The SHORT WAVE Magazine

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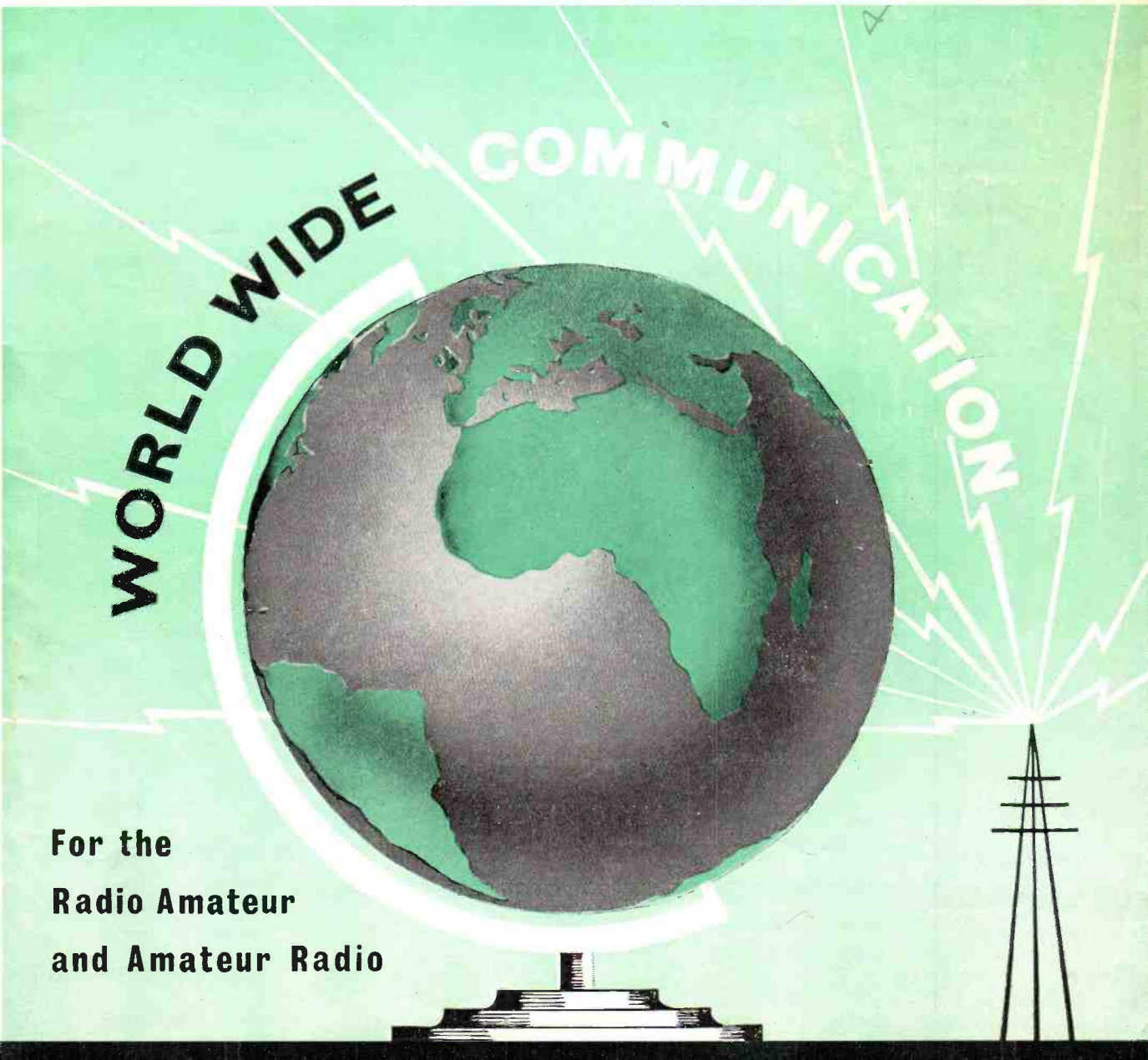
VOL. XVIII MARCH, 1960 NUMBER 1



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The SHORT WAVE Magazine

EDITORIAL

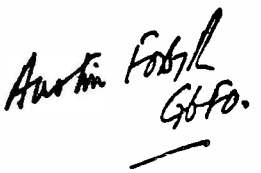
Jargon

Over the years, Amateur Radio has, not unnaturally, acquired its own jargon, used freely by the practitioners of the art, and understood only by the initiated. The interesting thing is that this jargon has become an international language, by which radio amateurs can express themselves and be understood by their fellows of any nationality.

All this is not only most remarkable, but just as it should be — world-wide communication by radio between individuals operating their own equipment is one of the most advanced developments of the age in which we live, and when one stands back to look at what is being achieved in the way of individual communication by radio amateurs, it naturally puts them in a category different from that of people whose horizon is limited by what they " see on the telly."

Hence our jargon, and the way it is used over the air. The fact that there is such a jargon is in no way reprehensible, or even regrettable, because all specialised human activities and pursuits have a language and a vocabulary of their own — scientists, doctors, lawyers, civil servants, journalists, cricketers, snooker players, musicians, printers and all the rest.

But what must be avoided in the use of our Amateur Radio jargon is to inject it into ordinary conversation, because out of context the utterance of any sort of jargon makes the speaker sound either pompous or slightly ridiculous. The unfortunate fact is that much of the colloquialism of Amateur Radio can sound a little juvenile when used in the wrong company or context (and particularly in the public print), so that radio amateurs must be specially careful — like doctors, lawyers, scientists and the rest — to keep their jargon to themselves.



Converter for Radio Teleprinter Reception

SUITABLE FOR STANDARD FSK TRANSMISSION

PART I

J. B. TUKE (G3BST)

With the practical possibilities of radio amateur teleprinter operation at hand, the problem of how to receive T/P transmissions has first to be tackled. This interesting article describes an FSK discriminator unit, suitable for operation with any receiver and capable of actuating a standard teleprinter. It is an ingenious but simple design, involving some original circuitry, and the principles of operation and adjustment under working conditions are described in detail.—Editor.

IN the European amateur communication field, radio teleprinter working is a comparatively new idea. This is probably due more to the one difficulty of obtaining printers than to all the other difficulties put together. Recently, however, a small number of second-hand machines have become available (mostly foreign or G.P.O. Type 3's) and there is no doubt that this form of communication will gradually attract more attention in Amateur Radio circles.

Let us first discuss a few points regarding RTTY as a method of communication for amateurs. One has heard it spoken of coupled with such phrases as "heavy QRM," "wide-band FSK," "jingle-bells" and there are still a few amateurs to whom radio teleprinter transmission is mentally linked with the transmission of MCW or spark! Although RTTY *does* use FSK, the frequency shift is normally only 800 c/s and may be less. On top of the 800 c/s bandwidth thus required there is a small figure to be added dependent on the speed of operation. Using the G.P.O. standard of 50 bauds* this additional width should not exceed 100 c/s, so that if we say the total bandwidth required is 1 kc, this may be taken as the *maximum possible* requirement. In this 1000-cycle band, using RTTY system, information can be sent at speeds up to 66 w.p.m., with an effect at the receiving end about four times as great as an A3 (phone) transmission using the same power. Interference to stations using RTTY will not be troublesome unless (*a*) It is very close to one of the frequencies used, or (*b*) It is of the wipe-out variety. There is no sideband splatter to annoy nearby fellow-amateurs, and TVI due to shock excitation is avoided since only the *frequency* of the transmitted wave is altered, its amplitude remaining constant.

When one considers the amount of information that can be transmitted in the bandwidth occupied, it is immediately obvious that RTTY is an extremely efficient communication system. (Of course, the commercial companies realised that years ago!)

General Principles

Having disposed of any possible objections to RTTY on moral grounds (!) let us now examine briefly the working of the system. While the mechanical/electrical system of a teleprinter is too complex to go into in detail in this article, it may be stated that when the transmit printer is at rest the radio transmitter is radiating continuously on one frequency—this is called the *Mark* frequency. On depressing a teleprinter key, a 20 mS pulse is transmitted on the alternate frequency (differing from the mark frequency by the frequency shift employed)—this being known as the *Space* frequency. Following this signal is a combination of five 20 mS signals which may be on *Mark* or *Space* frequency according to the character depressed. Finally, a further 30 mS signal is transmitted, this completing the cycle of events.

At the receiving end, the different transmitted frequencies are converted to reversing DC, which is applied to the coils of the printer electromagnet. That is to say, the frequency corresponding to *Mark* must be converted to DC of one polarity, while the frequency corresponding to *Space* is converted to DC of the opposite polarity. The reversing current through the electromagnet initiates a mechanical movement which results in the correct letter being selected on the typehead, and printed. While very much over simplified, this is the basic principle of operation.

The requirement at the receiver end is therefor a device to produce the necessary level

* *Baud*—a unit of circuit signalling speed, taking all mechanical, electrical and propagation factors into account. Over a given circuit, a rating of 50 bauds would be equivalent to a signalling speed of 62·5 words per minute, the average word being taken as a 5-letter group. *(Editor.)*

of DC to operate the printer, the direction of which is dependent upon the frequency of the radio signal being received at any instant.

The fundamental answer to the above requirement is some form of discriminator circuit — study of any such circuit will show a current output, the direction of which varies with the applied frequency, and there is of course no reason why commercial practice could not be followed and a complete receiver built delivering its output in this form, suitably amplified, solely for RTTY use. From an amateur point of view this is not very satisfactory, since few amateurs will wish to build a receiver simply for RTTY use when they already possess very good receivers with conventional audio outputs. What is required is an RTTY converter enabling a conventional receiver to be used for teleprinter reception.

The Creed Model 75 page-printer is a fine example of a modern teleprinter instrument, produced by a British firm with a world-wide reputation for high-grade telegraph apparatus. The Creed 75 is not yet to be found at "the average amateur RTTY station" but is the sort of machine to which all keen radio teleprinter operators will aspire, nevertheless!

Since the incoming signal from the transmitter is in the form of continuous wave signals (the frequency shifting between two definite frequencies) if the receiver BFO is switched on, then the audio output will be in the form of two audio tones of any frequency one cares to chose, but separated from each other by the frequency shift. An RTTY converter will, therefore, essentially be a discriminator operating in the audio range, and this is what is to be described.

Most discriminator circuits rely on the resonant property of L-C circuits, making use of phase and/or amplitude changes which take place when frequencies near to the resonant one are applied to such circuits. While perfectly simple when radio frequencies are employed, this becomes rather more difficult at audio frequencies, because large values of inductance are needed. These inductances are usually toroids because only this form of construction results in sufficiently high Q. Toroids are difficult to wind when large, and not at all easy to find on the surplus market. If for any reason it is required to change the resonant frequency of such a circuit (so as to accommodate different values of frequency shift) further complications are introduced, since impossibly large variable condensers are required; the only solution is to use a number of condensers with switching which results in jumps of frequency instead of smooth variation.

However, in the converter devised by the writer, these disadvantages have been overcome, since R-C circuits are used in place of L-C circuits. By making the "R" part variable, in the form of potentiometers, it is a simple matter to accommodate any value of frequency shift desired. Thus we get a neat solution to the problem, using normal audio circuitry.

Basic Converter Circuit

Basically, the circuit consists of two small AF amplifiers in parallel, identical in all respects except that they each amplify a chosen frequency much more than all other frequencies. One frequency chosen is that being delivered by the receiver corresponding to the *Mark* signal, the other that corresponding to *Space*. The outputs from these two amplifiers are rectified by simple diodes, and the DC resulting is combined in anti-phase in a

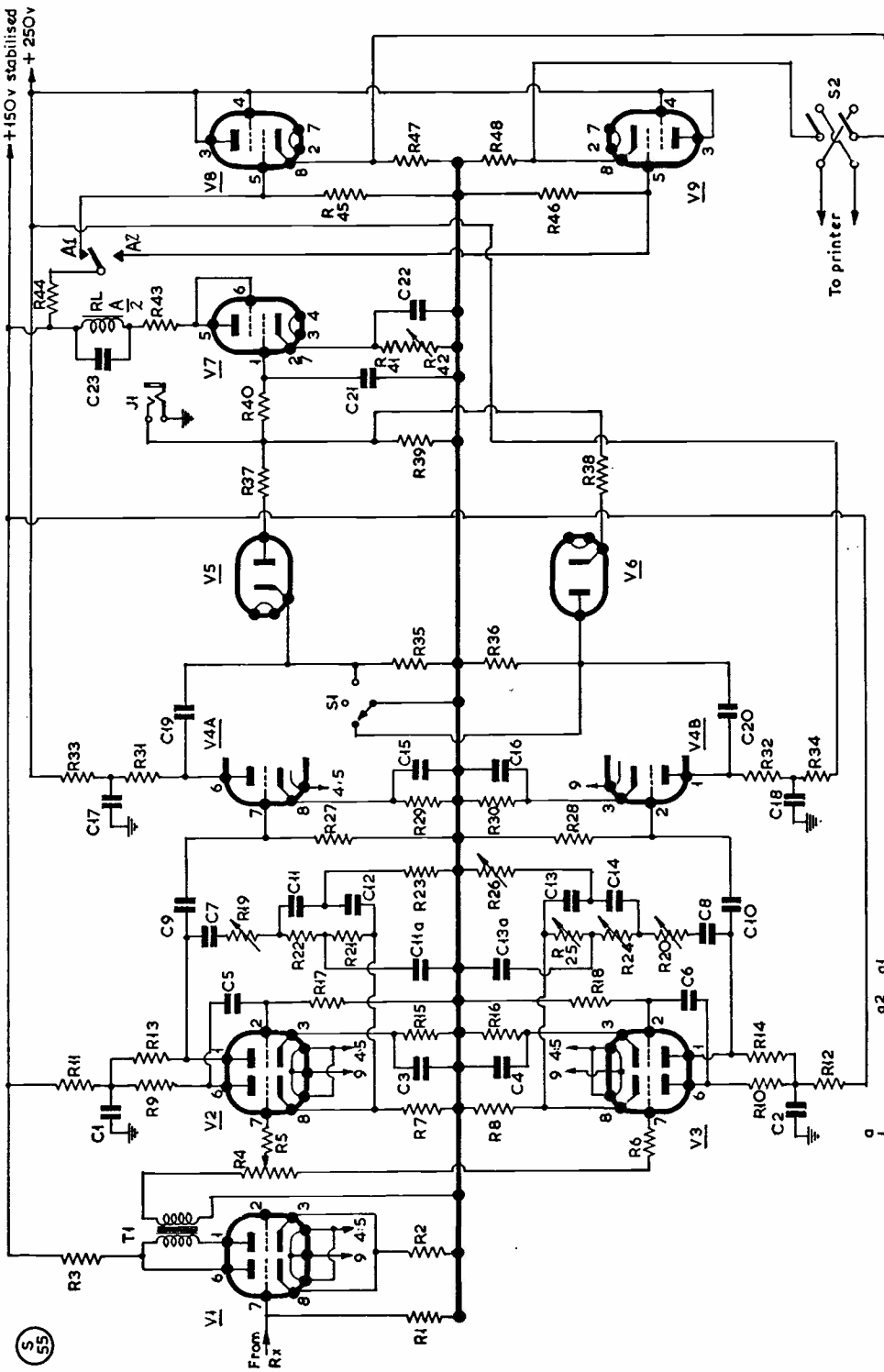


Fig. 2. Circuit complete of the FSK converter for T/P reception, designed and described by G3BST. It allows for a useful range of shift variation, and for reversal of the impulses to the printer, so that "mark" and "space" can be selected in the correct sense. It is also possible, for test and setting-up purposes, to go over to "local control," for printing through the converter from the machine's own keyboard. At G3BST, a Creed Type 3 (ex-G.P.O.) teleprinter is in use with this converter, enabling a large selection of press T/P broadcasts to be recorded.

common load resistor. This means that if the *Mark* amplifier is delivering a signal, DC will flow through the load in one direction, whereas if the *Space* amplifier is in operation, the DC through the load will be in the reverse direction. This reversing DC will, after suitable amplification, be applied to the teleprinter. The *Mark* and *Space* amplifiers use frequency-conscious negative feedback circuits in order to make them responsive to one audio frequency only, and these negative feedback circuits are designed around the "Bridge-T" filter network.

The Bridge-T network (*see* Fig. 1) is a derivative of the Wien Bridge, and has the same property — that is, it will pass all frequencies from input to output except one particular frequency. While there will be some overall attenuation at all frequencies, attenuation at the chosen frequency will be so large that one can, for all practical purposes, say that no input voltage will appear on the output side of the bridge. In the converter the bridge-T network is connected in series with a negative feedback circuit, resulting in heavy negative feedback at all frequencies except one—that to which the bridge is "tuned." The degree of

Table of Values

Fig. 2. Circuit of the Radio T/P Converter

C1, C2	= 16 μF, elect.	R5, R6,	R47, R48	= 4,000 ohms, 10w.	
C3, C4,		R31, R32,	R4, R19,		
C15, C16	= 25 μF, elect.	R37, R38,	R20	= 500,000 ohms, potentiometer	
C5, C6,		R40 = 47,000 ohms	R24, R25,		
C7, C8,		R7, R8,	R26	= 100,000 ohms, potentiometer	
C9, C10,		R15, R16 = 1,000 ohms			
C19, C20	= .01 μF	R9, R10,	R42	= 1,000 ohms, w/w var.	
C11, C12	= .001 μF	R13, R14,	V1	= 12AU7	
C11a,		R35, R36 = 100,000 ohms	V2, V3,		
C13a	= .01 μF	R11, R12,	V4	= 12AT7	
C13, C14	= .002 μF	R21 = 22,000 ohms	V5, V6	= EA50	
C17, C18	= 8 μF, elect.	R17, R18,	V7	= 6AK5	
C21	= .02 μF	R27, R28,	V8, V9	= 6K6GT	
C22	= 50 μF, elect.	R39 = 220,000 ohms	RL	= 2,000-ohm high-speed relay	
C23	= 0.1 μF	R22 = 82,000 ohms	T1	= Audio xformer 1:1	
R1	= 50,000 ohms	R23 = 5,600 ohms			
R2	= 200,000 ohms	R29, R30 = 1,500 ohms	S1	= Alignment switch, 1-pole, 3-way	
R3, R44,		R33, R34 = 10,000 ohms			
R45, R46	= 500,000 ohms	R41 = 250 ohms	S2	= Normal/Reverse switch, 2-pole, 2-way	
		R43 = 100 ohms			

negative feedback must be controlled since, at the "tuned" frequency, phase changes take place which introduce positive feedback; these, if excessive, will cause oscillation. The positive feedback is all to the good, since by carefully controlling it, not only are frequencies other than the chosen one heavily attenuated, but the chosen one is actually peaked up. The bridge network in one of the amplifiers is fixed and tuned to around 700 c/s. The network in the other is made variable and can cover from 1 kc to 3 kc, thereby catering for any desired frequency shift between 300 c/s and 2300 c/s.

Converter Circuit Details

The practical circuit is shown in Fig. 2. First in the valve chain is a limiter. This is essential so that the final DC produced by the diode rectifier shall be sensibly independent of the strength of the incoming signal. The circuit for limiting is that shown in the *ARRL Handbook,* to which readers are referred for details of operation. This circuit (like all others in that excellent publication) works extremely well and is to be recommended in place of simpler diode circuits. The component values given suit the voltage input from the writer's receiver (600 ohms output), but may need to be slightly adjusted in the light of individual requirements.

Next, a 12AT7 for each audio frequency (*Mark* and *Space*) is connected as a two-stage RC coupled amplifier with negative feedback applied between the anode of the second stage and the cathode of the first, *via* the appropriate bridge-T network, and a variable resistor to control the amount of feedback. The outputs from these amplifiers are fed to the individual sections of a further 12AT7 for voltage amplification. The amplified tones are then capacity coupled to two EA50 diodes, where they are rectified, and applied to a common load resistor in anti-phase.

Referring to Fig. 3, if we consider diode D1 conducting as the result of a steady *Mark* tone, current will flow through the common load resistor in such a direction as to make the top of this resistor negative with respect to earth while if D2 is conducting as the result of the application of a steady *Space* tone, the top of the resistor will be positive with respect to earth. In actual practice there will be a small output from D1 on a space tone, and a small output from D2 on a mark tone (as the amplifiers do not have zero-response off the chosen frequency) but the current from the appropriate diode is very much larger than from the other one, making the overall effect as though it alone was conducting.

[over

Amplification of Printer Signal

Having obtained a change voltage in the diode common load dependent upon the frequency of the incoming signal, the next problem is to amplify this to a sufficient level to work the printer. Three problems immediately arise! (1) The actual current applied to the printer must be independent of variations in signal voltage — and some variations are to be expected in spite of the action of the limiter; (2) The DC component, *i.e.* the current due to transmission of a continuous *Mark* tone while the transmit printer is at rest, must be retained; and (3) In the absence of *any* signal it is desirable that the converter shall automatically deliver a continuous *Mark* current to the printer which will otherwise race, that is, print no characters, but run continuously, wasting yards of paper! These three problems together make the use of any AC type of amplification extremely difficult, and the simplest solution is to make use of a relay. This solves all three difficulties simultaneously.

The output voltages from the discriminator is in the form of voltages at practically no power, so that the relay could not possibly be used direct from this source. The relay is therefore operated by the anode current of a valve which varies as the result of the discriminator voltages being fed to its grid. A valve having a *Gm* is around 5 mA/V is suitable and a 6AK5, triode connected, is used. This is cathode biased to having a standing anode current of around 9 mA, which is about the centre point of the characteristic. The anode current flows through the coils of a Siemens 2000 ohm hi-speed relay, the spring tension of which is adjusted to counterbalance exactly the magnetic pull due to the steady anode current. The grid of the 6AK5 is fed from the discriminator load *via* a simple low-pass filter (of which more later) so that if the discriminator load becomes negative with respect to earth as the result of a *Mark* tone, the anode current of the 6AK5 is reduced, thus allowing the relay tongue to make contact with the upper stud under the action of its spring; conversely, if the 6AK5 grid is driven positive as the result of a *Space* tone, the current through the relay is increased above the standing figure and the relay tongue makes contact with the lower stud. It is found in practice (in the writer's gear) that the relay will make positive contact with upper or lower stud for a variation of about 1 mA above or below the standing figure, and since normal operation results in variations of plus or minus 7 to 10 mA, the relay operation is extremely satisfactory.

It will be realised that the use of cathode bias for what is really a DC amplifier will introduce considerable negative feedback with consequent loss of sensitivity. For example, if the 6AK5 grid is driven positive by the discriminator, the increase of anode current will result in an increase of cathode bias, thus offsetting the original anode current increase to some extent. This is helpful rather than otherwise, in preventing overloading and excessive anode dissipation of the 6AK5, particularly when the grid is driven in a positive direction. On the other hand, maximum sensitivity *is* required for quick relay operation, so that a 50 μF condenser is connected across the cathode bias resistor. This means that the instantaneous change of current from *Mark* to *Space* is not appreciably reduced, thereby ensuring correct relay operation, but very shortly after that, the steady current will settle on a value somewhat nearer the standing figure as the condenser discharges. Since T/P signals consist of more 20 mS pulses than anything else, one can consider that the amplifier is adequately by-passed, the negative-feedback effect only becoming noticeable on the longer signals when it helps to reduce dissipation.

Filter Circuit

The simple low pass filter between the discriminator load and the grid of the 6AK5 is required to remove as much as possible of the AC component in the rectified signal from the diode. In view of the fact that as "square" a DC pulse as possible is required at the grid of the 6AK5, it is not possible to remove, by filtering, all the AC component, and it is therefore necessary to connect a 0·1 μF condenser across the relay coils, to prevent them from "singing" at the frequency of the applied tones, and to maintain a steady contact pressure.

It has already been said that the relay spring must be manually adjusted to counterbalance exactly the steady anode current of the 6AK5, and so any variation in the anode current due to ageing, or to slight changes in component values, should be followed by further relay adjustment. This would clearly be tiresome, so part of the cathode bias for this valve is made variable, enabling the value of anode current to be readily brought back to the required figure if any change takes place.

Printer Operation

While the simplest possible method of operating the printer from the relay would be to connect the teleprinter coils direct to the relay

contacts and a centre tapped DC supply, it must be remembered that considerable inductive effects will be present due to the application of " square-waves " to the printer coils and that sparking is to be expected as a result. This would almost certainly lead to erratic relay operation, to avoid which it would be necessary to fit sparking suppressor circuits. It is, therefore, much simpler in the long run to feed the printer coils from valve circuits which electronically reverse the current applied, thereby avoiding the above complications.

In this converter the printer coils are connected in a bridge circuit as shown in Fig. 4. Under normal conditions, with the circuit considered entirely on its own, both valves are biased well back by cathode bias, and the bridge as a whole is balanced, resulting in no current through the coils. Reference to the diagram will show that the 6K6 grids are connected to the relay studs, and that the relay tongue is taken through a limiting resistor to a positive source. If the relay tongue is making contact with the upper stud (as the result of a *Mark* tone) then the grid of valve A is made positive, thereby overcoming the cathode bias and causing the valve to conduct. This unbalances the bridge and current flows through the printer coils in the direction X-Y. If, however, the relay makes contact with the lower stud as the result of a *Space* tone, valve A is cut off, valve B conducts and currents flows in the direction Y-X. Using the values shown, current through the coils is in the order of 18-20 mA, which is the correct figure. The cathode bias resistors should be matched quite closely so that the current through the printer coils is the same in each direction—this is rather important. Using the circuit shown, the relay operation is entirely spark free, the current it carries being only a fraction of a milliamp, and sensibly " square-waves " can be applied to the printer coils without inductive troubles. The additional valves and circuitry required to bring this about are very much worthwhile compared to trying to operate the printer directly off the relay contacts.

It is very convenient to be able to print directly from the machine's own keyboard without having to disconnect the converter in order to feed the printer coils with a local signal. In order to facilitate this, a jack socket is provided connecting, as shown, to the diode load. If a small reversing voltage of the order of plus/minus three volts, obtained from a battery *via* the printer keyboard (as shown in Fig. 5), is applied to this point the 6AK5 will operate in exactly the same manner as if the voltage were the result of rectification by the diodes causing the printer to operate. A further advantage of having this local position available is that it checks the operation of the 6AK5, relay and printer bridge network. Consequently, if the printer works on " local " it must print on incoming signals, providing it is running at the same speed as the transmitting printer and is compatible with the system of transmission.

If a centre-zero mA meter having an FSD of 50-50 mA is available, it may be connected in series with the T/P coils, when it should show equal deflection on either side. While this meter is useful, it is not essential, since the

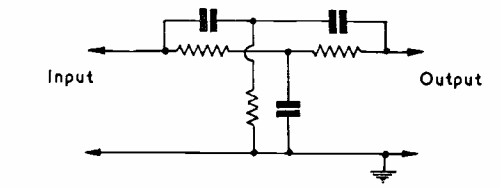


Fig.1 BASIC BRIDGE-T NETWORK

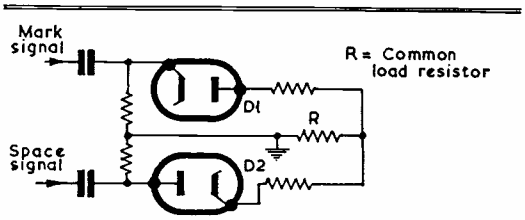


Fig. 3 BASIC DIODE CIRCUIT

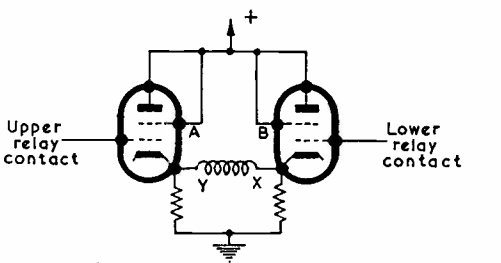


Fig.4 T/P BRIDGE CIRCUIT

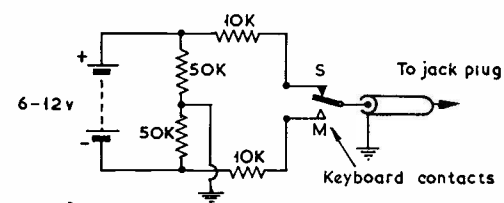


Fig.5 'LOCAL' KEY CIRCUIT

S 56

Figs. 1, 3, 4 and 5 above are discussed in detail in the text.

6K6 current is unlikely to change.

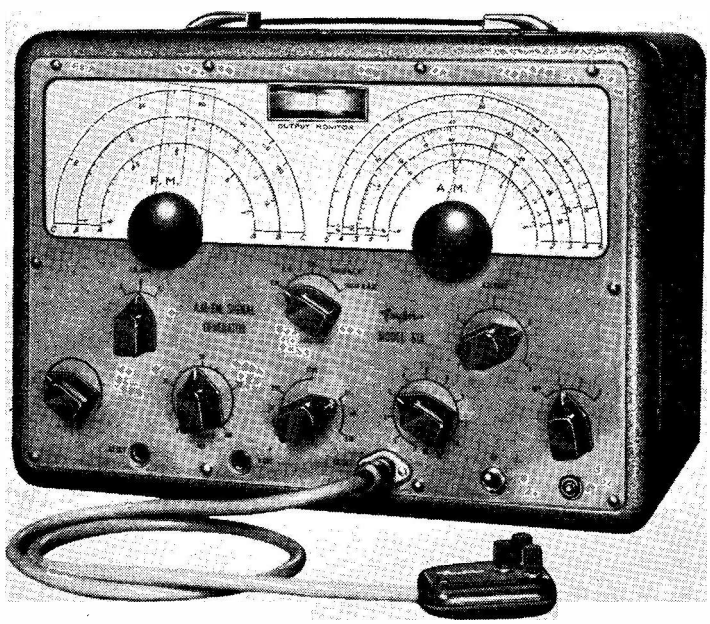
Another meter, to measure the anode current of the 6AK5 is, however, more or less essential and should be wired permanently in circuit. It is suggested that a meter having a full-scale deflection of 20 mA is used—if the standing anode current of the 6AK5 is then set to 10 mA, this may be looked up as a centre-zero meter, variations of anode current being considered as more or less than the standing current of 10 mA. Alternatively, a meter having an FSD of a much lower figure can be used with a preset variable shunt, in which case, with the anode current of the 6AK5 set at 9 mA, the shunt can be adjusted until the meter in use shows half scale. Providing the anode current is once set to a figure of around 9-10 mA, all that is required subsequently is a comparative indication.

Construction

The theoretical diagram supplies practically all the information that is required for building the converter, since any amateur who is experimenting with RTTY is unlikely to need information on how to string a few valves together. The input to the converter is nominally suitable for medium impedance, but it will work satisfactorily off any source that will supply the necessary AF voltage. If it is worked from a receiver having a low impedance output (3-5 ohms) it will be necessary to interpose a matching transformer. It is suggested that the two 12AT7 amplifiers be constructed side-by-side, since this will result in short leads. In the writer's equipment the EA50's have been soldered directly in the wiring under the chassis, without using holders. Opinions vary as to whether this is "the done thing," but it certainly makes for short leads. The relay should be mounted in a position which will allow easy adjustment of the spring tension with the power switched on, as this is necessary during the initial setting up. Gain and other controls should be fitted in positions which permit short leads. It must be remembered that the converter is essentially a multi-stage AF amplifier, so that adequate precautions must be taken to avoid hum and instability due to bad layout. If hum is present at the diodes it will seriously interfere with operation. The 4000-ohm cathode bias resistors associated with the 6K6 valves dissipate a fair amount of heat and should be mounted where their temperature rise will not adversely affect other components.

The power supply is conventional, delivering around 250 volts DC. The VR150/30 provides a stabilised voltage for those stages where variation in HT voltage might alter performance characteristics.

(To be Continued)



The Taylor Model 61A Signal Generator is an AM/FM instrument designed mainly for the servicing of HF receivers, and the IF section of TV receivers. In conjunction with an Oscilloscope, the 61A provides full facilities for the sweep alignment of RF, IF and detector stages of AM and FM receivers. The AM generator covers 4-120 mc in 5 bands, all on fundamentals. The FM and sweep bands cover 4-12 and 70-120 mc in three ranges, with FM deviation variable up to 100 kc from mean carrier. The sweep gives a total bandwidth of 1 megacycle. For maintaining calibration accuracy, a built-in crystal calibrator is provided, for which crystals can be supplied in the range 1-11 mc. RF output is monitored on the new, very neat Taylor edgewise meter.

HEATHKIT DX-100U

CW/AM PHONE TRANSMITTER FOR FULL POWER OPERATION ON ALL BANDS 10-160 METRES

SINCE it became available in this country, the Heathkit DX-100U, supplied in kit form by Daystrom, Ltd., has attracted a good deal of interest and attention—as indeed it might, for it is a well designed assembly, finishing as a nice-looking piece of equipment, both inside and out. Moreover, the DX-100U, being designed to an "international specification," can run up to 180 watts fully modulated on all six communication bands. To conform to U.K. regulations, the necessary power-reduction provision is made in the circuitry.

The illustrations and diagrams herewith give a good idea of what the DX-100U looks like and how the circuits are arranged. On the RF side, the PA takes a pair of 6146's in parallel, with a switched tank assembly covering all bands 1·8 to 28 mc inclusive, and operating at a final plate voltage of 640v. The PA is clamped by a 6AQ5, with which R15 (Fig. 2) is a variable pre-set adjustment to get the clamp setting just right.

As shown by Fig. 2, the DX-100U can be operated either VFO or crystal controlled, V1 being switched out in the latter case; this is the 6AU6 variable oscillator which has two separate tuned circuits, one for the LF bands and the other for 7-28 mc; the selection of these windings and their associated condensers is effected automatically by the single band-change switch, which controls all switching motions from VFO to PA. For crystal controlled working, the buffer V2 becomes the crystal oscillator, with V3 as the switched driver stage in either case.

Still looking at Fig. 2, it will be noted that two separate HT supplies are provided, with V14 as a bias rectifier. The inter-switching is so arranged that the modulator can only come on when the transmitter is put in the "Phone" position, this putting HT on the modulator screen line. When on either CW or phone, change-over control is either by a single front-panel switch or by relay *via* the remote-control socket on the rear chassis-drop. When on CW, the secondary of the modulation transformer T3 is shorted, a very essential precaution when keying at 150 watts input.

A neat speech amplifier circuit gives ample voltage gain with any crystal microphone, R23 being the audio control, between the two halves of the 12AX7. The audio driver stage is a 6CH6, and the modulators a pair of KT88's, which will give a good 100 watts of audio, ample for full modulation at maximum input. An interesting circuit feature is that the audio can be brought out separately, if required to operate with apparatus external to the transmitter itself — this is very useful where the station equipment includes, say, a transmitter for two metres, or some other band for which no modulator and power supply are available.

Since the paralleled PA valves and modulators require between them high peak currents under full-power conditions, two 5R4GY's in parallel are used in the main HT rectifier, which gives 700v. at 500 mA.

General Design

As can be seen from the photographs, the layout is such as to give a particularly neat

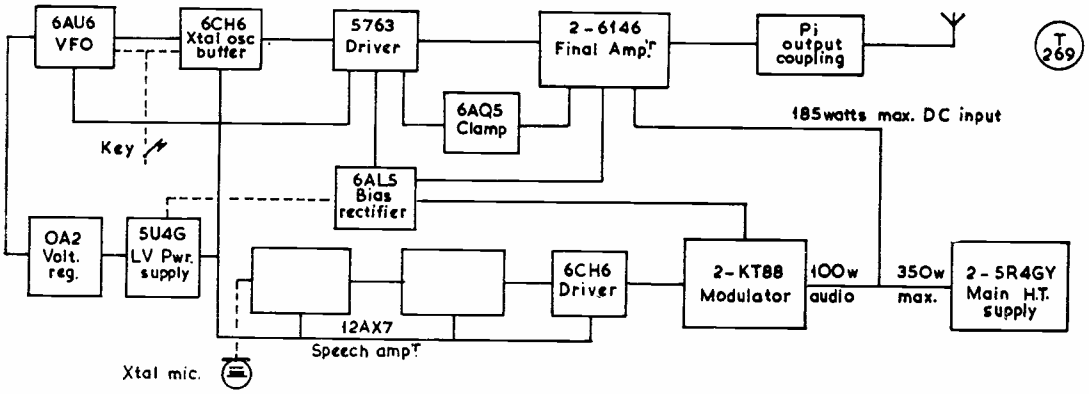


Fig. 1. Block schematic of the Heathkit DX-100U Transmitter, which uses a total of 15 valves, and can be operated on all six amateur bands.

above-chassis assembly, with weight evenly distributed — the iron-core components are generous, and therefore heavy—and the chassis depth is such that there is plenty of room underneath for assembly and wiring. As in all Heathkit equipment, the chassis and panel are completely prefabricated and fully drilled, the register of the holes being accurate and everything a good square fit.

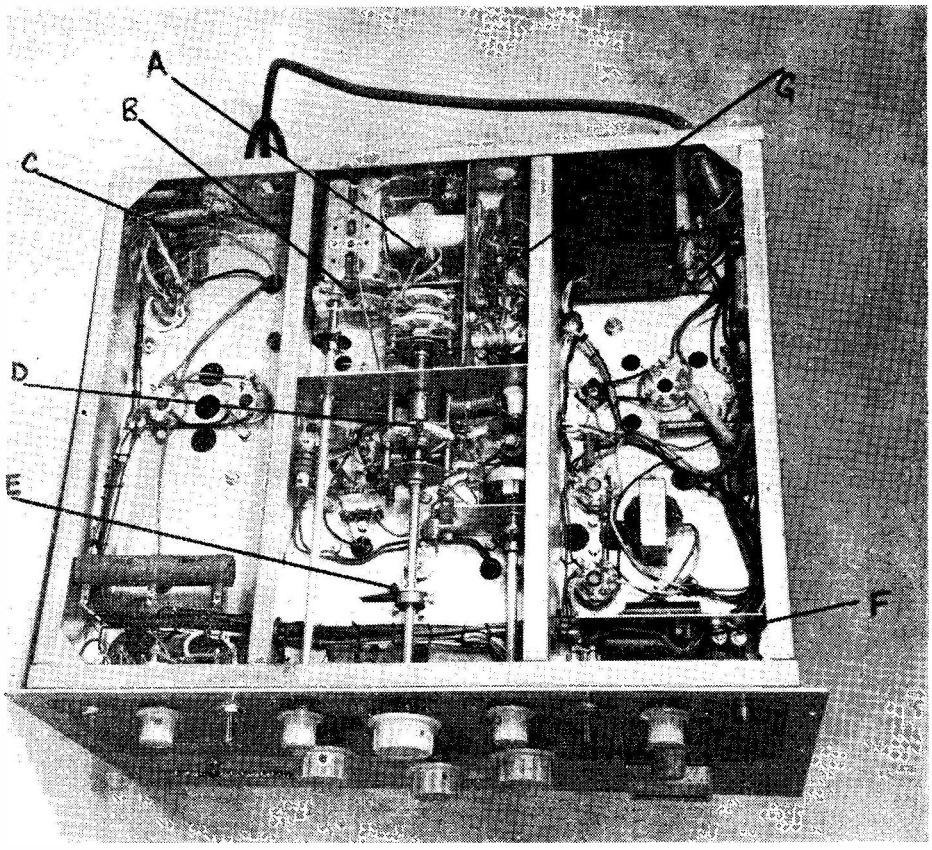
The panel layout makes for easy operation and the scaling on the variable controls is such that the settings for band-to-band adjustments can be accurately repeated. The driver control R8 sets the drive into the PA from band to band, and is the second knob from the left along the lower row in the front panel view. The large central knob in this row is the band-change switch, and alongside it (right) the aerial output coupling adjustment; this has a wider range of setting than usual as the total capacity available at C37 is ·0015 μF, made up by three 500 $\mu\mu$F condensers in triple gang. The two large knobs in the middle row are (right) PA tank tuning, C35 in Fig. 2, and the driver tuning condenser C25 on the other side.

At far left in this row is the five-position meter switch, by which can be read driver plate current, PA grid current, PA plate current, main HT voltage, and modulator plate current. The single instrument is scaled in such a way as to make these readings direct, except in the case of the main HT, for which the scale reading must be doubled.

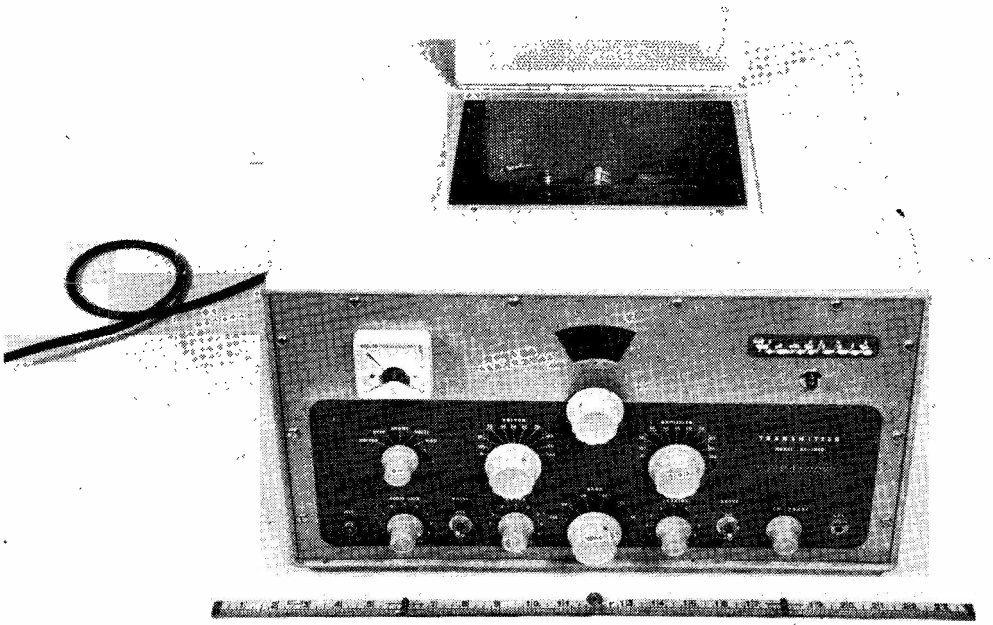
For reducing PA input, a simple circuit change, switch-controlled, is introduced at the screens of the PA valves. The transmitter can then be operated at inputs of from 5 to 30 watts.

The VFO Section

Any amateur-band transmitter can be made



Underneath the DX-100U as built from the Daystrom kit for the U.K. market. The items identified are: A, 160-metre coil; B, output tuning condenser, C37 in Fig. 2; C, RF chokes at remote control socket; D, band-switch assembly, VFO in front compartment, driver-PA behind; E, mechanical switch automatically selecting either L1 or L2 (see Fig. 2) for LF/HF VFO sections; F, speech amplifier assembly, in screened compartment behind main panel; and G, grid side of RF stage. The holes seen in various parts of the main chassis are for ventilation, the three in line in the left-hand compartment being for the 5R4GY parallel-connected rectifiers. The high-wattage resistor at lower left in this compartment is R32,R33 in the circuit of Fig. 2.



General appearance of the Heathkit DX-100U, as built from the parts supplied. The cabinet work is particularly good, and the ready-drilled chassis is rigid, well finished and adequately holed for ventilation. Band-change is by single-switch control (lower centre) and all bands Top to Ten are covered, for CW or high-level AM phone operation.

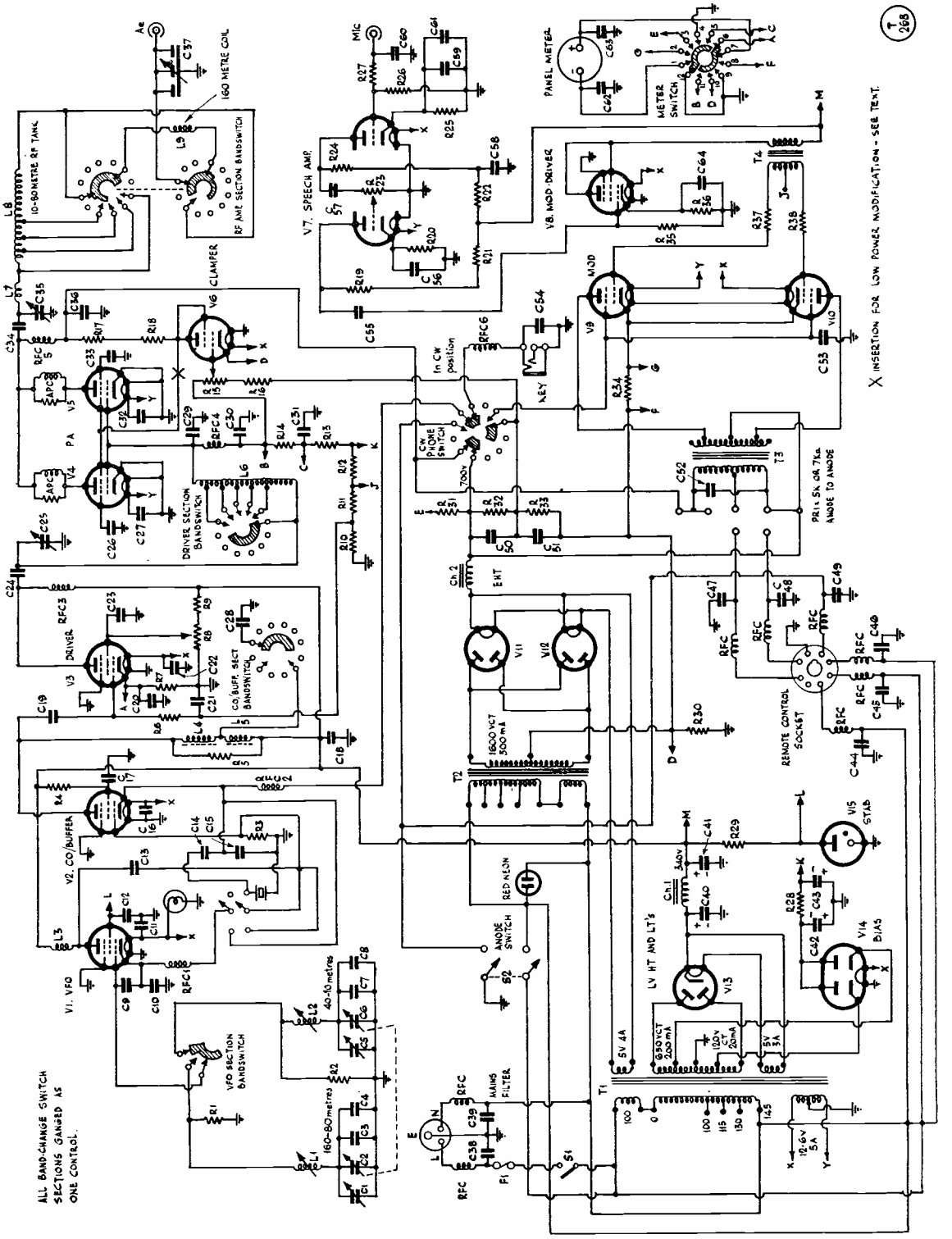
or marred by its drive oscillator, no matter how good the rest of the design may be. The VFO must not only be absolutely stable, with a good dial mechanism and an open scale for accurate frequency setting, but it must also give adequate output and key cleanly and sharply under CW conditions. These requirements are fulfilled in the case of the DX-100U, where the keying is in the cathodes of the VFO/Buffer stages.

It can be stated that the CW note is excellent, the re-setting accuracy high, and the stability very good indeed ; great care has been taken with the general design and layout of the VFO section, and the HT to the screen of the 6AU6 is stabilised, as shown by V15 in Fig. 2. The dial mechanism is smooth and positive, with a good open scale, and on any band the VFO can be set up close to a given frequency. As regards output, there is no trouble in getting more than enough grid current into the PA on all bands.

Constructional Points

The transmitter as illustrated here was built from a standard production kit, to the instructions given in the DX-100U manual, using the parts supplied. The manual runs to some 64 pages, covering not only the assembly of the transmitter, section by section, in great detail but also its setting up, testing, installation, maintenance, and servicing. The wiring-out instructions are given in point-to-point form, with large pictorial diagrams, and provided the assembly and wiring procedures are followed as laid down in the manual, one simply should not go wrong.

Several sections of the transmitter are put together as sub-assemblies before being fitted


ALL BAND-CHANGE SWITCH SECTIONS GANGED AS ONE CONTROL.
X INSERTION FOR LOW POWER MODIFICATION - SEE TEXT.
V1. VFO
V2. CO/BUFFER
V3 DRIVER
PA
V6 CLAMPER
V7. SPEECH AMP.
V8. MOD. DRIVER
MOD
V11
V12
V13
V14 BIAS
V15 STAB
10-80 METRE RF TANK
160 METRE COIL
RF AMP SECTION BANDSWITCH
DRIVER SECTION BANDSWITCH
CO/BUFF. SECT BANDSWITCH
VFO SECTION BANDSWITCH
40-10 metres
160-80 metres
MIC
PANEL METER
METER SWITCH
KEY
In CW position
CW PHONE SWITCH
ANODE SWITCH
RED NEON
MAINS FILTER
LV HT AND LT's
REMOTE CONTROL SOCKET
PRI: 5K OA 7ka ANODE TO ANODE
EHT
1600 VCT 500 mA
650 VCT 200 mA
100V CT 20mA
5V 4A
5V 3A
12·6V 5A

into the main chassis, which simplifies construction considerably; the most difficult of these items to instal is the 6146 PA sub-chassis, and in one or two other places a little bending and squeezing may be necessary to get parts together correctly—for instance, in our model the earthy end of the driver tuning condenser C25 fouled the PA screen until some adjust-

Table of Values

Circuit of the DX-100U CW/AM Phone Transmitter

C1, C5	= 20 μμF	C26, C28,	= .001 μF	R9	= 6,500 ohms	Ch2	= 6 Hy 500 mA	V4, V5	= 6146 (QVO6/20)
C2	= 35 μμF	C33	= .001 μF, 2 kV	R11	= 470 ohms	L1	= 114.5 μH	V6	= 6AQ5
C3, C7,		C34, C36	= wkng.	R14	= 5.55 ohms	L2	= 9.3 μH	V7	= 12AX7
C19, C29	= 47 μμF	C35	= 300 μμF	R15, R23	= 1-megohm potentiometer	L3	= 28.0 μH	V9, V10	= KT88
C4	= 10 μμF	C37	= 500 μμF	R16, R24,		L4	= 6.5 μH	V11, V12	= 5R4GY
C6	= 11 μμF			R26, R35	= 470,000 ohms	L5	= 15 μH	V13	= 5U4G
C8	= 4.7 μμF			R17, R18	= 10,000 ohms	L6	= 10-160m. driver	V14	= 6AL5
C9, C10,		C40, C41	= 40 μF, elect.	R20, R25,		L7, L8	= 10-80m. PA tank	V15	= OA2
C55, C57	= 510 μμF	C42, C43	= 20 μF, elect.	R27	= 4,700 ohms	L9	= 160m. PA coil		
C11, C12,		C50, C51	= 125 μF, elect.	R28, R37,		S1	= SPST toggle		
C16, C17,		C52	= .02 μF, 2 kV wkng.	R38	= 1,000 ohms	S2	= DPDT toggle		
C18, C20,				R29	= 15,000 ohms, 5w.	APC	= Anti-parasitic chokes on resistor forms, 4r. on 47 ohms		
C21, C22,		C53, C58	= 0.1 μF	R30, R34	= 0.1 ohm	T1	= 650-120-0v./200 mA		
C23, C27,		C56, C59,		R31	= 1 megohm	T2	= 800-0v./500 mA		
C30, C31,		C64	= 2 μF	R32, R33	= 15,000 ohms	T3	= Mod xformer, 2,800-ohm sec./ 5,000-ohm pri., A-A.		
C32, C38,		C60	= 220 μμF	R36	= 680 ohms	T4	= Driver xformer, 2:1.		
C39, C44,		R1	= 22,000 ohms	RFC	= Filter chokes	V1	= 6AU6 (EF84)		
C45, C46,		R2, R10,		RFC1,		V2, V8	= 6CH6		
C47, C48,		R12, R13	= 2,200 ohms	RFC2,		V3	= 5763		
C49, C54,		R3, R19,		RFC4	= 1.1 mH choke				
C61, C62,		R22	= 100,000 ohms	RFC3	= 2.5 mH choke				
C63	= .005 μF	R4, R5,	= 47,000 ohms	RFC5	= 1 mH 500 mA choke				
C13	= 100 μμF	R21	= 27,000 ohms	Ch1	= 7 Hy 200 mA				
C14	= 22 μμF	R6	= 1.02 ohms						
C15	= 150 μμF	R7	= 25,000-ohm potentiometer						
C24	= 68 μμF	R8							
C25	= 75 μμF								

Fig. 2. Circuit complete of the DX-100U, for which all values are given here. Input up to 150 watts is easily obtainable on any HF band, with ample modulation capability.

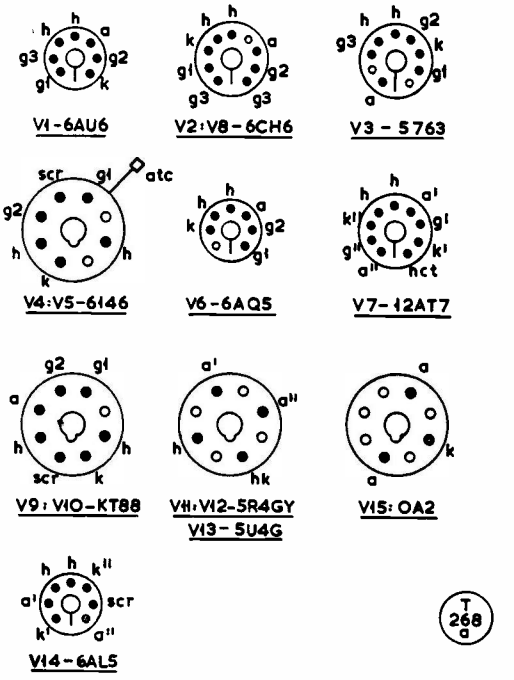


Fig. 2A. Base connections of the valves used in the DX-100U Note that in this sketch V7 should be marked 12AX7, for which connections are the same.

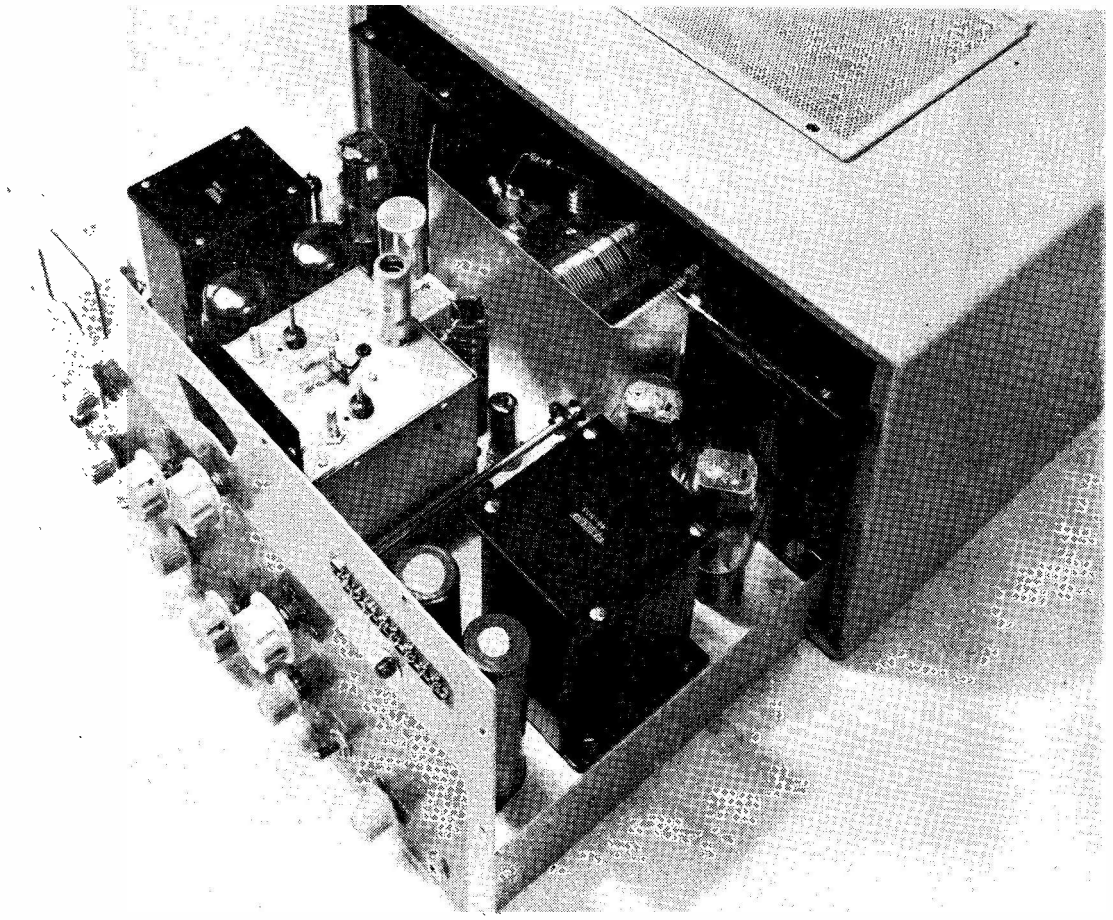
ment of the latter was effected (by bending).

Most of the controls will be found to be a close fit, tending to be tight on their bearings —this can be corrected by a little cleaning down and lubrication with a touch of light oil, such as machine oil or "3-in-One." When assembling the panel items, it is as well to spend some time on getting the alignments right before tightening up.

Test Results

The transmitter was set up strictly as laid down in the manual. Having made the usual checks and obtained some drive on one band, the pre-set coils and condensers in the VFO have to be adjusted for coverage and accurate frequency setting. An immediate difficulty was that while the wiring checked out all right, no sign of life could be obtained from the VFO or the CO, though the correct voltage readings were there on all valve pins. This puzzling fault was finally traced to the key jack, for which a separate earth connection must be provided—tightening up against the panel is not sufficient.

In adjusting the VFO, the setting for L2 slug (see Fig. 2) was no trouble, but that for L1 was 'way out, and for some time the 160/80-metre bands could not be found at all. It is



The DX-100U complete, upper chassis view, withdrawn from cabinet. At centre is the VFO unit, with the PA in line behind the screening partition. The modulator, consisting of a pair KT88's, is at upper left, with its speech amplifier section beneath the meter and immediately behind the front panel. In the PA compartment, the coil section visible is for 3.5-21 mc, there being separate coils for 10m. and Top Band. The iron-core components are generously rated, and high quality parts are used throughout.

necessary to proceed methodically with the VFO adjustment if good tracking—dial setting against frequency reading on a calibrated receiver or frequency meter—is to be obtained across all bands. When this is achieved, the VFO control is a joy to use, as the scale is clearly marked and well illuminated and, as mentioned earlier, one can put the VFO very accurately on frequency.

Having got grid drive on all bands, and made a note of the adjustments, the next thing is to set the clamp control R15 as explained in the manual and check the PA for RF output. This is done by putting a 100-watt lamp, on a length of coax, across the output (aerial) socket and then, having turned the drive well back and set the PA tank tuning and output condensers at about half-mesh, maximum dip is found in the usual way ; thereafter, the output loading and PA tank condensers are adjusted for maximum RF in the lamp as the grid drive is brought up—this procedure is carried out in different ways by different people, but as good a way as any is laid down in the DX-100U manual.

Incidentally, one way of getting a PA very nearly to resonance *without* HT on it we have never seen explained in any book : It is to apply drive, turn up the receiver on the frequency till a good, loud beat note is heard, and then rotate the PA tank condenser—at one point, a distinct " wheep-wheep " will be heard in the beat note as the PA tank goes through resonance ; this will then be the tune position, near-enough, for that frequency, and HT can be put on the PA in the knowledge that there will only be a slight movement necessary to get the dip setting.

On all bands 80-10 metres, the 100-watt lamp should light to full brilliancy when the transmitter is correctly adjusted all through; there is no use trying for full power on Top Band, even on a lamp load, as (in our model at least) the 160-metre coil "cooks" unpleasantly, so for U.K. operators anyway the QRP switch must be used!

Having got full RF output in the CW position, going over on the phone-CW switch will (if all is as it should be) bring in the modulator and, as the audio gain control is advanced, the lamp will show increment modulation. Speech quality is good. Some "talk-back" when the modulation was pushed up was found to be due to a looseness in the laminations of the driver transformer T4.

On sustained runs on full power, with the transmitter in its cabinet, heating is not excessive, and for extra ventilation the cabinet top can be opened, as shown in one view.

In General

The Heathkit DX-100U is in every way a very attractive design for the constructor who wants a full-power all-band job. It is capable of excellent results on the air on both CW and phone, and it is easy, and very interesting, to build. The parts supplied are of first-class quality and the finished transmitter in its cabinet is a handsome piece of equipment.

Construction of the DX-100U as illustrated here, and adjustments to the point of bench testing into a dummy load, absorbed about 35 working hours, no special tools being required nor were any serious snags encountered. Before the work commenced, some time was spent in a thorough reading of the manual — this is strongly recommended as it makes construction easier and quicker.

The all-Heathkit station established at the Daystrom Factory just outside Gloucester, on the Bristol road. Signing G3JPP/A, the gear includes a Heathkit DX-40U, a DX-100U, a Heathkit Mohawk receiver (at left, on the table) and various items of test gear and measuring equipment. The DX-100U as supplied in the U.K. is the central piece on the upper shelf.

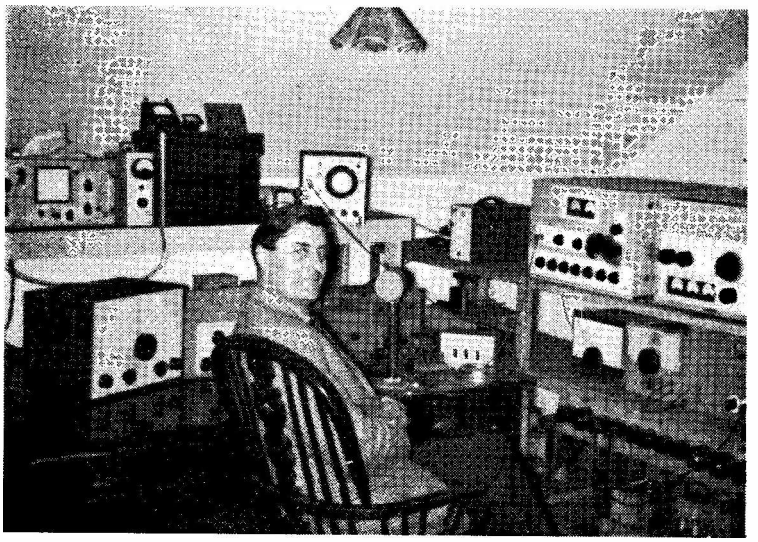
GUIDE TO BROADCASTING STATIONS

In addition to the main sections listing both geographically and in order of frequency all European long- and medium-wave broadcasting stations and nearly 2,500 short-wave stations of the world, the twelfth edition includes a list of over 1,000 European VHF sound broadcasting stations and another giving Europe's main television stations.

The regular revision of *Guide to Broadcasting Stations* is an essential, if formidable, task, and many hundreds of additions and amendments have been made in preparing this edition. It has also been considerably enlarged to accommodate a number of additional features giving useful information for the broadcast listener. These include standard time throughout the world, international allocation of call-signs and a wavelength-frequency conversion table. Published by Iliffe & Sons Ltd. Size 7¼ in. x 4¾ in., 110 pages. Price 3s. 10d., post free, obtainable from Publications Dept., Short Wave Magazine, Ltd.

DX COMMENTARY

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



G2MA

WE have a very mixed month to report on; pretty good on the whole, but with slack periods. Perhaps the most surprising feature was the way the 28 mc band kept open—and for much longer stretches than one would have expected. At times it was quite comparable with the standard set a year ago, when the sunspot peak was on us.

The MUF has been up in the 40's on several occasions, and on such days 28 mc was naturally the best band of all, with 21 mc some way behind and 14 mc quite uninteresting.

The reduction of Russian jamming (the intentional variety!) does seem to have given us some clearer spaces, especially on 21 mc, but there are still far too many buzz-saw and jingle-bell noises about. And we have often posed ourselves this question: Does such a state of lawlessness persist among the commercial users of radio that they have to "keep a channel clear" by sending call-signs all day? This, to our way of thinking, is one of the worst kinds of QRM because it seems so completely unnecessary.

Some of the amateurs that one hears talking about "*my* frequency" might start adopting this method of staking a claim—and then what would the bands sound like? The other strange fact is that many of the commercials keeping their channels clear have stolen these channels in territory to which they are not entitled, in any case.

It seems that we need an International Traffic Wardens' force to deal with the problem of Illegal Parking. Can any Bright Boy suggest a design for a parking meter? Funds to go, of course, to the legitimate users of the channel on which the parking takes place.

CALLS HEARD, WORKED and QSL'd

Contests?

We had a hunch that the Correspondence on Contests was going too strongly in the one direction. No one seemed to like them, and everyone who disliked them seemed to have different objections to them.

Now we have some vitriol from the other side—and we can assure everyone that nothing of the kind has been received previously and suppressed. We have been quite honest.

G3LAS (Cambridge) thoroughly disliked our quote that contests "bring an extensive array of bad manners and bad operating." He says he enjoys an occasional week-end of contest work "because it demands a far *higher* standard of operating than any other form of the hobby yet encountered." He rightly adds: "If you trouble to listen to the so-called 'natter-bands' of Forty and Eighty any morning, you will be even more appalled . . . ." and with this we heartily agree. (We did not make the original statement about bad operating in contests, anyway—it was a quote from a correspondent's letter.)

Continuing with G3LAS: "I can only suggest that, judging from the apparent lack of letters from prospective opponents, your tirade appeared to them, as to me in the first place, rather exaggerated and typical of a man with a favourite antipathy."

Next, and in rather cooler style, G2YS (Filey), who writes: "I *like* contests. I may never send in an entry, and may participate for one hour or twelve as I wish, but I get loads of enjoyment and I think they do good." He adds that they give a quick idea of how one's gear is working; they give a chance to everyone to work the rare ones (any contest with a rare station wanting to work *you* is a

good thing); they are a good test of operating skill; and they induce activity on under-populated bands. And he sums up by saying: "There is not a skill in Amateur Radio—constructional or operating—that a contest does not test to the full, and quite apart from all that, it can be darned good fun."

And so to G3BID (London, N.W.3), who says: "Surely it is quite unreasonable for the small but vociferous minority to spoil the pleasure of the hobby for the vast majority. Is this the much-vaunted 'Ham Spirit' of co-operation—for a small minority to drive the majority away from their hobby week-end after week-end? If contests must take place, they should be restricted to a portion of each band (CW or phone)—certainly not more than half."

And G2VV (Sunbury): "I do not actually dislike contests, but this rat-race of number-swopping between DX stations seems pretty pointless. I would like to see an organised test in which reports were made on the quality of the signal and the standard of operating. A 'points code' could be worked out (say, from 1 to 5). I have a feeling that there would not be quite so many participants."

G5BZ (Croydon) heartily disagrees with us and suggests that contests are popular "because they give everyone the chance to *contact* many different countries without the need of talking an awful lot of tripe to someone who talks the same tripe back to you . . . There is an awful lot of sentimental nonsense talked about Amateur Radio which, when you think about it, adds up to exactly nothing . . . the majority of amateurs just haven't got the guts to admit it." (And we freely admit that he *has* got something there.)

G3ISX (Welling) suggests that after we have scrapped contests, we should start on Tables, Ladders, Operating Awards, and finish with DX Commentary—"then the writer might be sorry he was so rude to all the blokes like me." Who, *us?* We haven't been rude to anybody, *yet!*

Shorts from G3LET (Westcliff), who likes contests; from G3IGW (Halifax), who is convinced that there was some tongue-in-cheek business going on, particularly as we followed last month's remarks with publicity for the biggest band-wrecker of them all (the ARRL Contest); from G3JSN (Watford), who doesn't like them; and from W3HQO (Philadelphia), who loathes them!

Perhaps we may be allowed a last word. When we first broached this obviously delicate subject (in the January issue) we complained mostly about the frequency and the long duration of contests. And we actually suggested that something running for about four hours "would reveal more about efficiency and operating ability." It's not contests *as* contests that we are tiring of, but the fact that so many week-ends are completely occupied by a 24-hour or 48-hour marathon affair of some sort. Lay on some well-devised four- to six-hour affair, and G6QB will be in there batting with the rest of them. Meanwhile, concerning the 24-hour and 48-hour manifestations, we don't retract a word.

Nothing has been suppressed in this wordy little battle. There is a wide divergence of outlooks, which is to be expected, and all comments have been, and will be, welcomed. People pleading on either side usually write a letter which is outspoken or even abusive in their own particular direction, and then end up with a plea for tolerance! Let 'em all come, but, to get it straight, let us repeat: Your Commentator does *not* condemn Contests . . . but he is convinced that there are *(a)* Too many of them, and *(b)* Too many hours involved in nearly all of them, considering that they are undoubtedly a

FIVE BAND DX TABLE
(POST WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
G3FXB	823	75	132	225	223	168	264
G2DC	807	87	118	238	199	165	266
G5BZ	793	66	121	269	206	131	278
G3FPQ	772	72	104	220	215	161	246
G3DO	693	25	51	249	188	180	277
GW3AHN	664	16	55	203	242	148	263
G3BHW	644	15	44	207	212	166	247
GI3IVJ	631	41	70	175	182	163	229
G3ABG	595	55	89	190	137	124	214
W6AM	567	40	68	297	96	67	297
G2YS	534	73	93	165	120	83	183
G3LET	506	40	106	187	120	53	205
UR2BU	488	22	54	150	145	117	187
G3IGW	471	46	77	115	119	114	170
G6VC	463	40	60	159	118	86	190
GM2DBX (Phone)	433	34	31	162	105	101	178
W6AM (Phone)	426	23	62	281	49	31	281
G3FPK	414	36	82	126	100	70	161
G3JAF	410	33	24	112	183	58	210
UR2BU (Phone)	385	10	27	112	126	110	163
MP4BBW (Phone)	384	1	5	173	125	80	191

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
G3LHJ	339	15	39	105	119	61	156
G6TC	333	20	71	128	72	42	146
G2BLA	331	36	62	77	78	78	128
G8DI	330	35	64	95	74	62	130
G3DNR	296	11	26	90	85	84	130
G3MCN (Phone)	291	4	8	62	142	75	178
G3BHJ	275	8	28	38	129	72	159
G3NOF (Phone)	273	8	15	29	113	108	144
VO2NA	268	19	37	110	66	36	119
G2DHV	267	22	29	130	62	24	149
G3WP	265	17	34	80	24	110	141
W3HQO	240	3	8	79	114	32	164
G3JFF	228	19	52	108	40	9	116
G3JSN	223	31	41	43	59	49	88
VQ4GQ	212	1	24	77	73	37	115
G3MMP	193	5	26	45	57	66	93
G3NAC	184	6	21	50	74	33	94
G3LZF	173	11	19	53	42	48	111
G3IDG	153	15	15	41	41	41	69
G4JA	151	30	24	57	30	10	92
G3GHE	141	11	26	33	15	56	88

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

minority interest.

And so we lead to our tour around the bands. For some reason, there is an exceptionally heavy mail this month, so some of the lists of DX worked have been severely pruned, and only the best ones have filtered through.

Ten Metres

G3NOF (Yeovil) found the band opening up to the USSR at 0700 and staying open until 2200 or even 2300 on many days. He even worked W's on phone at 2220 GMT! Best from his list: CR4AX, FB8CM, HKØAI, OA4IA, PJ2CM, TI2W, W9NLB/VE8, YN3LBV, ZD3E and a big bunch of W mobiles (all on phone).

G3BHW (Margate) worked phone with HH2AR, HKØAI, TG9TI, VP7NY, VQ8AV, VU2ANI and YN1AW; CW fetched in HKØAI and ZD1AW. G4JA (Baschurch), who was G2JA up to 1936 and is just back on the air, finds things somewhat changed during his long absence! He encountered plenty of DX on Ten in the mornings, but mainly JA's and ZL's—nothing startling.

G3DO (Sutton Coldfield) raised HCCC8 (Galapagos) on two-way SSB for an all-time new country. Incidentally, he has worked 70 countries on SSB in seven weeks' operating.

G3ABG (Cannock) accounted for VS9AE on phone; CW raised FQ8HA, OQ5IG, ZD2DCP and 2JKO. G3WP (Chelmsford) collected VU2BK, VU2ANI/5 and YA1AO, but was pained by the ghastly noises from the Russian novices.

GW3AHN (Cardiff) made phone contact with HC2MW, HH2RV, PJ3AB, YV5EB, ZD2JKO and ZE6JU; CW with VQ3 and 4, also ZD2's. G2BLA (Welwyn) mentions VQ2 and 3, W7UFB in Wyoming, ZC4 and ZD2JKO (the latter being G3JKO).

G3LHJ (Newton Abbot) worked CW with KP4CC, JA1, 2, 3, 6 and 7, VP3MC and VP9BO. G3LKJ (Torquay) stuck to Ten only, using 70 watts and a Quad. He thought the 10-metre band very good, and his phone raised XE3AF, VP1MC, ZD3E, HH2Z, ZS3X, HI8GA, KR6AM, VP2DY, VP5RD, PJ3AB and VU's, 2PS and 2BK—to mention only the better ones. He "inhabits the band" early in the morning, during the lunch-hour, and more or less all day on a Sunday.

G3GHE (Caversham), running phone only, collected CT2AI, FQ8HA, HZ1AB, KR6KS, PJ3AD, VQ2, VS6, YV, ZD2, ZD3E and "stacks of W6-7 and VE6-7," which he has never known to be so good on Ten.

G2DC (Ringwood) describes the band as "still mucked-up by the UA stinkers," but he raised VU2ANI/5 for an all-time new one, and others included EL1P, FQ8HA, JA, VQ2, 3 and 4, ZD1AW, ZD2, ZS, South Americans and many more.

G3IGW did an interesting thing; with 5 watts of CW into a 3-el. beam he worked all W districts in three hours on a Saturday afternoon, and in 1½ hours on the following day—good going! Others worked (presumably not with the

SHORT WAVE MAGAZINE DX CERTIFICATES

RULES

WNACA (Worked North American Call Areas)
Twenty-two cards to be submitted, for contacts with stations in ten U.S. Districts (W1-Ø); nine Canadian (VE1-8 with one 8 in Yukon, one in North West Territories); Alaska (KL7), Newfoundland (VO) and Labrador (VØ). Contacts may have been on any bands, phone or CW. Operators in W, VE, VO or KL7 are *not* eligible for this Award. (236 *WNACA Certificates issued to January*, 1960).

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 four 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. (173 *FBA Certificates issued to January*, 1960).

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), UAØ (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. (44 *WFE Certificates issued to January*, 1960).

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. (204 *WABC Certificates issued to January*, 1960).

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. The definition of U.K. counties is the same as for the WABC Certificate above. (160 *WBC Certificates issued to January*, 1960).

PRA (Polar Regions Award)
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. *Five issued*).

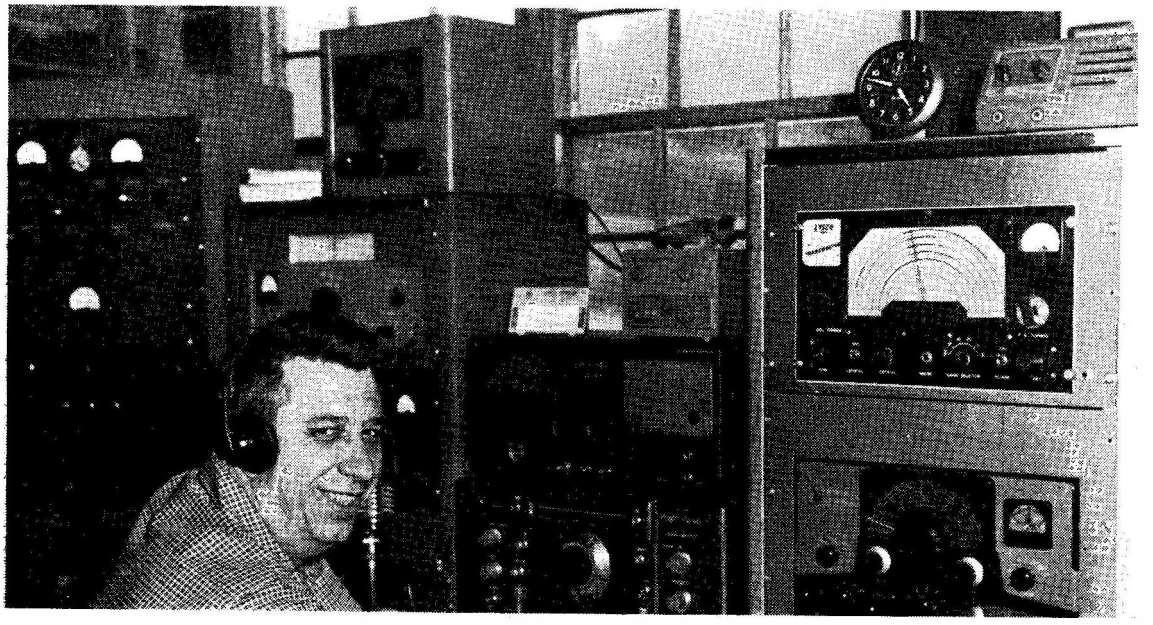
MDXA (Magazine DX Award)
To qualify for this Award it is necessary to have worked 3 continents, 15 countries on 160 metres; 5 continents, 40 countries on 80 metres; 6 continents, 80 countries on 40 metres; 6 continents, 180 countries on 20 metres; and 6 continents, 90 countries on 10 metres. (*Eight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

CONDITIONS

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 Awards," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1

(Overseas Amateur Radio periodicals please copy)



Station of W4HYW of Atlanta, Georgia, running 500w. AM-CW-SSB and active on all bands Top to Two Metres. The exciter units on the desk are Hunter 20A, Collins 310B1, Lysco 600S and Johnson Ranger, which between them energise a separate transmitter assembly consisting of a 750w. final RF amplifier for each band. His receivers are HRO-50T and S40A, with an RME DB22A pre-selector and a Selecto-jet. In addition to doublets for all bands, W4HYW has a Mosley Tri-Band TA33 array. A keen DX man, he holds our FBA and WBC Certificates — and we should also add that he is now on RTTY, the T/P operating position not being shown in this photograph.

QRP) were LA9RG/P, RAØAAA, and other Russian prefixes. Phone raised CN2's, IE1SMO, VP2DY, VP4LA, W7PGS (Wyoming), YN1AW and ZD3E.

G5BZ winkled out VU2ANI, with VQ3, ZD2 and VK; G3MCN (Liverpool) also raised VU2ANI, on phone. G3MBL (London, N.12) worked VQ8AV, OQ5RS and CR7EO.

Fifteen Metres

GW3AHN never misses much on this band, so we begin with him! Best catches on phone were EJØJ/MM, KA2NY, UL7FA, VP4LG, VP8DW, VU2ANI/5, YV1DP and 2AM, and 4X4IE (Jerusalem); his CW netted CE1AD, HC1JW, HH2CB, JA's, KL7, KP4, KR6ZT, OA4BP, TI2CMF, UAØ's, ZD1AW and ZD2GUP.

G2VV thinks Fifteen is still the best DX band, despite the commercial "clattertraps." With his 68-ft. indoor aerial he worked EA9AP, LU9DL (1045), VE6, VK and UAØKUV on the Mongolian border. G3NOF (phone) raised CE, EL2B, FF8, HK's, HV1CN, JA's (0815-0900), PY's, TF2WEM, VP5BL, VU2GE, ZL3UY (0025), ZS, 5A and 9G1BA.

G3BHW's phone hit HH2CB, HV1CN, FB8CD and VS5GS; CW scored with AP4M, FB8ZZ, HC1JW, XE1PJ, ZS6IF/8 and ZS7M. G4JA heard YA1BW at 1020 GMT (21060, working DL's), but had to dash away and didn't get him. G3MBL's 20 watts raised EL4L and ZL1AMO, both on a dipole.

G3LZF (Todmorden) heard G9SA calling CQ (!) and adds that the VK's and ZL's in the mornings have been better than ever before. G3DNR, on phone, worked CR7CH, KR6CE, UA9, VK and the like, but HV1CN got away.

G3ABG, CW only, booked in AP4M, UI8AG, VE8MD, VP7NT, VK's, VQ2's and 4's, ZD2GUP and 2JKO. G2BLA, same mode, made it with LA5AD/P (Spitzbergen), VE7, VQ2, 3 and 4, ZD2GUP, ZE5JE and ZL.

G3LHJ was lucky with JT1AB and LA1NG/P on CW, FB8CD, KA2MK, MP4BCI and ZS8O on phone. G6VC filled a gap with MP4TAF (CW), also VQ6NG, who is ex-ZD3G, ST2NG and so on; HC4IE and UD6AM were new for the band.

G3GHE contacted lots of ZL's, VK's and also KA2MK, 2NY and KR6LP. G3MCN raised FB8CD on phone. G5BZ collected VK7KA, VS6CL, XE1PJ and "the usual."

G2DC found the commercial QRM quite trying, but filtered out VU2ANI/5, AP4M, CE's, OA4FN, PY1-9, LU's, VK's, ZL's, VP4LA, XE1PJ and W7FVU/MM near the Carolines. He says VS5DA and 5GS are both active in the mornings, but weak and difficult to work.

Twenty Metres

G2YS worked HC2IU for a new one (0900), but missed YN4AB and ZP4A. G3BHW says the band is really coming back on form, and quotes DU1OR, ETE3CE, MP4TAF, TA2AR, VP2LO, VP4TR and 4WD, VP7NT, VU2ANI, YA1AO, ZS6IF/8, ZS7M, ZM7DA and 7G1A—a beautiful list.

MP4BBW (Awali) has used this band to such effect that he heads the Phone side of the WPX Table with his score of 145

prefixes—14 mc SSB only! Recent new ones, all SSB, were UI8, YI, FP8BP, UR2, VQ2AB, HP9FC/VQ8, PZ, HCCC8 (Galapagos), LA2JE/P and ZK1BS. Not by any means content with this, he hopes to get his beam up during March, *and* to add a linear to his KWM-1.

G3ABG found FR7ZD for a new one; other QSO's were CR4AH, FF8AD, UL7IF, VO2NA and VQ4HT. New for G2BLA were EA8CP, SVØWAC, TF5TP, UL7KBK and ZD2GUP. G3LHJ lists EL4A, SVØWZ, VE8AY and ZL3GU—all CW.

G6VC caught up with UM8KAA at last, and also collected his Zone 19 with UAØKAE. G6QN, recovering from an indisposition, got on the band with his B.2, and raised KL7MF, YV5GO and ZD2JKO. G3JVL, CW only, got in with DU1OR, FQ8HO, FY7YI, HC2IU, HK3TH, OR4KR and ZS6IF/8.

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
G6VC	96	96
G3FNV	94	95
G3JHH	94	94
G2CZU	81	83
G6QN	73	80
G3LHJ	70	74
G3MCY	69	70
G2CZU (Phone)	67	68
G3LEV	64	74
G3FS (Phone)	64	70
G3NFV	61	67
G3LEV (Phone)	60	68
G3MXJ	52	65
G3LNR	52	57
G2AAM	48	53
GW3NAM	44	53
G3NPB	44	51
G3JFF	36	44
G3LZF	26	37
G3NKH (Phone)	26	32
G3NNO	10	30

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

G5BZ's long list includes ZL3VH/3 (Chatham Is.), VK1ATR, KH6's, DU7SV, XE1RY, VKØJM (Princess Elizabeth Is.), VU2ANI, ZS3DP and FR7ZD. G2DC added VU2ANI to his list, also, others being EL4A, DU7SV, HC2IU and 1JW, JA, KH6, UL7 and ZD1AW.

G3IGW worked VK5NQ with his 5-watter; other QSO's were MP4TAF, UG6 and VS9OM. G3LET caught up with VU2ANI, VKØIT (Macquarie) and KG6AIG.

Forty Metres

G3LET has put up a 7 mc ground plane and is amazed at the improvement, especially for reception. In the evenings, at least part of the band is free from hash and BC, with VK's and ZS's almost commonplace. WAC was made one day in two hours from 2000 GMT onwards, and mornings have also been good. Main complaint is the lack of DX activity. Three lists show the following: *0700-0815* — HC4IE, FF8BF, VK2AMB, ZL1, 2 and 3. *1730-2200*—4X4's, LA5AD/P, OD5LX, ST2AR, FA, SV, VK's, ZS's, VQ3CF, 4AQ, 4GQ, 4FK, 4HT, VS1FZ (1830), VP5ME (2200), VP6RG (2115), KP4's, ZB2A, UM8, UJ8. *Nights* — VP7NT, ZD2GUP and 2JKO, VQ3HD. (Yes, it *is* Forty we're talking about.)

G3IGW worked CW with UI8AE, VP4LA and VP9BO; G2DC raised all W districts, VE1, 2, 3 and 4, ZD2's, ZD1AW, PY, LU5AQ, UAØAZ, ZC4 and 4X4.

G3JHH (Hounslow), along with others, mentions "PK4LB" on the band; alas, he was S9 at midday and an obvious phoney. G8DI (Liverpool) worked UM8ADF, ZD2JKO and 2GUP, and ZL2OP —all CW. G2BLA raised VE1 and 2, VO, W's, ZB1's and ZC4's. G3ABG added OD5LX for a new one.

G3DNR boosted his score with UA6, YU and a W1; he adds that W2BOO, with 1 kW, was only one S-point up on his own report (100 watts and a dipole 10 feet off the deck!) G3MXJ worked W2AIS/MM (off VP7); heard, but not worked—JA2XW (2250), FA, UL7, VK's and ZL's.

G3BHW gave the band a whirl and raised EA8CU, UJ8, UO5, UM8KAB, 4X4LQ and ZC4GF.

Eighty Metres

Not much of note here, but quite a few do at least mention the band, so here goes: G4JA worked W1, W4, VE1 and UA9. Queer ones (rather suspect) were PK4LB (see Forty!) and ZA5CM.

G3DNR collected LA9HC for a new one; G2BLA mentions UB5, LZ2KBA and ZC4GF; G8DI worked OY1R and VO1DX; G6VC added UC2AA.

G3JVL raised ZB1 and ZC4; G2DC worked PY1ADA, W1, 2, 3, 4, 8 and 9, VE1, 2 and 3, VO and VP7NT; G3LET made it with VP7NT (0500), also ZC4IP, ZB1FA and 5A2CV. G3LNR (Nottingham) reports that OY7ML has now come up on 80m, SSB, "causing pile-ups."

Top Band DX

Things have been good on the other side of the Atlantic, but not many cross-pond contacts have materialised. However, W1PPN did work G3PU on January 10 and 24. ZL3RB had a very brief one with W5SOT on December 27. DL1FF was heard calling W1PPN on January 10, and on the same morning W1BB heard W6KIP working W9OJH.

WØNWX hopes to be up on Top Band from FP8 during the second leg of the ARRL DX Contest, which will also be the week-end of the *CQ* 160-metre Contest. Now an FP8 should be possible from the U.K. . . .

First returns for the scheduled test on January 17 show that DL1FF worked W1BB, W2EQS and W2GGL; DJ1BZ was also heard over there; and OK3EE was logged by W1PPN. But not a trace of a G signal!

On January 15, W6KIP worked HC4IE—a very nice one. To offset this, the "YS4RA" previously reported has turned out to be a pirate. Thanks to W1BB and his fine bulletins for much of the above information.

Top Band Topics

GW3NAM (Barry), already well known on the band, joins the Ladder with 44/53; he heard W2EQS on January 24, also

DL1FF working W's with ease; outstanding G's heard in Barry are G3ERN, G3MYI, G3LYW and G2CDN.

G3MXJ put his score up to 52/65 with GC2FMV, GM3UM (Midlothian), GM3BSQ (Aberdeen) and GM3NPM (Ayr). G6QN has found conditions good, and has worked GM3AWF and GI3LFH frequently; he also caught up on Shropshire, thanks to G6US — a very senior Old Timer, back in circulation again.

G3NNO (Leeds) collected a whole bunch of OK's (he's now worked 11 of them), as well as HB9T, DJ2KS and DL1LB; on February 7 he heard W2TR at about 0630.

G2CZU (Bath) works the band on Saturday nights and Sunday mornings, but finds most contacts are renewals of old ones; he recently had his fifth with EI8J, and also raised GC3HFE, GD3LXT and several GW's.

Top Band Contest

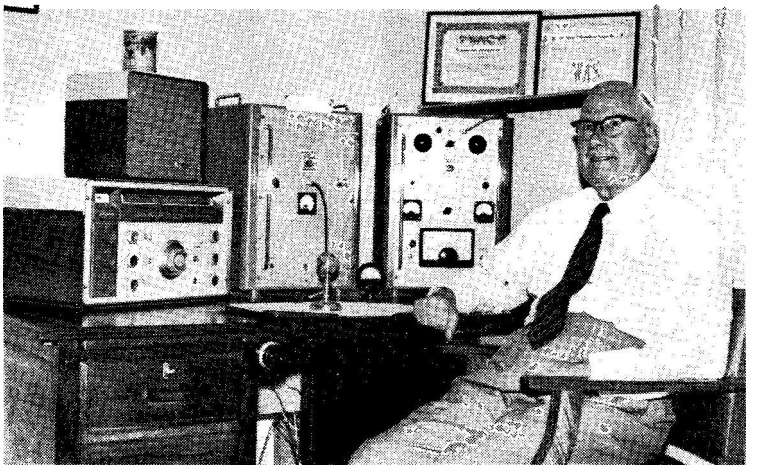
Grafton's Annual Top Band Contest will be held on March 26 (CW) and April 2 (Phone), between 2230 and 0100 GMT. But in addition to their "G2AAN Cup Contest" for members, they are also holding an Open Section for all U.K. amateurs.

Scoring, one point per contact, final score being the sum of the scores in the CW and Phone sections (that'll fox some of the key-punchers!). Exchange RST (or RS on phone) plus serial number starting at 001. Logs to G2CJN, 145 Uxendon Hill, Wembley Park, Middx., not later than April 13, with the usual signed declaration. Certificates awarded to first, second and third high scorers.

WPX MARATHON

Starting January 1, 1960

CW Only		Phone Only	
G6VC	201	MP4BBW (*SSB*)	145
G8DI	127	UF2BU	80
G3LZF	117	G3LHJ	59
G3JVL	114	GM3NQB	55
VU2XG	94	G3MCN	53
UR2BU	79	GM2DBX	51
G3LHJ	63	G2FQW	36
G2BLA	47	G3JSN	28
G4JA	41	G3DNR	23
G3WP	39	G4JA	22
GM3LYI	36	G2FQR	8
G3MGL	36	G3MGL	4
VO2NA	32		
G3DNR	28		
G3GMK	28		
G3BHJ	18		
G2BP	12		



ZE2JA, of Borrowdale, Southern Rhodesia is a well-known 10-metre operator, and has run a successful schedule with G2PX for more than two years. The transmitter consists of a Labgear LG.300 with associated modulator and power supply unit, and the receiver, at left in this photograph, is a National NC-300.

Shorts

G2VV writes: "To one DX call on Fifteen I've had no less than six EU stations replying. If there had been any DX I just wouldn't have heard it. Sometimes in the middle of a DX QSO an S9 EU clot comes up on the frequency and calls me." G2VV compares this brand of Clottery with bad driving on the roads, and says all these types remind him of road-hogs.

G3MVB (Sheffield) reports that QSL's for VP2DX should go *via* W8VDJ; G3JAF (Lymington) passes the QTH of VP8CC, for whom he is "QSL manager"; it is Colin Johnson, Halley Bay, Coats Land, Antarctica.

SWL S. H. Stephenson (Morden) heard 5LWP/MM, a station about whom there have been sundry queries, telling stations *he* worked to QSL *via* CX2BT, Box 37, Montevideo.

GM2DBX (Methil) makes a welcome reappearance and joins the WPX Marathon list; Jimmy is not very active, but the WPX idea has fetched him back, and he says his XYL is all in favour of it and says it's the best thing that could have happened to him!

G3IGW says we don't pay enough attention to QSL's (in view of the monthly heading to this Commentary) and suggests that we should list some of the moderately rare DX stations who *do* QSL in the normal manner. He starts off with a list comprising EA9IA, FQ8AT, HE9LAA, HI8CM, HP1AC, MP4QAO, OX3RH, UI8KBA, VP3HAG, 3MC, 7BT, 8DS, VS9MB, XZ2TH, YA1IW, ZD1FG, ZS8I, ZS3OW, 4S7FJ, 9K2AD and 2AP, 9M2DW. All these came *via* the Bureau — no direct QSL-plus-IRC's, just the straight procedure.

DX-peditions

Members of Cambridge University Wireless Society are planning a trip to the Isle of Man during the Easter vacation. They hope to operate from March 29 until April 7 on all bands, Ten to Eighty. Calls involved will be GD3LAS, GD3MBR, GD3MIK and GD6UW — both phone and CW.

For Top-Banders short of Cambridge (county), G3LAS will try to operate from Ely, March 12-28 and April 7-10, 2300-2359 GMT, mostly CW.

[over

The Wirral boys, signing GW3NWR/P, will be in Radnorshire on April 22 and in Breconshire on April 23, working Top Band (and two metres), using a balloon-borne aerial. This is a Club expedition and they hope to give a number of contacts for these rare counties.

News from Overseas

VS9AE (Little Aden) now runs a Quad and is active on Ten and Fifteen phone; he says he is hearing G's very well these days . . . VK4JS (Brisbane) is ex-G3EDJ of Harrogate; he has just got his call, and will be there about two years, looking especially for U.K. contacts.

UR2BU (Tartu) pushes up his Five-Band score and also enters the WPX Marathon; he needs only one Antarctic country for the rare PRA Award, of which we have only been able to issue five since it was instituted in September, 1957.

Peter Windle of VU2XG has started off with the DX. Licensed for two months, he has had 350 contacts in 75 countries, and joins our WPX Marathon ladder; he says he doesn't have much time on the air, but does his best to get on when conditions are right. At mid-day out there, things are good for North and South America; G's are harder to come by, but he has worked his father (G8VG) three times. VU2XG runs CW only, and mostly on 14 mc.

From the *Malayan Radio Amateur* we pass on the following: VS1JV is on 21 and 14 mc . . . VS1KB will be on shortly with a home-brewed rig . . . VS1FZ and 1JP are both very active . . . 9M2DB has a Tri-Band beam on a 40-ft. steel tower and works 14 mc SSB and 21 mc AM . . . 9M2DW is on 21 mc AM, and also in a 7 mc net with 9M2DX, 2CL, 2FR, 2FL, 2FX and others — 0030-0130 GMT, if you are there to listen then.

VS1CN and 9M2DQ appear to be 3·5 mc addicts, but the latter uses 50 mc as well! We also gather (same source) that there are 141 active members of the VU Radio Society, and that in that country (India) their maximum power for SSB has been increased from 25 watts PEP to 100 watts.

VO2NA (Goose Bay) remarks that he has "not made a very good start for the New Year," but moves up in the Five-Band and has a good total for the WPX affair, nevertheless.

Piracy

G3NQS (London, E.11) hasn't been on very long, but already someone has stolen his call and is using it on Ten and Eighty—bands not used by the legal owner. One "John," of Manchester, appears to be responsible.

G3HKX (Bexleyheath) is another victim. He has not worked Forty since February, 1958, has never worked Twenty at all, and his last QSO on Eighty was a year ago. So he suggests that "Derek" or "Eddie," using his call, should drop him an s.a.e. for their QSL cards.

DX Gossip

We don't all realise the hazards of DX-peditions. It seems that the proposed trip to Malpelo Island has been put off until March 25; the reason—that the island is overrun with *coral snakes!* Whether they are expected to evict themselves before quarter-day is not quite clear . . .

JA1ACB's projected trip to Marcus Island has also been postponed—until either April or July . . . ZD2AMS is due to start up from FD8-land, probably as FD8AMS, but he, too, has been delayed; he will be on 14040, 21040 and 28040 CW; 14140, 21240 and 28440 Phone.

KS4AZ was due to be active from February 16-23; we received the news just too late for inclusion in the last issue.

VU2ANI/5 packed up on January 29, after working 125 countries . . . FB8ZZ is on *Fifteen* CW around 1400; HV1CN on phone, same band, Sunday mornings; HKØAI on *Ten*, phone or CW, Sunday afternoons.

The OA4GM DX-pedition to the Galapagos duly took place, with the strange call HCCC8; this went down well, and SSB, AM and CW were used on the three HF bands.

HE9LAA, now on 28 mc phone, is the only active station there . . . VS5BY is expected back on the air by the beginning of March . . . Apparently, the recent HV expedition by I1ADW was not from the Vatican City at all; the ARRL say they have admission of this fact, and are now checking the earlier M1 expedition also! (What a nuisance this sort of thing is.)

VP2DX plans operation from Dominica for two months or so, and will also try to get on from Antigua, Montserrat, Anguilla and the British Virgin Is. . . . ZD3E, who is leaving Gambia in March, says ZD3S is a phoney.

XW8AI/FG7 is a fine-sounding call, but *quite genuine!* ZS5RD is shortly becoming resident in Swaziland. W5PQA, recently on from ZM7DA, is expected to show up from East Pakistan (AP) in a month or so.

W6AM, thanks to 9N1GW, has bumped both his CW and Phone totals up by one, now standing at 297 and 281! He is working on the ARRL to get the Nicobar and Andaman Islands recognised as separate entities, because they are 400 miles apart and there are sundry administrative factors which seem to make it logical. (Yes, he *has* worked both!)

ZL3VH/3, Chatham Island, was not a resident, and has left again by now; if you snapped him up you were one of the lucky ones . . . W1CJ/3 hopes to be set up shortly as 9N1CJ, from Khatmandu . . . AC4AX, who not only has a BC-610 but also the Instruction Book, awaits permission to go on the air.

From the SWL's

Some very interesting DX snippets from our SWL readers include the following: Peter Day (Sheffield) reports that 9N1CJ is already active (heard on 14310 kc SSB) . . . VK2KD on 7012 kc CW, week-ends . . . ZK1BS on 7100 kc phone (0940 GMT) . . . VP2AR and 3IG both on 7 mc phone and audible in Europe . . . VR6TC on 14 mc phone, mornings . . . VR5AC has been heard by DL's on 21040 kc CW . . . YA1BY is ex-DL6OF, and active . . . VQ8BBB, St. Brandon Island, on 14 mc CW at 1700

hours, our time.

Peter Day comments on the excellent DX on 40 metres, on which band he has logged exotic stuff like VQ2CZ, VS1EA, VQ4's, VK's, VP9BO, VP7CC, LA4CG/P, I5AIR and many more. Round about the week-end January 16-17 he says band conditions were *fantastically* good; on Eighty he heard W1BU on SSB in full daylight (0830 GMT) and also logged VP4LR (0735), KP4ADS and WØYKT.

Charles Rafarel (Poole) writes to say that FF7AB is in Mauritania, French West Africa, which is not in FF8 territory, but north of Dakar. (There are sundry autonomous states in these regions, but the Powers have never yet recognised them as separate "countries.")

M. J. Edwards (Oxford) says that YN4AB started up recently on 14 mc CW and has been heard frequently; his QSL manager is K4ASU. SWL Edwards adds that 4X4IC, on CW, was heard giving his QTH as "The School of Agricutur in Kfaryarok" — name Shlomo—which doesn't correspond with the *Call Book!* Also that AP4M says he will be on 14 mc CW most evenings, around 2330 GMT.

Just as a further inducement to go SSB . . . here are a few of the DX stations known to be using (or to have used) that mode during the past month or so: ZM7DA, ZM6AP/7, PZ1AX, VU2ANI, 9N1GW, LA3SG/P, OK7HZ/YI, HZ1AB, MP4DAA, 9K2AZ, HCCC8, ZK1BS, VS4JT, HP9FC/VQ8, VP6BY and VQ5FS. Makes you think, doesn't it?

Top People

Heading the current DXCC Honour Roll are W6AM and ZL2GX, both credited with 296; on the 295 mark are W1FH, W8HGW and W3GHD; highest U.K. scorer is G3AAM with 292; G2PL figures in the list with 291, and G4CP is the only other G, with 286. (Remember that all these figures are for *confirmed* contacts.) Leading the Phone list, as always, is PY2CK with 293; second, VQ4ERR with 287. No G—in fact, no European—appears in the phone section.

Turning to our own Ladders, we find G3FXB still perched at the top of the Five-Band Table, with G2DC and G5BZ in hot pursuit. But the third scorer (G5BZ) has the highest country total of the three, with 278.

The WPX Marathon shows G6VC well away with his fine total of 201; he will take some catching. But the sensation is, of course, MP4BBW, who completely dominates the Phone-Only column, despite the fact that his figure is for 14 mc *SSB only*. Maybe some of the laggards will be able to put in time this month and give the leaders a run for their money.

Appeals

GW3ITD/MM, of H.M.S. *Puma*, now in South African waters, asks us to explain that he is not a pirate, but is properly licensed for "working from the dockside"; accordingly, he hopes his calls will not in future be ignored by those who have been suspecting him of sailing under the Jolly Roger—in fact, *Puma* flies the White Ensign.

An appeal of a different sort from VQ3HG, who has suffered the havoc of a disastrous fire, in which he lost all his records for the period 12 Dec., 59, to 8 Jan., 60; as VQ3HG prides himself on being a genuine 100% QSL'er, he asks that those who want a card from him should QSL again for any contacts made between the dates mentioned.

So that's it for another month. Thanks, as always, to all our correspondents; to the West Gulf *DX Club Bulletins*; to W6YY and W1BB; and to many others who, hearing or working something worth noting, take the trouble to send in short snippets which help us to keep up-to-date month by month. The deadline is upon us, even as you read this, for the calendar forces the early date of **Friday, March 11,** for the April issue. First post, please, and address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. For overseas readers, who necessarily see this long after U.K. correspondents have forgotten it, the due date for the **May** issue is *April 14*, just before Bank Holiday. So get your airmails in to beat that.

W2EQS, Westwood, N.J. is a very well-known Top Band man who has worked 26 countries in five continents. He is often heard over here, with an outstanding signal.
Photograph W1BB

We look forward to meeting you again next month. Until then, Good Hunting and 73.

Late Flash News: G5JU reports that the morning of Sunday, February 21, was particularly good for the Top Band Trans-Atlantic tests. He heard nine DX stations and raised VE1ZZ and W1PPN. G3PU worked five stations. QRM was very troublesome, due in part to the clottish behaviour of three certain G's who did not work anything but effectively masked W2TR and others. An OK contest was also taking place. DX heard by G5JU included VE1HJ, VP5FP, W1BB and W2EQS.

From G3CQE we get it that *Yasme III* is to be fitted for RTTY, as it is expected that there will be plenty of worth-while T/P contacts to be made. This information has been confirmed by KV4AA through VE7KX, and G3CQE has had verification by T/P from the latter.

SWL • • • • • •

DISCUSSING TWO RECEIVERS — READERS' IDEAS AND SUGGESTIONS — RECEIVING TECHNIQUE — MORE STATION DETAILS — 20 YEARS AN SWL

TWO POPULAR RECEIVERS

ASSEMBLE half-a-dozen short-wave listeners, at a Club meeting or any kind of get-together, and you are pretty sure to find an R.109 and an R.208 among their gear. Many of those who own more specialised and more modern receivers also have one or other of these sets as stand-by. The two, between them, cover the very useful range of 1·8 to 60 mc, with only a small gap between 8·5 and 10 mc, which is not particularly interesting, anyway.

The block diagrams of the two receivers are shown, reduced to the simplest possible form. Both are perfectly "straight" in conception, the main difference being that the R.109 has separate valves for the local oscillator and the BFO, whereas the R.208 uses triode-hexodes (6K8G's) to combine the mixer and local oscillator, and then also the second IF and the BFO.

Let us deal first with the R.109. Its coverage is 1·8 to 8·5 mc, in two bands with a break at 3·9 mc, and in unmodified form it is designed for use with a 6-volt battery, from which HT is obtained by a vibrator-rectifier unit. The LT supply to each of the directly-heated valves passes through a dropping resistor.

Many users have removed the vibrator-rectifier unit and these dropping resistors, so that the set can be fed with a 2-volt LT battery and a separate HT supply, either from about 150 volts of batteries or from a simple mains unit.

Others have altered the valve line-up completely so that 6-volt indirectly-heated valves may be used on an AC supply; it is merely a matter of individual convenience. One of the advantages of leaving things more or less alone is that only two types of valve (AR8 and ARP12) are needed.

The input terminals are marked "80 ohms" and "500 ohms"; the former was intended for use with vertical quarter-wave aerials, but is suitable for dipoles, although the input is, of course, unbalanced. Probably the best way of using the R.109 is in conjunction with a separate ATU, taking the link coupling from the 80-ohm receiver terminal.

"Official Mods."

Various modifications to the original R.109 were made available while it was still in service. The R.109A uses a 6-volt indirectly-heated pentode (ARP36) in the RF stage; the R.109B has been similarly treated, but also the frequency coverage has been altered, and now reads as 2·5 - 12 mc, with a break at 5·5 mc. The R.109C is intended for CW reception and has had the AVC removed.

We shall be coming back to the R.109, but meanwhile a few general remarks on the R.208:

This has three wave-bands—10-20 mc, 20-40 mc and 40-60 mc. Unlike the R.109, which has the conventional IF of 465 kc, the R.208 uses a frequency of 2 mc, the oscillator being tuned 2 mc *higher* than the signal frequency.

Power may be supplied either by AC (100-250 volts) or from a 6-volt battery; in the latter case a vibrator-rectifier unit takes over; in the former a conventional full-wave metal rectifier circuit is used.

The input is marked "80-100 ohms" and is therefore suitable for a dipole. But again it is strongly recommended that an ATU be used to give full coverage over the range, the coupling to the receiver being of the normal co-ax type to the input terminal.

Unlike the R.109, this receiver has a built-in speaker; headphone jacks are provided, one of which mutes the speaker when the phone plug is inserted.

Combined Operations

Many SWL's who are fortunate enough to own both receivers have found that they work well in combination, making a versatile double-superhet, and giving pretty efficient reception from 10 mc upwards.

All that has to be done is this: use the R.208 in the normal way, up as far as the output from the first IF stage; capacity-couple this, through a shielded wire, to the input terminal of the R.109, which must, of course, be tuned to 2 mc. The front half of the R.208 may now be regarded as a converter working into the R.109.

However, as many users prefer the audio end of the R.208 to that of the other receiver, it is also possible to dispense with the second audio stage of the R.109, and to couple back from the first audio stage to the detector output of the R.208.

Under these circumstances, practically all the operating control is done from the R.208, although the RF control of the R.109, moving around in the vicinity of 2 mc, can be used as a fine-tuning control and also for selectivity adjustment.

Once this combination has been tried, and the general feeling of a double-superhet sampled for the

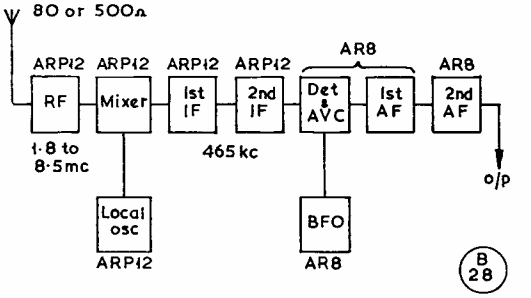
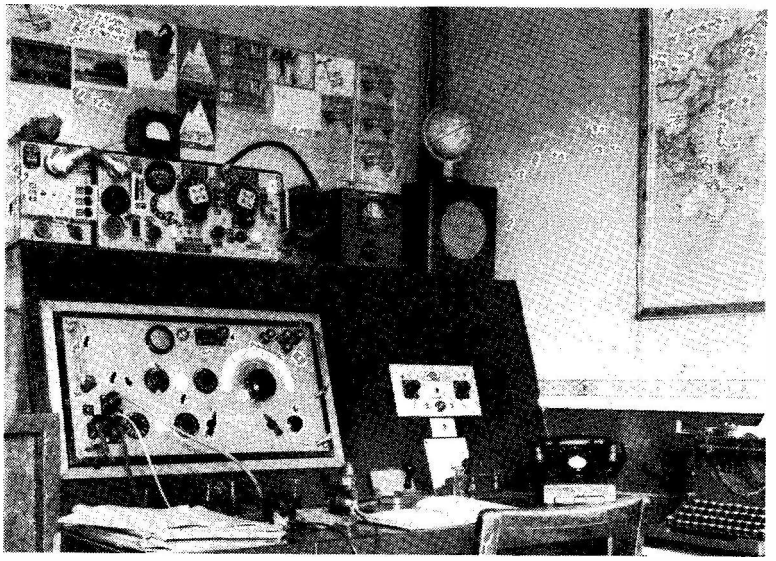


Fig. 1. Block schematic of the popular R.109 ex-Govt. receiver, known to many SWL's. It will be noticed that only two valve types are used throughout the receiver; the AR8 is a CV1306 or HL23DD, and the ARP12 is a CV1331 or VP23, both these valves being standard Mazda replacement types. In the R.109A, an ARP36 is used, the commercial equivalent of which is the modified SP41, or CV1065.



An SWL station organised for the job of serious short-wave listening is owned by F. K. Brooks of 14 First Close, East Molesey, Surrey. The main receiver is an R.107, with a 19 Set transceiver, and his aerial is a 140 ft. wire connected through an aerial matching unit. SWL Brooks is employed by the Post Office, but his G.P.O. job is connected more with QSL cards than with telecommunications!

first time, either receiver on its own tends to seem a little "insipid" and lacking in punch. Users of the two together find that the selectivity and sensitivity available are not far short of the standards expected from a good modern communications receiver, and the controls give sufficient mechanical bandspread for reasonably easy operation.

Readers who have evolved other worth-while modifications to ex-Government surplus receivers are asked to send in particulars, as they will almost certainly be of interest to someone, somewhere, who is using the same gear.

READERS' FORUM

An unusually interesting selection of letters seems to cover most subjects of concern to the SWL, and, as usual, we quote from them—sometimes at length and sometimes in the briefest possible form. From all the letters received details have been extracted of the receiver and aerials in use, which appear in tabulated form on p.34. Note that we are no longer taking note of the number of countries received and verified, since many listeners consider this irrelevant—and, in any case, many of them do not mention the matter.

J. M. Nisbet (South Croydon) says that he has pushed up his QSL return quite nicely by sending rather fuller reports than before. Details he gives include: Summary of band conditions, with details of skip and which paths appear to be open; Weather, including pressure and temperature; Details of the "home-town"; and the call-signs of local amateurs. J.M.N. is now active on Two, thanks to the gift of an R.1392. He wants to see some articles on power supplies, as some of those he has seen in shacks are "frightening." We agree! It shall be done.

David Rees-Jones (Liverpool) comes on the roll as another Mobile SWL. His first experiments were with an 18 Set, but latterly, and with much more success, using an R.109, modified to cover Top Band and fitting in the parcel rack of an Austin A.95. More recently still, he has turned to a Minimitter Converter working into a "Command" Receiver, with an ex-Govt. 8-ft. whip on a flexible "tank-type" mounting, co-ax fed.

N. R. May (Dunster) is a 15-year-old SWL who also looks forward to going mobile, and intends to pin his faith to a transistor job for that purpose. On his last mobile effort he logged VE6AIE/SU — a portable in Egypt. A comment on the Russian novice stations . . . N.R.M. says that at least 75 per cent of those he has logged on Ten have been perfectly readable, two of the best being RA6ABI and RAfKKM.

R. Lester (London, N.6) uses a 0-V-0 battery set and QSL's amateurs and BC stations alike, using a neat form giving all the necessary information. *R. C. Barnett (Nottingham)* says he was a SW broadcaster listener who "logged all the funny call-signs he heard" for some six months before he found out what Amateur Radio was all about . . . and then he found that G3LAQ lived only a few doors away! He would be interested to know how other SWL's started their interest in the amateur bands.

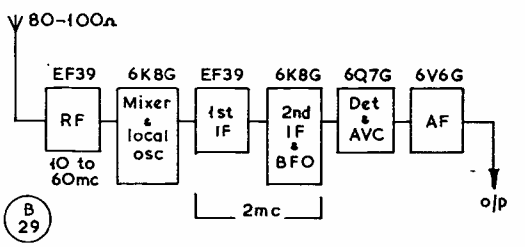


Fig. 2. The R.208 is another well-known general-coverage short wave receiver, of which large numbers have been sold as "surplus." The R.208 is of particular interest because it is completely self-contained and tunes right up to 60 mc (five metres). The text suggests a way in which the R.109 and R.208 can be used together.

Note from Canada

Fred Pheasey (Port Edward, B.C.) says he sticks mostly to BC reception, and derives much satisfaction from establishing friendly relations with the engineers of foreign transmitters. Many of those who operate on several frequencies at once welcome reliable monitoring, and some of them even ask in advance for checks on test frequencies being considered for

future use. F.P., by the way, has a Racal receiver.

Bob Griffiths (Ventnor) uses a 0-V-0 for portable work in the nice weather; at other times he has an S.640 which he can feed into a three-valve amplifier and a tape recorder. He exchanges tapes with six British SWL's and one from the USA, but his main interests are "general DX, 40-metre phone DX and aerial design." He tells us that the garden looks like a telephone-pole store yard already!

Another Veteran

Walter Taylor (Blackpool) is 68 years of age, and first became interested in radio after his demob. in 1919. The method of progression was roughly thus: Crystal set, amplifier; one, two and three-valve battery sets; mains jobs; ST-100 to ST-600 . . . and so on up to about 1935. In that year he bought a commercial receiver and gave "the lot" to a schoolboy, who is still at it!

Three years back, the bug bit again, and last year, after an unfortunate illness, a friend came up with a chassis and spare valves. This was got into working order, and now W.T. says he has more friends than he ever had in his life (although he's never met most of them) and he wishes he had never given up the hobby. We hope he has many happy years of it still to come.

Six Metres

R. A. Atkinson (Southampton) says he would like some details of the 5-metre band—its characteristics and when to listen, and so forth. These days it is, of course, the *six*-metre band; some countries are licensed for 50-54 mc. But, alas, in the U.K. this is just TV Band I. With a suitable converter, one can make a fairly good tour of European sound and

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continued

vision, but the chances of hearing the U.S.A. or the African countries allowed to use the band are extremely slender. The Rhodesian stations have been working into Cyprus and Malta on this band by means of what is known as "Trans-Equatorial Scatter" — but as a listening band in this country (from the amateur point of view) it "gives" but rarely—*see* p.40 this issue.

Home-Brewed

J. G. Davies (Flixton) was disappointed to see, in our last instalment, how few people used home-built gear. He, himself, builds *the lot*, which includes receivers, power packs, test meter, amplifier and pre-selector. He plans to get down to a 10-valve superhet incorporating "all the usual refinements."

M. Box (Weymouth) is active with a portable on Top Band, using a converted 18 Set; and is also moving on to Two Metres with a converted RF-26 using EC54, EF54, EF50, having an IF output on 7·5 mc, working into a CR-100.

Modified RF-24

J. E. Fry (Alton) runs an RF-24 with what he describes as worthwhile mods. They are as follows: The use of a 25-150 $\mu\mu$F ceramic variable, across the oscillator coil; a slow-motion drive on the condenser spindle; and co-ax cable for the output. The five-way switch is used for selecting the Ten and Fifteen-metre bands, positions 1, 2 and 3 being spread over Fifteen and positions 4 and 5 over Ten. He uses this unit with an R.1155N which is tuned to a quiet spot

SWL STATION DETAILS

QTH	RECEIVER(s)	AERIAL (s)	OTHER EQUIPMENT
Thomas O. Austin (Wigan, Lancs.)	R.110	Indoor dipole	
David A. Rees-Jones (Liverpool)	358X* Minimitter Converter	80-ft.	ATU
	Mobile (using converter)	8-ft. Whip	ATU
Nigel May (Dunster)	R.208 O-V-O	37-ft. wire, 28 mc dipole	
V. E. Batchelor (Sutton, Surrey)	R.208	66-ft. wire, Indoor wire	
John Marshall (Gomersal, Yorks.)	HRO, P.104 (144 mc), RF-24, RF-27, 78 Set, Eddystone 5-10 converter	66-ft. Windom, 22-ft. wire, 28 and 144 mc dipoles	
Ron D. Young (Chelmsford)	AR88D	75-ft. wire Vertical Whip Indoor Beam	Tape recorders F-M tuner 10-watt amplifier
R. Lester (London, N.6)	O-V-O battery	40-ft. wire	
Bob Griffiths (Ventnor, I.o.W.)	S.640* O-V-O	100-ft. wire 200-ft. wire "Vee," 35-ft	
P. Edwards (Hull)	AR88	28 mc dipole	
J. E. Fry (Alton)	R.1155, R.209, R.109A, R.1132, BC-1000, 46 Set, R.114 mod.	Indoor Vee, 27-ft. wire, Loaded Whip 56 mc and 144 mc dipoles	
R. C. Barnett (West Bridgford)	358X*, R.107	Dipoles and 12-ft. Whip	
R. A. Atkinson (Southampton)	R.107, RF-24, RF-26	14 mc dipole	
J. G. Davies (Flixton)	Six-valve super, two 1-V-2's, O-V-2, 1-V-1	132-ft., 33-ft., 14 mc dipole	6AK5 Pre-selector
Paul Bullivant (Edgbaston, B'ham)	CR-100/4	12-ft. Whip 2/long wires	ATU
Dave Quigley (Cowes, I.o.W.)	American Naval Scott SLR-F, 19 Set	50-ft. wire	ATU

* Eddystone Receiver Types

Note: This list is additional to that published on pp. 484-485 of the January issue. Further such lists will appear later in the year.

between 6·3 and 7 mc.

As his query about the Russian novice call-signs and where they emanate from is of general interest, we give the answer in full herewith:—

RA1, 2, 3, 4, 6	:	European Russia
RA9, Ø	:	Asiatic Russia
RB5	:	Ukraine
RC2	:	White Russia
RD6	:	Azerbaijan
RF6	:	Georgia
RG6	:	Armenia
RH8	:	Turkoman
RI8	:	Uzbek
RJ8	:	Tadzhik
RL7	:	Kazakh
RM8	:	Kirghiz
RN1	:	Karelo-Finnish Republic
RO5	:	Moldavia
RP2	:	Lithuania
RQ2	:	Latvia
RR2	:	Estonia

Substitute "U" for the first letter "R" of the prefix and you have the normal Russian amateur call-sign allocation—and any good atlas will show you where these areas are.

J. E. Paterson (Hatch End)—from whom a short contribution appears in this instalment—reports that he recently received a QSL from ZS6CR who, in his remarks, mentioned that he recognised his "call-sign" (G-L018) from the story and photograph of IIIT which appeared on p. 364 of the November 1959 issue of SHORT WAVE MAGAZINE.

RECEIVING TECHNIQUE

We repeatedly discover for ourselves that many listeners (and even some transmitting amateurs) possess good gear without having the faintest idea how to make the best use of it. A good example is the reception of CW. Someone recently sent us a tape recording of the Top Band tests, as heard on the American East Coast. On it were dozens of strong CW signals, but it was all we could do to read them from the tape.

It was obvious that the receiver had been operated with almost full RF gain on, giving a terrific background noise to start with. Under these conditions the BFO was not nearly powerful enough to produce a clean beat with the stations, so the CW showed up as an anæmic kind of thin piping sound, breaking into and partially suppressing that terrible background roar.

If the operator had merely turned the RF gain well back and advanced the audio gain by a corresponding amount (and, obviously, switched off the AVC) we should have had clear, musical notes from the CW stations, with little background noise.

If you are not satisfied with your receiver's performance on CW, try this test for yourself: Tune in any CW station you like, on any band. Listen to it awhile, and then slowly back off the RF gain until it has become practically inaudible. Bring up the audio gain until you can hear it clearly; and then back off the RF gain some more. Continue this process until you are using practically full audio gain, and note where your RF gain setting now lies. You will probably find that for all future CW reception you will keep the audio gain control almost full out, and do all your volume controlling with the RF control.

The same applies to SSB. Ninety per cent of the listeners who complain that they can't resolve SSB are trying to do it with too much RF gain and insufficient BFO injection. Switch off the AVC, advance the audio gain and turn the RF gain back until the signal is at a comfortable level. Leaving the BFO in the same position that you would normally use for listening to CW, tune up and down the "monkey-chatter" very carefully with the normal tuning control, until you find a place (very sharp) where it makes sense. If there isn't such a place, rotate the BFO pitch control through zero-beat until it settles at the same pitch on the other side. Then have another go—it's bound to work on one side or the other.

The only time when it really pays to use full RF gain and AVC is when you are tuned to a phone net comprising stations of all strengths varying from a "local-signal wallop" to much weaker signals. Then, for your own comfort, the AVC should really be allowed to work; and if it does work properly you should have all stations in the net delivering roughly the same amount of audio to your loud-speaker, some with more background noise than others, according to their relative carrier levels.

This method of reception is also essential if you want to give accurate S-meter readings, especially on a noisy band. For all general use of the receiver, however, you will need, if you wish to get the best out of it, to find that correct balance between RF gain and audio gain which gives the best signal-noise ratio.

On every occasion on which we have heard a particular type of receiver condemned as "too noisy," we have found that it has habitually been used with the RF taps full on. One listener we know even managed to acquire a bargain in this way: the owner was convinced that it was faulty, and sold it for well below its proper figure! The new owner simply used his common sense and found that he had acquired a much better receiver than his former one, with which he had anyway been quite satisfied.

"'59 IN RETROSPECT"

By J. E. Paterson, G-L018

With the birth of a New Year, it is as good a time as any to mirror the activity of 1959. A glance at the logs of last year, containing their remarks and statistics, can do us no harm and they are indeed quite revealing.

For G-L018 such a review is all the more interesting because the 31st December 1959 was the culmination of the first complete year of renewed activity after an absence of twenty years from the Amateur Bands. To recap: in 1936/1937 the QTH was Southport, Lancs., and the change-over to the present QTH was made in 1938; from the commencement of the second World War until November 1958 the amateur bands were not tuned. G-L018's only

S W L • • • • • •

continued

activity on the air was from the transmitters of A.E.S. Tunis, A.E.S. Naples, A.A.F.S. Florence, and A.B.S. Milan.

From November 1958 until the close of that year experiments were carried out with a new receiver and an aerial or two, but satisfaction was not attained until a second model of the Philco 3741 type had been installed. In consequence, the first log was not opened until January 1st, 1959.

In the year that has passed the results have been satisfying, with 115 Countries in 33 Zones heard and 75 Countries in 27 Zones confirmed. 500 QSL reports were dispatched from G-L018 in 1959, 50% direct and 50% *via* the Bureau. To date 170 QSL's have been received in return on approximately the same percentage basis as those sent out. A sample of the cards received in January 1960 shows that QSL's are still coming in steadily for reports mailed in the first half of 1959 (3 out of 12 were for the months of January and February); on this basis it seems safe to assume that, as the months go by, the net return will be well over the 50% mark for 1959. It is particularly interesting to record that out of 15 reports sent to British amateurs during the period under review only one failed to QSL!

G-L018 was still in possession of his QSL's for the 1936/1938 activity, and his goal for 1959 was to log and confirm any one of the stations that had been good enough to send cards for that period twenty years before. This proved an exciting diversion and it was achieved on 7th October 1959 when VP6FO was logged. The previous occasion was in January 1939, 20 years earlier. VP6FO's second QSL was received in November 1959 and his comments to G-L018 included:—

"— at least I have one witness that I do QSL. Twenty years is a long time and lots have happened since but I still enjoy Amateur Radio. I do visit England quite often—I shall be over again in 1961 and may have the pleasure of meeting you as well."

So you see it can be fun, great fun, and good hunting to you all in 1960.

BOOK FOR SWL's

Those wanting a useful practical manual on short-wave receivers and reception will find *Short Wave Receivers for the Beginner* well worth consideration—particularly as it only costs 6s. 6d., post free.

Starting with an introduction to SWL activity in general, including propagation, aerial and earth installation, the short-wave broadcast bands, the amateur bands, QSL cards and reporting, the book goes on to describe in detail the construction of several simple short-wave receivers.

These constructional designs are clear and well illustrated, and all the parts required are readily available—for instance, our advertisers Home Radio of Mitcham can supply everything for all the receivers described in the book. Being of the 0-V-0 and 0-V-1 variety, with suitable power supplies, these receivers can be confidently recommended to those beginners eager to build something with which they can be sure of getting results.

Short Wave Receivers for the Beginner, 70 pp., well illustrated, No. 14 in "Data Book" series, price 6s. 6d. post free from Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

GRAFTON TOP BAND CONTEST

Grafton (North London) is one of the strongest and best organised Amateur Radio clubs in the country, with a large membership. In previous years, they have held various private contests for their own members. This year, they offer a Top Band event open to all U.K. amateurs, details of which are given on p.29 of this issue.

THE "DEPENDAPAC" TRANSISTORISED DC CONVERSION UNIT

Earlier types of transistor power supply—mainly those of foreign manufacture—suffered from a variety of faults inherent in the design, *viz.* poor starting under load, low efficiency (particularly in the "half-power" position), inadequate filtering, bad oscillator waveform, indifferent construction mechanically, insufficient heat dispersal and not enough output power for the larger transmitters that can be used mobile on bands other than 160 metres.

The new "Dependapac" DC Converter has been designed and constructed to eliminate these faults, and is thus of considerable interest to all those—and not only mobile enthusiasts—who require a reliable and efficient HT source capable of continuous, efficient operation from low-voltage DC, *e.g.* a car battery.

In the "Dependapac." the oscillator is on 1.500 c/s and the HT output is obtained from sub-miniature silicon rectifiers. Starting is instantaneous from cold under any load conditions, and there are two switched power output levels, measured as 265v. 100 mA (for receiver applications) and 530v. 228 mA (transmitter requirements) the efficiency being 85% at full output. The features of the "Dependapac" are the use of a toroid-wound transformer with taps selected and oscillator bias adjusted by internal relay control—when switching from "receive" to "transmit" (low output-to-full power) the transformer tap is automatically changed over, and the maximum output of 150w. can be taken from the unit. When using the low-voltage supply alone, the efficiency is 90%; thus, there is no wasted "no-load" current drain due to the use of series resistors or voltage dividers for reducing the output voltage.

Tested on a fully charged car battery reading 13·2v., the primary current on the "receive" position was 2·3 amps. for an output of 265v. 100 mA, and on "transmit" 13·4 amps. for an output of 530v. 228 mA.

The "Dependapac" is substantially built, with proper heat-sink arrangements, and the size overall is only $8\frac{1}{2}$ins. × 5ins. × $2\frac{1}{4}$ins., with adjustable mounting brackets. Operation is entirely automatic, and only two external control leads are required for installation, with outputs to apparatus *via* an octal socket.

MOBILE RALLY ARRANGEMENTS

Mobileers, and those interested in the organisation of Mobile Rallies, are stirring early this year, and the available week-ends are getting booked up fairly rapidly. With nearly 800 U.K. amateurs actually licensed /M—and probably almost as many more giving the idea a thought—it is going to be another very busy year on the mobile front.

To ensure the success of a Mobile Rally, it is essential to have adequate advance publicity—and that means getting the arrangements finalised, *and letting us know about them,* at least six weeks ahead of the projected date. The information we require includes callsigns and bands to be used by talk-in stations, road and map references, the catering arrangements, and any special events organised for the Rally, together with the QTH of some responsible individual to whom enquiries can be addressed.

Following are dates and brief details as already notified to us:

March 6 : South Birmingham Club Mobile Rally at Lickey Beacon, near Bromsgrove, Worcs.

March 27 : Heathkit Exhibition and Demonstration, Cannock, Staffs. *See* p.45 this issue for details.

April 3 : South Birmingham Club Mobile Rally at Lickey Beacon, near Bromsgrove, Worcs. Details from : G. E. Simonite, G3JAO, 19 Wistaria Close, Birmingham, 31.

April 24 : North Midlands Mobile Rally at Trentham Gardens, Stoke-on-Trent.

May 8 : Cheltenham Mobile Rally, Montpelier Gardens, Cheltenham.

May 8 : Thanet Radio Society Mobile Rally at Hugin Site, near Ramsgate, on main Sandwich-Margate road.

May 22 : Northern Mobile Rally, Harewood House, between Leeds and Harrogate, on A61.

June 26 : West of England Mobile Rally at Longleat House, near Warminster, Wilts.

July 10 : South Shields and District Amateur Radio Club Mobile Rally—details later.

July 17 : Southern Counties Mobile Rally, at Beaulieu Abbey, near Southampton, the meeting to be held at the famous Vintage Car Museum. Several Clubs are co-operating to make this the *grand prix* occasion in the Mobile Rally calendar.

With ten events scheduled already, and several more in the planning stage, there will be no lack of objectives for mobileers this season. With the publication of this first list of fixtures, it is to be hoped that we shall be able to avoid any clashing of dates. And organisers should bear it in mind that while 160 metres will remain the most popular band for /M operation, for any Rally at which a large attendance is expected talk-in stations would be required for two metres and 80 metres as well.

When G3ESP/M parks for a Mobile Rally, he hangs his callsign plaque over his front number-plate.

THE SMALL ADVERTISING

Once again, the Small Advertisement columns in this issue offer a wide range of attractive items, at very fair prices. If you have anything to sell in reasonable condition and working order, you cannot do better than use our Readers' Small Advertisement section, the rate being but 3d. a word, with a minimum charge of 5s. Notices should be set out clearly, in typescript or ordinary handwriting, using the accepted abbreviations.

BBC FEATURES AMATEUR RADIO

One of the items in the regular morning Home Service programme "Today" recently was a discussion with G2BCX about an "emergency network" exercise held in East Anglia on Sunday, January 10. G2BCX handled his part of the interview very well, and in the course of the proceedings a test message was taken from G3HWG/M. The interview was recorded during the exercise. And that awful word *ham* was not used once—Jack de Manio would have heard about it if it had !

CORRECTION—K.W. ELECTRONICS, LTD.

In their advertisement on p.510 of our February issue, the wrong illustration was inadvertently used for the Geloso G209-R Receiver. This was due to a misunderstanding by our printers, and is much regretted by all concerned. The Geloso G209-R was illustrated on p.342 of the November, 1959 issue of SHORT WAVE MAGAZINE.

BBC HANDBOOK—1960

The new *B.B.C. Handbook* is just out. Full of interesting facts and statistics about B.B.C. broadcasting and the activities of the Corporation, it discloses, among other things, that the B.B.C. has succeeded in penetrating the jamming of its transmissions to the Communist-dominated countries of Europe. (This may well account for the recent Russian decision, given so much publicity, to cease their B.B.C. jamming !). The total number of transmitting stations now in use is 44 for the domestic services, involving 84 transmitters, and 20 VHF stations running 122 transmitters ; there are 23 TV transmitting stations and at the stations of the B.B.C.'s External Services 39 high-power short wave transmitters are in operation. *B.B.C. Handbook 1960,* pp.274, indexed, illustrated, price 6s., of B.B.C. Publications Dept., 35 Marylebone High Street, London, W.1.

SOME NON-AMATEUR FREQUENCY ALLOCATIONS

AND EXTRACTS FROM THE GENERAL RADIO REGULATIONS GENEVA, 1959

THE information summarised below has been extracted from the official documents covering the recent Geneva Conference, and issued by the International Telecommunications Union. It is thought that this summary will be of interest to readers generally. Many of the provisions are, of course, a carry-forward of decisions taken at previous such Conferences. The Frequency Plan for the Aeronautical Services will be given in a future issue.

Amateur Band allocations were dealt with in detail on pp.541-542 of the February SHORT WAVE MAGAZINE. The effective date for the new Regulations to come into force is May 1st, 1961.

Some Definitions

Carrier Power: The average power supplied to the transmission line during one RF cycle under no-modulation conditions.

Effective Radiated Power: The power supplied to the aerial multiplied by the gain of the system in a given direction.

Mean Power: The average power supplied to the transmission line during normal operation.

Peak Envelope Power: The average power supplied to the transmission line during one RF cycle at the highest crest of the modulation envelope, taken under conditions of normal operation.

Band Designations

These run from No. 4 to No. 12, presumably because Bands I - III have been adopted in the European Region for the description of TV and VHF/FM frequency areas. *Band 4,* 3-30 kc, is the VLF; *Band 5,* 30-300 kc, LF; *Band 6,* 300-3000 kc, MF; *Band 7,* 3-30 mc, HF; *Band 8,* 30-300 mc, VHF; *Band 9,* 300-3000 mc, UHF; *Band 10,* 3000-30,000 mc, SHF. Bands 11 and 12, above 30,000 mc, are designated EHF.

Maritime Allocations

The ship and coast station assignments cover a wide range of frequencies in the MF/HF/VHF Bands 6-8. Above the MF broadcast band, they are as follows, all in kc:

1605-1625, ship station CW; 1625-1670, low power radiophone, 20w. maximum; 1670-1950, Coast stations; 1950-2053, Ships work Coast stations; 2053-2065, Intership working; 2065-2170, Ships to Coast stations; 2182 kc, *Distress Frequency,* guard band 2170-2194 kc; 2194-2440, Intership working; 2440-2578, Ships to Coast stations; 2578-2850, Coast stations; 3155-3340, Ships to Coast stations; 3340-3400, Intership working.

3500-3600 kc is allocated to Intership working, and 3600-3800 kc to Coast stations. *In Region I, the 80-metre amateur band is 3500-3800 kc.*

Ship Stations, Telephony: 4063-4133; 4133-4140 SSB only; 6200-6211 SSB only; 8195-8265; 8273-8280 SSB only; 12330-12400; 12407-12421 SSB only; 16460-16530; 16537-16562 SSB only; 22000-22070; 22078-22100 kc SSB only. VHF 156-174 mc, for port, docking, Intership and local Coast station working, with 156·8 mc as the main calling frequency.

Ship Stations, CW Telegraphy: 4160-4238; 6240-6357; 8320-8476; 12471-12714; 16622-16952; 22148-22400; 25070-25110 kc. Ship stations must be equipped for automatic change-over and listening through on the receiving frequency.

Coast Stations, Telephony: 4368-4438; 8745-8815; 13130-13200; 17290-17360; 22650-22700 kc.

Coast Stations, CW Telegraphy and Facsimile: 4238-4368; 6357-6525; 8476-8745; 12714-13130; 16952-17290; and 22400-22650 kc.

Ship and Coast stations work cross-frequency within the appropriate band-area, *e.g.* a Coast station on 4390·2 kc would work a ship on 4085·2 kc, and a ship on 16.512·5 kc would work a Coast station on 17.342·5 kc.

Some General Regulations and Recommendations

All administrations are urged to discontinue the use of double-sideband telephony in the bands below 30 mc, *i.e.,* MF and HF, if possible by January 1, 1970.

Broadcasting stations in the Tropical Zone are to use 2300-2498 kc (Region I); 2300-2495 kc (Regions II and III); 3200-3400 kc, 4750-4995 kc, and 5005-5060 kc in all Regions.

All stations (and that includes AT stations) are forbidden to make unnecessary or unidentifiable transmissions, and are not to use more power than is needed for communication. (Strict conditions are laid down in Art. 19 for the *identification* of stations.)

Administrations shall take all necessary steps to ensure that the operation of electrical apparatus or installations of any kind, *including power networks,* does not cause interference to a radio service operated in accordance with the Geneva Regulations.

No radio station may be operated without a licence. The secrecy of radio correspondence must be observed at all times.

Call-signs: For land and fixed stations, three letters, *e.g.* GLD; Ship stations, four letters, *e.g.* GSMD; Aircraft stations, five letters, *e.g.* GAZAA; Land mobile stations, non-amateur, four letters followed by a digit other than 0 or 1, *e.g.* MZQP2; Amateur stations, one or two letters and a single digit, followed by a group of not more than three letters, *e.g.* G3XYZ, GM4LSD.

Frequencies for emergency and/or safety purposes are: 500 kc, 2182 kc, 121·5 mc, 156·3 mc, 156·8 mc and 243 mc.

VHF BANDS

A. J. DEVON

Some EDX/GDX Openings—
The Pattern of Activity—
Station News and Reports—

THE period under review has been a little more lively and exciting, with more activity and some spells of better conditions—particularly over the week-end February 6/7, when the glass suddenly went unusually high (up to 30·64 in. corrected on A.J.D.'s instrument). This gave some GDX and a good EDX opening into Northern Europe though, again, activity on the Saturday and Sunday was too low for full advantage to be taken of the opportunities. The full development of this opening was on February 8.

It is a great pity that this good spell did not favour us during the previous week-end, for the 144 mc CW contest on Sunday, January 31, when there was quite a fair level of activity under moderate conditions; though some of the CW was a bit ropey, it was good to hear regular two-metre phone operators having a serious spell of CW working. As somebody has remarked since, let us hope that they have not now switched off their BFO's and put their keys away until next year.

For those who were on, there was a brief auroral opening on February 2, round about 2000 GMT, when G3HBW was able to work GM2FXN (Dundee), with the usual rasping T1 note both ways; signals were 55-56, and it was a solid contact while it lasted.

Fortunately for the general health of the VHF bands, there are stations either new to two metres or new on the air starting up almost every week, and the general call-sign pattern as regards active stations has changed considerably, even in the last two years. These newcomers maintain the activity until they join those VHF operators who, for one reason or another, only contrive to come on when conditions are good, or when they just feel like it. The total potential U.K. VHF activity is now probably about 500 stations (this can only be an estimate, but it is based on good statistical data)—which sounds a lot, but is actually much *less* than when the same estimate was made about six years ago; the figure then came out at around 750-800.

The probability is that as the HF-band DX falls off as we advance towards the sunspot minimum, so the occupancy of the VHF bands will increase; if this does happen (as has been shown to be the trend during the last ten years or so), then about three years from now we can expect a total of 1,200 or more U.K. operators actively interested in the VHF areas. Round about August, 1963, your A.J.D. must remember to do another occupancy estimate—or is that tempting Providence too far!

VHFCC Election

In making his claim for VHFCC Certificate No. 261, Jindra Macoun, OK1VR, of Prague, mentions some interesting facts: He has worked 346 different stations on two metres, of whom 13 are G's, and in all 152 from outside Czechoslovakia, making 194 OK's worked. Among the 11 European countries he lists is SP, in which he has worked 23 different stations; other interesting prefixes shown in his list are OE and YU.

Station News

G8DR (London, N.W.2), who started on two metres in March '58, is now up to 36C in the All-Time, with 354 stations worked in just the two years. G3LTF (Danbury) gets into Countries with 12C, and has now got 36C for the Annual; during the period, he had some EU contacts in F, ON and PA; he reports that his schedules with G3ILX and GW3MFY are almost 100% reliable. These are both long-haul, G3ILX being in Barrow-in-Furness—good going.

One of the newer stations on the band is G3NBQ (Coventry), who started up on December 21; since then, he has achieved the very creditable figures of 74S worked in 26C, running 65w. in the PA, with a 3-ele flat-top at 15 ft. only; his lists show some nice GDX contacts, made when, as he puts it, "there was a slight uplift in conditions." Anyway, he has made an excellent start, and is being taken into the tables.

From G3JAM (Woodford Green) comes a closely-written card, from which we get it that he has now worked 255S, with eight of his 10 countries confirmed; he also remarks that since G3LVO makes his frequency 144·949 and G3NWG says it is

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1959

Starting Figure, 14

From Home QTH Only

Worked	Station
43	G3HBW
42	G5MA
36	G3LTF
34	G3JWQ, G3KPT
31	G2CIW
30	G5ML
29	GW3ATM
26	G3NBQ
25	G3GSO
24	G3HWR
22	G3AYC
19	GW3MFY
18	G3CO, G3ICO
14	G3DLU, G3IOE

This Annual Counties Worked Table opened on September 1st, 1959, and will run till August 31st, 1960. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. The first claim should be a list of counties with the stations worked for them. The list can be added to as additional counties accrue.

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
32	G2XV
27	G3HBW, G3JWQ, G3KEQ, G5YV
26	G6NF, GW2ADZ
23	G3BKQ, G6NB
20	G3HAZ
19	G2CIW
18	G3IOO
16	G2DDD, G2CIW*, G3LHA, G3MED
15	G4RO
14	G2HDZ, G3FAN, G3KPT
13	G3MPS
12	*G5BD*
10	G2OI, G3AYC, G3IRW
9	G5DS
7	G2HDY, G3JHM, G3LTF
6	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

* New QTH

144·942, G3JAM is thinking of measuring it himself!

GW3ATM (Portskewett, Mon.) still has 80w. in his 829B PA, with a 4-ele Yagi at 37 ft. and a G2IQ xtal converter into a CR-100; he is also building for mobile on two metres. GW3ATM is doing well, and would undoubtedly do better if he could get rid of some local-noise interference which drowns out all but S9 signals; this made things very difficult for him during the CW contest. When the band opened on February 8, he heard G3JAH (Preston) at RS-57. And for those who may be interested, GW3ATM/G5QA run a regular schedule at 9.30 p.m. on Mondays, Wednesdays and Fridays—the distance is 80m., and they are always S9+, though the path is over some of the highest ground in the West Country.

G3HWR (London, N.W.3) is becoming regular again, after a short absence, and mentions G5UF (Dorchester) on about 145·80 mc. as an interesting contact during the CW contest. G3HWR draws attention to the "migration of West Country stations into the London Zone," pointing out that though he sympathises with their reason for this (people just will *not tune* far enough HF for them), in fact they are no easier to work because they are under the local London QRM. As he says, this whole situation could be avoided if, while observing the Zone Plan, everyone tuned the band properly. Nothing will be gained by the weaker (meaning GDX) stations moving into the London Zone—to which all we can say is, how true! G3HWR has worked a total of 213 stations, but still needs cards from 134 of them!

G3HBW (Bushey) is now at the top of the Annual Counties, and occupies one of the 17C seats in Countries Worked; there is now only a single "loose one" between G3HBW, G6NB and ON4BZ (who could get to 18C if only *he* could raise GD!). The positions in this Table will be interesting during the coming season.

Six-Metre Success

After patient observation ever since October, G3EHY has at last caught the W's on 50 mc (6 metres). The first opening was at 1500 on January 27, with W1LGE and W1LUN heard. Over the next five days, with the MUF keeping high, Louis had some 60 contacts, cross-band Ten/Six, mainly with VE1 and W1-3—as G3EHY was apparently the only 10-metre European trying to work the W's on 50 mc, the pile-up was colossal; Louis say he now knows what it feels like to be the only DX station on when a whole continent is calling for contacts! The last day of the opening was February 1, when an ON appeared on 50 mc, and CT1CO on auto-sender was heard in the States.

DX Radar

The great new early-warning radar station projected for Fylingdales Moor, North Yorkshire, has been much in the news recently.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

18	G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP)
17	ON4BZ, (DL, EI, F, G, GC, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, SP, 9S4)
17	G6NB (DL, EI, F, G, GC, GD. GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, SP)
17	G3HBW (DL, EI, F, G, GC, GD, GI, GM, GW, LA, LX, OE, OK, ON, OZ, PA, SM)
16	G3CCH, G3GHO, G5MA
15	G2XV, G3FZL, G4MW, G6XM
14	G2FJR, G2HDZ, G3AYC, G3FAN, G3HAZ, G3IOO, G3JWQ, G3KEQ, G3WS, *G5BD*, G6LI, G8OU
13	G3BLP G3DMU, G3DVK, *G3GPT*, G3KPT, G5DS, G6XX, GM3EGW, PAØFB
12	EI2W, F8MX G2HIF, G3EHY, G3GFD, G3GHI, G3LTF, G3WW, G5CP, G5ML, G6RH, G8VZ
11	G2AJ, G2CIW, G2CZS, G3ABA, G3CO. G3JZN, *G3KUH*, G3LHA, G4RO, G4SA, G5UD, OK1VR
10	G2AHP, G2FQP, G2HOP, G3BDQ, G3BK, G3BNC, G3DLU, G3GSE, G3GSO, G3JAM, G3KQF, G3MED, G5MR, G8IC, GW5MQ
9	G2DVD, G2FCL, G3DKF, G3FIJ, G3FUR, G3IUD G4LX, G8DR, G8GP, GC3EBK, GM3DIQ
8	G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKX, G3GBO. G3HCU, G3HWJ, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB, GC2FZC, GW3ATM

The receiving aerial system will be a mesh-reflector assembly 400 ft. long by 165 ft. high and, with the transmitters envisaged, the range will be about 3,500 miles against small targets. To get this range, colossal power will have to be used, and there will be a considerable area of danger in the vicinity of the station. The three transmitting dishes will be 85 ft. in diameter and more than 120 ft. high, operating from within radomes for wind-and-weather protection.

Deadline ——

This is **March 16** for the April issue, by which time we may have had the first of the Spring openings. Address all reports: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Till April 1st, then, *73 de A.J.D.*

Audio Noise Limiter

FOR THE RECEIVER OUTPUT STAGE

In a recent issue of *Short Wave Magazine* ("Noise Silencing in Communication Receivers," p.514 February) reference was made to noise limiting on the audio side.

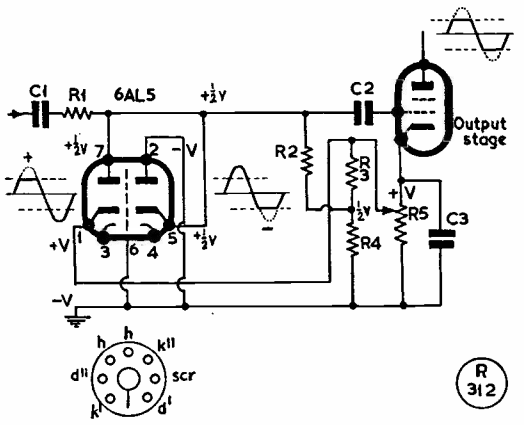
The circuit herewith shows a noise limiter of this type, used just before the final output stage in the receiver. The first points to notice are that the grid line to the last valve is blocked to DC by C1, C2 and a reference voltage — which controls the limiting effect — is taken from the junction of R3, R4 and applied to the plate of one diode section and the cathode of the other section.

This reference voltage is obtained from R5, in the cathode of the output stage, its value depending on the setting of R5 slider: If +V in the diagram is 16 volts, the reference voltage is $\frac{1}{2}$V (8v.) and the voltage across the two diodes, one conducting in the positive direction and the other in the negative, will also be 8v. The left-hand diode section cuts the positive peaks and the right-hand the negative, the output at the plate of the final audio amplifier in the receiver thus being limited as indicated in the diagram.

The general effect of this audio limiter — which is based upon an idea by VK7GC, and published in the Australian *Amateur Radio* of August 1959 — is that it works well against "spiky" or random noise, while general noise is held down to the peak audio level. If the clipping is carried too far, severe distortion will of course result, and so it becomes a matter of adjusting R5 to suit the receiving conditions. If carried still further, the audio output can, theoretically, be cut off altogether.

In practice, the voltage range available for limiting depends upon the value of R5 and the cathode current of the receiver output stage. In some cases, C1, C2 could be considerably reduced in value — to, say, ·005 or even ·003 μF. The values of R3, R4 should be about equal and they can be anything from 10,000 to 30,000 ohms each.

As will by now have been deduced, the feature of this circuit is that it gives variable limiting, being thus adjustable to receiving conditions. As in all circuits of this type, it is not possible to specify values suitable for any sort of audio stage likely to be encountered — but those given should be suitable as a starting point with most receivers.



Circuit of the noise limiter discussed in the text, using a double-diode at the grid of the receiver output stage. The action of the limiting circuit is such that positive and negative peaks are clipped, to a degree directly controlled by R5. The diagram refers only to the noise-limiter connection — there would be the usual grid return resistor taken direct from the grid pin of the output valve.

Table of Values

Double-Diode Audio Noise Limiter

C1, C2 = .01 μF (*see text*)	R3, R4 = 25,000 ohms (*see text*)
C3 = .01 μF	R5 = 500 ohms w/wound
R1 = 50,000 ohms	V = 6AL5, or any double diode.
R2 = 100,000 ohms	

(*Note:* In some cases, R5 may be as low as 250 ohms, or consist of fixed and variable resistors in series. C3 may not be necessary.)

INDEX TO VOL. XVII

As this issue of SHORT WAVE MAGAZINE starts a new volume, the 18th, each copy contains, as a free loose supplement, a detailed Index to Vol. XVII, March, 1959, to February, 1960. Among other things, this shows that during the year we used the work of more than 40 outside contributors; in this Index, there are over 500 references and cross-references, covering the whole field of Amateur Radio. For the moment, back-number copies of all ten issues, March, 59 to February, 60, are available, at 2s. 9d. each post free, though for some issues only a few copies are still held. Having checked the Index for what you may want, apply with remittance to: Circulation Dept., *Short Wave Magazine, Ltd.*, 55 Victoria Street, London, S.W.1. Two other points: If it's not in the Index, we cannot help you with the information you want; and the July-August issues are missing because we could not publish due to the printing strike.

TRANSISTORISED POWER SUPPLIES

These are coming to the fore, especially for mobile working. One of the firms now producing transistorised power packs is Communications (Air) Ltd., of Bagshot, Surrey, who have established an Amateur Division, under G2TX, for the design, development and manufacture of apparatus of interest to all radio amateurs. They will also undertake one-off orders to special requirements.

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the U.K. section 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.

EI9BC, A. Bradshaw, 454 Mountdown Park, Manor Estate, Whitehall Road, Terenure, Dublin.

GW3ITD/MA (for testing purposes alongside the Dockyard. *QSL to GW3ITD/MM).*

GW3ITD/MM, R.E.A. M. R. Davies, c/o Chief Petty Officers' Mess, H.M.S. *Puma*, c/o G.P.O., London.

G3MZY/A, J. D. Last, Wills Hall, Stoke Bishop, Bristol, 9. *(Tel.: Bristol 68.1389/68.3519.)*

G3NMI, R. Purdom, Croft Cottage, Berrow, Burnham-on-Sea, Somerset.

GM3NMN, R. H. Dunlop, 19 Glasgow Vennel, Irvine, Ayrshire.

G3NOO, B. R. Jessop, Northfield Lane, Church Fenton, Tadcaster, Yorkshire.

GM3NPR, W. Roxburgh, 3 Henrietta Street, Kilmarnock, Ayrshire.

G3NTG, C. E. Griffin, Severn Brow, Oldbury, Bridgnorth, Salop.

G3NTH, D. S. Davison, c/o Officers' Mess, R.A.F. Station, Bridgnorth, Salop.

GW3NUO, P. M. Williams, 22 Druslyn Road, West Cross, Swansea, Glam.

GM3NUU, J. S. Reid, 156 Hamilton Place, Aberdeen. *(Tel.: Aberdeen 51615.)*

G3NVA, F. F. Dodson, 78 St. Bernards Road, Olton, Solihull, Warks.

G3NVI, S. C. Fryer, 26 Hazel Drive, Derby Road, Wingerworth, Chesterfield, Derbyshire.

G3NVN, M. R. Bussey, 2 Park Avenue, Normanby Road, South Bank, Middlesbrough, Yorkshire.

G3NVX, R. H. Davison, 75 Wensley Drive, Leeds, 7, Yorkshire.

G3NWK, A. G. Lucas, 28 Bradley Road, Upper Norwood, London, S.E.19.

GW3NWQ, M. J. Caplan, 53(W) Signal Regt. (T.A.), T.A. Centre, Park Street, Cardiff, Glam.

GW3NXH, C. Jones, 53(W) Signal Regt. (T.A.), T.A. Centre, Park Street, Cardiff, Glam.

G3NXJ, B. James, 50 Keswick Drive, Warndon, Worcester, Worcs.

GM3NXM, W. G. Borland, 6 Burnside Way, Largs, Ayrshire. *(Tel.: Largs 2775.)*

G3NXN, R. Wickens, 32 Kenilworth Avenue, Wimbledon Park, London, S.W.19. *(Tel.: WIMbledon 9271.)*

G3NXP, D. Flannery, 7/69 Garbett Street, Ladywood, Birmingham, 1.

G3NXQ, A. K. Barker, 13 Eskdale Close, Warndon, Worcester, Worcs.

G3NXR, T. D. J. Miles, 7 Hampden Road, Wantage, Berks. *(Tel.: Wantage 618.)*

G3NYD, D. E. J. Coles, 113 Berrow Road, Burnham-on-Sea, Somerset.

G3NYE, A. J. Taylor, 22 Wilcott Road, Gatley, Manchester, Lancs.

GM3NYG, Miss J. G. Fish, 31 Oaklands Avenue, Irvine, Ayrshire.

G3NYI, W. H. Brownson, 176 Northumberland Avenue, Hornchurch, Essex.

G3NYK, A. J. Melia, 51 South Street, Wakefield, Yorkshire.

G3NYX, J. W. Heaviside, 56 Park Road North, Chester-le-Street, Co. Durham.

GM3NZC, R. D. Wilson, 38 McBeth Road, Stewarton, Ayrshire. *(Tel.: Stewarton 296.)*

CHANGE OF ADDRESS

G2SC, J. M. Scott, Nore Lodge, Nore Road, Portishead, Bristol, Glos.

G2WT, J. W. Wroth, Mardoleen, Whitehall Road, Ramsgate, Kent.

G3CIM, S. Denney, 52 Keswick Road, Cringleford, Norwich, Norfolk. NOR.60.D.

G3CNY, G. L. Blunn, 9 Orchard Lane, Codsall, Staffs.

GM3DNF, Dr. G. J. Bennett *(ex-G3DNF/GW3DNF),* 18 Monearn Gardens, Milltimber, Aberdeenshire.

G3ENB, W. E. Gates, 71 Bradford Road, East Ardsley, Wakefield, Yorkshire.

GM3FAO, A. F. Davidson *(ex-G3FAO),* BM/ATZX, London, W.C.1.

G3FF, F. Bottom, 237 Firbank Road, Wythenshawe, Manchester, 23, Lancs. *(Re-issue.)*

G3FOP, R. G. Barrell, 14 Gisborne Crescent, Allestree, Derby. *(Tel.: Derby 57222.)*

G3FOP/A, R. G. Barrell, 4 Bromyard Road, Tenbury Wells, Worcs.

G3GVM, F. Robins, 4 Broadview Gardens, High Salvington, Worthing, Sussex.

G3IEF, K. E. Felton, 143 Lower Road, Stoke Mandeville, Aylesbury, Bucks.

G3IFT, F. H. Tobin, 25 Park Avenue, Basing, Basingstoke, Hants.

G3JHI, R. L. S. Hathaway, c/o Officers' Mess, R.A.F. Station, Lyneham, Chippenham, Wilts.

G3KCJ, A. H. Webb, 5 Stansted Caravan Estate, Stansted Airport, Essex.

G3KLG, A. Gay, 13a Brighton Street, Barrow-in-Furness, Lancs.

GM3LNE, R. W. McInnes, 44 Redford Avenue, Colinton, Edinburgh, 13. *(Tel.: Edinburgh 81391.)*

GW3LSB, J. Lloyd-Jones, Pant Derw, Betws-y-Coed, Caerns.

G3LST, P. F. L. Clarke *(DL2AK),* Herons Flight, Shenfield Common, Brentwood, Essex. *(Tel.: Brentwood 5196.)*

G3LVN, D. D. R. Sibbald, 69 St. George's Road, Ilford, Essex.

G3LYY, J. T. A. Johnston *(ex-GM3LYY),* c/o Drudge, 28 Alvington Road, Carisbrooke, Isle of Wight.

G8VB, H. S. Simmons, 136 River Way, Christchurch, Hants.

The Other Man's Station DL2BC

THE equipment in this photograph—the station of DL2BC, Sgt. John Akehurst, Royal Signals, 212 Signal Squadron, B.F.P.O.36—is the Canadian Marconi No. 52 Set, consisting of two receivers and a transmitter, with mains and battery power supply unit. The receiver is a 13-valve superhet, with built-in calibrator, and is the left-hand unit of the assembly ; the frequency coverage of the equipment as a whole is 1·75 to 16 mc, with crystal or VFO control. At DL2BC, the second receiver is used for cross-band working with U.K. stations on 160 metres.

In the transmitter side of the 52 Set, 6V6's are used in all early stages and for modulation, which is by grid control, with a single-813 PA running 100w. on CW and 75w. on phone. Full BK is provided for CW (and MCW) working, and the transmitter has a QRO-QRP control which permits running at inputs down to 2 watts. For phone, either a moving-coil or carbon microphone can be used, and there is also a remote-control unit enabling the station to be operated from distances up to two or three miles. An ATU permits almost any type of aerial to be matched into the equipment.

Aerials at DL2BC include 20- and 40-metre dipoles, a 34-ft. vertical for 14 mc, and a 75-ft. wire used on 80m., together with a variety of three-quarter-wave end-fed wires.

As shown here, the station is situated nearly five miles from the home QTH at Osnabrück, so DL2BC fills in his spare time by operating at DL2BC/A in the evenings, using a 10w. CO-PA outfit on 20-40-80 metres—and DL2BC/M can also be heard from various parts of Germany using the 52 Set mounted in the appropriate vehicle ; with a 16-ft. rod aerial, ZL has been raised on 20-metre CW.

Main activity at DL2BC is working the U.K. on 20, 40 or 80 metres, and great interest is also taken in QRP operation with 2 watts into a good aerial. DX is worked as it presents itself, and all continents have been raised. Other personal interests are working fellow-amateurs in the Royal Signals, collecting stamps, and railway modelling. DL2BC was first licensed as DL2VM in West Berlin in 1952, and was later 5A4TZ in Tripoli ; the present call was issued in 1957 and DL2BC hopes to become a G about August—or, if not, to be posted to a DX location! In the meantime, a radio club is being organised for 212 Sqdn. so that the many SWL's in the unit can get some experience to lead on to their own tickets.

Finally, DL2BC welcomes all SWL reports, phone or CW, any band, and, if sent direct, all such reports will be QSL'd direct—and who can say fairer than that?

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Deadline for April issue : March 11)

(Address all reports for this feature to "Club Secretary")

WE return to the subject of Club publications, which seems to be a matter of great interest these days. More than one Club, which hitherto has attempted nothing of the kind, has found that the publication and circulation of a local newsletter of some sort has had a most beneficial effect in bringing back members who have lost interest.

One sound scheme is to arrange for the annual subscription to cover the regular posting of the Newsletter to members; then a small further subscription is collected at meetings which they attend. If the newsletter gives details of forthcoming meetings, it will often bring some of the "sticky ones" along. Likewise, it has been known that people in surrounding districts who have not formerly been members have asked to be put on the mailing list for the newsletter, and thus have been added to the membership, whether they turn up in person or not.

Once a publication has been started, and duplicating facilities laid on, the cost of producing extra copies is negligible; thus it is possible to allow membership (including the newsletter) for a subscription as low as 5s. per annum, with a small further payment at each meeting attended.

Clubs who feel they are on the wane might well try this; we know of two cases in which it has proved a powerful shot-in-the-arm.

Club Newsletter Suggestions

We see so many Club publications nowadays that it is possible to assess the probable value of each to the membership that receives it. The most effective seem to be those that, avoiding windy "editorials" and ill-prepared "technical articles," stick strictly to reporting local news and views and members' activities, on and off the air; the treatment can be brisk and *staccato*, and not above a little gentle leg-pulling.

For "body," the newsletter can contain such items as summaries of lectures—to let those who were not at that meeting see what they missed, and to remind those who were there about what they heard—and accounts of the Club's visits, outings and social gatherings. In the case of the latter, a full list, by name and call-sign, of those present is always of interest for the record, *i.e.* posterity. In fact, the compilers of Club newsletters should keep it in mind that each issue they produce is really a contribution to the history of the Club, apart altogether from its immediate value and interest to members as a source of local news.

It takes quite a lot of effort to produce a readable newsletter every month, whatever those may say who criticise. What they do not understand is that the labour is not so much in producing one issue, but on going on doing it month in and month out, year after year.

Club Activities

Barnsley held a very successful Annual Dinner and Social, with nearly 100 members and friends present. G2BH, the president, gave an address of welcome; G5KM proposed "The Ladies" and G6LZ's XYL replied. The evening finished with a programme of games and the awarding of several prizes.

Brentwood had their AGM on January 28, and elected G3MVG secretary, G3LJZ chairman and

Group taken at a recent Scarborough Amateur Radio Society meeting. Left to right: G2YS, G3NKP, G8KU, G3HFW, G3JFE and G3JBR.

G3LST treasurer. They meet every other Wednesday at The Hermitage, Chelmsford Road, and have a full programme ahead of them, including participation in the Brentwood Carnival.

Cheltenham meet on Wednesdays at 8 p.m. and are invariably on Top Band looking for contacts from G3GPW. They are re-organising their Club Room, and are preparing for a Mobile Rally on May 8 (at Montpellier Gardens, Cheltenham).

Grimsby get together on the first and third Thursday at the RAFA, Abbey Drive West. On March 31 G3ELZ will give a talk and demonstration on his new six-band transmitter.

Ilford hold a meeting every Thursday at 579 High Road (near Seven Kings Station). They have a full programme for months ahead, suitable for all ages, and have an average attendance of 30 at their meetings. All are welcome.

The Amateur Radio Club of British Timken, Northampton, are very well accommodated and have an excellent array of gear, with plenty of space for aerials. In this photograph are G3NOK and G3JXU (hon. secretary) with SWL's Stanley and Smith. The Club signs G3NIB.

Lincoln meet in the Technical College at 7.30 p.m. on alternate Wednesdays, next one being on March 9. **Preston** have changed their Clubroom and now meet at St. Pauls School, Pole Street, on the second and fourth Tuesdays. The March meetings are on the 8th and 22nd.

Nottingham hold their AGM on March 22; meanwhile their activities include R.A.E. classes on Thursdays and Morse classes on Tuesdays. Several interesting talks have been heard recently, and a very informative visit was paid to Nottingham University.

Reading continue to meet on the last Saturday of the month at the Palmers Hall, West Street. On March 26 the programme will be taken up with films and a lecture on the applications of transistors. **South Yorkshire** will in future be meeting on the second Tuesday and the fourth Thursday of each month, 7.30 p.m. at the Stag Inn, Dockin Hill Road, Doncaster.

Spen Valley had a very successful Annual Dinner, with an attendance of 61. They will be concerned with the Northern Mobile Rally at Harewood House on May 22. Their own Annual Trip, on May 29, will be to Ringway Airport.

Cambridge will hold their AGM on March 25, 8 p.m., at The Jolly Waterman, Chesterton Road. **Cannock Chase,** who recently ran a very successful Buffet Supper, meet at The Castle Inn, Bridgtown, on the first Thursday of the month. Thus their March meeting is already over.

Cornish held a lively discussion at Falmouth on February 3, ending up with a talk on Interference Sources and Cures. Their chairman, G3NKE/A, has been working /A from the *Scilly Isles.*

Cambridge University are planning a trip to the Isle of Man during the Easter vacation—for details, see *DX Commentary.* **North Kent** have had a Junk Sale, a talk on TVI-Proof Transmitters (G3FBA) and an Audio Demonstration. For March 10 the subject is Oscillators—a pretty wide subject which it is hoped will lead to a useful discussion.

Oxford University Radio Society has been in existence for about ten months, but has only just acquired workshop premises. Some five lectures per term are arranged, mainly from industry. Membership is about 70, with interests ranging through the whole field of electronics. G3LOF and G3NMW give Morse classes, and the former has drawn up plans for a transmitter. Offers of help and surplus equipment will be greatly appreciated.

Southgate report an attendance of 61 at their recent meeting, when a Signal Generator was discussed and described. At the March 10 meeting (Arnos School, Wilmer Way, N.14), G3HRH will talk on Aerials.

Aberdeen meets every Friday in the Club Room at 6, Blenheim Lane, and have recently acquired 21 fully-upholstered tip-up chairs (ex-Cinema). **Gravesend** held their AGM and elected G3FST president, G3NPS chairman and G3MXJ secretary. They hope to move their Hq. to a place where the Club Tx, G3GRS, can be put on the air. Meetings every Thursday, 8 p.m., at The Old Sun, Crete Hall,

HEATHKIT SHOW AND DEMONSTRATION

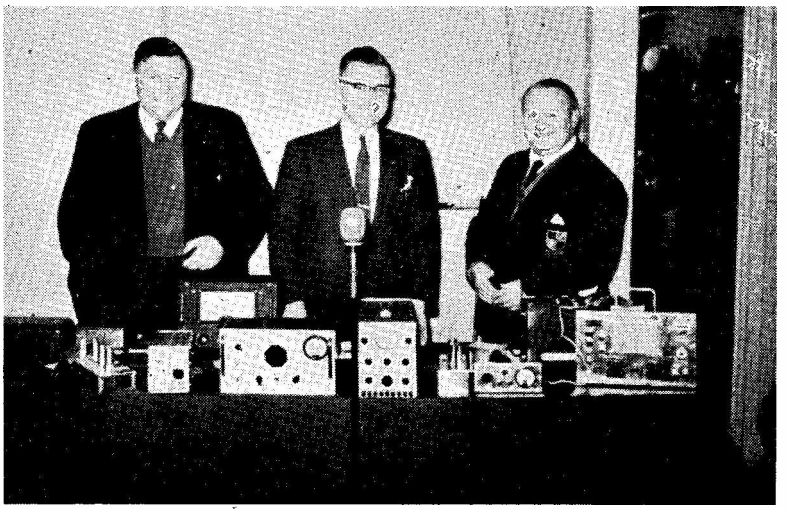
We are asked to announce that there will be an exhibition and demonstration of Heathkit equipment on Sunday, March 27, at the Walsall Road School, Girton Road, Cannock, Staffs., 2.00-5.00 p.m. The approach to Girton Road is off the A34, quarter-mile south of the town centre, and three-quarters of a mile north of the A5/A34 junction at Churchbridge. There is ample space for parking, and G3ABG will be on 1900 kc from 12.30 till 2.0 p.m. to talk-in visiting mobiles.

Road, Northfleet.

Worthing meet at 8 p.m. on the second Monday, in the Adult Education Centre, Union Place. On March 14 G3KFH/T will talk on Amateur Television, with a live demonstration. On April 11 G3JHM is due to give a demonstration of Centimetre Equipment.

For **Acton, Brentford & Chiswick,** meetings are on the third Tuesday each month at 66 High Road, Chiswick, W.4, where on March 15 G3EOH will be talking about Getting Going on Two Metres; on April 19 G2CAJ will demonstrate his two-metre equipment.

On March 12, **Thanet** will be holding their 13th Annual Dinner and Dance at the San Clu Hotel, Ramsgate; this event will include a contest "for the XYL who during the past year has done something most calculated to further her OM's comfort." Should be quite an entertaining evening!



Mitcham and District Radio Society held their annual Christmas meeting on December 18, at which the Constructional Contest was judged by, left to right: G3AGR, Mr. C. Sproxton of Home Radio, and Mr. R. Scot of the Sutton and Cheam Society. At this meeting, Mitcham also had a prize draw, for which there was a very good array of gear.

CLUB CALENDAR IN BRIEF

Aberdeen: March 4, Sale of Radio Gear. March 11, The 'ALZ Tx, by GM3ALZ; March 18, Crystal Calibrator (GM3NHW); March 25, SSB (GM3FKS and GM3ICS).

Barnet: March 29, Special Meeting—Major G. Watson, Radio in Antarctica.

Bradford: March 22, A.G.M.; April 5, NFD Arrangements; April 26, G3KLZ on The Development of Television.

Crawley: March 31, G3FZL, The IGY and the Radio Amateur. (At The Brewery Shades, Crawley High Street, 7.30 p.m.)

Crystal Palace: March 12, G8KW, The Latest KW Products; March 29, Morse Class and Technical Lecturettes.

Derby: March 9, Open Evening; March 16, Top Band Converters; March 18, Annual Dinner and Social, at The Irongates Grill; March 23, Open Evening.

Halifax: March 15, Field Day Arrangements; March 29, Ragchew; April 9, Visit to ABC TV Studios, Manchester. Meetings at The Sportsman Inn, Ogden.

Hastings: March 8, Tape Lecture, Transmitter Design and TVI (G3BCM); March 22, Discussion on Hi-Fi Reproduction. Meetings at 33 Cambridge Road, Hastings.

Hull: March 8, Junk Sale; Club Tx on the Air; March 29, The Oscilloscope (Gunther Engels, B.Sc.).

Leeds: March 9, Film Show; March 16, Demonstration of Hi-Fi Equipment; March 23, Demonstration of Table Top Tx; March 30, Visit to Leeds Police Information Room.

Liverpool: March 8, Stereo Amplifiers; March 15, Open Night; March 22, The Panadaptor; March 29, Film Show; April 5, Junk Sale.

Lothians: March 10, Radio Control of Models; March 24, NFD Preparations.

Midland: March 15, G3HAZ, Frequency Measurements and VHF Demonstration.

Purley: March 18, Junk Sale.

Slade: March 4, Mullard Film Meeting (at Bennett Hall, YMCA, Snow Hill); March 11, Modern Broadcast Reception; March 25, Electronic Digital Computers (G3GKZ).

South Birmingham: March 6, Top Band Mobile Rally, Lickey Beacon; March 17, Electronic Equipment in use at Birmingham University (G3JAO); April 3, Mobile Rally as above.

South Yorkshire: March 8, Transistors (G3JLZ); March 24, CW—For Better or Worse (G3CYS).

Spen Valley: March 16, Outside Visit; March 30, Electronics in Industrial Research.

Wellingborough: March 10, Cartoon Films; March 17, Junk Sale; March 31, The Upper Atmosphere (S. Harris).

West Kent: March 4, Film Strip Lecture; March 18, Demonstration of Wiring, Layout and Testing; April 1, Informal Evening; April 23, AGM.

Wirral: March 18, Lecture on Transistory, G3CSZ; April 8, Constructional Contest; April 22, Open Night; May 6, Chairman's Evening.

Wolverhampton: March 7, Ragchew; March 14 and 28: RAE Classes; March 21, to be arranged.

CLUB PUBLICATIONS

News Letters and Broadsheets are acknowledged from the following Clubs:

Crystal Palace (Newsletters Nos. 47 and 48); **Derby** (Newsletter 1960, No. 1); **Enfield Group** (Vol. 11 No. 10); **Newbury** (NADARS Newsletter No. 14); **Purley** (Newsletter for February 1960); **Southgate, Finchley and District** (Newsletter for February 1960); **Hastings** (Natter-Net Notes No. 4).

Army Wireless Reserve A.R.S. ("Broadcast"); **North Kent** (Newsletter No. 31); **R.A.I.B.C.** ("Radial"); **Mitcham** (Newsletter).

SPECIAL NOTICE — ALL HONORARY SECRETARIES

All hon. secretaries are asked to ensure that their Club activity reports reach us by the due date—given each month at the head of the "Clubs" article—all through the year. We have recently been receiving an increasing number of late reports, which it is impossible to write in after we close for press. This leads to misunderstanding and disappointment. All reports must include the name and QTH of the hon. secretary.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

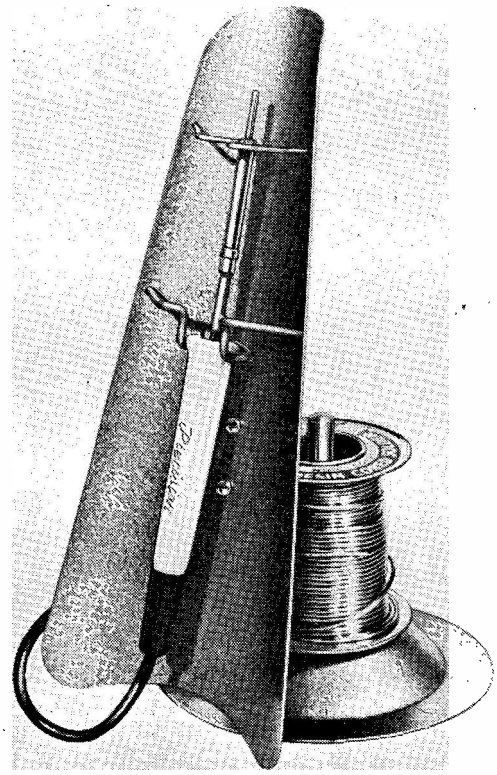
ABERDEEN: W. K. Heggie, GM3NHW, 80 Leslie Terrace, Aberdeen.
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W.3.
ARMY WIRELESS RESERVE: Maj. D. W. J. Haylock, G3ADZ, 3 Norris Gardens, Grange Estate, Havant, Hants.
BARNET: D. K. Robinson, 3 Castle Road, London, N.12.
BARNSLEY: P. Carbutt, G2AFV, 19 Warner Road, Barnsley.
BRADFORD: D. M. Pratt, G3KEP, Glenluce, Lyndale Road, Eldwick, Bingley.
BRENTWOOD: J. Horton, The Cottage, Burland Road, Brentwood.
CAMBRIDGE: H. Waton, G3GGJ, New Road, Barton, Cambridge.
CAMBRIDGE UNIVERSITY: J. B. Butcher, G3LAS, Pembroke College, Cambridge.
CANNOCK CHASE: P. Davis, G3NTY, 45 Broad Street, Bridgtown, Cannock.
CHELTENHAM: J. H. Moxey, G3MOE, 11 Westbury Road, Leckhampton, Cheltenham.
CORNISH: G. W. Hubber, 9 Cardrew Terrace, Redruth.
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate Crawley.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
ENFIELD: V. Croucher, G3AFY, 15 Nelson Road, London, N.15.
GRAVESEND: D. Andrews, G3MXJ, 42 The Fairway, Gravesend.
GRIMSBY: O. Gilliat, G3LOP, 24 Station Road, Healing, Lincs.
HALIFAX: A. Robinson, G3MDW, 7 Upper Brockholes, Ogden, Halifax.
HASTINGS: W. E. Thompson, 8 Coventry Road, St. Leonards-on-Sea.
HULL: G. G. Wray, G3MVO, 93 Wolfreton Lane, Willerby, Hull.
ILFORD: D. J. Penny, 175 Burrow Road, Chigwell, Essex.
LEEDS: D. Dinsdale, 8 Quarry Mount Street, Leeds 6.
LINCOLN: C. Lathwood, G3MUL, 40 Grange Crescent, Lincoln.
LIVERPOOL: H. James, G3MCN, 448 East Prescot Road, Liverpool 14.
LOTHIANS: L. Lumsden, 33 Hillview Road, Edinburgh 12.
MIDLAND: C. J. Haycock, G3JDJ, 360 Portland Road, Birmingham 17.
MITCHAM: D. Johnston, G3NFA, 23 Woodland Way, Mitcham.
NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Crookham Common, Newbury.
NORTH KENT: D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.
NOTTINGHAM: E. C. Weatherall, 16 Avebury Close, Clifton, Nottingham.
OXFORD UNIVERSITY: G. G. Gemmill, Worcester College, Oxford.
PRESTON: G. Lancefield, G3DWQ, 35 Brixton Road, Frenchwood, Preston.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
R.A.I.B.C.: W. Harris, 25 Playford Lane, Rushmere, Ipswich.
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTH BIRMINGHAM: G. E. Simonite, G3JAO, 19 Wistaria Close, Birmingham 31.
SOUTHGATE: A. G. Edwards, G3MBL, 244 Ballards Lane, London, N.12.
SOUTH YORKSHIRE: W. Farrar, G3ESP, 2a Highbury Avenue, Bessacarr, Doncaster.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
THANET: J. Barnes, G3BKT, 18 Grange Road, Ramsgate, Kent.
WELLINGBOROUGH: D. J. Trusler, 87 Irchester Road, Rushden, Northants.
WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral, Cheshire.
WOLVERHAMPTON: R. P. Thomas, 91 Fraser Street, Bilston, Staffs.
WORTHING: P. J. Robinson, G3KFH/T, 46 Hill View Road, Worthing.

"CENTURY AWARD"—R.A.F. AMATEUR RADIO SOCIETY

To mark its 21st anniversary, the R.A.F. Amateur Radio Society has instituted a certificate to be awarded to members who have worked 100 or more member-stations of R.A.F.A.R.S. One of these contacts must be with G8FC, the Hq. station of the Society at Locking, Somerset. Present transmitter membership is nearly 300, those eligible to join being past or present members of the Royal Air Force of any rank, and including civilian grades employed by the Air Ministry. The subscription is 10s. a year for full members, this including a copy of *QRV*, the society's own journal, which appears twice a year. If you are eligible and interested, write to: Hon. Secretary, R.A.F. Amateur Radio Society, Royal Air Force Station Locking, Weston-s-Mare, Somerset —and look out for G8FC on the air, operated by G3GPE, who is the communications manager.

FATHER TO SON — G2LP

Before the death of G2LP, his son was licensed as G3BNZ. The Post Office has agreed to re-issue the call G2LP to G3BNZ, and he is now operating under his late father's callsign.



Miniature soldering-iron and stand, designed and produced by Antex, Ltd. for the safe soldering of transistors and similar small components liable to be damaged by excessive heat. A needle bit provides a quick hot-point contact.

SMALL ADVERTISEMENTS

("SITUATIONS" AND "TRADE")

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.

TRADE

"HUDSON" 4-metre Amateur Band Tx/Rx, AC mains, 15w. Tx, double s/h Rx, cost £125, accept £60; ditto 12-volt mobile Tx/Rx, cost £85, accept £40. Both in excellent order. H.P. terms.—R.E.E. Telecommunications, Telecomm Works, Crewkerne, Somerset.

SMALL ADVERTISEMENTS, TRADE—*continued*

QSL'S and Logs by Minerva. The best there are.—Samples from Minerva Press, 2 New Road, Brentwood, Essex.

WANTED FOR CASH: Good clean communication receivers and SSB equipment. Please state price. — Short Wave (Hull) Radio, 30/32 Princes Ave., Hull. *(Tel. 18953.)*

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

SITUATIONS VACANT

AIR MINISTRY have vacancies for civilian RADIO TECHNICIANS at Royal Air Force, Carlisle, and at other R.A.F. Stations throughout the United Kingdom, for the servicing, repair, modification and testing of air and ground radio and radar equipment. Commencing salary (national) (according to age) is £525-£670 p.a.; max. salary £795 p.a. These rates are subject to a small deduction at certain provincial stations and to a small increase in London. Annual leave, 3 weeks 3 days, increasing to 4 weeks 2 days after 10 years' service, 5 weeks after 20 years' service, and 6 weeks after 30 years' service.—Apply, giving details of quals. and exp., and mentioning this advertisement, direct to the Officer Commanding, No. 14 Maintenance Unit, Royal Air Force, Carlisle, or to Air Ministry, C.E.4b, London, W.C.1, for vacancies in other areas; or any Employment Exchange, quoting "Carlisle 701."

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

HRO SENIOR, 6AC7 RF, stab. osc., power pack, bandspread coils for 10, 15, 20, 40, 80, plus LF coils, wired for 6 or 12v. operation, £25. B2, complete, £8. Minimitter 5-band converter, £12 10s. 0d. Minimitter Tx, in perfect condition, £50. — B. G. Meaden, G3BHT, Sandy Lane, Hightown, Nr. Liverpool. *(Phone Hightown 182.)*

FOR SALE: Panda Cub Tx, £35; Eddystone 840A, Rx, £42 (used 8 hours only); Eddystone 740, £20; Panda Antenna Coupler, £10; Labgear send-receive relay, 230-volt AC, £2; Panda TVI filter, £2; 62 Set, perfect for mobile Rx/Tx, £10.—Write with reasonable offers: G3JJU, 36a Westboro, Wimborne, Dorset.

WANTED: Tape Deck or complete recorder; faulty might suit if price right.—Full details and lowest price to: GW3GIN, 50 Romilly Road, Cardiff.

FOR SALE: Vols. 6 & 7 of *Short Wave Magazine*, bound; *Radio Handbooks* (Editors & Engineers), 11th & 12th Editions.—Box No. 2228, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

R107, in good condition, with RF24, complete with manual, £10. — L. Arnold, 24 Albert Road, Stechford, Birmingham, 33.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: G2IQ Two-metre Converter in tip-top condition (not surplus bits).—Write, stating particulars and price required, Box No. 2229, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: 3-EL 10/15m. Beam, £8 ; mast for same, £6 ; 35-foot lattice mast, £8 ; Panda ATU, £9 ; Low-Pass Filter, £1. Buyer collects.—Sullivan, 33 Keswick Road, Blaby, Leics.

R208, new condition, in transit case, complete with handbook, batt. and mains cables, £4 10s.; also ZC1 Mk. II, FB condition, modified for mains and Top Band, £8 (o.n.o.?)—G3MBW, 15 Hillside Avenue, Guilsey, Nr. Leeds, Yorks.

WANTED: R.A.E. correspondence course, Morse records and *Short Wave Magazine,* Volume 13. —Details: S.A.C. Addison, Block 14, R.A.F. Goch, B.F.P.O.43.

FOR SALE: Tx, 50 watts, 3 bands, 'scope, meters, valves ; R.107 Rx. S.a.e. for price list bargains. —G6OO, 41 Millview Road, Ruskington, Sleaford, Lincs.

HALLICRAFTER'S Super Skyrider, SX-16, 550 kc to 61 mc, manual, vy FB Rx, £20. WANTED: AR88, AR77, SX-28 or W.H.U.? — G3NKL, 64 Lexton Drive, Churchtown, Southport.

GELOSO 209 Receiver with manual ; unscratched condition ; perfect working model ; £55.—N. Jacobs, 41, Queenborough Gardens, Ilford. *(VAL. 1697.)*

PANDA CUB for sale, in almost mint condition, £40 (or best offer). Prefer buyer collects, owing to weight.—May be seen and tried at G4AH, 160 Cat Hill, East Barnet, Herts. *(BAR. 4272.)*

AR88D: Real FB, speaker, RCA phones, S-meter and manual, £35. FB Panda Cub ; buyer gets Z-Match Ae. coupler, dummy load, Tx/Rx relays and p/pack, 2in. x 2in. RF meters, Moni-Match SWR Bridge, plus meter, switched aerials, all combined in FB cabinet, £35 The Lot. UM4, £5 ; ZC1, Mk. II, £5 ; AVO Sig. Gen., £4 10s.; G4ZU 3-band beam with motor and ind. units, £5 ; 1200v. 500 mA double smoothed and fused p/pack, 19in. rack, £5. Other items. Will deliver 50 miles or so if required. —Please write before calling G3MAP. 22 David Road, Rugby.

FOR SALE: Ex-Naval VHF receiver type RL.85, 200/250v. AC, 27 to 84 mc in 3 bands, 13 valves, and service manual.—Send offer or s.a.e. for further details to: Bavister, 70 Crawley Green Road, Luton, Beds.

K. W. GELOSO Amateur Band Converter, RF gain control fitted, £14.—W. E. Quick, 9 Trenwith Terrace, St. Ives, Cornwall.

BC221/AH, professionally reconditioned, immaculate, £25 (o.n.o.?) G3FXB Rx, SX24/ Converter, 264 countries worked, £18. Valves, guaranteed: EB91, EF50, EF54, EF80, EF91, 6FI, 6F14, 6F15, 4/- each, post paid.—G3FXB, 86 Cross Road, Southwick, Sussex. *(Telephone 3382.)*

SMALL ADVERTISEMENTS, READERS—*continued*

SX28, perfect condition inside and out; sell or would exchange AR88D, 680X; s.a.e.—Pennington, 45 Cornwall Avenue, Peacehaven, Sussex.

LG300, Mk. II, £47 10s. 0d. cash, carr. paid; sale due to financial difficulties. — G3IJX, Kidside, Milnthorpe, Westmorland.

AR88D and AR88LF, excellent condition, £40 each. Two racks containing 160-, 80-, 40- and 10-metre Tx's with modulators and power supplies. Numerous other components, meters, valves, etc.; s.a.e. for full particulars.—G3OJ, 44 Preston Road, Holland-on-Sea, Essex.

PANDA EXPLORER Tx, 150w., £70 (o.n.o.?) Elizabethan Tx Console, black crackle, 40 watts, TVI-proof, 5 bands, £32. Bendix TA12C Tx, modified for 80, 40, 20 metres, £4. 150-watt modulator for 150-watt Tx, £6. Eddystone 504 Receiver (Communications), 580 kc to 30·5 mc, 5 switched ranges, S-meter, £25. Carriage paid on all gear purchased.—Box No. 2223, Short Wave Magazine, Ltd., 55 Victoria Street, S.W.1.

FOR SALE: Eddystone 840A, mint condition, only 100 hours' use; Mastatic aerial, complete. Offers? —Write 19a Packhorse Road, Gerrards Cross, Bucks.

WANTED: HRO, working, or for spares. Selling: VFO/xtal Oscillator Unit 145, with Power Unit 392. *Bulletins,* 1936-59; *Practical Wireless, Radio Constructor, Short Wave Magazine. Wireless Constructor,* 1924-26; *Wireless Weekly,* 1923; *Popular Wireless,* 1922-23; *Radio Times,* 1923-24. London area.—Box No. 2224, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HALLICRAFTER SX23 with speaker and servicing manual; serviceable; £12.—C. W. Elliott, 4 Church Walk, Streatham, S.W.16. *(Pollards 2795.)*

FOR SALE: HRO Senior Rx, table model, good condition, and general coverage coil sets, with power pack and speaker, £12 15s. No. 19 Set, mike, PSU, accessories, etc., £5 10s. Buyer collects.—Ring *Keynsham 3407* (after 6 p.m.): G3NXU, 18 Broadlands Avenue, Keynsham, Somerset.

PAIR new Brimar 6L6GA, 12/6; 120 *Short Wave Magazine,* £7; 49 *QST,* £4. — R. Grain, 15 Waverley Gardens, Grays, Essex.

BUG KEYS (new), all-brass, on ebonite, and mahogany base; a real sturdy job which will give pleasure and efficient service for years to come; £3. G.E.C. Miniscope in case (as new), with manual, £7.—W. Stirling, GM6RV, East Lodge, Kerelaw, Stevenston, Ayrshire.

WANTED: Oscilloscope, first-class appearance and condition; and surplus crystals Channels 45, 46, 47. State price.—Morgan, 52 Seafield Road, Southbourne, Bournemouth.

WANTED: Minimitter power pack and modulator units.—Christian, 65 Church Lane, Oakley, Bedford *(Oakley 283).*

SMALL ADVERTISEMENTS, READERS—*continued*

SALE: COMPLETE STATION, Marconi CR150 Receiver, mint condition ; matching case containing power supplies, built-in speaker ; £48. TABLE-TOP TRANSMITTER, 75 watts, miniature valves, compact unit construction, modulator, power supplies, mike, £22.—G3HID, Armadale, Burnham-on-Sea. *(Tel. 2511.)*

WANTED for cash by VQ4AA/G3LRM on home leave: Complete Low/Medium-power phone station, mains ; either LF/HF/VHF.—Tanner, 7 Raglan Way, Uley, Glos.

QUALITY Equipment at sensible prices: Geloso G210 Tx, £45 ; Geloso G207 Rx, £45 (both mint condition). HQ129X with latest makers' modifications, including calibrated bandspread, £45. Hallicrafter S27, fair condition, working, £20. BC-221, unmodified, with chart and power pack, £23. Leak TL12 amplifier with AM Radio Wharfedale sand-filled corner assembly, offers? Labgear Crystal calibrator, £5. Woden transformers and chokes, racks, meters, valves and quantities of quality components. Send s.a.e. and "want" list. All letters answered promptly, as must be sold.—G2HJV, 39 Northumberland Road, Leamington Spa. *(Phone 1390.)*

WANTED: Good Communication Receiver; also Converter, 14 to 30 mc. Full details (cash waiting). Collected East Midlands.—Box No. 2225, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TOWER, Steel Lattice, telescopic, 33 ft. open ; painted grey ; £20. Avo Universal Minor, £5 10s.—J. M. Woodroffe, 16 Fulmer Way, W. Ealing, London, W.13.

FOR SALE: Auto Transformer, 230v.-110v., 50 c/s. 54A Pyranol Capacitor Qty.2, 10 μF, 2 kv. DC. EHT transformer, 0-250v. tapped primary, 2600v. CT at 200 mA secondary. Varley LF swinging choke, 15/10 Hy, 0/300 mA. £6 the lot.—Marriott, A.M.W/T Station, Nr. Andover, Hants.

HRO-MX, 50 kc-30 mc, immaculate condition, power pack, coil racks, matching crackle speaker, £25. Deliver 30 miles.—P. Ward, 270 Park Street, Luton, Beds.

COLLINS TCS 14 Tx, works well, £5 ; Grayshaw Signal Generator, 100 kc-80 mc RF, £5 ; G73 Wavemeter, 30/-; R1155 for spares (no valves), £1. Carriage extra on above. Five hundred tested and boxed valves (*see* February *Short Wave Magazine* for list). — Meikle, 34 Victoria Road, Netley Abbey, Hants.

CR100, NL and S-meter ; RF26 unit, modified for 14, 21, 28 mc, 3·5 mc IF ; 7in. 50v. AC meter, £20 the lot (o.n.o.?)—Witham, 57 Gordon Road, Cowes, I.o.W.

"COMMUNICATOR" 2-metre 16-valve mobile Tx/Rx, 12v., excellent order, cost £80, accept £60 or terms. "Telecomm" 144/146 mc, 14-valve, double s/het. communications Rx, AC, as new, cost £65, accept £50 or exchange for first-class HF Rx.—Box No. 2226, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Marconi CR100, £20 ; recently overhauled by Marconi.—Write Boyd, 36 Egerton Gardens, S.W.3, or *Telephone FRO. 2600* (after 7 p.m. weekdays.)

SMALL ADVERTISEMENTS, READERS—*continued*

EXCHANGE Hallicrafters SX18, immaculate condition, 545 kc to 38 mc, for Eddystone 640 or similar.—Lyons, 5 East Street, Leigh-on-Sea, Essex.

FOR SALE: Collins 75A2 Receiver, complete with matching speaker; perfect condition. Offers?—Box No. 2227, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SIG. GEN., Grayshaw SG50, £3 10s.; Cap/Resist., Grayshaw CR50, £3 10s.; 1155 with pack and spkr., £3 10s.; p/pack, 300v. 200 mA, 12v., £1 10s.; TA12, broken up, 10/-; small Tx, unfinished p/pack, OK, £1. 77 *Short Wave Magazine*, best offer? 70 *Practical Wireless and Constructor* magazines, offers? Junk for beginners.—Schofield, 47 Ivanhoe Drive, Kenton, Middlesex. *(Evenings only.)*

WANTED: Valves, Type 5LPI, 807, 6Q5G, 80, 6B4G, 954, 955, 956, 6AB7, 6V6, 6SK7, 6L7, 6K7, 6J4, 1T4, 1R5, 77, 6A7, 76, 6BJ6, 84/6Z4; will exchange for 5U4G, 6AC7, 6SN7, 6SL7, 83, 1N21, 6SJ7, 6H6, VR105. Exchange TM-11-446, BC-1031A and 1032A manual for same thing for BC-1031B and 1032B Panadaptor. Want: Reiner Oscilloscope, good Audio Oscillator, RDO 30 mc Panadaptor. Have top-class portable oscilloscope and Advance Type 62 Signal Generator to swop. Manuals wanted: Crystal Calibrator No. 7, Mk. II; Dumont 208 Oscilloscope; R390/URR Receiver. Also want Magslips, Type 10638, 2280A.—Fletcher, 62 Moorbridge Lane, Stapleford, Notts.

HAMMARLUND Super-Pro Receiver, Type BC-794B, bandspread on all Amateur bands, excellent condition, with power pack. 150-watt transmitter, VFO, covering 80, 40, 20, 15 and 10 metres, 813 final; pair 811's mod., built-in ATU, single-switch control; new Panda Low-Pass filter; new PCR receiver. A gift. The Lot for £50. — Buyer collects at 88 Ormskirk Road, Up Holland, Nr. Wigan. *(Tel. Up Holland 422.)*

FOR SALE: An Eddystone Receiver, 680X, 12 months old, together with vertical aerial, £80 lot. —N. Reading, 62 Eastfield Road, Enfield, Middlesex.

VALVES FOR SALE: EF50, 1/6 each; 6V6, 6AL5, 6AS6, 6C6, 6SN7, 6D6, 42, 76, 6AC7, Z77, 2/6 each. Lighthouse Types: SG2C42, SG2C46, 5/- each; 805, 25/- each (plus postage). WANTED: Companion Power Unit Modulator for the Labgear LG.300 Transmitter.—Box No. 2230, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

K.W. VANGUARD Transmitter, 10-80m., one year old, in as-new condition, with K.W. low-pass filter; good DX and "States-side" results, cost £60. Owner purchased new transmitter. Price £40.—GM3MYJ, 31 High Street, Wick, Caithness.

EDDYSTONE 750, with matching speaker, £40; Tiger Z-Match Coupler, with instructions, £6; Denco 5-band coil turret, with dial, instructions, etc., 50/-. Will consider reasonable offers. — Box No. 2231, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

RADIOCRAFT (1955) Doubler/PA, bandswitched, full metered, ATU 7-28 mc; requires VFO and 600v. to make FB 100w. CW Tx; £12. Top Band phone/CW Tx, complete, twice WABC, £5 10s. Air test/collect or carriage extra.—G3ADZ, 3 Norris Gardens, Havant, Hants *(Havant 1861)*.

SMALL ADVERTISEMENTS, READERS—*continued*

PROUD OWNER of SX-28 has for sale R.208, realigned, some new valves, aerial pi-network; buyer collects; £9 (o.n.o.?)—Wilson, 48, Godstone Road, Purley, Surrey. *(BYW 1640.)*

SALE: K.W. Valiant, 10-160 metres, £35; R.E.E. 40-watt 144 mc Tx, complete, £60; Miniature Top Band mobile phone, 2E26 final, £7; AM912/TRC, 145 mc QRO PA, with brand-new unopened 4X150A, £10.—Box No. 2232, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HALLICRAFTERS SX101, LATE MODEL RECEIVER FOR IMMEDIATE DISPOSAL. FIRST £100 SECURES. PYE MOBILE RADIO TELEPHONE, VHF RADIO TELEPHONE COMPRISING BASE STATION AND ONE MOBILE STATION, FREQUENCY 118 TO 185 MC, £100 THE LOT (O.N.O.?) — MORTIMER, 51 TOWNHEAD ROAD, DORE, SHEFFIELD.

WANTED: J36 semi-automatic key, in excellent condition; state price.—Box No. 2233, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: BC348 Power Unit (inc. two meters) and speaker; working but needs slight attention; £8.—Tibbert, 397 Uttoxeter Road, Derby.

HALLICRAFTER Communications Receiver, S20R, S-meter, mains transformer, instruction manual, spare valves; first-class order throughout; £20.—*(MALDEN 6294.)*

R107 RECEIVER, 1·2 to 17·5 mc, £6 10s. AVO Model D, needs "P" adjustment knob, £4 10s.—Welsh, 110 Alderney Road, Slade Green, Kent.

FOR SALE: S27CA Rx, 130-210 mc, £35; RBW-2 Panadaptor, centre freq., 5·25 mc, £40; 1-177B Valve-tester with MX-949 adaptor, £8; TS-159 Sig. Gen. for TPX-1, £3; TS-325 A/U, 20,000 ohm/volt multimeter, £7; Marconi Sig. Gen., 150-300 mc, £2; TS-509 Wavemeter, 90-400 mc, £4; Triplett Sig. Gen., 100 kc to 120 mc, £15; Type 234A power pack, £2; ANQ-1A Wire Recorder, £3; Co-ax cable, 52 or 75 ohm, 6d. yd.—E. K. Laskari, 79a Woodstock Avenue, London, N.W.11. *(Phone SPE. 7536 after 7 p.m.).*

FOR SALE: Genuine AR88 S-meter, 57/6; 3 x 4 μF condenser pack, 12/6. Both brand-new; inclusive of postage.—A. J. Reynolds, 149 Waller Road, New Cross, London, S.E.14. *(Phone New Cross 1443 after 7 p.m.).*

30FT. STEEL LATTICE TOWER (2 Sections) with prop pitch motor, complete with AC power supply and remote beam position indicator; sacrifice at £8 10s. if collected Birmingham area; extra for carriage. Owner QSY.—Box No. 2235, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 740 for sale; one owner; £30 (o.n.o.?)—J. J. Rose, 38 Albert Terrace, Halifax Road, Dewsbury.

EDDYSTONE S.640, excellent condition; one owner; no modifications; £20 (o.n.o.?) New 813's, 30/-; 805's, 17/6. Various VFO's; rack 813 3-stage amplifier, 19in. 5ft. rack; portable masts. Possible delivery; s.a.e. enquiries.—G3ESO, 4 Earls Road, Amesbury, Wilts.

WANTED: Valve Tester; all-wave converter to 40-10 metres, Converter 10 metres down.—Box No. 2234, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: AR88D, bought last September from P.C.A. Spot-on performance; better than official figures; £55.—G2ZD *(Maidstone 87364* any time, or *Brixton 9342* daytime): T. C. Whimster, Bearsted Lodge, Bearsted, Maidstone, Kent.

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