just a plain oscillator. For instance, G5RZ was confessing, in 1925, to a "direct-coupled Hartley, input 3-4 watts DC, wave 70-80 metres" at a portable location on Norfolk Broads. G2SA reminds us that in 1929 there was a thing known as a "Split Hartley," and G2GW had a "1-valve transmitter" with 1500 volts to a "B.T.H. valve."

Receivers were usually of the mystic type known as "Low-loss Reinartz 0-V-1," and the term "low-loss," one has to explain, was purely relative. It probably meant that the Q was not so low as it had been in previous receivers . . . But they worked, despite strange aerial systems and low-powered, unstable transmitters. Even in 1926 we find innumerable contacts with VK, ZL, W6, KH6 and other places that we still look on as DX. Try it now with 10 watts and an 0-V-1 receiver, and you will realise that QRM could hardly have been a problem thirty years ago.

### Prefixes

It is worth a passing mention that neither the Channel Islands, Isle of Man nor Wales signed with anything but a straight "G" prefix. Scotland used an unofficial GC (C for Caledonia, one presumes) and Northern Ireland used GI very early on. But for some strange reason, GW meant the Irish Free State, with calls like GW11B, GW18B and the like. When the great rationalisation came, in 1928-29, GW11B became EI2B and so on. We found Channel Islands cards from many old friends, including the late G2ZC, who worked from Jersey for many years. His 1927 card says "Transmitters on 8, 23, 45, 115-400 and 440 metres."

The first card we can trace from Northern Ireland bore the call "IR-7AR" and was from the late Eric Megaw, who became GI6MU and G6MU. His IR7AR card quotes the power input as "about 10 watts," with the word "about" heavily underlined. Also in the file were five completely different cards from GI6YW—who is still active.

Scotland yielded a card from GM6IZ, whom we

worked on Top Band only a few days before writing this. Wales, also, showed up many old friends, including the present GW2OP and GW5BI.

Finally (talking of prefixes) we unearthed a card from G5YN in 1928, long before he went to Tibet and became the original AC4YN, the rarest station in the world and one that gave a new meaning to "DX." In 1928 we note that he was running 2½ watts at 130 volts, working on 45 metres with a "third harmonic aerial" with a transmitter described as "L.C. Hartley with LS5." The LS5 was the most-punished receiving valve of all time, and a godsend to all medium-powered amateurs.

One of the leading DX'ers in 1928 was G5ML, and his card shows that he had *then* worked 49 countries. G5BD, in the same year, had raised 28 of them, in 3 continents. G6CJ, in 1926, had been heard in Brazil with 2 watts.

In the next instalment we will deal with some of the interesting European characters of the same age. Be prepared for some startling prefixes and call-signs!

(To be continued)

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### GETTING IN QUICK

In a recent issue, a reader asked, through our Small Advertisement columns, for some special German valves. Here is what he says: "Two hours after the Magazine was delivered by the local postman, an SWL in the neighbourhood brought in 20 of these valves. The first post next day brought eight more from a GC reader, and someone in Surrey offered another 11 (fitted into a complete receiver), while yet another SWL sent two by a later post. I dread to think of what the next week or two may bring in . . .!"

### JODRELL BANK RADIO TELESCOPE

In his lecture to the Radar and Electronics Association on March 12, Professor A. C. B. Lovell, F.R.S., of Manchester University, revealed, among many other interesting facts, that his great telescope has proved the moon to be a very efficient reflector of radio signals—far more so than had been supposed by the pundits. At Jodrell Bank, they have had no difficulty in getting perfect echoes, and it seems that one particular part of the moon's surface is responsible for this. Due to the great gain of the telescope itself, quite considerable attenuation can be introduced into the transmission line, even though the transmitter used is relatively low-powered. Professor Lovell explained that their next objective would be to attempt getting echoes from Venus, our nearest planet. He hopes to be able to receive individual echoes up to a range of about 30m. miles, which is the distance of Venus during her close approaches to the earth. This is, of course, a vastly more difficult project than obtaining reflections from the moon, at a distance of a mere 239,000 miles. It will take something like five minutes for a pulse to travel out to Venus and back again, at her closest, and even at best the signal will be so attenuated that special methods will have to be used to detect it.

# DX COMMENTARY

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

WHAT with auroral disturbances and other minor blackouts, this has probably not been *quite* such a good month as last; but on the whole there has been no shortage of DX. The 28 and 21 mc bands, especially the phone sections, have been packed pretty full throughout the hours of daylight. Even the much-despised CW end of 28 mc has come through with a few nice DX pieces, and, at the other end of the scale, Top Band is still capable of producing Trans-Atlantic QSO's.

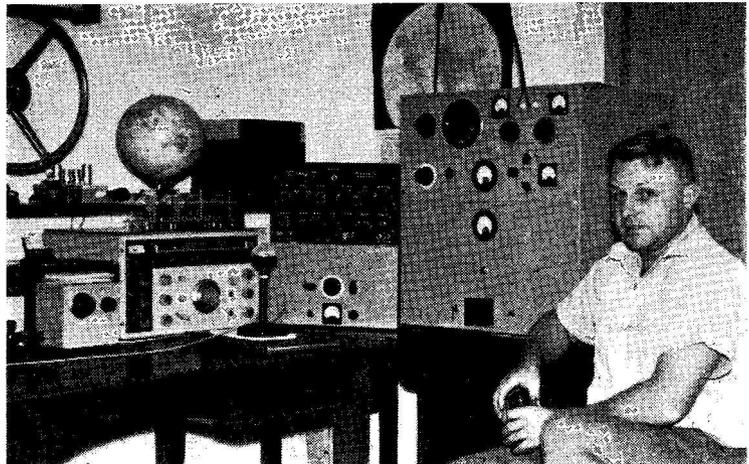
There were probably others, but we did particularly notice one freak morning. This was Wednesday, March 5, when, listening for about ten minutes on either side of 0900 GMT, the following were logged: KP6AL, KW6, KX6, YJ1DL, ZK1AK, loads of VE5, 6 and 7 and KH6's—all on 14 mc CW. Practically all of them were called, without a single reply. Everything was fluttery like the normal KL7 or VE8 signal. Which path were they all arriving by? And why were they not workable from here, despite the fact that all of them were S8-9?

On the previous day, listening on 28 mc at the CW end, in among the hordes of W's, we found FL8AC and KH6BG in QSO with each other—both good signals here. At other times we would find ourselves getting S8/9 from W6's whose own signals were barely readable despite 500 watts and rotaries.

But all this freak stuff was the exception rather than the rule, and on the whole the month was one of good solid DX, as the following reports will show . . .

## Round the DX Bands

Variable conditions, says G5BZ (Croydon), including a lot of



ZESJJ

## CALLS HEARD, WORKED and QSL'd

"watery" ones, but he has worked some interesting stuff. One plum was VR6AC (S9 both ways) on 28 mc—no pile-up. JT1AA, KR6AK and VK9JF (Cocos) on 21 mc; and AC5PN (1750 GMT) on 14 mc, apparently rock-bound on 14010 kc. Other nice ones on 14 mc were ZK2AD, KG6's, FB8XX and 8ZZ in consecutive QSO's, ZM6AS, VQ8AQ, ZS9Q and many others. The only really regrettable gotaway was KS6AD!

Following our appeal for details of gear used, G5BZ reports that he still runs a pair of 811's, an HRO receiver and a tri-band Quad.

G3DNR (Broadstairs) had the misfortune to lose his mast during the gale, and so is not fully active, but with temporary sky-wires on 28 mc he managed to raise EA9EI for a new one, along with ZD3, OQ5 and much of the usual stuff. As soon as his new mast is up he will be active on 14 mc and thinks the "TVI is beaten at last"—famous last words?

G3FPQ (Bordon) worked JT1AA on 21 mc *phone*, and nearly got him on 7 mc, but USSR stations

wrecked the QSO. Otherwise he is busy on construction work, with a double superhet progressing, and a new beam and SSB rig projected. See "Calls Worked" for his current DX.

G2BLA (Morden) says the bands are so full of W's and K's these days that the only out-of-the-ordinary incentive to work them is the WAS Certificate. He even suggests a Five- or Six-Band WAS Table with a possible award when the points reach some given figure. Meanwhile, G2BLA is busy on the W5's, 7's and Ø's in the hope of filling the remaining gaps.

G3BHW (Margate) has had a number of good contacts with JT1AA and JT1YL on 21 mc, with 589 and 599 exchanges. Both have been heard at various times between 1000 and 1430. Another one on the band was "AC4A," which causes the eyebrows to twitch at this end. XV5A was worked on 14 mc after being heard many times, and HS1JN was also heard there. Pacific signals have been notable between 1700 and 1900, and KP6AL was a welcome addition. Ten has been erratic, but VU2PS was worked at

S9 plus 30—stronger than any local.

G3FPK (London, E.10) had a prolonged SM-hunt on 7 mc, in search of his WASM II, but found the "V6T Thing," below the LF end, mighty trying. It's on about 6932 kc, spreads up to 7030 but cuts off sharply in the other direction. As G3FPK had an SWL report from Eric Trebilcock in Melbourne, he thinks we might be working the VK's if it weren't for this atrocity. On 14 mc he thought things mediocre except for the good stuff that pops up at unexpected times. An ear-shattering signal turned out to be 3A2CD (CN8FQ/W4UFQ) staying at the former 3A2BT QTH. So G3FPK, who gave so many people their first Monaco QSO with his 3A2BT expedition, collected *his* first 3A!

A sked on 21 mc produced even louder signals, but 28 mc didn't come off. JT1AA was also raised on 21—589 on a short call. 28 mc results are not so hot, owing to a mixture of dipoles rather close to each other.

Another "7 mc only" report from G3BST (Bletchley), with not very much to say owing to poorer conditions. He has been playing with aeriels and concludes (rightly, of course) that low-angle radiation is the whole secret. He thinks some of the "fancy beams" are so successful more on this account than by virtue of directivity, and concludes that unless one has a lot of mast height, a vertical is best. At all events, his own vertical has given him 78 countries on 7 mc since he came down from GM-land fifteen months ago.

G3LET (Westcliff) received a card direct from HA5AM/ZA, who has been on 7 mc (Saturday afternoons) as well as on Twenty. HZ1AB has been on 14 mc in the evenings, but not raised yet. 3A2CE is apparently in Monaco now (or he *was*) at the same time as 3A2CD. LA7RF/MM, in the Timor Sea, was a gotaway on 21 mc, and VQ1AD (or ADX) was heard on 14 mc around 1800 . . . does anyone know if *he* is good?

G3LCI (Wallasey) found 14 and 21 mc pretty good, although JT1AA still eludes him. February 17 brought the SU's out, and SU1IC was worked (QTH Cairo).

and QSL promised. G3LCI's aeriels comprise a 200-ft. end-fed wire, and dipoles for 14, 21 and 28 mc.

G3WL (Plymouth) bumped his Five-Band score up by 26 points, mostly on 14 mc, with a new dipole for that band.

G3ISX (Welling) now admits to a 28-mc beam, a 7-mc dipole and a 14-mc dipole underneath it; the 7 mc affair works well on 21 mc as a three-half-wave job. Counting a former "W3EDP" in the farm, these various wires have raised 106 countries and 41 States, together with quite a few awards. Regarding Kuwait, he tells us that all the 9K2 calls have been issued, but there is not yet any compulsion to use them. 9K2AQ is on 7 and 14 mc, hoping to be on 21 and 28 mc soon, but his gear was badly damaged on the way out.

G3JCQ (Barrow-in-Furness) is a long-wire addict. He used to have a "T2FD" job, but now has 275 feet, 35 feet high and running North-South. With this on 14 mc (100 watts) he has collected plums like KS6AF, ZK1BS, KM6EVK, ZL5AA, KH6 and KL7 and many hundreds of W's. G3JCQ would like us to get together a symposium on long wires and the techniques connected with them. He passes on the following gossip: KS6AF is now on holiday in VK4 . . . KM6EVK active on 14 mc . . . OA4IGY—c/o U.S. Embassy, Lima.

G3BHI (Norwich) points out that a dreadful result of VFO operation could be that rock-bound calls rather off the frequency may be missed. Moral—tune around! He also remarks on the way one can reply to one station and then, on the next over, find another one calling or even thinking he is in QSO. G3BHI thinks we ought to denounce 21 mc as being no good at all as a DX band . . . it's become too popular and he'd like it a little quieter! A gotaway for him was 9K2AK/M in a caravan with a whip aerial, 28 mc phone.

One of our correspondents asks us to suppress his identity, since he was told over the air by a reader that "he doesn't care a tinker's cuss who works the DX as long as he is told it is available." Acting on this, our now-anonymous correspondent reports the following: "Available" on Ten phone—ZK1BS, VP8AQ, VP5BE, ZD3E, VQ3SS, KAØIJ, KH6CEJ/KJ6, BV1US and OD5BZ. Likewise "available" on Fifteen phone: ZK1BS, 9G1BL, VE3BQL/SU, VQ3DC and ZD3F. Also known to be active, all on phone, are HKØAI, VK9AD, HV1CN and UAØLA on 14 mc, KB6BH on 21 mc and CR4AD, 4AS, YK1AT, ZD8K and UAØLA on 28 mc.

#### The Overseas Mail

VS6DS has been appointed



WIPPN, left, and ex-G3GGN (now VE2AZI) have a noggin during the latter's visit recently to Riverside, Rhode Island. The trophy is a 54 lb. bass, caught by WIPPN.

# LIST OF COUNTRIES BY PREFIXES

*Corrected to March, 1958*

AC3	Sikkim	FL	French Somaliland	KR6	Ryukyu Is. (Okinawa)
AC4	Tibet	FM	Martinique	KS4	Swan Is.
AC5	Bhutan	FN	French India ( <i>see</i> Note 1)	KS6	American Samoa
AG2	obsolete ( <i>see</i> II, Trieste)	FO	French Oceania	KT1	<i>see</i> CN2
AP	Pakistan	FO	Clipperton Is.	KV4	Virgin Is.
AR1	obsolete ( <i>see</i> YK)	FP	St. Pierre and Miquelon	KW6	Wake Is.
AR8	obsolete ( <i>see</i> OD)	FQ	French Equatorial Africa	KX6	Marshall Is.
BV	Formosa	FR	Reunion	KZ5	Panama Canal Zone
C	China	FR	<i>see</i> FG (St. Martin)	LA, LB	Norway
C3	<i>see</i> BV	FS	obsolete ( <i>see</i> 3V)	LA, LB	Jan Mayen Is.
C9	Manchuria	FT	New Hebrides	LI	Spitzbergen
CE	Chile	FU	Wallis and Futuna Is.	LU	obsolete ( <i>see</i> 5A)
CE0	Easter Island	FW	French Guiana	LU	Argentina
CE7Z, CE9	Antarctica	FY	England	LU-Z	<i>see</i> Antarctica
CM/CO	Cuba	G	Channel Is.	LX	Luxembourg
CN2	Tangier	GC	Isle of Man	LZ	Bulgaria
CN8	French Morocco	GD	Northern Ireland	M1	San Marino
CP	Bolivia	GI	Scotland	MB9	<i>see</i> OE
CR4	Cape Verde Is.	GM	Wales	MD1, 2	obsolete ( <i>see</i> 5A)
CR5	Portuguese Guinea	GW	Hungary	MD4, MS4	obsolete ( <i>see</i> 15)
CR5	Prince Is.	HA	Switzerland	MD5	obsolete ( <i>see</i> SU)
CR6	Angola	HB	Ecuador	MD7	obsolete ( <i>see</i> ZC4)
CR7	Mozambique	HC	Galapagos Is.	MF2	obsolete ( <i>see</i> II, Trieste)
CR8	Goa	HC8	Liechtenstein	MI3	obsolete ( <i>see</i> ET2)
CR9	Macao	HE	Haiti	MP4B	Bahrain
CR10	Timor	HH	Dominican Republic	MP4K	<i>see</i> 9K
CT1	Portugal	HI	Colombia	MP4Q	Qatar
CT2, CS3	Azores	HK	San Andres Is.	MP4T	Trucial Oman
CT3	Madeira	HK0	Korea	NY4	obsolete ( <i>see</i> KG4)
CX	Uruguay	HL	Iraq	OA	Peru
CZ	obsolete ( <i>see</i> 3A)	HN	Panama	OD	Lebanon
DJ, DL, DM	Germany	HP	Honduras	OE	Austria
DL8	Saarland	HR	Siam	OH	Finland
DU	Philippine Is.	HS	Vatican City	OH0	Aland Is.
EA	Spain	HV	Saudi Arabia	OK	Czecho-Slovakia
EA6	Balearic Is.	HZ	Italy	ON	Belgium
EA8	Canary Is.	II	Trieste	OO5, OO0	Belgian Congo
EA9	Spanish Morocco	II	Italian Somaliland	OX	Greenland
EA9	Rio de Oro	I5	Sardinia	OY	Faeroe Is.
EA9	Ifni	IS	Japan	OZ	Denmark
EA0	Spanish Guinea	JA	Mongolia	PA	Netherlands
EI	Eire	JT	Jordan	PJ2	Dutch West Indies
EK	obsolete ( <i>see</i> CN2)	JY	Dutch New Guinea	PJ2M	Dutch Saint Maarten
EL	Liberia	JZ	<i>see</i> W	PK1, 2, 3	Java
EP/EQ	Iran (Persia)	K	<i>see</i> JA	PK4	Sumatra
ET2	Eritrea	KA	Bonin Is. (Iwojima)	PK5	Dutch Borneo
ET3	Ethiopia	KA0	Baker, Canton, How- land and American Phoenix Is.	PK6	Celebes and Moluccas
F	France	KB6	Navassa Is. (and <i>see</i> Antarctica)	PK6, 7	<i>see</i> JZ
FA	Algeria	KC4	Eastern Caroline Is.	PX	Andorra
FB8	Madagascar	KC6	Western Caroline Is.	PY	Brazil
FB8	Kerguelen Is.	KG1	<i>see</i> OX	PZ	Dutch Guiana (Surinam)
FB8	New Amsterdam	KG4	Guantanamo Bay	SM	Sweden
FB8	Comoro Is.	KG6	Mariana Is.	SP	Poland
FB8	Tromelin Is.	KG6I	obsolete ( <i>see</i> KA0)	ST	Sudan
FC	Corsica	KH6	Hawaii	SU	Egypt
FD	French Togoland	KJ6	Johnston Is.	SV	Greece
FE	French Cameroons	KL7	Alaska	SV	Crete
FF	French West Africa	KM6	Midway Is.	SV5	Dodecanese
FG	Guadeloupe	KP4	Puerto Rico	TA	Turkey
FG	French Saint Martin	KP6	Palmyra Is.	TF	Iceland
FI	French Indo-China ( <i>see</i> Note 3)			TG	Guatemala
FK	New Caledonia			TI	Costa Rica
FKS	<i>see</i> OE			TI9	Cocos Island
				UA1	Franz Josef Land

UA 1, 3, 4, 6	} USSR (Europe)	VQ5	Uganda	ZD6	Nyasaland
UA9, Ø		} USSR (Asia)	VQ6	British Somaliland	ZD7
UB5	Ukraine		VQ8	Chagos Is.	ZD8
UC2	White Russia	VQ8	Mauritius	ZD9	Tristan da Cunha and Gough Is.
UD6	Azerbaijan	VQ9	Rodrigues Is.	ZE	Southern Rhodesia
UF6	Georgia	VR1	Seychelles	ZK1	Cook Is.
UG6	Armenia	VR1	Gilbert and Ellice Is.	ZK2	Niue
UH8	Turkoman	VR2	British Phoenix Is.	ZL	New Zealand
UI8	Uzbek	VR3	Fiji	ZL	Kermadec Is.
UJ8	Tadzhik	VR4	Fanning Is.	ZM6	Western Samoa
UL7	Kazakh	VR5	Solomon Is.	ZM7	Tokelau Is.
UM8	Kirghiz	VR6	Tonga	ZP	Paraguay
UN1	Karelo-Finnish Republic	VS1	Pitcairn Is.	ZS1, 2, 4, 5, 6	} Union of South Africa
UO5	Moldavia	VS2	Singapore	ZS2	
UP	Lithuania	VS4	Malaya	ZS3	South West Africa
UQ	Latvia	VS5	Sarawak	ZS7	Swaziland
UR	Estonia	VS6	Brunei	ZS8	Basutoland
VE	Canada (including Labrador and Newfoundland)	VS7	Hong Kong	ZS9	Bechuanaland
VK	Australia	VS9	obsolete (see 4S)	3A	Monaco
VK1	Formerly Heard Is., Macquarie Is., and Antarctica	VS9	Aden	3V	Tunisia
VKØ	See Antarctica	VS9	Maldive Is.	3W8	Cambodia
VKØ	Heard Island	VS9	Oman	3W8	Viet Nam
VKØ	Macquarie Island	VU	India	4S	Ceylon
VK9	Cocos-Keeling Is.	VU4	Laccadive Is.	4W	Yemen
VK9	Nauru	VU5	Andaman and Nicobar Is.	4X	Israel
VK9	New Guinea	W	United States of America	5A	Libya
VK9	Norfolk Is.	XE	Mexico	7B	unofficial (see PX)
VK9	Papua	XE4	Revilla Gigedo	9G	Ghana
VO	see VE and Note 2	XV	see 3W8 (Viet Nam)	9K	Kuwait
VP1	British Honduras	XW8	Laos	9S	obsolete (see DL8)
VP2	Leeward Is.	XZ	Burma	Aldabra Is.	
VP2	Windward Is.	YA	Afghanistan	Antarctica:	KC4, CE7Z, LU-Z, VK1, VKØ, VP8 all apply
VP3	British Guiana	YI	Iraq	Nepal	
VP4	Trinidad and Tobago	YJ	see FU	Wrangel Is.	
VP5	Jamaica	YK	Syria	Notes:	
VP5	Cayman Is.	YN	Nicaragua	1. FN (French India) only counted as a separate country until November 1, 1954, after which it was included as VU (India).	
VP5	Turks and Caicos Is.	YO	Roumania	2. VO (Newfoundland/Labrador) only counted as a separate country until April 1, 1949, after which it was included as VE (Canada).	
VP6	Barbados	YS	Salvador	3. FI8 (French Indo-China) only counted as a separate country up to July 19, 1955. After that date see XW8 and 3W8.	
VP7	Bahamas	YT	Yugoslavia		
VP8	Falkland Is.	YV	Venezuela		
VP8	South Georgia	YVØ	Aves (Birds) Is.		
VP8	South Orkney Is.	ZA	Albania		
VP8	South Sandwich Is.	ZB1	Malta		
VP8	South Shetland Is.	ZB2	Gibraltar		
VP8	see Antarctica	ZC2	obsolete (see VK9)		
VP9	Bermuda	ZC3	Christmas Is.		
VQ1	Zanzibar	ZC4	Cyprus		
VQ2	Northern Rhodesia	ZC5	British North Borneo		
VQ3	Tanganyika	ZC6	Palestine		
VQ4	Kenya	ZC1, 7, 8	obsolete (see JY)		
		ZD1	Sierra Leone		
		ZD2	Nigeria		
		ZD3	Gambia		
		ZD4	Gold Coast		

secretary of the Hong Kong A.R.T.S., and sends the latest news. VS6AE and 6AZ are on SSB, with 6BJ coming up. VS6DJ, 6DK and 6DL are all on phone with Heathkit rigs. The R.A.F. gang are VS6DV (Club station), 6DO, 6DP and 6DX. VS6AE and 6CL are on both phone and CW and very active; VS6DS on CW only. VS6DA has become ZC4DA; VS6DE, 6DI and 6DN

have returned to U.K., and 6CV is home on leave. VS6CJ is on 50 mc, looking for JA, KA, KR6 and the like.

CR9AI, 9AH, 9AL and 9AK are all active on the DX bands; at a recent Hamfest the whole lot got together, and made the PMG of Hong Kong their guest of honour. A real "Chinese chow" was provided, and BVIUS, who had flown into Hong Kong that

very afternoon, was also present.

VP5EG (St. Andrew, Jamaica) is ex-VQ4EG. MI3TM and G3LHO. He will be in VP5 until 1960 and intends to be active on CW and SSB shortly. His QTH is 1500 feet a.s.l. and he hopes to push some RF out from there, especially to his old friends in VQ4.

W6AM (Long Beach) made it with ZL1ABZ (Kermadecs), which

puts him up to 277 when the card arrives! (This man will make the 300 mark yet, if they can invent a few more countries.) This was a cross-band contact, 14260/3690,

and W6AM scored by being the only one of those lined up who could hear the ZL. No trouble in getting his own signal out there, 5 and 8. Meanwhile, VQ8AS has

put him up to 276.

OK1JX (Prague) keeps us posted regarding JT1AA's affairs, and makes it pretty clear that Ludvik can't speak English. Further, he says that stations hearing an OK1JX/JT1AA phone contact in Czech should not expect him to act as interpreter for them—it's a little *too* much to ask! Stations making CW contacts and asking JT1AA to listen for their phone have received cards worded like "listening reports," which have shaken them a little, but cards may be returned to OK1JX for alteration. From February 25 onwards both JT1AA and JT1YL logs have been sent to OK1JX, who now makes out the QSL's himself. First G contact with JT1AA was G3AAM on September 11; first with JT1YL was G3KSL on February 4, her first day of operation.

DL7AA (Berlin) goes up a few more notches in the Five-Band, and says he has now applied for his Phone DXCC—Rudy is also working hard for WAZ on four bands, and a Phone WAZ. He'll get them!

#### DX Gossip

ZD4BF is now signing 9G1BF (no connection *whatever* with our old friend G1BF!) and is on 14330 kc. SSB. Another one near by is OHØNC on 14320 . . . LA6CF hopes to operate during the summer from either Jan Mayen, Svalbard or Bear Island . . . LA2JE is still active from Hope Island . . . SM8AQT/SM/P is on Svalbard now.

VS9AD (Norfolk Is.) hoped to be on 21 and 28 mc by the time this appears . . . VR3A and VR3N both active from Fanning Island . . . VKØTC is a new one on Macquarie Island, and says Heard Island activity is *nil*; it has been abandoned as a weather station.

XW8AI is handing out phone contacts from Laos (14167 kc) . . . ZK1AK is very active from Cook Is., around 14040 kc . . . HS1C is on CW, 14020. HS1WR going on phone. HS1E starting up shortly.

ZL1ABZ on Kermadec is still confined to his two frequencies of 3690 and 3844 kc. ZL2GX is the

## COUNTIES OF THE UNITED KINGDOM

As Used for Scoring in WBC and WABC

### ENGLAND (41)

Bedfordshire  
Berkshire  
Buckinghamshire  
Cambridgeshire  
Cheshire  
Cornwall  
Cumberland  
Derbyshire  
Devonshire  
Dorsetshire  
Durham  
Essex  
Gloucestershire  
Hampshire (*incl. I.o.W.*)  
Herefordshire  
Hertfordshire  
Huntingdonshire  
Kent  
Lancashire  
Leicestershire  
Lincolnshire  
London (Postal Districts)  
Middlesex  
Norfolk  
Northamptonshire  
Northumberland  
Nottinghamshire  
Oxfordshire  
Rutland  
Shropshire (Salop)  
Somerset  
Staffordshire  
Suffolk  
Surrey  
Sussex  
Warwickshire  
Westmorland  
Wiltshire  
Worcestershire  
Yorkshire  
Scilly Islands

### NORTHERN IRELAND (6)

Antrim  
Armagh  
Down  
Fermanagh  
Londonderry  
Tyrone

### ISLE OF MAN (1)

### SCOTLAND (33)

Aberdeen  
Angus  
Argyll  
Ayr  
Banff  
Berwick  
Bute  
Caithness  
Clackmannan  
Dumfries  
Dunbarton  
East Lothian  
Elgin (Moray)  
Fife  
Inverness  
Kincardine  
Kinross  
Kirkcudbright  
Lanark  
Midlothian  
Nairn  
Orkney  
Peebles  
Perth  
Renfrew  
Ross and Cromarty  
Roxburgh  
Selkirk  
Shetland (Zetland)  
Stirling  
Sutherland  
West Lothian  
Wigtown

### WALES (13)

Anglesey  
Brecknock  
Caernarvon  
Cardigan  
Carmarthen  
Denbigh  
Flint  
Glamorgan  
Merioneth  
Monmouth  
Montgomery  
Pembroke  
Radnor

### CHANNEL ISLANDS (4)

Alderney  
Guernsey  
Jersey  
Sark

This is the accepted SHORT WAVE MAGAZINE List for WBC and WABC. It is published for the information of readers interested in these Certificates, details of which are given in "DX Commentary" at regular intervals.

*Overseas Amateur Radio periodicals please copy.*

sked-master and can be found on 14 mc . . . VQ4EO/FE8 has been heard in the States, but no reports from here.

JT1AA has actually been making phone contacts on 21 mc, just as promised last month . . . he may even be on SSB one day. G3FNF (formerly AP2RH) threatens to visit "rare DX" in the early autumn, but no details yet . . . VQ8AQ is a new one from Rodrigues Island.

Concerning the latter, we hear that there will be a re-arrangement of all VQ8 calls. Mauritius stations will keep their two-letter calls, but Chagos and Rodrigues will be assigned three-letter calls with the first letter "C" for one and "R" for the other.

The FKØAD character who has been giving his QTH as Chesterfield Island seems to have been just another phoney. He also signs FK8AD or FW8AD when he feels like it, and FK8AS says there is nothing on Chesterfield Island (one mile by 150 feet) except seven coconut trees!

A really rare prefix is WS6! It's a novice call on Samoa, KS6, and is the XYL of KS6AD . . . ZC3AC is active but mighty elusive on 14 mc CW.

An interesting one to watch is VO1EX, who is ex-MP4BCA and is in charge of the Decca Navigator station on Ramea Island. This is in the FP8 group, quite a long way from anywhere, and might well become a "new one" —we don't know as yet. He is rock-bound on 21093 kc, but also will work other bands, with a large aerial farm available. Usually around during 1830-2030 GMT or thereabouts, daily, on his 21093 crystal. He is piled up with W's at week-ends.

**DX-Peditions**

At the time of writing, one of the most highly organised DX-peditions of all time will (it is hoped) be leaving for Socorro Island, XE4, with a view to operating through the second half of the ARRL Contest (March 22-23) and remaining there for some days afterwards to work the rest of the world. We can only hope that they did get there, and that you discovered them and worked them—for, if it happened as intended, it will be all over by the time this issue reaches you.

This one was laid on by W4K VX and the OVARA (Ohio Valley Amateur Radio Associa-

tion), and the transport arrangements included overland travel to Mazatlan, Mexico, thence by KN6YNI's 40-ft. yawl to Socorro. The overland "caravan" was to consist of W2NSD's station wagon and W4K VX's car and trailer, with intercom. by means of 50-mc outfits loaned by W6AM. High power on all bands, with regular beam aerials, should have put the XE4 signals into every part of the world.

VS1HU's planned trip to the Maldives, VS9, is still on the cards, but no date yet given . . . HA5AM/ZA promises to be on the air again in April and May . . . Fernando de Noronha is now officially issued with the prefix PYØ, and as there are some U.S. representatives of RCA and PAA on the island, we may expect some regular activity.

VE3MR and T12IO plan to go to San Andres (HKØ) and operate from HKØAI's QTH . . . W9EVI should actually be active from Clipperton (FO8) by now; on schedule, he should have arrived around March 15, but there was some possibility of a licence hold-up; Phone operation mostly is planned.

VR2AP intends to be on from CR10, ZC5, VR4 and FU8 with QRP rigs, SSB and AM. This one will start from Singapore, whence he was bound from Fiji during March.

Danny Weil, VP2VB, has now set himself a definite sailing date of April 6-7 (Easter), and if the weather is favourable has every hope of keeping to it; *Yasme II* will sail from Lymington, Hants., making for KV4AA, and the first DX stop is expected to be Navassa, KC4. Further news as we hear it, and look out for him *en route* and later from KV4AA.

**Chaotic Counting**

VPØRT operated from Anguilla Island from January 21 onwards, on 21 mc SSB. "Country status" remains chaotic, since the island is part of the newly-formed Federation of the West Indies, but the new call, VPØ, was official and actually issued by the new Government.

Another complication is arising in the Middle East, with the join-

**FIVE BAND DX TABLE (POST-WAR)**

Station	Points	Countries					Station	Points	Countries						
		3.5 mc	7 mc	14 mc	21 mc	28 mc			3.5 mc	7 mc	14 mc	21 mc	28 mc		
DL7AA	872	113	170	235	185	169	249	G6VC	373	34	47	138	86	68	155
W8KIA	784	68	145	269	164	135	269	W6AM (Phone)	353	13	32	248	39	21	248
G3FXB	733	72	130	209	184	138	234	G3GZJ	332	29	60	102	96	45	136
G5BZ	719	64	118	247	172	118	254	G3IGW	309	44	65	86	66	48	121
G3FPQ	672	69	97	197	181	128	218	G6TC	285	17	64	123	50	31	137
G2DC	657	74	100	202	144	137	218	G3FPK	281	30	64	104	55	28	128
G3DO	623	24	46	232	155	166	249	G3JZK	270	15	53	58	91	53	135
W1VG	604	25	120	204	139	116	209	G2BLA	256	27	45	65	65	54	107
W2EQS	577	79	118	177	114	89	193	G3JJG	250	37	43	92	48	30	109
W6AM	507	30	58	276	86	57	276	G3JVJ	241	23	63	65	53	37	97
G3WL	489	40	81	163	117	88	190	G3HQX	226	12	37	74	45	58	104
G2YS	478	67	86	154	109	62	171	G3LET	224	11	44	110	43	16	120
G3ABG	471	45	84	170	92	80	186	G2DHV	223	20	27	120	41	15	130
G3BHW	458	15	32	167	135	109	201	G3DNR	210	10	21	81	45	53	97
G2HPF	406	38	64	157	74	62	172	VO2NA	151	13	17	78	32	11	82

(Failure to report for three months entails removal from this Table. New claims can be made at any time)

ing of Syria and Egypt into the United Republic of Arabia. We are informed that YK1AT "counts as a new country from February 1, the day on which papers were signed." What, then, happens to SU's? Do they count as a "new" one, too? And are they the same as YK, and if not, why not? If YK and SU counted as separate countries before the Union took place, do they now

count as separate, but "new" ones? This whole country-counting business has turned into a farce, and it's high time some rigid rules on the subject were laid down, even at the expense of reducing the total number available to 200 or so. We have our own ideas about this problem, and will propound them in due course.

In the meantime, we show in this issue not only a new Prefix

List based on the latest available information, but also the rules for our own DX Operating and Achievement Certificates, and (because it is asked for so often) the accepted List of U.K. Counties for the WABC and WBC awards. We do hope that all overseas Amateur Radio periodicals will duly note and copy—it will save so much time and correspondence.

### SHORT WAVE MAGAZINE DX CERTIFICATES

#### WNAKA (Worked North American Call Areas)

Twenty-two cards to be submitted, for contacts with stations in ten U.S. Districts (W1-0); nine Canadian (VE1-8 with one 8 in Yukon, one in North-West Territories); Alaska (KL7), Newfoundland (VO) and Labrador (VO). Contacts may have been on any bands, phone or CW. Operators in W, VE, VO or KL7 are *not* eligible for this Award. (163 WNAKA Certificates issued to March, 1958).

#### FBA (Four Band Award)

Cards to be submitted with confirmation of contacts with 20 different countries, each country to have been worked on four different bands. Any bands will qualify e.g. 160-80-40-20, or 80-40-20-10, or 160-40-20-15 — and so on. Entrant's own country may count as one of the 20 countries. (109 FBA Certificates issued to March, 1958).

#### WFE (Worked Far East)

Eighteen cards to be submitted, for 18 different countries selected from among the following: C (China), C3 (Formosa), C9 (Manchuria), CR9 (Macao), CR10 (Timor), DU (Philippines), FI (French Indo-China), HL (Korea), HS (Siam), JA/KA (Japan), KR6 (Ryukyu Is.), PK1-2-3 (Java), PK4 (Sumatra), PK5 (Dutch Borneo), PK6 (Moluccas), UA0 (USSR in Zone 19), VSI (Singapore), VS2 (Malaya), VS4 (British North Borneo), VS5 (Brunei), VS5 (Sarawak), VS6 (Hong Kong) and XZ (Burma). All or any bands count. (31 WFE Certificates issued to March, 1958).

#### WABC (Worked All British Counties)

Sixty cards required, from sixty counties of the British Isles, all to have been worked on the 160-metre band since January 1, 1952. Counties to be as shown in any standard atlas, *not* "administrative counties" such as the three Ridings of Yorkshire, East and West Sussex, County of Bristol, and so on. Isle of Wight counts as Hampshire — not separately. Isle of Man does score separately, as do all the Channel Islands. Scilly Isles also count separately. For London, the L.C.C. area scores as one County. (165 WABC Certificates issued to March, 1958).

#### WBC (Worked British Counties)

Open only to claimants *outside* the United Kingdom and Eire. Cards required from 50 different counties of the British Isles, worked on any band 3.5 to 28 mc inclusive, phone or CW. Stickers will be issued to claimants showing proof of contact with 60, 70, 80 or 90 counties. The definition of U.K. counties is the same as for the WABC Certificate above. (93 WBC Certificates issued to March, 1958).

#### PRA (Polar Regions Award)<sup>2</sup>

Claimants must be able to show cards as follows: (a) Arctic — QSL's from six of the areas Alaska, Canada, Finland, Greenland, Norway, USSR *all lying north of the Arctic Circle*. Jan Mayen and Spitzbergen (incl. Bear Is. and Hopen Is.) — making eight possibilities from which the six cards can be derived. Also (b) QSL's from any six of the following eight Antarctic areas: Antarctica, Falkland Is., Heard Is., South Georgia, South Orkneys, South Sandwich Is., South Shetlands and Macquarie Is. Cards must not be dated earlier than January 1st, 1955, and contact can be on any band, CW or phone. (Award instituted September, 1957. None yet issued).

#### MDXA (Magazine DX Award)

To qualify for this Award it is necessary to have worked 3 continents, 15 countries on 160 metres; 5 continents, 40 countries on 80 metres; 6 continents, 80 countries on 40 metres; 6 continents, 180 countries on 20 metres; and 6 continents, 90 countries on 10 metres. (Four Awards issued).

Note: Claimants in the U.K. are required to send all cards in support, by registered post with a check list, when making their claims. Overseas claimants (only) may send either (a) A check list, without cards, duly certified by the Hq. of their national Amateur Radio society, or (b) An uncertified check list, from which all or any cards may be called in for scrutiny by us. In no case will any Award be issued without proofs we consider to be good and satisfactory.

**Claims, enclosing return postage (five IRC's in the case of overseas claimants) for all the above-mentioned Certificates should be addressed "DX Commentary," Short Wave Magazine, 55 Victoria Street, London, S.W.1.**

*(Overseas Amateur Radio periodicals please copy)*

### Contests

The CW Section of the French Contest will run from April 13, 1200 GMT, to April 14, midnight. RST and three-figure serial number from the outside world, but F stations also identify their Department by figures or their country by letters (e.g. F8DU/78 and FA8BG/OR). Three points per contact, and multiplier for the sum of all departments and French Union Countries worked on each band. Logs to REF.

Via GM3FFQ (Edinburgh) we have it that the Central Radio Club of the USSR is organising a DX Contest for the period 2100 GMT May 10 to 0900 GMT May 11; this is a CW-only affair, on the 3.5 to 28 mc bands, and competing Russian stations will identify themselves by calling "CQ MIR." No other information available at the moment, but it is assumed that usual DX-contest procedure applies; anyway, it will be made clear enough by listening to a few contest QSO's before actually joining in.

### Top Band DX

Several good DX openings have occurred, though very few of them have been of interest to our 10-watters on this side of the Pond. However, on February 9 W1BB worked G3JVI, G5JU and G6BQ, and W1PPN worked G5JU. W1BB/1, which was the station concerned on this date, was established at the Winthrop Yacht Club in order to have an aerial entirely over salt, marshy ground; two 260-ft. legs were erected over the water, and the gear was installed in, and operated from, a locker!

All sorts of troubles were encountered, including a trip at low tide to remove a boat that

**DX WORKED**

By G3FPQ (Bordon)

28 mc CW: JT1AA, VQ6LQ, ZD3G

21 mc Phone: FB8ZZ, JT1AA

21 mc CW: JT1AA, UJ8AF, VQ6LQ, ZD3G

14 mc Phone: VK9AD

14 mc CW: ZD3G, ZK1BS

7 mc CW: MP4BBL, UF6AC, ZB1SS, ZC4BN, ZD2CKH, ZD3G

By G3DNR (Broadstairs)

28 mc: EA9EI, OQ5RS, SV1AE, ZD3E, ZS1RA

21 mc: ZC4BA

By G2BLA (Morden)

28 mc: LU2JAO, VP7NM, ZE3JO, ZS6R

21 mc: CT3AB, VO2NA, YO6KBA, ZD3G, ZL1BJ

14 mc: UO5PW, VK2BA, ZB2I, ZC4IP

7 mc: I2PAP, ZC4BL

By G3BHW (Margate)

28 mc: FE8AK, FF8AP, KA7WW, TI2OE, VU2PS, ZP5JP

21 mc: AC4A, FB8CD, JT1AA, JT1YL, KW6CM, VU2JA, 2RM, XE1PJ

14 mc: CR4AH, EL1T, FB8CE, KH6's, KP6AL, ST2AR, UG6AV, VK0AS, VQ3CF, VU2MD, XV5A, 3A2CE

By G3FPK (London, E.10)

28 mc: MP4BBE, 4BBL, VQ3SS, VQ6LQ, ZD2DCP, ZD3G

21 mc: JT1AA, KA2BE, KL7's, KP4KD, MP4's VE8MX, 8OW, 8PB, VQ2AS, 2RS, VQ3SS, VS6DV, VU2JA, W6GRF/MM, YN1AA, ZD3G, 3A2CD

14 mc: CT2AI, HA5AM/ZA, 9G1EE, SV1RX, UA0KAR, UD6KAB, VS1's, VS6DV, 3A2CD, 4S7WB

7 mc: CN8JX, UA9KOA, UA0AG, UD6AI, UNIAH, UO5IT, UP2AD, ZC4IP, 4X4IO

By G3BST (Bletchley)

7 mc: FA3CZ, PY2KD, 7AGY, SV0WP, 1AX, UM8KAA

By G3LET (Westcliff)

21 mc: CO3YP, F2CA/FC, KR6AK, VQ6LQ, VS9AE, W4YY, 3A2CD, 3A2CE, 4X4JU

14 mc: CR7CI, FL8AC, HA5AM/ZA, UA0KAR, VS1FZ, ZE7JG, ZS's, 3A2CE

By G3LCI (Wallasey)

21 mc: LU0AC/MM, MP4BCG, VS1HX

14 mc: FL8AB, HZ1AB, KL7MF, SUIIC, VQ3CF, 5A4TC, 4TK, 9K2AQ

By G3JCO (Barrow-in-Furness)

21 mc Phone: OA4IGY, VP2GC

14 mc Phone: KL7AFR, KM6EVK, VE8AN, 8DA, 8JW

By G3BHH (Norwich)

28 mc Phone: FA9RV, W2DUM/MM, ZE2JB

21 mc Phone: UA1KBB, UA6KTB, VP6GT, 6WR, VS9AD, W2DUM/MM

21 mc CW: KA0KHB, KR6AK, UA1CC

By G6VC (Northfleet)

28 mc: TI2LA

21 mc: JT1YL, 3A2CE

1.8 mc: YU1IJK

was bumping into one of the masts, ending with a broken rope and Stew floundering in "goo-ey mud" . . . all in the cause of Top Band DX.

February 2 was a good morning, with G6BQ and G8GP getting across. W6SK also appeared, working W8GDQ, W8NH and others. W1BB, on this morning, went to his Portable QTH but didn't arrive until the DX peak had passed.

January 19 was a blank morning; January 12 was not so bad, and the interesting point was that the band was open in all directions. W1BB worked VP7NM; W1PPN worked G6GM and GW6HB; and W6KIP was heard on the East Coast, as was W5SOT.

So much for the Trans-Atlantic Tests. Now for some even more interesting news. On February 22 ZL3RB logged W9FIM, W9NH, W9NPC and W9PYF; and on February 6 W6KIP worked KP6AL, 579 both ways.

During the ARRL DX Contest, February 22, W9PNE worked VP7NG (peaking S9 and louder than most W's), and later in the morning worked KH6IJ, also like a local!

*Late Flash:* The final Test, February 23, gave no European DX, but VP7NM and KH6IJ worked many W's.

For all the above, thanks to W1BB, who continues to compile his most useful bulletins which, in a file, comprise virtually a history of 160-metre DX.

From G5JU (Birmingham) we hear that W6KIP, now in Los Angeles instead of his former QTH in Death Valley (*below* sea level) has been trying all sorts of DX out westwards. KM6BK

reported his signals strong, in a cross-band contact, and DU7SV was on the listen, but without success as yet. W6KIP works on 1998 or 1999 kc, and naturally G5JU has hopes (even if very slender ones) of an eventual QSO.

**Top Band at Home**

The county-chasers continue their activity, but the DL's are now off the band. We hope their special licences may be renewed next season. Conditions for local and semi-local work continue good, and a pleasing feature of the band is the terrific concentration of phone activity at the HF end, which used to be sadly neglected. Recent experiences suggested to us that a phone WABC might be possible between 1970 and 2000 kc only.

G3LBQ (Brentford) added GM3JNW (Clackmannan), GM3JDR (Sutherland) and G3KYU (Salop) to his score; G3IGW (Halifax) raised UA1OE (Archangel) on CW, and heard ZC4BL. ZC4AZ replied to a CQ, but his signal was too good to be true and he was duly written off. On phone, G3IGW got down to Sussex and Devon, and up to Glasgow.

G3LEV (London, S.W.16) is progressing towards his phone WABC; one unusual QSL was from the Tatsfield monitor station of the BBC, reporting him on the medium-wave broadcast band! But before this trouble he raised GM3LKG and G13HFG on phone, as well as DL1FF, YU1IJK, YU3EU and UO5FC on CW. On February 2 he heard W1WQZ calling "CQ 160" on phone, and working a WØ who wasn't audible over here.

G6VC (Northfleet) raised YU1IJK and heard UB5FJ at 229. He also put his score up to 96 by booking in GM3JDR (Sutherland).

G3LNR (Nottingham) raised G13JEX (County Down) and GM3JDR for two new counties and one new country. He also heard this YU1IJK character, but we gather from sundry comments that he is widely looked upon as a phoney.

G2NJ (Peterborough) tells us that DL3CU was valiantly battling for his WABC right up to

midnight on February 28, when the DL licences for the band expired. He finished up with a score of 47 counties and, of course, hopes (as we do) that they will get their special permits back next season.

G2CZU (Bath), the proud owner of Phone WABC No. 1, has now been diverted off the band by the joys of ten-metre CW, but hopes to be back in time to collect Merioneth from the Hastings (G6HH/A) expedition after Easter. At least that one will give him All Welsh Counties.

There are ugly rumours in the air about Top Band—no need to panic yet, but keep off those blessed Coast stations.

#### SWL Corner

From P. Day (Sheffield) come the following items of gossip: VP8BS is on 21180 kc phone, 1800 GMT . . . CR10AC is on 28 mc phone, Sunday mornings . . . VQ8AQ and 8AS are both on 14 mc CW around 1830, and ZK2AD has been heard at 1800 GMT . . . VS2DQ is active on 50 mc. P.D. also tells us that G3HFD (Sheffield) has now worked VK3AZY 192 times on 21 and 28 mc phone (VK3AZY is the type who has never used more than 12 watts). G3HFD has often gone down to 10 watts for his contacts, and has no beam—just a long wire.

Good ones heard by P.D. during the month were FB8BX, HS1E, VP2GC, VK9DB, CP1AM and FB8ZZ on 21 mc phone; KW6CM (599 at 1030) on 21 mc CW; KX6BQ (SSB, 1545), W5RYG/KG6 and VS9AJ (14 mc phone); JT1AA, FK8AS, KG6AAY and ZC3AC (14 mc CW).

N. B. Rivett (Malta) has been logging W's on Eighty phone, and also heard CR6CA on 14 mc phone. M. J. Presidge (Birmingham) logged both JT1AA and JT1YL on 21 mc CW, bringing him up to 37 Zones in 1958. Other good ones were VQ8AQ (14 CW), HV1CN and VK9AD (14 phone), HS1E and VQ3ES (21 phone) and 9K2AX, FE8AH and CR9AK (28 phone).

S. R. Smith (Crewe) specialised in 21 mc phone and logged HS1E,



Roger Wheeler, Brightlingsea, Essex, who runs G3MGW, is but 15 years old—the lucky chap! He has a BC-348 receiver and a 10-watt transmitter, with an 807 PA. At the moment, activity is on 80 metres only, with the other bands to come along in due course.

VS1 and 2, VP2DC, VP8BS, VE8NH and a bunch of KL7's. V. Kelly (Betws-y-Coed) found CR8AC, KP6AL, KM6ENK, PJ2CE, VP2AB, HI8BE and FO8AG on 14 mc CW; CR4AD, HS1E, JT1AA and 1YL, FB8BC and 8BX, HI7LMQ, KW6CB and ZD3E and 3G on 21 mc; and PYICK/Ø, CR7's, KG6AGS and VE8's on 28 mc. He also reports that VKØCJ is active from Macquarie; that FO8AG was on 14344 kc CW, along with HE9LAC; that VR2AP will be in CR10-land soon; and that VP5ES is with the USAF on Turks Island.

V. Porter (Loughton) mentions SVØWB on Rhodes (14 mc phone) working a VE3 and saying it was his "first contact for two months and would be his only one," as he was going QRT. Others on the band were BV1US, KH6OR, VP2AK and VS2WD (all phone). CR4AD and ZS8I were heard on 21 mc, and 28 mc revealed AC5PN, CR9AC, VP3BL, VQ1E and VQ6ST. M. J. Edwards (Carterton) reports KX6AF on 21 phone, also EL1P and KR6RB. FF8AP is active on 50 mc, work-

ing LU and PY.

*Late Flash:* The OVARA trip to XE4, and W9EVI's trip to Clipperton Is. have both been called off after all—because the necessary licences were not granted! . . . But they were nice ideas . . . VS1FJ expects activity from the Maldives to be possible within two or three months, as large planes are now landing, and equipment is pouring in . . . ZC3AC is said to operate on 14110 kc and to answer calls 100 kc lower, at the bottom of the band.

Thanks and acknowledgments, as ever, to the *OVARA DX Bulletins*, the West Gulf DX Club, W6YY, W1BB and our numerous correspondents and SWL's.

And so we take our leave until next month's issue, for which the deadline is **first post on Friday, April 18**. For the June issue and for those who correspond by air-mail, the closing date will be **May 16**. Address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1—and don't forget to separate out the "DX Worked" at the end of your letter, please!

## SSB Topics •

IDEAS AND CIRCUITS—CLEARING UP THE G2NH  
EXCITER—DX NOTES AND OPERATING NEWS

Conducted by R. L. GLAISHER, G6LX

A RECENT paper by R. Jeremy (S.T. and C. Pty. Ltd.), published in the *Proceedings of the Australian I.R.E.*, summarises the progress of single-sideband in the field of commercial communication links and discusses the future application of SSB to the HF mobile services.

The paper deals with circuit techniques, the requirements necessary for multi-channel commercial operation under multiplex conditions, and the possible future use of SSB for ground-to-air and air-to-ground communication. For airborne use size, the efficiency of linear amplifiers, and frequency stability, are listed as the major problems ahead of the design engineer.

At the I.A.T.A. meeting held in Montreal last year, this frequency stability problem was brought into the open and a set of standards laid down for SSB equipment. These specified target accuracies of 5 c/s for the ground equipment and better than 7 c/s for the airborne side. This must have given our commercial friends quite a shock as the present requirement is 30 parts-per-million (which represent errors of up to 720 c/s at 24 mc). These standards relate to long-term stability—what about the Doppler effect and how many amateur transmitters (commercially manufactured or otherwise) would come within a mile of meeting such a specification? !

### High-Level Mixer for 9 mc Phasing Exciter

The well-tried method of generating a single-sideband signal at 9 mc by the phasing system has many advantages. Both upper and lower sideband output is available; the critical phasing adjustments can be made the optimum at a single frequency and it is possible to insert a carrier for tuning or adjustment purposes. The 9 mc output can be mixed with drive from a 5 mc VFO to provide output in both the 80 and 20 metre bands (using "product" and "difference" mixing techniques).

Operation on the other amateur bands does, however, present a difficulty as the VFO injection frequency has to be multiplied (or mixed with the output from a crystal-oscillator). For example, the injection frequencies recommended for operation in the 21 and 28 mc bands are 12 and 37 mc. (It is possible to use 19 mc injection for 10 metres, but spurious signals can be a problem.)

The description of the G3MY mixer unit ("SSB Topics," February, 1957) prompted the writer to test a modified version of this unit in conjunction with a Multiphase 10B exciter. Results were excellent and output more than sufficient to drive a 4-125A linear amplifier on both the 10 and 15 metre bands.

The high-level mixer used is basically the same as the G3MY unit, but tailored to cover both bands with the same coil and condenser combination. A single crystal having a fundamental frequency around

8350 kc is employed, with the anode circuit of the crystal oscillator tuned to the third harmonic. This gives an injection frequency of 25050 kc which, when mixed with the 3600 kc output from the phasing exciter, provides a signal (by "additive" mixing) on the 10-metre Sideband frequency of 28650 kc. The same VFO setting and "difference" mixing puts the signal on 21450 kc, which is the high frequency band edge of the 15-metre band adjacent to the sideband segment. It is, of course, necessary to switch sidebands on the exciter when changing from Fifteen to Ten, otherwise the output sideband will be inverted.

The mixer and buffer anode circuits not only tune 10 and 15 metres, but also cover the injection frequency of 25 mc. This is a point to watch as the 25 mc signal is as strong as the wanted outputs in the amateur bands. To overcome this difficulty, a parallel-tuned "sucker" circuit is loosely coupled to the mixer anode. The circuit of this rejector is shown in Fig. 1.

Experience in using the G3MY circuit has indicated that the link coupling between crystal oscillator-mixer, mixer-anode and buffer-cathode, and the buffer anode and coaxial feed to the linear amplifier, are all *very critical*. If trouble is experienced in obtaining sufficient output, it is well worth while trying different spacings and link turns. The coils used in the common 21/28 mc model are shown in Table I.

### The Collins KWM-1 Transceiver

In the last few months a new SSB equipment has appeared on the three HF bands. Designed for mobile and fixed station use, this small transceiver is making quite a name for itself amongst the SSB fraternity. The circuitry is somewhat similar to that employed in the KWS-1 and 75A-4 apparatus. Some very clever circuit tricks have been incorporated in the design which allow the common use (for "transmit" and "receive" functions) of the mech-

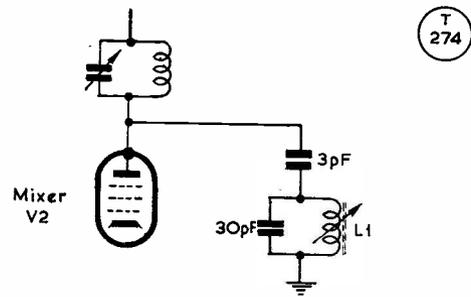


Fig. 1. The 25 mc trap circuit mentioned in the text; it functions as a "sucker" to eliminate the 25 mc output from the 10/15 metre mixer. Coil L1 can be 20 turns of 30g, on a 1/2-in. slug-tuned former of the Aladdin type, spaced to fill the length.

anical filter, HF oscillator, BFO, VFO, part of the IF strip and the control circuits.

Covering the range 14 to 30 mc, the receiver and transmitter normally operate on exactly the same frequency, *e.g.*, if the receiver is tuned to 14310 kc, the output from the transmitter will also be on 14310 kc. In the U.S.A., where phone stations work in limited band segments, this common frequency working was quite a disadvantage. Collins have recently introduced a "DX Adaptor" for the KWM-1 which allows the transmitter section to be uncoupled from the receiver and operated on crystal control. As to be expected, the circuit diagram for the KWM-1 is very complex and difficult to follow without a detailed accompanying description giving the breakdown of the individual stage functions. It is hoped that "SSB Topics" will have the opportunity to test the KWM-1 in the not too distant future, as several of these equipments are already in use in Europe.

For those who wish to become confused, a block diagram of the KWM-1 circuit arrangement is shown in Fig. 2. The transmit signal paths are in heavy solid lines, the receive signal paths shown in dashed lines and control circuits in light solid lines.

#### Voice Control for the G2NH Exciter

A suitable circuit for VOX operation with loud-speaker anti-trip facilities is shown in Fig. 3. This circuit is as in the KWS-1 transmitter and should satisfy the many requests for information on the

subject. It has been incorporated in the "SSB Topics" G2NH Exciter and is performing right up to expectation. Other suitable VOX circuits are described in the SSB handbooks, and although these are not all as sophisticated as the KWS-1 arrangement, they are capable of good performance. If loud-speaker operation is required the anti-trip circuit is a "must."

#### Query Department

First, this month is a plea for help from SWL A. Bird, of Nottingham, who is having trouble resolving SSB signals on the HF bands. A. B. explains that he is using a "surplus" HRO receiver and can tune sideband on 80 metres without difficulty. Although the receiver appears excellent for AM reception on 14 and 28 mc it is almost impossible to tune or hold an SSB signal on these bands. Subsequent correspondence has indicated that a general-coverage coil is in use and slight drift is experienced on 28 mc even when receiving AM signals. It also transpires that the BFO will not tune through zero-beat and that the frequency jumps unless the coil-pack is very carefully centred.

Other than a major mechanical and electrical overhaul there seems little that can be done to improve the situation, using the receiver on its own. Even if this work is carried out, there is no guarantee that it will clear the trouble, as the war-time HRO's are notorious for drift and bad-note effects on 21

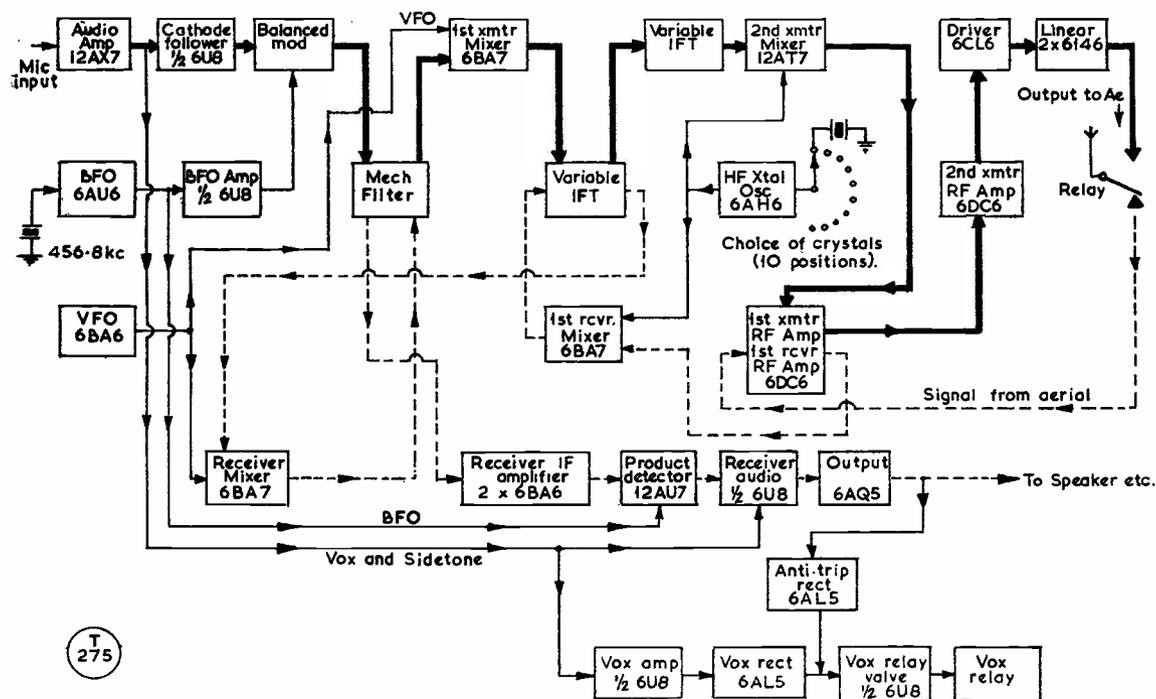


Fig. 2. This is a simplified block diagram of the new Collins KWM-1 SSB Transceiver. The equipment covers 14-30 mc, and the receiver and transmitter tuning "follow" automatically — though this has been found to be a disadvantage in SSB DX working. The heavy line is the transmitter sequence, the light solid line shows the control circuitry, and the dotted line the receiver arrangement, for which some sections are common with the transmitter side. Several KWM-1's can already be heard in the SSB segments of the DX bands.

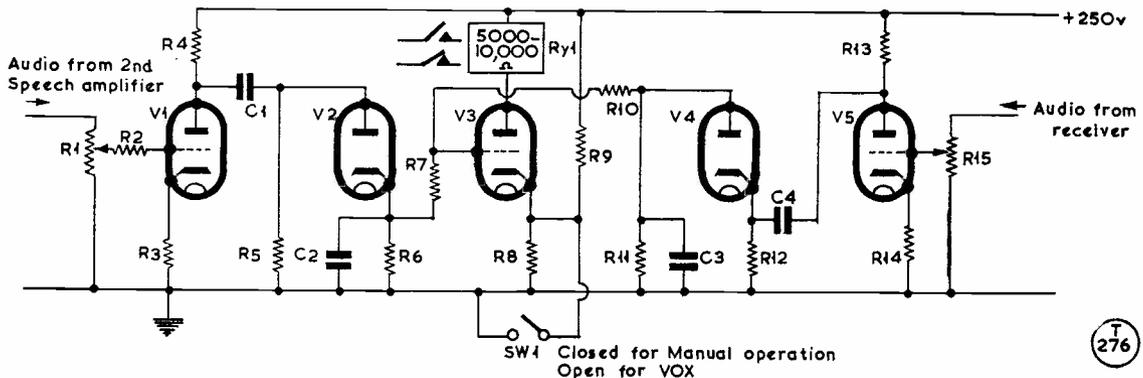


Fig. 3. Suitable VOX circuit for the G2NH SSB Exciter, with loud speaker anti-trip facilities (essential if a speaker is used). The circuit is derived from that of the Collins KWS-1 transmitter, and works well with the Exciter described in the December 1957 issue. The relay RY1 should be of the fast-acting type for fully effective voice break-in working.

and 28 mc.

As the 80-metre position seems satisfactory a solution would appear to centre around the use of an external converter. Crystal controlled types in conjunction with the HRO usually suffer from breakthrough on the tunable IF, and for this reason we would recommend the use of a conventional tunable type front-end. The IF can be in the 3-4 mc range and should be selected for an interference-free frequency.

SWL Bird also asked if front-end injection of the carrier would help the situation. In his case, the main cause of difficulty stems from front-end drift (local oscillator) and a too-fast tuning rate. Under these conditions, there is little to choose between BFO and front end injection. The BFO must, however, be adjusted so that the correct injection frequency is obtained.

The next query is from Eire and relates to the W2EWL phasing exciter. EI6W (Galway) is experiencing trouble in obtaining suitable audio transformers, and although he has tried several types of the miniature "anode to loudspeaker" variety he is still doubtful about the results.

Many copies of the W2EWL exciter have been constructed using this type of transformer, and as far as we know they have all been successful. Others have used a surplus transformer obtained from an aircraft intercom. amplifier. We have no details of the type except that it is in a round can about 3in. diameter x 3in. high. The ratio is said to be designed to match 3500 ohms into a 15-ohm load and both primary and secondary are centre-tapped. Has anyone any further information?

G6CW (Nottingham) urgently needs (on loan) copies of the KWS-1 and 75A/4 handbooks.

The next question again relates to the G2NH exciter. A Cambridge reader has constructed a copy of this unit, but is having trouble driving a single 807 Class-AB2 linear amplifier. It seems that a 6AG7 buffer is in use and enough output is available fully to light a 12-volt or 6-watt bulb link-coupled directly to the exciter output.

This output should be more than enough to drive the 807, so assuming the linear is correctly wired and

### Table of Values

Fig. 3. VOX circuit for the G2NH Exciter

C1 = 0.1 $\mu$ F, paper	Ry1 = 5/10,000-ohm coil sensitive relay, contacts as needed
C2 = 0.2 $\mu$ F, paper	V1 = VOX Amp., 1-12AT7
C3 = 0.5 $\mu$ F, paper	V2 = VOX Rect., 1-6AL5
C4 = .05 $\mu$ F, paper	V3 = Relay Valve, 1-12AT7
R1, R15 = 1 megohm pot'meter	V4 = Anti-trip Rect., 1-6AL5
R2 = 1 megohm	V5 = Anti-trip Amp., 1-12AT7
R3 = 220 ohms	SW1 = SPST on-off switch
R4, R5, R12, R13 = 100,000 ohms	
R6, R11 = 1.5 megohm	
R7, R10 = 2.2 megohm	
R8 = 680 ohms	
R9 = 22,000 ohms	
R14 = 330 ohms	

the grid circuit is capable of being tuned to the 3.8 mc band, the trouble is likely to be matching. If it is of any help, the G2NH exciter used at G6LX drives directly a single 813 to the full 150 watts. Link coupling is used and the coil details are as follows:

Buffer amplifier anode coil—22 turns No. 18 SWG 1in. dia. spaced to occupy 1½ ins.

Buffer amplifier link —4 turns No. 20 SWG close-wound, spaced 1/16in. from cold end of anode coil.

The buffer is tuned by a 300  $\mu$ F condenser and the linear grid circuit has the same value of condenser. The grid coil is nearly identical with the anode coil except that 19 turns are used with a variable link of 5 turns, which is adjusted for maximum drive.

It is worth checking the coaxial-line and the connectors in use. Some months ago the writer experienced trouble when air-testing a new exciter. The output appeared satisfactory, but when connected to the linear it was almost non-existent. After much checking the trouble was traced to a faulty Pye plug which shorted the RF from the inner conductor to

the earthed metal chassis. The short was intermittent and did not show up (when measured on an ohm-meter) until the cable was flexed.

If everything appears satisfactory the only other point to watch is the 807 valve. Some of the war-surplus types are very hard to drive due to an ingress of air. On AM and CW operation there is usually plenty of drive to spare and these "soft" valves will often work quite satisfactorily and without the user being aware that there is anything wrong!

The last question this month comes from several readers who doubt the statement made in a recent "SSB Topics" relating to DX working with simple aerials. It's quite true, chaps, and to prove the point G3MY has provided details of his ground-plane which has been so successful for him on 14 mc—

### SSB COUNTRIES-WORKED LADDER

(Starting Date January 1st, 1954 — Two-Way SSB Only)							
STATION	3.8	7	14	21	28	Total	Confirmed
VK3AEE	0	0	115	0	0	115*	90
W2JXH	0	0	107	0	0	107*	97
G6LX	21	4	103	47	18	107*	96
DL4SV	19	0	103	6	0	106*	98
ZS6KD	0	0	104	0	0	104*	90
ZL3IA	0	0	103	12	6	103*	—
ZL3PJ	0	0	103	0	0	103*	—
W3ZP	0	0	103	0	0	103*	—
W4INL	0	0	100	0	0	100*	—
W4IYC	0	0	100	0	0	100*	—
W6UOU	0	0	100	0	0	100*	—
5A5TH	0	0	96	10	15	96*	85
W2KR	0	0	95	0	0	95*	—
G3MY	18	0	92	27	0	95*	—
CN8MM	0	0	90	0	0	90	—
W3SW	0	0	90	0	0	90	—
F7AF	0	0	89	23	7	89*	70
W2CFT	0	0	88	0	0	88	—
K2GMO	0	0	85	1	0	85	—
VE3MR	0	0	84	0	0	84*	—
AP2BP	0	0	84	0	0	84*	65
YU1AD	0	0	79	0	0	79*	—
ZBICZ	0	0	79	0	0	79*	—
GW3LLU	0	0	76	0	0	76*	54
GW2DUR	5	0	71	0	0	72	—
G3AUB	0	0	65	0	0	65*	—
G5BJ	0	0	60	0	0	60	—
G3IRP	5	0	57	0	0	57*	—
GW3EHN	7	1	56	3	2	57	—
G5US	4	0	56	0	0	56	—
VQ4GX	0	0	50	0	0	50	—
G3COJ	12	2	41	5	0	46	—
VQ4ERR	0	0	46	0	0	46*	—

Table corrected to March 3, 1958  
\*Reported this month.  
Stations which have not reported for 6 months are deleted.

nearly 100 countries worked on two-way SSB.

### The G3MY Ground Plane Aerial

The aerial is mounted on top of a 25ft. steel pole with the vertical radiator and radials insulated from the pole. A thick wire ring is used to parallel the radials, which are made of 14 SWG wire. The radials slope at 50° and are also used to guy the pole. The radiator is constructed from a 7ft. length of 1in. dia. dural tube with a "surplus" tapered copper-plated steel whip making up the remaining length. The length of the radiator is 16ft. 4½in. and the radials 18ft. 6in. These lengths are *critical* and have been derived for the location and for the slope of the radials and the pole in use. The aerial is fed with heavy 72-ohm coax and the standing-wave ratio is very low.

### Some Trouble Shooting

Following the appearance of the G2NH SSB Exciter in the December issue, and the accessories described in February "SSB Topics," some mistakes have been disclosed in the diagrams and tables. Although corrections have already been published, the following is a *resumé*, with the details necessary to amend the diagrams.

Fig. 4, p.538, December 1957. A coupling condenser of 100 μF should be inserted between the anode of V2 (CO section) and the cathodes of V3. C6 should be .005 μF, and not as given.

Fig. 1, p.646, February 1958. The link windings L2, L4, L6 are shown at the "hot" end of their respective main windings; they should be wound at the "cold" (or HT feed) end.

Fig. 3, p.651, February 1958. The circuit as shown will not block the BM V4 under key-up (receive) conditions. The original mixer used a different coupling arrangement, and this caused some confusion. The circuit as drawn will still block the Class-A stage and will usually be satisfactory with normal receiver gain settings. To get it right, the two grid leaks of V4 should terminate at the junction of C1,R1, instead of as shown. The VFO signal should be fed to V4 as in the original circuit (see Fig 4, p.538, December). The bias on V5 is a little high for Class-A operation; hence, the C19, R23 combination (Fig. 4, p.538, December) can be dispensed with, and the cathode taken straight to earth.

We apologise to those who may have been misled on these rather tricky points, and hope that all is now clear.

### News and Views

We wonder how many Sidebanders watched the film sequence of life at the U.S. South Pole base, which was screened by Associated Rediffusion in the news programme "This Week" on January 30. The 75A-4 and KWS-1 at KC4USN was featured as the main link with the outside world, via Amateur Radio. It was through this station, operating on SSB in the 21 and 14 mc bands, that many of the recordings were made which were so extensively re-broadcast by the BBC during the Hillary/Fuchs meeting

at the South Pole.

It was good to hear G3EPL back on 80 metres after his long spell of enforced activity due to eye trouble. For the time being, his operating scope is limited to 3.8 mc as he is not able to tune his transmitter without outside assistance.

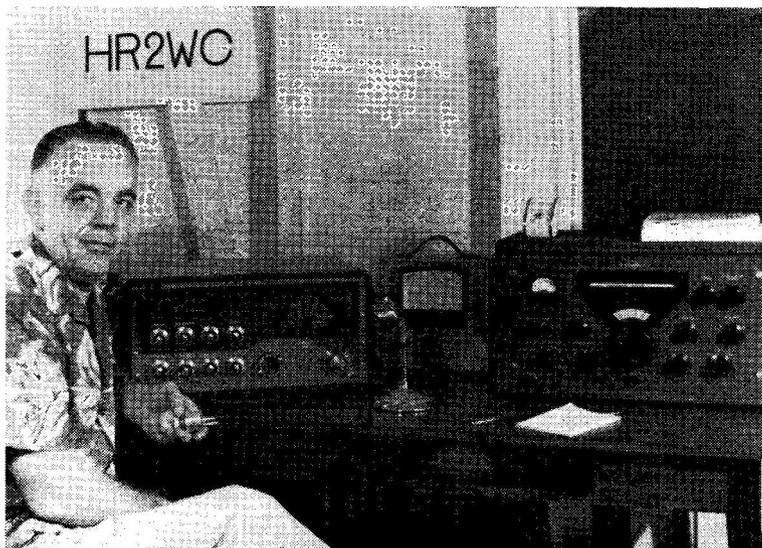
G3LXE is a newcomer to Sideband. Located near Alexandra Palace, his introduction to SSB was on Top Band. He is now active on 80 metres with a modified Edmunds filter exciter and 807 linear amplifier.

F7DD reports that his tour of duty in Europe has been completed and he is now on "extended holiday." He expects to visit Sideband stations he has worked in North Africa and Europe before returning to the U.S.A. in June; London and Manchester are on his calling list. OZ7BO is back on after a rebuild.

G3ALD (Yorks.) has built a phasing exciter using the Multiphase 10-B circuit. He is not too satisfied with the performance and is constructing the G2NH model with the G3MY mixer for multiband work. G3KFX (Ipswich) recently joined the Sideband ranks; he is active on 3.8 mc, but has plans for the other bands. GW3EHN (Swansea) is continuing with SSB on 160 metres and asks for more Sideband activity now that the regular Monday night nets have been discontinued.

Another newcomer is EI1J (Cork). He is at present on 14 mc. EI6W (Co. Galway) is rebuilding, but should be back on 14 and 3.8 mc within a few weeks; a modified W2EWL phasing exciter will be in use. We hear that GD3GMH is now using one of the new Hallicrafters HT32 transmitters. For long a supporter of SSB, it was grand to hear him putting out such an excellent signal on 3.8 mc. Judging by the DX that has been calling him on the HF bands the HT32 must be doing a good job—or is it that GD call?

K9EAB, writing from hospital in Illinois, asks European Sideband stations to look for him on 21 mc. He is a bad case of polio and operates from



HR2WC, Cortes, Honduras, is ex-YN1WC and was licensed as W6EWC in 1931. HR2WC started on 80-metre SSB in 1953 and now runs a kilowatt, with a Collins 75A-2 receiver and a Hallicrafters HT-32 Exciter. The aeriels are a 7/21 mc doublet, and a dipole for 14 mc.

inside an iron lung. Best wishes for a speedy recovery, OM.

Several readers have expressed interest in the commercial SSB signal that appears from time to time just above the high end of the 14 mc band. This unscrambled upper-Sideband transmission is radiated by a station in New York during periods of poor propagation over the North Atlantic path. We understand it is used for adjustment of receiver levels, aerial selection, and so forth. This station has also been heard transmitting AM and multiplexed scrambled telephony.

Early February is not the best time to climb a 60ft. tower to free a jammed beam, particularly at night when the temperature is minus 10° C. During a recent trip to Germany and while waiting for a plane connection at Frankfurt the writer visited the U.S.A.F. club station at Rhein-Main (DL4RM). Although the U.S.A.F. Base is located next to the civilian airport, security is a problem and it required much telephoning before permission to visit was granted by the "Air-Police." Following a long walk through the snow, we arrived at the station to find the Base fire department in attendance with a portable searchlight and several harassed DL4's "up the pole."

The Rhein-Main group are real enthusiasts for SSB and now use it 100%, even though they have several AM and CW transmitters of advanced design and much higher power. They are at present rebuilding the station and are planning to convert the AM equipment for SSB operation. (Thank you, over there, for a most interesting and enjoyable few hours.)

#### DX Notes

During the period now under review, high-frequency band conditions have been very mixed

TABLE I

#### Coil Details for 21-28 mc High-Level Mixer

##### CO TANK

8 turns 24 SWG close-wound on ½-in. dia. Aladdin former, without slug. Link 3½ turns PVC close-wound at cold end. Main coil tuned with 50  $\mu$ F variable condenser.

##### MIXER ANODE

7 turns 24 SWG space-wound to occupy length of Aladdin ½-in. dia. former, without slug. Link 4 turns PVC close-wound at cold end. Main winding tuned with 60  $\mu$ F variable condenser.

##### BUFFER ANODE

7 turns 18 SWG spaced to occupy 1-in. on ¾-in. dia. former. Link winding 3 turns 18 SWG close-wound at cold end. Main winding tuned with 60  $\mu$ F variable condenser.

and have varied from periods of high MUF to times when the bands were almost completely dead, due to sunspots. Most of the reports this month refer to these difficult propagation periods and emphasise the advantages of SSB in getting through under dead-band conditions.

As mentioned some months ago in "SSB Topics," VQ4EO is trekking across Africa in an SSB-equipped Land Rover. He reports that conditions have been wretched, but he has managed a few contacts with the U.K. At the time of writing, he has covered VQ3, 4 and 5, OQ5, FQ8, FE8 and ZD2. The U.K. is his final destination and he hopes to make most of the trip overland. SSB operation is promised from some more rare ones *en route*. This is a real "expedition" and he is finding the going a little tough (the understatement of the year?). Good luck, OM, and thanks for so many new ones. (See story elsewhere in this issue.—*Editor.*)

Two other expeditions are on the books and are tagged 100% SSB. The first is the long expected ZS7 trip planned by ZS6AJ, which was due early in March (sorry it was not possible to give advance notice about this). The other is a visit to HKØ, now being arranged by VE3MR, TI2HP and TI2RC. The expected date is April 11 to 13, but this is provisional and subject to the licence being received in time.

JA2YA, reporting to "SSB Topics" for the first time, says that conditions between Japan and Europe have been very poor since early January. It's the same story from KR6AF and HS1A, but all three stations mention that they were able to keep in touch *via* SSB, while their AM locals were having a thin time.

We were surprised and pleased to hear from UA3CR that he is a regular reader of "SSB Topics"! Both UB5TW and himself are recent converts to SSB and are attempting to whip up interest for increased Sideband activity in the U.S.S.R. UA1DZ has been back on 14 mc with a much-improved signal.

ZB1CZ has given up regular operation on 3.8 mc, as he finds the G's do not frequent the band until after his bedtime! He will always come on by arrangement, to provide a ZB1 contact. AP2BP, reporting back on the Ladder, mentions that he has been receiving BBC television on a more or less regular basis. A home-built TV receiver is in use and he has received a QSL from the BBC!

5A5TH reports that KH6RU has been active from FO8, KS6 and VR2. He is due in VK9 by early April and other locations are on his tour route. F7AF mentions that KM6AX is back on 14 mc and can be worked from Europe around 0800 GMT. 4X4DK is now active and is using the equipment supplied by VE3MR. He has been joined by 4X4JU, who is using DSB. MP4KAM is now 9K2AM, and MP4KAC is 9K2AC. The CN8IF expedition arrived in Monaco during late February and used the call 3A2CD; conditions were "difficult," but some DX was worked on 14 and 28 mc.

The XV5A controversy is causing much heart-burning in the States. He is ex-KV4AD and has been licensed by the Viet-Nam authorities who, unlike their French predecessors, have no objection to amateur operation. Copies of his licence have

been sent to the F.C.C. and the A.R.R.L., so perhaps the present ban for DXCC will be relaxed.

We are sure that many of our readers will be sorry to hear that HR2WC has closed-up shop and is now back in the States. For long the most consistent Sideband signal from Central America, and certainly the first SSB station to operate from this area, he feels that it's time to get back to a more reasonable climate. His new location in the States is Florida and he is operating mobile under the call W6EWC/4.

Several weeks ago a story was circulating on the bands relating to YV5FL and the recent troubles in Venezuela. We are glad to report that he is fit and well and the "story" was without foundation. He can be worked on 14 and 21 mc most evenings.

GW3LLU, passing along his score for the Ladder, also draws attention to the bad conditions. They do not seem to have worried him unduly, as he reports working all the new ones! A similar note from DL4SV, who has now worked 106 countries with 96 confirmed. No need to ask if he has collected the newcomers!

The top man on the Ladder is VK3AEE with 115 countries worked two-way Sideband. QSL's are not coming in as fast as he would like, but he has high hopes that the 100th card will be received within a few weeks. Congratulations, OM. Both ZL3IA and ZL3PJ have topped the century, as have ZS6KD, W2JXH, W3ZP, W4INL, W4IYC, W6UOU and your conductor (thanks to VQ4EO and KH6RU).

CQ are now issuing certificates to any station which can produce QSL's from 100 or more countries worked from one location on two-way Sideband (including DSB). Claims and cards should be sent to: W3SW, 919 McCeney Road, Silver Spring, Maryland, U.S.A.,

It is hoped that we shall be able to present an interim report on the SSB Contest in the June issue of "SSB Topics." So that we can make the story as complete as possible, we would like to hear the G's point of view, so do not forget the deadline.

Thanks to all the U.K. and overseas readers who have passed along information for these notes.

#### Dead-Line—

This must be **April 30** for the next "SSB Topics," in the June issue of *SHORT WAVE MAGAZINE*. Please get your claims for the Table up-to-date, and let us have all your news, views, queries, ideas and suggestions about Sideband working by that date. So, till June, 73 *de G6LX*.

#### THE ABRIDGED VERSION

This refers to that edition of the *Radio Amateur Call Book* which is complete except for the American listings; it has been produced to cheapen the *Call Book* for those who normally QSL their W contacts through the bureaux. The Abridged Edition is excellent value for money, as it gives the callsign/addresses of all known radio amateurs outside the U.S.A., under every prefix except the K/W stations. In the Abridged Edition, the U.K. listings occupy some 28 pages, out of the total of 186 pages. We can still supply the Abridged Edition (Winter Issue) of the *Call Book* from stock, the price being 17s. 9d. post free.

### GREAT MAN OF SCIENCE

On February 28, Sir James Swinburne, F.R.S., attained his 100th birthday. A distinguished engineer, and practically the founder of the modern British plastics industry, he was actively associated with Bakelite, Ltd., until his 90th birthday. During his long life, Sir James has had many interests. Educated at Clifton College, he started as a locomotive engineer, and then became a draughtsman. At about this time, he met Swann, inventor of the incandescent lamp, and learnt enough to start lamp factories in France and America. His next engineering contact was Crompton, with whom he worked for three years on dynamo development. Swinburne acquired a vast miscellany of technical knowledge, and was frequently in demand as an expert witness in specialised litigation, in which he made a great reputation. By the early 1900's he was probably one of the leading electrical authorities in the world, and he was made F.R.S. in 1906. He was at that time a consulting engineer, and had started private research into synthetic resins (or "plastics," as they are now called). When Swinburne went to the Patent Office to register his process, he found he had been anticipated—*by one day*—by a Belgian chemist called Baekeland, who gave his process the trade-name Bakelite. Undeterred, Swinburne continued his research and produced a lacquer for the protection of brass and other metal surfaces; this led to insulating varnishes of the sort now used throughout the radio and electrical industries, and companies were formed to exploit the processes commercially. Later, Swinburne and Baekeland joined forces, the result being the well-known firm of Bakelite, Ltd., with a large modern factory at Tyseley, Birmingham.

At his great age, Sir James Swinburne is honoured not only by the Royal Society, but also by the Institution of Electrical Engineers and the Faraday Society, of both of which he is a past president, and by the Institution of Civil Engineers. From his birthday photographs, this very distinguished old gentleman looks as fit and as spry as many a man 20 years younger. He now lives in retirement in Bournemouth.

### CARDS IN THE BOX

If your call appears below, it is because we hold card(s) for you at our Bureau, but have no forwarding address. Please send a large, stamped, addressed envelope, with name and call sign, to: BCM/QSL, London, W.C.1, which is a full and sufficient, and the only, address for our QSL Bureau. If publication of the call sign/address in "New QTH's," and subsequently in the *Radio Amateur Call Book*, is required, that should be mentioned at the same time.

G2CI, 2ERL, 2FEL, 2FUR, 2HTT, 2UG, 3AYP, 3BBW, 3BJ, 3DEI, 3DKA, 3DSF, 3DXZ, 3GKV, 3IOZ, 3LBK, 3MAO, 3MBN, 3MBO, 3MDE, 3MDO, 3MEH, 3MEQ, 3MFI, 3MHM, 3MNO, 3PGW, 3PVU, 3STC, 4AOK, 6TY, GI3AX, GM3HLU, 3KNT, GW3AIP.

### PRICE INCREASE — CALL BOOK

We are informed by the American publishers of the *Radio Amateur Call Book* that, consequent upon the fact it is now more than 12 per cent. bigger than a year ago—with up to 15,000 new call sign/addresses and some 25,000 changes of address or deletions in every issue—it has become necessary to advance the price somewhat. This increase would be much more had the *Call Book* people not invested a large amount of money in modern business machinery methods to reduce the cost of production. While it is true that the more licences there are the greater the number of *Call Books* sold, the fact remains that to keep a publication like the *Call Book* up-to-date on a quarterly basis entails increasingly heavy expenditure out of proportion to the greater number of entries. And make no mistake about it—the *Call Book* is up-to-date. The G listings in the forthcoming (Spring) edition will be the most accurate and complete yet published, going right into the G3M's. The price of this edition (in the Complete version) will be 41s. 6d., and we should have stocks shortly after you see this. Orders, with remittance, to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

### SATELLITE V LAUNCHED

Since we wrote that bit on p.37 of the March issue of *SHORT WAVE MAGAZINE*, the Americans have had another crack. On March 5, Satellite IV was fired, consisting of a 32 lb. body carrying a tape recorder, which was to be triggered and interrogated from the ground; unfortunately, this attempt turned out to be a failure, after what appeared to be a good launch. Then, at 1218 GMT on March 17, Satellite V, now known officially as "1958 Beta," was successfully placed in an equatorial orbit; it is a small 3½ lb. test sphere, carrying two transmitters (108.00 and 108.3 mc), one of which is powered by solar batteries, so it should have an indefinite life. "1958 Beta" is expected to remain in orbit for ten years or more, and is radiating a healthy signal, which has been reported by radio amateurs as far north of the track as Italy and Japan. The orbit time is given as 135 minutes, and the speed 18,000 m.p.h. Both the USA and the USSR are now well into the satellite business, and further launchings, of more interesting vehicles, can be expected from time to time. Incidentally, to give some idea of what all this costs, it is said that "1958 Beta"—which, after all, is only 6 ins. in diameter and is no more than a test—has set the U.S. back some £40 millions.

### THE "NEW QTH" PAGE

This has been a regular feature of *SHORT WAVE MAGAZINE* for a great many years; it ensures the earliest possible appearance in print of a newly-issued call sign, or a change of address, and is also one of the means by which we keep the *Call Book* up-to-date on the U.K. listings. There is no charge of any sort for entry in "New QTH's," and all readers not already in the international *Radio Amateur Call Book* should notify us of their call sign/addresses without delay.

**D**URING the period we are now considering, the barometer attained its lowest reading on February 24 and its highest on March 21, with nearly as good a figure for March 2-4. Between these dates, the fluctuations were quite considerable, though fairly smooth — that is to say, there were no very violent changes, either way.

As the trace started to climb upward during Sunday, March 2, so conditions improved, until by the early evening of that day, northern stations were getting into the London area, and to the south generally, very well. This state of affairs happened to coincide with the closing hours of the first two-metre Contest of the season, which started on March 1st. Activity was quite good on the Saturday, but conditions were definitely poor — at that time, the barometer was still moving downward. For those in on the Contest, it was slow going for most of Sunday, though with a considerable spurt towards the evening, as activity improved with the conditions. For instance, by 1230, G4DC (Upminster, Essex) had made 73 contacts; five hours later, he was up to 93, and he finished with 100 QSO's booked in. G5MA (Gt. Bookham, Sy.) made six contacts in about the last hour, while the figure given by G5YV (Leeds) at 1840 on March 2 was 83. In fact, it was only during the last hour that the scoring rate really began to accelerate.

If our observations are anything to go by, it looks as if G4DC will come out the high scorer, with G5MA and G5YV not far behind. There is no doubt that this Contest did stir up the band — quite a number of OT's came out of hibernation (your A.J.D. noted G6LL and G6NF, among others) and there was even a certain amount of CW being worked. An unusual signal was that of G3FCQ, who was on *MCW* — not heard on VHF for many a long day, but a very effective way of modulating a carrier, nevertheless.

#### More Aurora

Still on the subject of conditions, PE1PL reports that on March 13 aurora-type signals were noticed on Band II (VHF/FM BC). There was no amateur activity on the

# VHF BANDS

A. J. DEVON

The March Contest—

Some Good Periods—

Round the Stations—

VHF Convention, London, May 17—

two-metre band at the time (1320-1530 GMT), but aircraft were heard on about 144.4 mc with characteristic "via Aurora" signals.

PE1PL gives his tally of U.K. stations worked for the month as: G2HCG, G2NY, G5BD, G5WW, G5YV, G6FO and G6YU. The regular schedule keeps out of this lot are G2HCG, G2NY, G5WW and G6FO. As to results, G2HCG always makes it on phone, and G6FO every day on CW; the G2NY path is about 50% reliable, and G5WW — who can only be on for Saturday mornings — has had one or two QSO's.

Remember that PE1PL looks for U.K. stations every week-day between 1.00 and 1.15 p.m. clock time, and that his freq. is 144.00 mc dead.

#### Some of the Gossip

G3KEQ (Sanderstead, Sy.) who seems to put a good signal out in all directions, claims three more for the Annual, which he now leads, and also goes up in 70 cm Counties. A nice two-metre QSO for him was GW3FKO/P in Cardigan, during the Contest.

G3IER (Cheltenham) reminds us that there will be a two-metre talk-in station (G3YZ/P) for the

Cheltenham Mobile Rally on Sunday, May 11; he also reports that one of their group, G3HXN, managed to work stations in 22C during the Contest.

From Derby, G3KQF writes that recently "all activity has been of a local nature." On two metres, he has pushed up to 75w. with an 829B, and for 70 cm is tripling a QQVO6-40A; for the latter band, he has a G2DD-type converter (this was described in the March 1953 issue of *SHORT WAVE MAGAZINE*, and is a good basic design for those making a start on Seventycems). G3KQF says that there is activity in the Derby area most nights, the regulars being G3GSO and himself, with G2CRL, G3EKX, G3KAG, G3LCV, G3LHW and G3OZ also up on occasions. And G3KQF pays us the compliment of saying we ought to be doing something about a contest, as those we used to run, with what he calls "the Magazine system of scoring," were very enjoyable. Others have been good enough to make much the same sort of comment — so it

#### TWO METRES

COUNTIES WORKED SINCE

SEPTEMBER 1, 1957

Starting Figure, 14

From Home QTH Only

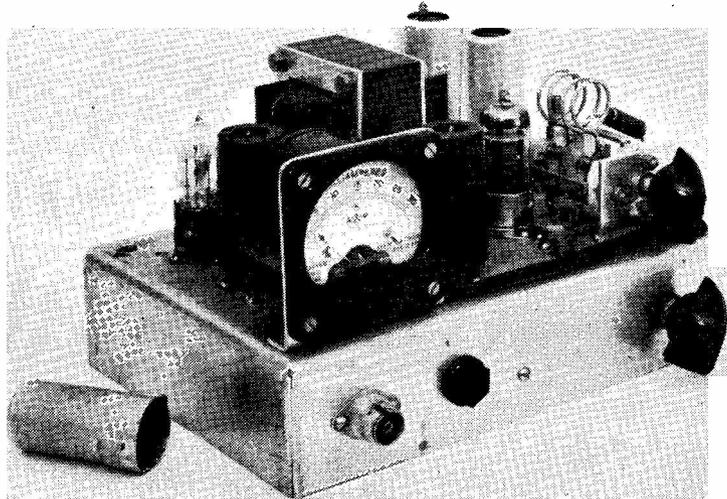
Worked	Station
50	G3KEQ
45	G5MA
43	G3HBW
41	G3GHO
36	G8VZ
34	G2CIW
30	G3JWQ
27	GM3DIQ
25	G3KHA
24	G2AHY, G3GSO
22	G3KQF
21	G3KUH
17	G3DLU
15	G3CKQ

*This Annual Counties Worked Table opened on September 1st, 1957, and will run till August 31st, 1958. All operators who work 14 or more Counties on Two Metres in the year are eligible for entry in the Table. The first claim should show a list of counties, with stations worked for them, as soon as 14C have been achieved. Thereafter, the list can be added to as more counties accrue.*

looks as if we shall have to give it thought; say, for September-October.

G8VZ (Princes Risboro') found one or two spells of good conditions in the course of his regular schedules with G3ENY, G3JWQ and G3KHA. The best evening noted — which also is the best we logged — was Monday, March 3, when the sked QSO's were made with S9 signals both ways. Jack holds, and we agree, that 100-mile distances are in fact workable almost any time on two metres — if people would only try, and be prepared to go on the key when things are too thin for phone. Incidentally, he is one of those public-spirited citizens who give their spare time for local duties — in his case, the Fire Service. So when, in the middle of a QSO, the bell goes at G8VZ, that's it!

Last month, we mentioned G3NR as being active again, from Bracknell, Berks.; this time, he writes to put us in the picture. All his gear is home-built, the receiver being a Cascade with tunable oscillator, with the 5 mc IF taken into a fixed-tuned double-super, which is used with converters for other bands.



Neat two-metre /P transmitter, by G3KUH (Rotherham). The RF side is 7Z/Z77 into 144/EL91 driving a 6C4 running  $4\frac{1}{2}$  watts input. The speech amplifier consists of a 12AX7 (to that high-gain circuit given on p. 535 of our issue for December 1955) into a 6BW6 as modulator. The nice-looking mod. transformer you see here is not a commercial product — it was designed and made up by G3KUH himself, as being the only way in which he could get what he wanted. The chassis size is 7 ins. by 5 ins. by 2 ins. deep, and the height overall  $4\frac{1}{2}$  inches. If you heard or worked G3KUH/P in Westmorland, this was the Tx in use.

## TWO METRES

### COUNTRIES WORKED

Starting Figure, 8

- 16 ON4BZ (DL, EI, F, G, GC, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, 954)
- 16 G3GHO, G5YV, G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM)
- 15 G4MW
- 14 G2FJR, G2HDZ, G3IOO, G5BD, G5MA, G8OU
- 13 G2XV, G3BLP, G3CCH, G3DMU, G3GPT, G5DS, G6XM, G6XX, PA0FB
- 12 F8MX, G2HIF, G3FAN, G3GHI, G3JWQ, G3KEQ, G3WW, G6LI, G6RH
- 11 EI2W, G2AJ, G3ABA, G3DVK, G3GFD, G3HAZ, G4RO, G4SA, G5UD, GM3EGW
- 10 G2AHP, G2FOP, G2HOP, G3BK, G3BNC, G3DLU, G3EHY, G3GSE, G3JZN, G3KUH, G3WS, G5MR, G8IC, GW5MQ
- 9 G2CZS, G2DVD, G3DKF, G3FIJ, G3FUR, G3IUD, G3LHA, G5ML, GC3EBK
- 8 G2CIW, G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3GBO, G3HCU, G3HWJ, G3KHA, G3VM, G5BM, G5BY, G8SB, GC2FZC

The transmitter runs EF91's into an 832, which was the first PA; this now drives a very nice valve, a Mullard QY3-125, to 120w. input. The G3NR beam is a 5-ele Yagi at 28 ft., fully rotatable, the driving element being a wind-screen wiper motor, with gear box — which is an interesting solution to this particular problem. (It ought to be quite man enough to turn a well-balanced system, especially with some extra gearing.) By the way, G3NR acknowledges the very useful reports of SWL Woodhouse, which were a great help to him in getting things lined up properly.

Over in Cambridge, G2CIW found things a bit better, with a marked improvement in activity and conditions during March 1-4; his best DX raised was GW3BOC/P for Flintshire, also F8GH, G3ENY and G3IOO; the latter was worked on 70 cm, too.

G3KUH (Rotherham) still wants about six cards for his VHFCC — he remarks that if he owes anyone a card, they have only to say so, over the air or otherwise, and it will be sent *pronto*. G3KUH is on

every evening from 2300, and also Sunday afternoons; he mentions G3LLE (144.37 mc) as a new station in Sheffield, with G2LG (Rotherham) coming along, and G3DVK about to appear again after reorganisation. G3KUH offers some very useful suggestions in the way of new awards to encourage activity; one or two of these at least we shall probably be able to adopt — if so, they will be announced here as soon as possible.

G3GSO (Derby) puts in claims, and reports a change imminent to a 5/5 head for the beam.

G3KHU (Plymouth, ex-Huddersfield) has got started on 145.8 mc, with a QQV03-20A in the PA, and a 4-ele flat-top; he looks for contacts during 7.00-8.30 p.m., clock time. Another station new on the air is G3KAZ (Bradford Abbas, Dorset). Of both these we hope to hear more in due course.

### The Tabular Matter

The Editor has been flogging your poor old A.J.D. on to get the Tables out of the file and bring them up-to-date. Hence the spread this time —

**TWO-METRE ACTIVITY REPORT**

*Lists of stations heard and worked are requested for this section, set out in the form shown below, with call signs in strict alphabetical and numerical order.*

G8VZ, Princes Risborough, Bucks.  
**WORKED:** G2FNW, 3AYJ, 3EJO, 3ENY, 3FIH, 3GSO, 3GZM, 3IRS, 3JGY/P (Hereford), 3JGY/P (Worcs.), 3JWQ, 3JZG, 3KHA, 3KKL/P, 3KMT, 4GZ, 5DW, 5YV, 6XM, GW3FKO/P (Cardigan). (All over 50 miles; February 16 to March 16).

G3KUH, Rotherham, Yorks.  
**WORKED:** G2FKZ, 2FMO, 2FNW, 3AGS, 3APY/M, 3ATM, 3CCH, 3CNF, 3DJJ, 3EEO, 3EVV, 3FGT, 3FIH, 3GFD, 3GHI, 3HA, 3HWC, 3IWI, 3JWQ, 3JZG, 3LLE, 4DC, 4GZ, 5CP/A, 5MA, 5YV, 6XM, 6XT, 6XX.  
**HEARD:** G2ACV, 2ANT, 2NY, 3HXN, 3JGY/P, 3JZN, 3KKO/P, 5BD, 5DW, 5KG, 8VZ. (February 1 to March 14).

SWL Tomlin, Malvern, Worcs.  
**HEARD:** G2DCI, 2FNW, 2NV, 2WJ, 3APY/M, 3ARK,

3BA, 3DF, 3DJJ, 3EJO, 3ENY, 3FCQ, 3FGT, 3GGR, 3GZM, 3HAZ, 3HXN, 3IER, 3IOO, 3JGY, 3JR, 3JWQ, 3JZG, 3KEQ, 3KPT, 3KQF, 3LGJ, 3NL, 4DC, 5BM, 5YV, 6NB, 8BP, 8VZ, GB2RS. (February 1 to 28, week-ends only).

SWL Winters, Melton Mowbray, Leics.

**PHONE:** G2BVW, 2CDB, 2CIW, 2DSF, 2FNW, 3APY/M, 3BU, 3EEO, 3FAN, 3FUW, 3GGR/P, 3GSO, 3JWQ, 3JZN, 3KQF, 4DC, 4MK, 5CP, 5MA, 5YV, 6NB, 6YU, 8VZ, GB2RS.  
**CW:** G2CIW, 2FMO, 2FNW, 3ALC, 3EEO, 3JWQ, 4DC, 4MK, 5MA. (February 19 to March 16).

SWL Woodhouse, Storrington, West Sussex.

**PHONE:** G2AHP, 2AHY, 2AIH, 2ANT, 2APY/M, 2AUD, 2BDP, 2BDX, 2BVW, 2CDB, 2CIW, 2CPX, 2DD,

2DDD, 2FM, 2FMJ, 2FNW, 2HCG, 2MV, 2NM, 2WS, 2XV, 2YC, 3AAZ, 3ABA, 3AFN, 3BA, 3BBR, 3BEX, 3CGQ, 3CNF, 3DDM, 3DDR, 3EEO, 3EJO, 3EJO/P, 3ENY, 3FAN, 3FCQ, 3FD, 3FIH, 3FMO, 3FP, 3FQS, 3GDR, 3GGJ, 3GGR/P, 3GHI, 3GHO, 3GOZ, 3GVC, 3GZM, 3HBW, 3HZK, 3IAM, 3IBI, 3INV, 3IOO, 3IRA, 3IUL, 3JGY, 3JGY/P, 3JR, 3JWQ, 3JZG, 3JZN, 3KEQ, 3KHA, 3KQR, 3KSR, 3LCK/A, 3LGI, 3LHA, 3LOK, 3LTF, 3LVD, 3PV, 4DC, 4KD, 4MK, 4PS, 5CM, 5DS, 5MA, 5NF, 5US, 5WW, 5YV, 6JK, 6JK/P, 6NB, 6OU, 6OX, 6XM, 6YU, 8AL, 8SC, 8VZ, GB2RS, GW3BOC/P, PEIPL.  
**CW:** G2ANT, 2CIW, 2FMJ, 3ABA, 3BEX, 3CCH, 3EEO, 3FIH, 3GDR, 3HZK, 3IBI, 3JWQ, 3JZG, 3LTF, 4MK, 5CM, 5MA, 5US, 5YV, 6FO, 6NB, 6OX, 6XM, 8VZ, GW3MFY. (February 16 to March 17).

**SEVENTY CENTIMETRES**

**ALL-TIME COUNTIES WORKED**

Starting Figure, 4

Worked	Station
29	G2XV
26	GW2ADZ
24	G3HBW
23	G3BKQ, G6NB
21	G3KEQ
18	G2CIW, G3IOO
16	G6NF
15	G4RO, G5YV
14	G2HDZ
12	G5BD
10	G2OI, G3IRW
9	G2DDD, G3LHA, G5DS
7	G2HDY, G3JHM
6	G3FAN, G3JMA, G3KHA, G3WW
5	G3FUL, G3IRA, G3IUD, G5ML
4	G3JGY

*On working four Counties or more on the 70-Centimetre band, a list showing stations and counties should be sent in for this Table, and thereafter new counties worked notified as they accrue*

but until conditions, and so activity, improve sufficiently to justify more than the present space allowance for "VHF Bands," it is not possible to show all the tables together in one issue. Claims for the All-Time are being held for its next appearance — if you have any, make them when next writing in.

There will probably be some interesting movements in Countries Worked this season; ON4BZ is very much in the "hot seat," and will be working hard for a GD contact, to put himself just one ahead. Under exceptionally good conditions, there should be chances with EA, OE, OH, OK and SP, where there are known to be active two-metre stations, not yet worked from the U.K.

And in quite another direction, VOIEX (Ramea Is., off Newfoundland) will be there, with good gear and ready to take advantage of any opening that may occur. The possibilities were discussed here in January (see p. 598) and it may be mentioned that an HF-band talking channel has already been established.

**Scottish Convention**

GM3DIQ reports that this was a great success; the G contingent, out of the total of 36 attending, included G2AIW, G2UJ, G5JU, G3HBW, G3HWR, G3HZK, G3CCH and G3DA. Arnold displayed and described the G3HBW 23-cm gear — and GM3FYB distinguished himself by winning no less than four of the 26 prizes provided for the draw!

**May VHF Meeting**

We are asked to announce that the annual London VHF/UHF

Convention will be held at the Prince of Wales Hotel, Kensington, London, on May 17; it will be an all-day affair, with a get-together in the morning, technical lectures in the afternoon, and a dinner-and-draw in the evening. Tickets and full details from F. G. Lambeth, G2AIW, 21 Bridge Way, Whitton, Twickenham, Middlesex.

**General Notes**

Three of our regular listeners report this time: SWL Tomlin went out with G3JGY/P for March 1-2, and enjoyed it very much; SWL Winters is now well organised for 50 mc reception, but has missed the season, we fear; SWL Woodhouse listens on the G8VZ schedules, and is interested to find that G3JWQ can always be heard down in Storrington, Sussex.

Space has run out again, so it only remains for A.J.D., with his 73, to give you his closing date for May — it is April 23. CU on May 9, and have a good Easter.

**BRITISH ISLES**

**TWO-METRE ZONE PLAN**

(This is reproduced here for the attention of all concerned).

- Zone A & B: 144.0 to 144.2 mc.** All Scotland.
- Zone C: 144.2 to 144.4 mc.** All England from Lancs. Yorks., northward.
- Zone D: 145.8 to 146 mc.** All Ireland.
- Zone E: 144.4 to 144.65 mc.** Cheshire, Derby, Notts., Lincs., Rutland, Leics., Warwick and Staffs.
- Zone F: 145.65 to 145.8 mc.** Flint, Denbigh, Shrops., Worcs., Hereford, Monmouth and West.
- Zone G: 144.65 to 144.85 mc.** Northants., Bucks., Herts., Beds., Hunts., Cambs., Norfolk, Suffolk.
- Zone H: 145.25 to 145.5 mc.** Dorset, Wilts., Glos., Oxon., Berks. and Hants
- Zone I: 145.5 to 145.65 mc.** Cornwall, Devon, Somerset.
- Zone J: 144.85 to 145.25 mc.** London, Essex, Middlesex, Surrey, Kent, Sussex.

# Modifying the RF-24 for Six Metres

CONVERSION FOR TUNING  
50-54 MC

D. T. BRADFORD, VQ4EV (ex-G3GBO)

*The phenomenal DX reception enjoyed by those who have been able to listen on the 6-metre (50 mc) band is, by now, well known. Though the present state of the band is probably that it is about closing until next season, there will be sporadic openings when the MUF goes high enough. The modification discussed here is an interesting one, applied to a standard surplus item which is still very easy to buy. And if you are at all interested in DX, by September or so you will be wanting something to cover the 50 mc band.—Editor.*

**B**ECAUSE it is basically a fixed tuned device, the RF-24 unit is not as popular as its tunable counterparts the RF-26 and 27 units. However, providing the RF and Mixer circuits can be operated as broad band stages, it is quite a simple matter to tune the oscillator from the front panel.

One of these units has been successfully modified for 6-metre (50 mc band) coverage and the work can easily be carried out in a couple of evenings' work (say, four hours) and

the results obtained are surprisingly good. As it is readily and cheaply available it is thought that many may be interested in modifying the RF-24 for general listening around 6 metres.

## Stage One—Tuning Gear

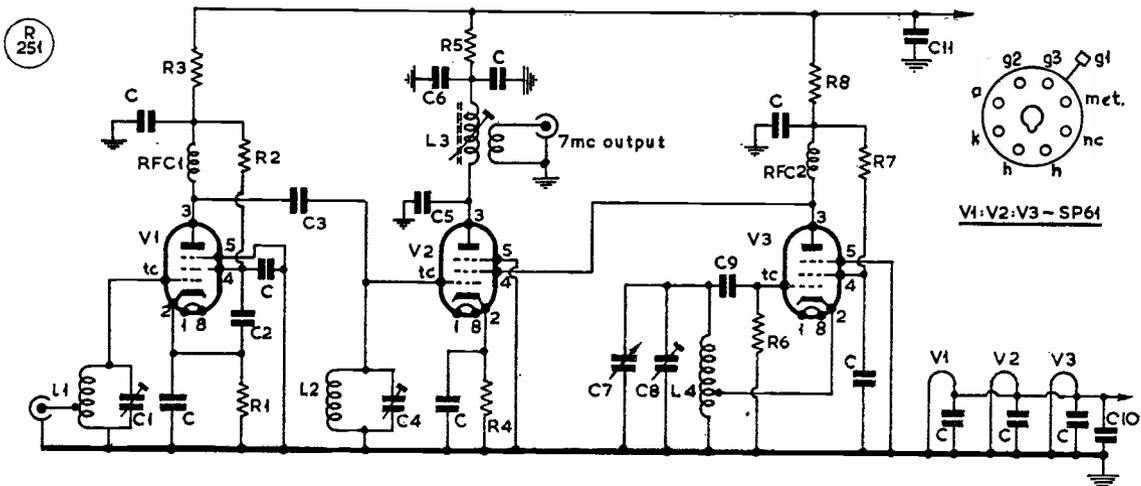
Remove the 3-wafer 5-position band switch, first disconnecting all parts soldered to the contacts. Extract four of the five concentric trimmers in each compartment, leaving trimmer No. 1 in the aerial input section, trimmer No. 2 in the mixer grid section and trimmer No. 5 in the oscillator (rear) section. (The numbers mentioned here are those marked on the outside metal cover adjacent to the adjusting holes.) The three remaining trimmers should be stripped of any parallel fixed condensers or resistors. Remove RF and Mixer coil formers.

The mixer grid coil L2 is replaced by 4 wide spaced turns of 20g. tinned copper, ½ in. internal

## Table of Values

Modification circuit for RF-24 on Six Metres

C = All 350-500 $\mu\mu\text{F}$ by-pass, as originally fitted	R4 = 220 ohms
C1, C4, C8 = 3-30 $\mu\mu\text{F}$	L1 = 5t. 22g. ½-in. i.d., tapped one turn from earthy end
C2 = 500 $\mu\mu\text{F}/.001 \mu\text{F}$	L2 = 4t. 22g. ½-in. i.d.
C3 = 100 $\mu\mu\text{F}$	L3 = Existing IF tuned circuit, with 5t. link
C5 = 10 $\mu\mu\text{F}$	L4 = 4-3/4 turns, 22g., 3/4-in. dia., tapped 2t. from earthy end
C6, C10, C11 = .01 $\mu\text{F}$	V1, V2, V3 = SP61, as fitted
C7 = 15 $\mu\mu\text{F}$ , osc. tuning, see text	RFC1, RFC2 = New RF chokes, 36g. on resistor former, see text
C9 = 25 $\mu\mu\text{F}$	
R1 = 100 ohms	
R2, R6, R7 = 10,000 ohms	
R3, R5, R8 = 2,200 ohms	



Circuit of the RF-24 Unit, as modified by VQ4EV for tunable operation on the six-metre (50-54 mc) band. Normally, the RF-24 is a fix-tuned unit, but this modification shows how it can be altered, C7 being the panel variable control, giving a good sweep in the 50 mc area. The RF and mixer stages are operated "broad band," to eliminate tuning complications, and the IF output remains at 7 mc. The condensers marked C in this diagram are the by-pass capacities as originally fitted, and are usually 350  $\mu\mu\text{F}$ . The SP61's are retained, and a new oscillator coil made.

diameter, self-supporting, connected across the mixer compartment trimmer. The grid (top cap) of the mixer valve is then connected to the unearthed (stator) of the trimmer and the stator is also taken to the wire coming up through the chassis from the anode circuit of the RF stage. This wire has to be replaced as it is a little too short to reach the trimmer.

The RF stage grid coil L1 is connected in a similar manner to the grid of the RF stage, but requires five turns, tapped at one turn from the earthy end for a connection to the aerial socket. Otherwise this coil is of the same gauge and diameter as that of the mixer.

The original oscillator coil L4 consists of  $4\frac{3}{4}$  turns of 20g. tinned copper wire wound on a ceramic former about  $\frac{3}{8}$  in. in diameter. This can be used as it stands, for without the stray capacities of the switch gear it can be made to tune 43-47 mc (oscillator range for 50-54 mc when using 7 mc IF). The trimmer C8 in position 5 is wired across the oscillator coil. In addition, and in parallel to this, a small variable single hole fixing condenser C7, of about 15  $\mu\mu\text{F}$  capacity, is mounted in the oscillator compartment using the slot vacated by the switch. Two large washers, one on each side of the partition, help hold the condenser firmly when its fixing nut is tightened. This condenser is driven from the front panel via a  $\frac{1}{8}$  in. diameter shaft and two flexible couplers, passing through the slots formerly occupied by the wafer switch shaft. Almost any sort of reduction drive that is conveniently available can be mounted on the front panel for easy tuning.

The concentric trimmer C8 in the oscillator compartment then acts as band-set condenser, while the range 49-55 mc (roughly) is tuned from the front panel.

The RF and mixer circuits are left broad-tuned. If peaked at about 51 mc the sensitivity is reasonably uniform (though by no means "flat") over the range. A front panel operated aerial trimmer in place of the concentric trimmer in the aerial compartment would probably be a worth-while refinement, though this has not been tried so far.

### Stage Two—Below Chassis Wiring

Whilst there are quite a lot of wiring changes here, none of them are in the least bit difficult. In both RF and Mixer compartments remove all "stopper" resistors in series with various electrodes (between 10 and 47 ohms). All the by-pass capacitors, C in the diagram, can then be connected direct on to the valve holder tags and their lead lengths shortened considerably.

The RF stage anode load resistor is replaced by a small RF choke (about 7 feet of 36g. enamelled close-wound on a 1 megohm, 1 watt resistor will do). The choke and coupling condenser ends are connected direct to the valve holder tag and *not* to the connector board, as in the original circuit arrangement.

Join G2 and cathode of the RF stage through a miniature 500 or 1000  $\mu\mu\text{F}$  condenser. The IF output coupling condenser C5 (10 or 15  $\mu\mu\text{F}$ ) is unsoldered at the end feeding the cable and returned to earth. (This is to compensate for the reduced stray capacities with link coupling.) A 5-turn link is wound round the IF coil (beware of breaking the fine wire termination) using 22g. plastic covered wire. One side is earthed while the other feeds the IF output coaxial cable. The HT side of the IF tuning coil is by-passed to earth with a 0.01  $\mu\text{F}$  tubular condenser C6 added in parallel with the existing 350 or 500  $\mu\mu\text{F}$  component, marked C in the diagram.

Remove all leads to the mixer cathode and take them to earth via a 220 ohm resistor, R4 (see later) and 500  $\mu\mu\text{F}$  condenser C in parallel. Disconnect all items connected to G2 of the mixer and run a single wire to the oscillator valve anode tag—but first disconnect and remove the aperiodic cathode injection transformer; this will leave two holes with rubber grommets, one of which can conveniently carry the G2 lead. Having extracted the injection transformer from the oscillator compartment, feed the anode of the oscillator valve (and the mixer screen grid G2) via another choke, RFC2. Remove all components connected to the oscillator cathode (the 220-ohm resistor can be used for the mixer cathode) and connect it directly on to the tapping point on the oscillator coil, two turns from the earthy end.

### Alignment

The main receiver should be set to 7 mc and the IF transformer peaked for maximum signal when 7 mc is injected into the mixer grip (top cap). If no signal generator is available a "piece of wire" connected to the mixer grid should produce break-through on 7 mc, which can be peaked. The signal source should then be connected to the aerial input socket on the front panel. Set the tuning condenser C7 at half mesh and the signal source to about 51.5 mc. Rotate the concentric trimmer C8 in the oscillator compartment until the signal source is heard. It should be found in two places, the highest capacity (LF side) is the correct position out of these two.\* The aerial input and mixer grid trimmers, C1 and C4

respectively, are then adjusted for maximum signal on 51 mc.

When the unit is replaced into its screening box, slight re-adjustment of the trimmers is usually necessary. If no signal generator is available this procedure will have to be carried out on an incoming signal, or on ignition noises. The method of screen injection using DC coupling reduces the "through capacity," so that pulling of the oscillator when tuning the mixer grid is negligible.

No electrode "stopper" resistors have been found necessary in the models in question, though in some cases where self-oscillation of RF or mixer stages occurs, it may possibly be necessary to replace some of these until oscillation ceases.

### RF-25 Modification

The RF-25 unit has also been successfully modified in this manner, though it is necessary to change the oscillator circuit to that of the modified RF-24 unit and increase the size of the coil. The RF choke as fitted in the RF-25 oscillator should be retained for sub-chassis use in the oscillator circuit. If this is put in the RF stage anode, oscillation of this stage has been found to occur. Some experiments with RF chokes in this position may prove worth while in cases of regeneration. The co-axial "pipe" in the oscillator section of the

RF-25 unit is also no longer required and is removed.

These units have been found to work quite well on 150-200 v. HT, but remember that they require 2.7 amps. of LT at 6.3 v.

All HT and LT leads should each be decoupled with an 0.01  $\mu$ F condenser to earth at the rear of the Jones plug, where they enter the chassis. It helps to reduce IF breakthrough, although this has not been found to be a serious problem.

It is noticeable in these units that the by-pass condensers have connecting wires which can be shortened considerably. Often wires up to one inch long are used, which with a little "juggling" can be reduced to a quarter-inch at each end.

Difficulty may be experienced in removing some nuts coated with varnish. Scraping first with a screwdriver tip to remove most of the varnish, followed by a drop of thin oil such as "Three-In-One" often remedies the trouble. Allow the oil a few minutes to penetrate before attempting removal. A hot iron will also allow the nuts to be moved.

In areas where Channel 1 Band I television is in use it may be necessary to operate the local oscillator on the HF side of the signal frequency to avoid interference.

(\*In the case of TVI the lower capacity of the two positions may be best, but this will probably increase the frequency coverage, reducing the band spreading effect.)

### LICENCES FOR SOUND/TV

By the end of January, the total of combined sound and TV licences in issue was 7,898,247. Sound-only licences totalled 6,743,027, making it altogether 14½ million homes equipped for BBC reception. There are more than 327,000 sets fitted in cars.

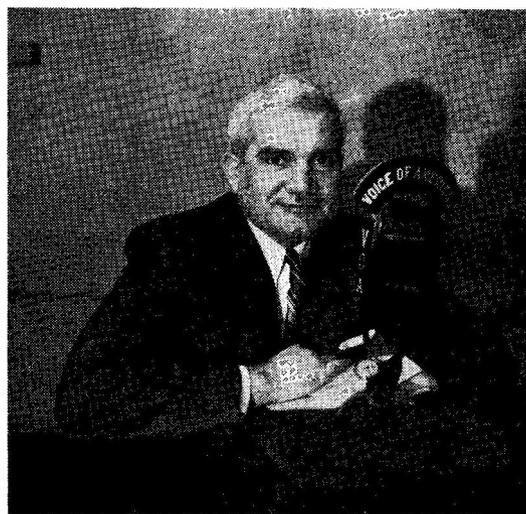
### VHF/FM BC IN GD

The BBC announces that its Isle of Man VHF sound broadcasting transmitter was brought into regular service on March 9, radiating the North of England Home Service on 92.8 mc. The transmission is horizontally polarised, with an ERP of 6 kW.

### "VOICE OF AMERICA" AMATEUR BROADCASTS

We are informed that the 15-minute Amateur programme put on by the "Voice of America" has been resumed. The schedule is every Tuesday, some time between 9.00 and 9.30 p.m., on the following VOA channels: 7110, 9635, 15130, 15250, 17875, 21485, and 21500 kc. The show is repeated on the VOA long-wave (173 kc.) high-power transmitter near Munich at 10.30 p.m. (It should be noted that these times are GMT, and that our clocks change shortly to BST.) The broadcast is in English, is conducted by W2SKE, and consists of news items, interviews, and information of the kind that is likely to be of interest to radio amateurs. The QTH for the

programme is: Amateur Radio, IBS/EC, Voice of America, Washington 25, D.C., U.S.A.



When the "Voice of America" Amateur Radio show is on the air, weekly on Tuesdays at 2100 GMT over several V.O.A. channels, W2SKE does the talking. He also scripts the programmes.

## VQ4EO ON SAFARI

TRANS-AFRICA JOURNEY

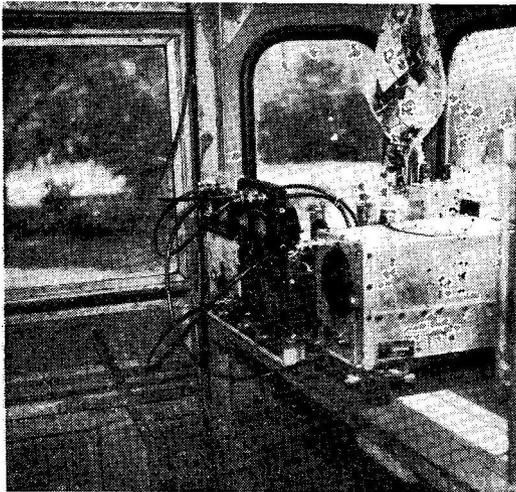
A. F. WARD (VQ4FB)

IT was cold, even though we were on the Equator, and it was only just beginning to get light at Macalder Mine, on the east shore of Lake Victoria. Today was a different day, though—for VQ4EO, Paul Stein, was setting out on his *safari* across Africa with a 14 mc SSB rig, and a 21 Set, mounted in Land Rover KFB-110. (As a matter of fact, the transmitter was incomplete at the start of the journey, having no PA; this was to be fitted at Nairobi.) Across the Lolgorien Cold Belt sped the Land Rover, with all the equipment strapped down to benches at the rear of the vehicle, over the most atrocious roads, and into the Masai Reserve.

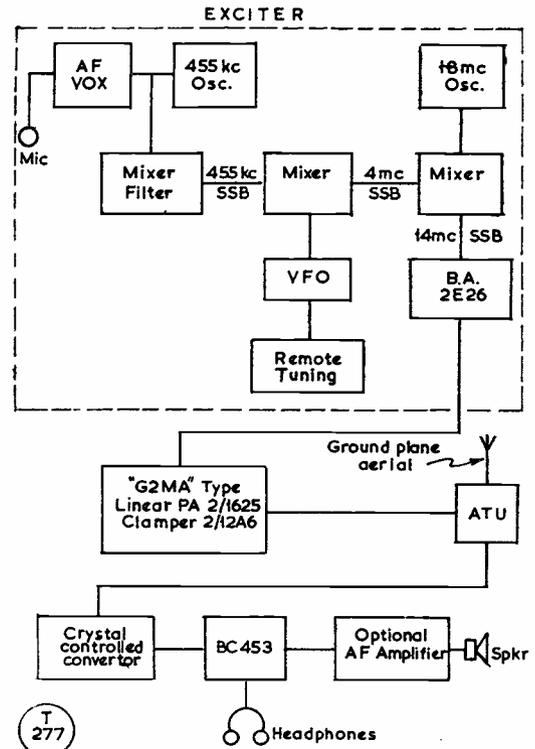
Coming round a bend, KFB-110 came face-to-face with a giraffe; not funny things if they are annoyed—one kick from their hind legs, and bang goes the windscreen. This character took it into his head to *chase* the Land Rover for a quarter-mile or so, before stopping to feed on the leaves of one of the stunted trees that abound in the semi-desert regions of Kenya.

The idea of travelling along such an ill-defined road through wild country was to see if the radio equipment (and KFB-110) would stand up to the harsh treatment they would both undoubtedly receive in the next month or two, on the long journey through to West Africa. For this *safari* was planned to make the east-west crossing, a distance of some 3,000 miles across the breadth of Africa.

First thing to go wrong was the 12-volt charging system—so the headlights were no better than a “NAAFI candle” for the last part of the run to Nairobi. However, the Land Rover arrived safely at VQ4FB, and next morning the vehicle was



Mounting of some of the gear in VQ4EO's Land Rover, for the journey across Africa. SSB is worked on 14 mc, with a 21 Set for general SSB communication on other bands.



Block schematic of VQ4EO's mobile SSB station, fitted in his Land Rover. A 14 mc ground-plane, complete with radials, can be erected on the roof of the vehicle.

unloaded of the radio gear and *safari* paraphernalia, and taken down to a local garage. After check-over, the pronouncement was that “The springs will have to be reset, wheel bearings renewed, and the brakes relined.”

In the meantime, work was started on the Class-B linear final for the transmitter, à la G2MA in “SSB Topics,” *SHORT WAVE MAGAZINE*, June, 1957. In the evening, VQ4EV came round, and lent a hand to get the job finished. When it came to testing the SSB transmitter, the idea of a moonlight picnic, somewhere out in the bush, was mooted and enthusiastically seized upon by VQ4FB's XYL, Audrey. So we fitted the gear back in the Land Rover, packed up enough food and drink to feed ten times our number, and went off to a spot about 18 miles out of Nairobi, on the Mombasa road; the “spot” was a little hill, about 5,000 ft. a.s.l. Leaving Audrey to get on with the catering, the aerials for the 14 mc SSB transmitter and the 21 Set were assembled and slung up, the former being a 16 ft. ground-plane fixed on the roof of the Land Rover, complete with radials; that for the 21 Set was a 60-ft. AOG, running to the most convenient tree, the height of this aerial being 5,008 ft. a.s.l.!

Whilst the gear was being got going, assisted by the consumption of some bottled RF, XYL Audrey was making a good job of the cooking—sausages, and samosas, a rather curried edition of a meat patty.

### The VQ4EO/P Gear

The SSB transmitter consists of a crystal-filter exciter, with VFO, driving a "G2MA" linear Class-B final, running a pair of 1625's, with an estimated peak power of 60-70 watts. The block schematic for the equipment shows the general arrangement.

For receiver, a crystal-controlled converter is used, feeding into a BC-453. For this trip, both transmitter and receiver are operative only on 14 mc, but the 21 Set is carried for emergency communication on 7, 21 and 28 mc. The transmitter unit of the 21 has been extensively modified to take a 5763 in the VFO and PA; the power output on "transmit" is thus increased.

Power for all the radio gear is taken from a 24-volt battery, which runs genemotors for receiver and transmitter, and supplies all the heaters. This battery is charged from an auxiliary dynamo coupled to the power take-off under the middle seat of the Land Rover.

During the evening, VQ4EO/P did very well with the SSB transmitter, logging phone contacts with the following stations: VQ4ERR, VQ4GX, ZS6AQQ, ZS5DW, ZE5JJ and ZS6AJ. On CW, the stations raised were: DJ3KR, SM5CRY, UR2AR and SM5LN. All this was on the 14 mc GP aerial, mounted on the vehicle.

VQ4EO will have the good wishes of all readers for his long journey—the stretch across Africa should have been completed by about the time this appears in print. Anyone who may already have heard, or



Party when VQ4EO fetched up at VQ4FB, Nairobi, on the eve of the Trans-Africa journey. The males are, left to right: VQ4EO, owner-operator of Land Rover KFB-110, fitted for SSB operation on the DX bands; VQ4FB, author of the article, and now on leave in the U.K.; and VQ4EV (ex-G3GBO). The lady is VQ4FB's XYL, Audrey, and their bound is, not inappropriately, named "Mau-Mau."

worked, Paul Stein under his various call-signs will have some idea, from this brief description of the first part of his trip, of the conditions under which it is being undertaken.

### MOBILE RALLY ARRANGEMENTS

Further to the announcements on p.45 of the March issue of SHORT WAVE MAGAZINE, here are more details covering forthcoming Rallies. It will be noted that there are now three scheduled for the same date, May 18, albeit in widely separated parts of the country.

**Northern Mobile Rally.** In the latest information on this, the talk-in stations are given as: G3IJC/M and G3LHQ/M (1990 kc CC) for Top Band; G2FCP/A, 3700 kc, VFO, for 80 metres; and G3GJV/M, 145.00 mc, for two-metre Rally mobiles. The date is Sunday, April 13, and visitors are specially asked *not* to call the control stations till they are right in Leeds or Harrogate. Harewood House is mid-way between these two places, on the A.61, and police patrols will be on duty. Visitors are reminded that applications for car stickers and advance meal bookings should be made to: N. Pride, 100 Raikes Lane, Birstall, near Leeds.

**North Midlands Mobile Rally.** The organisers' slogan for this is "Take a trip to Trentham on the Twentieth" (of April). There will be three talk-in stations: G3GBU/A on 1985 kc; G3MAR/A on 3650 kc; and G3BA/A on 144.7 mc, with G6SN/M standing-by on high ground to help sort out the two-metre mobiles. Further to the details given last month, visitors should note that Trentham lies two miles south of Stoke-on-Trent, on the A.34, and that they are asked to work the control stations as early

as possible on the approach; a QSL card should be put on the windscreen, and the charge for entering the Gardens is 1s. for a car, 1s. 6d. for each adult passenger and 9d. for harmonics. The AA is arranging sign-posting from near Stoke. No advance booking is necessary.

**Cheltenham Mobile Rally.** This is to be in the Montpelier Gardens, Cheltenham, on Sunday, May 11, and control stations will be standing-by for visitors, on Top Band and two metres. The attraction here is the Gardens, which should be at their best by that date. Further details about the Rally can be obtained from: L. W. Lewis, G8ML, 117 Fairview Road, Cheltenham, Glos.

**Lincolnshire Mobile Rally.** This is by way of being a Hamfest, to be held at the George Hotel, Spilsby, Lincs, on Sunday, May 18, assembly 12 noon to 2 p.m. Talk-in stations signing G2FT/M and G8GI/M will be open from 10.30 a.m., on Top Band. Tickets for the meeting (and high tea) will be 7s. 6d., and lunch at the George can be booked when applying for tickets. All bookings should be made with N. T. Hodgson, G2ABK, Main Road, Hundleby, Spilsby, Lincs, by Wednesday, May 14, latest. The programme includes a Junk Sale, for which any surplus gear can be brought along.

The **Bournemouth Mobile Rally** and the **Manchester Mobile Rally** are also to be held on Sunday, May 18—see p.45 March issue.

# NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the quarterly issue of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

**G2AQJ**, R. Collins, Steine House, Old Steine, Brighton, Sussex. (Re-issue.)

**GW3AJZ**, N. McKechnie, 5 Trewern Estate, Welshpool, Montgomeryshire. (Re-issue.)

**G3ISH**, W. Bewell, 6 Rothesay Avenue, Exmouth Street, Hull, Yorkshire.

**G3IYT**, S. R. Walker, 34 Humberstone Road, Grimsby, Lincs.

**G3JXW**, W. J. Wills, 24 Watermead House, Homerton, London, E.9.

**G13LCE**, Amateur Radio Club, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G13LNJ**, A. J. Topp, c/o Sgts' Mess, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G3LOO**, K. R. Piper, 2 Catherina Terrace, Stockwell, London, S.W.8.

**G3LVP**, K. F. Eastty, 83 Herongate Road, Wanstead, London, E.12.

**GM3LVS**, J. C. Downie, Edina, 219 High Street, Methil, Fife.

**G3LXU**, G. C. Wallis (ex-ZB2R), 91 Swiss Avenue, Chelmsford, Essex.

**GM3LYJ**, J. Pattullo, 57 Victoria Street, Dunfermline, Fife.

**G3MAJ**, E. Holden, 26 Charles Street, Piercy, Waterfoot, Rosendale, Lincs.

**G13MDA**, D. Beeden, c/o Sgts' Mess, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G13MEB**, I. MacKellar, c/o Sgts' Mess, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G3MEM**, D. Morgan, 76 Culver Lane, Earley, Nr. Reading, Berks. (Tel.: Reading 62831.)

**G3MEM/A**, D. Morgan, c/o Mill Farm, Nyetimber, Pagham, Sussex.

**G13MFA**, R. P. Vere, c/o Sgts' Mess, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G13MGD**, R. Gordon, c/o Sgts' Mess, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G3MGI**, D. Binns, 136 Street Lane, Roundhay, Leeds, 8, Yorkshire.

**G3MGV**, G. Gordon, 19 More-down House, Amhurst Road, London, E.8.

**G3MGY**, D. V. Mayers, 728a High Road, North Finchley, London, N.12.

**G13MHE**, V. Tointon, c/o Sgts' Mess, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G3MHT**, E. J. Landon, 339 Brampton Road, Bexleyheath, Kent.

**G3MIH**, B. W. Sutton, 163 Eaton Road, West Derby, Liverpool, 12, Lincs.

**G3MII**, P. Roper, 104 Royston Avenue, Southend-on-Sea, Essex.

**G3MIK**, R. Kerley, St. John's College, Cambridge.

**G3MIN**, B. C. A. Kenneford (ex-VQ5CB), 16 West Way, South Lancing, Sussex.

**G3MJB**, B. A. Toseland, 40 The Queensway, Old Dalby, Melton Mowbray, Leics.

**G3MJF**, L. H. Fielding, 397 Torbay Road, Harrow, Middlesex.

**G3MJL**, M. J. Leahy, 5 Whitehall Road, Hanwell, London, W.7.

**G3MJU**, M. A. Stott, 6 Preston Road, Southport, Lincs. (Tel.: Southport 56895).

**G3MJX**, A. Bird, 2 Cheviot Walk, Pogmoor, Barnsley, Yorkshire.

**G3MKH**, G. Rooney, 270 Spital Road, Bromborough, Wirral, Cheshire. (Tel.: Bromborough 2313).

**G3MKR**, B. Haywood, Penarth Cottage, 15 Tunncliffe Street, Macclesfield, Cheshire.

## CHANGE OF ADDRESS

**E17V**, J. Cahill, 10 Strawberry Hill, Sunday's Well, Cork.

**G2DWM**, H. E. Hardy, 7 Windsor Road, Finchley, London, N.3.

**G3BMT**, W. R. Watson, 2 Newlands Drive, Sheffield, 12, Yorkshire.

**G3CSE**, C. W. Smith, 61 Mollison Road, Hull, East Yorkshire.

**G3DUW**, R. Hodgson, 29 Harlow Avenue, Harrogate, Yorkshire.

**G3FRV**, R. G. B. Vaughan, 9 Hawkins Road, Tilgate, Crawley, Sussex.

**G3FTV**, F. A. Grant, 49 Kirkby Road, Ripon, Yorkshire.

**G3GKH**, M. D. Johnson (ex-HZ1XA/ZL3QC), Spencer Cottage, Upham, Hants. (Tel.: Durlley 259).

**G3GYX**, J. J. Wilson, 6 The Grove, Breaston, Derbyshire.

**G3HDW**, J. D. Ward, 12 Seaforth Drive, Waltham Cross, Herts.

**G3JBC**, J. W. Cox, 71 Brandish Crescent, Clifton Estate, Nottingham.

**G3JKI**, A. E. Howell, 62 Woodstock Avenue, Horndean, Hants.

**G3JUX**, J. McFarlane, 31 Ball Haye Road, Leek, Staffs.

**G3KDY**, R. Folgate, 42 Clarendon Street, Nottingham.

**G3KDY/A**, R. Folgate, Forest Mead, School Lane, Newbold, Coleorton, Leics.

**G3KHU**, R. W. Gabbitas, 12 Thornyville Drive, Oreston, Plymouth, S. Devon.

**G3KSL**, D. G. Quarrington, 3 The Crescent, Beckenham, Kent.

**G13KVD**, D. N. Jones, c/o Sgts' Mess, R.A.F. Station, Ballykelly, Limavady, Co. Londonderry.

**G3LIT**, K. Worrall, 32 Penny-mead, Harlow, Essex.

**G8NF**, H. Benson, 10 Westcliffe Terrace, Harrogate, Yorkshire.

# THE OTHER MAN'S STATION

**G3KEJ**



**T**HIS time it is the station of G3KEJ—operated by the Rev. C. B. Burke, B.Sc., a priest of the Franciscan Order, ordained in 1949, who is senior science master at St. Bernardine's College (of the Franciscans) at Buckingham. The station is located in the school laboratory, and the boys' radio club is, of course, centred on G3KEJ.

A keen SWL since the tender age of 14 years, the licence arrived in January 1955, since when the station has been active, in one way or another, on all bands from Top to Ten, and in both modes.

The main transmitter is the assembly just behind the operator, and is home-brewed; it runs 6V6-6V6-1622 into a pair of 807's in parallel, clamped by a 6V6. The PA input is 120 watts on CW and 100w. on phone. The speech-amplifier/modulator is 12AX7-6SN7-6SN7 driving a pair of 807's in Class-AB2, and the microphone is a D.104 crystal type. An entirely separate transmitter is used for Top Band (it is seen above the receiver) consisting of ECO EL32-6V6 PA, with a modulator using EF36-6J5-6L6. The 160-metre transmitter is actually the VFO-driver section for the main transmitter.

RF output from either transmitter is taken to a 268-ft. Zepp-fed aerial, coupled through 600-ohm open-wire line to a universal aerial tuning unit (made up from T.1154 parts). Two other aerials are available, each being folded dipoles, one for 15 and the other for 20 metres.

Receivers include a pre-war RME69 with DB20 pre-selector—that famous combination of the late 1930's—which, having been revalved and realigned by G3KEJ, is still giving very good results, particularly on 21 and 28 mc; another receiver is a home-brewed job involving a CR-100 coil pack, with which an RF-24 Unit, modified for 15 and 10 metres, can be used. Being a school laboratory station, there is a good selection of test gear and ancillary equipment available, including an oscilloscope, signal generator, and various bridge instruments.

G3KEJ, having been licensed at the time of "CW only," started off on the key on Top Band until the restriction on phone working for "1st year operators" was lifted, in November 1955. Under pressure from the boys, the main station activity now tends to be phone on the DX bands, chiefly Fifteen and Ten; the station record to date is 68 countries in 25 zones. There is no particular interest (at present) in contests or the acquisition of operating certificates—it is almost entirely a matter of QSO-ing for the sake of making contacts, preferably DX, and the QSL's visible in our photograph are only a fraction of the cards that have come in since the station was put on the air.

So G3KEJ is another to join that happy band of science masters who, running a station as a school activity, do so much to foster and widen a practical interest in Amateur Radio.

*Short Wave Magazine covers the whole field of Amateur Radio*

# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for May Issue : APRIL 18)

RECENT remarks here about Mobiles as an aid to Club Activity in the summer season have revealed the fact that there is a widespread interest in the subject. A large number of Clubs have found their Sunday-morning activities completely changed by the fact that one or more of their members have "gone mobile" and therefore look for the assistance of other members, on the air from their home stations.

Two additional ventures also come to mind. Firstly, the **Hastings Club**, acting on a suggestion made by G3BDQ, have organised a complete Mobile Tour for the week after Easter (starting on April 12) which will certainly arouse some interest in the areas through which it passes. Secondly, **Southgate** announce that they will be holding Sunday-morning meetings to which visiting mobiles are invited.

Both of these schemes strike us as excellent, and fuller details will be found in the panel opposite. We already hear of Clubs having arranged to meet the Hastings tour *en route*; and we know of quite a few individuals who propose to make quite long journeys to the Southgate Sunday Mornings.

Further schemes will no doubt be evolved, and we shall be very glad to hear of them in time to give publicity in these columns.

**Acton, Brentford and Chiswick** continue to meet every third Tuesday of the month, 7.30 p.m., in the A.E.U. Club, 66 High Road, Chiswick. A committee has been formed to help members with TVI problems, and Morse practice is also laid on. New members will be welcomed.

**Blackpool and Fylde** meet every Wednesday in their Clubroom, Back Gadsby Street, for Morse at 7.30 p.m., followed by the regular meeting at 8 p.m. At the last meeting G3JLF spoke on Sound and the Cinema, and G4HH demonstrated a midget Tape Recorder. At their recent AGM they elected G3FYZ president, G3JLF treasurer and G3IZG secretary-treasurer. On April 16 there is a Tape Lecture on Mobile Operation, and on the 30th a talk on Propagation.

**Wellingborough** meet on April 10, 17 and 24, but the only event of which we are notified is that on the 17th, which will be a Junk Sale. The **British Two-Call Club** have elected G2CUR president for 1958 and G8SC vice-president. Membership is now up to 180.

**Caernarvonshire** met at the Liverpool Arms, Bangor, on March 13, when the topics were Transmitters and SSB, also a talk on Amateur Radio. New members will be welcomed—for secretary's QTH see panel.

**Clifton** will have a talk on K-W Products, by G8KW, on April 11; April 18 will be a Constructional

Evening and Ragchew; and on the 25th G3HZI will be talking on Direction Finding. All meetings 7.30 p.m. at 225 New Cross Road, London, S.E.14.

Recent events for the **Enfield** group included talks by G6OT on RF Impedance Matching, a sale of equipment and a Film Show. Their excellent publication, *Lea Valley Reflector*, is full of information of interest to members of the group.

**Flintshire** are not meeting in April, but on May 5 they will have a talk on Amateur Television by GW3JGA/T. The subject at their last meeting was Command Receivers, by Mr. L. W. Barnes.

**Leicester** meet on April 14 for G3MCP's "Symposium on the 'Cub'"; April 21 is a free night for work on the new clubroom; and on the 28th G2CFC will expound on Aerials.

**North Kent** also have a talk on Aerials for the Beginner, by G3ISX, on April 10; at the following meeting, on the 24th, there will be a Film Show. They, too, circulate an excellent News Letter to members. Their station, G3ENT, has recently been on the DX bands with considerable success.

**Purley** held a constructional evening on March 7 and a Junk Sale on March 21. **Sutton Coldfield**, a newcomer to these columns, will meet on April 10 for General Activities, Morse and technical classes, and on the 24th for a lecture on Communication Receivers by G5JU—both meetings beginning at 7.30 p.m.

**Torbay** held a very successful Annual Dinner and Social, which was attended by more than fifty members and friends. Reviews of Club activities were followed by the traditional "draw," to which many manufacturers had contributed. Their March meeting was concerned mainly with plans for Field Day. Next meeting is on April 12, 7.30 p.m., at the YMCA, Torquay.

**Bradford** are due for a talk by Mr. G. Craven on Oscilloscope Interpretation on April 15, and by G3DAR on Single-Sideband on April 29—both at 66 Little Horton Lane, Bradford.

**Aberdeen**, on April 4, will have a show, of members' gear, at which valuable prizes may be won;

All Clubs and local groups are invited to use this space for publicity and the reporting of their activities. We sometimes get complaints that "Our Club is never mentioned." The reason always is that no report has been sent in! Reports should be addressed to The Club Secretary, "Short Wave Magazine," 55 Victoria Street, London, S.W.1, and be posted to arrive on or before the date given every month at the head of this article. Reports received late cannot be taken into this feature. Photographs suitable for reproduction are always welcome, and a small fee is paid for those used, immediately on appearance.

on the 11th their title is "Your Questions Answered"; on the 18th there is a Junk Sale; on the 25th GM3ALZ will talk on Portable Equipment; and on May 2 the subject is Selectivity.

**Aldershot** devoted their last meeting to the Cubical Quad for 10-metre operation; next meetings after publication are on April 16 and 30 at The Cannon, Victoria Road, Aldershot, 7.30 p.m.

**Cardiff** are laying on a special meeting on April 18 at The British Volunteer, for the purpose of meeting the **Hastings Club's** mobile tour, details of which were given in this space last month, and also right here!

**Coventry** announce a slight change of programme. What was to have been a Constructional Evening, on April 21, may now turn out to be just the reverse, as it will be devoted to a Sausage-and-Mash Supper! Note, also, new secretary's name and address—in panel.

**Northampton** will, on April 10 and thereafter, meet on Thursdays instead of Fridays, until further notice. A "19 Set" is being prepared for /P operation during the summer. On April 4 a tape lecture by G8TL on Mobile Operation will conclude the winter programme.

**Wirral** will be meeting on April 11 at 4 Hamilton Square, Birkenhead, when the prizes for the draw at the annual dinner will be displayed. The dinner itself is on April 18 at the Coach and Horses Inn, Moreton, Wirral. Tickets (10s.) may still be obtained from the hon. sec. Programme for the 25th is still uncertain, but the meeting will be held. Acknowledgements also to Wirral for their *Newsletter*.

**Bury**, meeting at the George Hotel, Kay Gardens, will be having a talk by G2HW on April 8. The following meeting, on May 13, will take the form of

a Technical Forum, the subject being Aerials.

**Crystal Palace** held their AGM, at which the 1952

#### CLUB MOBILES

##### HASTINGS CLUB'S SPRING TOUR

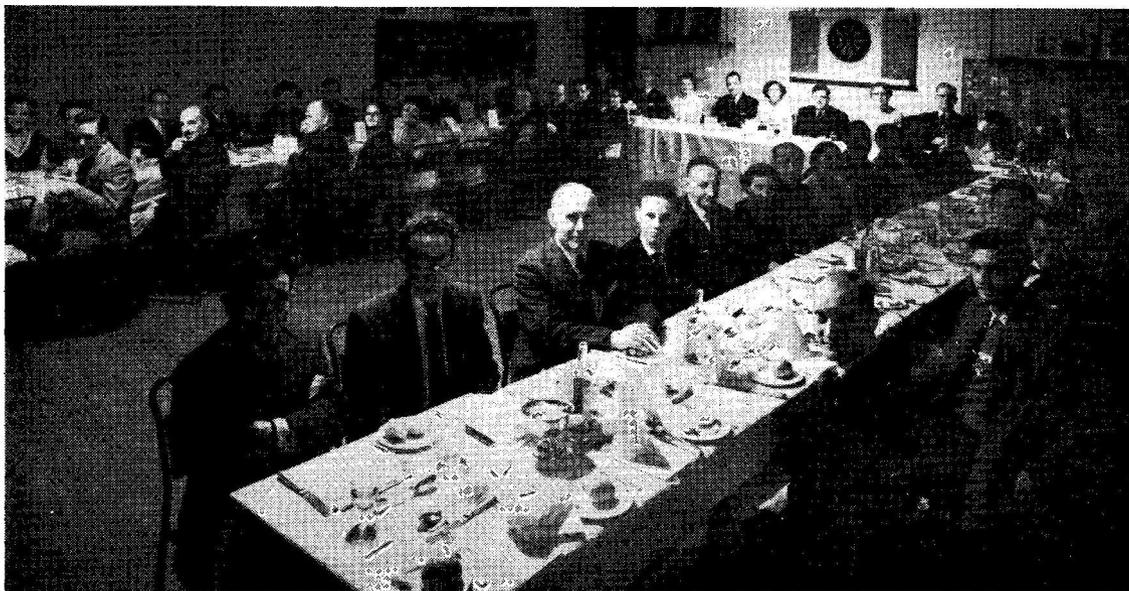
From April 12 until April 19 members of the Hastings Club will be "on the road" with two or more mobiles. Full details of their 800-mile tour were given in this space last month (p. 49). They are travelling up through the Midlands to North Wales, down through Wales and home *via* Cardiff and Newport, with as much portable and mobile operation as possible throughout the tour. "Rare counties" will be put on the air on the Top Band, notably Rutland, Merioneth and Montgomery. Crystal frequencies will be 1815 for CW, 1970 and 1990 kc for phone; 3630 and 7073 kc for phone; 7011 and 7037 kc for CW.

##### SOUTHGATE CLUB'S SUNDAY-MORNING MOBILE MEETINGS

On April 13, and thereafter, most probably on the second Sunday of each month, Southgate will be holding an informal "get-together" for mobiles at Colney Heath, from 10 a.m. onwards. Talking-in stations, on Top Band, will be operated by G3KDF, G3LXP and G3MBL. All are welcomed, particularly those with mobile or portable gear.

The QTH is reached by forking left on to A6 just north of Barnet, proceeding on this road for 5½ miles and turning right on to B556 at "The Bell." Carry on along B556 for about two miles and turn sharp left just before the small bridge.

Full particulars from D. E. Bootman, 18 Worcester Crescent, Mill Hill, London, N.W.7 — and please send s.a.e. (Tel.: MIL 5156).



The Clifton Amateur Radio Society is one of the active and successful Clubs in the London area, and here we see the occasion of their recent anniversary dinner. The chairman is G3FNZ and the honorary secretary G3DIC. Clifton have their own Hq. at New Cross, S.E.14., where they operate G3GHN, a call well-known in MCC. Clifton events are regularly supported by more than a dozen licensed operators, and they have a large SWL membership, for whom there are very good facilities.

Committee Cup was awarded to Mr. George Gaunt for his services to the Club. On April 19 the meeting will be devoted to a Film Show.

**Grafton** recently heard a talk by G2MI on The International Aspects of Amateur Radio. Another interesting event was the Club's exhibit at the L.C.C. "Leisure Hours" Exhibition at the County Hall, when G3AFT/A was operated on the DX bands and G2CJN/A on Top-Band phone.

**Nottingham** continue to meet on Tuesdays and Thursdays, 7.15 p.m., at Woodthorpe House, Mansfield Road. The Club Tx (G3EKW) is active on Top Band most Club nights, and Morse practice is available, as well as excellent facilities for constructional work.

**Romford**, at their recent AGM, elected G2BVN chairman, G3EBF treasurer and G3MDP secretary. Forthcoming events include lectures, mobile and constructional evenings, and monthly Junk Sales. Meetings every Tuesday, 8.15 p.m., at RAFA House, 18 Carlton Road, Romford.

**South Shields** heard a talk by G3LKZ on Portable Working at their March meeting. He will be discussing FM Tuners on April 30. The Club shack has been completely re-decorated and the gear is being rebuilt shortly. SWL, transmitting and construction competitions finished at the end of March, and results will be made known in May.

**Surrey** (Croydon) recently held a very successful Junk Sale. The next meeting, on April 8, will be the AGM—7.30 p.m. at the Blacksmiths Arms, 1 South End, Croydon.

**Brighton** have a Morse class and the Tx on the air on April 8; on the 15th there is a Junk Sale; on the 22nd a talk by G3LJK on Ferrites; and on the 29th Mr. D. Hemsley on the subject of High-Gain Amplifiers for Biological Research.

The **Shefford** group meet each Friday at 8.00 p.m., in Digswell House, and all interested in radio, television and electronics generally are welcome. Refreshments can be obtained on the premises. Recent events have included a Colour TV demonstration by G2DUS/T, and a discussion on SSB by G3GKA.

Forthcoming events for **Midland** (M.A.R.S.) include a talk on receivers by G5BJ (April 15), and the North Midland Mobile Rally (April 20), of which further details are given on p.101 of this issue. There is also a Morse class every Thursday—details from the hon. sec.

At **Stockport**, attendance at meetings is improving, and a number of outdoor events are scheduled for the summer months. Next meetings are April 9 (Physiotherapy Techniques), April 23 (Tape Recorders) and May 7 (Hi-Fi).

**NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:**

**ABERDEEN:** A. G. Knight, 6 Blenheim Lane, Aberdeen.  
**ACTON, BRENTFORD & CHISWICK:** W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.  
**ALDERSHOT:** S. E. Hume, 25 Kingsway, Aldershot.  
**BLACKPOOL & FYLDE:** J. Wells, G3IZG, 91 Park Road, Blackpool.  
**BRADFORD:** D. M. Pratt, G3KEP, 27 Woodlands Grove, Cottingley, Bingley.  
**BRIGHTON:** R. Purdy, 37 Bond Street, Brighton 1.  
**BRITISH TWO-CALL CLUB:** G. V. Haylock, G2DHV, 63 Lewisham Hill, London, S.E.13.  
**BURY:** L. Robinson, 56 Avondale Avenue, Bury.  
**CAERNARVONSHIRE:** J. Howard, 40 Rhuddlan Avenue, Llandudno.  
**CARDIFF:** R. Morris, GW3HJR, The Shack, St. Cenydd Road, Caerphilly.  
**CLIFTON:** C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.  
**COVENTRY:** V. A. Dalkin, B.Sc., 8 Westminster Road, Coventry.  
**CRYSTAL PALACE:** G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.  
**ENFIELD:** V. Croucher, G3AFY, 15 Nelson Road, London, N.15.  
**FLINTSHIRE:** J. Thornton Lawrence, GW3JGA, Perranporth, East Avenue, Bryn Newydd, Prestatyn.  
**GRAFTON:** A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.  
**LEICESTER:** P. G. Goadby, G3MCP, 535 Welford Road, Leicester.  
**MIDLAND:** C. J. Haycock, G3JDJ, 360 Portland Road, Birmingham, 17.  
**NORTHAMPTON:** S. F. Berridge, G3ITW, 20 Ethel Street, Northampton.  
**NORTH KENT:** D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.  
**NORWICH:** H. Staff, G4KO, 59 Charles Avenue, Thorpe, Norwich.  
**NOTTINGHAM:** F. V. Farnsworth, 32 Harrow Road, West Bridgford, Nottingham.  
**PURLEY:** E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.  
**ROMFORD:** L. S. Owen, G3MDP, 53 Applegarth Drive, Newbury Park, Romford.  
**SHEFFORD:** G. R. Cobb, G3IXG, Western House, Ampthill Road, Shefford, Beds.  
**SOUTH SHIELDS:** K. Sketheway, 51 Baret Road, Walkergate, Newcastle-on-Tyne 6.  
**STOCKPORT:** G. R. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.  
**SURREY (CROYDON):** S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.  
**SUTTON COLDFIELD:** A. C. Phillips, G3JFZ, 23 Plantsbrook Road, Walmley, Sutton Coldfield.  
**TORBAY:** G. Western, G3LFL, 118 Salisbury Avenue, Barton, Torquay.  
**WELLINGBOROUGH:** P. E. B. Butler, 84 Wellingborough Road, Rushden.  
**WIRRAL:** H. V. Young, G3LCI, 9 Eastcroft Road, Wallasey.

**SCOUT JAMBOREE ON-THE-AIR**

This event, scheduled for May 10-11, was announced on p.45 of the March issue of SHORT WAVE MAGAZINE. Station GB3BP at Gilwell Park will be operated on all five communication bands by the Wanstead, Woodford and District Radio Club. Two operating positions will be provided, one for 160/80 metres, on which bands all G stations are asked to call, and the other for 7-28 mc, for working stations outside the U.K. only. Similarly, the Sutton Coldfield Radio Society will be on the air for the event, signing GB3SP, the call used at the Scout Jamboree station up there last year. The whole idea is to bring together, over the air, Scouts holding amateur call signs; there will be no "contest atmosphere" about it. The general call "CQ Jamboree" will be used, and all working will be phone-only, except during the night on 7 mc, when CW will be used.

**REMEMBER THIS NOTE**

We are always in the market for articles and photographs of Amateur Radio interest; payment is made for all contributed material, at specially good rates for articles of exceptional value or interest. Notes on the preparation of articles appeared on p.259 of the July 1957 issue, and general guidance for contributors is given at the foot of the Contents page in every issue.

## SMALL ADVERTISEMENTS

9d. per word, minimum charge 12/-. No series discount; all charges payable with order. Insertions of radio interest only accepted. Add 25% for Bold Face (Heavy Type). No responsibility accepted for errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

## SITUATIONS VACANT

**B**BROADCASTING ASSISTANTS (Temporary), Grade V Technical, required by War Department in Middle East and East Africa. Duties include operation and maintenance of medium-power MF or HF transmitters. Radio II of City and Guilds, or equivalent, normally required. Three-year tour initially. Salary £500 to £691 per annum; starting point according to age and experience, plus Foreign Service Allowance ranging from £110 to £1,230 per annum, depending on station and marital status. Outfit allowance, £35.—Apply any Employment Exchange, quoting Reference 2/OS.269/58, Sheet No. 19/58.

**W**IRELESS OPERATOR/MECHANICS required by FALKLAND ISLANDS DEPENDENCIES SURVEY for service at isolated British Bases in Antarctic. Must be able transmit and receive Morse at 20 words a minute and be capable elementary maintenance wireless transmitting and receiving equipment. Salary according to age in scale £330, rising to £420 a year, with all found, including clothing and canteen stores. Keen young men between 20 and 30 years required (preferably single), of good education and high physical standard, with genuine interest in Polar research and travel, and willing to spend 30 months under conditions testing character and resource. Successful candidates will sail in October.—Write to the Crown Agents, 4 Millbank, London, S.W.1. State age and name in block letters, full qualifications and experience, and quote M2C/42653/5Q.

**C**OMPANY wishes to engage the services of a Technician with theoretical and practical knowledge of Aerial design. Some commercial experience desirable. Application will not be disclosed without permission. Present staff notified.—Reply to Box No. 1988, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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**E**LECTRONIC SERVICE ENGINEER URGENTLY REQUIRES POSITION AS FIELD SERVICE ENGINEER OR SIMILAR. MUST REMAIN HEREFORD. SEVEN C. & G. CERTIFICATES. — P. BUCHAN, G3INR, 123 HINTON ROAD, HEREFORD.

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**Q**SL's and Logs by Minerva. The best there are.—Samples from Minerva Press, 2 New Road, Brentwood, Essex.

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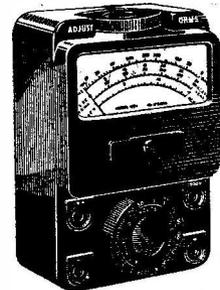
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Power output — 5 watts.  
Anode modulation.  
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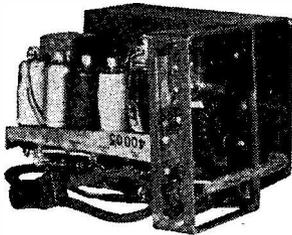
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**TRANSMITTER-RECEIVER "38"** as above. Complete with set of external attachments, £2 2s. 6d. Post Paid.

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**WANTED:** BC610 Hallicrafters, ET-4336 Transmitters, BC-312 Receivers, BC-221 Frequency Meters and spare parts for all above. Best cash prices.—P.C.A. Radio, Beavor Lane, Hammersmith, W.6.

**QSL CARDS AND LOG BOOKS, G.P.O. APPROVED. CHEAPEST, BEST, PROMPT DELIVERY. SAMPLES.—ATKINSON BROS., PRINTERS, LOOE, CORNWALL.**

**TRANSMITTER, Type 36, for 10, 15 and 20m. bands; complete, ready to use; AC mains. S.a.e. details.—Charles Britain (Radio), Ltd., 11 Upper Saint Martin's Lane, London, W.C.2.**

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**EIGHT BRAND-NEW 813 Valves, 30/- each. WANTED:** Eddystone S.750 or S.680.—Clarke, West Lodge, Dell Road, Grays, Essex.

**CLASS D W/meter, manual, mains, £5 10s. 0d. AVO Sig. Gen., overhauled by maker recently, £17 10s. 0d. Type A Mk. III Trans./Rec., mains/6v. p/pack, £12 (o.n.o.).—Box No. 1975, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.**

**LG. 300, with power pack/modulator, required.—**Details, price, to G3HYO, 18 Montagu Street, Kettering, Northants.

**FOR SALE or Swop:** Xformer 1000-0-1000v. at 300 mA, 813 and base. **WANTED:** Woden Mod. Xformer UM2.—G3LBH, 18 Maiden Lane, Crawley, Sussex. (Tel.: Crawley 2128, after 6.15 p.m.).

**SALE:** Class-D Wavemeter, with 240/12v. transformer, £4.—G. H. Coulter, Freen Court, Sandwich Road, Whitfield, Dover.

**WANTED:** Unserviceable HRO Senior, complete with dial-gang IFs, with or without coils; state price. All letters answered. —GM3JQL, 12 Glendevon Road, Perth, Scotland.

**WANTED:** LG.300, complete. Cash or exchange for Eddystone "888."—Box No. 1976, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**FOR SALE:** Two 813's, little used, 30/- each; Receiver Section, Marconi No. 9 set, £3 10s. 0d.; SCR-522, converted 2 metres, needs attention, less valves, 10/-; Woden UM3, as new, 50/-; 12-inch Regentone TV console, £9; ZC1, partly stripped, £1.—G3BLN, 73 Bournemouth Road, Parkstone, Dorset.

SMALL ADVERTISEMENTS, READERS—*continued*

**FOR SALE:** Sectional Mast, 60ft., with wire guys, etc. (never erected), £16 (o.n.o.); R.107, £12; Valve-tester (AVO), £9; Mullard capacity/resistance bridge, £8; REL SCR-522, £3; REL 78, 35/-; Trans. 53, 35/-. **WANTED:** Coils for R.1082; Manuals, 19 Set, T.1154; *CQ* magazines in exchange for *Radio Constructors*, *Wireless Engineer*, *Electronic Engineer* or *Radio & TV News*.—Moore, 30 Abbey Crescent, Sheffield, 7.

**300w.** T53 Tx, modified for Ten, £53; 2-metre Tx, 1392 Rx, with p/packs, 4/4 beam with pole, prop-pitch motor, trans. and switch, £35. Meissner Sig. Shifter, coils 20/40, £6 10s. 0d. Buyer to collect. Also BC-610 items, valves, etc. Stamp, list. Or sell whole QRA, ful. furn. (a very nice residence) for £4,500.—Write: G4OT, Woodham Walter, Maldon, Essex.

**HRO** Rack-mounting, 5 coils, 3 bandspread, power pack, noise limiter. Delivered London area. £18 (o.n.o.).—G3BFP, 5 Ridgemount Avenue, Shirley, Croydon.

**FOR SALE:** Eddystone 840A Receiver, Brown's Phones, Type A, still under guarantee, £39.—Box No. 1977, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED:** G.E.C. Miniscope, IF alignment unit No. M683B.—Offers to G3BPE, 35 Bladindon Drive, Bexley, Kent.

**SALE:** Minimitter Tx, carefully used below limits stipulated by manufacturer, eighteen months old, with LP filter, £67 10s. 0d. — Box No. 1978, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**WANTED:** Eddystone 680X, good condition, cash settlement.—Phone *PAR*: 9664, or write Shine, 70b Ladbroke Road, London, W.11.

**SALE:** BC-348R, no p/pack, manual, at 10 gns.; and 358X, with p/pack, at 5 gns. S.a.e. for details.—Green, 48 Borough Way, Potters Bar, Middx.

**HAMMERLUND HQ129X**, mint condition, untouched from new, matching speaker and manual; prefer buyer collects.—Offers to: J. Newham, 13 Warkworth Avenue, Wallsend, Northumberland.

**TRANSMITTER 160/80/40** with power supply and Class-B mod. without p/pack, £10 10s. 0d. Army 12 Set, requires slight attention, £9 10s. 0d. Midlands.—Box No. 1979, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**FOR SALE:** Modern Self-contained Table-top Transmitter, 40 watts, Phone/CW, 10-80 metres, band-switched; Geloso VFO, 6146 PA; Pi-output; TVI-proof; complete with mike and low-pass filter; £30 (carriage paid). Also 10-metre double Superhet Receiver, perfect, £10.—Box No. 1980, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**RF**26, 18/-; RF15, 9/-; RF24, 11/-; brand-new, in original cartons; postage, 3/6.—Jay, 69 Church Road, Moseley, Birmingham, 14.

**WHY QRT?** Share Chelsea House; active DX station; workshop facilities; offered amateur (no family) QRL; London area.—Box No. 1982, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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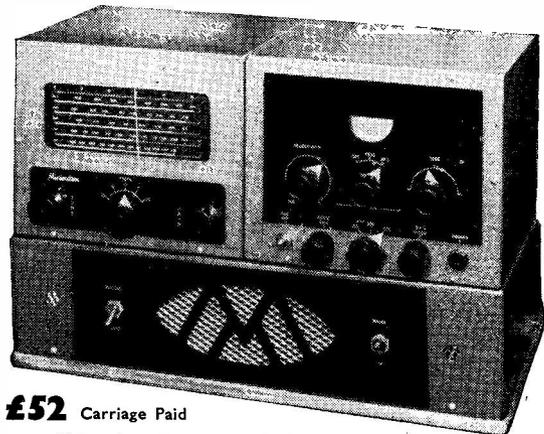
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**RCA RIBBON MIKE** and table stand, new, unused, £3 10s. 0d.; AR88 Manual, 10/-—Morgan, 52 Seafield Road, Southbourne, Bournemouth.

**HALLICRAFTER SX24**—G3JOM's station receiver, 540 kc-43.5 mc; xtal filter with spare xtal; built-in 3.5 mc band-edge marker; justervalved; £15.—G3JOM, Flat 1. 1a Princess Terrace, Ripon, Yorkshire.

**SALE**: Minimitter. Offers? BC-453, 6v. valves, £2; Calibrator, 1000/100/10 kc, 50/-; Woden de Luxe, 830 v. CT, 150 mA, 6.3v., 5v., £2; 34ft. unused Telcon K35B feeder, 10/- Collection preferred.—G3GHE, 43 Sheridan Avenue, Caversham, Reading.

**AVO** wide-range Signal Generator, as new, £25; Bendix TA12B, new, £3 10s. 0d.; Type 210 Signal Generator, £5; QST, Sept. '54 to date, offers? WANTED: Electronic Flash, 100 joules minimum.—GW3HJR. The Shack, St. Cenydd Road, Caerphilly, Glam.

**CR** 100, £20; LP Filter, £2 (o.n.o.). Numerous smaller items; s.a.e. requirements. WANTED: Short Wave Magazine before March '56.—G3LMP, 7 Queen's Gardens, Eaton Socon, Hunts.

**SALE**: SX28 Receiver with manual, £37; owner giving up radio. Buyer please collect.—S. Hyde, Chalcroft, Cliff Way, Compton Down, Nr. Winchester, Hants.

**GW3EJR** not QRT, just spring-cleaning; s.a.e. for bargain list. No junk offered. Receivers, VHF Transmitter, Dynamotors, Transformers, Chokes, Meters, Xtals, etc.—J. B. Armstrong, 32 Hillfield Place, Parcillyn, Cardigan, Wales.

**A** MATEUR selling up all gear; buyer takes lot; £30; s.a.e. for details.—Hyde, 46 St. Richard's Road, Westergate, Chichester, Sussex.

**WANTED**: B2 Tx, complete, or other Tx.—Full parts. to B. Haywood, 15 Tunnicliffe Street, Macclesfield.

**EDDYSTONE 840A** for sale; showroom condition, perfect performance; 16 months old but used hardly two months; never troubled; inspection welcomed; £36.—Box No. 1981, Short Wave Magazine, Ltd., 55 Victoria Street, S.W.1.

**TYPEWRITER**, Royal model, just overhauled, excellent condition; will exchange for good commercial amateur-band receiver.—Bates, 39 Kingsbury Road, Birmingham, 24.

**HRO SENIOR**, metal valves, 6C4 osc., p/pack, coils BS 10, 20, 40, 80; GC 160, 0.48-0.96 mc; manual, in excellent condition; £28. HRO spares: S-meters (3), £1 each; main dials (2), £1 each; xtal box and xtal, 25/-; main tuning condenser (2), 10/- each; HRO Cabinet and panel, £1; 2 sets of IF Trans., 10/- set of three; GC Coil, 1.7-4 mc. new, 30/- Valve screens and bases. Valves: 6C6, 6D6, 6B7, 4Z. Small dia's, etc. Hallicrafters S27 Cabinet, £1. Pse. add p/p.—G3EWZ, 16 Mendip Road, Liverpool, 15.

**OFFERS**: Late model Minimitter; two-tone grey; AM-FM-CW; little used. K.W.E.A. Rx, 1-10 mc, original mains power pack and check meter.—Box No. 1987, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

## SMALL ADVERTISEMENTS, READERS—continued

**Q**ST, Oct. '53 - Mar. '58, 54 issues, 50/-; RCA BC-348, complete with 21/28 mc converter, power unit, good DX'er, £15. Buyer collects.—Swallow, 74 St. Augustine Road, Southsea, Hants.

**R**1155, perfect working order, unmodified, £6 10s.; 230v. DC-to-AC alternators, 500w., £5; 750w., £7 10s.; 829, CV90, VCR-522 (Miniscope), 15/-; 6CL6, 8012, PT15, 50L6, 7/6. Post extra.—V. A. Cedar, 9, North Drive, London, S.W.16.

**GOOD EQUIPMENT FOR SALE: R.1155A Rx.** with power pack, £6; U.S.A. Master Osc. MI-19467, with manual, £1 10s.; Woden UM2 mod. trans., £1 10s.; Woden 20H, 10 mA LF Choke, 10/-; Partridge mains. trans. (Prim: 10-0-200-220-240, Sec.: 850-500-0-500-850v.), 120 mA, £2 10s.; Partridge LT trans. (Prim. as above, Sec. 4v. 4A, CT), 15/-; Partridge LF choke, 12/2 OH., 120 mA, 10/-; Q.C.C. mod. choke, 7/6; RF Unit 756/1825, approx. 195 mc. variable, with 3 acorn valves, Type 956, 15/-; 100 kc sub. std. and 10 kc multivibrator, with xtal and 3 valves, on chassis, £1 10s.; VCR-517c CR tube, with base, £1; CO straight/tritet and BA or PA unit, 6V6 and 807, 14 and 7 mc coils, neat chassis, £2; 150w. p/p coil unit, adj. ant. link, 3 plug-in coils, 28 mc to 7 mc, 15/-; 150w. split-stator tuning for above, 60-60  $\mu$ F, 10/-; 50-50  $\mu$ F ditto for grid, 2/6. Pair of PT15's, £1 10s.; 1/4074a, 5/-; 2/U18/120, 10/-; 2/42's, 7/6; 3/VR91, 5/-; 2 6J6, 7/6; and others. 0-1 amp. RF thermo, 7/6; 0.2 amp. RF thermo, 7/6; 0-250 mA, CV76; 0-120 micro-amp., 5/-; 0.300v. AC/DC mov. iron (large iron-clad, about 9 ins. diam.), 7/6. Lots of oddments. —G2VK, 6 Hale Road, Tottenham, London, N.17. (Tot.: 4166.)

**H**RO RECEIVER wanted, with bandsread coils; would collect within reasonable distance.—Full particulars to G3AWK, 2 Valley Road, Chilwell, Notts.

**W**IDOW late G3JN wishes offers for Hallicrafters SX-43 Receiver, ex-U.S.A., in excellent condition.—Apply (with s.a.e.) to E. H. Ricketts, G3PV, 29 North Road, Berkhamsted, Herts.

**S**OUND Tape Recorder, three-speed, twin-track, 5 mic., 5000 ft. tape, E.M.I. edit-joint kit, £45. R.1155N P/pack, output, fair; R.1132A, new; TR9, new; WS-38, with 12-volt p/pack and LF stage, unused.—N. Graham, Castledawson, Co. Derry.

**24**v. DC Cowl Gill Motor; also BC-453, valve-type 717. — Please reply via Box No. 1984, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

**T**1131 TRANSMITTER (RF section dismantled). £15; push-pull 813 PA, 80-10m., £11; part rebuilt driver (Geloso, 807), £9, or £33 together. DST-100 Receiver, with power unit, £18; Top Band Tx, incl. Mod. and PSU, £7; 19 Set Mk. II, with power unit, £3.—Box No. 1983, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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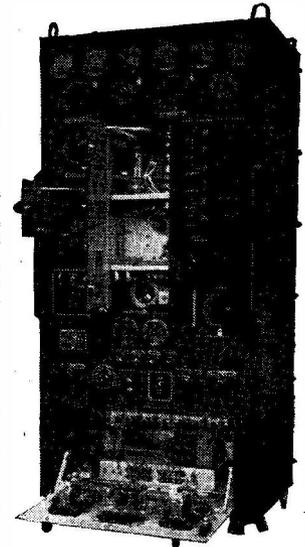
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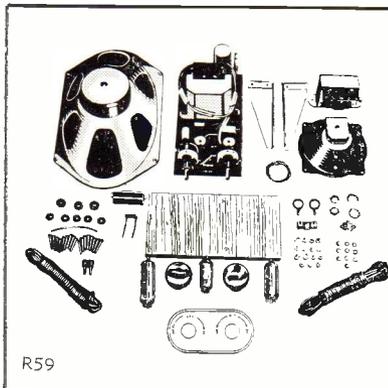
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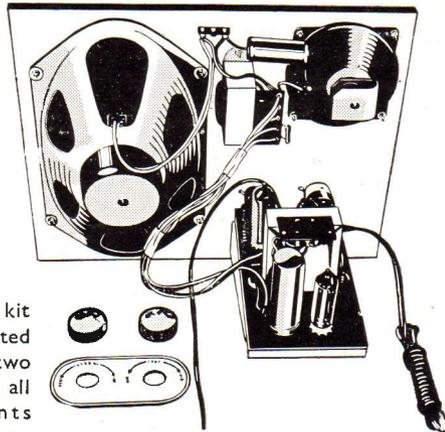
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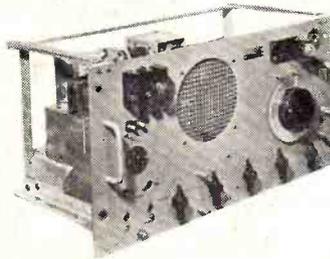
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