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The SHORT WAVE Magazine

VOL. XXVII SEPTEMBER, 1969 NUMBER 7

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SHORT WAVE MAGAZINE

(GB3SWM)

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AUTHORS' MSS

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

Reflections

A few pages further on in this issue appears a statement regarding our non-participation in the Amateur Radio exhibition projected for October. There is no need to add anything here to what is said on p.417—merely to draw attention to it.

* * * *

In August on this page we discussed certain trends in the practique of DX operating which seem undesirable. The matter of DX-peditions of doubtful merit might also have been mentioned—and here we do not (repeat, not) refer to the many worthwhile trips made round the country each season by U.K. amateurs, with the laudable objectives of (a) Breaking new ground in the way of rare counties or difficult localities, and (b) Having at the same time an interesting holiday with an Amateur Radio slant. This sort of thing is all entirely to the good and to be encouraged, as it adds to the general interest and on-the-air activity.

The DX-pedition we have in mind is of quite another sort—the "sponsored" project, to rare and distant parts, which, being very expensive to mount, is only possible at all if a sufficient number of donors can be induced to come forward—the implication being that those who pay the doubloons will get the contacts. Not only is this concept entirely contrary to the spirit of Amateur Radio but it is obviously open to abuse, to the extent that financial impropriety might be suspected, even where none exists or could be proved to exist.

In the interests of all concerned, the "sponsored" DX-pedition should be firmly discouraged—never contribute, and don't join in the pile-ups even if the expedition does get out.

* * * *

As forecast earlier in the year, this has indeed turned out to have been the most active season yet in the Mobile Rally context. With nearly 3,000 U.K. amateurs now licensed for mobile operation—representing approximately 20% of the total of British licences in issue—attendances have been large and enthusiastic. A feature of many of these events has been the increase in Trade support. Gradually, it emerges that the gregarious instincts of most radio amateurs are well satisfied by the properly-organised Mobile Rally.

Austin Forsyth, G6FO.

INTRODUCTION TO LOGIC SWITCHING

AND A DESIGN FOR AN ELECTRONIC KEYER USING INTEGRATED CIRCUITS

D. A. HOLLINGSBEE (G3TDT)

IN the field of industrial control semi-conductor " logic " elements are rapidly superseding the relay and other mechanical switches. For complex processes they offer the advantages of small size, silent operation and, subject to correct design, indefinite life and reliability. The theory of logic switching has been described many times in the technical press and it is not intended to repeat it here in detail, but to give just sufficient outline to enable the reader to understand the working of this design.

The basic logic unit is the " gate " which can take two primary forms: The " AND " gate, Fig. 1A, can be likened to a series arrangement of switches in which the output is high until switch 1 *AND* 2, *AND* 3 are closed. Fig. 1B shows an " OR " gate in which the output is high if either switch 1 *OR* 2, *OR* 3, is closed.

Rather than high or low, the output condition is usually referred to as " 1 " or " 0 " and, depending on the logic system used, the " 1 " can be positive or negative. Also by putting all the switches into the opposite state, the function of the gate is reversed and termed NOR and NAND. Needless to say, transistors are used as the switching element. In some cases, conventional components are moulded into circuit blocks and work at high enough voltage to permit direct connection into systems using heating elements, gas relays, motor contactors, and such. The *Mullard* " NORBIT " range is a good example of these. For high speed applications and when many components are involved, integrated circuits are used. These take two basic forms known as DTL (Diode/transistor logic) and TTL (Transistor/transistor logic). In general, the DTL is slower and dissipates more heat than the TTL. On the other hand the DTL offers better immunity to stray noise and is, generally, more tolerant.

Apart from gates, various other devices are available but only one is of importance. This is the JK Flip-Flop, which is a monostable version of the multi-vibrator. It has two outputs, one of which is always at 1 when the other is 0. If a square wave is applied to the input (clock) the output will change on *one* edge of the input signal. In the case of the DTL circuit used here it is the negative going edge that causes the change and it can be seen that the output frequency is half the input and that if a number of JK's are connected in series, each will divide the incoming signal by two. This is the basis of binary counting as used on direct read-out receivers, frequency meters, etc., but need not concern us here. In addition to the connections mentioned, there are facilities for pre-setting the outputs before a clock pulse is applied and for ensuring a certain condition after a clock pulse.

Coming now to Amateur Radio it would not seem, at first glance, that there is much application apart from frequency measurement and digital voltmeters. Second thoughts suggest several uses, the first being in RTTY in which character generation is a perfect example of what can be done with logic. For CW sending it would be practical to design a keyboard sender that transmitted one cycle for a *dit* and three for a *dah*. It was this latter thought that prompted the idea for an electronic keyer of the more or less conventional style but using up-to-date techniques.

Design Considerations

The automatic keyer must work from a standard paddle arrangement and give an equal mark/space ratio to one side and a 3 : 1 ratio on the other. It must not be possible to start a " mark " until the minimum space-time has elapsed and, once started, a " mark " and " space " must be completed. The speed range must be such that a novice (like the writer!) can attain proficiency while the best operator cannot beat the machine —say, 6 to 40 words per minute. Without knowing what constitutes an average word or character it is difficult to define a word but a little research gives an average word as five letters and an average character as two *dits* and a *dah*. This is the equivalent of ten spaces per character, including the gap, so a maximum space width of 0·2 seconds and a minimum of ·033 was the target.

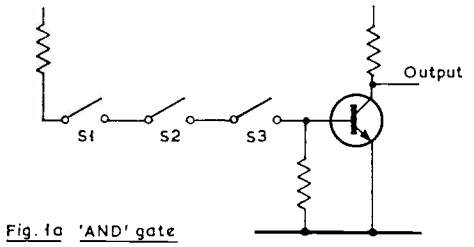


Fig. 1a 'AND' gate

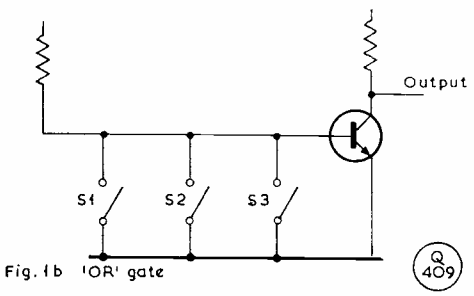


Fig. 1b 'OR' gate

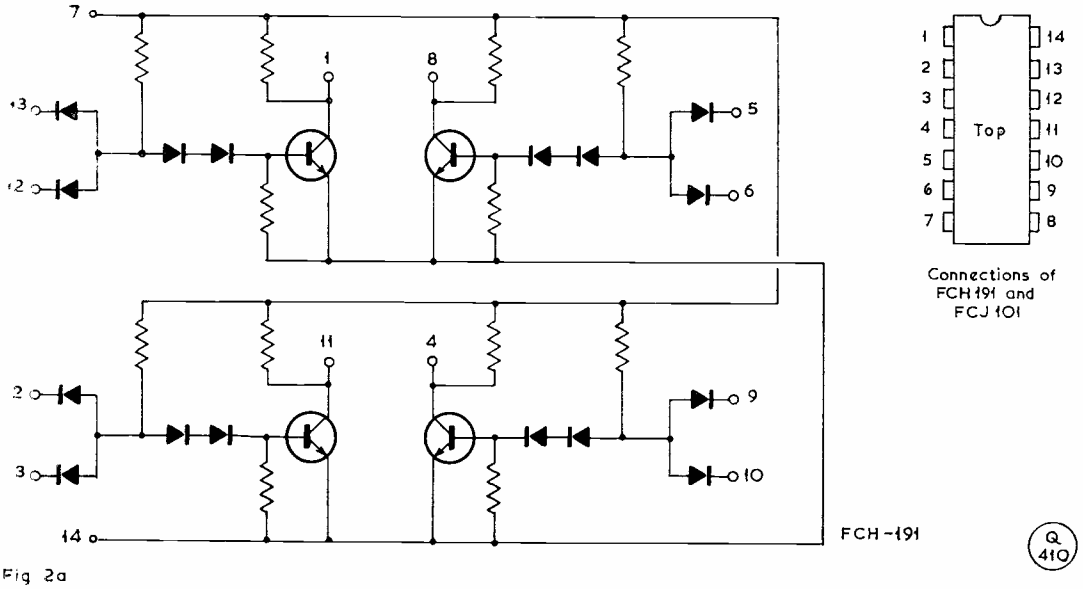


Fig. 2A. Diagram of the FCH-191 Integrated Circuit.

Component Selection

The *Mullard* DTL's type FC were selected as they are inexpensive and easily obtainable. The maximum counting rate, incidentally, is about 5·0 mc. The gate unit chosen was the FCH 191, Fig. 2A. This is described as a NAND/NOR quadruple gate and consists of four separate gates in one package measuring 11/16″ x ¼″ x 5/32″ approximately. Each gate has two inputs and the working is such that if *either* input goes to " 0 " (negative in this case) then the output is " 1 " (positive). The companion JK flip-flop is the type FCJ101, Fig. 2B, p.414. The circuit of both types is shown in Fig. 2. In this application none of the J or K inputs are used and are strapped to positive as are unused inputs on the gates.

Mark or space time is determined by a relaxation oscillator utilising a unijunction transistor. This is another device that may be unfamiliar. It functions as follows: Normally, the device is open circuit, but if the voltage on the emitter is raised then, at a certain point, the emitter will conduct through Base 1 and continue until the voltage on the emitter is lowered below a certain level. If a capacitor is connected between the emitter and negative and charged through a resistor, then after a certain time, the capacitor will reach the voltage at which the emitter conducts and the capacitor will discharge until the stored voltage is reduced below the cut-off point of the transistor. As the charge passes through the base resistor an EMF is developed across it in the form of a pulse—see Fig. 3, p.415. The remaining transistors are all conventional and their purpose will be described later.

CIRCUIT DESCRIPTION

Looking at Fig. 4, and with numbers in brackets referring to pins, in the rest state the inputs (10 and 9) to gate A1 are 1 (high), therefore the output is 0. This is split two ways: To gate A2 to drive the output to 1 and switch on T1 thereby preventing Cx1 from charging, and to gate A3 where the signal is inverted by gate A4 to hold the relay switch, T4, off. (*See* Fig. 4, p.415.)

Dot Generation

When the paddle is moved to the dot position one input (10) of gate A1 is taken low *via* diode D1. The output from A1 (Now " 1 ") permits an " 0 " on the output of A2 and A3. A2 switches off T1 and allows Cx1 to start charging while A3 is fed back to clamp A1 (in case the paddle is released) and inverted by A4 to turn on T4 and the relay. The paddle also puts a " 0 " on C1(9) to give " 0 " out on C2(11). This clamps the second JK which is not required for dot production and feeds an " 0 " back to C1(10) to hold in. When the oscillator fires, a positive going pulse is fed to the base of T3 which, in conjunction with B2 and B4 form a pulse-shaping circuit. This is needed as the JK will only respond to signals that change from " 1 " to " 0 " in 0·1 microsecond. When this signal reaches the JK it changes over and the output becomes " 0 "; this is taken to B3(5) and inverted by B1 to give an " 0 " on the output (4). This is fed to A3 where it is inverted to switch off the relay *via* A4 and T4 (dot complete) and also to A2 to keep the oscillator going for the space-time irrespective of the paddle position. The low output from JK1 is also used to clear the hold-on of C1 and C2(2).

[*cont'd. p.415*

TABLE I

I.C. Connections, Fig. 4

CIRCUIT REFERENCE LETTER	PIN No.													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	C	C	C	C	C	C	I	C	C	C	C	C	C	O
B	C	C	C	C	C	C	I	C	C	C	C	C	C	O
C	NC	C	C	C	I	I	I	NC	C	C	C	I	I	O
D	I	I	C	I	NC	I	I	NC	I	C	I	I	I	O
E	I	I	C	I	C	C	I	NC	I	NC	I	I	I	O
F	C	C	C	C	C	C	I	C	C	C	C	C	C	O

CODE : C, See Circuit diagram, Fig. 4: I, 6 volt + rail: O, Ground: NC, Do not connect.

This table, with Fig. 2B below and Fig. 4 opposite, should be studied carefully by those not familiar with logic circuitry and integrated-circuit modules. In effect, Fig. 2B is a unit having external connecting points as numbered. By reading Table I with Fig. 4 and Fig. 2B, an operating circuit is built up to perform the desired function —in this case an automatic CW key.

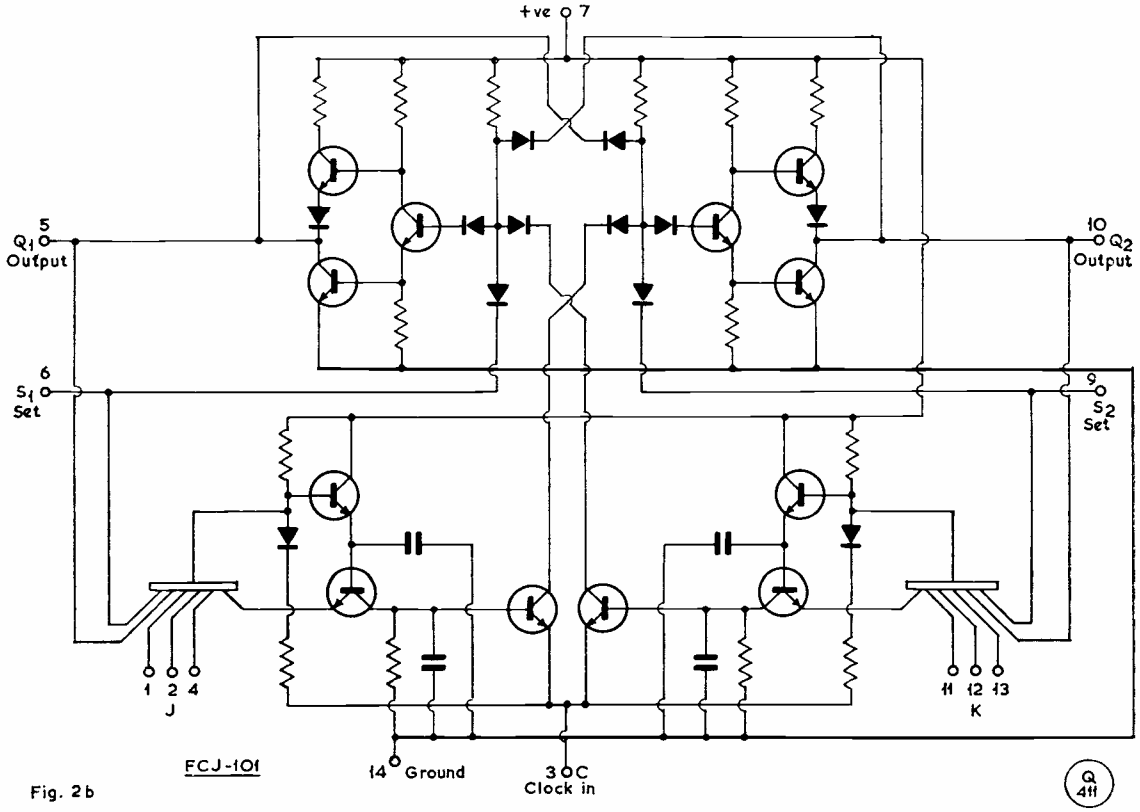


Fig. 2B. Diagram of the FCJ-101 Integrated Circuit.

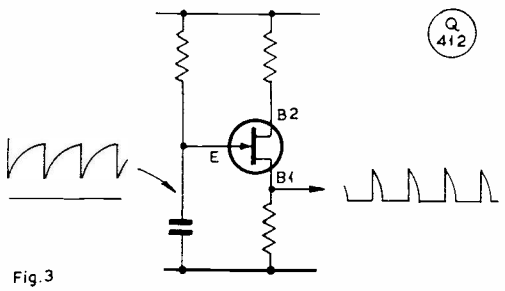


Fig. 3. Unijunction relaxation oscillator—see text.

When the second oscillator pulse reaches JK1 it causes the output (10) to revert to "1." (JK2 is not affected as it does not respond to positive going signals.) The circuit now reverts to its original state and if the paddle is still in the dot position, will start again.

The purpose of the zener diode between Cx1 and T1 collector is to hold the capacitor just below the emitter cut-off voltage of T2. If this is not done, the first timing period is almost twice as long as the second and subsequent periods as the capacitor is not completely discharged when the oscillator fires. The zener suggested gives an error of about 10% on the prototype. A diode, on OA91 for example, in series with the zener could give a better match. It may be found with some unijunctions that the zener will not allow it to cut off, in which case two diodes in series could be tried. In general, this problem should not occur, but transistors do not always meet specifications!

Dash Generation

When the paddle is moved to the dash position a low is again applied to gate A1(10) but D1 is now reverse biased, the input to C1(9) remaining at 1. This in turn implies a "1" on the re-set terminal of JK2 which

Table of Values

Fig. 4. IC Electronic Keyer

Cx1	= 1·0 μF, tantalum (*Radiospares*)	Tr4	= BSW66 (*Mullard*), *see text*
C2, C3	= 0·47 μF tantalum (*Radiospares*)	*Gate* A, B, C, F	= FCH-191 Integrated Circuit (*Mullard*)
C4	= 0·1 μF		
C5	= 0·22 μF disc ceramic	*JK;* D, E	= FCJ-101 Integrated Circuit (*Mullard*)
R1, R6	= 4,700 ohms		
R2	= 56,000 ohms	D1, D3, D4, D5	= OA91, etc.
R3	= 33,000 ohms	D2	= OA202
R4	= 10 ohms	ZD1	= BZY88-C1V3 (*Mullard*)
R5	= 100 ohms	RL	= Reed Coil No. 1 (*Radiospares*), coils in parallel (connect diagonals). *See text for reeds*
RV1	= 100,000 ohms		
RV2	= 10,000 ohms, preset		
Tr1, Tr3	= BC108, 2N2926 etc.		
Tr2	= 2N2160 (*SGS*)		

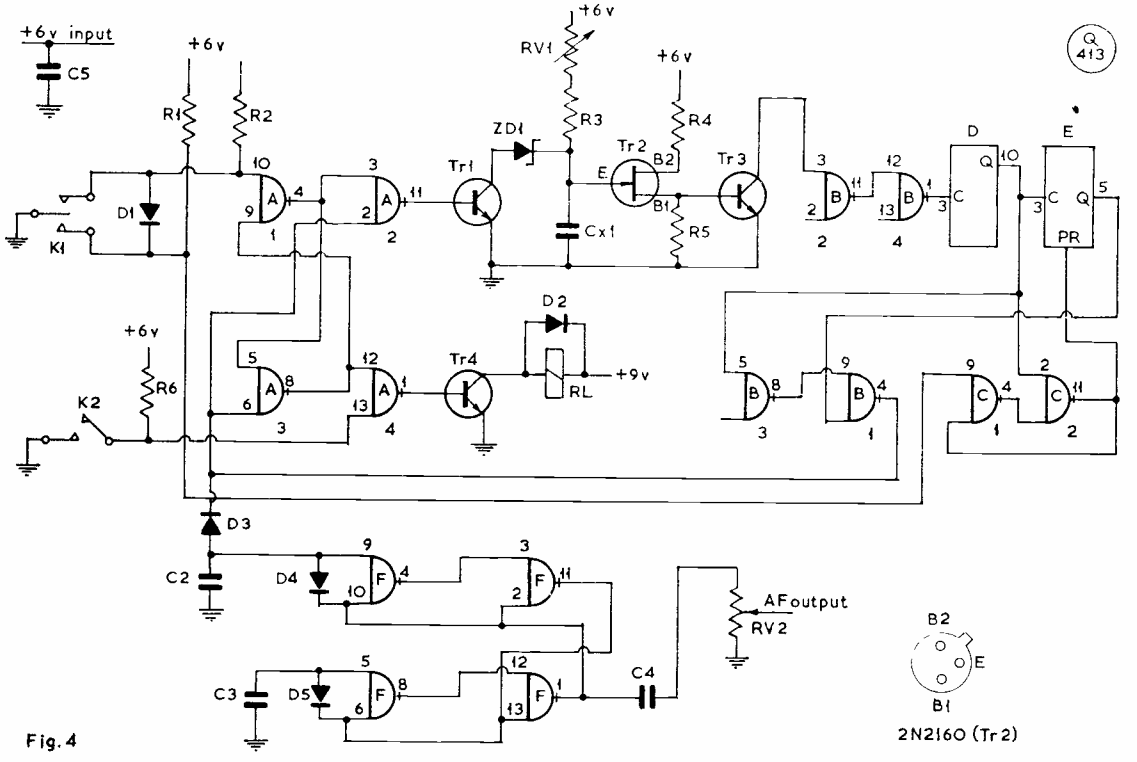


Fig. 4. Circuit complete of the I.C. Electronic Keyer—read with Fig. 2B and Table I.

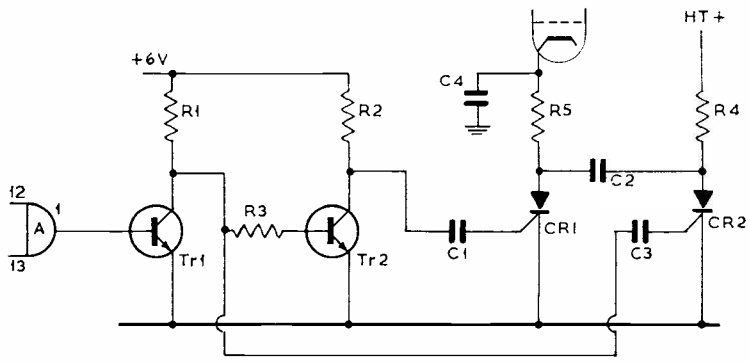


Fig. 5. Cathode keying by Silicon-Controlled Rectifiers.

means it is not clamped in one condition.

The system starts in the same manner as for the dot. The relay comes in and the oscillator starts, but when JK1 changes state the negative-going output signal causes JK2 to change over. This gives an " 0 " on the output of JK2(5) and this is fed to gate B1(10). This signal takes over from JK1 so that although the signal from B3(8) has changed to " 1 " the output from B1(4) remains at " 1." As a result the front-end conditions are unchanged and the relay remains energised for a second period and the oscillator is still running. The second pulse from the oscillator causes JK1 to change state again and the output (10) goes to " 1 " but the rising signal does not affect JK2 so the rest of the system is unchanged and the relay is energised for a third period. At the end of this time JK2 once more changes but this time the output goes to " 0 " and JK2 changes over so that the signal to B1(10) becomes " 1." As the signal to B1(9) is also " 1 " (*via* JK1(10) and B2(8)) the output of B1 is " 0 " and the relay is released but the oscillator is kept running to give the " space " in the same way as for the dot signal. Note that C1 and C2 are not operative during dash generation.

Construction

Fig. 4 is a wiring diagram that can be duplicated with point-one pitch *Veroboard*. These components are intended for printed-circuit mounting and trouble may be experienced if conventional wiring methods are adopted.

The maximum speed is largely a case of relay selection, which in turn will depend on switching requirements. The supply voltage to the relay can be increased to any figure that the switching transistor will stand.

In the case of the BSW66 this would be about 30 volts. In general, the lower the coil resistance the better as this implies a lower inductance and less problem with dangerous transients and, although these can be suppressed with a diode as shown in the circuit, there is a tendency to slow down the release time of the relay.

In point of fact the BSW66 was specially developed for relay switching and has a V_{CEO} of 100 (max.) and as the specified reed relay coil produced transients of about 50 volts it could be used without the diode network but it has been included for two reasons. First, the high voltage could cause mis-firing of the IC's and secondly the reed contacts release faster than they make and the 1·5 mS (approx.) delay evens out the mark/space ratio at maximum speed, in this case 100/120 cycles.

Table of Values

Fig. 5. Circuit of SCR Cathode Keying

C1, C3	= 0·1 μF	R5	= Existing component
C2	= *see text*	Tr1, Tr2	= BSW66, BFY 50/1/2, etc.
C4	= Existing component	CR1, CR2	= *see text*
R1, R2	= 560 ohms		
R3	= 4,700 ohms		
R4	= *see text*		

There is a choice of four dry-reed switches to suit the coil and the type used in the prototype was designated " Reed 7 RSR," by *Radiospares*. It is a normally open switch rated at 250 mA DC, 15-watt maximum, with a breakdown voltage of 750v. Also suitable is type Reed 13-RSR which has change-over contacts but is only rated at 200 mA., 10-watt and breaks down at 300v. Of course, an infinite number of reed coil/transistor assemblies could be cascaded, the second stage having its base connected to the collector of the preceding stage through a 4700-ohm resistor. This will give alternate open and closed contacts.

The cheaper BFY50 transistor will work in this circuit but experiments with other transistors or relay coils should only be attempted if a good oscilloscope, backed by some knowledge of the subject, is available. Don't forget a highly inductive load is being switched in a fraction of a micro-second.

Fig. 5 shows a scheme for cathode keying that dispenses with the relay and uses instead two silicon-controlled rectifiers (SCR) or thyristors. This is a three-terminal device with anode, cathode and trigger or gate. In its normal state the SCR blocks the flow of current but when a few volts are applied to the trigger (positive with respect to cathode) it conducts like a normal rectifier and continues to do so even if the trigger signal is removed and can only be shut off by reducing the current below a certain figure. In the circuit CR1 is switched on when Tr2 is turned off. This enables C2 to charge up and when Tr1 is turned off, CR2 is turned

on and the positive charged terminal of C2 is shorted to earth. This puts a negative pulse on the anode on CR1 and interrupts the current flow long enough for it to turn off (approx. 0·1 milli-seconds).

No component values are quoted as the SCR's would need to be selected to suit the transmitter and would-be experimenters should obtain manufacturers' data sheets. However, the following points may help:

(1) The SCR cut-off current must be below the valve cathode current,

(2) The current through R4 must be below the SCR cut off,

(3) C2 must be large enough to provide sufficient current for CR2 to turn on and must be of good quality construction (try 0·1 μF ceramic).

For high-voltage applications the price is likely to prove prohibitive but 400v. types are available, new, at about 25s. each. Normal pulse shaping methods could be adopted although there will not be any arcing to worry about.

The side tone generator produces a square wave at about 900 cycles and is switched off by the clamping diode D4 which is reverse biased when the relay is called for. Almost any free-running oscillator circuit could be used instead provided the switching arrangement does not load the logic circuit. The output can be taken direct to headphones or the AF stage of the receiver and is completely free of clicks. A loud speaker could be used *via* a transformer. As shown the generator does not work in conjunction with the manual key as this facility is primarily for tuning up.

Power requirements are six volts at a modest 50 mA so dry batteries would last a reasonable period. If a mains power pack is used it must be regulated to between 5·5 and 6·5 volts. On no account must it exceed eight volts.

Setting Up

The shortest time unit is determined by R3 and this should be adjusted with RV1 at minimum resistance, a lower value giving a shorter time. Increasing the value of RV1 will give a wider range. The values suggested give pulse lengths from 35 to 140 milliseconds, or about 34 to 8½ words per minute. The only other point is the key contacts K1; only a very small current passes through them so perfect conductivity is essential.

U.K. LICENCE STATISTICS

We are informed by the Post Office that as at June 30, the U.K. radio amateur licences in issue totalled as follows: Amateur (A) 13,216; Amateur (B) 1,576; Mobile (A) 2,627; Mobile (B) 201; Amateur TV, 184. This makes it that there are 14,976 G licences extant, and that of these 2,828 have the additional permit for mobile operation.

Analysing the RSGB membership at the same period against these figures, we find that while about 8,000 of the total membership are given as holders of transmitting licences, some one thousand or so of these would be in the category of overseas members holding Tx permits. This means that U.K. transmitting members of the RSGB total approximately 7,000—which is less than half the 15,000 U.K. amateurs licensed! This is disturbing, because on the last analysis on these lines (p.235, June, 1968) the RSGB could then be shown to have had 60% of U.K. amateurs as members. The proportion is now down to less than 50%.

AMATEUR RADIO EXHIBITION — SPECIAL NOTICE

This year's Amateur Radio exhibition is scheduled for October 1-4, *venue* as last year (New Horticultural Hall, London, S.W.1). For the first time since these events were started, more than 20 years ago, we shall not be taking a stand.

Our general attitude towards the exhibition as now constituted was explained in the Editorial in the July issue of SHORT WAVE MAGAZINE. On these grounds—and also because we are always particularly busy as the winter season starts—we have withdrawn from whatever exhibition may be taking place this October, in the hope and with the expectation that there could be a real Amateur Radio Show and Convention, with full trade support, either next year or in 1971.

However, anyone coming to London during the period October 1-4 will find that the *Magazine* Office and bookstall will be open every day till late in the evening. We are within a few minutes' walk of where the exhibition is to be held. The nearest Underground station is St. James Park; we are a couple of minutes away, right opposite the New Scotland Yard building, near the corner of Strutton Ground, known to every taxi-driver in London. Any bus along Victoria Street passes our office, and our window (at street level) looks exactly like the illustration on the front cover of the August issue.

We shall have the whole range of our books and publications on display, with subscription service and *Magazine* staff in attendance. It will be possible for book orders to be packed and despatched from the Office immediately—so that you need not be burdened by having to carry anything home. The service will be immediate and certain—for years now we have been organised to deal with book orders, large or small, through the post. Indeed, we are the largest purveyors in the business of books on Amateur Radio, an enterprise we started as long ago as 1946.

Our current range of titles is shown in this issue—*see* inside front and outside back covers, and p.460. All these titles will be laid out for your inspection (subject to being still available when the time comes).

If you are going to be in London during October 1-4, come and see us. Remember that the Tube station is St. James; any bus along Victoria Street will drop you within a short walk if you ask to be put off at "The Army and Navy" or "New Scotland Yard"; any taxi-driver will drop you at our door if you ask for "55 Victoria Street, corner of Strutton Ground." We shall be glad to see you.

DISCUSSING PHASED VERTICAL ANTENNAE

ON THE HF BANDS—A TRI-BAND SYSTEM GIVING DIRECTIVITY CONTROL BY SWITCHING—CALCULATIONS, MEASUREMENTS AND PRACTICAL APPLICATION

B. N. TAIT (G3DDN)

THERE must be many amateurs who feel that the erection of a rotary beam in their garden is rather a frightening and costly undertaking, and yet think that without it they are getting left behind in the search for DX on the HF bands. In the writer's case, having moved to a magnificent site in Cornwall right on a cliff edge overlooking the Atlantic, the problem was one of neighbours who had paid large sums of money for a property with a sea view, and who were unlikely to take kindly to a Quad or Yagi in their foreground! A ground plane had already proved most successful, but, on 20 metres in particular, European QRM can very easily blot out all but the strongest DX stations—unless one can devise an aerial system with the advantage of directional properties.

So experiments were started using a pair of ground planes, switching them in and out of phase, which is almost equivalent to rotating an antenna mechanically, and certainly a lot easier and cheaper. Initial tests were made using two home-made 10-metre ground planes spaced 16 feet apart. Fed " in phase," they produce a bidirectional figure-of-eight pattern broadside to the plane of the verticals; fed 180° " out of phase " a similar pattern is produced in the opposite directions, *i.e.*, " endfire," as it is called. The actual theoretical forward gain is not more than 4 dB over a single vertical, but the side attenuation can be as much as 30 dB, which compares very favourably with any rotary beam. The method of phase switching is shown in Fig. 1.

Having proved the effectiveness of a " vertical beam," the writer embarked on a somewhat more ambitious scheme—a three-band vertical beam system, using two commercially built ground planes incorporating traps for Ten, Fifteen and Twenty metres. It was decided to settle on a spacing of 16 feet, as half-wave spacing is most suitable for 10 metres, and the advantage of quarter-wave spacing (as it is on 20 metres) is the fact that by feeding the verticals 90° out of phase—instead of 180°—a cardiod pattern is produced with a side attenuation of 20 dB and a rear attenuation of 30 dB—most useful for overcoming the QRM on Twenty. Then, by inserting a quarter-wave delay line in either feedline the cardiod pattern can be switched in either direction.

The switching does become a little complicated with all the necessary quarter and half wavelengths of coax required for each band, but nevertheless the whole system is very much simpler than the mechanical rotation of a fairly large beam! The three-band switching is shown in Fig. 2. At Fig. 3 is the front panel layout, showing markings for each band—*see* p.420.

Measuring the Coax

The formula for calculating an electrical quarter wavelength of coax is:

$$\frac{246 \text{ feet} \times \text{velocity factor}}{\text{frequency (mc)}}$$

The velocity factor of normal coax is somewhere between 0·5 and 0·8, but if it is not known for certain (normally obtainable from the manufacturer) it is advisable to calculate this first, otherwise a considerable number of short lengths of coax are going to finish up in the dustbin.

This is the suggested way of going about the calculation: Cut off exactly 14 feet of 52-ohm coax. Connect one end to a single-turn loop of wire and leave the other end open circuit. Couple the loop loosely to the coil of a GDO and find a dip on the meter at a frequency somewhere below 14 mc. Check this frequency very accurately with the aid of a general coverage receiver. It is now possible to calculate the velocity of this coax by writing the previous formula as:

$$\text{Velocity factor} = \frac{14 \text{ feet} \times \text{frequency (mc)}}{246}$$

Repeat the process with the 75-ohm coax.

Both these lengths of coax can be used in the circuit, so in order to get them to resonate in the centre of the 20-metre band, they should be trimmed at not more than an *inch* at a time, checking progress with the GDO.

All the required lengths of coax can now be cut using the original formula for calculating the approximate length, adding on several inches before the initial cut, and

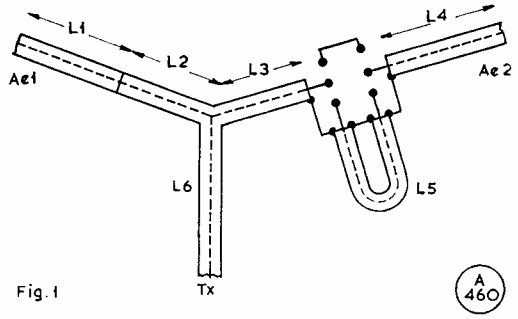


Fig. 1. With spacing for the Verticals at half-wavelength, dimensions for L1, L4, should be any equal length of 52-ohm coax; L2, L3, quarter-wave of 75-ohm coax; L5, half-wavelength of 52-ohm coax; L6, any length of 52-ohm coax.

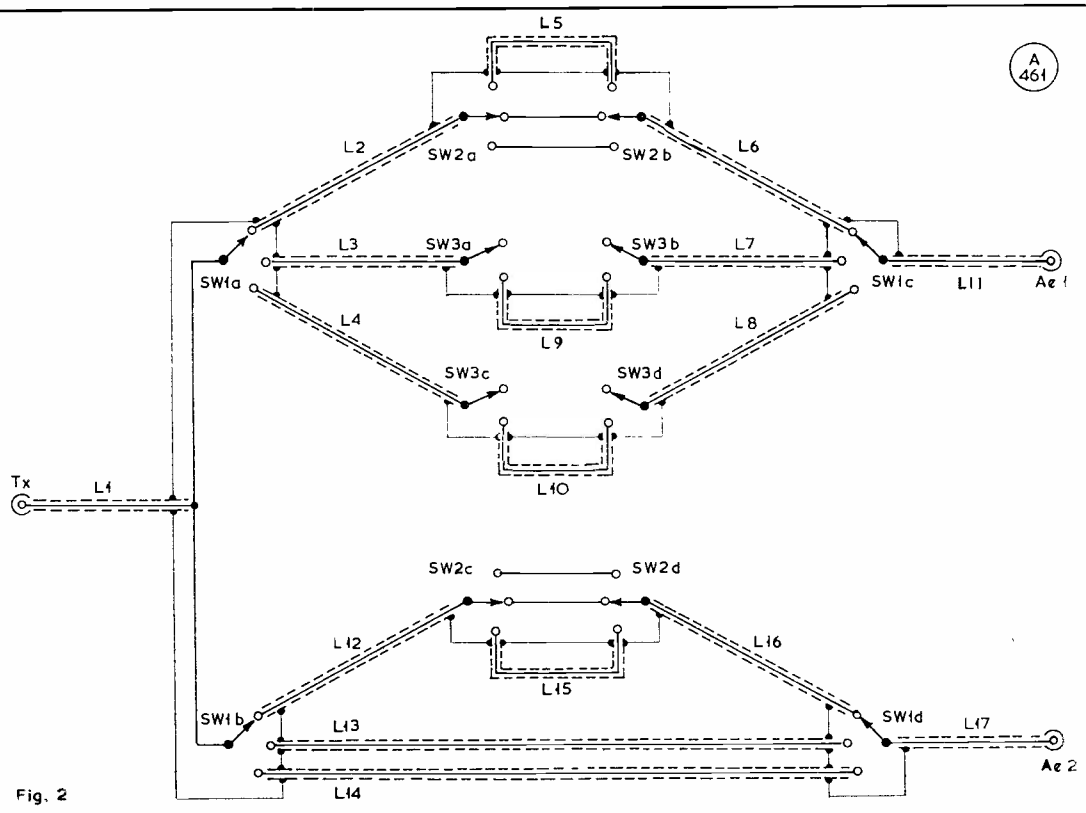


Fig. 2

Fig. 2. Lengths for Phasing Units : L1, any convenient length of 52-ohm coax. L2, L12, quarter-wave 20m. 75-ohm coax. L3, L13, quarter-wave 15m. 75-ohm coax. L4, L14, quarter-wave 10m. 75-ohm coax. L5, L15, quarter-wave 20m. 52-ohm coax. L6, L7 and L8, L16, 52-ohm coax, kept as short as possible (see text). L9, half-wave 15m. 52-ohm coax. L10, half-wave 10m. 52-ohm coax. L11, L17, any equal length of 52-ohm. Sw1, 4-pole, 3-way. Sw2, 4-pole, 3-way. Sw3, 4-pole, 2-way. (These switches should all be high-quality ceramic.) The feeder lines to the two vertical aerials Ae.1 and Ae.2 must be of identical electrical length.

then trimming and checking with the GDO after each cut. Note that on ten metres *half an inch* is critical.

A half-wavelength of coax is naturally exactly double the length of a quarter-wave, but note that to measure this with the GDO the far end of the coax must be short circuited.

Construction

The whole unit can be built into a metal box 15in. x 9in. x 7in. No chassis is required, as the switches are mounted on the front panel, the sockets on the back, and the coax is coiled up and tucked inside the box.

First make the connections from one tag to another on Sw2 and Sw3 as shown on the circuit diagram, keeping the wires as short as possible, then mount the switches on the front panel. Using three or four standoffs construct a common earthing line around the switches, made of 12 or 14g. wire. The braiding at the ends of all the lengths of coax which are connected to the switches should be soldered securely to this wire. The input and output sockets should now be mounted on the back of the box.

Next, solder all the measured lengths of coax to the switches and also the 52-ohm coax from Sw1C and Sw1D to the two output sockets. Now make the connection from the input socket also with 52-ohm coax, but at the switch end connect to Sw1A only.

Alignment

Connect a GDO to the input socket of the unit by taking a single loop of wire loosely coupled to the coil, and switch Sw1 to 20 metres and Sw2 to " in phase." With nothing plugged in to either output socket, check for resonance, *i.e.*, dip the meter, at some frequency below 14 mc. (You are now measuring L1 + L2 + L6 + L11.) Check this frequency accurately, and now disconnect the input coax (L1) from Sw1A and connect to Sw1B. The resonant frequency of this section should be identical with that of the first section, if the two antennae are to be exactly in phase. If this is not the case they can be balanced by shortening or lengthening L6 or L16, whichever is more convenient. Repeat this check until the resonant frequencies of both sections are identical.

Now, with Sw1 switched to 15 metres carry out the same check for " in phase " on this band. Should adjustment be necessary the cable to be trimmed is L7. If it is not possible to balance them it may be necessary to add a short length of 52-ohm coax between the end of L13 and the connection to Sw1d.

Repeat the same procedure for 10 metres, adjusting the length of L8, or adding a short length of 52-ohm coax between the end of L14 and Sw1D.

It is not so important to check the " out of phase " or cardiod positions; if these are not exactly 180° or 90° it simply means that the directional pattern of the two

verticals will be slightly moved to one side or the other—however, with patience it is possible to get these to perfect accuracy by the method previously described, but noting the frequency difference between the " in phase " and " out of phase," and adjusting the appropriate switch connections accordingly.

Results

The foregoing may seem somewhat complicated, but the fact is that no antenna system will work at maximum attainable efficiency unless quite a lot of time is spent on detailed measurements and adjustments. If the system is correctly adjusted and the two ground planes are reasonably in the clear, the lobe patterns and extremely low-angle radiation prove most effective for DX working. The writer's system is laid out to give the two cardiod patterns on 20 metres towards VK and ZL for the long and short paths. Signal reports have been most gratifying, and the ability to cut down (and even eliminate) QRM at the turn of a switch certainly makes the effort seem well worth while.

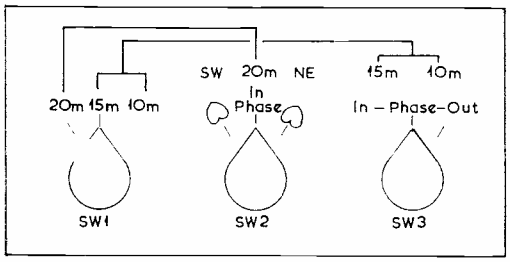


Fig. 3. Control Panel Layout.

As a footnote the Antenna Noise Bridge made by *Omega-T Systems Inc.* and available in the U.K. from *Radio Shack, Ltd.* makes the work of measuring the lengths of coax a much simpler, quicker and more accurate job than by using a GDO.

LABGEAR 160-TWIN TRANSMITTER

MODIFICATIONS FOR OUTPUT ON EIGHTY

R. C. WARRICK (G3VCJ)

HAVING spent two holidays on the south coast of England recently making very few mobile contacts on Top Band it was decided to attempt modifying the existing 160-metre gear in the car to cover 80 metres as well, in the hope that the extended range would improve the situation.

In spite of its name the Labgear 160-Twin as-is operates on 160 metres only. The modification for 80m. was found to be very simple and it was felt the details would be of interest to other users of this transmitter.

The only components needed are two miniature slide switches, fitted at each end of the front panel—the right-hand one " Down On," and that on the left " Down Off." ·

Next cut to open circuit the lead between the stator blades of the VFO tuner and the postage stamp trimmer (there is only one lead between these two points) and wire in the left-hand switch, insulate the joints and take the leads through a piece of screening; this operation has the effect of removing all the capacity from the VFO except for the tuner itself across the coil. The VFO output is now in the 160-metre band instead of over 0·9-1·0 mc.

Strangely but conveniently the anode doubler coil in the next stage is already resonant in the 80-metre band and tuning the slug for a grid dip at 3·6 mc gave equal drive to the PA both on 160 and 80 metres.

To complete the modification we only have to tap the tank coil half-way along, and take a lead from here and also from the tag at the top of the coil to the RH switch (Switch " Down " then shorts out half the coil for 80m.).

Setting Up

With both new switches in the " Up " position the Tx is as original for 160m. Slight adjustment of the postage-stamp trimmer will be necessary to correct the calibration, due to the newly fitted leads.

Putting both new switches in " Down " position changes over to 80m., and though 3·5 to 3·8 mc will be a little cramped—about one inch of the scale, found satisfactory in use—calibration marks can be made by checking against a reliable receiver and/or frequency meter.

On Test

The Tx performed as usual on 160m. and on 80m. the output was even better; no abnormal drift was experienced and using a whip aerial on the car for 80m. no trace of a signal was found on the 160-metre band even at 100 yards.

Thanks to G3KQM for his patience and help in double checking calibration accuracy and comparative signal reports band to band.

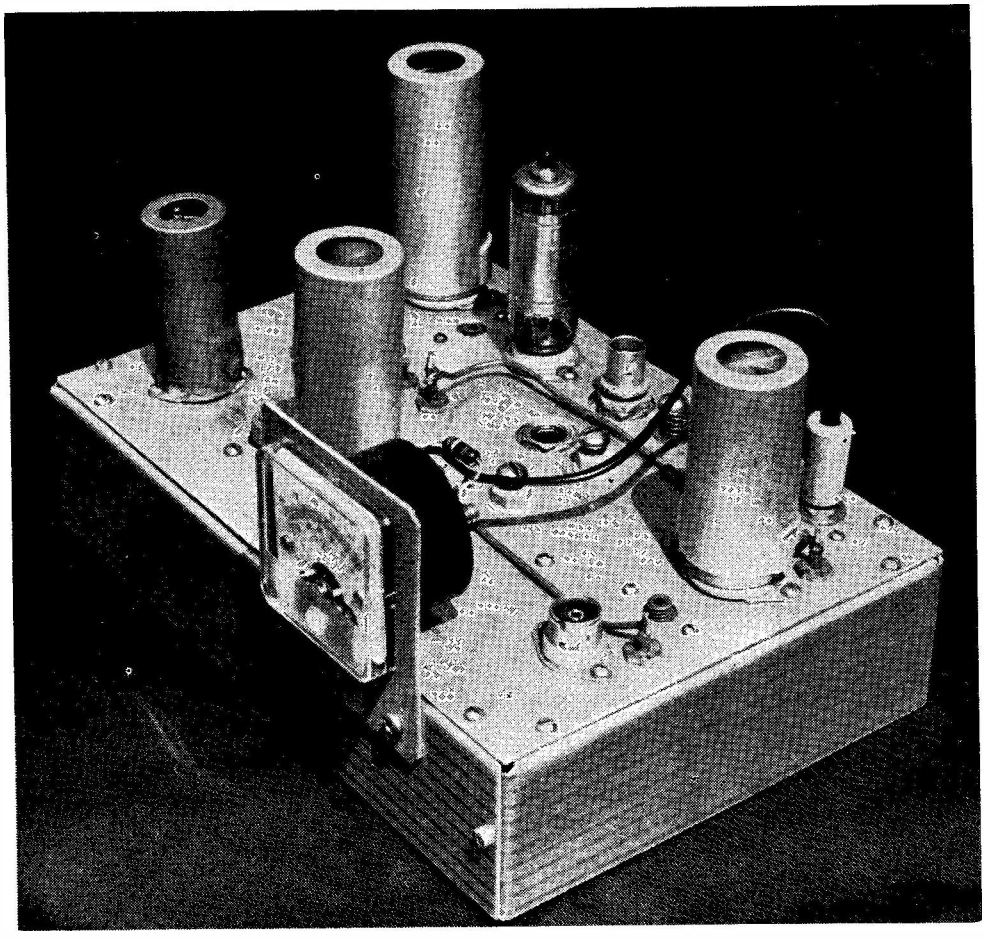
BEGINNER LICENSING IN EIRE

Beginner licences in Eire are issued as " experimental permits," with callsigns in the EI9 sequence, and for CW only on specified frequency bands, *e.g.*, 7000-7100 kc and 1400-14350 kc, with a maximum input of 25 watts. The authorisation itself is headed " Experimenter's Licence." This is something between what used to be the old U.K. " Artificial Aerial " licence and the full permit that could follow on passing the Morse Test, with certain restrictions—such as no operation at all on 80m. without special permission and various power gradations, from 10w. to 500 watts.

A PRACTICAL 13-CENTIMETRE CONVERTER

PROVED TO GIVE RESULTS— DESIGN AND MECHANICAL CONSTRUCTION—FOR OUTPUT AT 24-28 Mc TUNABLE

A. WAKEMAN (G3EEZ)



THE converter to be described was developed some four years ago for use on the 13 cm. band. The design was inspired originally by the 23 cm. K6AXN converter which had been in use at the home station for some years and had proved very reliable. The aim was to build a 13 cm. converter using a minimum of stages and comparatively small in size which could be used for portable and fixed station use. A further necessity was to include arrangements whereby the converter could be easily adapted for pulse operation—currently a subject for experiment.

The converter developed met all of the requirements and multiplier stages numbered only three valves plus a stabiliser and a dual triode head amplifier—see Fig. 1, *over*.

Recently the design has been proved by on-the-air tests over reasonable distances.

The converter is built on a flat 18g. aluminium plate 7½ × 5in. This eases wiring and after completion the

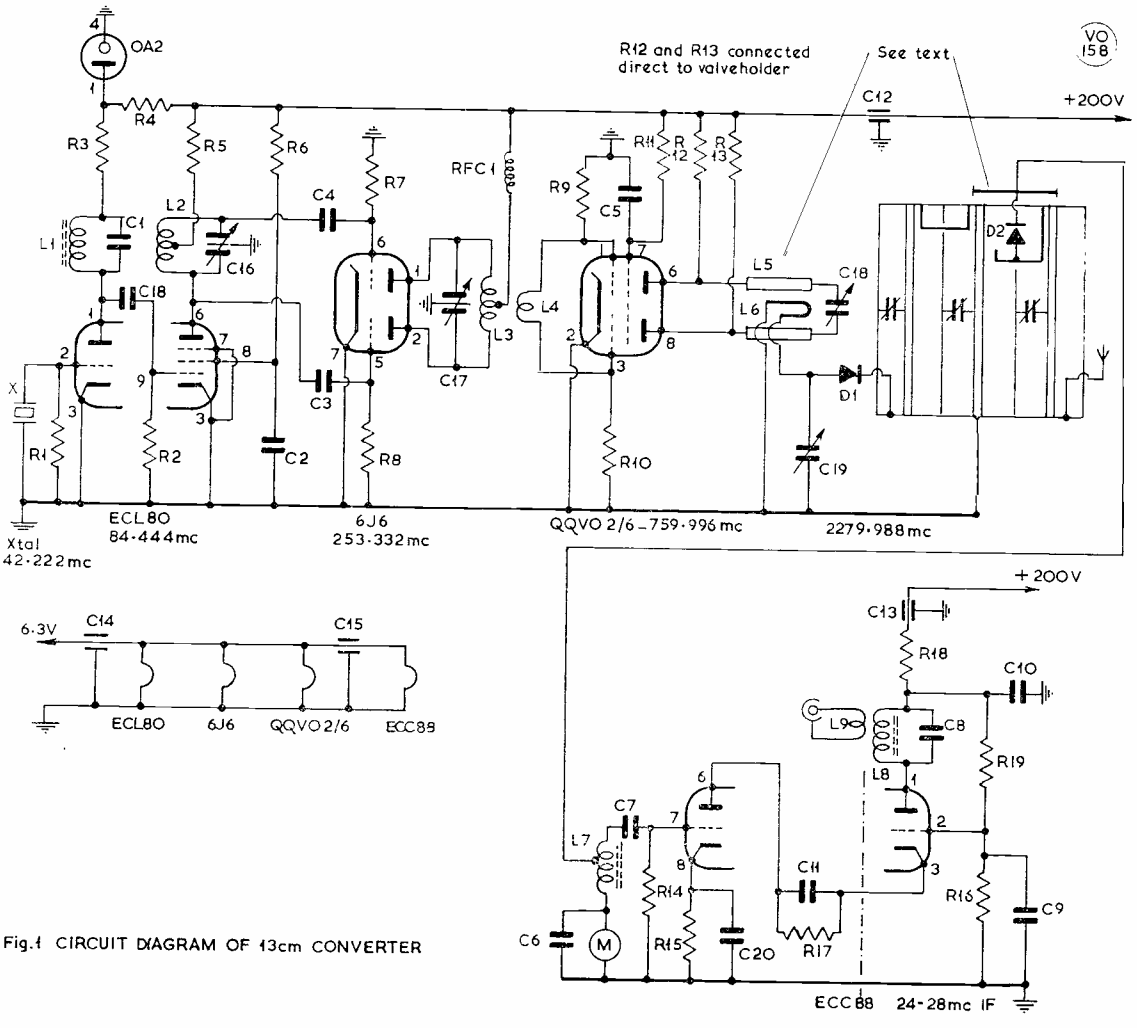


Fig.1 CIRCUIT DIAGRAM OF 13cm CONVERTER

Fig. 1. Circuit complete of the 13-Centimetre Converter.

TABLE OF COIL DATA

L1 — 8 turns 24g. enam. close-wound on ¼in. slug tuned former.

L2 — 9 turns 18g. tinned Cu, self-supporting, wound to $\frac{7}{16}$in. i.d. by 1in. long, centre tapped.

L3 — 3 turns 18g. tinned Cu, ¼in. i.d. by ⅜in. long, centre-tapped.

L4 — 2 turns insulated wire presented to centre of L3.

L5 — Tank lines—*see* sketch Fig. 4, p.425.

L6 — Loop coupling—*see* drilling layout Fig. 2, opposite.

L7 — 25 turns 30g. enam. close-wound on ¼in. slug tuned former, tapped 6 turns from meter end.

L8 — 25 turns as L7 but without tap.

L9 — 3 turns insulated wire at cold end of L8, for output into IF/AF Rx.

RFC — 12 turns $\frac{3}{16}$in. inside diameter, 24g. enam., on suitable small former.

Notes: Valves used are ECL80, 6J6, QQV02-6 and ECC88 as head amplifier for output 24-28 mc tunable on main Rx as IF/AF strip. Diodes D1, D2, GEX-66. All resistors rated ½-watt unless otherwise stated. Values and dimensions on the UHF side should be adhered to closely. Tuned circuits must be checked for resonance in the correct frequency area.

Table of Values

F[g. 1 (left). Circuit of the 13-Centimetre Converter

C1	= 15 $\mu\mu$F	R1	= 15,000 ohms
C2, C5, C11	= ·001 μF	R2	= 68,000 ohms
		R3	= 1,000 ohms
C3, C4, C7	= 47 $\mu\mu$F	R4	= 2,200 ohms, 1-w.
		R5	= 470 ohms
C8	= 4·7 $\mu\mu$F	R6, R14	= 10,000 ohms
C6, C9, C10	= ·01 μF	R7, R8, R9, R10	= 47,000 ohms
		R11	= 33,000 ohms
C12, C13, C14, C15	= ·001 μF, feed-thru	R12, R13,	
C16, C17	= 10 + 10 $\mu\mu$F, butterfly split-stator	R15	= 68 ohms
		R16	= 330,000 ohms
		R17	= 100 ohms
C18	= 22 $\mu\mu$F	R18	= 6,800 ohms, 2-w.
C19	= 3 $\mu\mu$F trimmer, *Radiospares*	R19	= 220,000 ohms

sides can be bent up and screwed to the base plate. The depth of the sides is 1¾in.—see Fig. 2, below.

Construction will be fairly straightforward if the drilling diagram and drawings shown here are followed. Although not critical up to the 780 mc stage layout should be closely followed from there on.

It is imperative that the QQV02-6 valve should have a screening can as removal of this de-tunes the stage. A p.t.f.e. valveholder is recommended here. Holes for the line tuning screws and clearance holes for the BNC socket nuts on the line sub-assembly can be marked off from the sub-assembly on to the aluminium plate forming the chassis before fitting the sub-assembly. The supports for the 780 mc lines are made from ceramic stand-off insulators. The slug tuned coil formers are *Radiospares* ¼in. type and C19 is a *Radiospares* 3 $\mu\mu$F trimmer. Tuning screws can be locked with 2BA nylon nuts or springs and washers inserted under the heads.

Lining Up

The crystal oscillator, doubler and 6J6 tripler can be aligned using a grid dip oscillator and wavemeter and should present no difficulty. The QQV02-6 stage grid resistors should be lifted off the earthing point and a 0-1 mA meter inserted in series. The previous stages can then

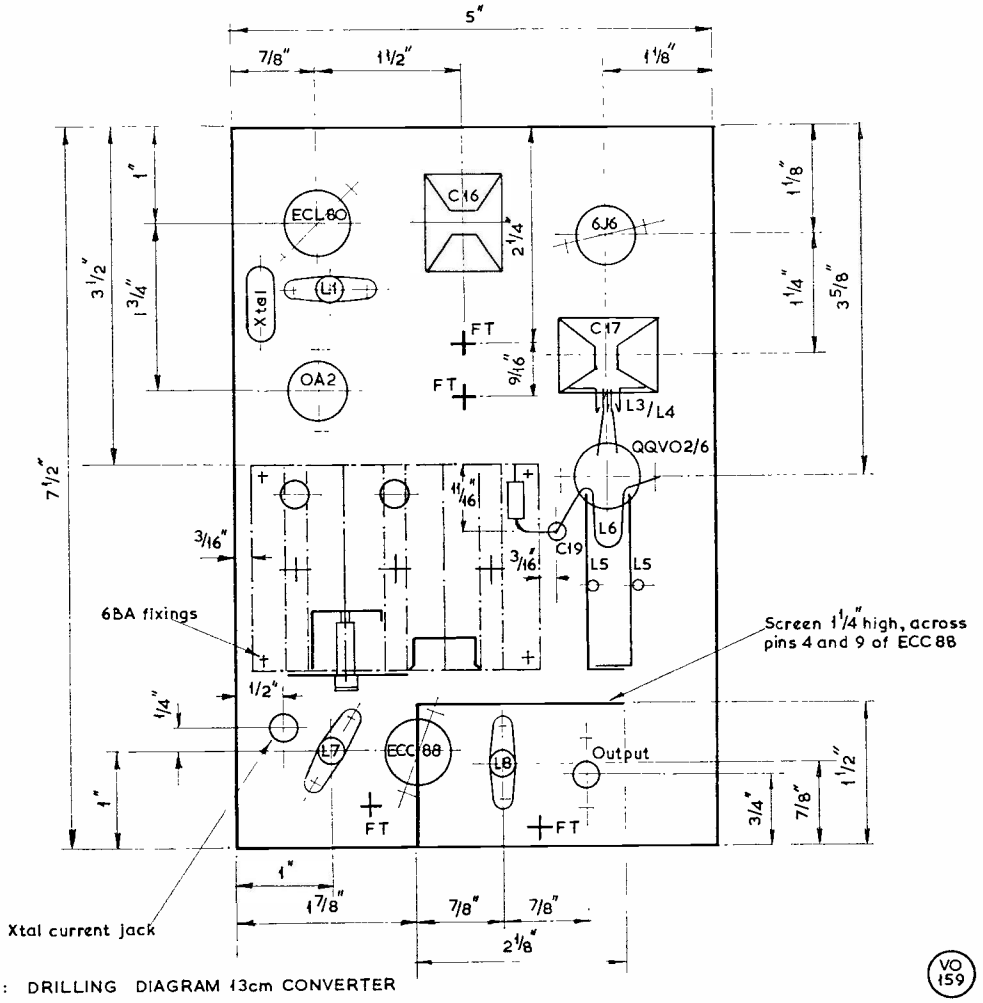


Fig. 2: DRILLING DIAGRAM 13cm CONVERTER

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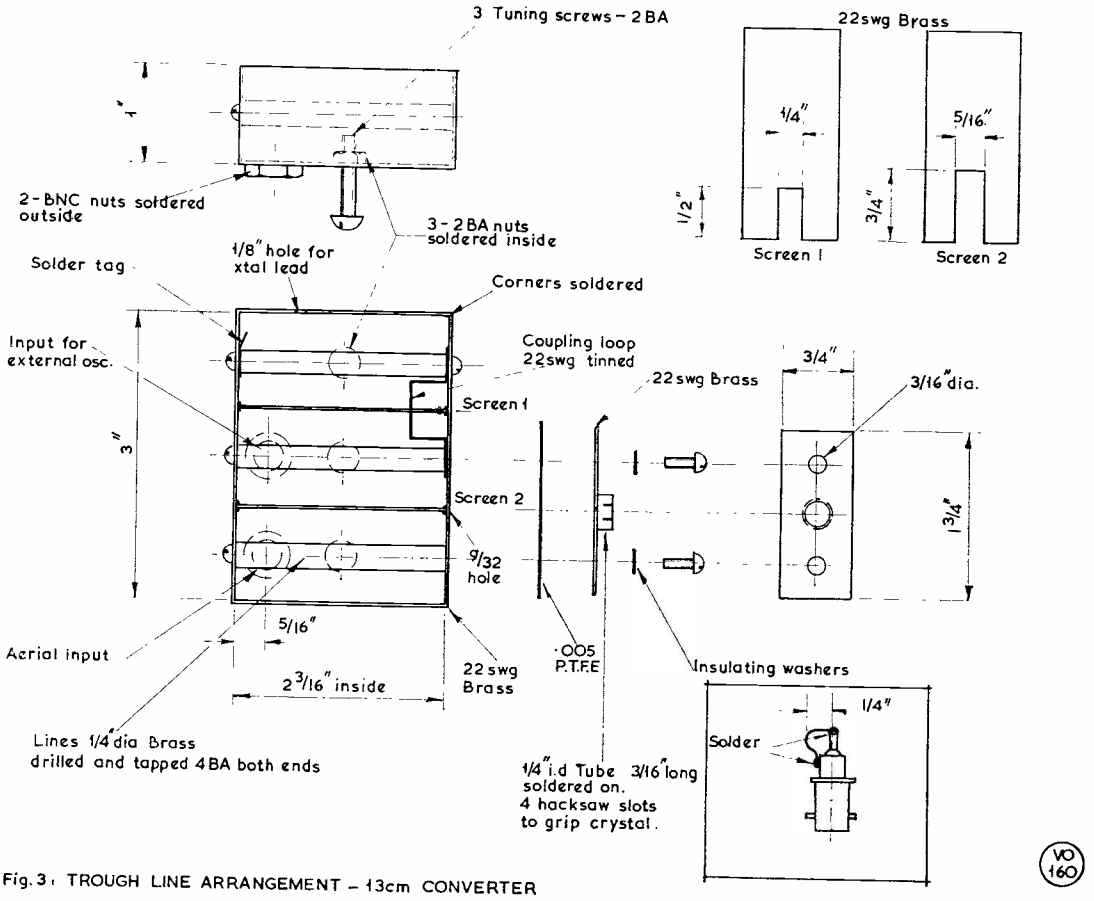


Fig. 3: TROUGH LINE ARRANGEMENT – 13cm CONVERTER

Fig. 3. Trough-line layout and construction.

be tuned accurately for maximum drive to the '02-6 and the coupling L4 adjusted for maximum drive. This adjustment is fairly critical. After obtaining full drive the coupling should be fixed in place with polystyrene cement and the grid resistors returned to the earthing point.

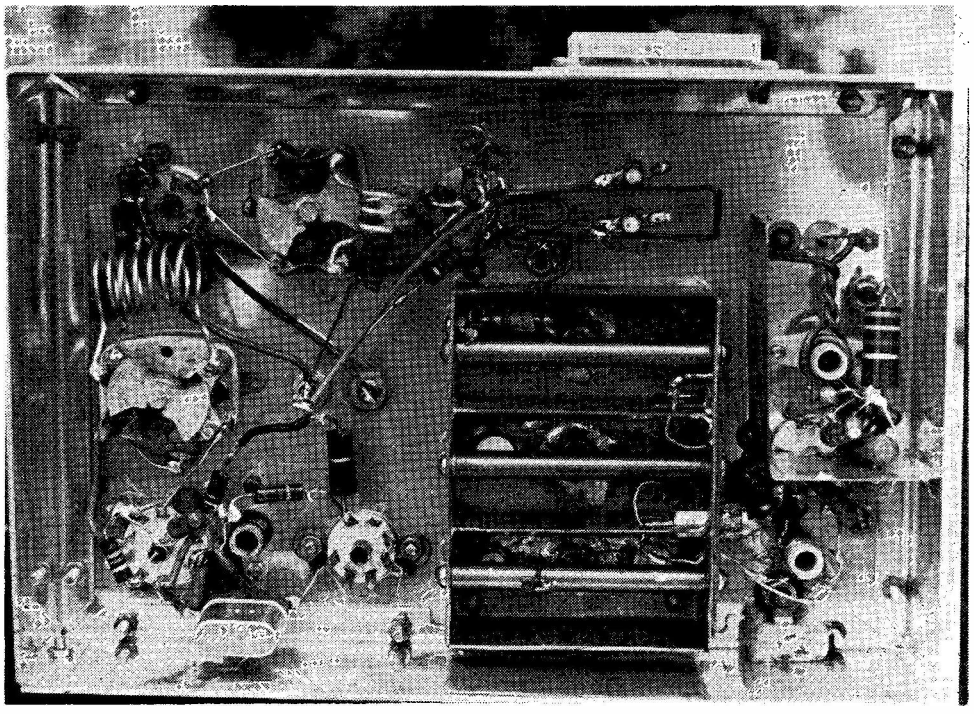
Tuning of the '02-6 lines L5 is by moving the lines towards or away from each other, thus varying the capacity C18, Fig. 1. A wavemeter is useful here but it is possible to adjust these lines using a germanium diode in series across a 50 microamp meter and tuning for maximum output. These lines can only tune the desired frequency (if the dimensions shown are copied).

Next, a 500 microamp meter can be plugged into the crystal current jack and the GEX66 tripler line adjusted for maximum reading. The high-Q break can also be juggled to give maximum reading. (The aerial line screw should be well out during these adjustments.) The coupling from the mixer crystal to the high-Q break line should be varied to obtain maximum current and will be found to require fairly close coupling. This coupling consists of a piece of tinned copper wire about $\frac{1}{2}$in. long attached to the mixer crystal end by means of a clip taken from an octal socket. The last $\frac{3}{16}$in. is bent at right angles and coupled close to the high Q-break line. The octal clip is also connected to a coupling wire approximately $\frac{1}{16}$in. away from the aerial line and is earthed at the end of that line. The loop coupling and trimmer capacity C19 on the QQV02-6 lines can be varied during these adjustments to increase current.

In the setting-up process it will be found that some adjustments are inter-dependent, particularly those of the line, but always try to achieve maximum meter current.

It should be possible with a 200v. supply to obtain 0·2 mA but even a current as low as ·05 mA has been found to produce signals very little degraded.

By tuning the aerial line a point should be found where the current takes a marked dip—this is when the aerial line is tuned to 2280 mc. Slacking off the screw about one turn should tune the line close to signal frequency. The head amplifier slugs should be set to give a reasonably flat response over 3-4 mc. When connected into a receiver tuned to the passband a marked increase in background " sharsh " should be apparent as these coils are adjusted.



Under-chassis layout of the Converter—compare with drawing opposite of trough-line arrangement.

Results

Results have been very encouraging and a check on the sensitivity of the receiver using an 1N21C mixer was quite up to expectations. Signals over a 100-mile path have been received using a 3ft. dish with waveguide feed.

For use on pulse reception all that is necessary is to introduce a tunable local oscillator of the 2C40 variety, as published in early editions of the *ARRL Handbook*. The oscillator can be coupled into the high-Q break line and adjusted to give the necessary crystal current. An IF receiver with a broad passband, such as the AR88 in selectivity posn. 1 is acceptable, or an IF strip having a passband of one megacycle could be substituted. Then, tuning the local oscillator will resolve any signal receivable. The multiplier valves and stabiliser can be unplugged under these circumstances.

Note that when using the converter thus that the 200 volts should not be exceeded.

On receiving a signal the aerial coupling can be adjusted by turning the BNC socket through 90°. This adjustment is again fairly critical for best signal and in the converter described proved to be at an angle of 45° to the line.

The crystal current meter is a permanent fixture in the converter described but can be disconnected after alignment. The coupling loops for aerial and external local oscillator consist of a piece of wire, cut and soldered as shown inset in Fig. 3, on the end of a BNC socket.

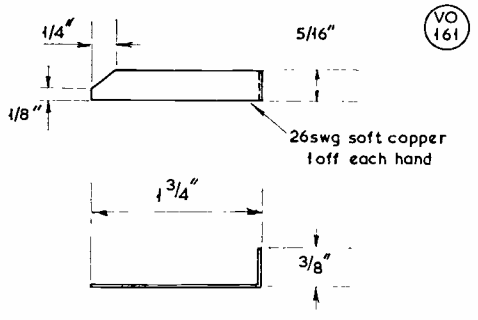


Fig.4: QQVO2-6 LINES (L5) 13cm CONVERTER

Conclusion

The converter has remained stable over a long period of time and once aligned requires virtually no touching up. The sensitivity is adequate for the average station and the converter offers an easy and straightforward approach to receiver problems on the 13-centimetre band. Any constructor with a little VHF experience could build this converter.

TRANSCEIVER MIXER-VFO

BASIC UNIT FOR OPERATION ON 80 METRES

F. G. RAYER, A.I.E.R.E. (G3OGR)

A TRANSCEIVER running 10-15 watts is a handy one-box station to have, and the circuit shown here should be of interest to those who like this kind of equipment. It provides automatically for transmission on the same frequency as that to which the receiver is tuned, in a similar manner to that general with SSB transceivers.

Values in the diagram are for 80m., as this is the band on which operation was wanted, but the system could no doubt be used equally well on Top Band, or other frequencies.

Receiver FC

V1 is the receiver frequency changer, or combined osc./mixer, of usual type. The particular coils listed, and values for T1, T2, Cx and Cy, with VC1/2, are in this case to bandspread 80m. V1 was an ECH81, but there is no apparent need to change existing circuitry here if a different valve is already fitted.

As an example of the method of working, assume the received signal is on 3600 kc. With a 465 kc IF, the oscillator circuit L2 is tuned to 4065 kc, mixing in V1 providing the difference-frequency of 465 kc for the IF amplifier.

Transmit Oscillator

L3 is a BFO coil unit, adjusted to 465 kc, the triode section of V2 acting as oscillator. A 4065 kc input reaches V2 from L2 through C1. One difference-frequency available from V2 is 4065—465 = 3600 kc. This is selected by the tuned circuit L4 and passed to the transmitter section buffer or first stage.

So long as L3 is left tuned to the receiver IF, the output from V2 through C4 will always be of the same frequency as the transmission tuned in by L1, because L2 is always tuned 465 kc HF of the received signal.

A crystal oscillator could be used instead of L3, but as the frequency stability depends also on L2 it was decided to employ an ordinary L/C combination.

Tuning Adjustments

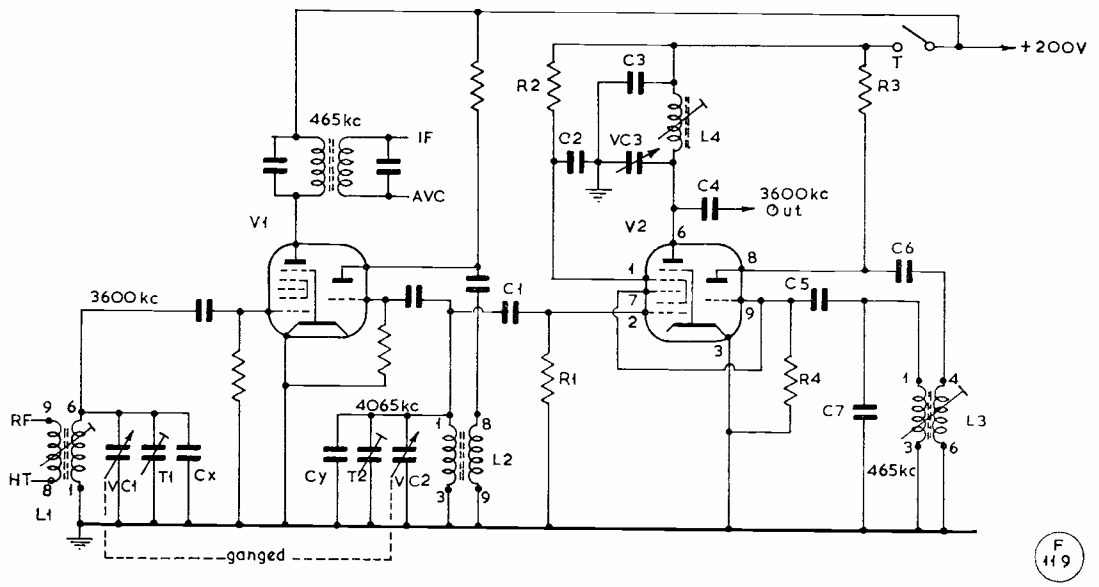
The cores of L1 and L2 needed to be moderately far out. It should be noted that the bandspread or band-coverage obtained with a particular value for VC1/VC2 can be modified by moving the cores, and re-adjusting T1/T2 to suit. Actual frequency coverage is at maximum with T1/T2 at minimum, and the inductances of L1 and L2 at maximum. Screwing down T1 and T2, and with-

Table of Values

Circuit of the Mixer-VFO

C1, C5	= 50 $\mu\mu$F	R4	= 47,000 ohms
C2, C3	= ·01 μF	V1	= Rx FC stage
C4, C6	= 100 $\mu\mu$F	V2	= Tx mixer, ECH81
C7	= 140 $\mu\mu$F, 1%		*(see text)*
VC1, VC2	= 20 $\mu\mu$F, ganged	L1	= Denco *yellow*, Range 3
VC3	= 50 $\mu\mu$F, tune	L2	= Denco *red*, Range 3
Cx, Cy	= 35 $\mu\mu$F	L3	= Denco BFO2/465
T1, T2	= 30 $\mu\mu$F, trimmers	L4	= Denco Range 3, *blue* or *yellow*
R1	= 1 megohm		
R2, R3	= 22,000 ohms		

Note: Coil specifications are for coverage of the 80-metre band.



Circuit of the Transceiver Mixer-VFO.

drawing the cores of L1/L2, reduce frequency coverage. Finally, the cores were adjusted at about 3550 kc, and the trimmers at about 3750 kc.

L3 is placed on the IF by correctly tuning a signal, applying HT to V2, and rotating the core of L3, as when adjusting a BFO.

L4 can best be checked with a GDO, because the core position and stray circuit capacity, including that of the following valve, influence frequency. With the coil listed, the core needs to be well in. The coupling winding is removed.

L4 must be tuned correctly, because 4065 + 465 = 4530 kc and this frequency is *not* wanted as drive for the transmitter. For the same reason, a choke or other broad-banded circuit should not replace L4. At least two resonant circuits should come before the PA, and should be correctly tuned to avoid spurious signals.

In use, the circuit furnished 2mA PA grid current when a 5763 followed V2 as buffer-amplifier. For best frequency stability, and especially the HF bands, the VC2/L2 section would be constructed as a stable master oscillator or VFO, and V2 employ a crystal. Receiver signal frequency circuits (aerial and mixer grid) would usually be peaked up with their own ganged capacitor. Using the PA tank as aerial tuned circuit on "receive" would seem to increase 2nd channel interference, from experiments made.

With all circuits of this type, drive and output frequencies of the transmitter section should be carefully checked with a reliable wavemeter or similar means.

TWELFTH JAMBOREE-ON-THE-AIR

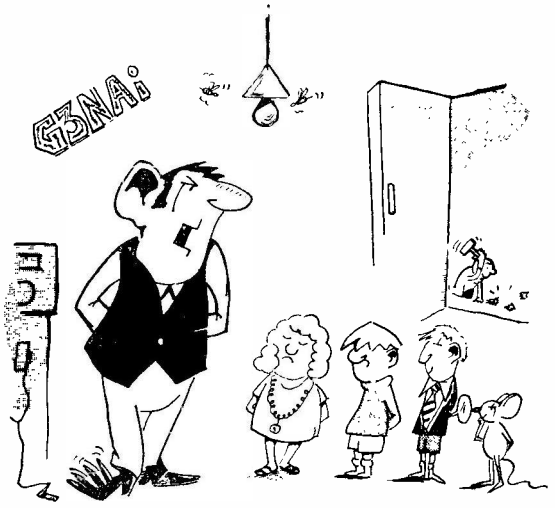
This annual event takes place over the weekend October 18-19, 0001z (midnight Friday) till 2359z on Sunday, 19th—*see* p.356, August. Scouts all over the world will seek to make contact by Amateur Radio, to which end the co-operation of licensed amateurs locally is essential. Arrangements for participation can be made either *(a)* By Scout associations approaching amateurs in the neighbourhood, or *(b)* Interested AT-station operators getting in touch with the local Scout authorities. The Jamboree-on-the-Air is *not* in any sense a contest—it is a QSO Party, world-wide, for which all amateur bands and modes are used. The U.K. Organiser for the event is: L. R. Mitchell, G3BHK, Katoomba, Tyneham Close, Sandford, Wareham, Dorset.

"THE OTHER MAN'S STATION"

Photographs and descriptive matter are always of interest for this feature, which appears often and was started in SHORT WAVE MAGAZINE before Hitler's War, more than 30 years ago. Over the years, something like 250 individual station descriptions must have been published (the feature does not appear every month), and it is interesting that some have shown the development of a particular station over the years. All we want is a really good photograph (in black-and-white, size not important) with full descriptive notes giving all relevant details, not only of the equipment but also of the operator himself (or herself)—age, occupation, start in Amateur Radio, interests on the air, and similar personal information as may be permissible for publication. We write the story to fit the space, and payment at generous rates is made immediately on appearance. "The Other Man's Station" has for many years been a popular *Magazine* feature, and through it many personal contacts have been made and new friendships formed. Your own offering for "O.M.S." (as we call it in the files), should be addressed to: Editor, SHORT WAVE MAGAZINE, Buckingham. (And, if you are writing from overseas, add "England.")

G.P.O. MICROWAVE SYSTEM

Telephone traffic is now carried some 4¼ million circuit-miles by radio over the Post Office microwave network, which links major cities in the U.K. and supplements the conventional cable system (itself a marvel of size and complexity). Additionally, there are over 6,000 video channel-miles for TV services. The highly-directional microwave dish aerials are aimed along strictly optical paths from station to station on the signal route. One of the great advantages of microwave radio-relay links is that they ensure trouble-free transmission of colour TV, while the supplementary microwave circuits also greatly increase the capacity and efficiency of the U.K. telecommunications system as a whole. The Post Office microwave network has shown a growth-rate of 40% a year for the past ten years—making the G.P.O. one of the world's major users of microwaves for communication.



". . . now then, who's got Dad's 807 . . ."

COURSES FOR THE R.A.E.

Further to the list on p.389 of the August issue of SHORT WAVE MAGAZINE, the following Courses of Instruction for the Radio Amateur's Examination (" Subject No. 55 " in the City & Guilds syllabus) have been notified:

Barking, Essex: Class to be held at the Gascoigne Recreational Centre, Gascoigne School, Morley Road, Barking, on Tuesday evenings at 7.30 p.m., starting on Sept. 23. Applications to The Warden, at the address given.

Birkenhead: At the Technical College, Borough Road, on Thursday evenings, with L. Roberts, G3EGX, as lecturer, as in previous years. Enrolment early-September, at the College.

Boreham Wood, Herts.: At the College of Further Education, Elstree Way, Boreham Wood, on Wednesdays, 7.0-9.15 p.m., starting Sept. 24, with G. L. Benbow, G3HB, as lecturer. Enrolment at the College, Sept. 8-9, 6.0 to 8 p.m.

Brighton: At the Technical College, a course of instruction in R.A.E. Theory, two evenings per week. For further details and fees apply (quoting " Subject No. 55, City & Guilds ") to: Main Office, Brighton Technical College, Richmond Terrace, Brighton (*66544*) BN2-2SZ.

Colchester: At the North-East Essex Technical College, Sheepen Road, on Tuesday evenings 6.30-9.0 p.m., commencing Sept. 30. Enrolment Sept. 15-17 or at first meeting. Morse practice will be given on Wednesday evenings. For further details apply: F. R. Howe, G3FIJ, Principal Lecturer, Electrical Eng. Dept., at the College.

Crawley: At Ifield Evening Institute, Lady Margaret Road, Ifield, on Monday evenings 7.0-9.0 p.m., fees 45s. for juniors and 90s. over-19's. Enrolment, Sept. 10-11, 7.0 to 9.0 p.m., at the College, or by post to: A. J. Gibbs, G3PHG, 6 Dairyfields, Gossops Green, Crawley, Sussex. (Qualifying age date for fees is Sept. 1.)

Falkirk: At Falkirk High School, Falkirk, Stirlingshire, starting Oct. 15. Enrolment Oct. 9, 7.0-9.0 p.m., fee 25s.

Glasgow: At the College of Nautical Studies, 21 Thistle Street, Glasgow, C5, on Tuesdays and Thursdays, 7.0-9.30 p.m., commencing Sept. 9. The course covers R.A.E. theory, licence conditions and Morse instruction, and no prior knowledge is assumed nor required. Enrolment at the College on the opening evening, fee 20s.

Grimsby: At the Adult Education Institute, Hereford Centre, Ely Road, on Monday evenings, 7.0-9.0 p.m. Enrolment Sept. 16-18, same time, fees 22s. 6d. (or 10s. for those under 18 and not in full-time employment) with additional fee for students wishing to take the Examination at the Centre.

Harlow: At the Technical College, to which apply for enrolment details.

Liverpool: At Riversdale Technical College, Riversdale Road, a wide range of full-time, part-time and evening courses is offered, including the R.A.E. (evenings). Apply: Head of Dept. of Electronic & Radio Engineering, Riversdale Technical College, Riversdale Road, Liverpool, L19-3QR (*Tel: 051-427 1227*).

London (Chingford): At the Community Centre, Friday Hill House, Simmons Lane, Chingford, E.4, on Monday evenings, 7.30-9.30 p.m. Enrolment, fees and starting date to be finalised. Apply early-Sept., by letter or telephone, to: E. Johnson, G2HR, 35A Woodland Road, North Chingford, E.4. (*Tel: 01-529 2932.*)

London (Ilford): At the Ilford Literary Institute, Cranbrook Road, starting on Sept. 24, enrolment Sept. 8-11, 7.0 to 8.30 p.m. at the Institute, for R.A.E. Theory and Morse tuition. Fees vary from 50s. over-21, to 25s. for juniors. This course has been passing students through the R.A.E. successfully for more than 20 years. Apply in the first instance, with s.a.e., to: W. G. Hall, G8JM, 48 Hawkdene, North Chingford, London, E.4.

London (Wembley): At the Wembley Evening Institute, Copland School, High Road, Wembley, on Monday evenings (Morse class, 7.0-8.0 p.m., R.A.E. theory, 8.0-10.0 p.m.) commencing Sept. 22, enrolment Sept. 15-18, 7.0-9.0 p.m. at the School. Lecturer will again be Alan Bayliss, B.Sc., F.I.E.E., G8PD. This course has been running regularly since 1950, and has a very good success-record.

Loughborough: At the Technical College, Radmoor, on Tuesdays, taking Morse practice 6.0-7.0 p.m. and R.A.E. theory 7.0-9.0 p.m. Starting Sept. 16, fees are 74s. 6d. inclusive, and the lecturer is D. R. Doughty, G3FLS.

Lowestoft: At the College of Further Education, St. Peter's Street (*Tel: Lowestoft 4177/8*), on Wednesdays, 6.30 to 9.0 p.m. For further details apply Principal, at the College, or to A. F. Ward, G3HSP, course lecturer.

Mexborough: At the Schofield Technical College, Park Road, on Wednesday evenings, 6.30-9.30 p.m., starting Sept. 17, with Morse tuition as required. Modern equipment is available, all Amateur Radio interests are covered, and the College has its own station, G3UQA. For details apply: H. Nelson, C.Eng., lecturer-in-charge.

Newcastle-on-Tyne: At the Gosforth County Secondary School, Jubilee Road, Gosforth, on Tuesday evenings, 7.0 to 9.0 p.m., a 24-week course leading into the May, 1970, R.A.E. Classes start Sept. 16, enrolment evenings Sept. 8-9 at the School. Fees for under 18's, 7s. 6d.; over 18, 48s.

Princes Risborough: At Evening Institute, County Secondary School, Risborough, on Monday evenings (Theory) and Wednesdays (Practical), 7.0-9.0 p.m. Classes start Monday, Sept. 15, enrolment Sept. 10-11, at the School.

Sheffield: At the Western Road Evening School, Western Road, Sheffield 10, on Wednesday evenings, 7.0-9.0 p.m., starting in September. Details from J. Bell, G3JON, 30 Alms Hill Road, Sheffield (*367774*) S11-9RS.

Slough: At the College of Technology, William Street, on Thursday and Friday evenings, Morse being taken by G3FVC and R.A.E. Theory by G3WQC. Enrolment at the College on Sept. 11 and 16, 2.0-8.0 p.m. Fees are graded—under 18, 15s.; 18-21, 50s.; and over 21, 60s. The College has a fully operational station, G3XPL, which is run as an integral part of the course.

Thanet: At the Technical College, Ramsgate. Apply for details immediately to R. T. Trull, G3RAD, 1 Approach Road, Broadstairs, Kent.

Warrington: At Orford Evening Institute, on Monday and Wednesday evenings (R.A.E. Theory and Morse tuition both nights), 7.0-9.0 p.m. Course starts Sept. 22, enrolment Sept. 15-16, fee 40s. inclusive. Course tutor, G. Scott, G3RSQ. Apply to the Principal at the Institute.

Because for most teaching establishments the winter session starts in September, there would be no point in our publicising further R.A.E. Courses unless they are to commence during October—in which case we should be notified immediately (Editor, SHORT WAVE MAGAZINE, BUCKINGHAM), for any later listing to appear in the next issue.

Readers who have not found—either here or in the listing on p.389, August—any Course on offer in their locality, or within reach, should enquire (quoting " Subject No. 55, City & Guilds ") at the local office of their Education Authority (address in telephone directory) for information about Courses that may be available in their area—the point being that many such are only advertised locally, and not to us. In other words, it may mean a journey to the next town to join a Course.

SPECIALLY ON THE AIR

Stations scheduled to make a public appearance in connection with some event locally are now as follows:

GB3EIF, September 1-12: For the Edinburgh International Festival, station located in the Mountbatten Building, Heriot-Watt University, Grassmarket, working the HF bands using SSB, with possible activity on two metres. Arranged by the Lothians Radio Society, a special QSL card will be issued to confirm all QSO's, and SWL reports will be acknowledged by card *via* bureaux.—V. W. Stewart, GM3OWU, 9 Juniper Avenue, Juniper Green, Midlothian, Scotland.

GB3WRA, September 6: Operating from the annual Wycombe Show on The Rye, High Wycombe, Bucks., running all bands 4m. to 160m., AM/CW/SSB. Visiting amateurs will be specially welcome.—A. C. Butcher, G3FSN, 70 Hughenden Avenue, High Wycombe, Bucks.

GB2GF, September 5-7: In connection with the 200th anniversary of the original Shakespeare Festival, the Birthplace Trust have invited the Stratford-upon-Avon & District Radio Club to establish a station in the Shakespeare Centre. Activity will be on the DX bands during the day and on 80/160m. in the evenings. A special QSL will be sent *via* bureaux, and cards should be addressed to: I. A. Cobbold, G3RPJ, 3 Avenue Road, Stratford-upon-Avon, Warwickshire.

GB3SB, September 13-20: For the Holywood Civic Week, Co. Down, N.I., operating all bands 10-160m. and VHF.—C. Billington, GI3WSS, 33 Wood End, Holywood, Co. Down, Northern Ireland.

GB3RC, Sept. 20: In connection with the local Rotary Club's display associated with the annual Ringwood Carnival. Rotarians throughout the world have been alerted and a special QSL card will be sent for all contacts. Station will work SSB on 10 to 80m., and will be on the air during 0900-2000z.—P. Edwards, G3DKJ, 151 Hightown Road, Ringwood, Hants.

GB3MAN, Sept. 28-Oct. 5: Station to operate during Freshers' Week, University of Manchester Institute of Science & Technology, on all bands 10-160m., running AM/CW/SSB/RTTY. Visitors will be particularly welcome, to meet members of the Amateur Radio Society operating GB3MAN.—T. F. C. Davis, G3YMM/EI4BY, hon. secretary, Amateur Radio Society, Students' Union, UMIST, Sackville Street, Manchester, 1.

SWISS RECIPROCAL LICENSING

It is announced that the Swiss authorities will grant limited-duration licences (three months) to visiting amateurs from countries with which Switzerland has a reciprocal agreement, the U.K. being one. The correct address for making the initial application is: Sektion Allgemeine Radioangelegenheiten, Generaldirektion der PTT, Speichergasse 10, CH-3000, Bern, Switzerland.

". . . sure you're using that throat mike correctly, OM . . ."

"SPECIALLY ON THE AIR"

RESULTS AND EXPERIENCES WITH GB2HRH, CAERNARVON, AND GB3SUA, STRATFORD-UPON-AVON

AS many readers will know, we regularly publicise the plans and objectives of those amateur-band stations intended to make a special appearance before the public in connection with some event of local importance.

This year, it happens that there have been two such having world-wide significance, far beyond any purely local interest, and both coming off during July—the Investiture of the Prince of Wales at Caernarvon on July 1, and the celebrations at Stratford-upon-Avon, July 11-13, to mark the 700th anniversary of the founding of the Town Guild in 1269. (Stratford is, of course, known all over the world by reason of the Shakespeare connection, and is one of this country's most important tourist attractions.)

These occasions demanded that preparation for both events be started well in advance, and that the Amateur Radio participation should be serious and effective. The Post Office also made its own essential contribution by issuing duration-only callsigns appropriate to the events. In both instances considerable success was achieved, in terms of public interest and world-wide DX worked.

* * *

The station signing GB2HRH for the Investiture was conceived and inspired by Jack Evans, G3WET, who (though living and working in Sutton Coldfield as a partner in a firm of public-health consultants) is a Welsh-speaking native of Criccieth, Caernarvon. Aided by a small committee—all of whom were active GW's—a site was arranged at Glan Gwna Holiday Park, Caerns., with a fully-equipped 6-berth caravan to house the gear and the operators. This accommodation was lent by the owners of the property, a 200-acre estate in the foothills of Snowdonia, the domain of Welsh princes of earlier days.

Equipment on loan was provided by K.W. Electronics, Ltd., and Chas. H. Young, Ltd.; a special bi-lingual QSL card was put in hand; and a certificate designed for the Prince of Wales Award, involving contact with GB2HRH under various conditions. During the week before the Investiture the gear was installed in the caravan and the antennae erected—a K.W. trap dipole, a TA-33Jr. beam at 30ft., and a half-wave aerial for Top Band.

Station GB2HRH was opened and went on the air officially under that call on Saturday, June 28, in the presence of the Mayor of Caernarvon and the Chief Constable, with a (pre-arranged) QSO of real DX interest —9V1PA, Singapore, who gave the company assembled a solid 9 + 20 signal, much to the astonishment of the dignitaries present, who included, as well as the Mayor and the Chief Constable, the High Sheriff and Deputy-Lieutenants of the County, the chairmen and clerks of the Borough and Rural District Councils and the Vicar of Caernarvon. In all, about 40 official and semi-official guests were there for this historic QSO—entirely genuine, but very well stage-managed by the GB2HRH team. Letters of goodwill to the station and its operators from Prince Charles and Lord Snowdon, Constable of Caernarvon Castle, were read to the guests, who were

One of the three operating positions in the GB2HRH caravan, with GW3IEQ, chief operator, busy peeling them off on 20 metres. The gear built into the console included a KW-2000B with its linear. On the 14 mc band, working into a K.W. trap dipole, the GB2HRH effort produced world-wide contacts, with U.S. stations particularly eager.

The main operating team for the *highly successful GB2HRH* undertaking, put on during the period June 28-July 6 to cover the Investiture of the Prince of Wales. Between them, with some outside assistance, they kept the station on the air practically 24 hours a day. Left to right, standing: SWL Williams, GW3VBX, GW5YB and G3LQP; seated, l. to r., G3AQW, GW3OXU, GW3IEQ (chief operator), and G3WET (who inspired the project). Over the ten days that GB2HRH was in action, more than 3,200 contacts were made in 79 countries. Several of the QSO's were in the Welsh language—now spoken so well by H.R.H. himself.

left with a very good impression of the efficiency with which an Amateur Radio operation can be mounted.

The serious on-the-air business for GB2HRH then started, the station remaining active round-the-clock on all bands 10-160m. till July 6. Main DX channels were 15m. and 20m., on which contacts were made world-wide, including VK6CT, Carnarvon (as they spell it), Australia. GB2HRH was in great demand on all bands. Pile-ups were all too usual and the welcome given to the callsign by VE stations was particularly warm, even emotional. Operators like 7Z3AB waited hours to get in for a contact, and one U.S. enthusiast tried for four *days* before he got his QSO. Even on Top Band, in the local-G context, the pressure was spectacular, and at one period no less than 70 U.K. stations had to be worked in line, in regular contest fashion, to satisfy the demand.

On the DX bands, the chief operator was GW3IEQ, with relief by resident-ops. GW3OXU, GW3VBX and G3WET, who also had the assistance of committee-members GW2HFR, GW3NWV (who put in many hours as an out-station feed-in of DX contacts for GB2HRH), and GW5YB.

Advance publicity, started in SHORT WAVE MAGAZINE in our April '69 issue and kept up till July, resulted in requests for skeds from all over the world, particularly the Commonwealth and the United States. These skeds were kept successfully with virtually all stations requesting them. G3WET, the Welsh and Spanish-language speaker, was kept hard at it—his personal ambition was to raise a station in Patagonia, LU, that odd community down at the end of South America, to which many Welsh people emigrated generations ago, and where they still speak the language of their homeland. (If you want to hear the Welsh in all its purity, go to Patagonia! As it happens, we have a direct subscriber in Punta Arenas, beginning to be about as far south as you can get in that area—but he is a CE, on the Chilean side of the demarcation line.)

In all, more than 3,200 QSO's were logged for GB2HRH, in 79 countries, including rarities like VR2CC (Fiji) and VK7KW (Tasmania). It was the aim of the GB2HRH crew to work as many stations as they could in as relaxed a manner as possible. Close-down for GB2HRH was on 40m. at 1257z on July 6, 1969. (Any contacts claimed after that time/date would be entirely spurious.)

Gear used throughout was that normally available to any U.K. amateur under the *K.W. Electronics, Ltd.* and *Heathkit* (Daystrom, Ltd.) labels. During some 140 hours of almost continuous working, under pressure conditions, such minor faults as did occur were quickly put right.

We congratulate G3WET and his GW team on a very fine operation, of world-wide interest and much to the credit of Amateur Radio.

* * *

Another huge success in a similar context was the operation of GB3SUA, Stratford-upon-Avon, during July 11-13. Visitors came in not only from all over the country but also from the world outside. The 700th Anniversary Celebration was on, and Stratford was full of visitors from overseas—naturally, a proportion of these tourists held back-home callsigns, and they were utterly astonished to find, just opposite the Memorial Theatre, an amateur station going full blast and working the world.

With a miniscule grant of £20 from the Borough Council (" to cover expenses "), it is a fair certainty that GB3SUA did far more to project, world-wide, the image of Stratford-upon-Avon than other Celebration events that must have cost many times that amount.

However, it is fair to say the report states it that GB3SUA had full co-operation from members of the Town Council and its employees. Here again—as in the case of GB2HRH—the station set-up was in a large caravan, lent by a local firm normally using it for display at agricultural shows—and therefore not only spacious, but also fitted with a small kitchen and bar-space. The Council provided pot-herb decorations and professional lettering for signs and information, so that the general effect could rightfully be described as " very smooth." (Your correspondent, happening to be in the neighbour-

At the Stratford-upon-Avon 700th Anniversary Celebration, the Mayoral party stand by for a QSO by GB3SUA (operated by visiting G2YS, president of the RSGB), with G3FTG (chairman of the local Club), checking to see that the switching is being properly operated. Their gear for the HF bands was a KW-2000A Transceiver with a KW-600 Linear, into a Mosley TA-33Jr. Together with the LF band station, a total of more than 1,000 contacts in 60 countries made up a very satisfactory log—altogether a most successful exercise.

hood on a private visit which had nothing to do with the Anniversary Celebrations—Stratford is a place to be avoided under crowd conditions!—looked in on GB3SUA on the Saturday afternoon and can confirm all this.)

GB3SUA in the caravan was laid out to run two stations simultaneously—one on 80m. AM/SSB, and the other on 15-20m. SSB only. The gear they used included K.W. Electronics, Ltd.; Mosley; Eddystone; and Heathkit. The antennae dominated the site opposite the Shakespeare Theatre, in the centre of the town.

The station and aerial layout were such as to give interference-free operation—mutually between transmitters—on the working bands. All QSO's could be put out over the local P.A. system so that anyone within earshot could follow what was going on inside the GB3SUA caravan.

In parallel with the on-the-air operation, a good and very explanatory press hand-out was circulated; a BBC interview (one of the most intelligent and well-composed your correspondent has heard in the context of Amateur Radio) was arranged with Midland Regional News; and enough material of general interest was made available to ensure good coverage of the Amateur Radio effort in all the Midlands newspapers.

Local Wx conditions were superb when GB3SUA went on the air at 0900z on July 11. The official opening was later that day, attended by the Mayor and Mayoress of Stratford-upon-Avon. The G3NMR/G3UML caravan arrived for the weekend, to provide night-watching and, with G2YS, additional operating capacity.

A sked with W1OKG in Stratford, *Conn.*, came up on 20m. without difficulty, but the Stratford, *Ontario*, station failed to materialise, which was a pity, as many visitors came round to the GB3SUA caravan to listen for these contacts. However, many interesting DX phone QSO's were made, from VP8KO in the South Orkneys to stations in VK and ZL. In fact, the DX came thick and fast over the weekend July 11-13 and by early on the Sunday morning the projected total of contacts with 700 different stations had already been booked in—so the team (getting a little weary by now) went on to make it the full thousand, clocked up late on Sunday, 13th, on 80 metres.

The analysis shows that in the end these 1,000 QSO's were with some 60 countries, achieved in about 50 hours' operating time. A large QSO-location map outside the caravan not only kept the public informed about where Stratford-upon-Avon's signals were getting to, but also proved that there was no place on this earth outside the range of GB3SUA.

Loaned equipment for the GB3SUA project included a KW-2000A, KW-600 and a trap dipole; a beam assembly from Mosley Electronics; receivers and other items from Eddystone Radio, Ltd.; and much apparatus lent for the occasion by members of the local Stratford-upon-Avon and District Radio Club—who laid on the whole show, with Michael Webb, G3OOQ as organiser, under chairman G3FTG. Between them, and with the ready assistance of their Club members, they proved to numerous interested visitors that Amateur Radio is a slick modern hobby—and that from just a caravan near the Shakespeare Memorial Theatre on the banks of the Avon, they could (like Shakespeare himself) talk round the world. A very fine effort, indeed.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

THE month under review has, by and large, been a somewhat up-and-down sort of affair, with the hot weather raising the summer static level on the LF bands to impossible levels at times, and the usual doldrums affecting the higher frequencies. Nonetheless, DX has been around, and has been worked as ever by the persistent types—in spite of the static, the gardening QRM, the holidays, and whatever. Perhaps, therefore, it would be as well to get straight in to the story, as unfolded by our various reporters.

Top Band News

Here we must first say how sorry we all are to hear the sad news that W1BB's XYL, W1DQF, passed away in her sleep on June 18; apart from the great personal loss to W1BB, who has our deepest sympathy, Alice was also a great booster of Top Band, and sparkplug to W1BB in his efforts towards making Top Band DX'ing the world-wide thing it has become. And as if that were not enough in itself, W1BB was carted off to hospital for a major operation which kept him there from June 24 to July 21—although, happily, it is understood he is now making good progress at home and should be on the band as usual for the coming DX season.

Talking of the winter Top Band Tests, the problem raised by the liberalisation of the U.S. 160-metre allocations—the area 1825-1830 kc is no longer clear for the W's to hear EU stations but is occupied by W's using SSB either actually on the frequency or " splashing " over it—has not been resolved as yet. Much work is being done over there to try and educate Top Band operators, but, as always, the problem will be the local natter-groups who have never heard of DX on 160 metres, complaining bitterly about the QRM when some keen type asks them to move over for a few minutes while the opening lasts.

Back to history now for a moment: MP4TAF was on 160m. on the night of July 26, and worked G3XAQ around 2320z, on 1802 kc—nice work! The buzz had gone round the U.K. addicts a couple of evenings before, and so quite a queue was waiting, but unforunately MP4TAF shifted up to 1825 kc, where he was much less well heard, although G3TSA did make a marginal contact. At the same time, G3WAH worked MP4TCN on Forty, passed over a list of the G's waiting, and Derek took the list over to MP4TAF—just in time for the band to close! Well, it was a good try by all concerned.

W1BB managed a couple of new countries to take him up to 107, when he raised the K4IA/KC4 group on Navassa, and also made a QSO with KV4FZ on one of his trips when the latter was signing VP2LZ from St. Lucia.

From G3UGK (Potters Bar) comes news that MP4TAF may well be on 160 metres again before the season is out—and that ZC4HS and VP9GJ are in the offing. On a more domestic note, the trip to GC was not regarded as being a howling success as far as Top Band was concerned, for various reasons other than that the Alderney exercise came unstuck. Great

SIX-BAND DX TABLE
(All-Time Post War)

Station	Countries	28 mc	21 mc	14 mc	7 mc	3.5 mc	1.8 mc
W6AM	348	131	140	347	116	54	7
G3DO	337	199	237	330	90	83	9
G2DC	336	171	308	328	165	112	20
G3NOF	314	178	216	297	34	40	2
G3LZQ	254	138	155	201	72	38	8
G3IAR	221	126	161	193	91	73	12
G3IGW	204	127	152	168	122	91	42
G3RJB	163	63	48	149	59	37	8
G3PQF	159	103	46	96	84	57	12
G2XBY	156	93	108	91	56	53	5
9H1BL	151	84	83	111	49	44	—
G3VDL	145	59	105	101	53	31	—
G3SED	136	31	26	66	43	40	39
G3VPS	128	36	42	108	50	36	14
G3IDG	122	74	89	55	27	19	11
G3MDW	116	47	66	83	20	15	7
G3EJA	106	100	23	51	22	12	2
G3WPO	94	34	14	52	47	23	21
G3WJS	66	—	8	55	41	45	14

Note: Placings this month are based on the " Countries " Column.

problems were encountered with 59+ stations using the 1860-1880 kc segment to carry on local nattering, contributing more than a reasonable level of sideband-splash to boot, making it impossible to work the weaker stations, who thus missed out on a Guernsey QSO. With so much of the DX-chasing—in terms of counties, at least—now taking place by tacit agreement in the 1875 kc region, it would not be unreasonable to hope that the local ragchewers would keep that area free to help the under-powered stations who would like a bash at the DX.

Another, and very justifiable, moan about the AM and CW signals in particular (as distinct from most of the SSB ones) is the apparent inability of so many of them to net within kilocycles of the desired spot, probably due to oscillator pulling. Many CW stations lost a QSO because of this, and the fact that GC3UGK was monitoring his el-bug through the muted receiver and hence could not work them if they were out of the pass-band. For the future, the G3UGK/G3XTJ crew are planning to " do " Rutland on the Bank Holiday weekend, with Brecon to follow on a date to be decided. August Bank Holiday should be pretty busy with this crowd plus the GM3SVK party attracting plenty of takers from Scotland!

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
Phone and CW		
G3NPB	98	98
GM3OXX	98	98
G2NJ	98	98
G2HKU	96	96
G3SED	93	96
G3WPO	88	91
GI3WSS	88	91
G3VLX	72	93
G8HX	76	83
G3XTL	62	78
G3WJS	60	86
G3XDY	65	89
G3XTJ	51	82
G3XGD	42	55
G3KFE	39	62
Phone only		
G2NJ	98	98
G3SED	91	92
G3VGB	82	93
G3WPO	77	84
G3PQF	71	86
G3NPB	17	62

(Failure to report for three months entails removal from the Table. Claims may be made at any time. Six months of " Nil " reports will also result in deletion.)

An unusual call to hear on 160m. was G3NOF (Yeovil) who has been taking the odd sniff round the band with SSB, but has only so far hooked G and GW contacts—a far cry from the time G3KFE worked Don for the first and only time on any band, with CW, back in November 1959, when G3KFE was using the proverbial " bit of damp string " for an aerial.

Via *DX News Sheet* comes a hint that by the time this comes to print is about when JD1YAB, operated by JA3UI with a kilowatt into a dipole, will be stirring things up on 1909 kc from Ogasawara Is. To give some guidance on the best times to listen, daylight there is 1950z till 0850z in September, and clearly there is no time available to make a sked via JA3AA.

Now to 5N2: The situation there is that while no new licences are being granted for the moment, those existing have again the use of 160m.—a concession that 5N2AAF intends to take advantage of in the period from November onwards.

Nearer home, and probably complete by the time this is being read, is the EI exercise by G3WET and G3WEX, aided and abetted by EI7E, using a variety of skywires and a couple of KW-2000A's. If you worked EI2VAQ or EI2VAS—that was them!

Dear me—we do get problems! This one is posed by G3YLC (Downham Market) who has hung up a half-wave wire with a view to knocking off the counties, but having added 'em up from an atlas, can't make it total 98. Treat Yorkshire as one, Scillies as one, add the four Channel Islands, plus Orkney and Shetland for good measure, and there you are —check with the public library, and please don't ask us to " print a list of the 98 counties! "

Nice to hear once again from G8HX (Mansfield) who for eight months has been on the HF bands, but has now put his K.W. Vanguard away in the corner and returned to his old stamping-ground of many years—using the old-faithful Top Band rig, renewing old friendships and meeting stations he had not before worked on the 160-metre band. Frank mentions G3XTL and his activities from Angus and Kincardine, both under his own call /P and GM3SIG/A.

By coincidence the letter which next comes to the surface is from G3XTL (Warsop) himself, who fell asleep over the key while operating from the Newquay area during the Summer 160m. contest, packed up the gear on the Sunday morning, and reappeared from Arbroath the same evening! Needless to say, after catching up on sleep, operation during the second week of the trip was far steadier. Incidentally, Chas. frequently pops off to rare parts at short notice, so if you should hear G3XTL/A or /P at any time it is well worth giving him a blast on the off-chance that he may possibly be in some wanted county.

GM3YCB (Clydebank) managed to get through the postal system at the third time of trying, with an entry for the Table, and some notes on his activities /M with GM3WDF; they have done one-night stands from Dunbarton, Renfrew, Lanark, Stirling, Perth, Kincardine, Kinross, West Lothian and Mid-Lothian. Over the period September 19-29, there is a trip projected to *Skye*, taking in *Argyll*, *Perth*, *Inverness*, and *Ross and Cromarty*. Don't think that his /M signals won't penetrate down south—your scribe can vouch for the GM3YCB mobile signal at the G3KFE QTH when 'YCB was on from the Lothians! Further ahead still, this team have a projected run to Selkirk and Peebles in October.

A horizontally-polarised G3RFS (East Barnet) writes in to say that he is passing the time away reading ten years of back numbers of SHORT WAVE MAGAZINE (*phew!*), but did manage to get a new fifty-foot stick up for the Top Band aerial before going to hospital and, when he comes out, work will be done on the inverted-Vee for 3·5 and ground-plane for 7 mc. The planned trip to 6Y5 and 9Y4 earlier in the year foundered on the rock of a slip-up

in the arrangements for leave of the two buddies who were to go with him, but Neville says he will be in Kingston, Jamaica, at Christmas for certain.

G3XDY (Cleethorpes) is a little cross in that he has arranged his holidays coincide with the GM3SVK expedition, although the only one he is desperate for is Kirkcudbrightshire. Not so G3KFE, who wants *all* that Fred can dish out in the way of his Scottish tour, but will be at work and fourteen miles from the machinery each night—after specially " chatting up " G3SVK to make sure the latter did the ones G3KFE wants!

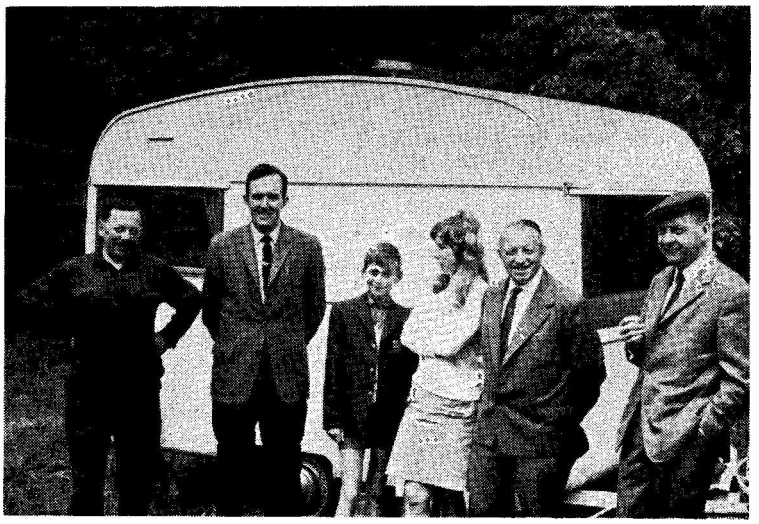
From GI3WSS (Holywood, Co. Down) we hear that Cyril has gone up to 91C worked after his QSO with GM3VAR/A in Berwick. Other contacts included GM3GIZ/P, Orkney; GW3WOH/P from Caernarvon; and OE7ZUJ/P for a new country; the latter is mentioned in several letters and was G3LSF on holiday in Austria.

Top Band for G2HKU produced GW5YB, PAØSE and PAØPN, plus GM3VAR/A in Berwick, all SSB, together with CW operation which raised OL2AIO, GM3OXX, GW3GCZ; most of them around 2100 clock.

Andy The Lamp, GW3UUZ (Llantwit Major) is still around, praise be, as after so long a silence we had given him up as lost; Andy got fed up with SSB and reverted to CW, for which he now runs a DX-100 and HQ-170 set-up, used occasionally to look around the CW end last thing, or, more frequently, to work AM and give many mobiles heading to or from holidays in Wales or the West Country a daylight QSO of some interest.

Bits and Pieces

Your conductor's talk recently about the possibilities of mobiling as a way of beating TVI on the DX bands, and the equipment problems, brings a comment from G3ESP (Pontefract) who says that changing from positive-earth to negative-earth to suit the preferred gear has two solutions—either change the car (G3KFE would have to pay 'em to take his away!) or read the G3ESP article in the *Magazine* earlier this year on a zero-cost way of doing a conversion. Walter goes on to remark on SSB operators who over-drive their transmitters so that the ALC circuit is limiting hard on peaks with audible distortion of the signal —which can be cleared by reducing the AF gain a little with very beneficial results in terms of the audibility of the signal.



Left to right: G3US, G3ESP/LX, LX1RB and LX1SD (the two youngsters are the harmonics of LX1RB), taken at Lintgen when G3ESP/M (with G3US and G3XDF) took his caravan to Luxembourg. Gear on board consisted of a Sommerkamp FT-150 and enough wire for an 80m. dipole, erected as convenient. Best DX was PY on 80m. SSB.

Various people have commented on or enquired about the stations using the 3Z prefix. These all emanate from Poland, and country-wise count the same as SP.

Those who worked GB3FI, GW3VKL/P or G3XZW/P were helping to commemorate the original experiments carried out in May *1897* by Marconi and Kemp from Flatholm Island to Lavernock Point in Glamorgan and Brean Down, Somerset. The QSL card has on it extracts from Kemp's diary over the period of the experiments, with pictures of the two and their gear, in addition to the usual QSL information referring to the 1969 contact. It was in this district that " original communication by wireless " was achieved, and the local groups (Barry and Taunton) are to be congratulated on having staged a commemoration by Amateur Radio — Marconi himself always maintained that he was an amateur working on first principles.

Contests and Awards

The big event to come is undoubtedly the *CQ* World-Wide DX Contest, booked for the weekend October 25-26 (*Phone*) and November 29-30 (*CW*). Times 0001 Saturday to 2359z on the Sunday. Object of the exercise, as always, is to work as many Zones and Countries as possible in the 48 hours. The standards are our *DX Zone Map*, DXCC country list, WAE country list, and the WAC continental boundaries. QSO points are at the rate of one for a contact with a different country within one's own continent, and three for one with a country in a different continent. No QSO points claimable for a contact with one's own country, although such a contact may be claimed for multiplier purposes only—the multiplier being one for each Zone on each band, and one for each country worked on each band. The final score is calculated by adding up the total QSO points, and multiplying by the sum of the Zone and Country multipliers. For all the dope, send an adequacy of IRCs to *CQ* for a supply of log pages and summary sheet. *CQ Magazine* DX Dept., 14 Vanderventer Avenue, Port Washington, Long Island, N.Y. 11050, U.S.A. (The rules in full are, of course, in the *CQ Magazine* column by W1WY.) Logs to reach *CQ WW Contest Committee*, postmarked not later than December 1 for the Phone leg and January 15 for the CW section. Logs are to be in a

standard form, with all times in GMT, a separate log for each band, forty contacts to the page, with Zone and country multipliers shown only the first time they are worked. Disqualification results either by violation of local radio regulations in the country of the operator; claiming excess multipliers; or a log containing more than 3% of duplicate contacts —so be careful! There are three divisions: Single operator, single band; single operator all-band; and multi-operator, the latter dividing down into single transmitter and multi-transmitter. As for the trophies, the list of them is as long as your arm. And, this year, we hope that there will be strong U.K. support for what is a worthwhile Contest for those interested in competitive DX operating.

The Cornish Award is now reactivated, with Ted Bowden, G2AYQ, as the awards manager for the Cornish Club; the certificate is a truly Cornish effort, designed by one club member, printed by another, and aimed at stimulating activity in the County. For full details on this one, contact G2AYQ, *QTHR*.

Eighty and Forty

A thin pile this time, which seems a pity as both bands have been in pretty fair shape on the occasions when your E.P.E. checked them, bearing in mind the time of year.

Reporting the HF Bands

GW3UUZ uses his Top Band vertical quarter-wave also for 3·5 mc. After a previous contact on Forty, a sked was arranged with ZL3GQ on Eighty, which resulted in a 569 both ways—*nice !* Forty also yielded quite a crop of W/VE calls for the log, while PY7AZQ and ZL3GQ were both worked out of Andy's CQ calls—which must have pleased the Lad in the Lighthouse no end!

Talking of lighthouses, and their occupants, G2NJ (Peterborough) had a rather interesting contact with GM3VBB/A, when the latter was on Sule Skerry Lighthouse, out to the west of Orkney. Apparently, GM3VBB has operated from various lighthouses in the GM area. On Forty, G2NJ mentions YO4WO /MM, heard on CW on August 9.

Eighty for G3NOF is something a trifle out of the ordinary, but it happened during the month; and Don raised 3V8NC on SSB among others. The latter was also booked in by G2HKU (Sheppey), along with LX1EB and various EU's on SSB, plus HBØXWS (who is QSL'd *via* DK1YK) worked on CW. As for Forty, it produced an SSB contact with 9H1BA.

G3WJS goes up by four on 7 mc, his tally being an assortment of W's, also DL7NS/OHØ, 3V8NC, VE's, UL7KDL, UW9FR and ET3USA. Eighty seemed to have had its moments, too, with DL7NS/OHØ, GD3KDB, UA1DX, UO5PK, LX1EB, W1SWX and UL7KBH. It is worth looking also at some of John's gotaways, which included such nice ones as 3V8NC, 3V8AA, UH8DC, CE2DI, PY1ACT, XE1CE and CX2BH—pretty fair for the summer season.

Miscellany

Recent talk about QRP as a means of keeping on the air when higher power produces TVI touched off an interesting comment by G2HKU, who recalls that when he first got going he had no mains power, and so made his DXCC with between 5 and 21 watts, driving the PA flat out either by a vibrator-pack running from an accumulator, or simply a couple of HT batteries in series (at 4s. 1d. each in the early nineteen-fifties). With this sort of input Ted was able to make DXCC.

Still with G2HKU, he remarks that none of our correspondents seem to realise that, contrary to the general belief, the BBC do *not* intend to give up using Band I for TV. Transmitters are to be converted to 625-line for educational programmes.

Piracy is unfortunately a matter we have to mention in this piece from time to time. G3XYS (London, S.W.1) has been the victim of one calling himself Tom and giving QTH in Liverpool; he seems to come up between 2300 and 0300 GMT, mainly AM, but occasionally CW and SSB. G3XYS has been told by those who have worked this spurious type, and SWL's who have heard him, that he " seems to know what he is talking about " and is somewhat elderly if the voice is anything to go by. For the record, G3XYS has never worked SSB, has only had about five AM contacts since being licensed, and will be abroad for the next five months anyway. Your scribe can add a footnote to this one,

A recent portable-mobile excursion to Long Mountain, near Welshpool, signed GW3SRT/P on Top Band and two metres, showing how the gear was operated from the vehicles. In the group are, l. to r., G3WWH, SWL Linney, G3UDA and (standing right) G3WNI.

and say that Liverpudlians of his acquaintance are well aware of the pirate in their midst, and have, we understand, passed on the name and address of this character to the authorities.

The HF Bands

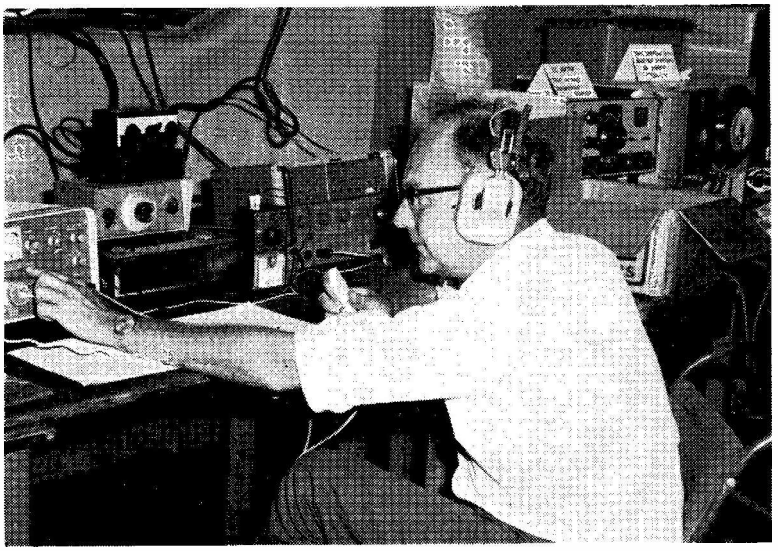
Taking Ten first, one gains an impression of summer doldrums; certainly your scribe, on the few occasions when, by the fact that he was on sick leave, he was able to give it a thorough going-over, found only a tired silence.

After several months of quiet, G3VPS (Wartling) announces that he still does make the occasional foray on the HF bands, even if he has been turning most of his attention to VHF. As far as 28 mc was concerned, the period 1600 to 1800z was favourite, with CW the preferred mode, to raise ET3, VQ8, CR6, CR7, LU and CX.

In spite of the Triband 3-element Quad at the hotel kept by Les Ward in Guernsey, sitting up at 50 feet, GC3UGK found Ten, as he puts it, a dead loss. All that was worked was DM and 9J2DT, with a lot of pregnant silences following his CQ's.

G3NOF also has a pretty poor opinion of 10 metres, albeit just before he wrote it seemed to be picking up a little, with South Americans audible in the evenings. Don made SSB contacts with KV4AD, LU's, OHØAM, ZS, 5H3MA and 9J2VX.

Turning to 21 mc, GM3JDR (Golspie) found it up-and-down, with lots of short-skip to wipe out DX. SSB gave VQ9/A/BC, CE3FI, CR6EU, and VS6BC, while CW produced a much larger list—



Clive Bowden, G3OCB, running one of the talk-in stations signing GB3CRC for the Cornish Rally at Truro on July 27. He will be remembered as the contributor of several good, practical, constructional articles to this Magazine.

9V1PD, 5H3KJ, KR6NR, UAØLS, PY1NEW, UAØZB, TA2FM, 7Q7RM, UG6AD, CE3ZW, UWØJK, VU2IAB, 5N2AAU, 5N2AAF, LU1ZR, VS6BC, VQ9MK, PY7VL, VQ8CC, ZS, 3V8NC, ZD9BM and stuff like DJ1UP/LX, CX9BT, FL8MB and EA8BK.

GC3UGK played 15 metres pretty hard and found the going quite reasonable with SSB, which gave him a list which he reckons " should be better than the one from GM3JDR "! Let readers be the judges—all W call areas, VE and VO, KP4CSZ, KR6JT, 9V1OE, several JA's, VU2OLK, CE3UM, HK3AVK, ET3USA, CR6LG, PY1MB, TF2WLW, 9V1PD, DU7ER, MP4TAF, ZC4AK, 6W8XX, 3V8NC and VS9MB.

In the view of G3NOF the 15-metre band has started to pick up a little after the " summer recess." For him a few VK's on the long path popped up around 0700, with JA's workable at times varying from 0900 to 1800z, VU as late as 2300, and the North and South Americans sometimes being there into the small hours of the morning. Contacts Don specifically mentions are JA, MP4TAF, MP4TDA, OA5G, YBØAAF, ZS and 9V1PL.

Twenty Metres

Unquestionably, still the amateur world's most active band, in any mode or style. GC3UGK spent a while on Twenty during his visit to Guernsey, and remarks that, while there are 20 or so licensed amateurs on the Island, only GC8HT uses the HF bands; so when the GC3UGK signal was put out, it raised a pile-up of quite alarming size. All W call areas were worked many times over, with a total of 27 states, many EU's, of course, and, on CW, VE's, TF2WLW, KV4AM, JX5CI, VP9GK and XE1KD, with SSB raising in addition a load of W's and VE's, 3V8NC, C31BS—the new prefix for Andorra—and precious little else, mainly because of the disproportionate amount of time spent on the key.

The band yielded seven new all-time countries for G3VPS, CW producing QSO's with ZC4, 6Y5, KP4, ZL, VK, SV1, UI8, UL7, UG6, UA9, UAØ, while the SSB mode gave CT2, 3V8, ET3, FP8, 6Y5, VK, EA8, CT3 and SV1.

G3NOF reports the early-morning sessions as having been good to VK and ZL most mornings; the Pacific has not been much in evidence although a couple of mornings the Pacific Island net at 0700 on 14270 was monitored and stations heard included KH6, VK's, ZL's, W's, KJ6CF, VR2CC and VR2FT. SSB was the mode used to raise CE3FZ,

FIRST YEAR OPERATOR'S LADDER

TOP BAND ONLY

Call	Counties CW	Counties Phone	Countries
G3XTL	78	—	15
G3XTJ	68	62	14
GM3YCB	52	81	11
G3XVC	40	27	11

Note: A first entry for this Table must be accompanied by a statement of the date of first licensing. The same county may be claimed for both CW and Phone. Placings will be determined by taking a different column each month; this time it is based on the " Countries " column.

CP1GN, CP5FB, FØCH/FC, FP8AP, HB9XVO, HV3SJ, KG4DS, KH6JGU, KH6GKV, KJ6CF, K6JGS/HKØ (San Andres Is.), JX3DH, MP4BHH, OHØNF, VE8RCS, an assortment of VK's, including VK9XI on Christmas Is., W5, W6, W2FHO/W7 (Arizona), W7EOE (Nevada), XE3AF, YN1HF, ZS5TK and 4X4YM. Among the Gotaways were CEØAE, CR8AI, DU1ZAF, FO8AA, HZ1AB and VR6TC.

An occasion of short-skip on 20m. one Sunday rather amused G3WJS (Halstead), contacts being made with G3SMI, PAØOCT, PAØPFW, G3VMW and GI3YDO. A little further afield there were the usual W's and VE's, HK3RQ, TF3AU, PY's, UL7JG, UA9WL, UL7KAA, UO5AP, UA9WS, UAØII, UV9KAG, CR6GO and 3V8NC, to give a total rise, including the PA and GI, of six countries on the band.

Whilst he was up in Angus, G3XTL used a HW-32A mobile on Twenty to work various stations from W to EI and GI on SSB, on only a home-made whip.

Not much activity during July from GW3UUZ, although he did get on the band once or twice and worked six new States plus VE7; one CQ call netted him eight W6's in a row, with a couple of W7's and VK5XK to round things off nicely!

Talking of States, G2HKU is still looking for contacts with Utah and Wyoming to make his WAS, but never even seems to hear them. However, Ted does get out quite well, and worked WØEXB, WB6KBY, WB6LPN (for the latter's first G contact), CEØAE (who gave him 59), HP1RS, both being new ones for the band, FØHI/FC/M, W7's, JW9DL for another new one, and VK3AKP, all with SSB. Just to keep in practice, the key was used to raise 3V8NC. All the contacts mentioned were made around 0700z.

QSL Addresses

G3NOF usually has a few to offer, and this month is no exception. 5H3MA cards are to go to VE3DLC; CP5FB to Box 519, Cochabamba; 3V8NC to G3TXF; HBØXVR to W7CRT; KG4DS to N.A.S., Box 46P, FPO N.Y., N.Y., 09593, U.S.A.; VU2DK to Box 104, Poona, India; VE8RCS *via* DOTM; MP4TDA to G3HSE; HBØXVO to DL4SE; JX3DH to NRRL; YBØAAF to DL1SU; K6JGS/HKØ to W4VPD; and CR8AI to Dili, Timor.

Here and There

Prefix hunters may be interested to learn that during 1970 VK stations will be allowed to use the prefix AX; a special award will be available to commemorate the Cook Bi-Centenary, by working a total of 50 stations using the AX prefix.

It is understood that the VS5MC operation of VS6AA is asked for "proof" by ARRL, and naturally enough Maurice is not going to play. This "proof" business is getting past being funny—5Z4KL had trouble with ARRL over his 5X5 exercise earlier this year, and at one stage said that he would not be prepared to do another one in August as had at first been planned; however the RSEA committee vouched for him and ARRL accepted this. There seems absolutely no consistency about the ARRL and their actions where DXCC is concerned.

Gus Browning, W4BPD, was on Desroches when the trimaran, which was returning to pick up supplies, was wrecked with the loss of the captain. It is understood that a large proportion of the expedition funds was aboard at the time. Gus left Desroches on July 15 for Mahé, and later was heard from 5Z4ERR. He was to be back in the U.S. around August 19, and at the time of writing he had not been able to get on from any of the four other stops which were originally planned.

Deadline

So there it is for another month; the deadline for October is a little early this time at **September 8,** when we hope to hear all the news, views, and comments, printable and otherwise, on whatever comes under the heading of this piece. Address, as ever, to CDXN, SHORT WAVE MAGAZINE, BUCKINGHAM. 73, es DX.

MOBILE RALLY EVENTS

Those still to be played off before the Season ends are as follows:

August 31: The G3VGG, Bromsgrove & District Amateur Radio Culb, Mobile Picnic will be held in the grounds of Hartlebury Castle (Worcestershire County Museum) near Kidderminster, Worcs. Talk-in will be given on 2m. and 160m.—J. Dufrane, 44 Hazelton Road, Marlbrook, Bromsgrove, Worcs.

October 5: Scottish Mobile Rally, incorporating an exhibition of radio equipment, at the Beach Ballroom, Aberdeen. Free parking with ample space, a grand draw and refreshments available on the premises. Trade support is solicited. This is a first venture, and we wish them well. Information from.—A. W. Smith, GM3AEL, 1 Sclattie Place, Bucksburn, Aberdeen, AB2-9QD, Scotland.

October 12: Peterborough Radio & Scientific Society's Mobile Rally at Walton County School, Mountsteven Avenue (off Lincoln Road), Peterborough. Opens at 2 p.m., with free admission, parking and entertainment. Talk-in stations on 2m., 4m. and Top Band, also trade stalls. Refreshments available on site, and plenty of indoor accommodation if wet.—D. R. Byrne, G3KPO, Jersey House, Eye *(351)*, Peterborough.

October 16: Ipswich Radio Club and Colchester Radio Society are jointly organising a Mobile Rally to be held at the Suffolk Show Ground, Ipswich. There are to be trade stands of Amateur Radio, electronics, Hi-Fi and Do-It-Yourself interest. Adequate car parking, cover if wet, and light refreshments available on site. Talk-in on Top Band and two metres.—B. J. Garnham, G3SJO, 17 Sutton Park Avenue, Colchester, Essex.

VHF BANDS

A. J. DEVON

AS many readers will know, Mike Dormer, G3DAH, conductor of this piece since March of last year, was laid on his bed-of-sickness within a few hours of clearing the August offering for press. It then became a matter of finding a stand-in till such time as G3DAH could return to duty—which, it is hoped, will be with next month's "VHF Bands." In the meantime, something had to be done to keep the feature running. The Editor's bloodshot eye fell on A.J.D. "You do it," he said, "you've done it before. Try and do it again, only this time make it good." And he added "Keep it *staccato*, with a touch of the *pianissimo*, and don't make any silly mistakes with the VHF Activity Table, or anything like that."

Those were the orders, so A.J.D. switched up the old converter and, while listening to its deafening sharsh on the beacon frequency, began to think back over the years—right back to 1938, when he first started this piece under the heading of "Five Metres"—till November, 1947, when Ted Williams, G2XC, took over the feature. He stayed in this hot seat until May, 1952, and did a great deal of valuable work in building up the U.K. VHF interest. For personal reasons Ted decided to retire altogether from Amateur Radio and went the whole hog by giving up his licence —so the feature (now called "VHF Bands") reverted to A. J. Devon, remaining his responsibility for the next 16 years or so, until Mike Dormer, G3DAH, joined us in March, '68, to take it over as a regular commitment.

We are glad to be able to say two things: That after all these years Ted Williams, *ex*-G2XC, is still with us as a reader, and that G3DAH should be back in said hot-seat for the next appearance under this heading.

* * *

Though the glass has been consistently high during the period since last time out, it has not produced anything in the way of superlative EDX, or even GDX. In other words, we have found much the same VHF conditions as experienced in previous years when the summer has been hot and dry for a long time. The reason is that the short nights of midsummer have not been cool enough to set up a real temperature-inversion for the late evening—and it is a pronounced inversion of temperature that we need for good tropospheric propagation over DX distances. During the height of the heat-wave it was not till early morning—when the heavy mists started to rise over the river and the air was chill and windless—that good VHF/DX was possible. But who is around on the two-metre band at 0530z, when all you can really hear is the dawn-chorus! Yet if half-Europe had been on at the time, you would have been able to work them all before breakfast.

We are now getting towards the time when good DX *can* be expected in the late evening. The signs to watch for are a warm day followed by a cool evening, with thin cloud at a great height. If aircraft are about, they will leave long condensation trails. There will be little or no wind at ground level and, if you are near the sea, the visibility will be poor. If you are in a fringe area, your TV picture will be brighter and steadier than usual, with a better lock than perhaps you normally get. You can then go into the shack and switch on, with a fair certainty that something should be coming through. If all the signs fit, then it is certainly well worth while starting to pump out CQ's.

* * *

So far as it within him lies, A.J.D. has brought the Tabular Matter right up to date. It is interesting to note that the 35 entrants now in the Table have between them put in no less than 20 movements—so there is no question about progress being made on all VHF bands. (No doubt, Mike will be sorting out the band-by-band positions for a future issue.)

We are also holding several VHFCC claims—to be dealt with in due course —and some new "Firsts" will have to be taken into the list when next we can show that Table. Those that were missed in the presentation on p.169 of the May issue were because the *Magazine* archives had not been checked over after about 1961. It can be taken that, somewhere, we hold details of all that has ever happened on two metres since the band was opened early-1948. Over the last 20 years, we have experienced, and recorded, in the amateur VHF context, results by way of tropo., spor-E, Aurora, ducting, forward-scatter, meteor scatter, E-M-E, balloon transponder and *Oscar* working—many times over.

* * *

As to what is happening now, an item of special interest is that 9H1BL, Malta, has got a 4-metre Rx going with a good aerial; on July 26 he logged, on CW at levels around 579/599, 1840-1850z, G3NNO, G3NJN/P and G3SLJ/A, also a (doubtful) "G3MEH" or "G3MEV," at about 459. This will help to enthuse the 4-metre boys, as 9H1BL is understood to have a Tx in hand— anyway, he is listening on the band, and so is 9H1AY.

G3NNO (Harrogate) himself runs 40w. to a 4-ele Yagi at 37ft., the Rx being a valve converter into a BC-348 —and so far Michael has accounted for 29C on four metres, including GD and GM.

Those interested in Hereford for the 70 mc band will be glad to hear that G3VPS/G3SJV will be there for the weekend September 20-21, main freq. 70·275 mc, each evening 1800-2300z, AM/CW. For anyone wanting to fix skeds, G3VPS is *QTHR*.

Two-Metre Notes

G8BJD (Southwick, Sx.) gets 12w. RF out of a home-built Tx, into a slot-fed 4/4 at 35ft. In just a year's operation, the log shows 250 stations worked, 30 of them being F's. He is also on 70 cm, and active on A/TV as G6RZD/T.

An old friend of this piece, GD2HDZ, is making nice progress in the two-metre column and remarks that of the 500 or so stations he worked as G2HDZ up to 1957, he has

THREE-BAND ANNUAL VHF TABLE

January to December, 1969

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	TOTAL pts.
G3DAH	11	1	62	14	16	4	108
G2JF	—	—	55	11	28	7	101
G3COJ	11	2	52	11	19	6	101
G8BMD	—	—	51	9	29	4	93
G8AUE	—	—	44	4	32	4	84
EI6AS	13	7	38	12	—	—	70
G3EHM	—	—	45	10	11	2	68
G8APZ	—	—	36	8	16	4	64
G3EKP	23	6	19	6	5	3	62
G3LAS	20	1	36	4	—	—	61
G8ADP/A	—	—	36	5	16	3	60
G2AXI	15	2	32	5	4	1	59
G3BYV	—	—	21	7	15	6	49
G8APJ	—	—	26	6	8	2	42
GD2HDZ	—	—	35	5	—	—	40
G8BJK	—	—	34	6	—	—	40
G3TDH	35	5	—	—	—	—	40
G8AYN	—	—	14	4	16	5	39
G3AHB	—	—	24	4	8	1	37
G8ASR	—	—	32	4	—	—	36
G8AUN	—	—	29	6	—	—	35
GI5ALP	8	3	17	5	—	—	33
G8BJC	—	—	28	5	—	—	33
G3KMI	12	1	14	3	—	—	30
GW5NF	—	—	24	5	—	—	29
G8BDJ	—	—	18	6	3	2	29
G8ARM	—	—	—	—	23	5	28
GW8CGN	—	—	23	4	—	—	27
GC8AAZ/P	—	—	22	4	—	—	26
G8BKR	—	—	12	2	8	2	24

TWENTY-THREE CENTIMETRES

STATION	COUNTIES	COUNTRIES	TOTAL
G8AUE	7	1	8
G8ARM	7	1	8
G8ADP/A	3	2	5
G8BAV	3	1	4
G8AYN	1	1	2

The THREE BAND ANNUAL TABLES show total claims to date from the year commencing January 1st, 1969. Claims should be sent as here-to-fore to:—VHF Bands, SHORT WAVE MAGAZINE, BUCKINGHAM. Summaries by bands will be published at suitable intervals.

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only been able to find about six so far!

G8BYV (Dereham) modulates his 12-watt PA, a QQV03-10, by a pair of OC35's; the beam is 8/8 slot-fed, at 35ft.; and the Rx a home-built FET converter into an R.216 tuning 24-26mc. (Anent G3DAH's recent operation, G8BYV remarks " it's probably the one opening he would like to have missed "!)

Incidentally, it is worth mentioning here that G3DAH (Herne Bay) has had over 13,000 VHF contacts during the last two years—he works all three bands, and is /M on two metres as well.

G3COJ (High Wycombe), having acquired a second harmonic (by courtesy of Mrs. Bower) has not been very active of late—he says he expects the infant will be competing for the use of the Tx in 10-15 years' time. Brian was pleased to raise EI6AS on SSB, and also suggests that the " Firsts " list needs re-checking in some instances—we know!

G8BMI (Keighley) remarks that his log shows that he works one of about every three stations heard, and finds his QSL-return ratio is 36%—and wonders if these are the sort of figures one would expect for two metres. To us, they seem somewhat on the low side.

G3TNO (Horsham) has been trying a new NBFM detector (suggested by G3SHK) with a vast improvement in weak-signal readability—S2 can be R5 when the NBFM is properly adjusted. G3TNO himself can work AM/CW/FM/SSB as required, but seldom uses AM nowadays. He mentions an interesting SSB contact recently, with an F coming in very strongly, who turned out to be generating only 4 watts p.e.p. The installation at G3TNO runs 250w. p.e.p.! In spite of the mortification, he is extending into the 4-metre band, to run about 10 watts RF out, in all modes.

The Table figures shown for GW8CGN (Llantwit Major, Glam.) are the product of but one month's activity, during his university vacation. His Tx is one of the classic AM arrangements for two metres—a QQV06-40A taking 75w. input, modulated by a pair of 807's, to give deep control; the Rx side is 6CW4-EF95 into an Eddystone 940 tuning 3-5 mc; his aerial is an 8-ele *J-Beam*, 25ft. a.g.l. and 200ft. a.s.l. With a new QTH in prospect, not far away but

100ft. higher with better aerial-siting facilities, he expects to be able to put out a much-improved signal. For anyone wanting Glamorganshire, GW8CGN is there most evenings, on 144·334 mc.

Reference the note on p.378, August, about EI2VBB, the G call should have been given as G8CEF.

Contest Notes

Dates to put on the pad are September 6-7 (VHF Field Day and Region I IARU Contest), and September 21 (Two-Metre Fixed Station Contest). The former should be specially interesting, as many U.K. groups are known to be intending participators —if we get a spell of decent Wx over that weekend, activity should be high, with the two-metre band chock-full of strong signals from vantage points all round the country. And if during this event you hear stations using the prefix PD3, don't be 'fright—it will be some of the Dutch boys who have opted for it, to celebrate " 50 years of broadcasting in Holland." The inducement is a free issue of QSL cards by the BC people.

With the IARU Region I contest right upon us, the complete official results of the 1968 event are still awaited! The adjudication for this was undertaken by the Polish national society . . . oh, well! We were able to publish the unofficial results in June " VHF Bands," p.234, and these can be taken as correct as regards the leading stations.

The two-metre SSB contest on August 4 failed to rouse any great enthusiasm, though conditions were by no means poor. The nearer EU's were coming through well in the southern part of the country, but activity generally was low.

It is reported that conditions for the 70-centimetre contest on August 10 were fair during the early hours, with PA/ON stations at good strength. Then, just about mid-day there was an abrupt change—contacts over the 100-mile mark were hard to come by and activity declined precipitously. Very little CW was heard, most stations using AM phone.

The very first European two-metre contests were laid on by SHORT WAVE MAGAZINE and were well supported, with what (for those days) were large entries. For instance, does anyone reading this remember the 1948 Contest, reported in our January '49 issue? This was run in two sections

Left to right: G3DAH, G6FK, SWL friend, G8AEV and G3THW, taken at the Wolverhampton VHF Convention in June last, already reported in these pages. G3DAH represented " Short Wave Magazine " for the occasion; G6FK was chairman of the organising committee, the others also being on the committee. They put on a very good show.

(we still had five metres at that time, the two-metre band having only recently been released). Winner for both sections was the redoubtable Hilton O'Heffernan, G5BY, with Maurice Mason, G6VX, his runner-up on two metres. There was a total of 58 entries, and among other well-known calls in the list (some still active) are G2NH, G2WS, G3WW, G5MA, G5NF, G5RP, G5UM and G6HD—to mention only a few from a long tally.

These early annual VHF contests—planned, managed and adjudicated by A.J.D. and G2XC—with their variations as the pattern of operating changed, were so successful that inevitably they produced a band-waggon reaction — " everybody " started organising VHF contests, and now there is a plethora of them, with much thinner support for each. Never mind . . . ours were the pioneer efforts, all in a good cause.

* * *

Your A.J.D. is not at present certain of the facts relating to the 1296 mc (23-centimetre) record, but an item in the June '69 issue of the Australian *Amateur Radio* claims this for VK4KE-VK4ZT, at 138 miles over virtually a line-of-sight path.

It may be remembered that our ZS colleagues have full use of the 50 mc (6-metre) band, which has never been an allocation in the U.K., though at one time it was much used for cross-band contacts 28/50 mc between G's and W's all over the U.S. (The only station to use 6 metres from the British Isles area has been EI2W, Dublin, who is licensed for it.) Anyway, what the ZS's are finding is that on occasion the 50 mc band opens to DX, and they are able to work not only all round the Union but across to America as well. The probability is that they can expect more consistent results on 6m. than we get on four metres. It follows that if 4m. conditions are good for ZB2 and 9H1, it might be possible to get cross-band working ZS/G using 50/70 mc. Well, worth a try, one would think.

There are 6-metre beacons at ZE1AZC (50·046 mc) and ZS6VHF (50·10). In addition to the established U.K. beacons for 70 mc, we also have ZE1AN (69·998 mc) and, more recently, EI4RF (70·32 mc).

Conclusion

Deadline, with all your criticisms, complaints and harsh comments (the Editor hasn't seen this piece yet!) will have to be **Saturday, September 6,** addressed " VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM. *73 de A.J.D.*

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SHORT WAVE LISTENER FEATURE

SOMETHING ABOUT AERIALS — DISCUSSING ANOTHER HEAVY MAIL — NOTES, NEWS AND QUERIES — THE LENGTHENING HPX LADDER

By Justin Cooper

IN the July " SWL " we discussed the applications of preselectors, attenuators and converters in making life easier for the reception of amateur signals. Several times in the fairly recent past the role of an ATU in getting the best transfer of signal from an aerial, of whatever type favoured, to the receiving system front-end has also been mentioned.

The next step is to consider the aerial itself, in the simplest possible terms, and what can be done to make it as efficient as one can from the point of view of getting amateur-band signals in. Right from the start, it should be realised that there is nothing magic in the *length* of the aerial. *Any* piece of wire which is in the path of a radiated signal will pick some of it up, the amount having a direct relationship to the " capture area " of the wire —which for our purposes may be regarded as that area within a quarter-wavelength or so all round the aerial, assuming the wire is in free space. The problem is that no practical aerial *is* in free space, and so our wire will tend to pick up a greater amount of energy from signals arriving from certain directions, while the feed impedance to which we have to match in order to extract the maximum proportion of signal is to a large extent unknown in the case of a random-length aerial.

Suitable test equipment for accurately measuring the impedance presented by the aerial is extremely expensive, and so the usual—and equally effective—method is to build an ATU and fiddle with it until we get the best received signal. However, we can lay down some general rules as to the height and orientation of an aerial for best effect on a given band. A vertical aerial of a length no greater than three-quarter-wave (which would be 50ft. for 20 metres) will give a very good response to signals arriving at low angles—that is, from a long distance—but is extremely fussy about having a good earth system to work against. If the wire is horizontal, the ideal height is a wavelength, or if that is not practical, a half wavelength. Heights of a quarter-wavelength, or an odd number of quarter-waves, tend to produce great response from signals reaching the aerial from very high angles. Changing from a dipole at a given height to a parasitic beam at the same height will not materially alter the *angle* of best response.

Thus, our aerial should be a piece of wire at a height of half or one wavelength for the preferred band (difficult to achieve in amateur practice) fed through some sort of aerial coupling circuit—any one of the multi-band aerial designs can be coupled to the Rx through a suitable ATU. At the ATU there should be a ground connection as short as possible to the best obtainable earth. And it must be emphasised once again that the earth is as important as the aerial. In areas where the ground is rocky, the earth is indeed *more* important than the aerial, and energy expended in laying down radials and generally improving the earth will pay enormous dividends. If you want practical proof before you start improving the earth, just listen to a mobile signal and watch the S-meter as he crosses a bridge over a river!

Changing the subject: At the time this was in the typewriter the R.A.E. results were not out—but when we reach print they assuredly will be! Our congratulations to the successful, and to those who have had the misfortune to " come unstuck," don't be down-hearted, and *do* have another go—but make sure you do as much preparation as you can.

HPX Queries

Quite a few oddities have been turned up this time, some of which can be cleared up by reading the HPX Rules, which we are publishing again in this issue. *C. Price* (*Bolton*) mentions a station signing OS3AY, who was heard calling CQ on May 9, claiming to be on an island off the coast of Norway. This one sounds rather like a phoney, and no one else seems to have mentioned him or given any indication as to his true status.

Another of the same ilk was OF1VR, claimed last time by *D. J. Reynolds* (*Dudley*) and passed through by your J.C. without comment—he must have been dreaming at the time. SWL Reynolds is now sitting tight with fingers crossed for the results not only of his A-level examinations, but also of the R.A.E.

(*Editorial Note:* If correctly logged and identified, OS could be Belgian and OF Finnish—possibly special-activity stations.)

Some pirates really do give themselves away in the most obvious way, like the " VP4SX " purporting to come from a country that has been signing 9Y4 for Heaven only knows how long! This one was caught by *C. R. Bagwell* (*Camberley*), who has a few useful tips to offer on getting the best out of aerials; he always checks them for resonance by using a GDO to excite them and measuring the standing-wave ratio with a home-brew bridge.

Frequently people question stations using call-signs like AJ3UI—this prefix belongs to the American MARS (" Military Affiliate Radio System ") network, and although the stations are amateur-operated they are *not* amateur stations and are therefore not eligible for inclusion in a prefix list. *D. A. Haines* (*Bromley*) men-

At centre, Neill Taylor, 9 The Crescent, North Wembley, Middlesex, with two SWL friends—Chris Vickers (left) and Dave Kirman—on the occasion of a school exhibition, for which Neill gained a prize for the equipment on show. They now have an Amateur Radio Club at Salvatorian College. Neill also won last year's SWL prize in the Radio Society of Harrow's Constructional Contest.

tioned them this time, and concludes his letter with a gripe about the number of GB stations that fail to come across with cards in exchange for reports he has sent them. To be fair, most of the GB stations are pretty well swamped in QSL requests from the stations they have actually worked—GB2HRH had over 3,000 QSO's to acknowledge, for example—and whoever has the chore of writing *that* number of cards out will not look very favourably on the vast majority of SWL reports. Another aspect of the question is the sheer cost of the cards; unless they are paid for by the body for whom the station was put on, the local lads have all the costs to bear out of club funds or their own pocket, which is no joke for a small group.

M. Williams (*Sleaford*) found another oddball in a station signing BY1PK—this one could just possibly be genuine (China) but it would seem to be extremely unlikely.

That "5A3CH" considered dud by *J. Dunnett* last time has the cudgels taken up on his behalf by G3WPO, who points out that he is none other than Dave, G3SWA out in Benghazi, with a Swan-350 doing the work.

The question raised by *D. J. Browning* (*Bishops Stortford*) as to the status of LG5LG and his whereabouts is answered directly by the letter from *S. C. H. Green* (*Brixham*). It seems that Norway and Sweden between them established an independent territory called Morokulien in connection with the International Refugee Year of 1959. Amateur Radio activity started there on June 30 last year, when the special calls LG5LG and SK9WL were allocated. The object of the exercise, as far as the amateur side goes, is to provide for education and equipment for blind and physically handicapped radio amateurs. To help raise funds, stations wanting cards are requested to send their QSL's plus 3 IRC's to LG5LG/SK9WL, PO Box 1, N.2242/S.67044, Morokulien, Scandinavia. If direct return card is desired, make it four IRC's. Thanks to SWL Green for passing on the information.

Anyone ever heard of an HB6? This one appeared on Top Band at the interesting hour of 1230z, and was logged by *R. Hyde* (*RAF, Locking*) at 339, so he is understandably not sure he got the call right. Most likely a phoney, but just possibly an HB4, which is a prefix allocated to Swiss military-amateur stations.

The difference between KR6 and KR8 stations has *S. W. Dean* (*High Wycombe*) a little worried; KR8 is the prefix for Ryukyu Is., which includes Okinawa, while KR6 is the prefix for U.S. personnel in Ryukyu.

Peter Whiffing (*Newcastle-upon-Tyne*) has various HPX rules queries, which will, in the main, be solved by a reading of the rules, appearing again on p.447; but he does raise a pertinent one when he asks if QSL cards are to be shown. *No, sir*—because HPX is *not* an award, and in any case the cost of handling all the cards would be astronomical—quite apart from the fact that cards from some areas take months to arrive, even direct-mail, let alone sent *via* the Bureaux.

Still on this theme, a look at the letter from the Top Dog himself, namely *Stewart Foster* (*Lincoln*). Stew voices a thought which must be passing through many

minds as to the country status of the various VQ9/A stops made by W4BPD in recent months. As far as we are concerned they all count one, namely VQ9, but just how many will be acceptable as " new countries " by ARRL for DXCC is anyone's guess. Personally, J.C. would like to see all these cases of reefs and sandbanks, which only appear when the tide is right, thrown right out of DXCC, and regarded as merely " fun " operations by the ops. concerned. About the only possible exception would be Geyser Reef, because at least the crew of a native boat which was wrecked there managed to survive on it for six months before rescue, even though it does go below water at high tides. (There is a book about this adventure which is well worth a read when the DX is not about.)

VR6 is the prefix for Pitcairn, and Tom Christian VR6TC is the only licensee on the island—*ergo*, a VR6FK heard by *R. Nicholls* (*Narborough*) was a misreading or a phoney, probably the latter. Seven other questions in his letter all seem to relate to good prefixes.

That OH2BH/Ø/SR which puzzled *B. Livesey* (*Beckenham*) was a genuine enough amateur signal, emanating from Skarp Reef, and publicised beforehand on the grapevine—but what its worth will be in the eyes of the DXCC people we do not know.

* * *

Anyone know such a receiver as an R.71? *R. Berkolds* who lives at *73 Barberry Avenue, Davis Estate, Chatham, Kent* has one, for which he wants some information so that he can get it working properly. Anyone with any ideas on the subject could write to Richard in the knowledge that his help would be much appreciated.

If you tune an SSB signal in you sometimes hear an annoying whistle, particularly in certain areas of the bands, says *R. Carter* (*Blackburn*), who wants to know what-and-why? If the signal was an AM one in the first place then you were listening to the real carrier wave beating with the locally-generated one used to resolve SSB. On the other hand, there are many SSB signals about where the carrier suppression is a little less than good practice calls for. The residual carrier, even if 25 dB down, may well be strong enough to be audible on the other side of the world.

Still with matters technical, we come to *G. Braund* (*Taplow*) who complains that when he is on Top Band and Eighty, he gets a terrible noise from the TV set as soon as it is switched on. This is a problem which seems to be much less prevalent than it used to be in years gone by; it is caused, basically, by the shape of the TV line timebase waveform, and the awful " caning " it gives the line-output transformer core, which tends as a result to radiate a strong magnetic field which produces a noise like a buzz-saw at harmonics of the line timebase speed, right up to the 3·5 mc band and sometimes higher. The way to attack the problem is to find out how the signal gets into the communication receiver; if it is picked up *via* mains, the answer is obviously a filter in the mains lead, but if RF-borne and picked up on the Rx aerial, then screening of the TV may help, or relocation of the amateur areial to take it as far away from the TV aerial or feeder as is possible. (If all else fails, drop a bomb on the TV!)

J. Struthers (*Hawick*) has begun to take more of an interest in Ten, and is interested in Sporadic-E propagation. This mode occurs when layers or patches of heavy ionisation develop, usually about 50 miles above the earth's surface; it is more common in the summer months in concentrations high enough to affect 28 mc and even 70 or 144 mc, making possible QSO's in the general range 400 to 1,300 miles. However, it is also a major factor in propagation over relatively short distances at night on the LF bands, the highest frequency usable being, as always, dependent on the degree of ionisation.

There are two problems worrying *S. Palmer* (*West Wickham*). The first is the way the setting of his selectivity control varies when the set has been switched off and has been allowed to cool, and again when the HRO has been on for long periods and is thoroughly warmed through. Stephen reckons this might be a valve, but your scribe would suspect that it is nothing more or less than one of the inductors or capacitors changing value with increase in temperature. So long as it does not do nasty things to the receiver performance in other directions one could " live with it," or possibly improve matters quite a bit by treating the receiver to better ventilation, by way of a few holes in the bottom of the case, and in appropriate places in the chassis, plus the propping open of the lid. Incidentally, it is a good scheme to stick a bit of masking tape on the side where the drill will break through so that the swarf does not go where it is not wanted. The second question is for the circuit of a cheap-and-easy two-metre converter, with no catches like coils or expensive transistors! Well, now, the converter without a tuned circuit would be a real novelty—and anyway there is nothing difficult about winding coils. As for the transistors, the day of the half-crown VHF transistor for low-level applications is well and truly here, so there shouldn't be much problem there. As for a crystal, even those can sometimes be come by cheaply at Club junk sales, and there are several clubs in his area.

C. Burrows (*Romford*) has a short HPX List because of a dying battery in his receiver—as he says, it is quite startling how the " apparent gain " comes up when a new one is fitted. However, one would not expect the gain to drop so much as the sheer audio output, which is not the same thing. Most stages are gain-stabilised by their associated circuitry, but the output power from the last stage is directly dependent on the supply voltage, and, incidentally, is far and away the biggest user of the energy in the battery.

New Entrants

Already four of these have been mentioned: Namely R. Carter, whose " copperplate " writing is a delight to read, incidentally; B. J. Gilbert, S. W. Dean, and R. Berkolds. To these, and the others to be mentioned under this heading, Welcome, and Good Hunting.

An Eddystone 840C to twenty-seven feet of wire at a height of twenty feet helped *K. F. Bone* (*Chard*) to make his first entry in the Phone list at 229.

Weston-under-Lizard is the delightful name of the spot where *R. Thorneycroft* does his listening. He has 140 feet of wire out, the first 70ft. heading North/South and the remainder East/West; to date this aerial has pumped 343 prefixes into the front of his Star SR-200 receiver; plans are afoot for a 144 mc tunable converter.

A new entry to the CW list is quite an event, and this time *H. Wright* (*Pontefract*) is the one who gives cause for celebration. However, it is not surprising that SWL Wright should come in on the CW side, as he was a brass-pounder during Hitler's war. Nowadays, he has two receivers in use, a Heath RG-1 for general-coverage, and an Eddystone 888A for the amateur bands.

HPX LADDER

(Starting January 1, 1960)

SWL	PREFIXES
PHONE ONLY	
S. Foster (Lincoln)	1057
A. W. Nielson (Glasgow)	947
J. Singleton (Hull)	889
B. Geary (Leicester)	860
G. J. Smithies (Brighouse)	837
M. A. Lount (Leicester)	751
M. G. Toms (Ilford)	731
R. Wood (Slough)	728
J. Fitzgerald (Gt. Missenden)	716
C. P. Davis (Leicester)	685
R. Allisett (Guernsey, C.I.)	684
I. Poole (Leeds)	678
W. Moncrieff (Hampton)	661
G. Dover (Nottingham)	650
N. Henbrey (Nothiam)	643
D. Reynolds (Dudley)	638
C. J. A. Morgan (Wallsend)	636
J. P. Scragg (Stockport)	592
L. Cunningham (Wath-on-Dearne)	586
M. Pipes (Derby)	562
G. Braund (Taplow)	560
N. Whiting (Leeds)	560
R. Bagwell (Frimley)	558
G. Ayton (Sunderland)	556
K. Plumridge (Southampton)	554
L. Harwood (Wirral)	552
H. M. Graham (Harefield)	525
D. Henbrey (Northiam)	521
D. Robinson (Birmingham, 26)	511
R. Nicholls (Narborough)	500
P. Brown (Isham)	499
C. Wynn (Birmingham, 22B.)	485
J. E. Jenkinson (Oxford)	483
R. Walters (Etwall)	467
D. Palmer (Fareham)	460
T. J. Bucknell (St. Albans)	454
T. W. Hyder (Southampton)	450
R. C. Waterman (E. Lothian)	449
M. Broadway (Chelmsford)	447
R. Carter (Blackburn)	444
A. Cobb (Hull)	441
N. Peacock (Tonbridge)	439
D. Nobles (Isham)	436
P. Sharman (Hayes)	432
K. Mendorf (Wellesbourne)	422
A. Parker (Chesham)	421
C. Shearing (St. Agnes, Cornwall)	420
M. J. Quintin (Wotton-u-Edge)	410
P. N. Butterfield (Wakefield)	407
C. Freeman (Nottingham)	406
S. Palmer (West Wickham)	398
J. Seddon (Manchester)	397
P. Schofield (Bolton)	392
R. Bence (Cardiff)	384
R. W. Cook (Leicester)	379
M. Wigg (Ferndown, Dorset)	375
S. Cole (Newport, Mon.)	373
C. Price (Bolton)	370
D. Whalley (Corsham)	370
J. Pullen (Barton-on-Humber)	365
J. W. Struthers (Hawick)	364
K. Kyezor (Perivale)	362
R. A. Treacher (Eltham)	361
A. Wood (Husthwaite)	354
S. Osborne (Derby)	351
W. Rees (Newport, Mon.)	347
R. Thorneycroft (Shifnal)	343
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(NOTE: *Listings include only recent claims. Failure to report for two consecutive issues of "SWL" will entail removal from the Table. Next list, November issue, for which the deadline will be September 12.*)

SWL's—PSE NOTE!

Closing date for the next appearance of "SWL," in our November issue (due out on October 31), will be Friday, September 12, addressed "SWL," Short Wave Magazine, Buckingham. Remember also that we are always glad to see, for possible publication in this feature, good photographs of SWL interest, with descriptive notes—address as before. Any pictures that we can use are paid for, immediately on appearance.

R. Horne hails from Ferryfryston, near *Castleford* in Yorkshire. Roger has been interested in radio for eight years, but QRM from married life and three children was enough to stop any serious attempt at getting on the air. However, the RA-1 has been made to produce enough prefixes to enter the Table, and now there are strong hopes of a ticket before the end of the year.

An early start has been made by *R. Ellis* (*Llandaff*) who, although he is only fourteen, first became interested three years ago. His list contains 243 prefixes, written up in book form for ease of checking, and Robert acknowledges the help he has had from Cyril Parsons, GW8NP, who found him a CR-100, and from the lads at the Barry Club, of which he is a member.

Another new entrant who is appreciative of help given him, this time by Plymouth group members, is *J. R. Lloyd* (*Plymstock*) who runs an Eddystone EC-10, and finds it every bit as good as the makers claim.

After three years QRT, *Chris. Freeman* (*Nottingham*) has returned to the fray; he uses a Trio receiver with Codar Q-multiplier and preselector, an R-107, and an Eddystone 870A. The first two receivers are coupled to a Mosley TA-33Jr. beam with a rotator, while the other receiver is used in conjunction with a Joystick—nice set-up!

K. Taylor (*Sunderland*) has an HA-700 receiver, which pleases him no end, particularly on Fifteen—a band which at the moment of writing is producing in J.C.'s receiver no amateur signals at all but a 59 BBC commentary on the Test Match! Ken uses as aerials a 21 mc folded indoor dipole which is coaxial-fed—a little unorthodox, this—plus a 66 footer, end-fed, to cover the other bands.

The Joystick and the Trio 9R-59 receiver are quite a popular combination, and *M. Fisher* (*Bradford*) uses it, with the Joystick indoors, to enter a first claim in the Ladder at 231.

Another 9R-59 user is *G. P. Osborne* (*Hull*) who is very much of a new starter in our hobby but certainly has the interest. Perhaps his best move is to join the Club up there, and so come into contact with other short-wave listeners and licensed amateurs.

Rest of The Clip

It's a funny thing how so many operators, and SWL's, eventually return to the band on which they made their start. *J. Fitzgerald* (*Gt. Missenden*) re-enters the fray after his various sessions away from home, with a prospect in front of him of further trips—this time job-hunting, now he has finished his training. John is

finding himself deserting Twenty in favour of the LF bands once again.

M. A. Lount has been spending much of his time listening to the contests and increasing his tally of /M and /MM calls, mainly on 14 but in a few cases on 21 mc. Tony, of course, hails from *Leicester*.

Some of the ill-mannered operators on Eighty phone get a raspberry from *J. Brackenridge* (*Ayr*); three SSB operators decrying AM, with techniques of operating that would make a cat sick, busily declaring that the operating methods of a fourth—whose call they had the cheek to mention over the air—made *them* sick! One could wish the licensing authorities would do the decent thing and suspend transmitting facilities for some of these obnoxious characters, who are clearly violating the terms of their licences.

R. A. Treacher (*Eltham*) has bought himself a Codar T28, which is giving him much pleasure on the LF Bands, when used with a 66ft. aerial ($\frac{1}{2}$-wave on 7 mc). Holidays will be starting at the end of August, after examinations during the middle of the month, and so the way should be clear for some intensive operations after that.

Listening to LA5KG and W1AA handling traffic for LI2B was an interesting experience for *Ray Bence* (*Cardiff*), with only one small fly in the ointment—he could *not* find LI2B! As consolation for such mishaps, which come to all of us at some time on the bands, *N. Crampton* (*Romford*) has set up an aquarium right alongside the rig, and finds it a soothing influence after the rigours of the pile-ups.

One of the useful properties of the dipole is its ability to work on the third harmonic, which makes a dipole on Forty effective on Fifteen, as *D. Nobles* (*Isham*) has found out; as usual with such discoveries the HPX score reflects the results.

R. A. Mortimer (*Abingdon*) has extended his aerial out along the garden with no apparent improvement in reception. However, what is worse is the plague of noisy electric motors which seem to come out to play in the warm summer weather—one consolation, the darn things usually end up by cutting their own cables, and scaring the owners out of their wits!

A short note with the HPX list comes in from *I. Poole* (*Leeds*) who is now doing the metalwork for his transmitter against the day when the ticket arrives, and has discovered what an exasperating shape the hole of a crystal-holder is when one has not a tool to cut it out. Perhaps the best way out of this one is to make up a punch of the desired shape and a couple of bits of angle cut to give the desired support. The punch can be of silver steel. All you then need is a good hefty clout with a large hammer, and there is a perfectly-shaped hole. A set made up by a friend with a lathe will last as long as you will need them, if used with care, and only cost a few coppers in the making.

The brief list from *L. Harwood* (*Wirral*) is due to time spent on VHF—but the list also shows that he is getting well in at the VHF/DX. Another VHF enthusiast is *M. G. Toms* (*Ilford*) who goes along with your scribe on the question of attenuators, as discussed in the preamble in July. Mike does not expect to get much time on the HF bands in the coming weeks with so many VHF contests and activities, but will be back on the HF bands with a bang in October, when he will be endeavouring to improve on previous performances.

The list from *D. Maunders* (*Settle*) has taken 8 months to compile, with the help of a short aerial, end-fed to an Eddystone 940 receiver, backed up by a Hallicrafters S.27. There is also a Joystick in the loft, and a Joymatch ATU is used with either aerial to feed the receiver in use.

That inactive crystal filter in the AR88 of *J. Dunnett* (*Preston*) was improved no end by taking it out out of its holder and cleaning it all up with CTC (carbon tet., or *Thawpit*) to get rid of the oil and sludge, followed up by a repeaking to get the best out of it. This, incidentally, is a job that needs care, and should *never* be attempted on a sealed crystal.

E. P. Englehard (*Macclesfield*) found, as so many have before him, that the services of the local repair shop is *not* the best way to get a receiver back on the air. His came back *minus* 14 mc, and so most of his time was spent on Eighty. One weirdie heard was LA5ID/G/MM who said he was ten degrees from the North Pole (?).

A kindly neighbour is the basic cause for the rise in the score of *T. J. Bucknell* (*St. Albans*)—as a result Terry now has a full-size 5RV up at 34 feet, with results which are a decided improvement, especially on Twenty.

What sort of special aerial should one build for Fifteen is the rather difficult query posed by *P. Smith* (*Chesterfield*). One would think a 7 mc inverted-vee would be a good one—it was for J.C. for long enough. Another possibility would be a rotary beam or Quad, or a ground-plane. All can give good results if properly set up " like the man in the book says," with no attempt to avoid the hard work in getting it going properly.

R. Cook (*Leicester*) has been virtually out of action for five weeks thanks to the activities of decorators—and adding insult to injury, after he had been turfed out of his room to make way for them the blighters were a fortnight late.

* * *

What tackle does J.C. use, enquiries *D. Randles* (*Sale*). The answer is " Not very much ! " On the receiving side there is an Eddystone 888, always kept in peak trim by regular routine maintenance, and for transmitting a K.W. Vespa Mk. II—a fine tool indeed—which can be hooked in to a passive-grid Class-AB1 Linear using a brace of 813's at 2500 volts to give full legal output without a trace of grid current in the transmitter or the linear. The linear is not often called on, though. On the aerial side, a wire of random length—it has stretched since first it went up as a Top Band half-wave!—is used on all bands down to Fifteen through an ATU, and occasionally even on Ten. Other aerials come and go, over the years, but have been, in the main, of assorted centre-fed types for a band favoured at the time. Test gear comprises metering equipment, RF and AF generators, GDO, oscilloscope and various minor bits of gadgetry. Anything more is usually available on loan, for short periods if required. That's about it, saving only the use of a preselector on Ten occasionally, and an attenuator usually, on the LF bands, Forty in particular. The main thing is that it is looked after, and arranged so that everything happens just as desired without any great flurries of activity to achieve a result.

HPX RULES

(1) The object is to hear and log as many *prefixes* as possible; a prefix can only count once for any list, whatever band it is heard on.

(2) The /M and /MM suffixes create a new series; thus G3SWM, G3SWM/M and G3SWM/MM all count as prefixes, and, where it is known to be legal, /AM also.

(3) Where a suffix determines *location*, the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, *e.g.* VE1AED/P/SU, VE2BUJ/P/SU they are arbitrarily counted as SU1 and SU2 respectively, and the same holds good for similar callsigns.

(4) When the prefix is changed both the old and the new may be counted; thus VQ4 and 5Z4 both count.

(5) The object is to hear *prefixes*, not countries, thus there is no discrimination between, say, MP4B- and MP4AK - which count as one prefix.

(6) Only calls issued for Amateur Radio operation may be included. Undercover and pirate callsigns will not be credited, nor may any MARS stations be claimed.

(7) G2, G3, G4, etc., all score separately, as do GW2, GW3, GW4, etc., and in the same way K2, W2, WA2, WB2, WC2, WN2, all count even though they may be in the same street.

(8) Send your HPX list, in alphabetical and numerical order, showing the total claimed score; with subsequent lists, it is sufficient to quote the last claimed score, with the new list of prefixes, and the new claimed total, with your name and address on each sheet, to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, to arrive before the SWL deadline for that particular month.

(9) Failure to report for two consecutive listings, *i.e.* four months, will result in deletion from the Table, although there is no objection to a "Nil" report to hold your place.

(10) **Starting Score 200.** Phone Table is mixed AM/SSB, with a separate CW Table. No mixed Phone/CW Table, nor will AM-only or SSB-only entries be accepted.

(11) Lists will be based on those shown in the current *Short Wave Magazine* list of Countries and Prefixes, as given on pp.509-514 of the October 1968 issue, and with the current edition of the *DX Zone Map*.

NOTE: The *DX Zone Map* costs 14s. 9d. and includes the latest Prefix List. The *Prefix List* alone, by countries, prefixes and zones, alphabetically both ways, costs 9d. with large s.a.e. Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

What between O-Levels, and R.A.E., *D. Palmer (Fareham)* has not had so much time for listening. In addition he has applied himself to improving the receiver alignment and has nearly completed the AF side of the transmitter which will be used to launch the first call when he gets that ticket.

Some people have an unreasoning dislike of cord drives, which can be quite good if properly maintained. *L. Cunningham (Wath-on-Dearne)* has found to his cost that it is harder to make a gear-assembly work properly and free from backlash than ever it is a cord-drive, and so his tuning modification has ended up in the junk-box. Mechanical gearings *look* simple, but seldom are.

What between holidays and other journeys, *H. M. Graham* has not much to report on the bands in the way of new prefixes, but during his holiday he came across the G3BID QTH with its fine location and impressive aerial system. A few days later he found G3BID/M up on Hardy's Monument, working them at a great rate from an even better site, but did not actually make any personal QSO. Back in *Harefield*, on July 5, ZD3D was putting in a whacking signal on 21 mc.

Some time back we mentioned *E. Kronquist (Liss)*, as being keen and interested. Since then he has been in touch with G3TLF, who has been swapping tapes full of Morse with him for practice, and G3SLH of Elstead, on whom he called by arrangement. So progress is being made.

Thanks to the many interesting letters this time, and perhaps an excess of garrulity on the part of your J.C., space seems to have run out on us—so we acknowledge letters, notes and Table entries from the following: Rev. D. P. Brewster, *Oxford;* R. Waterman, *Aberlady;* M. Pipes, *Derby;* W. Moncrieff, *Hampton;* K. Haywood, *Manchester;* A. Vest, *Durham;* M. J. Quintin, *Wotton-under-Edge;* J. E. Jenkinson, *Oxford;* M. J. Wigg, *Ferndown, Dorset;* K. Plumridge, *Southampton;* P. N. Butterfield, *Wakefield* (who forgot to sign his letter!); K. Kyezor, *Perivale;* C. Pearson, *Northfleet;* C. Shearing, *St. Agnes, Cornwall;* C. Jones, *Mold;* P. Sharman, *Bromley;* C. Garcia, *Worthing;* R. Woods, *Slough;* S. Cole, *Newport, Mon.;* C. Morgan, *Wallsend;* D. Robinson, *Birmingham:* R. Miller, *London, S.W.15;* G. Ayton, *Sunderland;* B. A. Smith, *Ruislip Manor;* P. Schofield, *Bolton;* J. Pullen, *Barton-on-Humber;* S. Bushell, *Sunbury-on-Thames;* and M. Stokes, *Wakefield.*

All letters are as welcome as the flowers in spring, so let's be hearing from you—the address, as always, "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM. As for the deadline, that is **September 12,** latest. 73, es DX.

INTERESTING COINCIDENCE

G3WLT (Shaldon, Devon) was not getting out at all well on 80m., so he tried the ideas about aerial feeding as suggested by G3OGR ("One Wire for All Bands," July SHORT WAVE MAGAZINE)—and using the Fig. 1 configuration, his 90ft. wire loaded up immediately. Indeed, his very first QSO using the new ATU was with G3OGR himself! Since then, mid-day contacts of up to 200 miles or so are usual, with RS-58/9 reports. The Tx, a Codar A.T.5, runs but ten watts.

THE MONTH WITH THE CLUBS

By "*Club Secretary*"

(Deadline for October issue: September 5)

(Please address all reports for this feature to "Club Secretary," SHORT WAVE MAGAZINE, **Buckingham.)**

LAST month we reminded you that MCC is coming along again soon; the battle will be re-joined, as in every year since licences were first restored after the War, to decide which club is "cock of the walk." All the rules (which will be much as last year) will be printed in October, but meanwhile, reserve the date—the weekend November 8 and 9—organise the gear and operators, loggers and so on—and maybe even give it a little extra zest, if that be possible, by dishing out a challenge to your nearest neighbour groups! Under our scoring system, Clubs are in effect competing on level terms with all other groups in their own Zone—even though we also seek leaders overall. MCC is a great opportunity to give less-experienced members a chance to learn about contest operating under real conditions.

A challenge of a different kind is revealed in one of the letters to "Clubs" this month. This hon. sec., who shall remain nameless, is clearly down in the mouth at the inability of his group to rise much above the survival line, even though, happily, they show no signs at the moment of going below it. This group is based on a town of 50,000 or so population, according to a fairly recent *AA Handbook* on your conductor's desk, and yet an average attendance is about fourteen. What do they do, when they get together one evening each month? There you have it—they have a ragchew. As far as your scribe can recall, that is about all they have done since he has been compiling this piece. The members are happy that way. Doubtless; but equally so the other *potential* members have heard that this is all they do, so have decided to go in the shack on meeting-night. Not much point in going to a club meeting where everyone sits around and gasses and nothing to entertain ever happens.

What can the club do about it? Easy—organise a programme of events for each month; talks, trips out, the odd tape lecture, contests maybe—such as MCC and NFD, and heaven-only knows what else. The objection that is always raised—we can't do it here because there are no people to give lectures—is pure *bunkum*. If a Club in the north of Scotland can do it and thrive; if groups in towns a tenth the size of this one and out "in the sticks" to boot, can boast of bigger memberships and better programmes, then this club, in a sizeable town in a populous area, can also. It needs a sustained effort over several years—which is tough on the chap who is organising the programme!—before the message gets through to the unbelievers, but it will, in time. Finally, there is the point that most of the unsuccessful clubs have secretaries who are apologists for their group's imagined failings. A little bit of proper pride in the Club is felt by the recipients of letters, who are then much more likely to help out by giving a talk or whatever.

The Reports

Taking first the area which can be, broadly speaking, described as the Midlands and North of England plus Scotland, the top of the pile is **Mansfield,** who have been missing from these columns for some time; but it is nice to hear they are still around and still getting together at the New Inn, Westgate, Mansfield, on the first Friday in each month.

At **Coventry,** there is a weekly meeting, with September 5 given over to preparations for VHF/NFD. On the 12th, the St. John Ambulance Brigade are to give a lecture on "First Aid in the Amateur Station," a topic which is covered far less frequently than it should be in most groups. As for September 19, there is a night-on-the-air with the Club rig, and the month is rounded off by the all-important AGM. By the time this reaches print, they will have had their DX-pedition to Wales, results of which it is hoped may be available for mention in the October issue.

The **Lichfield** crowd assembles in the Swan Hotel, Bird Street, Lichfield, on the first Monday and third Tuesday in each month; details of the programme were still being finalised at the time of writing.

Now to our old friends, the **Northern Heights** group, who have a room at the Sportsman Inn, Ogden, Halifax. Highlights for September are Sunday, 14th, when there is a D/F event; September 24 at Hq, when there will be a donated Junk Sale to help pay for the vehicle they have recently acquired to make running outside events more easy—they sent in a couple of nice photographs which sadly were not quite contrasty enough for reproduction. Wednesday, October 8, is set aside for a lecture; and during October they have two stations on in Jamboree-on-the-Air, for, respectively, Keighley (GB3KSG) and Halifax, where the call will be G3MVH/A.

After what has been virtually a summer recess, the **Salop** lads kick off again on September 18 at Hq. September 25 is down for a Junk Sale, so the chaps should be able to stock up the stores with raw materials for the winter programme of construction.

Normally, **Solihull** have booked the third Tuesday in each month, at the Old Manor House, 126 High Street, Solihull; but this month there is an extra, by way of a demonstration of the arts and crafts of the A/TV game, given by G3PTM and G5QI, which is down for September

30. Visitors are always welcome, of course.

The first full year of operation has just been completed by **Sunderland,** with the AGM, followed by a brief recess for the summer. Activities resume the normal pattern of first and third Tuesdays in each month again, commencing with the September 2 date, starting time being 7 p.m.

Pudsey were so pleased by the success of their White Rose Rally that the first meeting of the group after the rally was devoted to plans for making it even better next time! Other events are in the pipeline for September, but at the time of writing their letter dates had still to be "firmed up."

Film shows, live and tape lectures, demonstrations; all these figure in the forthcoming **Fulford** programme, who have moved home to the Scout Council Offices, 31 George Street, York. They get together there on Tuesdays, and prominent in the programme plan will be a series of lectures to help potential RAE types to gain the knowledge required to obtain the coveted pass-slip.

Midland have a very crowded July and August programme, but to date we have no details of the September goings-on. However, we can say that they are to be found at the Midland Institute, Margaret Street, Birmingham 3, on the third Tuesday in each month. Members are kept informed by a very good *Newsletter*, which contains some interesting technical articles from time to time, the latest one covering a practical version of the Synchrodyne receiver for Top Band.

Over to **Peterborough,** where we understand that after their interesting trip to the Cambridge University Radio Telescope, their next outing is to take the road to Jodrell Bank to see the rather different radio-telescope there. Normal meetings are held at the Old Windmill on the

MCC—November 8-9

Rules and full details will appear in the October issue. Clubs not having taken part in MCC—the Magazine Club Top Band Contest—at any time in the last five years should apply immediately for an identification code-group, with s.a.e., to "MCC," Short Wave Magazine, Buckingham. This is the biggest Club event of the year, and one of the most important Contests on Top Band.

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SOLIHULL: J. Lester, G3VXV, 173 Damson Lane, Solihull, Warks. (*021-705 3060.*)
SOUTH BIRMINGHAM: R. Brice, 53 Leycroft Avenue, Tile Cross, Birmingham, 33.
SOUTHDOWN: L. E. Tagliaferro, 9 Tugwell Road, Hampden Park, Eastbourne (*54244*), Sussex.
SURREY: R. Morrison, G3KGA, 33 Sefton Road, Croydon CRO-7HS. (*01-654 5982.*)
SUNDERLAND: D. Mitchinson, G3XID, 32 St. Aidans Avenue, Grangetown, Sunderland.
SWANSEA (Telephone Area): M. D. Connor, 54 Talley Road, Swansea SA5-7EU.
THANET: J. P. Barns, G3BKT, 93 Crescent Road, Ramsgate, Kent.
TORBAY: Mrs. G. Western, G3NQD, 110 Truro Avenue, Hele, Torquay.
VERULAM: W. C. Dennis, G3NCK, 129 Colney Heath Lane, St. Albans, Herts.
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral L63-5NE.
WIRRAL (DX Association): J. A. Share, G3OKA, Trelawney, 21 Curlender Close, Bidston, Birkenhead L41-7BN.
WORCESTER: R. L. Avery, G3TQD, 24 Alexander Avenue, Droitwich (*3943*), Worcs.
WORTHING: P. J. Robinson, G6KFH/T, 46 Hillview Road, Worthing, Sussex.

London Road, each Friday evening.

Worcester have Hq. at 35 Perdiswell Park, Droitwich Road, Worcester, but we have not got any up-to-date information of the goings-on of the group, for which we must refer you to the hon. sec. at the address in the panel, p.449.

A good title is there for the lecture Tom Douglas, G3BA, is to give the **East Worcestershire** group, at the Old People's Centre, Park Road, Redditch on September 11. He asks " Why VHF—Well, Why Not? "

Our visit to Scotland this time is to Edinburgh, where the **Lothians** Radio Society are located. Their first meeting of the session is to be at Mountbatten Building, Heriot-Watt University, where the show station on September 11 will be running the call GB3EIF. A talk on Workshop Practice is down for September 25, by GM3BCD, at the YMCA, 14 St. Andrew Street. In an attempt to attract as many newcomers as possible there will be several evenings slotted into the programme with them specifically in mind.

The first two days of September are fully occupied as far as the **Leicester** lads are concerned, with a station being run as part of the Leicester Show in Abbey Park, and signing G3LRS. Another activity is VHF/NFD, for which they are joining forces with the **Leicester VHF** crowd, at a site on the A47 near Billesdon to the east of the city.

South Birmingham have September 3 booked at the Scouts Hut, Pershore Road, Selly Park, and intend to listen to Region 3 representative G3PWJ, and to ask some questions.

The **Nunsfield** House crowd in Derby have rooms 8 and 9 each Friday. The form is usually two " open " evenings, when operating the rig is done in one room and maybe a talk in the other, and a couple of evenings which are firmly scheduled for films and a lecture. They were operating the HF band station at the Derby Rally on August 17.

Last in this clip is a new formation. This one is called the **Wirral DX Association,** and after a few meetings at the home of G2SB, they have now a permanent booking at the Red Cat, Greasby. However, they have a visit down for September 24, so if you are thinking of visiting them it would perhaps be wisest to contact the hon. sec., address as in panel. As always, we hope they have every success after what sounds like a very good start.

Wales and The West

Here our first, and most pleasurable, duty is to record the formation of a new group, known as the **Swansea Telephone Area Radio Society.** Although, as its name implies, it has been formed as a group by members of the Telephone Service, it is nonetheless an " open " club which welcomes members from outside the service. As for Hq., it is hoped that by September they will be at the Telephone Engineering Centre, Gors Road, Townhill, Swansea. For all the details, contact the hon. sec.—see our address Panel. Meantime, we wish them every success.

September at **Torbay** means the 27th, when the talk will be on Transistors, at Hq., Bath Lane, rear of 94 Belgrave Road, Torquay.

From where we sit, it looks like September 4 as the date for the main meeting of the **Cornish** group; the subject will be " Direction-finding Projects," by G3XFL. The venue for this one is, as always, the SWEB Clubroom, Pool, Camborne. In addition to the main meeting there are, as part of the organisation, various subsidiary groups, getting together separately and catering for special interests. It is suggested that anyone interested could well take the trouble to investigate by getting into touch with G3UCQ, *see* p.449.

Nice to hear again from **Bristol,** who are still in their old Hq. at 41 Ducie Road, Barton Hill, Bristol. After reading about some of the things that have happened they have taken the trouble to install a burglar alarm system to deter any more would-be marauders. They get together at Hq. every Thursday evening.

Chippenham have another of their mini-D/F hunts coming up on September 9, the first call going out at 7.15 sharp. September 30 is reserved for a talk by G3VBH on a simple transmitter for Top Band. Every Tuesday, the lads are to be found at the Boys' High School, Hardenhuish Lane, Chippenham.

From the hon. sec. of **Reading** crowd, we hear that by the time this reaches print they ought to be able to put the Club call, G3ULT, on the air, for a short while at the beginning of every meeting. In addition, future lectures are planned, including one on Computer Software, Building the G2DAF SSB Transmitter, and a talk about VHF and UHF by G3PWU. For details of venue, dates, and so on, contact with G3TEB is advised—see Panel.

Visitors are always welcome at **Wirral**—look for them on the first and third Wednesday in each month at the ex-Civil Defence Hq., Upton Road, Birkenhead. On September 3 there is to be another Junk Sale, conducted by Basil O'Brien, G2AMV.

* * *

The recent Flatholm Island expedition to commemorate Marconi's work of 1897 was a joint effort of the **Barry** College of Further Education lads and the **Taunton** group. Barry were kind enough to send us further details of their initiative (photographs not good enough, unfortunately), and it seems this is indeed a lively and active group—for details, please refer to the hon. sec., as Address Panel, p.449.

September 5 and 19 appear to be the dates for the **Saltash** meetings, which are held in the Burraton Toc H Hall, Warraton Road, Saltash, albeit at the time of writing we have no idea of the detailed programme. For this information, contact G3XWA—*see* Panel.

A change of venue to be noted for **Exeter,** who now have a booking—still the first Tuesday in each month—at the YMCA, St. David's Hill, Exeter. This gives September 2 for a talk on SSB, by G3OFY. October 7 should be an interesting evening when it is hoped to put on a West Country quiz, with Exeter, Torquay, Plymouth, Saltash, Yeovil, and Taunton Clubs all in it together.

National and International

Quite a few in this clip, the first of which is the **Royal Navy;** the current *Newsletter* is quite the most interesting your conductor has seen for some time. The society caters for all those who are, or have served, in the Royal Navy, and associate membership is open to members of the navies of other countries. For details, contact G3RFH, as in Panel.

Some of the SWL's and licensed members of the Otley Radio Society (Yorkshire). A comparatively recent formation, the Club has done very well so far and there is much activity and enthusiasm among all members Callsigns in the picture include G3NNO, G3WDW, G3WPS, G3WVD and G8AWN.

The **Hong Kong** group seems to be thriving, and blessed with a sense of humour, to judge by their *Newsletter*, which is now to become a monthly affair. Anyone going to Hong Kong, either permanently or " in transit " to somewhere else, would do well to contact VS6AA, and so get a chance to know the lads.

On to **RAIBC**, who cater for the invalid and bedfast section of the Amateur Radio fraternity in this country; they keep in touch by means of nets on about 3·7 mc—Tuesday at 10.00, Wednesday afternoon at 2.00, and the Cheshire Homes net on Thursday afternoons, also at 2.00 p.m. In addition there is, of course, the newsletter, *Radial*, and the personal contact of members with each other and through the supporters as far as possible. G3LWY will be only too pleased to pass on details to those who wish to join or would like to help.

The **Civil Service** crowd have a home for the London members at the Civil Service Recreation Centre, Monck Street, London, S.W.1, where they can get together on the first and third Tuesday of each month. The main event in September is on the 16th, when the Annual General Meeting gives the members a chance to take a few pot-shots at the committee.

Ex-G Club members are those born in the U.K. and now resident overseas. Once again, it is a question of keeping in touch by way of nets—the favoured frequency being 14·347 mc, each Sunday evening at 1900z, with U.K. stations expressly invited to take part. There is also the **Bulletin**, which is an affair of about twelve pages, coming out every other month and usually full of interesting snippets.

The letter from the **British Railways** society this month mentions an award available for working three members of the Swedish railwaymen's group, for which the custodian is SM3WB—for details contact the hon. sec. From September 21 to 25 delegates from the various railway groups will be holding a congress at Grainau, near Garmisch. Of the 200 members from 14 countries, there will be three making the trip from the U.K. A special station will be on the bands, signing DLØCF, on Forty and Twenty, in the mornings and, possibly, evenings. There will of course be a special QSL and even a special stamp to go on it!

A.R.M.S. have a change of cover and styling for their *Mobile News*, and the current issue carries Part 1 of what looks to be a most interesting piece by G3BID on his trip to the Gambia and operation as ZD3F.

London and the South of England

Guildford first, where they get together on the second and fourth Friday in each month, at the Model Engineering Hq., Stoke Park, Guildford, as well as having regular joint meetings with the **Surrey University** chaps, at the University. At the time of writing, we have no information on the September programme, other than that they will be taking part in VHF/NFD.

Silverthorn, who meet at Friday Hill House, Simmons Lane, Chingford, have, with great regret, to declare that no visitors can be allowed at their meeting on September 12. Not that they do not *want* visitors, but rather that they know they will be somewhat overcrowded for the lecture on TVI by a member of the GPO staff. At all other times, visitors are made very welcome.

At **Clifton** (London) the routine is two meetings each week, on Wednesdays and Fridays, the venue being 225 New Cross Road. The autumn and winter programme is now being finalised and is to include lectures, film shows, contests, and other items. Details from the hon. sec.—*see* Panel.

Maidenhead have their usual session on September 1, which is down for a Junk Sale, and the 16th will be the informal. Both these at Hq., the Victory Hall, Cox Green, Maidenhead. The lads will also be operating VHF/NFD—the site is called Hard-to-Find Farm, at Flackwell Heath, near High Wycombe—and if you do find it hard to locate, try Grid Reference SU 873906 on

Sheet 159 of the one-inch OS map.

The first meeting in September for the **Purley** lads is in the small hall, on the 5th, for a Natter, albeit most of the nattering will be about last-minute arrangements for VHF/NFD. On September 19, in the large room, they have the Annual Constructional Contest. Hq. is the Railwaymen's Hall, 58 Whytecliffe Road, Purley.

The Rose Wilmot Youth Centre, Littlehampton Road, Worthing, is the Hq. for, naturally enough, the **Worthing** club. The clubroom is closed on September 2, as the lads will be visiting Swandean Telephone Exchange, and on the 9th also. However, they are back in business on the other Tuesdays in the month, and indeed have the AGM down for the 23rd—all members please to note the date and be sure to attend!

There are two meetings in the September programme of the **Edgware** crowd, who make a restart on September 8 after the summer recess with an informal, following this with a Night-on-the-Air at Hq. on September 22. They still assemble at St. George's Hall, 51 Flower Lane, Mill Hill, London, N.W.7, as they have done for some time.

Crystal Palace got their *Newsletter* out early in order to leave the hon. sec. free to operate on the High Power Field Day—but from our point of view it was a help as well, as we have advance information that their next meeting is September 20, when there is to be a film show, mostly of technical content.

Unfortunately, we have not had the latest detail on the **Surrey** programme—we seem to have got a little out of phase with their newsletter—but we can say that the venue is the Swan and Sugarloaf, South Croydon, on the third Tuesday.

G3VA is down to talk to the **Mid-Herts** chaps in September, on a Technical Topic—wonder what it can be?—at Welwyn Civic Centre on September 11.

An even more technical topic is on the programme for neighbouring **Verulam** on September 17, when Mr. J. R. Smith talks about " Home Brew Radio Astronomy." This one is in the Council Chamber, the Town Hall, St. Albans. On September 28 they are going to try and do an experimental D/F Hunt on 144 mc which is being laid on by G8BNR.

Now to **Echelford,** where September 8 is a Construction Night and the 25th is entitled " Colour 2." They have Hq. at St. Martins Court, Kingston Crescent, Ashford, in the hall; and we notice from the *Newsletter* that it is important that you pick up an ashtray rather than dump your detritus on the floor, as the staff have an aversion—rightly, too—to having a large clean-up after the meeting is closed.

The latest copy of *Mid-Sussex Matters*, the news letter of the **Mid-Sussex** crowd, gives no details of the September programme, for which it will be necessary to contact the hon. sec.—*see* Panel. However, we can say that their meetings take place at Marle Place, Leylands Road, Burgess Hill, which is also the location of their club station.

Thanet do not mention their Hq., for which it will be necessary to get in touch with G3BKT—*see* Panel, but we do have the date as September 26. In addition, they have a proposal for an R.A.E. class to run at Thanet Technical College, Ramsgate—anyone interested please to contact G3RAD at 1 Approach Road, Broadstairs, Kent.

The same goes for anyone in the **Harlow** area, where it is again proposed to run an R.A.E. at the local Technical College; details from the Harlow Technical College, where one may enrol. Someone has to shoot the hon. sec. of the Bishops Stortford group for forgetting to pass on the gen on this one earlier! However, he has his problems in getting talks organised. The one for September is about Oscilloscopes, and will be given by G3VTR on the 15th, at the usual venue, the British Legion Club, Windhill, Bishops Stortford.

The lads at **Southdown** have nothing laid on for September 8, when they get together at the Victoria Hotel, Latimer Road, Eastbourne, so they will just have a good old natter for a change, and welcome any visitors who may be holidaying in the area.

Acton, Brentford and Chiswick assemble on September 16, to hear from G3CCD of his experiences when operating in France as FØHC/M. This one is at the usual Hq. at 66 High Road, Chiswick, London, W.4.

On to **Cray Valley,** where September 4 is down for a show of films, and September 18 for a Natter Nite. Both are at the Congregational Church Hall, Court Road, Eltham, London, S.E.9.

North Kent have dates for September 11 and 25 this time; the first one is " Members' Current Projects," while the second is a talk on the Diplomatic Wireless Service by Mr. J. D. Ralphs. A pity they forgot to tell us where to direct you to the meeting, but memory says it could be the Congregational Church Hall, adjacent to the Clock Tower, Bexleyheath.

Shefford have four meetings in September, as follows: September 4 for last-minute planning in connection with VHF/NFD. September 11—who forgot the aerials on that occasion ? A Surplus Sale, and the preliminary discussion about the Annual Dinner to come on September 18, and to round it off a talk on Oscilloscopes is to be given by G3VMI on September 25. Look for them at the Church Hall, Ampthill Road.

A blank is registered by **Norfolk** on September 1, since that clashes with the Bank Holiday. However, they are together again on the 8th, for an informal, and for September 15 have a Bring-and-Buy Sale. A lecture by G2IG on Harmonic Absorption covers the 22nd, while the last evening of the month, September 29, is devoted to RTTY. To find them, look for the " Brickmakers " public house, Sprowston Road, Norwich.

In Conclusion

That's it for another month; the deadline for next time, with the October news, is **September 5,** addressed to " Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM. And, meanwhile, don't leave your preparations for MCC till the last minute!

MCC—November 8-9

Rules and full details will appear in the October issue. Clubs not having taken part in MCC—the Magazine Club Top Band Contest—at any time in the last five years should apply immediately for an identification code-group, with s.a.e., to " MCC," Short Wave Magazine, Buckingham. This is the biggest Club event of the year, and one of the most important Contests on Top Band.

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.

EI4BY, T. F. C. Davis (G3YMM), The Manse, College Road, Sligo. (*Tel. Sligo 2337.*)

EI9BY, J. F. O'Hara, Ardagh, Rochestown Road, Douglas, Co. Cork.

G3EGS, R. W. Collett, 13 Maple Road, Bourneville, Birmingham, 30. (*Re-issue.*)

G3SEF, R. I. Frew, 17 Peterborough Road, Harrow, Middlesex. (*Re-issue.*)

G3WCI, G. C. Roast, 40 Rodney Road, Hartford, Huntingdon, Hunts. (*Tel. Huntingdon 51136.*)

G3XRY, W. R. Doe, 48 Jenningtree Road, Erith, Kent. (*Tel. Erith 30502.*)

G3YGF, J. N. Gannaway, 31 High View, Pinner, Middlesex.

G3YMC, D. W. Sergeant, 8 Cliff Crescent, Waddingham, Gainsborough, Lincs.

G3YMI, Amateur Radio Club, Y.M.C.A., 111 The Rock, Bury, Lancs.

G3YMM, T. F. C. Davis. *QSL via EI4BY.*

G3YMN, J. Rhys, Sunnybank, Eastcliff, Porthtowan, Truro, Cornwall.

G3YMQ, F. A. Rosser, 88 Worple Way, Rayners Lane, Harrow, Middlesex.

G3YNO, M. D. Booth, 72 Main Street, Elloughton, Brough, Yorkshire. E.R.

G3YNY, A. R. Richings, 242 Westward Road, Ebley, Stroud, Glos. GL5 4ST. (*Tel. Stroud 2826.*)

GM3YOE, A. Watson, 42 The Avenue, Eyemouth, Berwickshire.

G3YOQ, L. A. O. Spinks, 2 Ventnor Avenue, Grantham, Lincs.

GM3YOR, A. Givens, 41 Veronica Crescent, Kirkcaldy, Fife.

G3YOS, C. Gerrard, 9 Walkerscroft Mead, Croxted Road, London, S.E.21.

G3YOV, T. J. Gammage, 37 Florence Road, Northampton. NN1 4NA.

G8CIX, Amateur Radio Station, 46 Redbridge Lane West, Wanstead, London, E.11. (*Tel. 01-989 4588.*)

G8CQI, H. R. Booth, 244 Worple Road, Laleham, Staines, Middlesex. (*Tel. Staines 53104.*)

G8CRB, S. Blunt, 260 Hemdean Road, Caversham, Reading, Berks. RG4 7QT. (*Tel. Reading 71025.*)

G8CSH, A. M. White, 2 The Woodlands, Ryall, Upton-upon-Severn, Worcs. (*Tel. Upton-upon-Severn 2389.*)

G8CSQ, P. H. Benson, 46 New Village, Ingleton, via Carnforth, Lancs.

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G2HFP, R. N. Higson, Haydock Fold Cottage, Under Billinge Lane, Pleasington, Blackburn, Lancs. (*Tel. Blackburn 55830.*)

G3ABB, C. L. Fenton, 2 Churchill Parade, The Street, Rustington, Sussex. (*Tel. Rustington 3369.*)

G3EEO, Nunsfield House Amateur Radio Group, c/o N. J. Gregory, 21 Back Lane, Chellaston, Derby. DE7 1TN.

G3EFR, F. Simpson, 44 Victoria Avenue, Willerby, Yorkshire. E.R.

G3FMH, A. Smith, 87 Holmfield Road, Blackpool N.S., Lancs. FY2 9RT.

G3GLW, P. B. E. Willis, 23 Douglas Crescent, Thornhill, Southampton.

G3ILZ, T. E. I. Bromham, 19 Highfield Avenue, Farington, Leyland, Lancs. PR5 2GP.

G3ISP, P. Cairns, 23 Derby Crescent, Hebburn, Co. Durham.

G3IUZ, Rev. H. R. Davis, 18 Tennyson Road, Harpenden, Herts.

G3JLK, C. C. Jeffery, 423 Broadwater Crescent, Stevenage, Herts.

G3JXN, Dr. J. E. Tindle, 45 The Ridings, Ealing, London, W.5. (*Tel. 01-997 5181.*)

G3KPB, S. A. Moore, 315 Reigate Road, Epsom Downs, Surrey. (*Tel. 25-52844.*)

G3KYM, H. Stamper, 107 Station Road, Lower Stondon, Beds.

G3MEW, G. E. R. Denman, 24 Ascot Road, Copnor, Portsmouth, Hants. PO3 6EY.

G3MYI, J. L. Lewis, 96 Hidcote Road, Oadby, Leicester. (*Tel. Oadby 4698.*)

G3NRU, D. B. Foster, Fairview House, Maltmans Hill, Smarden, Ashford, Kent. (*Tel. Smarden 248.*)

G3PGE, G. Wilkinson, 22 Ribble Street, Bacup, Lancs.

G3PKJ, A. Goulding, 47 Mayfield Grove, Bailiffe Bridge, Brighouse, Yorkshire.

G3TSY, G. C. Frewer, 20 Northumberland Road, Istead Rise, Northfleet, Kent. (*Tel. Southfleet 3167.*)

G3TTJ, J. G. Barber, Ivy Cottage, Horton Kirby, Dartford, Kent.

G3UBP, C. Riches, 5-A The Oval, Marlborough Park, Sidcup, Kent.

G3UCO, A. W. Macdonald, 18 Chasewater Crescent, Worcester.

G3UKV, M. I. Vincent, Coomeville, off Clare Street, Cheltenham, Glos. GL53 7NW.

G3UZ, F. G. Sadler, 19 Kithurst Crescent, Goring - by - Sea, Worthing, Sussex.

GM3VTH, D. S. Coutts, 22 Langholm Crescent, Macedonia, Glenrothes, Fife.

G3WDA, Mrs. L. H. Lewis, 96 Hidcote Road, Oadby, Leicester. (*Tel. Oadby 4698.*)

G3WSW, J. Holmes, 23 Bournes Row, Hoghton, Lancs.

G3WUH, W. E. Dufton (*DL5XC*), 11 Caernarvon Terrace, R.A.F. Rheindahlen, B.F.P.O. 40.

G3WYJ, K. F. Price, 65 Longmeadow Road, Saltash, Cornwall.

G3YGM, M. A. Osborne, 73 Cherry Tree Avenue, Cowplain, Hants.

G8BUX, K. Buxcey, Cold Wall Farm, Mellor, Stockport, Cheshire. SK6 5NH. (*Tel. 061-427 1811.*)

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FOR SALE: KW-2000B Transceiver, with AC/PSU, in as-new condition, price £210. Would consider good receiver in part exchange.—Cooper, G3VMB, 42 The Osiers, Braunstone, Leicester (896213), LE3-2XN.

SALE: Eddystone EA-12 receiver, in immaculate condition, £120. Eddystone mains filter, rated half-amp., new, 40s. Garrard Type 4-HF turntable, two heads, £8. Precision Test Meter, 20K o.p.v., £6. Sphere Signal Generator, 290 kc to 50 mc, £4. Geloso two-metre VFO, 40s. Aiwa table microphone fitted Geloso xtal, 40s. Also valves, transformers, components, etc., etc.—Willetts, G3UGE, 5 Ida Road, West Bromwich, Staffs. (Tel: 021-553 0409).

SELLING: Transistor portable/car Radio, MW-LW, £7. New Avo Multimeter with leads, £8 10s. Gyrscope and motor, 18s. 6d. VHF Rx covering 100 to 180 mc, with PSU and speaker, £20. Wide-range Marconi valve voltmeter, £15. (All these items carriage extra; s.a.e. with enquiries). Manuals: R.208. 20s.; Rebecca. 40s.; Canadian Type 58 Tx, 25s.; VHF Calibrator 120. 30s.; VHF Calibrator 18. 20s. Circuits: BC-1000 (Rx 31), 5s.; Rebecca Tester 102. 20s. Postage and packing extra.—Hayward, Sunnyfields, Lighthouse Road, St. Margaret's Bay, Near Dover, Kent.

SELLING: B.40 receiver, in good condition, price £12.—Bower, 19 Kepier Court, Durham (61056).

FOR SALE: KW-2000A with PSU, price £170, also KW-1000 Linear, £95—both as new.—Culling, 25 Kingsand Road, London, S.E.12. (Tel. 01-857 2593, evenings only.)

FOR SALE: 3/CV-32J 3-centimetre klystrons, 60s. each. One 3-cm. klystron, unknown marking, but working, 60s. Also 2/4304CB's, pair for £4. Two VHF Tx/Rx's, similar TR.1986, price £5 each. R.1481 VHF Rx, £5. Cash, or prefer swop the lot for Heathkit HW-30, complete.—Kemp, Scarf Block, R.A.F. Station Locking, Weston-super-Mare, Somerset.

MOBILE Rig in full working order: Codar A.T.5; Eddystone EC-10, with PSU, switching unit and microphone; all-in bargain at £55 or near offer. Would consider selling items seperately.—Ring Coles, 01-907 6894 (London).

SALE: Heathkit SB-400E transmitter, in excellent condition and very little used, coverage 10 to 80m., CW/SSB, price £100, buyer to collect.—Waters, G3OJV, 16 Hill Crescent, Hornchurch, Essex.

WANTED: R.1392 receiver, fully tunable and in good condition.—Akines, 164 Sutcliffe Avenue, Grimsby, Lincs.

CLEARANCE SALE Reluctantly Necessary: Long list, including KW-2000, T.W. VHF gear, Transverter, VFO's, etc. Definitely no junk. Pse send s.a.e. for list.—Butcher, G3LAS, 7 Barclay Close, Hertford Heath, Herts. (Tel: Hertford 6122).

WANTED:: The third IF coil for the CR-300.—Dunn, 5 Eden Close, Beverley, Yorkshire.

WANTED: HW-32A Transceiver; also HP-23E power supply, in good working order. Full details, pse. —Morgan, 6 Tyne View, Clara Vale, Ryton, Co. Durham.

SKY HOOKS for sale: Met. balloons, 3 ft. diameter, 10s. each. Aluminium wire, 275-ft. reels, 10s. All ideal for erection of balloon-supported aerials.—De La Salle, 15 Avenue Road, Brentford, Mddx. (Tel: 01-560 8671, after 6.30 p.m.).

SALE: Heathkit DX-100U, together with SB-10U Adaptor for SSB, both factory-built, with jump leads and manuals, £60 the pair, or near offer.—Weaver, G2FFT, 6 Hilly Plantation, Thorpe, Norwich, Norfolk.

AVAILABLE Shortly, the following fabulous equipment: Collins 75A-4 receiver, £195; Hallicrafters HT-32B Tx, AM/CW/SSB, £165. Also "G2DAF-type" Linear, 2/813's, PSU, £25. Heathkit OS-2 'Scope, £12. All offers and enquiries answered.—Dodd, GD3RFK, Kionlough Cottage, Bride, Isle of Man.

SELLING: Five-Band table-top 60-watt AM Tx, a good performer, £12. Top Band Tx and modulator, both with integral PSU's £4. Carriage extra. WANTED: A Z-match Unit.—Thorburn, G3WBT, 27 Banklands, Workington, Cumberland.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Pair of bases for 4CX250B, new, 60s. each. Honor TE-22 Audio Generator, sine and square wave, as new, £10. Gnome Enlarger with lens for 35 mm., as new, £10. Two-metre 100-watt Tx, uses '640, in cabinet and with xtals, but less PSU/Modulator, £12. FM/VHF "low-band" Tx, less valves and xtal, 40s. Nombrex RF Signal Generator, as new, £6. Polaroid Model 95 camera, takes Type 47 film, £10.—Ring Dykes, G8CKH, 01-300 4825 (London).

FOR SALE: Heathkit DX-40U with VF-1U VFO, and their manuals, price £25 or near offer. Could deliver to any reasonable distance.—Dowsett, 159 Hawthorn Crescent, Portsmouth, PO6-2TJ, Hants.

OFFERING: Lafayette KT-340 receiver with manual in very good condition, £15.—Pratt, Red Lodge, 25 Warren Road, Freckenham, Nr Bury St. Edmunds, Suffolk.

SALE: Heathkit DX-100U Tx, FB condition, price £30 or near offer. Unused 9 mc KVG filter and carrier xtals, £12 10s., or offer. Heathkit 10-12U 5-inch Oscilloscope, almost new and perfect, £27 10s. —Derrick, 218 Winchester Way, Bolton (20768), Lancs.

FOR SALE: Hallicrafters SX-99 Rx, 540 kc to 34 mc, amateur bands electrically bandspread, with xtal filter, BFO, ANL, S-meter and matching speaker, £22 10s. VHF Panadaptor/Spectrum Analyser, displays 3 mc either side of 30 mc, with centre frequency, sweep width factor and gain controls, just the job for two-metre band scanning, £17 10s. Panadaptor, 465 kc, plus or minus 100kc, remaining features as foregoing, price £9 10s. R.1155 Rx, working but needs PSU, £5. Command Rx Q5'er, 70s.; 3.0 to 6.0 mc, £5.—Quayle, 104 Southmoor Road, Oxford.

FOR Quick Sale: Heathkit DX-100U, in very good condition, £38 or near offer. Also a Creed 7B Teleprinter, £8. Delivery possible in Midlands area. —Box No. 4822, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: R.C.A. AR88D, rack mounting, front panel in black-hammer finish, new dials fitted, in excellent working order and with handbook, £40. Buyer to collect.—Court, 3 Eden Road, High Halstow, Nr Rochester, Kent.

SALE or EXCHANGE: Thoroughbred Bicycle, with costly accessories, £22. New Audobon binoculars. £24. Set of fine old bone chess-men, £9. An excellent solo tent, with flysheet, £12. Offers considered, or would EXCHANGE for an Eddystone EC-10 Rx in perfect working order.—Marshall, Worth Abbey, Crawley, Sussex.

SELLING 805 valves, unused, 25s. each. Modulation transformer for 2/807 push-pull, 2/807 in parallel, 25s. Woden DT-1 driver transformer, 20s. Eddystone bug key, 30s.—Dorward, G6UD, 22 Beechwood Crescent, Southwick, Sunderland, Co. Durham.

FOR SALE: Mains xformer for AR88D, 90s.; set of IF transformers, 75s. Crystals: HC-6U, 1 mc, 35s.; 12.7 mc, 22s.; crystal for BC-221, 45s. All these items brand new, postage extra. Manual for Type 13A 'Scope, 40s. BC-221 Frequency Meter, complete with all spares and in mint condition, price £27 10s., plus carriage. (Lancs.)—Box No. 4823, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: T.W. Twomobile receiver, perfect, £18. Home-built two-metre Tx, less PSU, £5. Eddystone 898 dial, unused, £4. Various crystals and odd items, s.a.e. for list.—Darrington, G3WHL, 182 Thorne Road, Doncaster (3564), Yorkshire.

URGENT: Can anyone help with a circuit, or give detailed information, covering the ex-R.A.F. Drive Unit Type 114 (serial No. 447), 25-cycle tuning fork? All costs refunded.—Harvey, G3IUG, 39 Curlieu Road, Oakdale, Poole, BH15-3RJ, Dorset.

SMALL ADVERTISEMENTS, READERS—*continued*

SELLING: Heathkit DX-100U Tx, in good condition and with handbook, best offer over £27 10s. Could deliver to 50 miles.—Robson, G3NZK, 6 Eastleigh Road, Fair Oak, Eastleigh, Hants. (Tel: Fair Oak 1228, after 6.0 p.m.).

SALE: R.C.A. AR88LF receiver, in very good condition, with S-meter and product detector, £35. Sphinx Tx, good condition, £45. Nuvistor two-metre converter, IF 4.0 to 6.0 mc, with PSU, £8 10s.—Lindsay-Smith, G3WNI, 22 Kingswood Crescent, Copthorne, Shrewsbury, Salop.

SALE: Solartron CD-513 Oscilloscope, in good condition, with handbook, £35 or near offer.—Arkell, 13 Princes Avenue, Muswell Hill, London N.10.

OFFERING: K.W. Viceroy Mk. IV, as new, with extra filter and aerial relay, one owner and in mint condition, CW/SSB Tx. Eddystone 680 receiver, coverage 500 kc to 30 mc, five bands, crystal phasing, with S-meter, etc. K.W. Top Band Phone/CW Tx. Variac, 230v. at 10 amps. Eddystone 888A S-meter. T.W. Converter for 70 Cm., IF 28 to 30 mc, unused. Sensible offers, pse, or W-H-Y—Roberts, G3AQX, Cottage Farm, Wessington, Derbyshire. (Tel. Alfreton 2943).

SELLING: New Air System bases and chimneys for 4CX250B, at 50s. each. New p.t.f.e. bases for QQVO6-40A, 5s. a time.—Box No. 4825, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: R.C.A. Model CR-91 receiver (AR88), in good condition, fitted xtal calibrator and muting relay, with manual and some spare valves, price £37 10s., or near offer. Could deliver to 25 miles, otherwise buyer to arrange transport.—Kirkby, G3BRJ, Trefaes, Westella Road, Yelverton, Devon.

EXCHANGE or SELL: Trio JR-500S, in good condition, with Eddystone speaker unit FOR Eddystone EC-10 receiver.—or £40 o.n.o. for the JR-500S. Green, G8BQB, 109 Umberslade Road, Selly Oak, Birmingham, 29.

WANTED: Sixty feet (or three separate 20ft. lengths) of heavy duty, balanced 75-ohm transmitting type feeder. Either parallel or the screened variety would be suitable. Any offers, pse.—Rigby, G3KTJ, 30a Pimbo Lane, Upholland (2601), Nr. Wigan, Lancs.

SURPLUS: Top quality polypropylene non-rot rope. Diameters: ¼in., 1300 lbs. breaking strain; 5/16in., 1890 lbs. B/S; and ⅜in. dia., 3100 lbs. B/S. Send s.a.e. for sample.—Powell, GW3HUM, 21 Tanybryn Estate, Valley, Anglesey.

REQUIRED: Eddystone Receiver, state age and serial number, delivery Essex.—Box No. 4824, Short Wave Magazine, L'd., 55 Victoria Street, London, S.W.1.

SALE: Receivers: R.450/FRR.28, 540 kc to 54 mc; Hallicrafters 540 kc to 109 mc, 27 to 145 mc, 38 mc to 1000 mc, BC-348, £12 10s. R.1155, £5. Bendix, 30s. Receiver-Indicator, £5. R.C.A. 160-metre Tx, size 6½ x 6½ x 9in., £8 10s. BC-221, £10. Multimeter, 35s. HRO coil pack, 20s., crystal 20s., dial 30s., PSU 50s. New Teleprinter. R.C.A. crystal multiplier, 70s. Marconi ATU, 25s. Valvetester and other items; send s.a.e. for list. Carriage extra.—Wright, 249 Sandy Lane, Hindley, Wigan (55948), Lancs.

WANTED: Eddystone 770U receiver, Mk. I or Mk. II model, must be excellent as regards condition and performance. Please state details and price asked.—Signey, 50 Sturdee Gardens, North Jesmond, Newcastle-on-Tyne 2, NE2-3QT, Northumberland.

OFFERING: One or two 2-metre transistor converters, BF180 RF, FET mixer, IF 3·9 to 5·9 mc, £7 each.—Clowes, G8BXT, 21 Adderley Terrace, Sandford Hill, Longton, Stoke-on-Trent, Staffs.

FOR SALE: Eddystone 888A receiver, really mint condition, superb performer and little used, price £75. Various Minimitter mobile whips, 70s. each. Taylor Type 45C Valvetester, £15. Dow-Key relays, xtals and meters.—Reynolds, G3IDW, 6 Church Way, Lower Stratton, Swindon, Wilts.

FOR SALE: Sommerkamp FL-DX500, £110. Trio JR-500SE, with matching speaker and Codar Q-multiplier, £55. (All new in February.) Also an AR88D, £28.—Morris, G4HU, QTHR, or ring 061-430 3858.

SALE: Hammarlund HQ170A-VHF receiver, latest version, covers two metres to Top Band, brand new ex-U.S.A. direct, in carton with manual and guarantee card, £160. Waters pre-amplifier, 50s. Johnson Match-Box with coupler, Mosley Auto-Whip Model TM5, tunes 10 to 80m., cost $73·00. Unused Hy-Gain vertical Type HT-18, price £65. Original instruction manuals for NCX-3, NC-100, Johnson Invader, AR88D, SX-28A and SX-101A.—Barnet, G3DAM, P.O. Box 10, Evesham, Worcs.

WANTED: Instruction Manual for Valve Tester Type I-177; also copy "CQ" for September '59.—Bovey, 1 Chapel Lane, Dartmouth, Devon.

FOR SALE: Codar CR-70A with PR-30 and many improvements, price £16. Z12 amplifier and home-built PSU, 60s. R.C.A. CA-3014 I.C., unused, 15s.—Roberts, 18 Buckley Street West, Wigan (46109), Lancs.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Eddystone 840A receiver, covering 480 kc to 30 mc in four bands, £27 10s. Brand-new Command receiver, 1·5 to 3·0 mc, £9 10s. Creed Type 7 teleprinter, £9. Redifon CFS adaptor, 455 kc nominal input, complete with PSU, brand new, £12 10s. CRM-1 indicator, £6 10s. Triplett 1632 signal generator, as new, £13 10s. R.216 film-strip dial, 21s. BC-453, Q5'er, 70s. AR88 speaker, brand new and boxed, 65s.—Reynolds, 5 Headland Way, Lingfield, Surrey.

WANTED: First-class AR88D, or similar. Must be fine performer, corresponding condition and appearance. Details and price including delivery, pse.—Newstead, 79 Pinnacle Hill, Barnehurst, Kent.

WANTED: Loan of Instruction Manual for the Drake R-4B receiver.—Cameron, Coombe Cottage, Pitchcombe, Stroud, Glos.

SELLING: Eddystone 940 receiver with accessories, in very good condition, new cost £125—asking £35 or nearest offer.—Mason, 11 Kenner Close, Lincoln.

SELLING: Complete station, CW/AM, comprising 50w. Tx (Geloso VFO into 807), with ATU, SWR meter, GDO, CR-100 fitted S-meter, pice £50 or near offer. Can be seen working and would deliver to 50 miles.—Turk, G3PQC, 102 Manor Road, Farnborough, Hants.

SALE: Sommerkamp FL-200B transmitter, £95; also FR-100B receiver, £85. Both units in excellent condition.—Bailey, 3 Garden Close, Harbledown, Canterbury, Kent.

WANTED: Eddystone 830/7 wide-range communications receiver, or other first-class AM/SSB Rx.—Halford, 107 Bluebell Road, Swaythling, Southampton, Hants.

EXCHANGE or SELL: Eddystone 840C receiver, in mint condition, £40; Heathkit DX-40U and VF-1U VFO, £25—both together £60, or take cheaper Rx in part-exchange. Crystal Calibrator No. 7, 25s. B2, PSU, 65s.—Walters, G3MXO, 433 Bordesley Green, Birmingham, 9. (Tel. 021-772 5409.)

FEW Copies "QST" available, Sept. '68 to July '69. Price 6s. each at counter, or 7s. by post.—Sales Counter, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: National NCX-3 SSB Transceiver, coverage 20-40-80m., 200 watts p.e.p., £70. Lafayette HA-63 receiver, 550 kc to 30 mc, £20.—Heaton, G3UGX, Worston House, Nr. Clitheroe, Lancs.

WANTED: HW-30 Transceiver; also AR88, TW2 Communicator, Top Band Communicator, and HW-32A. (Berkshire).—Box No. 4827, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: Heathkit IO-12U Oscilloscope, £20. Also R.C.A. AR88LF, £20. Would deliver to 30 miles.—Kenyon, G8CAK, 59 Oakfield Park, Much Wenlock, Shropshire.

FOR SALE: Eddystone 740 Rx, in good working order, price £14. Wanted: Small self-contained Top Band Tx/Rx, must be reasonable. (Lancs. area).—Box No. 4826, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Army No. 4 mine detector, or ferrous metal detector. Also Fisher microscope.—Beard, Temple House, Littledean, Glos.

OCTOBER Issue "Short Wave Magazine" due out September 26. Single-copy orders, 4s. (or 4s. 3d. "first-class") post paid, to reach us by Wednesday 24th, for despatch on Thursday 25th. These copies are sent flat in an envelope.—Orders, with remittance, to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

DISPOSING: Pye Base Station, 165 mc, in first class condition, £25. Pair of TR.2002 Tx/Rx units, all valves and crystals, 12-volt, £5. Cossor type 339A double-beam 'scope, £5. Marconi No. 2 Valve-Voltmeter, complete, £5. ATU for 52 Set, 20s. Send s.a.e. for other radio items available. New 8mm. developing tank, £5. Mecablitz Electronic Gun, Model 45, £8. Prefer buyers collect. WANTED: Codar T.28 Rx.—Vaughan, 65 London Road, Benfleet, Essex.

SALE: Sideband Tx for 80-20-15-10m. (28·2 to 28·7 mc), 480 watts p.e.p., circuit as K.W. Viceroy but 6HF5's in PA, built-in solid state PSU, Vox and break-in CW, in grey hammer screened cabinet, £28, carriage extra. K.W. low-pass filter, Ch.I, 72 ohms, 50s.—Edwards, G3KGN, 126 Danescroft Drive, Leigh-on-Sea, Essex.

WANTED: Pye Radiotelephones Type AM10B, AM10D and AM25T, also small quantity QQV03-10 valves.—Austen, 28 Valebridge Road, Burgess Hill (3409), Sussex.

WANTED: Collins, brand-new or in mint condition, equipments Type 312B-5 VFO-console; portable PSU PM-2; Speaker 312B-3; TD-1 dipole antenna; new Astatic D.104 crystal microphone. Details and prices, pse.—Box No. 4828, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Codar A.T.5, 250v. PSU 250/S, SWR meter, ATU, Ae. current meter, Morse key, xtal mic., £20. HRO, miniature valves, plus stabiliser and internal 1000/100 kc crystal calibrator, with 10 coil packs (six bandspread) with stabilised PSU and Q5'er, two speakers, price £20.—Ring Maddox, G3JBA, 01-648 2845, after 7.0 p.m. (London).

FOR SALE: Scruffy DX-40U and VF-1U; No. 36 Set; chassis, aluminium; 25-watt modulator; price £15 The Lot, or Exchange for VHF gear—W.H.U.?—Ring Worters, 01-393 8894 (London).

SELLING: R.C.A. AR88LF Rx, in perfect working order, original unscratched paint-work, no mods., and including S-meter and manual, price £36.—Ring Pyke, G8BXH, 01-743 4497 (London).

WANTED: Power unit, etc., and circuit information on the BC-659 Tx/Rx. Complete outfit purchased if in good condition. Also wanted R.208 Rx, or any receiver covering range 20 to 150 mc approx. Must be in perfect condition.—Harland, 6 Dart Road, R.A.F. Abingdon, Berks.

SALE: Pye Telecommunications Ranger 2202 series, mobile, boot mounted, high-power radiotelephone Transceivers, very suitable for 4 metres, price £15 with circuitry. Call and collect any time.—Johnson, 27 Montfort Crescent, Sherwood, Nottingham (69882).

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