

The SHORT WAVE Magazine

VOL. XXI

MARCH, 1963

NUMBER 1

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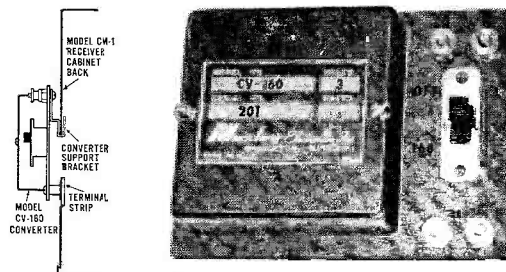
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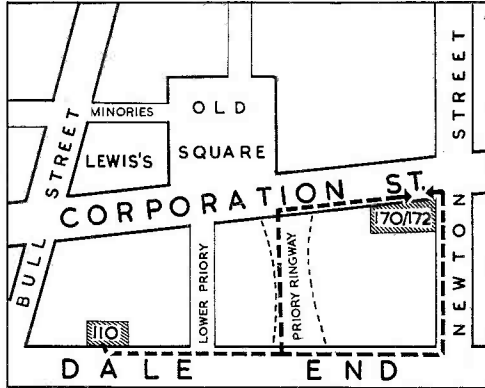
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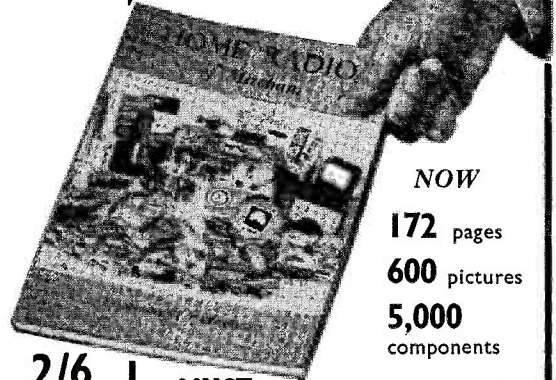


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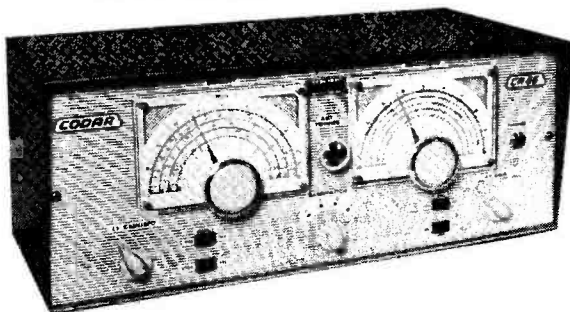
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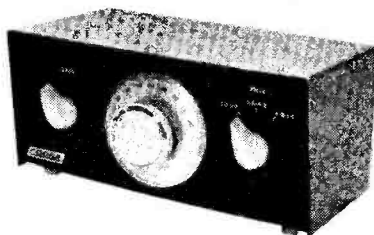
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**INDEX TO
ADVERTISERS**

	PAGE
Anglin	54
Cathodeon Crystals	52
Charles H. Young	3
Codar Radio Co.	4
Daystrom	<i>cover iv</i>
Easibind, Ltd.	56
Francis & Lewis, Ltd.	<i>cover iii</i>
G3HSC (Morse Records)	54
Green & Davis	52
G.W.M. Radio	53
H. L. Smith & Co., Ltd.	56
Home Radio	3
Jack Tweedy	56
James Farlow	56
K.W. Electronics <i>front cover & cover iii</i>	
Minimitter	53
Mosley Electronics	1
Multicore	3
Norman Birkett, Ltd.	56
Partridge Electronics, Ltd. <i>cover ii</i>	
Peter Seymour	6
Quartz Crystals, Ltd.	<i>cover ii</i>
Short Wave (Hull) Ltd.	<i>cover iii</i>
Small Advertisements	50-56
Smith & Co. Ltd.	55
Southern Radio	56
Southern Radio & Elec.	54
Southern Radiocraft (Tx) Ltd.	<i>cover iii</i>
S.W.M. Publications	2
Webb's Radio	51
Withers	55
Z. & I. Aero Services, Ltd.	6

SHORT WAVE MAGAZINE

Vol. XXI

MARCH, 1963

No. 233

CONTENTS

	Page
Editorial	7
Channel Switched Mobile Transmitter, Part I, <i>by J. A. H. Spratt, M.I.R.E. (G3KWG)</i>	8
DX Cruise in the Pacific, Part I, <i>by R/S M. J. Matthews, R.N. (G3JFF)</i>	14
QRP Tx for Two, <i>by M. A. Thorp (G3PQM)</i>	18
The S-Meter Problem	21
DX Commentary, <i>by L. H. Thomas, M.B.E. (G6QB)</i>	24
Adapting A Design, <i>Notes by GW3HUM</i>	31
Transistorised Grid Dipper... ..	32
SWL — Listener Feature	33
VHF Bands, <i>by A. J. Devon</i>	38
Miscellany — <i>Comment on the Times</i>	41
Mobile Rally Calendar	42
New QTH's... ..	43
The Certificate Issues	44
The Month with The Clubs — <i>From Reports</i>	46

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The SHORT-WAVE Magazine

EDITORIAL

Silver *It was 25 years ago this issue that the writer assumed the editorial responsibility for SHORT WAVE MAGAZINE — and so it has continued ever since. A great deal has happened in this quarter of a century, in the world of Amateur Radio and in the greater world outside.*

A long and exhausting war — in which radio amateurs played a distinguished part — was fought and won, and since then the nation has had to face, and has safely surmounted, a recurring series of crises. Those to whom Amateur Radio is a relaxation have increased more than threefold, and they have seen great advances in procedures, methods and techniques. Much of this progress can be attributed to the pressure of war — it is probably not too much to say that there was faster development in radio communication during 1939-'45 than at any previous period.

Though in the 25 years since March, 1938, we ought to have published 300 issues, the actual count is 221 — because when the tocsin sounded in September, 1939, with that month's issue cleared for press, all the then members of the MAGAZINE staff were in uniform. Two of them, 2AMW and 2CUB, gave all they had to give — their calls will never be re-issued.

Editorial responsibility for a regular monthly periodical like SHORT WAVE MAGAZINE — which has never been late for the issue date, even if delivery through the post or on the bookstalls has been delayed for reasons beyond our direct control — covers a much wider field than might be supposed. Not only must the MAGAZINE have clear policies and objectives covering every aspect of Amateur Radio but (because we are entirely independent and unsubsidised) it must also succeed as a purely business undertaking in the highly competitive field of radio publishing.

It is not intended here to catalogue what are the editorial duties and responsibilities, but merely to say again what was said with our post-war re-appearance in March, 1946 — “We cannot expect, and indeed will not attempt, to please everybody all the time, but we shall hope to please most of them for some of the time.”

And with that thought we go forward again, with our thanks to all those — readers and trade friends, critics and colleagues — who have borne thus far with the writer of this piece.

*Austin Fobler
G6FO.*

CHANNEL-SWITCHED MOBILE TRANSMITTER

FOR CAR, BOAT OR CARAVAN
— SPOT-FREQUENCY SELECTION
ON 80 AND 160 METRES —
LOADING INTO ANY AERIAL —
FORTY WATTS ON EIGHTY,
TEN WATTS ON TOP BAND —
TRANSISTOR POWER SUPPLY

Part I

J. A. H. SPRATT, M.L.R.E. (G3KWG)

In the September 1962 issue of SHORT WAVE MAGAZINE our contributor described a 12-volt Receiver, designed for mobile or portable operation, which attracted a good deal of attention. This is the companion transmitter and, in fact, in his own model, the two units are combined in a single cabinet, giving coverage of the 1.6-4.0 mc range, with spot-frequency selection. Experienced readers will recognise that the transmitter circuitry is basically simple, and can therefore be relied upon to be effective and trouble-free. Various modifications of the general design are possible — for instance, many

THE transmitter to be described was designed for use in conjunction with the receiver which was the subject of an article in the September 1962 issue of SHORT WAVE MAGAZINE. The complete equipment was basically for use in the Maritime Mobile communication band of 1.6-4.0 mc, but has many features to commend it for Amateur operation in the 160m. and 80m. bands, either as main station equipment, or for mobile and emergency purposes.

It has been noted that many mobile stations work crystal controlled using a plug-in crystal on either Top Band or Eighty, some equipments being capable of working both bands. However, the band-changing time can be protracted, and usually necessitates stopping the vehicles. To overcome this lack of agility, the transmitter discussed here has six pre-tuned channels, any one of which may be set up to any frequency in either band. The channels are all crystal controlled, so that the only adjustments are to select the channel required, switch to low power for 160m. to comply with the ten-watt regulation, and press to talk. There is a fine-tuning control to ensure correct resonating under conditions of varying aerial characteristics. The transmitter is for phone use only, but is easily modified for CW. It can be used on either 12v. or 24v. supplies, but the latter necessitates changing

versions of the Receiver have been built with no intention of combining it with this particular Transmitter; similarly, the Tx itself could be modified for crystal microphone input, or for VFO/BA drive instead of the straight CO on spot frequencies, or it could be used as a separate push-to-talk bench transmitter. Though intended primarily for marine service, as it stands the transmitter would be very useful for amateur mobile/portable operation on the two LF bands, when the requirement is only convenient talking channels.—Editor.

the transistors in the power unit. The complete 12/24v. facility could be employed on the transmitter, as on the receiver, but the cost of HV transistors for 24-volt use, having sufficient current rating to cover the 12-volt condition, tend to be rather expensive (about £5 a time).

As on the receiver, the facility for either positive or negative earthed battery supply is incorporated because it is very useful and entails little or no difficulty. The transmitter runs up to 40 watts input on full power. This is reduced to the statutory ten watts input in the low power condition. The PA will work into aerials from ten feet in length (unloaded whips) to 70 feet long, end fed. A modification (Part II) is given to allow it to work into loaded whips if required, although this will increase the channel-changing time, since the whip may have to be retuned, especially when band changing. However, not too much ingenuity is required to make the aerial tuning semi-automatic. The transistor power unit makes the unit reasonably economical on battery consumption, the drain being approximately 10 amps. on 12v. for the full-power condition.

Circuit Description

Referring to the block diagram Fig. 1, it will be seen that the transmitter is quite conventional. A crystal controlled oscillator drives a PA stage which is L-matched into the aerial. The PA is high level anode-and-screen modulated by a push-pull modulator. A good quality carbon microphone is used which gives sufficient output to drive the modulator direct, with reasonably good quality and frequency response. A transistor power supply provides HT

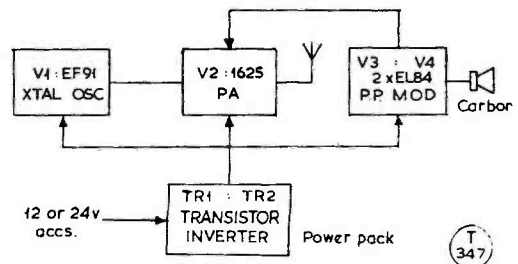
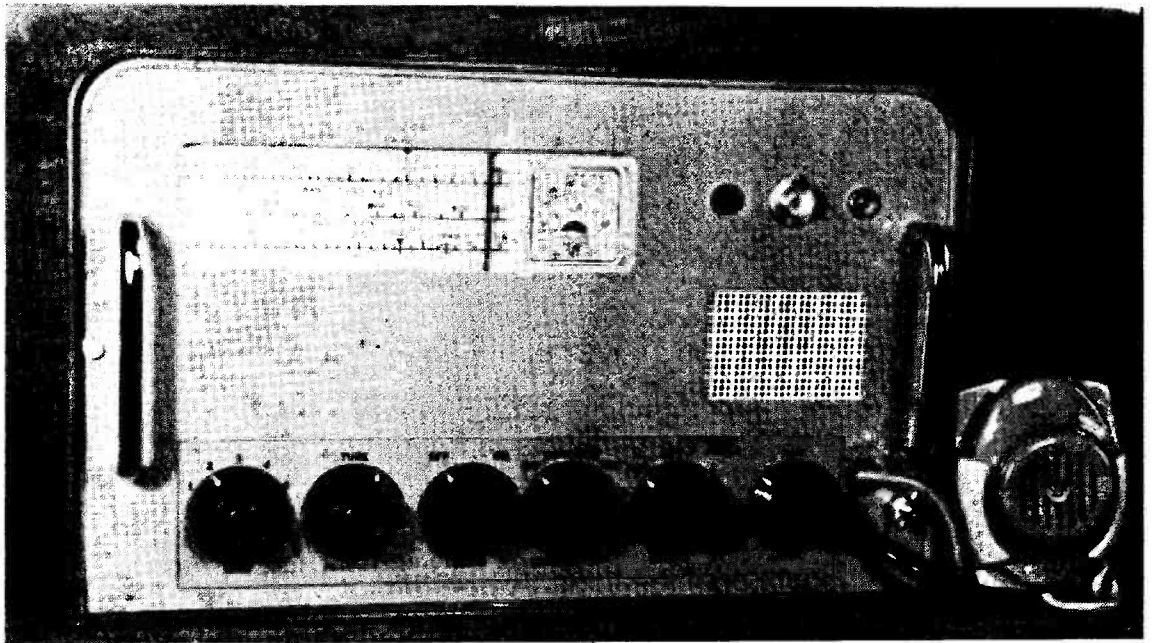


Fig. 1. Block diagram of the G3KWG LF-hand transmitter: basically, it is a very simple design, being no more than a CO-PA modulated by a single-stage speech amplifier from a carbon microphone.



The 1.6-4.0 mc Transmitter/Receiver designed and constructed by G3KWG, running up to 40 watts input crystal-controlled on six spot frequencies on the transmitter side. The receiver, using ECH83 valves (12v. HT type) has already been described, in the September 1962 "Short Wave Magazine"; the article herewith deals in detail with the transmitter — which could, of course, be built as a separate unit. The PA tank is designed to match into any aerial (right-hand control) and above the speaker grille is the RF tell-tale, for tuning up and as a modulation indicator — which is obligatory by the marine specification for apparatus of this type. The transmitter is suitable for general mobile or portable operation and is self-contained for power; it will work direct from a 12-volt (or 24-volt) DC supply. The transmitter function switch, third from right, gives a 10-watt setting for Top Band operation. The band switch, second from right, is the channel selector, crystals being fitted for the frequencies required.

for all stages. A built-in tuning meter monitors the PA current and can be switched to check PA grid voltage for tuning purposes. An aerial current indicator is fitted, this being a 60 mA bulb which serves as a useful check on modulation and permits tuning in the dark, should illumination fail, or the meter go faulty. The requirements of emergency operation made this indicator mandatory, but it can be omitted if not considered necessary for the individual use to which the transmitter is put. Of course, there is the disadvantage that it consumes about 30 mW of precious RF power!

Fig. 2 is the circuit, with V1 (EF91) as an asymmetrical Colpitts crystal oscillator, this being chosen because the crystal excitation is easily controlled by the ratio of C3 to C4 and one side of the crystal is earthed; this makes measurement of the crystal dissipation relatively easy, and is important, as it was considered necessary to keep the crystal dissipation down to about 5 mW, so as to allow the use of the modern Style D crystals. Of course, the old Style 10X, which can happily handle the odd watt or so, can be substituted — but these are quite large, and they are expensive if you have to buy them from scratch. A further advantage of keeping the crystal dissipation low is improved frequency stability; this has been measured and found to be better than ± 100 parts per million under all conditions of operation and

over the temperature range from -10 to $+40^\circ$ C. This means that you can work the band edges good and close, if you so wish, under all environmental conditions, without fear of report!

In this oscillator, the valve screen grid acts as anode, the actual anode obtaining its signal voltages by electron coupling. This gives a degree of isolation and reduces crystal pulling when the tuned circuit comprising L1 and the selected trimmer, CT1 to CT6, is tuned to the crystal frequency. It should be noted that it is essential for this tuned circuit to look inductive at the crystal frequency, which means ensuring that it is tuned slightly HF of resonance. If this is not done, there is a tendency for some crystals not to oscillate reliably. The LC ratio is kept fairly high to give a high dynamic impedance, and thus good RF output. In all cases the crystal and the anode tuned circuit work at fundamental frequency.

The PA stage is V2, which is a 1625, all-same 807. The reason for choosing this valve is the 12v. heater, and the fact that they were very cheap. There is no objection to using an 807, but the heater circuitry will have to be juggled accordingly. Other alternatives are the 5B/255M and its various brethren, which are the basic valve with different heater voltages and anode top cap — no top cap choices. The PA stage is straight driven by the output from V1, and the bias conditions chosen are

optimum for phone working up to 100% modulation depth. The main bias is supplied by grid current (approximately 4 mA) through R9.

Protective bias is provided by the cathode resistor R10, which protects the valve from damage due to loss of drive or a fault in the aerial circuitry. The cathode voltage is monitored by the tuning meter, which is arranged to read in terms of cathode current flowing. The meter is also switched, when necessary, to read the grid voltage across R9. This allows one to tune the oscillator anode without recourse to an Avo—which is something of an advantage in a vehicle or on a boat where there isn't much room for etceteras. Parasitic suppression is provided in grid and screen by R8 and R7 respectively, whilst L2, R11 form a suppression circuit for the anode. The output tuned circuit L3, C12 is an L-match, which was chosen as being optimum for the original purpose as a maritime mobile, working with aerial lengths of between 30 and 80 feet, but capable of reasonable results on a 10-foot whip. However, with a loaded whip and say 72-ohm cable, it would be better to convert to a normal π -network, and place a bank of 500-750 μF trimmers and a wafer switch across the output.

The amount of inductance required for each channel is chosen either by soldering taps on to the coil, or using a cruciform coil and having clips. The main disadvantage of the L-match is that the only variable parameter for a given input and output impedance is the loaded Q—however, with the given circuit the transfer efficiency of the tank is of the order of 80%, which is reasonable. R12 in Fig. 2 and Fig. 3 (*Part II*) acts as a static leak; it can be replaced by a choke, with the added advantage of blowing the HT fuse should C11 break down; this does prevent one getting a possibly lethal belt. Alternatively, C11 should be made at least 1500v. DC working (mica) and not one of those things available on the surplus market with the legend "2200 Volts DC Test"—the actual working voltage of these condensers is of the order of 750 volts only; true, they very rarely seem to break down under twice this voltage, but one should not take chances!

S1A, S1B and S1C, the frequency-change switch, is made up of wafers ganged on the same switch, and thus select the correct crystal, its oscillator anode tuned circuit, and the appropriate aerial tap. On transmission you just check that the PA current is a minimum by touching up with C12, and then talk away. The aerial current indicator is the 60 mA bulb connected to a few turns of wire, L4, at the live end of the tank coil L3. This acts as a current transformer, and you vary the number of turns to give a reasonable bulb brightness on all channels ensuring, of course, that you don't blow the bulb when modulating, since the current will increase by about 25% for 100% modulation depth. The PA normally runs at 450 volts HT at around 80 mA, and the overall efficiency into a standard load representing a marine aerial (200 μF in series with 10 ohms) is of the order of 50%.

Modulator Section

The modulator comprises V3 and V4 which are push-pull connected EL84's run rather heavily in

Table of Values

Fig. 2. Circuit of the Mobile Transmitter

C1, C2 = .005 μF , 750v.	R6 = 22,000 ohms, 2w.
C3 = 20 μF , s/m 250v.	R7, R8 = 47 ohms, $\frac{1}{2}$ w.
C4, C7 = 180 μF , 250v.	R9 = 22,000 ohms, 1w.
s/m	R10 = 100 ohms, 2w.
C5 = .001 μF , 750v.	R11 = 100 ohms, 1w.
C6 = 500 μF , 250v.	with L2 (APC)
C8 = .001 μF , 1 kV.	R12 = 1 megohm, 1w.
mica	R13 = 56 ohms, 1w.
C9, C10 = .01 μF , 400v.	R14 = 82 ohms, 2w.
C11 = .001 μF , 1.5 kV.	R15, R16 = 100,000 ohms, $\frac{1}{2}$ w.
mica	R17 = 1,000 ohms, 15w.
C12 = 500 μF , var.	R18 = 20 ohms, 3w.
C13 = .02" plate spacing	w/wound
C14, C15, C20 = 25 μF , 25v. elect.	R19 = 10,000 ohms, $\frac{1}{2}$ w.
C16, C17, C18, C19 = .04 μF , 150v.	high stab.
C21, C22 = 16 μF , 450v. elect.	R20 = 56 ohms, 3w.
C23 = .003 μF , 150v.	w/wound
C23 = 2 μF , 150v. elect.	R21, R22 = 10 ohms, 1w.
CT1-CT6 = 8-80 μF comp. trimmers	R23 = 2,200 ohms, 1w.
CT7-CT12 = see Table I (<i>Pr. II</i>)	R24 = 91,000 ohms, $\frac{1}{2}$ w.
R1, R2 = 47,000 ohms, 2w.	high stab.
R3 = 68,000 ohms, 1w.	R25 = 500,000 ohms, 1w.
R4 = 47,000 ohms, $\frac{1}{2}$ w.	TR1, TR2 = 2N1553 (12v.)
R5 = 680 ohms, $\frac{1}{2}$ w.	2N2070 (24v.)
	V1 = EF91, 6AM6
	V2 = 1625 (12v. 807)
	V3, V4 = EL84

Notes:

Resistors and fixed condensers can be *Radiospares* items; C18, C19 and R20-R23 are part of the *Ajax* Transistor Power Supply kit; TR1, TR2 are also supplied with this kit. The compression trimmers can be *Cylidon* type TP1, or *Radiospares*. C12 must be a variable transmitting type, with minimum plate spacing of .02". R11, L2 comprise an anti-parasitic choke.

MISCELLANEOUS ITEMS

T1	— Mod. transformer: pri. 120 mA, sec. 100 mA (<i>Ajax Electronics</i>).
T2	— Mic. transformer: <i>Radiospares</i> midget o/p type, using 50 : 1 tap.
T3	— Inverter switching transformer (contained in <i>Ajax</i> kit).
T4	— Inverter output transformer (contained in <i>Ajax</i> kit).
MR1	— Fitted in receiver section (<i>p. 347, September, MR4</i>).
MR2	— Silicon diode 100v. p.i.v., 0.5A, G.E.C. SX631, or <i>Radiospares</i> .
MR3	— As MR2, and part of <i>Ajax</i> Transistor Power Supply kit.
MR4, MR5	— Silicon diode 800v. p.i.v., 0.3A., G.E.C. SX638 (both contained in <i>Ajax</i> kit).
RLA	— 2-pole change-over, rated 1.5 kV, 12v. or 24v. coil.
RLB	— Contactor, single-pole make, rated 10 amps., 12v. or 24v. coil, as appropriate.
S1A-S1D	— Ganged switch assembly; single-pole 6-way.
S3B	— Trolex wafer, 3-pole, 4-way (<i>Electroniques</i>), with S3A, on-off.
S4	— Microphone pressel switch, press-to-talk.
S5	— Gate switch, single-pole spring-loaded, push to make (<i>Radiospares</i>).
Mic.	— Fist microphone with pressel switch, single-button carbon insert (<i>S. G. Brown</i>).
Meter	— 0-1 mA, panel mounting type.
Fuses	— F1, 5A; F2, 250 mA; F3, 3A. (<i>Radiospares</i>).

TABLE OF COIL DATA

L1	— Inductance 80 μH , <i>Electroniques</i> type HSO.
L2	— 5 turns 22g., spaced turns over R11, for APC.
L3	— <i>Loading coil</i> : 14 turns 20g. enam. close wound, inductance 70 μH approximately.
L3	— <i>Main tank coil</i> : 60 turns 20g. enam., wound 14 t.p.i., on 3-in. former, tubular or cruciform (<i>see text</i>).
L4	— RF indicator winding; 3 turns insulated wire coupled to L3 (<i>see text</i>).
RFC1, RFC2	— 2.5 mH RF chokes, 100 mA rating (<i>Electroniques</i>).

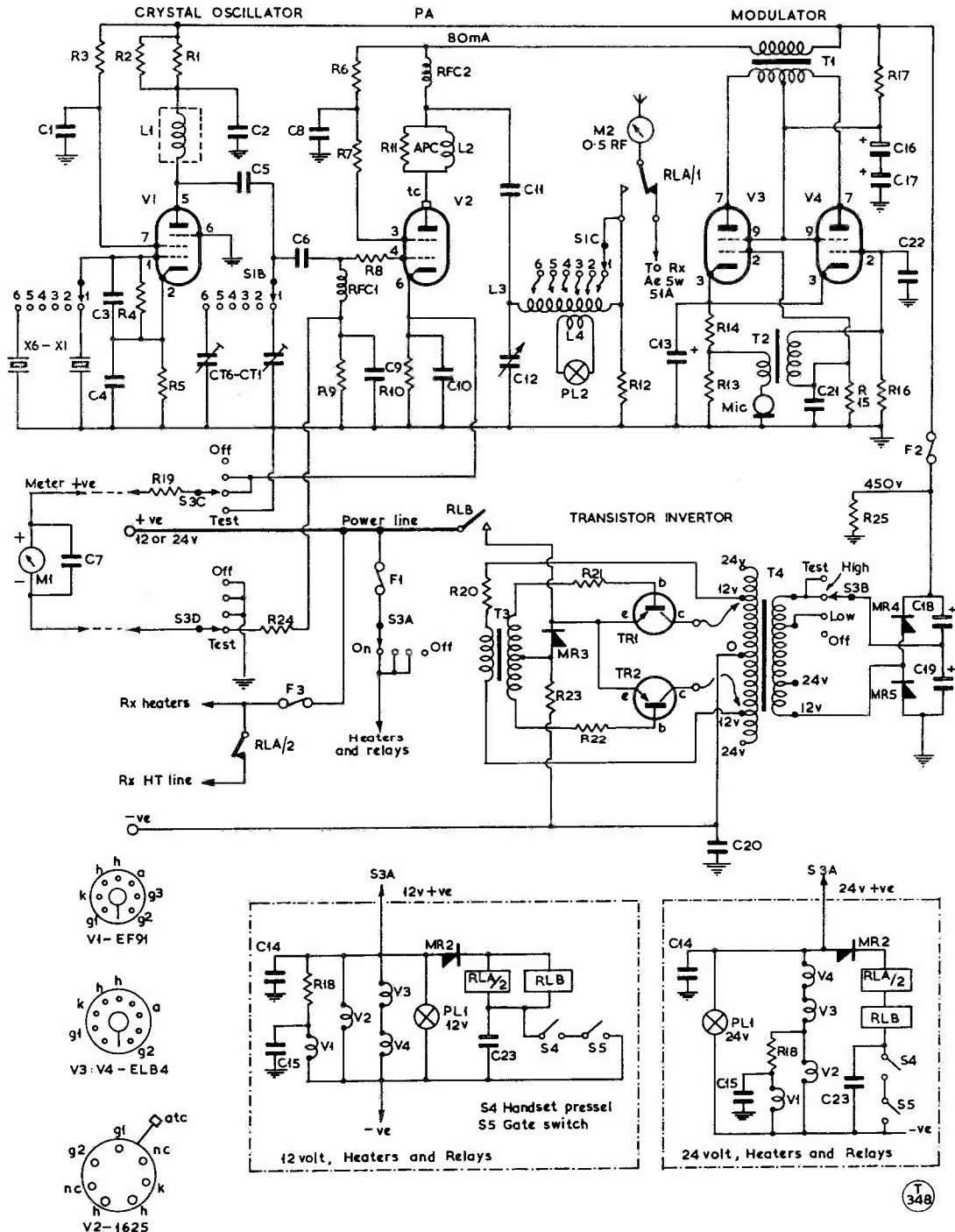


Fig. 2. Circuit of the RF section, modulator and power supply -- 12-volt, or 24-volt DC input -- for the LF-band portable/mobile transmitter designed and described by G3KWG. V1 is the CO, taking switched crystals, and driving the PA, V2, as a straight amplifier. Modulation is by V3, V4, using only a carbon microphone to economise on circuitry while getting adequate amplification; if a good single-button type of commercial carbon microphone is used, quality will be perfectly satisfactory. The coil L3 is made in two sections, with taps for different bands or aerials, and almost any end-on system can be matched -- see text. On the power supply side, T3 is the switching transformer, and T4 has compensating taps, for either 12v. or 24v. DC input; at full power, the output is about 450 volts at 200 mA, with good regulation; the circuits inset show the LT changes for the two possible input voltages.

Class-AB1, giving a good 18 to 20 watts across the secondary of T1 with less than 10% harmonic distortion. The HT under these conditions is about 340 volts between anode and cathode, so the valves are not being run wickedly outside maker's ratings. The HT is derived from the main 450-volt line through the series dropper R17 and the reservoirs C16, C17 in series; this combination will cope with the required current peaks, without distortion, down to 300 c/s. The input to the modulator is by means of T2; it will be noted that the transformer used has no centre tap, this necessitating the resistive centre-tap formed by R15 and R16. Polarisation for the carbon microphone is obtained from a tap on the common cathode resistor of the modulator, which supplies 5 to 6 volts. Deriving the polarising voltage this way is preferable to taking it from the supply direct, as it saves altering the values of the resistances when changing from 12 to 24 volt supplies, and reversing the polarity of the smoothing condenser if the earthed line is changed from positive to negative. C21 and C22 are to reduce the upper frequency response to about 3500 c/s. The frequency spectrum is crowded enough these days, and there is very little justification for using a wider bandwidth than is absolutely necessary for good communication quality.

Power Supply

The transistor inverter is of the Jensen type in which a small saturating transformer T3 is used for switching purposes, together with a non-saturating output transformer T4 for taking off the AC power. TR1 and TR2 (2N1553 for 12 volts or 2N2070 on 24 volts) are the oscillator transistors, and the commutation resistor is R20. It will be noted that there are equalising resistors R21, R22 in series with each base. To provide starting under all conditions, the starting circuit comprising R23 and MR3 is fitted. The inverter produced a practically square wave output at approximately 400 c/s, which is stepped up in the secondary of T4, and rectified by a full-wave voltage doubler. The output on full power is 450 volts nominal, with about 250 volts on low power. There is a compensating tap for use with 12 volts, to take up the larger voltage drop across the transistors. The complete unit can supply at least 200 mA on full power with excellent regulation. Due to the difficulty of obtaining the transistors and then winding up the transformers one's self, it was obtained as a complete kit from Ajax Electronics Ltd. at the reasonable price of £7 10s. Being in kit form, it allowed the unit to be built into the transmitter with extreme economy of space, which would not have been possible with a fully constructed commercial unit.

At first glance the control circuitry looks a little frightening, but it is really quite simple. Separate heater configurations are shown for the 12v. and 24v. conditions, and this includes the relay connections. It will be noted that there is a diode in series with the relays, so that, should one accidentally reverse the polarity of the supply, then the relays cannot operate, since the diode will be reverse-biased. This little protection circuit will save two very costly transistors

going to Valhalla, and it is recommended that the diode be not omitted, since this would be false economy—we all make mistakes, and as usual, this lesson was learned the hard and expensive way!

Across the send/receive and gate switches S4, S5 is a lag circuit, C23 which reduces the effective time taken for the switch to open, and as a consequence, the fall of current through the relays takes longer. Now, since the inductive voltage, which by Lenz's Law will tend to make the LT line voltage considerably higher for a few milliseconds, is proportional to the rate of change of current, then by making the time longer, we get a reduced rate of change of current, and consequently less of a voltage spike produced. Spikes of up to +60 volts have been measured on LT power lines when switching open inductive circuits. On a 12-volt line, 60-volt spikes are embarrassing to transistors, and very expensive, since they "punch through" with great ease. This lag circuit is another *must*, and it will pay good dividends to include it—another lesson learnt the hard way. The gate switch, S5, is not really necessary, as long as one remembers that transistor inverters can be silent killers (especially after one has been used to the warning noise of the rotary generator). The gate switch used was a micro-switch which was depressed by contact with the back of the cabinet, hence if the chassis were pulled forward, then the handset pressel was effectively disconnected, and the inverter could not be started. The action of having to connect a jumper across the terminals of the gate switch is at least an *aide-memoire*.

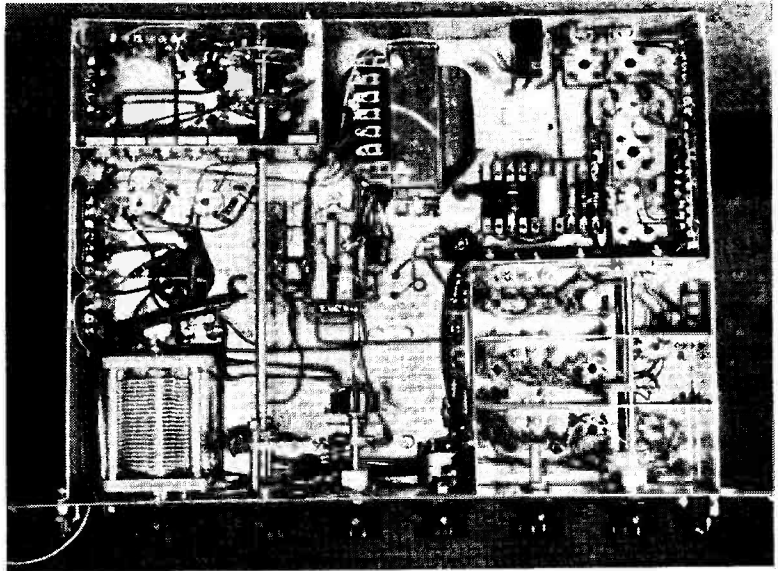
Two relays have been shown. RLA is the send/receive relay, which switches the aerial from receiver to transmitter, and breaks the receiver HT line. RLB is a contactor to apply the LT to the inverter direct. The power line to the inverter is not fused, because of the voltage drop along the line, and secondly the usual form taken by a fault on the line is a dead short in the transistors due to "punch through." In this case the emitter lead, which is of 20g. wire, acts as its own fuse. Happily this occurrence is unlikely if the safety precautions already mentioned are incorporated. A fault on the secondary of the output transformer will put the circuit in a safe condition, by preventing oscillation. Thus, the necessity of a fuse in the LT line is obviated, although there is nothing to stop anyone adding one for peace of mind—but do not lose too much across the holder—it is very easy for 0.5 volts to be dropped across the fuse holder and its wiring, when ten amps. are passing. If desired, there is no reason why the functions of RLA and RLB should not be combined, as long as a suitably-rated relay can be found. R19 and R24 are meter resistors to allow the meter to be calibrated in terms of 100 mA FSD in the case of the PA current, and 100 volts FSD for the PA grid voltage; the meter is actually reading 10 volts FSD in the PA current position. (These meter resistors will have to be adjusted for the instrument used, if different from that specified.)

It should be noted that the LT circuitry is run with an isolated negative line, so that either positive or negative battery lead can be earthed, as required.

F1 fuses the heater and relay circuitry. Power switching is by a single switch S3, A-D, which contains the on-off switch mounted on the rear of the shaft, and has a three-pole four-way wafer, performing the following functions in the order given:—(a) Off; (b) Low power; (c) High power; and (d) Test.

In the (b) position, the on-off switch is closed, and heater current is supplied. Pressing the handset switch will actuate the relays, and transmission will occur in the low-power condition, since the wafer S3B will select the low voltage tap. On (c), as for case (b) but the high-voltage tap is selected by S3B, so that full power transmission results. On (d) as for (c), but the meter is connected in reverse polarity via S3D and R24 to the grid leak of the PA.

The layout of the transmitter is not particularly critical, and is well suggested by the photographs, which show where the screening goes. The PA coil is mounted vertically on the chassis, and the cruciform type of construction is advocated. Two pieces of paxolin of about $\frac{1}{4}$ in. thickness are cut and slotted, so that when mated, they make a cruciform former, as seen in the photograph (*Part II*). The two pieces of paxolin can be securely held by a good adhesive. However, before sticking the cruciform together, it is advisable to groove the edges, so that the coil will remain rigid, without having to use liberal coats of polystyrene cement and other similar artifices. A considerable amount of patience is required for the grooving job, but the results are well worth the effort. Securely clamp the two plates together, ensuring that they are the correct way up; take a normal hacksaw with a rather coarse-set blade, and cut grooves to a depth of about $\frac{1}{16}$ in. spaced fourteen or so to the inch. Do not go by estimation, but use a rule to obtain the spacings; the results, if the job is well done, are very satisfactory. Other alternatives are to do a double-wind with the cruciform ungrooved, then remove one of the windings to give an evenly-spaced coil. However, this is not suitable for use with clips. There is no objection to using a tubular paxolin former, if this is available in the right diameter of 3 inches. Using a tubular former, strips of paxolin about a $\frac{1}{4}$ in. wide and up to a $\frac{1}{4}$ in. deep are cemented to the former along its length; then, when the winding has been completed, it will be found easy to solder taps along the edges of the strip. In all cases, the windings should be terminated on either turret-tags punched into the former, or, probably easier for most, use a 4 or 6BA nut and bolt, with a solder tag for the winding termination. To mount the former on the



General layout under-chassis of the G3KWG transmitter/receiver, with the aerial tuning condenser C12 at lower left; next the channel selector, and then the transmitter function switch; the remaining three knobs are receiver controls. Another photograph in Part II will show the rest of the construction.

chassis, two eye bolts are fixed to it, the bolts going through holes in the chassis, to be held by nuts. If 2BA eye-bolts are used, the whole coil assembly is held sufficiently rigid to withstand the normal bump and vibration amplitudes met with in mobile installations.

Care should be taken in the mounting of the power transistors. Although the dissipation in the transistors is small when used as switches, they should still be mounted on a reasonable heat sink. After drilling the holes for mounting, ensure there are no burrs thrown up, and finally clean off the area round the holes and where the mica washer is to fit, using a piece of fine emery paper. Check that the transistors have no sharp edges—a not unknown occurrence—and carefully mount the transistor with its mica washer and insulating bushes. It is advisable to put a solder tag under each of the two collector fixings, so that current sharing takes place. Remember that the 12-volt version takes about 10 amps. through each collector, and proper connections must be made to carry these currents. After mounting the transistors, and before connecting any wires, ensure that there is no connection between collector and chassis, by checking with an ohmmeter. This will show whether you have made a good job of mounting the transistors, and if you haven't, will allow you to correct the damage the easy way. Punctured micas and collectors down to deck are not too disastrous if you are on negative earth — the transformer primary is just shorted out — but if you are on positive earth, then short circuit current will pass through the transformer primary.

To be concluded

DX CRUISE IN THE PACIFIC

JANUARY 1961 TO JULY 1962—
SIGNING G3JFF/MM, VS1HU,
9M2MA, VR1M, VR2EA
AND YJ1MA

Part I

R/S M. J. MATTHEWS, R.N. (G3JFF)

Few who read this story will not catch the romantic flavour of DX achievement in distant parts under exotic callsigns—and fewer still will not envy G3JFF the opportunity he had. But it should also be remembered that as a keen and experienced radio amateur and a member of the company of one of H.M. ships on detached duty—H.M.S. "Cook" commissioned for survey work in the Pacific—he had to make these opportunities for himself. He was fortunate in having the assistance of an enthusiastic SWL, also a member of the ship's W/T staff, who co-operated in all the shore-expeditions under the various callsigns with which G3JFF obtained permission to operate.—Editor.

TOWARDS the end of 1960 I was once more informed by "Their Lordships" that I was required to pack my "bag and hammock" and depart for foreign climes. Having served in the Royal Navy for over 15 years this was by no means an infrequent request (!) and I started making arrangements to close down the home station.

However, when I learnt that this commission was to be spent in an area of the world where radio prefixes like VR1, FK8, KJ6, etc., were locals it was decided to investigate the possibility of operating from one or more of them.

The ship I was to serve in was the Royal Navy survey ship, *Cook*, based on Suva, the capital of the Fiji Islands. She had been in the area for nearly six years carrying out surveys around Fiji and other Commonwealth areas in the western Pacific, and enquiries into her future movements revealed that she would be continuing this work and also visiting the New Hebrides and Gilbert and Ellice Islands, with a possible visit to the Solomon Islands if time permitted. We were also to get a six-week leave-and-refit period at Auckland in New Zealand.

The ship was at Singapore completing a long refit. I decided to take out my (much-modified) Panda Cub transmitter, and use a Geloso front end converter with a Naval B.40 receiver—the aerial was to be a Mosley tri-band vertical. Contact was made with the Colonial Office in London to find out about the regulations for operating Amateur Radio stations in these islands. The reply was to the effect that I was only required to present my U.K. licence to the

local authorities and pay the licence fee. (This has been the case in many parts of the world that I have visited.)

On reaching Singapore in January, 1961, and as the ship would not be ready for nearly two months, I decided to take out my old VS1HU call and operate from the Naval Barracks. During the period in barracks I made 547 QSO's with stations in 78 countries—including G3IKG and G3FXB on 40 metres.

Prior to leaving U.K. G3CQE had asked if there would be any chance of RTTY operation whilst I was away. As the ship was fitted with an FSK keyer, T/P working would be possible at sea, but I didn't think the opportunity would arise from any DX location. However, as what G3CQE wanted was an Asian contact for his WAC-RTTY, a crystal was obtained through VS1GQ by air from the U.K. and a daily schedule kept with G3CQE on 21090 kc, so as to catch an opening.

The equipment used was a Redifon GK-185 crystal controlled FSK keyer, Naval 603 transmitter and on the receiving side a Naval B.40 receiver and American converter. With the arrival of the crystal we were ready to go and finally a QSO lasting 26 minutes, with signals R5 both ways, was made between Asia and Europe on RTTY. The equipment was fitted in the ship three days later!

The wireless office on board *Cook* had a very convenient spare bay which would just take the amateur-band transmitter and converter plus some ancillary equipment—see photograph p.307 August SHORT WAVE MAGAZINE. The converter was to be used in conjunction with a nearby B.40 receiver; however, the converter had not yet arrived, and within a few days we were due to go to sea. A QSO with a U.K. amateur enabled a postcard to be sent off to R.A.F.A.R.S. asking for their help in getting this piece of equipment out post-haste, and very soon it was in the hands of G3III, due to leave on a flight to Singapore in a few hours' time. The converter arrived on board twelve hours before *Cook* sailed for trials! A 21 mc vertical was rigged up, which was to produce exceptionally good results on the DX bands from the Maritime Mobile station.

Having obtained permission from the C-in-C, Far East Station, and received my G/MM licence from the U.K. GPO, I was able to operate from *Cook* during our trials off the east coast of Malaya. However, being restricted to 10 metres not many QSO's were forthcoming.

During week-ends we anchored at Telok Tekek, a bay on the island of Pualo Tioman, and it was whilst ashore (on a swimming party) that I noticed the local policeman was in charge of the island's R/T link with the mainland; I thought that his QTH would be a good one for a bit of operating. I made a few tentative suggestions and the upshot was that the following weekend I took the equipment ashore and after rigging up a long wire of some 250 feet I was ready to go; prior permission had been received to use the call 9M2MA (which I had held in 1959). In the pile-up after the first CQ I managed

to hear G2CIX, giving him his first 9M2 contact. QSO's with other EU's and G's followed quickly and before we had to pack up and return to the ship I had made 89 contacts, and given 22 "first 9M2" QSO's.

Trials completed, *Cook* headed south into the Pacific. The trip was to take longer than normal as we were to carry out soundings along the proposed route of the western Pacific section of the Commonwealth round-the-world cable. Our track took us north-about Borneo, through the Celebes and down the east coast of New Guinea and Papua.

Crossing the Line

During this section of the voyage we Crossed the Line and were visited by King Neptune and his court. Yours truly was one of the unfortunates to be summoned before "His Majesty" on charges of "operating radio equipment whilst sailing the high seas, and causing interference to users of transistor radios." After having been daubed with miscellaneous foul liquids, dosed with grease pills and shaved by the imperial barber, I was consigned to the swimming pool and ducked—thus initiated, I was fully authorised to carry on operating G3JFF/MM !!

At Port Moresby in Papua I was glad to meet VK9RO and his XYL, who went out of their way to entertain me. Rob was busy building an SSB rig and was to be the first VK9 operating this mode. Just before sailing I had a quick personal QSO with VK9RR, who being an ex-R.N.Z.N. type, was pleased to sample a tot of "Nelson's blood" and see the rig and the ship.

Our next port of call was to be Vila, the administrative centre of the New Hebrides Condominium. The captain was to attend a hydrographic conference to determine the amount of survey work required in Vila harbour and we could therefore expect a couple more visits during our period in the area.

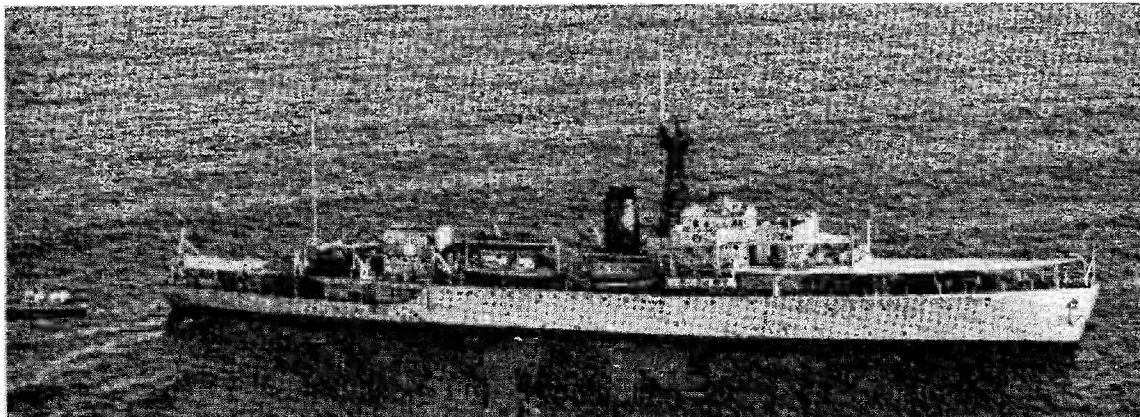
As we were only here for two days I called on

the radio inspector for the Condominium to ascertain the position with regard to obtaining a licence to operate from Vila during our later visits. This was forthcoming, the call issued being YJ1MA. Whilst in Vila I also made the acquaintance of YJ1AA, who occasionally listened round the bands.

As we sailed from Vila to carry on with our cable survey one of our sailors was taken ill with peritonitis and it was obvious that he would require to be operated on fairly quickly. The nearest town was Santos, situated on the northernmost island of the New Hebrides group (Espirito Santo), and it was to here that we steamed. Whilst in contact with the local radio station I asked if the operator knew YJ1DL, who I had worked when operating from VSIHU in 1958. The operator replied that he should do—it was he! While the patient was operated on, Dave and his XYL took me into town where we had a quick drink and then down to their house for a look around. Dave had not been back on the air since his return from Australia, about a year before, and claimed that he was kept off due to the bad manners of certain DXCC-minded people who ruined every QSO he ever tried to make!

On July 9, five weeks after leaving Singapore, we steamed through the reef into Suva harbour and tied up alongside the wharf. Many local people had come down to see us arrive—H.M.S. *Cook* was an old friend returning after 18 months' absence. Amongst the people on the jetty that morning was an amateur I had met over two years previously in Singapore—VR2AP, a member of the Fijian R.N.V.R. Within half-an-hour of berthing I was on my way to collect my Fiji licence, call VR2EA.

Alan, VR2AP, proved an excellent host and, as well as introducing me to the locals, also introduced me to the pastimes of those who live in tropical climates—underwater swimming around the reef, fishing and cruising in his own boat. The station of VR2AP was situated at the Cable and Wireless



This was the class of ship in which G3JFF was serving during his DX tour in the Pacific, 1961-'62, when he was able to operate /MM from H.M.S. "Cook" and also to sign several exotic calls — such as VR1M, VR2EA and YJ1MA — when ashore in those areas. The ship was on survey duty for the Admiralty, and was therefore operating as an independent unit. This made things very convenient for all concerned, and H.M.S. "Cook" might almost be described as G3JFF's private yacht — such are the advantages of serving in the Royal Navy! However, from the story here, it is clear that G3JFF and his collaborator on the amateur bands, SWL Roy Stanney also of "Cook," both worked and played hard, while not letting slip any opportunities to get on the air.

Official Admiralty photograph, courtesy C.N.I.

transmitting station at Vatawaqa, just outside Suva—Alan being an engineer at the station. He was the only regular VR2 on SSB and operated entirely on 14 mc.

Soon it was time for us to leave Suva and proceed to the survey ground for the first survey of the commission. The survey area was to be the north-eastern coast of Vanua Levu (Fiji group) and we were to establish a base camp, for the inshore survey parties, at a village called Naduri.

The inshore survey party were to live in the village and actually form part of the community. The village girls had volunteered to do the cooking and washing, whilst the children were only too happy to carry the equipment between the huts and the survey boats each day. In return the sailors were able to provide the village with a few "luxury" items from their stores, including oil which was in short supply.

The ship would be surveying the area outside the great sea reef, whilst the inshore party would work within the reef, and as we would be away from them for several days at a time, and also anything up to 200 miles distant, there was a need for radio communication. Here was where I came in.

Amongst the equipment set up at Naduri was a complete radio station, with its own diesel generator for power. The villagers had not seen electric light before and they thought it marvellous that the turn of a switch could give more light than twenty of their oil lamps! I had no lack of volunteers when it came to erecting aerials and while they were at it I got them to rig up a 14 mc dipole for future use. With palm trees in plenty around the village we had no shortage of ready-made aerial masts. Once the party were established we sailed for our job and once more I was operating maritime-mobile.

Conditions back to Europe were extremely poor on the DX bands, but the surprising thing was that with very little coming from that direction I could still hear the UA1's and UA3's—but no one else!

VR2EA, Naduri, Fiji

Two weeks later we returned to Naduri to replenish the camp party. As we were to spend the weekend there I decided that I would put VR2EA on the air. One of the ship's radio operators, Roy Stanney, had become extremely interested in Amateur Radio and had listened to many of my /MM QSO's. He asked if I would like a hand, knowing that an additional operator for logging would enable me to concentrate on QSO's in contest style.

On July 22, 1961, at 0239z, I sent out my first CQ from VR2EA and soon we were in QSO with VK3SO. A few minutes later we were the centre of attraction, with the main customers coming from the west coast of the United States. The QRM had to be heard to be believed and when the JA's joined in it will be understood why we were unable to hear the Europeans though they could copy us! This was to be the pattern for all our operating in the Pacific—European ground-wave QRM on 20 metres in U.K. was never so bad! In fact, the only European worked on that first session was G3AAM, and he was

only RST-449, in terrific QRM. I made 186 QSO's, all on 14 mc, with over 80% going to the Western U.S.A. and Japan.

For six weeks we steamed up and down off the north of the Fiji Group. During three days of the survey we crossed the 180th meridian eighteen times, passing from today to tomorrow and back to yesterday. Every three weeks we called in at Suva for fuel and stores. A second visit to the Naduri base camp enabled me to operate from VR2EA once more, and this time 224 QSO's were made, mostly on 14 mc, with the Europeans getting a little more of their share of QSO's. G3NEO was the first U.K. station to break through the QRM and he was followed by GM3KBZ and GW3AHN, the low-power DX man from Wales. To complete the U.K. countries worked we raised GI3NKQ before packing up at Naduri. We managed to make a total of 54 U.K. contacts, many being first VR2 QSO's.

It was now time to break off our surveying in the Fiji area and steam north across the Equator again to the administrative centre of the Gilbert and Ellice Island colony—Tarawa. Here we were to complete a survey of the atoll and lagoon started two years before by *Cook*. Due to the long distance between Suva (our fuelling port) and Tarawa, we were unable to spend very long there. Our visits to Tarawa were to last four or five days only.

Prior to our sailing for Tarawa I had written to the Government wireless officer for permission to operate from there; he turned out to be none other than VR1A and though not very active himself offered all the assistance I would require to get on the air. During our passage from Suva to Tarawa we were in daily contact with the Tarawa station, and during one of our routines VR1A suggested that we operate from the radio station. This I readily accepted and had the radio workshop put at our disposal, together with an Eddystone 750 receiver and a 360-foot long wire aerial slung between two 70-foot masts.

On arrival at Tarawa I was introduced to the most active VR1 of the day, VR1B, who was a radio engineer at the station. His main interest was SSB and his own QTH not very far from the station. The radio station's main transmitters were sited adjacent to our operating position, so as well as having to cope with the QRM from the amateur fraternity we would have to endure additional interference from several 500-watt transmitters and a 2 kW broadcasting outfit!

On September 21, 1961, VR1M made its first CQ and within a few seconds pandemonium reigned on 14 mc. The first contact we managed to sort out from the pile-up was W6JWT, and soon the W6's were getting the bulk of business, with a few JA's, VK's and ZL's here and there. The first U.K. station heard was G2FYT in Bristol, followed a few moments later by G6QB, with G6XL, G3YF and G5RI.

Operating from Tarawa was limited for two reasons. First, and naturally enough, I had a day's surveying work to do and was unable to get ashore

before 0500z daily; we had to return back on board about 1200z (no all-night leave); secondly, the public electricity supply on Tarawa is shut down around 1230z daily and switched on again at 1800z—so all-night sessions were out of the question, anyway. As well as curtailment of operating time for these reasons we also experienced our fair share of component failures in the transmitter due to the high temperature and humidity of the area. However, in spite of these difficulties we were able to give a great many people their first contact with VR1 and before we sailed five days later had made 397 QSO's with stations in 37 countries. Conditions being what they were (very poor) it was commonplace to find the locals (VR1M, VR2DK, VR3L, VR4CV, FK8AT and ZK1AR) all having a local ragchew. Even a DX call-sign won't get contacts when conditions are at a low level.

YJ1MA, Vila, November, 1961

The time had now come when we would be leaving the Pacific area for our leave and refit in New Zealand. As this was also the beginning of the hurricane season in the area it was just as well for us to withdraw whilst the going was good. However, before leaving the Pacific for the year, we were to return to Vila to make a start on the harbour survey, and also to prepare the ship for Commodore's inspection at Auckland. Moreover, and most important to me, I was going to endeavour to get YJ1MA on the air for a few hours.

In the middle of Vila harbour there is the island of Iririki, on which the British Resident Commissioner lives. I managed to get his permission to operate from a garden shed situated down near the beach.

I had also managed to persuade the electrical officer to let me borrow one of the ship's emergency diesel generators to provide power for the equipment, and thus it was that on November 17, 1961, another rare prefix made itself heard on the air. The call, YJ1MA, stirred up the usual hornets' nest from the other side of the Pacific, but DX stations were not heard, partly due to the QRM and partly due to poor conditions. The only two Europeans raised on our first operating session were G13NPP and G6VQ; the following day G8KS and G6ZO managed to get through, but no more U.K. stations were worked from Vila during this period. With conditions so poor we tried 7 mc where we had some tussles with the usual broadcast station QRM (Radio Peking and Radio Moscow) and a few weak, but legitimate, users of that band. Before we went QRT we had managed to give 310 contacts to stations in 45 countries.



Displaying the QSL cards used by G3JFF while serving in H.M.S. "Cook" in the Pacific, during 1961-'62, when he was able to operate under some rare prefixes. For card-handling purposes, his QSL manager was W1HGT.

Once again we headed south. This time we were headed back to civilisation, New Zealand, where the ship would go into dock and undergo a four week refit and we ourselves would have two weeks' leave over Christmas and the New Year. As we neared the land of "the long white cloud" we could feel a cool nip in the air which was very reminiscent of the U.K., and on December 6 we anchored in the Bay of Islands. The following morning we steamed down the Hauraki Gulf and tied up alongside in the Naval Base at Devonport, in the shadow of the Auckland Harbour Bridge. The weather was typically English—pouring with rain. Having got the Commodore's inspection over—he was extremely interested in the non-Service equipment in the W/T office—I made contact with the secretary of the Auckland branch of N.Z.A.R.T., so that I could meet some of the locals, including those I had worked from time to time.

The secretary was Paul Weston, ZL1ATB, and we arranged to meet in Auckland. I would be able to identify his car, naturally enough, by his QSL card exhibited on the windscreen. He took me up to his QTH at Mount Albert and introduced me to his mother; during my stay in Auckland they were very kind to me. It just happened that some of the boys on the North Shore were holding their regular meeting that day, and we drove over the new harbour bridge to Takapuna, where I met many well-known ZL's. Through this meeting I was invited to spend evenings with various local amateurs.

To be concluded

QRP Tx FOR TWO

FOUR WATTS. MODULATED —
OUT OF A MESS TIN

M. A. THORP (G3PQM)

This simple but effective little transmitter could be described as the "Mess-Tin for Two" — because the model was, in fact, built into a standard Service container as issued. Of course, in following the design, any suitable box chassis of about the same size could be used, the point being that this is essentially a simplified design for a low-power two-metre transmitter.—Editor.

THIS article describes a simple two-metre transmitter, easy to build, yet capable of good results. As such, it is ideal for the beginner, yet very suitable for a bedroom, or for operation as a mobile station. The power input is four watts only.

The transmitter came about because something was wanted just to get on the air while a larger transmitter was under construction. Results have been such as to make it very unlikely that the latter will be wanted! Many reports of excellent speech quality and signal strength have come in, and a range of 65 miles has been worked under normal conditions, with DX possible during openings. The beam used at the writer's QTH is an eight-element Yagi, at a height of 16 feet.

The RF Circuit

This is the basic overtone crystal oscillator and tripler-doubler-PA arrangement, without any frills. The overtone oscillator works on the third overtone and thus a crystal in the 8 mc range is required. (It is advised that a new crystal be used; some surplus types give a poor output in overtone circuits.)

Output from the oscillator is at approximately 24 mc. Note that the frequency may not be exactly three times the frequency of the crystal, as is usual in the overtone mode. This output is fed into the tripler, which is the other half of the ECC81, V1. An output of 72 mc is taken from the anode circuit, and into the doubler stage, an EF80, giving drive in the two-metre band by inductive coupling to the grid side, L3/L4, of the PA stage.

The tank side of the PA consists of L5, C22 tuned to the same frequency as the grid circuit, and this requires that a good screen must be placed between these two circuits. The output is coupled into the aerial by L6. No neutralising has been found necessary, on the writer's transmitter.

A piece of copper sheet should be soldered to the earthy pins of V3; it should also be soldered to tags bolted to the chassis, and the screen must extend to the full depth of the chassis. This screen

is important and it must be well soldered and bolted down; do not use it as an anchoring point for components.

The Modulator

This is again a basic circuit, as Fig. 2, p.20, which can be wired up into a very small space. The ECC82 is a double-triode speech amplifier feeding into the triode section of the ECL82. The time constants of the coupling give the required audio bandwidth. Plate-and-screen modulation is used and the modulation transformer is an ordinary push-pull audio output type; HT goes to the centre tap, the PA stage to one side, and the plate of the pentode section of the ECL82 to the other end, as shown in the circuit opposite. The microphone is a standard crystal insert type.

Metering

Metering is only required in setting up, and at intervals later. Therefore, no meter has been fitted; any multi-meter type of instrument may be temporarily connected to the test points provided — see table for grid current readings.

Switching

No change-over relay is used in the writer's version — just a four-pole two-way switch was found to be all that is needed. The RF section is kept to one side of this switch and screened off, and the HT control to the other side. Receiver muting is achieved by switching the HT to the converter via S2, Fig. 1. Remember to wire a high-value resistor (500K) across the contacts to prevent cathode poisoning of the valves in the converter.

Power Pack

The power supply requirements are HT at about 250 volts, 70 mA and LT at 6.3v., 2 amps. Screened leads should be used to connect the power unit to the transmitter.

Construction

The general constructional form for the model of this transmitter at G3PQM is shown in the layout diagrams, Figs. 3 and 4, p.20. The writer actually used an R.A.F. mess tin as a chassis, but any four-sided box of size 6½ ins. by 5 ins. by 2 ins. would be suitable.

It is advised that the layout be followed closely. Great care must be taken with the PA base connections and screen, and all leads requiring to go to earth should be kept as short as possible, e.g., place a solder tag close to any valve pin to be earthed, and avoid all long earth wires — the chassis has a much lower inductance than wire — and use only one wire per earth tag. The feed-through ceramics C6, C12, C19 should be soldered to a strip of copper and then bolted to the chassis proper using at least four screws. Scrape all parts of the chassis and solder tags where they have to make contact with each other. Insulate the coupling coil with sleeving, the coils being wound as given in the table. They will probably require squeezing in or

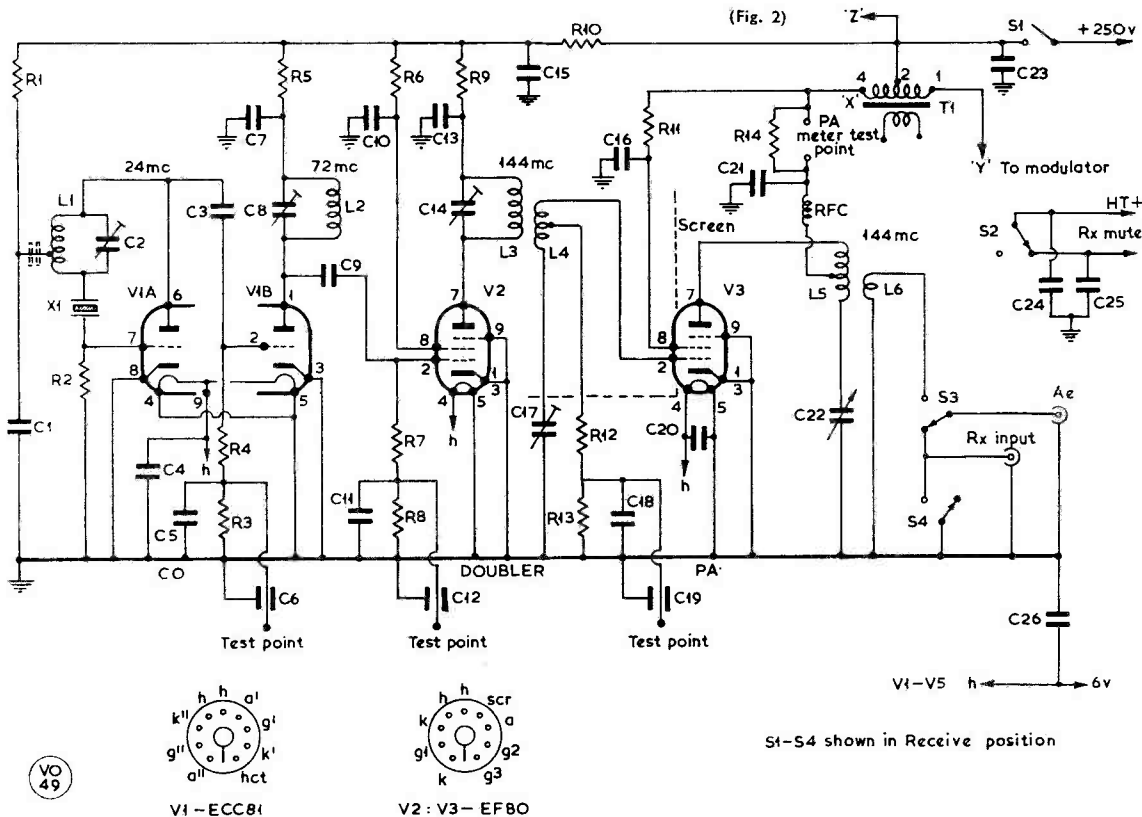


Fig. 1. Showing the circuit arrangement for the two-metre transmitter described by G3PQM. It is essentially a simplified, low-power design, running four watts input only, and would be very suitable for anybody making a start on VHF; even if eventually replaced by something more ambitious, it would always be available as a stand-by. As explained in the text, straight change-over switching is used, this being quite in order with low power. The modulator is a separate unit, shown in Fig. 2, overleaf, and the HT supply used should not exceed 250 volts.

opening out for resonance when the stages are tuned up. Do not rush the work. Do not try to finish it in one day. If these points are watched there should be no trouble in getting the transmitter to work properly first time.

Tuning Up

Having completed the transmitter, remove all valves except the ECC81. Switch on (having first checked the wiring) and with a wavemeter check that the oscillator is "giving" on about 24 mc. (A GDO used to adjust all tuned circuits before

- TABLE OF COIL DATA**
- L1 — 24 turns 24g. enam., close-wound on 3/8-in. dia. former with iron-dust core, tapped 5 turns from grid end.
 - L2 — 4 turns 16g. tinned copper, wound to 3/8-in. o.d., turns spaced over 1/2-in., self supporting.
 - L3 — As L2, but of two turns spaced over 3/8-in.
 - L4 — As L2, but of 3 1/2 turns spaced over 1/2-in.
 - L5 — As L2, but of 5 1/2 turns spaced over 1/2-in., tapped at centre for RF choke connection; leads to L5 should be 1-in. long.
 - L6 — 1 turn 18g. enam., wound to 3/8-in. diameter and sleeved, coupled to centre L5.
 - RFC — 20 ins. of 34g. enam. wound on 1-in. dia. former, and doped.
 - T1 — Modulation transformer, Radiospares type Standard AF O/P.

Table of Values

Figs. 1 and 2. RF section and modulator of Transmitter

C1, C26 = .005 μF, cer.	R4, R7 = 47,000 ohms, 1/2w.
C2, C8, C14, C17, C22 = 30 μF, trimmers	R5, R22 = 1,500 ohms, 1/2w.
C3, C9, C27 = 47 μF, s/m	R6 = 12,000 ohms, 1/2w.
C4, C5, C7, C10, C11, C13, C15, C18, C20, C21 = .001 μF, hi-K	R9 = 4,700 ohms, 1/2w.
C6, C12, C19 = .001 μF, feed-through	R10 = 330 ohms, 1w.
C16, C23, C24, C25 = 470 μF, disc	R11 = 15,000 ohms, 1/2w.
C28 = 100 μF, elect.	R12, R23 = 27,000 ohms, 1/2w.
C29 = 8 μF, elect.	R14 = 100 ohms, 1/2w.
C30 = .002 μF	R15 = 6.8 megohm, 1/2w.
C31, C33 = .01 μF	R16 = 56,000 ohms, 1/2w.
C32, C34 = 25 μF, elect.	R17 = 120,000 ohms, 1/2w.
R1, R2 = 10,000 ohms, 1/2w.	R18 = 1,200 ohms, 1/2w.
R3, R8, R13, R28 = 1,000 ohms, 1/2w.	R19 = 1/2-megohm, log.
	R20 = 100,000 ohms, 1/2w.
	R21 = 560,000 ohms, 1/2w.
	R24 = 10,000 ohms, 1/2w.
	R25 = 33,000 ohms, 1/2w.
	R26 = 180,000 ohms, 1/2w.
	R27 = 470 ohms, 1w.
	V1 = ECC81, 12AT7
	V2, V3 = EF80, 6BW7
	V4 = ECC82, 12AU7
	V5 = ECL82

GRID CURRENT TABLE

V1B, test point C6, 0.6-0.8 mA. V2, test point C12, 0.5-0.7 mA. V3, test point C19, 0.7-1.0 mA. (Measured on 0.5 mA meter range)

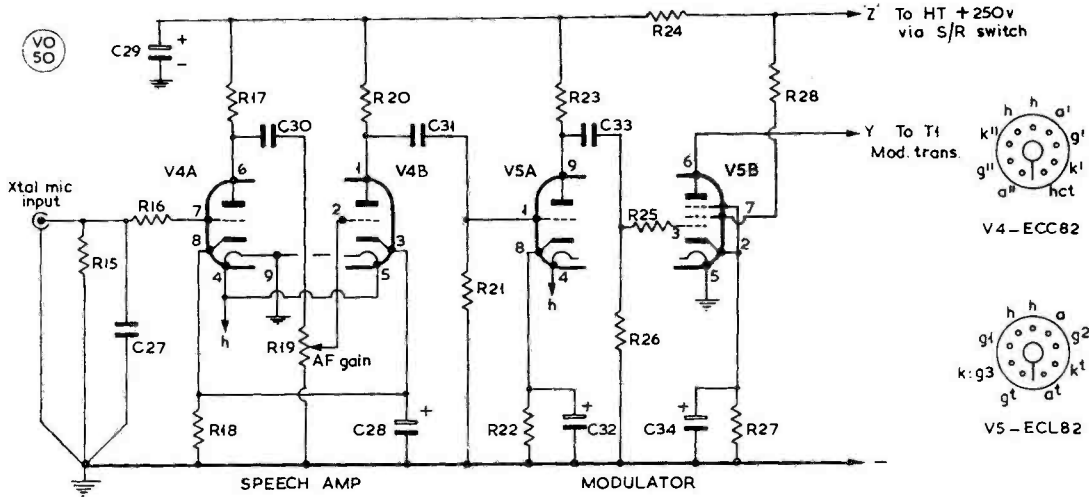
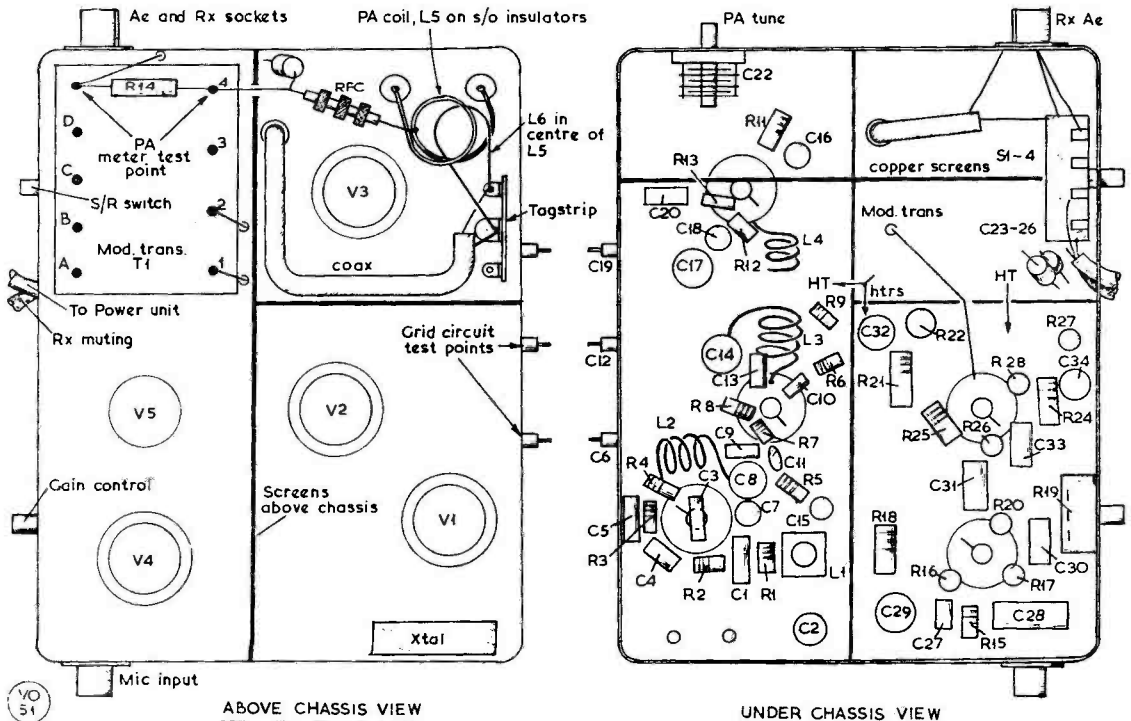


Fig. 2. The modulator for G3PQM's low-power two-metre Tx involves two valves only; the use of the ECL82 is rather interesting in this connection, as with the ECC82 twin-triode at V4A/V4B, a third triode section becomes available, ensuring ample drive into the modulator proper, V5B. R19 is the audio gain control, and the method of modulator connection is shown at Fig. 1. Values are given in the table on p.19.

Figs. 3 and 4.



These layout diagrams show how G3PQM built the two-metre transmitter complete into a container 6½ ins. long by 5 ins. wide by 2 ins. deep. If using a small box-chassis of about these dimensions, it would be as well to follow this layout, but in any case screening and coax should be used as indicated. These drawings are as nearly as possible to scale.

switching on would be a big help.) It will be found that on adjusting the oscillator trimmer and core, the frequency will jump in multiples of 8 mc — pick the setting giving 24 mc, tune for peak output then detune in the direction away from the sudden drop in output; only detune slightly from peak. Now check that the anode of V1B resonates at 72 mc. Adjust trimmer C8 and coil L2 until this is achieved.

Now proceed through the other stages, replacing the valves as you go. The coupling between L3 and L4 should be correct when the coils are as close as possible without touching — this will be found to give the required grid current for V3. Now

with the aerial connected and L6 as far out of L5 as possible, tune C22 for a dip in PA plate current, using an external meter across R14. Couple in the aerial more closely until the plate current is not more than 15 mA. Using a field-strength meter, adjust C22 for maximum RF in this external pickup. Re-check that plate current is not more than 15 mA. Plug in the audio valves, turn up the gain to about half-way, and go ahead and make your first contact. You should be pleasantly surprised by the reports you receive.

The writer would like to thank G2JF, G3ANB, G3AGN, G3OMB, G4OU and many others for their help in the tests and their encouraging reports.

THE S-METER PROBLEM

CIRCUIT TO SOLVE IT, SUITABLE FOR MOST RECEIVERS

MANY amateur-band receivers are operated without any sort of S-meter. The need for *some* such device to indicate comparative signal level is, therefore, constantly felt—even by those who bravely proclaim that *they* go by what comes out of the speaker and know an S9 signal when they hear one (which is pretty often). One of the most elastic terms in the whole vocabulary of Amateur Radio is S9!

Fortunately, it is quite an easy matter to make good the deficiency of not having a meter by which to read a signal. But before discussing the circuit shown here, a little consideration of the whole subject of S-meters—which is a very wide one, with many unexpected angles—may be helpful to the newcomer.

The first point to make is that even S-meters as fitted in standard commercial receivers do no more than compare the relative level of signals, either from different stations, or the same station at different times. Receivers fitted with calibrated S-meters *appear* to give an absolute indication of signal strength, but in fact the reading by itself is meaningless unless the level at which the S-meter was calibrated into its receiver is known, and the receiver itself is always operated under precisely the same conditions as those obtaining when the calibration was originally made.

This can practically never happen—different manufacturers calibrate at input values of their own, and when the receiver gets into the hands of its user, his local noise level varies from day to day, the mains voltage fluctuates, interference on the frequency puts a “false zero” on the S-meter, while

the gain of the receiver itself will vary from band to band and will drop off as the receiver gets older.

What all this comes to is that, generally speaking, nobody's S9 is the same as anyone else's—indeed, as the writer has done, it is interesting and instructive to line up half-a-dozen receivers on the same aerial, tune in the same signal, and see what the S-meters say. They will all read differently, the variation being anything from a conservative S7 to a generous S9+20 dB. What, then, is the practical use of an S-meter?

The answer is that in spite of all the apparent anomalies, it will still *compare* the level of signals as between stations on the same band at the same time, or the result of tests, provided that due allowance is made for any noise or interference that may be present when readings are taken. This is, really, the sole practical use to which the S-meter can be put (as a measuring device) under the normal conditions of amateur working. But it is an extremely useful application, and alone justifies the fitting of an S-meter — and in spite of all the theoretical arguments that can be put forward, the fact remains that it is very nice to have on the receiver some sort of calibrated meter the needle of which moves upwards as signals are tuned in!

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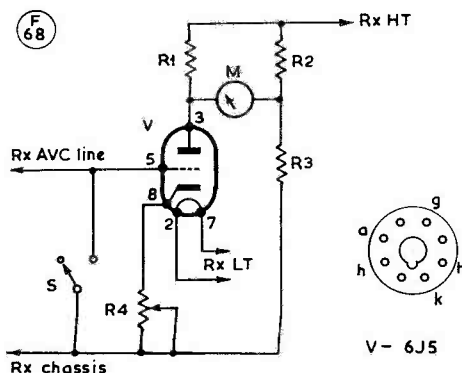


Table of Values

Circuit for the S-Meter Unit

R1, R2 = 500 ohms, 1-w.	M = 0-1, or 0-10 mA m/c movement (see text)
R3 = 50-70,000 ohms, 2-w. (see text)	S = SPST, AVC off
R4 = 5,000 ohms, 3-5w. w/wound	V = 6J5, or any similar triode

The external S-meter circuit discussed in the text. This is not a new arrangement, and has been described before — but as a practical indicating device, which can be used with almost any receiver in which the AVC line is accessible, it is worth bringing to notice again.

Practical S-Meter

The circuit on p.21 has been tried, very successfully, with a CR-100 and an R.1155, and (for check purposes) in several receivers already fitted with some kind of regular S-meter. It also works with any of the Eddystone receivers such as the 888, the 888A, the S.640 and the S.750. The needle "reads upwards" as the signal level increases, *i.e.*, the rest position of the needle is the normal zero. Though an additional valve is involved, almost any small triode will do, and the unit can be powered from the receiver supply.

Operation of the circuit depends upon the fact that the voltage developed in a receiver AVC circuit bears such a relationship to the level of the incoming signal that the plate current of the meter valve can be made proportional to this voltage, applied to its grid. With the meter connected as shown, in a bridge circuit, the needle movement will, as it conveniently happens, bear a linear relationship to incoming signal levels.

The meter itself can be almost any sort of moving-coil movement, scaled either in micro-amps., or in milliamps, from 0 to 1, or 0-10 mA. The resistor network is simply adapted to accommodate whatever meter (but not reading higher than 10 mA f.s.d.) that may be available.

Values as given in the circuit are for an 0-1 mA movement, and will handle a signal range of more than 70 dB, *i.e.*, from zero to S9+20 dB or so on the usual amateur reckoning. If calibrated by the method suggested later, the action is self-protecting in that any signal over the maximum calibrated level will not increase meter current—therefore, the needle can never "wrap itself round the stop," no matter how strong the local signal tuned in.

The receiver AVC line can usually be picked up most easily at the BFO on-off control, as explained on p.493 of the November issue of SHORT WAVE MAGAZINE.

Construction

Clearly, the few components needed can all be clustered round the valveholder, itself mounted on a small aluminium bracket bolted somewhere conveniently inside the receiver, with the meter connections brought out on flying leads. In the CR-100, for instance, a good place is in the space to the left of the line of valves, looking into the receiver from the front. In any receiver, there will be enough space somewhere for the unit.

The extra HT/LT load involved is very small, and well within the capacity of any receiver power pack.

Adjustment

With the valve pulled out of its socket and the receiver switched on (HT on) prune on R3 till the scale reading is a maximum; the easiest way to do this is to reduce the value of R3 till the reading is

enough over-scale to enable it to be brought accurately on-scale by means of a shunt across the meter terminals.

Then plug in the valve, warm up, and after the receiver has settled to normal working conditions, turn the AVC control to "off" and adjust R4 for zero meter current.

When AVC is switched on again, the meter needle will respond to the incoming signal.

If the receiver with which the S-meter is to be used has no manual AVC on-off control, the grid of the meter valve should be earthed while R4 is adjusted. When the AVC control voltage on the grid of the meter valve goes high enough (as when a very strong signal is being received) to cut off the plate current, the meter will read its maximum and no signal will increase it further.

Calibration

This is one of those rare occasions when one does not need to say "if a signal generator is not available"—for, in fact, it is not necessary.

Since the S-meter now evolved can only work as a *comparative* signal level indicator, what better than to tune in the weakest readable telephony signal on some quiet frequency and, wherever the needle sits, call that S3. Then tune in a medium-wave BBC station and, wherever the needle stops, call that S9+20 dB. This is, of course, done with AVC "on" and the RF gain at maximum; any IF gain, if fitted, should also be at full.

Take 6 dB per S-point, and mark off the scale in equal divisions accordingly—thus, the scaling from S1 to S9 will "cover" 54 dB, the S9+10 mark then being "equivalent" (by our arbitrary reckoning) to 64 dB, and S9+20 to 74 dB which is about the practical limit of the device with any receiver having reasonable front-end gain.

This will not be so far out, either. In the first place, S9+20 dB is a good average value for a BBC medium-wave transmitter and, secondly, 6 dB represents the accepted "times 4" power gain between S-points, while S3 is a reasonable level at which to put the minimum readable signal.

When all this has been done, the advantage of starting with a 2½-in. (or even 3-in.) meter, mounted externally, in a little box of its own, will be apparent. The movement will be more sensitive to small changes, and the scale will be much easier to mark. This is done by fitting thin white card, cut to shape, over the original scaling and marking off with a very thin black pen—a pair of dividers, a sharp hard pencil, a stencil set, a draughtsman's ruling pen and Indian ink are useful accessories for making a really neat job of it.

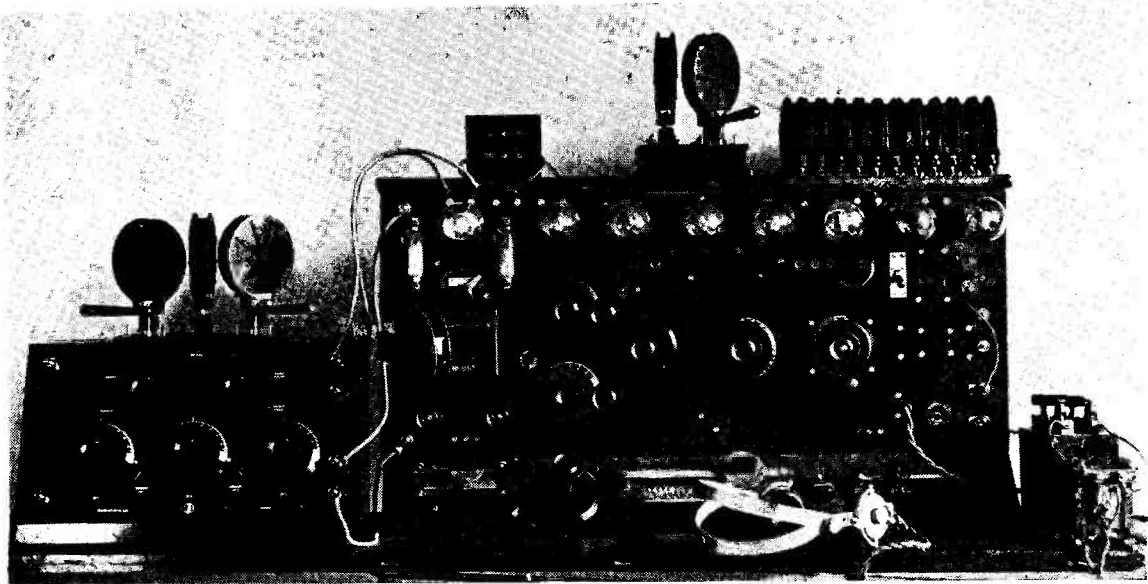
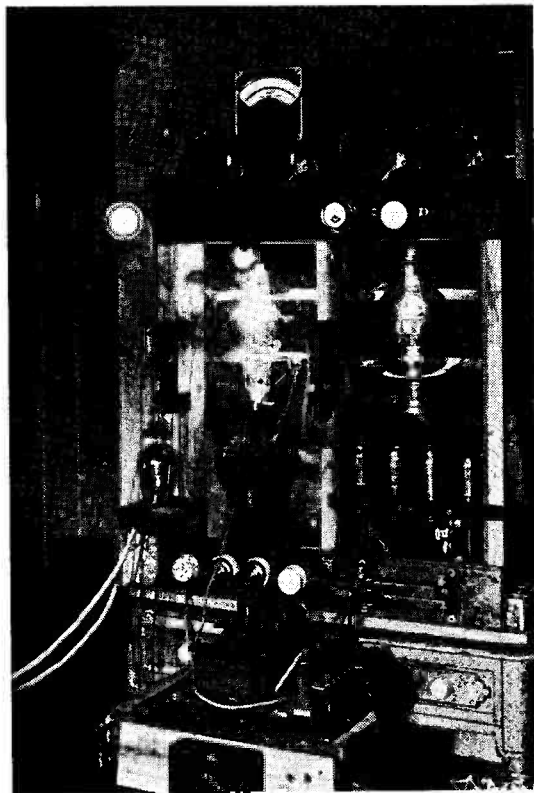
It would be proper to add here that, in exactly the same way, the S-meter arrangement used in the G5NH Receiver—see circuit round V10 in Fig. 3, p.627, February issue, SHORT WAVE MAGAZINE—could be adapted and calibrated to any receiver having its AVC line accessible.

ANOTHER OLD-TIMER NOTE

Arising from the paragraph item on p.639 of the February issue of *SHORT WAVE MAGAZINE*, a very interesting letter from G2RY (Bridport) adds quite a lot of further information. "A. J. Alan," 2ST, was one of those amateurs licensed for 1600 metres in 1924, others operating at that time on this rare amateur wavelength being 2CW (Bath), 2FL (Warminster) 2GG (Newbury) and 2RY himself, then at Kintbury, Berks. G2GG is still at his original address in Newbury—see p.636, February—and is regularly active on Top Band and two metres; G2RY himself is now on 430 mc. With deep respect we raise hats to (G)2GG and (G)2RY.

And harking back to "A. J. Alan," 2ST, we can add a note of our own: On one occasion, when broadcasting from the BBC's London studio, the lighting suddenly failed; having written the story himself and rehearsed it to be word perfect (for he was a perfectionist to the last detail) he carried on without a tremor—but always afterwards he arrived at the studio with a bottle and a candle; before going on the air, he would light the candle and stick it in the bottle, so that he could see his script if the BBC fuses blew again.

The 45-metre transmitter built and operated by 2DX (now G2DX of Camberley, Sy.) in the 1920's. It was of the master-oscillator power-amplifier type, and capable of world-wide communication—look at the glow in that driver stage! The PA, on the right, was a T450, with the tank circuitry up above. This lot fed out into a large 8-wire cage aerial 70 ft. high. 2DX was in on all the DX of those days, made the first U.K./Tasmania contact and also the "first" with Byrd's Expedition into the Antarctic; one night in 1926 he worked all U.S. districts at a sitting.



Probably one of the first superheterodyne receivers in this country—built by 2DX (Camberley, Sy.) about 1925. It was a 10-valve job, with a couple of V.24's (the first low-loss HF type ever made), seen clipped in vertically at the left-hand end of the main panel, a handsome piece of ebonite. With plug-in coils, a wide wave-range could be covered, and inter-stage coupling was made variable by means of swinging coils. Vernier tuning was by small friction-drives against the main dials, and practically everything was made variable, down to the selection of the note-magnifiers (or LF stages) by a plug-and-socket arrangement.

DX COMMENTARY

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

ONCE more the Top-Band news is in danger of overshadowing all the other bands put together. This proves very little except the healthy truth that most of us are more interested in doing something unusual, or difficult, than in pursuing routine DX when it is relatively easy. The sheer fascination of even *hearing* a callsign like HR3HH, or VP8GQ, or W6KIP on a band which, a few hours later, is a mass of coastal fish-fone and local nets, induces a large number of people to leave their comfortable beds early on a cold morning, and they feel well rewarded if 160 metres is open for DX.

During the month the HF bands have been noticeably better than they were; those early-closing nights on *Twenty* have not been nearly so numerous, and it was amazing on three or four occasions to hear the U.S.A. coming through quite well at 2230 GMT—a very different business from that dead band at 1800.

Fifteen, too, has opened on the East-West path on several occasions, with good signals from the U.S.A. as far over as W9 and WØ. Despite the very low sunspot number, things are evidently going to be quite interesting this Spring.

And this thought drove us to our log books for 1952 and 1953, to see what was happening 'way back at a comparable period in the previous sunspot cycle.

The pattern for February in those years was very much like that of the past month. On 14 mc the VK and ZL signals around 0730-1000 GMT seem to have been more numerous, and VK's



DJØBF/G3OOH

CALLS HEARD, WORKED and QSL'd

occasionally appear in the log at strange times such as 1510 and 1625; there are also rather more entries of the KG6 type. But no DX-peditions, no rarities and no new ones worked. The W6 and W7 signals in the afternoons were much as they are now.

On 7 mc, too, conditions were pretty similar. W6's were worked fairly frequently over the long path, around 1430-1500 GMT. W1, 2, 3 and 8 could be raised easily, either at 2300 or 0800; ZS was worked at 1830, ZL at 1835 and VK as late as 0855.

By February 1953 we had 21 mc (it was opened for amateur operation in July 1952) and this band, too, seemed to be very much as it is now. W's were there for a few days during the month, VQ3 and VQ4 and ZS nearly all the time, with the occasional VU and VK to liven things up.

Having checked up the similarity between the February conditions and those of this year, it seemed logical to have a look also

at March and April, 1952 and 1953. Again, there seems to have been no shortage of DX. Indeed, April 1953 is notable for the fact that KH6's seem to have been worked almost every day of the month, during the 0700-0900 session, and this extended well into May. 1952 was not so good in this respect.

From March onwards, in those years, 7 mc doesn't seem to have been popular, although a few late-night sessions pulled in VS9, VP5, VP7, VP9, VQ4, ZE and VE7 on that band. (March 30, 1952, even reveals VQ4HJP, ZE3JP and VP6AA on 3.5 mc CW.)

During both years the DX on the HF bands improved steadily from the end of February until mid-June; and then 1954 was at a very similar level.

All this may not mean much, but we could hazard a guess and suggest that general DX is not going to be too bad this year, and that the Spring season which is nearly on us will be quite lively.

The DX-pedition craze had not even been heard of one cycle back, and had someone as energetic as W4BPD or W0MLY been at large in those years, there is no doubt that all and sundry would have been working them.

In short: Don't worry about the sunspot number or the propagation forecasts—take your DX as you find it . . . and you should be able to find plenty.

Around the Bands

Despite the pressure and importance of Top Band news, we are reversing last month's procedure and starting at the HF end this time. There is no news whatever about *Ten Metres*, which hardly qualifies for a heading of its own; but two comments: G3NOF (Yeovil), who supported this band until the bitter end, remarks "Ten has been completely dead although I always keep checking it." And G3HCU (Peaslake), who used to do great things on the 10m. band, reminds us that last time it was at its lowest level we organised a 10-metre Activity Sunday. He suggests that this plan might be repeated, over a six-hour period or some-such, awarding points on a mileage basis; he is certain that 100 miles or so can be covered on ground-wave, and he is probably right. We will do this in the Spring, and announce a suitable date next month (if a possible hole can be found in the welter of contests).

Fifteen Metres

Towards the middle of February *Fifteen* showed some really good openings to U.S.A., and for most of the period there was DX of some kind available, especially between 0900 and 1400, when Asia and Africa (and sometimes Oceania) were coming in reasonably well. G3NOF worked AM with VQ4IE, 9G1AB, 1DT and 1EE; SSB with VQ2WR and W's.

G2DC (Ringwood) writes: "Still lots of life in the band, and predictions show that it could be lively during February—but I am afraid that inactivity will be the trouble." Too true—where have all our usual correspondents gone to? Have they *all* assumed the band to be no good? G2DC worked

CE1AD, CO8JK, CR6AC, CR7CI, T18AL, VP5MJ, VP8GQ, VK1-4, ZL1-4, W1-Ø, VE1-6.

G3LPS (Blackburn) raised ZS1Ø, VQ2WM and numerous W's, on CW.

Surely someone else has been working DX on *Fifteen*? If so, we look forward to hearing from them next month.

Twenty Metres

As usual, anything can happen here, and there has been no lack of DX. The band is open noticeably later—sometimes very late indeed. But let the reports speak for themselves.

G3LMD (Southport) with a ground-plane and a Heathkit DX-40, worked CW with CT3AB, FP8AP, KP4BBN, KV4AA, UL7CH, VE8MG, VQ2EW, ZL3V1, ZL4GA and 6W8DD; fair openings for W6 and 7 also reported. G3LMD's previous calls have been VO1FB and FP8BD, and he has the logs with him, so anyone short of a QSL should write to him. Five expeditions have been made to FP8BD, the last being in September 1962, when over 1,000 contacts were made, mostly CW.

G3BHI (Norwich) worked SSB with MP4BDC, SVØWT and 1AI, TF2WHE, VP2LS, VS9ACH, VS9MB, ZS6BS and 5N2HJA; and he says the VS9KAA expedition is now postponed indefinitely, since the KWM-2 did not arrive in time for the proposed trip.

G3RFS (East Barnet) raised 9Q5EI, ET3RN, 5X5IU, TT8AJ, VQ2WR, ZS, 5A, 5B and some of the more distant Russian prefixes, running 40-75 watts of CW to a dipole or a ground-plane.

G3GDC (Plymouth) continued his work with AM phone and accounted for OHØNI, HH2W and 2PB, TI2LCB, HK1AGA, ZL's, ZS's, VQ1IZ, 5H3HZ, CR6AK, VE5, W7 and the like; he says VEØMN is the Canadian Government Research Trawler A. T. Cameron, operator VO1FC, using 60 watts. As G3GDC notices no other reports of 14 mc AM, he would be interested to know what sort of DX the other AM stations are working!

G3KMQ (Shaftesbury) thought conditions were pretty poor when

he was on, but managed to raise FB8ZZ, KG4AM, XE1PJ, CR6EI, CO6XZ, VS1GZ, VS9AAA and VP5XG.

GM3JDR (Golspie) could hear W's busy with Gus when at VQ8BI and FR7ZC, but no trace of his signals up there. However, on CW GM3JDR fetched in CR6's, CT2BO, FB8ZZ, ST2AR, VQ2IE, YV5ACP, ZS's and 5H3HZ. SSB accounted for CN8AW, HV1CN, KG1AG, KG4BQ, LA5FI/P and 9RG/P, VE3FFW/SU, VE8MD, VP7NS, VQ2 and 4, VS9ACH, VS9MB, ZB1, ZL, ZS3-6 and 5X5FS. He was delighted to receive his WAZ for SSB (No. 139 and the first in Scotland).

G3NOF stayed on SSB, which netted him PY4AS, TF2WGW, VE3FFW/SU, VK2AVA,

FIVE BAND TABLE

Station	14 mc	21 mc	7 mc	3.5 mc	1.8 mc	Countries Worked
W6AM	316	87	59	30	8	320
G2DC	286	268	147	101	12	307
G3DO	282	223	62	69	10	301
G3FXB	276	269	162	93	9	307
G3FPQ	269	256	139	113	26	296
G3NOF	185	184	19	29	2	234
G2YS	181	129	96	75	21	205
G3KMQ	178	76	64	44	12	199
G8VG	150	72	85	38	12	168
G3LHJ	134	173	47	23	11	204
G3IGW	131	127	99	51	28	148
G3PEU	122	68	17	15	4	138
G3JWZ	107	77	62	52	9	132
G2BLA	96	98	77	39	9	150
G3NFV	91	121	44	55	16	167
G3JVJ	89	77	72	41	4	129
GW3CBBY	80	32	54	36	19	100
G3PEK	67	28	51	30	12	80
G3BHI	65	165	29	14	1	180
G3IDG	53	63	27	17	9	92
G3PMR	35	19	19	5	7	44
G3NYQ	32	17	38	30	11	55
GW3PSM	14	7	36	9	1	43

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

VQ2WR, VS9ACH, ZS's, 5N2HJA, W's and VE's. He was hearing signals from KA, KR6 and KG6 in the mornings, and found the band generally closing around 2000, although on occasions it was open to both North and South America at 2300.

G2DC thought conditions pretty good except to the Pacific. Two brand-new ones for him were VK9LA and FW8DW; others worked on CW were CR8AC, CR9AD, FB8XX, FB8YY, VQ8AI, VS9ART, VS9MB, VU2BK, VS4AR, VK2-6, VE1-7, W1-Ø, ZS1-9 and 6O2GM . . . so there's really not *much* wrong with Twenty.

G4MJ (Birmingham), on SSB, worked YA1AW, VQ8BI, FW8DW, KH6PD/KG6 (Marcus Is.), and had a brief one with VR30 on 14118 kc at 1725 GMT. VKØID, raised on CW, was on Heard Island on February 27, which more or less clears up the rumours about that place.

G3LPS, with CW, booked in VK6RS, 4S7EC, VS9AAA, VK7SM, KP4RK and LA2NG/P.

Forty Metres

Poor old Forty—it tries so hard, but everybody conspires to mess it up. We heard a lovely signal from a VS6 one afternoon around 1500 GMT, but every time a European with a receiver winkled him out and called him, dozens of Europeans would go back to the said European! Are they still using 0-V-1's, or what?

G3RFS worked CW with 5A1TU, 5A3CJ, PY1ABK and SU1AA. . . G3PEK, the day before he wrote, raised KV4AA, KV4CI and W's. . . G2DC found W6 coming in nicely (long path) in the afternoons, but all attempts to hear Danny Weil (FW8DW) on sked at 1200 were foiled by the clotted. However, Jack worked KV4AA, KV4CI, ST2AR, UA9, UAØ, VU2BK and 2GG, VQ2GW, VQ4AR, VQ8AI, YA1AW, W1-Ø, VE1-3, VO, 4S7LP, 5A1TW and ZL2GS.

A few sorties on the band by G6QB around 2230 produced better reports from W's than Twenty was giving earlier the same evening; and at about 0800

several West Coast stations were raised, also XE1OK. At the latter time, if you are lucky, most of the clotted is inaudible; but on occasions no DX was there until 0815-0830.

G3LPS's bag (CW) included JA8LN, VK, ZL, YV1AD, PY7TY, WA6UNF (1536), VK7SM (0845) and OX3XU.

Eighty Metres

This is a band on which the aforementioned clotted is not so troublesome; but you simply can't win, because the commercials are now so tightly packed that there is barely room for a CW station in between them. However, the DX goes on, both on CW at the low end and on SSB at the high end.

Taking the CW first: G3PEK raised W1, 3, 4 and 9, VO2, VE1 and 2, ZB1CR and OY7ML. . . G2DC didn't spend much time on 80m., but did collect KV4AA, KV4CI, KP4AOO, SVØWZ, ZL2AIX and 2GW, W1-4, 8 and 9, VE1 and 2, VO and 4X4JF. He says the DX is there, if you can copy it through six or seven different modes of transmission!

G3IGW worked U18CC, OHØ and W's from 2215 onwards; he heard VK6LE (579), OY, TF5TP, 4X4NX and ST2AR. G3KMQ switched on one Sunday night, and when he heard ST2AR he had to check that he had the right coil in his HRO! Over three days he worked ST2AR, 9Q5AB, VO1BQ, LA6CF/MM (off Colombo), KV4AA, KV4CI and LA7RF/MM off the Canadian coast. G3KMQ was only using a 20-metre aerial as an inverted L, with the 15-ft. top about 17 ft. high and most of the rest lying in the corner of the shack!

Now for the SSB DX! G3NOF has joined the party, at least on the listening side, and says VE1BC has been a good signal as early as 2000, while VK, ZL and W have been logged as late as 0900. Others heard: OX3KW, PZ1AX, VE3FFW/SU, KP4's and FG7XT.

G3DO (Sutton Coldfield) improved his score on the band with HA9OZ, UQ2FX, ZB1CR and UF6FB. GI6TK (Co. Down) considered himself lucky to get VR30 and FG7XT as well as the usual

VK's and the like. G3BJH reports working GD3GMH, HA9OZ and ZB1CR, adding "we do hear the real DX, but no QSO's."

SWL reports on Eighty SSB were received from David Hayes (London, N.3), Barry Cushing (Whyteleafe), R. V. Coupe (London, W.3), and Barry Curnow (Plymouth). Some surprising DX was heard by these listeners, from which we only have space to select the very best: VE7ZM (0630), VR30 (0710), VP2AB (0037), VK's (1930), XE1CV (0812), FG7XT (2328), PJ2AA (2300), HR1CM (0705), VP5BL (0200), HH2V (0400), ZS1JA (2000) and numerous ZL's (0800). We hope to give our SWL correspondents some more space next month.

Top Band History

January 1963 was probably the most eventful month that One-Sixty has ever known, and naturally a tremendous crop of reports has been received. We therefore have to produce them in a highly condensed form; and we are confining this summary to the month of January only. February will be dealt with next month, but present indications are that it did not start too well.

January 6 (*Third Test*): W1BB reports "huge success," with 42 W/VE stations working 45 DX stations. W1TX worked 13 Europeans; DL1FF worked 14 W's. G3PU raised VP8GQ and WØVXO for his "biggest thrill

TOP BAND LADDER

(G3P-- and G3R-- stations only)

(Starting date July 1st, 1962)

Station	Counties	Countries
G3PLQ	79	14
G3RBP	75	18
G1R3CB	53	9
G3REA	62	10
G3PPE	42	9
G3RDO	42	8
G3RJH	39	8
G3PMR	36	7
G3RJI	30	4

(NOTE: This ladder will continue until the end of 1963. Entries will be accepted up to July 1st.)

for years." VP5XG worked several W's and heard Europeans. ZL3OX heard W6K1P and K7GCO (0905). Ex-G3CCZ, in Jamaica, heard G6BQ and GW3JI, also VP7NY. HK7ZT and HC1DC. Being called were VR3O, KL7AYA and an XE. W6's and 7's were working the East Coast. The following G's are known to have got across, but possibly there were many others: G2PL, 3ERN, 3IGW, 3LIQ, 3MYI, 3OFA, 3NBP, 3NXJ, 3OQT, 3OZF, 3PGN, 3PU, 6BQ, 8JR, GM3PBA and GW3JI.

January 13: Not so good, but the W's reported "medium DX in all directions." W6K1P was working the East Coast well. G's known to have got across were G3IGW, 3OQT, 3PU and 6BQ . . . many of the others were probably keeping warm in bed on this morning! G3IGW reports "not too good for W, but heard HC1DC, VP8GQ, UB5WF (S7 on SSB!), and worked UO5AA."

January 16: Unusual weekday activity—G3PQA called CQ at 0300 and raised W2EQS, K2GNC, W2UWD, K3MBF (589), W1TX, W8HGW, K8HBR/2, W8HRV, W2IU and W0NWX; the last-mentioned was 349 and gave G3PQA 469.

January 20 (Fourth Test): W1BB reports that 22 W/VE stations took part, and 28 DX operators including HC1DC, HR3HH, VP5XG and XE1OK. There was bad snow-static on the other side. But G3PU worked HC1DC for a "First" (and for his own 40th country on Top Band!) and also a K5 at 0815. G3FGT worked HC1DC and HC1JW; G3CHN worked VP8GQ. And G3IGW raised 4 W's and VE1ZZ, and heard HC1DC. Others who got across were G8JR, G3PQA, 6GM, 3OQT and, of course, DL1FF.

January 26-27 ("CQ" One-Sixty Contest): This was it! And how fortunate that the organisers changed the date from late February to late January, because they hit the weekend of the season. U.K. stations getting across this weekend are too numerous to mention! Everyone was on, and conditions "gave" to the full. "Wow, what a test!" says W1BB;



One of the most consistently successful DX men on Top Band is G3PU — E. Orchard, 4 Hillcrest Road, Southlands, Weymouth, Dorset — who has been in the front rank of 160-metre operators since the 1930's — he now has WAC and no less than 40 countries worked on Top Band! The Tx takes an 807 at 8½w., into a 275 ft. aerial 70 ft. high, the receivers being CR-100. Several thousand QSL cards are not visible in this photograph, which shows G3PU's shack in his bungalow roof-space.

"Things certainly were afire," writes G3IGW; "Never heard anything like it," remarks G16TK . . . so the comments go.

G16TK accounted for no less than 28 W's and two VE's (K4HJJ was raised at 0825); he heard VP8GQ (0430), HR3HH (0835), K7ICW (0805), HC1DC, and G3FGT was calling VQ2IS. G3PGN heard 21 W's and three VE's on the 26th, 23 W's and three VE's on the 27th, and said they were the best mornings he had ever known (despite the power cuts). G5JU worked 27 W's and three VE's, giving him a contest score of 11,697; he heard H18XAG, WA6JPQ, W0AIH and VE3BWY.

G3IGW worked VP5XG for a beautiful "First," heard W6JTB, 6GTI, 6K1P, WA6JPQ, W7ZZW and W0DK, and says that the combined logs of his SWL friends

show at least 70 W's heard. His own contest score was 13,685 points, from 16 countries.

GM3PBA worked W1BU and heard W6K1P (0730), W5FIX, VP8GQ, HR3HH and a station believed to be PY7DZ. G5ZT came on after a long absence, with a 600-ft. long wire, and knocked off W1ME, 9EWC, 2FYT, 1BU and VE3KE; he heard 30 W's and three VE's.

VE3BWY (Toronto), who had quite a few W and VE contacts when he was G6WY, naturally wants to repeat the message in the other direction, but so far hasn't managed it; however, he reports hearing G16TK, G3PU, 5JU and 3PQA, as well as VP5XG, HR3HH and DL1FF. And he did work HC1DC, XE2OK, VO1BD, W4WQQ/VP9, five W6's and a W7 in Arizona.

G3NHE raised W9EWC for his

very first QSO across the pond . . . followed up with W1BU, VE1ZZ and 5A3CJ; he says W1BU was S9 for some hours. G3PEK thought conditions marvellous but only managed 5A3CJ. G2DC also had no luck with the W's but worked 5A3CJ, who, with Europeans, gave him 121 contacts in the contest. G2YS was surprised to hear a W1 working an inaudible W4 at 2250 GMT, of all times.

G3RBP realised his ambition and registered with VE1ZZ and W1PPN. . . G3PQA worked 16 W's, including 9EWC and ØVXO, and heard many more, as well as HC1DC. . . SWL A. M. Quest (Leeds) logged 45 W's and four VE's; his best DX hauls were HC1DC and WØVXO.

Probably the most amazing feature of this contest weekend was the big break-through of the W6's and 7's; they were on 1998 kc, but listening at the other end of the band. Several G's who called them hopefully (having heard others do so) were wondering where on earth they could be . . . at least one lost a QSO through this; he was answered, but he was not listening HF at all!

Altogether it was a marvellous experience, this weekend, and, as some who were on commented, One-Sixty sounded more like Forty. Perhaps we shall have another good opening before the season peters out . . . and certainly we may *hope* for something equally sensational next year. (But what must be happening on all those weekdays when everyone on this side is in bed?)

Other Top Band News

The run-of-the-mill doings on 160 metres (which now include GDX and EDX that would have raised a big cheer a few years ago) must also be drastically summarised. The main item of interest, apart from the Trans-Atlantics, is that CT1CO showed up on the band and was worked by scores of G's, though whether he was genuine is not yet established.

G3MRN (Ely) scored 1379 in the contest, working OK, DL, HB, PA and the U.K.—W's and VE heard but not raised . . . G3IAG

(Littleport) lost his half-wave due to icing conditions, which broke the mast, not the wire. But he can't work the W's with a bent half-wave and remarks that several people getting outstanding results are using loaded verticals (G5XB, when he worked VP8GQ, couldn't even hear him on his horizontal half-wave).

G3PQA and G3RJI hope to be going to the Channel Is. this Summer, and will be taking gear for Top Band and Eighty (dates not yet fixed). . . GW3CBB (Swansea) mentions a contact with VE1ZZ, but gives no date; OH3NY and the other Europeans were also raised. . . G3IDG has been going through a lot of literature and concludes that the *possible* score for Top Band countries (post-war) is as high as 76. All have been heard or worked from the U.K.

G3REA (Warrington) asks "How can we get more GM's on the band? And where are the GC's?" . . . G3PPE (Wallasey) comments on the erratic behaviour of 160 metres as regards general noise. Some nights he had to turn it in, while others were "glorious." After playing with several wires, he favours a 170-ft. length tuned against a 120-ft. counterpoise, on which he can work GW3PPF (Cardiff) in daylight with 589 each way.

G3PLQ (Salisbury) has managed to get back to sea after all, and was aboard *m.v. Daru* and then *m.v. Sulima*. While hove-to in the North Sea during a severe gale he heard quite a few G's, GM's and Europeans, and hopes to report from somewhere more interesting later on; he has heard a buzz that OZ's and HA's may now use the band.

G3PVK (Worcester Park) joins the ladders and says he has been experimenting with balloon-supported verticals (using a home-made hydrogen generator!) He managed to get on one morning with 130 feet of vertical wire, and W's were notably strong. He has worked 5A3CJ and OH3NY, plus the usual Europeans.

And for those wanting the Isle of Man—the Cambridge University Wireless Society boys will be there with GD6UW during March

21-April 1, running all bands 160-10 metres, and they will QSL 100%. This is the regular C.U.W.S. Spring expedition, with which they have been very successful in previous years. Any arrangements can be made through M. Sandford, G3PIT, Tx Sec., G6UW, Christ's College, Cambridge. (We wonder when the "other place" will show the same initiative—it must be ten years since we heard from the Oxford University Radio Society.)

Top Band Contest

Grafton Radio Society remind us that their annual Top Band Contest will take place on March 23 (CW) and March 30 (Phone)—both days from 2230 until 0100 the following day. There is an Open Section for any U.K. station—exchange RST or RS plus serial

TOP BAND COUNTRIES LADDER

Station	Confirmed	Worked
<i>CW and Phone</i>		
GM3COV	98	98
GM3OM	98	98
G2NJ	98	98
G3LWQ	93	93
G2CZU	90	92
GM3KLA	87	88
GM3PBA	85	86
G3PLQ	81	89
G3OXI	76	82
G3OWR	75	80
G3PGN	73	76
G3RBP	70	75
G3OKJ	64	69
G3IDG	49	52
G2BP	48	54
G3REA	45	62
G3OLU	45	53
GM3JKD	?	46
<i>Phone only</i>		
GM3OM	89	90
G3FS	86	86
G2CZU	69	69
G2NJ	42	42
G3PLQ	37	41

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

number starting anywhere between 001 and 100. One point per contact; final score the sum of CW and Phone scores. Logs to G2CJN (QTHR) by April 10.

Late Flashes: G8FW told G3IAG that he heard PZ1AR from 0030 to 0200 one morning. 1801 kc. . . OK2KGE told G3IAG that he had worked SVØWZ on 160m. . . ZE3JO writes to say that he himself, with ZE3JJ and VQ2W, are all on Top Band on Sunday mornings. 0430-0530. They are willing to sked on spot frequencies if anyone is interested. (ZE3JO-QTHR.)

General Chat

GM3JDR's idea (see last month) of widening the scope of WPX by bringing the call letters into it has brought forth quite a lot of comment. G3IDG makes the possible score 676, and says the three-letter calls could be included by using just the last two letters . . . Others are frankly against the whole thing, and their outlook is best summed up by an SWL, A. M. Quest (Leeds), who asks "Are you trying to reduce our hobby to a mere number-collecting racket? I thought the purpose of Amateur Radio was communication between intelligent individuals, not the collection of numerical sequences. You might as well collect bus-tickets . . . I know the 'country' system is not perfect, but at least it is based on solid geographical fact, not alphabetical coincidences." The debate continues . . .

GM3JDR himself writes on another subject—the "MC." He says "Nothing wrong with an MC in a huge pile-up but I prefer to find my own way. I have had help from G3AWZ and others, six or eight times, but was always on my own when the call was in the hands of the DX station. I will never pass reports to other stations . . . they must make the two-way QSO themselves without aid."

G2DC comments on "the latest and craziest decision of the DXCC Moguls, who have now decided to split the Channel Is. into two groups. Jersey becomes a 'new' one, with the remaining islands keeping the old Channel Is. title. I wonder when someone will get them up on the Isle of Dogs, and



E. J. Kelly operates GM3PDK at 101 Cluny Gardens, Edinburgh, 10, and runs a 45w. Phone/CW transmitter, consisting of 6C4-6AM6-6AM5-5763-5B254M PA, modulated by a pair of 6L6's, with speech clipping. On the Rx side, he has a much-modified and improved SX-24, fitted with an EF80 RF stage, 1-lattice filter, Q-multiplier, separate detectors, and a crystal calibrator; for 15-20m. a CC converter is used into the SX-24 tuning 5.0-5.5 mc. Aerials are dipoles, a 140 ft. wire for the LF bands, and a ground-plane for 15m. Main interest is construction and future projects include an SSB Tx, a DSB rig for Top Band, and a transistorised receiver.

perhaps Wigan and its pier?" It's true, of course . . . the great decision has been made in the State of Connecticut, and the prefix GC now embraces two "countries." Can you beat it?

G3RFH, who has been operating/MM in Antarctic waters, but confined by his licence to ten metres, is now VP8HF/MM and is on Twenty CW. He had not worked a G at the time of writing, but is full of hope. He passes on the news that VP8HD (G3PMO) is on Twenty CW; VP8DW and 8FJ on Twenty and Fifteen phone; VP8GA, 8GB and 8GQ on Twenty; and there is talk of a VP8 in South Georgia coming on Eighty. (Later: VP8HF/MM worked GM3AEY on CW for his first U.K. contact.)

DX Briefs

HL9KH is operating on 7001 kc around 2100 GMT, and working lots of Europeans; also at regular intervals he hopes to be on 3502 kc. His QSL manager is W9VZP, whose letter was passed along to

us by GM3PAE (Edinburgh).

Danny Weil was due to leave FW8DW on February 8 or 9, after a good spell with better conditions than he had at ZM6AW; he is proceeding to Suva for *Yasme III* to have repairs and overhaul; further programme uncertain—either cruising the Pacific during 1963 or returning to the States and winding up the DX-pedition . . . QSL's for contacts with Gus, W4BPD, coming in steadily; W4ECI now has the logs for ZD9AM onwards . . . 4W1AA still active and says QSL via Box 2928, Cairo; W3CXX is awaiting proof that he really is in the Yemen before handling cards . . . WØMLY, with KP4BIQ and a group of W5's, due to open from Navassa (KC4) during February. (All the above from G2DC.)

K1YZW, recently worked by G6QB, turned out to be Walter Schreuer, formerly G3DCU and then VK3AWU; he passes 73 to all his old U.K. friends and colleagues.

Gus, W4BPD, was operating

FR7ZC until February 7; he was then due to move to 5R8, whence he was hoping to fly to Juan da Nova Island and to come up as FR7ZC/J. After this, to Europa Island, as FR7ZC/E; these two operations might well extend into March, so this note should not be too late . . . While FW8DW is keeping things busy in the Pacific, ZD8DW is making them hum from Ascension . . . YA1AW, in Kabul, is active 1200-1400 on Twenty SSB . . . ZS61M, an airline pilot, is occasionally on from Cocos-Keeling, as VK9ZS . . . FG7XT says that at least four FG7's are building their own SSB gear and will make the island really active.

PY4AS, 4GA and 4OD were planning an expedition to Trinidad Island; it has been postponed until late June, when they will be able to keep open for 30 days . . .

5T5AD (Mauritania) has received an SSB exciter, a Drake 2B and a TH-4 beam; he hopes to be using them in a month or less . . . KH6PD/KG6 (Marcus Island) operates pretty consistently on 14295 kc SSB, around 2000 GMT.

ZL1ABZ (Kermadec Is.) is on 3795 kc SSB at 0730, looking for G's . . . 5N2SMW will go to Dahomey, 5V4, if he can borrow a small portable rig . . . Several TU2's now active, mostly on Fifteen AM, but TU2AK is on Twenty SSB . . . 9L1GM (Sierra Leone) very active on 14050 CW.

The new times and frequencies of the "Ex-G Radio Club" net are: *Sundays* 1400 GMT, 14125 (Canadian net, with VE6TF and VO1DZ controlling); 1500 GMT, 14345 kc (the 21395 kc net is discontinued); and 1900 GMT, 14345 kc. (This gen. from G4MJ.)

Last Minute Flashes

Gus Browning opened up from Juan da Nova (FR7ZC/J) on February 10 and was going great guns on the 11th, SSB and CW on Twenty . . . G3PFB (Northwich) received the news *via* K2UYK that VQ4IN has received a permit for One-Sixty; he will no doubt be on the air as soon as possible.

And that's it for another month, and a pretty full one at that. We now have a little breathing space, since next month's deadline is **first post on Friday, March 15**. No excuse for being late on that one, so please let us have everything in promptly, and not necessarily posted on the Thursday evening! Address it all to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. And until then, 73, Good Hunting and—BCNU.

HEATHKIT PRICE REDUCTIONS

A wide range of Heathkit products are subject to purchase tax. Resulting from the Chancellor's announcement of purchase tax reductions, these savings have immediately been transferred to the Heathkit apparatus affected, taking effect from January 1st.

THE TWO-WAY RADIO INDUSTRY

In the United States the new industry is that of Two-Way Radio. The reason is that big business concerns and operators of large commercial transport fleets are being encouraged to instal their own communications systems, on an ever-increasing scale. The frequency bands used are 25-54 mc, 148-174 mc and 450-470 mc. Of course, the G.P.O. has for several years now made the same sort of facility available to commercial mobile users in this country, and a vast amount of VHF/Mobile equipment is operated by our public services—such as police, fire, ambulance, dock and harbour works, and so on. But development in the private sector of industry and commerce is relatively slow, and this is where a big market is being opened in the United States. Their Citizens' Band idea is a different thing again, as it makes very low-power radio communication (using the walkie-talkie type of apparatus) available to the private individual.

CORRECTION—"TRANSISTORISED SPECTRUM GENERATOR"

In the circuit on p.635 of the February issue, the battery symbol should be reversed—negative to the S4, S5 switching. And on p.636 in the same article, the 25th harmonic at a p.r.f. of 20 kc is, of course, 500 kc, and not as given.

"WORLD RADIO HANDBOOK"— 17TH EDITION, 1963

The latest edition of this indispensable guide to the world's broadcasting—long, medium, short-wave and TV—is now available and, as usual, gives an enormous amount of detailed information. All the broadcasting services of every country are covered, including programme schedules and station addresses, and there is a full listing—by station name and callsign, frequency, wavelength and power—of all broadcasting transmitters from 2000 metres to 12 metres. There are various maps, charts and tables designed to help and inform the listener, with some useful practical articles on reception. In short, all you can possibly want to know about world broadcasting can be found within the 246 pages of *World Radio Handbook*, 17th Edition, price 22s. post free. from stock, through our Publications Dept.

INDEX, VOLUME XX

Every copy of this issue of *SHORT WAVE MAGAZINE* should have, as a free loose supplement, an Index to Volume 20, concluded with No. 232, dated February. This Index will repay close study, because it will lead you to a great deal of useful information covering nearly all aspects of Amateur Radio—we say "nearly," for even in a year of 672 pages of *SHORT WAVE MAGAZINE* we cannot find the space to say everything that needs saying on a theme as diversified as Amateur Radio, in which there are now so many specialised activities and interests. However, you will find most of them dealt with in Volume 20, and if for some reason the Index has missed your copy of this issue, you can get one free of charge on application to our office, with a large s.a.e. (the Index is about *Magazine* size, and of eight pages).

ADAPTING A DESIGN

VERSION OF THE G3KWG RECEIVER

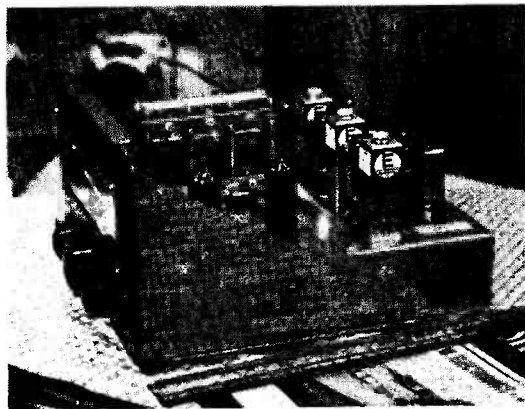
From Notes by GW3HUM

IN response to the paragraph item "Do Let Us Know" (p.593, January issue), H. W. Powell, GW3HUM, of Valley, Anglesey, has sent in the accompanying photographs of his version of the "Hybrid Receiver for Mobile Operation," described by G3KWG in the September, 1962, issue of *SHORT WAVE MAGAZINE*.

As can be seen, this is a typical instance of the adaptation of a published design. With no intention of building the matching 1.6-4.0 mc transmitter (which is described in this issue), GW3HUM says that his main object when constructing the receiver was to make it as small as possible, so that it could be used either in the car or on his boat—he has got it down to 5ins. by 8ins. by 9½ins. wide.

Construction is in three entirely separate sections. The first to be completed was the front end, in an aluminium box with two partitions, and totally enclosed, on top of which are mounted the tuning condenser and the first two valves; this was fully wired out and tested before being fitted to the panel.

The second section to be built was the front panel, with its side supports, carrying the tuning control and the other panel fittings; a ½in. hole was left ready to accept the shaft of the wave-change switch, which protrudes from the coil-box. These two units were then fitted together with 6 BA fastenings, and the tuning control coupled to the condenser assembly via two 1½in. drums connected by spring-loaded drive cord. Next came the third section, carrying the IF/AF side, BFO and output connections which,



Another view of the 1.6-4.0 mc receiver, as constructed by GW3HUM from G3KWG's original design.

when completed and wired as one unit, was likewise bolted up to the panel and front-end chassis.

Results

GW3HUM goes on as follows: "After making the necessary checks, HT was applied and the receiver functioned from the moment of switching on; after alignment and other adjustments, it was then decided to fit an internal 3in. diameter speaker, for which the perforated outlet can be seen at the top of the receiver. I cannot add further to that which has already been said by the author of the article. Although my layout is not quite as he suggested, it has made no difference, for the receiver performs very well indeed. Having built up this receiver, I am delighted with its performance. Many pleasant evening hours were spent in its construction—although drilling seemed endless when making the coil-box, front panel and IF chassis, wiring was quite straightforward, and the result very much worth while.

"Although this is my first attempt at building a communications-type receiver, I have constructed many other items of equipment, including two transmitters, all of which have come from *SHORT WAVE MAGAZINE* articles."

(EDITORIAL NOTE: We would be interested to hear from other readers who have built apparatus of any sort from *Magazine* articles, with notes on their results and experiences.)

UNFORTUNATE FIRE IN MANCHESTER

Late on January 18, a disastrous fire gutted the premises of North-West Electronics, in Rochdale Road, Manchester. Much valuable radio equipment and stores were completely written off. The partners in the firm are G3AOS and G3MAX, well known in Lancashire and on the two-metre air. New premises are being sought, and in the meantime they keep smiling—they will have the sympathy of all their friends and many readers who know them on the air.



The G3KWG 1.6-4.0 mc receiver, described in our September 1962 issue, as built by GW3HUM (Valley, Anglesey) and discussed in the accompanying notes — an instance of adapting the main principles of a design for an individual requirement. Whereas elsewhere in this issue (p.9) we see the G3KWG receiver combined with its associated transmitter, in GW3HUM's version the Rx is made a separate unit.

TRANSISTORISED GRID DIPPER

FOR AMATEUR-BAND
COVERAGE

THE circuit shown here is the basic grid-dip oscillator (GDO) arrangement simplified by the use of a transistor—this simplification producing the important advantage always associated with transistors: Power from a 9v. dry battery. This is of greater significance than it may seem, because the GDO is the sort of test instrument that needs to be handy and very portable. With a valve oscillator, as in the usual type of GDO, the LT and HT have to be provided through trailing leads, since a transformer cannot be avoided (and transformers at mains voltage are too unhandy to be very portable, while trailing leads are always a nuisance).

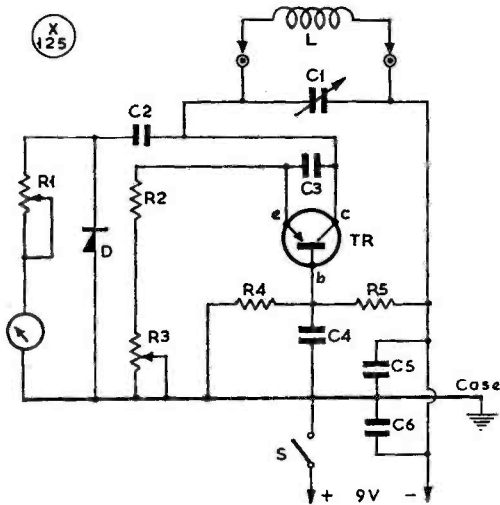
By using plug-in coils for the inductance, a wide range of frequencies can be covered. Though not shown in the diagram, this coil could be elaborated by being given a link winding terminating in a small

(1-in. diameter) two- or three-turn loop on a flexible lead—in other words, an RF probe.

Construction can be in a 4in. by 3in. by 2in. box, with the meter fitted on the middle of the front panel and the plug-in coil mount at the top end of the box. The actual size of the box will be dictated by the dimensions of the tuning capacity C1, the meter that may be available (something scaled in microamps, is best) and the shape of the internal battery; this can be mounted on the base-plate for easy renewal, and its positive side should be connected to the mounting.

The resistor R3 is to control oscillation from band to band—in the usual manner of grid-dip oscillators, this will be a variable factor—and R1 is to keep the meter needle on scale when the band is changed.

Values are given in the table and as regards the coils, following are some representative sizes when using a 60 μF condenser at C1: 80m., 30 μH , or 46 turns of 28g. enamelled close-wound on a $\frac{1}{2}$ in. diameter former. 20m., 2.1 μH , 12 turns as for 80 metres but spaced over $\frac{1}{2}$ in. Using Eddystone type 763 plug-in formers, *Top Band* would be found with 120 turns of 28g. close-wound over two inches. For 20m. again, using this same type of former and wire as before, 8 turns over 1 $\frac{1}{2}$ in. would be suitable. For the bands above 14 mc. a smaller capacity would be better for C1. For instance, with 20 μF , 7 turns of 28g. enamelled wound over 1 $\frac{1}{2}$ in. on an Eddystone 763 former would find the 28 mc band. These figures show that a certain amount of experiment and adjustment may be necessary to get the required coverage—this is easy enough by, in the first instance, checking the GDO working as an oscillator against the station receiver. If there is a reasonable calibration on the Rx, the GDO can itself be calibrated at least to that standard of accuracy, provided C1 is fitted with a suitable (small) graduated dial.



A transistorised GDO using plug-in coils at L, and described in the article. R3 is for oscillator adjustment from band to band, and R1 for setting the meter needle. A microamp.-scaled instrument should be used, such as a surplus item like the meter in the Type 3 Visual Indicator.

Table of Values

Transistorised Grid Dipper

C1 = 60 μF , var. (see text)	R3 = 3,000 ohms, pot.
C2 = 5 μF	R4 = 4,000 ohms
C3 = 10 μF	M = 40,000 ohms
C4, C5 = 50 μF	M = 0.50 or 0.100 microamp.
C6 = 100 μF , elect.	D = OA9J
R1 = 250,000 ohms, pot.	TR = OC170
R2 = 200 ohms	L = Plug-in (see text)

MORE ON THE BBC ABOUT "HAMS"

In a play on the Home Service on February 9, on the theme of a submarine feared sunk, one of the communications improbabilities was based on the possibility of "radio hams" having sent phoney messages—in fact, some of the action towards the end the piece was based on the alleged fact that "hams" had been responsible for hoaxing signals in a previous "Subsunk" episode. Without this insulting and entirely unnecessary piece of plot sequence, it would have been a good play, with plenty of authentic submarine atmosphere and human interest. Though there is apparently no hope for any BBC producer called upon to handle a technical theme, the author, Hackforth-Jones, should know better than to use such an idea.

Always mention Short Wave Magazine when writing to Advertisers — It helps you, helps them and helps us

SWL • • • • •

STARTING AS A TRANSMITTING AMATEUR —WHAT IS NEEDED?—HOW MUCH WILL IT COST?—THE READERS' FORUM—NOTES AND NEWS FROM LISTENERS

A LETTER came in recently making comparisons between the conditions of 1962 and those of 1932 for those who are just about to become fully-fledged amateurs. We cannot do better than quote:

"What really shook me into writing this was the realisation that to-day's young starters live in an entirely different atmosphere from myself and my contemporaries of the pre-war period. My first transmitter and receiver, both entirely home-built, cost me less than £10 altogether, and they gave results that almost satisfied me (we were never completely satisfied in those days, and never have been yet!). But I worked DX—lashings of it—on that ten-pounds'-worth, and I knew that commercially built gear was right out of my financial reach, so it never worried me.

"A few days ago I met a youngster who had just spent £10 on a kit of parts for a Grid Dip Oscillator! Well worth the money, too, and he made a nice job of putting it together—but how does that compare with my complete station for the same amount? Yes, I know that the pre-war £10 would be about £40 to-day, but even so, how far would that go towards building a complete station—unless you made everything yourself?

"Nowadays I know many amateurs who have only been on the air a short time, and they have spent roughly £250 in hard cash. And guess what they've got for it . . . (a) a receiver, and (b) a transmitter. And *nothing else!* Incidentally both of those are what we should call very good value for the money these days, and are among the cheapest of the reputable commercial gear available.

"Well, I don't think that represents the spirit of Amateur Radio at all. Pass your R.A.E. and your Morse, spirit up £250 from somewhere (goodness knows how I would ever have managed a quarter of that) and go straight on the DX bands with SSB! What do you really know? You haven't even got the *feel* of being an amateur. You would get more fun from building a simple crystal

oscillator from a few junk parts, and seeing how many countries you could work with it on Forty CW.

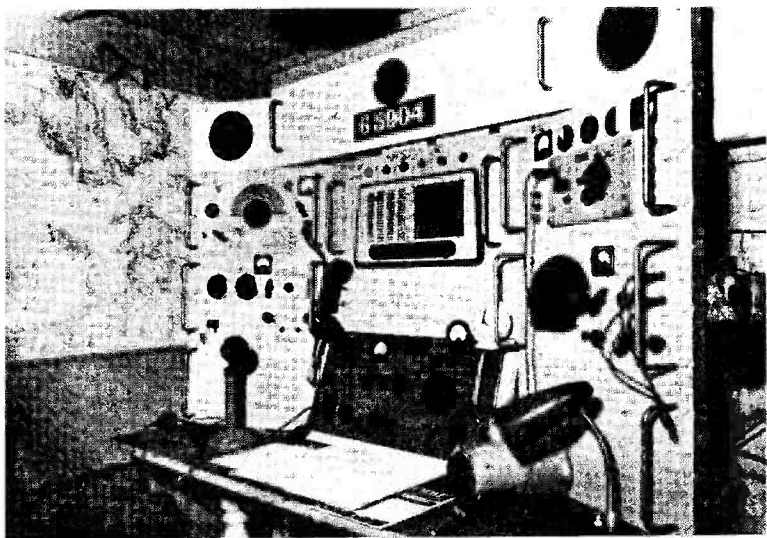
"But you see these youngsters looking round the Radio Communications Exhibition, and what is there to encourage them to get a few essentials together and start building? Ready-built stuff running into hundreds of pounds, kits that are not all that much cheaper . . . but where is the section for the novice who wants to start up quickly with something of his very own—built on the kitchen table?

"What was once the lifeblood of Amateur Radio is now squeezed out of sight, and unless a youngster is fortunate enough to belong to a really good local club, he can't even find out about the practical side of it."

Helping the Novice

So much for our correspondent, who has undoubtedly scored a point. And, partly at his suggestion but more because we were planning it anyway, we are going to do our share towards helping the keen novices along. The original series on this theme, "Amateur Radio for the Beginner," appeared in the April 1955-April 1956 issues of SHORT WAVE MAGAZINE, long since out of print. But many an active operator of today derived his original inspiration from that series, and much of the gear described in its articles is still in use.

This section of the *Magazine* is devoted to the SWL, but not every SWL spends all his radio time just listening—many of them are at least thinking of the day they pass their tests, and wondering just what is the best way of starting up. So a certain proportion of the material in the SWL section will henceforth be



The SWL station of Frank Auyon, Kirton, Blackeys Lane, Neston, Wirral, where the layout has been designed round a main receiving console. He has a large amount of equipment, including as receivers an R.107, Pye P93U, 18 Set, R.1132, R.1155, R.1392 and a Canadian Marconi Type 52—with these and various home-built or modified receivers, SWL Auyon can cover one to one thousand megacycles! He also has a variety of test gear, including a signal generator and an oscilloscope, together with a tape recorder, and several TV receivers covering all channels and the Continental systems. His aerials include a 300-ft. long-wire, a Cubical Quad, beams for 15 and 20 metres, and a stacked array for TV reception. Quite an installation!

written with the SWL's future, rather than his present, in view.

Strange though it may seem, there are quite a number of SWL's who have never made personal contact with a real live amateur, and thus have never been inside a genuine "shack." If they base their ideas on some of the photographs they have seen, showing benches full of expensive equipment, then they must sometimes despair of ever becoming transmitting amateurs themselves. The truth is that the great majority of amateur transmitters do *not* have their shack photographed, because they are not all that proud of its appearance! They may be technically satisfied with the performance of the gear, which is what really matters, but not everyone has the know-how, the tools or even the time or inclination to make things look professional.

A glimpse of an *average* shack, caught in an unguarded moment, would do much to re-assure the aspiring SWL and to convince him that he, too, could "join the senders."

Basic Needs

Suppose you have just passed your R.A.E. and Morse tests, but have not yet done a thing about getting on the air. All you have is an aerial, a tolerably good receiver and, of course, some knowledge and experience in using it effectively. What is the absolute minimum of gear you need to get going on the air with your newly-allotted call-sign? We suggest that your best bet is a single-stage CW transmitter for the Top Band. Even a simple crystal oscillator, using a 6V6 or similar valve, will enable you to use 10 watts of CW. If you have a reasonable aerial and an ATU, as well as the receiver already mentioned, nothing stands between you and the WABC (Worked All British Counties) Certificate!

If you start with one or two crystals (frequencies like 1820, 1830, kc and so on) you will be able to make CW contacts every evening; the only disadvantage of Top Band is that there is hardly any activity there on week-days until tea-time and after, but if you are out at work this will not bother you at all.

Next stage would be graduation from crystal



B. Curnow of Plymouth, on the left, met R. Western (Torquay) at the Plymouth Radio Club dinner on January 19, when they were able to have plenty of good talk about matters of mutual SWL interest.

oscillator to VFO and PA (a VFO straight on the aerial is *not* recommended); and after that you are all set to build a modulator, which you can simply add to the transmitter when you want it, without making any alterations whatever to the RF side of the gear. But if you do what we consider to be the wise thing, and start off on the key with the simplest possible outfit, you will probably get very keen on Top Band CW and won't be in a terrible hurry to play around with modulators. And once you become adept at making contacts on the key, you will acquire a taste for CW that will never leave you—and, remember, even today all the real DX is worked on CW!

A surprising number of amateurs who start on Top Band find it so fascinating that they stay there for years. Others, of course, yearn for the DX possibilities of the HF bands; and there are quite a few who use the surprising combination of Top Band and Two Metres, without showing interest in any of the "QRM bands."

What Next?

What you do after serving an apprenticeship on Top Band is, of course, entirely up to you—it's a hobby! But six months or a year with a simple gear on One-Sixty will be quite invaluable to you in giving you the "feel" of things. And if you imagine that the possession of a receiver and a transmitter is all that is called for, you will soon be awakened on that score, for there are lots of fascinating gadgets for you to build yourself, to contribute to the efficient working of the station. Remote-controlled aerial change-over, coupled up with receiver muting; accurate frequency measurement, whether by means of a 100 kc crystal calibrator added to the receiver, or a separate heterodyne frequency-meter; full "break-in" working if you want it; to say nothing of experimentation with aerial systems . . . all these are time-consumers which will probably make you wonder whether one band isn't enough to cope with, after all.

And—the important point—not one of these refinements will involve you in any great expense. Even the transmitter can originally be made from bits which you will probably have around the place—G3COI's amusing article about Junk Boxes, in the January issue, had more than a grain of sense in it—the only outlay necessary being for a good crystal or crystals. And, while you are occupying the kitchen table with your VFO of the future, your crystal oscillator transmitter can remain quite untouched and always ready to go on the air.

Finally, we might remark that if Top Band doesn't appeal to you, you can equally well build a simple crystal-oscillator stage for Forty Metres, using powers up to 20 watts or so, and work all round the continent of Europe on CW; you might even raise a W or two if you stay up late. A unit of this very type was described by G3BDQ on p.631 of the February issue of *SHORT WAVE MAGAZINE* and is ideal for you to start off with. In fact, if you change the crystal, use about three times as many turns on the coil, and a tuning condenser of twice the size, you could make that very unit the model for your first Top-Bander. And a very nice little transmitter it would be, too, for the CW operator.

So . . . watch this feature, as they say, and we will lead you slowly along the road by easy stages. And if you also join your local club and get to know others with similar interests, you will be able to share the experiences of them all. *That* we regard as the most important thing for any beginner to do. Many of our regular readers mention, from time to time, how helpful it has been to find that others in the same stage of enlightenment or bewilderment are not only available, but most friendly—and only a visit to a local club will find them.

READERS' FORUM

Once more there are quite a few readers who break the news that they will be leaving us shortly, having passed R.A.E. and, in some cases, the Morse test as well. We wish them all good luck and hope that their SWL experience will stand them in good stead as fully-fledged operators—at least they will know *how* to listen, which is more than one can say of many transmitting types at present on the air!

P. L. Stevens (Donnington) received his "Pass" slip on December 23; he was particularly pleased at having got through when 17 years of age (it cost him only 6d. instead of 30s.!) By the way, he is one of the select little crowd of stalwarts who appear on the CW section of the HPX ladder, and he has been collecting some good DX on Eighty before midnight (both CW and SSB); he also heard his first W on Top Band (W2FYT) on January 27.

Barry Curnow (Plymouth) has now logged 63 countries on Eighty SSB; his CR-100 has been livened up by a friend in the trade and he finds it excellent; CW is the newest interest.

K. A. Randall (Fareham) voices the complaint common to many SWL's—that Twenty is closed by the time he gets home in the evenings. So he makes the best of the week-ends and goes in for medium-wave DX as a sideline; the next project is to get going on Two Metres as well.

C. H. Miller (Tayport) deplores the "shocking noises" on Eighty (these teletype stations certainly clutter the band far worse than the old CW commercials ever did). But even between 1900 and 2100 GMT he manages to hear some DX. VK3AHO was S8 one Sunday evening, and he usually averages S6 and breaks through all the QRM.

R. Green (Ipswich) queries the use of a receiver with a product detector for AM phone. Simple, really—just leave the BFO on and tune to zero beat. You will then be receiving it on one sideband, and there will be *no* phase distortion. With a good slow-motion dial there is no trouble in holding the zero-beat position and the carrier will not interfere at all.

R. G. Evans (Swansea) is another who has been driven on to Eighty by the state of the HF bands. He considers he has been rewarded, having logged HK4, VS9, SU, ZL and VK—all on SSB. He is now experimenting with an ATU and with a 6BJ6 as an RF stage ahead of the R.107.

A. J. Birch (Lichfield) says his main interest is Top Band, and he logs some useful GDX and EDX on AM, using a broadcast receiver and 132-ft. wire. *K. Staddon (Stroud)* stays mostly on Eighty, where

SWL ● ● ● ● ● ● ●

continued

some of the missing European prefixes have been picked up.

Roger Western (Torquay) is another Top Band expert, with fifteen countries confirmed already; his biggest thrill was hearing WIBU on AM phone (January 20), RS 45; and his best morning's listening fetched in 22 W stations, HC1DC and VP8GQ. Getting K5ALU was another pleasure—the first from the fifth district. And Eighty SSB accounted for some nice ones, such as VP2AB, VP5BL, HR3HH and 1BL, KZ5LC and YV1EE.

DX/TV

The small amount of interest in this exciting offshoot of short-wave listening is rather surprising. Our only correspondents keen enough to report on it are *Charles Rafarel (Poole)* and the "Belgian Ace" *Jacques Herreman*. Charles Rafarel has now logged 74 TV stations in 21 countries and at last has received planning permission for a "real aerial system" with a 60-ft. lattice mast. Jacques Herreman has logged the Russian station Zaporozhye (Channel R6, Band III) by tropospheric propagation—1,500 miles! Possibly a record for Band III.

These two experts are to be joined by *R. R. Loe (Colchester)* who is getting organised for DX/TV, with an aerial rotator—this assembly may also carry an HF-band beam. And R.R.L. mentions that as he has been getting very good reception of Far East BC stations around 1530-1600 on 60 metres, it suggests



SWL. Frank Benson runs his station at Olcote, Old Newton Road, Newbury, Berks, and his receivers—a CR-100, a 52 Set and RF-24 Unit used as a 10-15m. converter—give him coverage of all amateur bands from 10 to 160 metres. His aerial is 132 ft., coupled through an ATU, at a height of about 30 ft. SWL Benson's main interest is DX on 15-20m. and Top Band.

useful possibilities for the 80m. amateur band at this sort of time.

Returning to normal DX, SWL Rafarel remarks on excellent signals from VS4RS on December 22—for the benefit of those who assume that the 21 m: band is firmly closed. Also various good openings to ZS, VK and ZL.

Charles Pocock (Watford) confines his activities to Top Band, Eighty and Twenty, with an R.107 plus S-meter and the SSB mods. He has his sights on the R.A.E. next May.

R. Adams (Shoreham) has been acquiring "extras" such as a meter, a Q-Multiplier and "a rather primitive oscilloscope." He has also switched his main interest from the HF to LF bands but is handicapped by lack of aerial space—twenty feet is the maximum!

Stewart Foster (Lincoln) has heard his first Trans-Atlantic DX on Eighty, and also has at last managed Zone 6 with XE1AB on Twenty. . . . David Williams (Budleigh Salterton) thinks Eighty is improving for phone DX, and finds Forty all right for CW, but devoid of any interesting phone.

R. J. Howego (London, E.11) tells us that he built the ATU described in the last instalment of "SWL" (January issue, p.605, Fig. 3) and was "amazed" at the difference it made. Most of his listening is on Twenty, but GCE QRM now intervenes. He logged "6L1WF" and queries the 6L prefix. Could it have been 6O? (There is an active 6O1WF).

R. Scadden (Bridport), another reader aiming at R.A.E. next year, uses a combination of a Globe King single-valver and a five-valve TRF receiver, and apparently covers all bands except Twenty! He also aspires to some two-metre working and would like to correspond with others similarly interested (QTH: 38 Court Orchard, Bridport, Dorset).

Bed-Spring Aerial

Peter Robinson (Ruddington) joined us last June, and is yet another who was "amazed" at the difference in results when he built an ATU—for use with his divan bed-springs as an aerial! He now has a BC-348P, but for years has used a modified broadcast receiver, a TRF two-valver and a crystal set.

C. M. Palmer (Birmingham) likewise started up with the family broadcast receiver on Forty and Twenty; graduated to an R.1155L; and recently, through the "Small Ads." section of the Magazine, acquired an AR88D with which he is delighted. He queries the prefixes 6L1 and UW3. . . . 6L1 we have already commented on, and UW3 is just an "overflow" from the ordinary UA3's. UW9's and UT's

Correspondence for the next appearance of this feature, in the May issue, should reach us not later than March 29, addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1. Good photographs are always wanted for illustration, and are paid for on appearance.

SWL • • • • •

continued

can also be heard, by the way, and the latest arrival seems to be a UV6.

T. Keith Evans (Aberystwyth) started about 18 months ago with a one-valver, on which his best DX was HV1CN and CT3AV on Eighty SSB. He graduated through a number of odd receivers to his present S.840C. He asks for the best all-band aerial to fit into a length of only 32 feet, and is thinking in terms of cubical quads for Twenty and Fifteen. (But as he says, later on, that his best DX is now on Eighty, we should hardly think it worth while.) One of these "wrapped-round-the-garden" affairs totalling about 130 feet of wire should behave nicely on all bands.

Laurie Margolis (Ilford), who is only twelve years old, joins our HPX ladder with the astonishing total of 426, and says he has heard about 250 countries. This is partly explained by the fact that he uses an HQ-170 and a TA-33 rotary beam, both of which belong to his father, G3NMR! A trap dipole is also used for the LF bands, and the chief interests are Eighty SSB and Fifteen AM.

Representation

P. J. Lennard (Wartling) asks whether the amateurs are represented at the conferences at which frequency-allocations are made. Indeed they are—very powerfully represented—but the reason for the "clutter" on so many bands is that they are not

HPX LADDER

(Starting January 1, 1960)

Qualifying Score—150

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
H. G. Shaw (Heswall)	643	R. Ashby (Hinckley)	257
R. J. C. Coats (Cowie)	564	C. Steedman (Huddersfield)	254
A. W. Nielson (Glasgow)	561	R. V. Coupe (London, W.3)	251
C. N. Rafarel (Poole)	448	K. A. Randall (Fareham)	249
L. S. Margolis (Ilford)	426	J. E. Pither (London, E.5)	239
R. Hunter (Kenton)	422	A. Huggett (Lamberhurst)	229
R. R. Loe (Colchester)	407	G. A. Lawler (Dublin)	221
F. C. Anyon (Wirral)	402	D. Hayes (London, N.3)	209
B. Curnow (Plymouth)	395	R. G. Evans (Swansea)	200
D. A. Whitaker (Waddington)	383	R. J. Hudson (Loughton)	191
R. K. Western (Torquay)	371	M. D. Stapleton (London, W.13)	182
D. Smith (Stammore)	370	B. J. Tarry (Warrington)	182
M. H. Saunders (Malvern)	340	D. A. Williams (Budleigh Salterton)	182
P. J. Lennard (Wartling)	339	C. M. Palmer (Birmingham)	178
M. Warrington (Barnley)	324	A. J. Birch (Lichfield)	173
M. Healey (Horsham)	323	T. K. Evans (Aberystwyth)	158
F. Bourne (Plymouth)	321	K. M. Duggan (York)	153
S. Foster (Lincoln)	312		
N. H. Maer (Sutton Coldfield)	312		
R. Adams (Shoreham)	303		
D. Douglas (Edinburgh)	300		
K. C. Staddon (Stroud)	294		
J. F. Hobson (Emsworth)	292		
C. Miller (Tayport)	278		
D. J. Aldridge (Southend)	275		
R. J. Howego (London, E.11)	260		
		CW ONLY	
		R. K. Western (Torquay)	482
		C. Harrington (Hounslow)	447
		P. J. Lennard (Wartling)	399
		G. Thomas (Salford)	284
		P. L. Stevens (Donnington)	274
		K. M. Duggan (York)	241

(NOTE: Listings include only recent claims. Failure to report for two consecutive issues of "SWL" entails removal from the Table. Next list, May 1963 issue, deadline March 29).

exclusive amateur bands (One-Sixty and Eighty, for instance) and we just have to live with our neighbours. Stations that blatantly use the *exclusive* amateur bands are nearly always in countries that were not signatories to the conferences, in any case, and nothing can be done about those, either.

David Aldridge (*Southend-on-Sea*), like so many others, is fed up with the early fade-out of Twenty, but he has made the best of it by listening in the early mornings, when SSB has been heard from ZM6, KC6 and similar rare ones. And on the day of writing (January 22) he found South Africa and South America coming in as late as 2030 GMT. Spring is on the way!

R. J. C. Coats (*Cowie*), who has now penetrated to the second place on the HPX ladder, has built a Nuvistor converter for use with his CR-100, and says it certainly sorts out the weak SSB stations in fine style. Its usefulness is not so noticeable on a friend's "rather superior" receiver.

R. V. Coupé (*London, W.3*) sends "probably his last line," having passed the November R.A.E. and being on the way with the Morse. He says "I shall now become one of the lost ones, with a G3R-- call sign." Twenty SSB is his main interest, and just recently two UA3's were logged with the worst-quality signals he had ever heard. On Eighty SSB, however, he has logged 169 prefixes—no mean score.

R. K. Towers (*Cambridge*) seems to be our solitary "VHF-only" listener, and he now has his promised pre-amp with a 416B. GDX has been logged, including SSB. To newcomers on VHF, he suggests "Try to spend at least some part of Sunday morning, Sunday afternoon and Monday evening listening for the first time" (More activity and more encouragement!) A good beam also helps, as does the habit of settling on the frequency of one of your locals and waiting to see who he works. SWL Towers hopes to be going to the Isle of Man with the Cambridge University Radio Club station (GD6UW) at Easter.

David Hayes (*London, N.3*) shows a score of 209 on the HPX ladder, which is made up *entirely* of 80-metre phone. This includes 82 countries in 23 Zones, but he points out that G3FPQ has worked 116 countries on that band. The DX has not been found without some loss of sleep, and the times quoted for VP2, PZ, PJ2, HI, HR, HH, VP5 and the like vary between 0030 and 0530. *Moral*—there's always *some* DX around, but it won't adjust itself to fit in with your favourite hours.

So that concludes this session, and we have to remind you that the next deadline (for the May issue) is *Friday, March 29*. By then we hope that the seasonal improvement in conditions will be well under way, and we wish you all Good Listening.

STABILISED TRANSISTOR OSCILLATOR

For certain Naval applications, in which high frequency stability is essential, Marconi's have produced an oscillator unit consisting of a silicon transistor CO with a buffer amplifier, enclosed in a miniature oven, the whole thing being made plug-in. The output frequency is 5.0 mc, accurate to 3 parts in 10^8 from all causes. This can be expected at any temperature between -15° C and $+55^{\circ}$ C, and is achieved by the design of the crystal oven, which has a thermistor as a temperature-sensing element; it drives a DC amplifier which in turn directly controls the oven heating. Mounting of the unit complete is on an octal valve base.

SOURCE OF SUPPLY—COMPONENT PARTS

A wide range of cheap and well-made components can be obtained under the *Radiospares* mark. We have recently been specifying them for general purposes (where the particular part used is of no great consequence as regards make) because *Radiospares* components can be obtained through any local radio dealer; he may not have what you want actually in stock, but he should have the latest *Radiospares*, Ltd., catalogue to hand, and as the firm gives a by-return service (*trade only*) you should be able to get anything from a crocodile clip to a reel of wire in a matter of a few days—but it is fair to explain that most items have to be ordered in minimum quantities; unless your dealer happens to be doing a lot

of radio/TV repair work, and therefore can hold stock for his own needs, there may be a little difficulty about some of the things you may want.

DROITWICH FREQUENCY STABILITY

It may not be generally known that the BBC's long-wave Light Programme transmitter, on 200 kc, is maintained at an exceptionally high order of accuracy on frequency, actually within 5 parts in 10^9 and is widely used as a frequency standard. A daily check is made from the N.P.L. against their caesium resonator—about the ultimate in accuracy at present—and the error found has been not greater than 1 part in 10^{10} . At Droitwich, 100 kc Essen quartz rings are used, in equipment supplied by Airmec, Ltd., of High Wycombe, and the whole set-up is housed in a specially-screened building.

NOVEMBER R.A.E. RESULTS

The results of the Radio Amateurs' Examination held in November last by the City & Guilds show a marked improvement in the pass rate. Of the 418 candidates who presented themselves, 295 got the coveted slip, giving a pass-rate of 70%. According to the Examiner: "In general, the candidates appear to have been well prepared . . . there was, however, a tendency for many candidates to be too brief and sketchy in their answers." So, if you are taking the May R.A.E., watch that point.

"Short Wave Magazine" is independent and unsubsidised and has a world-wide circulation among Radio Amateurs

VHF BANDS

A. J. DEVON

THE extraordinary perturbations of the barometric trace since last we were together did not do much for VHF conditions during the period—except over the weekend January 26-27, which by a stroke of luck happened to coincide with the RSGB's two-metre CW contest. In fact, by midnight on the Sunday, the pen had gone off-scale to show a reading of about 31 ins. This sort of thing is phenomenal by any standard, and sets a new record (if these are the sort of records we want) as regards the barometer. The millibar value was of the order of 1048 mb over the space of a few hours and with the first of the thaws coming on, the rising temperature was enough to produce a slight inversion.

Mainly, however, this happened during the late evening of Sunday, January 27, so that conditions were improving towards the end of the contest, with the CQ'ers getting exhausted in the search for new stations to work. Some of the contacts noted at about this time included G3BOC in Cheshire working G3KEQ in Surrey; G4LU having his 49th QSO with G8VZ at 1915; G3GWL (Bletchley) calling GW3ATM (Portskewett, Mon.) at 2125; and G3HRH working GW3MFY at 2155. In terms of stations worked, the high scorers in the London area were G2JF with 67S, and G3EVV with 66S, working GW8UH at just about finishing time. The level of activity and the scoring rate during the latter part of the contest are

shown by G2JF's 14 stations worked in the last hour-and-a-half, while G3HRH got in 16S in just about the same period. Some of the CW heard was pretty pedestrian, and there were one or two really shocking notes — these comments do *not* apply to any station already mentioned, needless to say—but in spite of that it was good to hear a reasonable degree of CW activity, under quite good conditions, and people really trying to make contacts on the key.

The CW test periods we arranged for February 3/9 were not very successful, to say the least. To start with, conditions were right flat, which did not encourage activity, and secondly the February 3 period was probably ill-timed, as it came on the Sunday immediately following the contest already touched upon. However, a number of stations did have a good try and we have about a dozen reports covering QSO's made between 30 or so stations at what in the circumstances might be called GDX distances. Looking over these, we find that G3NOH (Bournemouth) worked G3JLA, G3JXN and GW3MFY; using 75w. input and a 12-ele stack at 150 ft. a.s.l., G3NOH remarks that he is now convinced that 100-mile contacts are possible on CW whatever the conditions. For G3NWG (London, S.W.18), the test was a blank, as the only station heard at over 100m. was G6GN, all others being local. G3JYP (Appleby, Westmorland) found nothing doing on the first test, and during the February 9 period worked only G13OFT (135m.) for GDX; G3JYP remarks that "conditions were certainly poor, a long way short of the state of the band for the CW contest the previous week."

On the other hand, G3EDD (Cambridge) worked four stations in the two test periods at distances of well over 100 miles, his best being GW3MFY, 175m., on the 9th, and raised with some difficulty after about 35 mins. of trying. G3EDD runs 120w. to a QV06-40 in the PA, his Rx is an E88C-EC91 job into an AR88, and his 4 by 6-ele array gives a gain of 16 dB.

One of the hardest and most

persistent workers during the two test periods was G3JLA (Stevenage), but his effort was ill-rewarded—he had only three contacts at the 100m. *plus* distance, the best of them being with G3NOH (Bournemouth). G3JLA has a QV06-40A in the PA, taking

TWO METRES COUNTIES WORKED SINCE SEPTEMBER 1, 1962

Starting Figure, 14
From Home QTH Only

Worked	Station
58	G3BA
54	G3BOC
53	G3EDD
51	EI2W
49	EI2A
48	G3BNL, G3CO
45	G4LU
44	G3OXD/A
43	G3HRH
40	G3JYP, G3PBV
39	G3JXN
37	G2AXI
36	G3NUE
35	G3FIJ
34	G3OJY
33	G3JWQ, G3PSL
31	G3DVQ
29	G2BHN
27	G2DHF/P
26	G3NOH, G5QA, G5UM
25	G3CKQ
22	G3LQR, G3PTO, G8VN
20	G3GWL, G3JHM/A, G3NPF, G3PKT
18	G3GVV, GI3ONF
15	G3CCA
14	GW3ATM

This annual Counties Worked Table will close on August 31, 1963. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. QSL cards or other proofs are not required when making claims. The first claim should be a list of counties with the stations worked for them. Thereafter, counties may be claimed as they accrue. Note: While new claims can be made at any time in the period from now to end-June 1963, all operators are asked to send in amended scores as often as possible, in order to keep the Table running up-to-date. After June 30, 1963, only amended scores from those already standing in the Table at that date will be accepted.

100w., his beam is a slot-fed 8/8 at 34 ft., and the Rx a 6CW4 cascode into an SX-28 tuning 4-6 mc.

GB3CUW, Snaefell, March 26-April 2

This will be the callsign to be used on the VHF bands (4m. and 2m.) during the forthcoming expedition of the Cambridge University W.S. to the Isle of Man; the station is to be established on the summit of Snaefell, and will be linked back on 80m. to the base camp in Douglas, signing GD6UW on the HF bands. GB3CUW is, of course, a special G.P.O. allocation for the occasion, and the contact-man for the C.U.W.S. party is M. Sandford, G3PIT, Christ's College, Cambridge. This is not the first time the group has been to the Isle of Man—but nobody has ever before operated the 70 mc band from there. In fact, GB3CUW should be in good demand on both bands, as there are plenty of people wanting a first-contact with GD.

On Four Metres

A good clip of reports this time, showing that things are moving on the 4-metre band, even if activity is not yet what it could be. G3OSB (Lincoln) is now operational, running 18w. with a 3-ele Yagi at 35 ft., his Rx being RF-27 into CR-150; his contacts so far have included G3PJK for Lancs. and G3IUD for Ches., both by sked arrangement, and G3OSB also mentions locals G3HRP and G3LYK as active.

From Sheerness, Kent, G4OU writes that he has recently completed gear for four metres, consisting of 6J6-6J6-EF91 driving a pair of QV04-7's in parallel in the PA, and taking 12w. input, modulated by a pair of 6V6's; his Rx is a modified RF-27 Unit into a CR-100, with a xtal-controlled converter under construction; and the beam a 3-ele flat top; after one week's operation, G4OU expresses himself as very pleased with the results he is getting—but he would like to find more activity on the 70-mc band. Wouldn't we all! He would be glad to sked with anyone (QTHR).

Next, an interesting report on

4m. from G13HXV (Belfast) who has been able to raise 8 counties for the all-time table; five of them are EI/GI, and the others G/GM; he gives G13HJA and G13NFM as now regularly active, also EI7A in Co. Donegal; all these chaps are working one another without difficulty, and looking for G's.

G3NUE (Worcester) has got to 17C for the table, and his 4-metre rig now consists of a QV03-20A running 50w., and clamped by a KT66, modulation being from the two-metre rig, using KT88's; the aerial is a cubical quad; and his converter E88C cascode RF, into 6AK5 mixer, with another 6AK5 as tunable local osc., producing 1F output at 7.5 mc. G3NUE mentions that G3NDF (Gt. Bookham, Sy.) has worked about 65 different stations on 4 metres.

Also in the counting of stations worked, we note that the total for G3PJK (Manchester) is now 48S in 19C and four countries; he reports GW3RBM (Wrexham) as

active and getting out well.

G3OKJ (Hatch End) started up on 4m. in April last, and by the end of the year had worked 41 different stations, using only a dipole and a DET-19 in the PA, with 18w. input. He describes himself as "in a poor location and using very simple gear, with less than the average amount of operating time available," and quotes his own results only to show that the band is gradually being used more, with new stations appearing all the time; in this connection, he mentions G3RPE (Hemel Hempstead) who started up on 70 mc as soon as his ticket came through—we would say the first instance of such a thing happening.

Some Two-Metre Notes

G3HRH (Welwyn) is now at 43C in the Two-Metre Annual, and G3GVV (Haywards Heath) also moves up; he made some new contacts during the CW contest.

[over



... We'll have to find some other — way of turning this — beam, Fred ..."

It will be remembered that for some years G8VZ of Princes Risborough has been running a regular schedule with G3JWQ (Ripley, Derbs., 100m.); they have now had more than 1,700 contacts; and seldom miss—if the path is not open for phone, they use CW; and G8VZ only runs 12w.

G4LU (Oswestry) comments on the good conditions for the CW contest on January 27, with stations in the Home Counties area coming in well; he also raised GW3MFY for a good QSO, and G4LU's total of stations worked in the contest came to 57. G5YC (City & Guilds, London) report that they are building a 100-watt station for two metres, to be installed in South Kensington, 150 ft.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

- 20 G3HBW, G3LTF (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP)
- 19 G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OK, ON, OZ, PA, SM, SP)
- 19 G3CCH (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, OE, OH, OK, ON, OZ, PA, SM, SP)
- 18 G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP), ON4BZ
- 17 OK2WCG
- 16 G3GHO, G3KEQ, G5MA, G6RH, G6XM, PA0FB
- 15 G2XV, G3AYC, G3BLP, G3FZL, G4MW, GM3EGW
- 14 G2CIW, G2FJR, G2HDZ, G3CO, G3FAN, G3HAZ, G3IOO, G3JWQ, G3KPT, G3WS, G5BD, G6LI, G8OU
- 13 G2HIF, G2HOP, G3BA, G3DKE, G3DMU, G3DVK, G3EHY, G3GPT, G3NGG, G3PBV, G5DS, G6XX, G8VZ
- 12 EI2A, EI2W, F8MX, G3AOS, G3GFD, G3GHI, G3JAM, G3NUE, G3OBD, G3WW, G5CP, G5ML, G8DR, GW2HII
- 11 G2AJ, G2CZS, G3ABA, G3BDQ, G3BOC, G3GSO, G3HRI, G3JUD, G3JVP, G3JZN, G3KUT, G3LHA, G3OHD, G4RO, G4SA, G5UD, G6XA, OK1VR
- 10 G2AHP, G2AXI, G2FQP, G3BK, G3BNC, G3DLU, G3GSE, G3JHM/A, G3KQF, G3LAR, G3LTN, G3MER, G3OSA, G5MR, G5TN, G8IC, GC2FZC, GW3ATM, GW5MQ
- 9 G2BHN, G2DHV, G2DVD, G2FCL, G3BOC, G3BY, G3FIJ, G3FUR, G3JLA, G3OXD/A, G3RMB, G4LX, G5UM, G8GP, GC3EBK, GI3ONF, GM3DIQ, GW3MFY
- 8 G2DDD, G2XC, G3AEP, G3AGS, G3FEK, G3GBO, G3HCU, G3HJW, G3JXN, G3KHA, G3PKT, G3MPS, G3OJY, G3VM, G5BM, G5BY, G8SB

above street level. The installation will also include 3 cm. gear, for which they have two complete outfits, running three milliwatts AM with 18-in. paraboloids; when they are ready to go on the air, the G5YC chaps hope to be able to arrange 3 cm. skeds, as the site gives them line-of-sight coverage over most of London; the group's hon. sec. is G3OZF.

From Birmingham, G3OHC reports moves in the Tables for their Club station G3OXD/A (Albright & Wilson), with 235 stations now accounted for on two metres; constructional work for 4m. and 70 cm. is in hand, and G3OHC himself is preparing for /M working on 2m.

G3GWL, formerly of Coleshill, Warks., is now at Bletchley, Bucks., and in a considerably better QTH—he had to start all over again for the Annual, and comes in at 20C; with the better Wx, a new 4/4 J-Beam will go up. Other reporting moves in the Annual are G3CCA (Oadby, Leics.) and G3CKQ (Braunstone, Leics.). G2CIW (Birmingham) reports nothing much doing, and comments on G3OJY's suggestion—see last month—about crossbanding with VHF stations; Jack wonders whether this would, in fact, be a good thing, as on the congested HF bands there are already enough heavy carriers on for hours at a time, some of them never identified by a call sign. On the other hand, G3JYP remarks that up in Lancashire crossbanding 2/160 metres is already very popular—and, as a matter of fact, it often goes on round A.J.D.'s way, too.

G3PIJ (Reigate, Sy.) reports himself as active on two metres, running TW gear, with a 5-ele Yagi at 17 ft., "rotated by the remains of a clockwork motor and many yards of string." A 100w. linear PA is planned, to be driven by the TW2 Tx, and G3PIJ says he will be concentrating on two metres—incidentally, he is just 16 and still at school. Good luck to the lad!

Up in Edinburgh, GM3POK has got going on two metres, running 30w. to an 832, with a converter using E88CC in cascade to 6AK5-12AT7 osc. into a modified SX-24

FOUR METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 8

From Home QTH Only

Worked	Station
27	G3EHY
26	G3JHM/A
22	G5FK
19	G3BNL, G3OHH, G3PKJ
18	G5JU
17	G3LZN, G3NUE
14	G3OKJ
12	G3LQR, G5DS
9	EI2W, G3IUD
8	G3AYT, G3HXV

This Table records Counties Worked on Four Metres, on an all-time basis. Claims can be made as for the other Tables, e.g. a list of counties with the stations worked for them, added to from time to time as more counties accrue. QSL cards or other confirmations are not required.

tuning 12-14 mc. (A photograph of his station appears on p.29 of this issue.)

From Rainham, Kent, G3PKT, describes his gear as a QV03-10 PA taking 20w., his beam as a slot-fed 8/8, and his Rx as a tunable cascode converter into a TCS main receiver, with a pan-adaptor; he also has a halo aerial fixed up indoors which, he says, "works fine." This rig has given G3PKT contacts in 8 countries and 23 counties, with more than 170S worked; he is also getting going on gear for 70 cm. and 23 cm.

... And just as this was going down, we heard of the sad and sudden death of H. A. M. Clark, G6OT, on February 14. A capable and distinguished member of the amateur fraternity, he did his share of VHF work.

Finally—

Mercifully, the calendar gives us a little more time this month—it has been a chase and scramble since the Exhibition, your A.J.D. can tell you—and perhaps we can now swim out into calmer waters. Anyway, closing date for next time is **March 22**, which makes it easier, and the QTH is the usual one—so, till April 5. 73 de A.J.D.

Miscellany

INCIDENTAL INFORMATION, AND ITEMS OF TOPICAL INTEREST

(The heading under which almost anything may appear)

Those SSB nets on Eighty, so often quoted under this heading, are always worth listening to as a commentary on current affairs. But a sad note of bitterness has been observed of late; the flavour of "Panorama" and "To-Night" is being replaced by more than a suspicion of "That Was the Week That Was," but, unfortunately, without the wit and humour. Satire is a weapon, and it has to be used by a satirist. Mere fun-poking, or even honest abuse, is no substitute. However, the general atmosphere is not one of depression—there are still some cheerful moments. And the discussions are by no means confined to Amateur Radio (though, of course, they ought to be!).

The discovery of the piezo-electric effect in bone was reported in *Nature* (January 5, 1963). It appears that samples of human ribs, femur and toe have been shown to develop an electric potential when distorted, the voltage being about 0.3 mV per kilogram of force applied. Critical adjustment of the pressure of a pair of headphones across the skull may thus be an important factor in winking out the weak ones from the QRM!

Lloyd Colvin, W6KG, now retired from the U.S. Army, has visited 96 countries and proposes to add four more just for the century. He has also worked DXCC and WAZ from four different continents during his service travels. W6KG is now enjoying his retirement with a station located on a mountain top in the Berkeley Hills, telephone and power lines all being installed underground to give him a clear shot in all directions.

Another very well-known operator in California is John Knight, W6YY, whose place of work is a large TV station at the top of Mount Wilson. His home station is near Los Angeles and some 20 miles (airline) from the TV site. He is at present at work on a complete remote-control system, whereby his entire station will be moved to the mountain top and wholly controlled from his home by a 430-mc link. This, of course, will include band-switching, VFO'ing, selection and rotation of beams . . . and will also provide for CW, SSB and AM. If anyone has heard of a more ambitious amateur prospect, please write and tell us about it!

"We don't work hard enough to instil in the public a sufficient sense of Romance about Radio. Someone gave me an LP of selected Gresley Pacifics for Christmas; keenly as I am with the majesty of the

sound of steam locomotives, I am bound to think 'Where could you get an LP called "Vintage Amateurs in Mid-Over" or "Some Time Signals from GBR received in the Khyber Pass"?' "

(Letter from G3NWT)

"There are so many new prefixes on the air nowadays that I can't tell who is who. All these new ones sound like tube types! Do they have a Worked All Tubes Award?"

(W6KYT, in "The DX-er")

Perhaps you never associated *QST* with Citizen Radio? But a look at the cover of the August 1921 issue shows the sub-title "A Magazine Devoted Exclusively to Citizen Wireless" . . . Jumping to February 1925 we find it "Devoted Entirely to Amateur Radio." ("Collector and Emitter," *Oklahoma*)

It is noted that aerials are no longer built, constructed or made. They are fabricated. A quarter-wave rod for mobile work is a vehicular antenna system, and a common or garden coax plug becomes a Type N male with neoprene housing. A pot of varnish will no longer protect those beam elements,



" . . . I can't find those volts you said you'd dropped, Henry . . . "

which must now be dipped or galvanized and iridized or bright cadmium plated—for weatherability . . . Thanks to brilliant, revolutionary and exclusive new design concepts, aerials can now be loaded at the end, the middle, the frontside and the otherside. They need no guys, radials, relays, traps or gadgets . . . they all have a higher forward gain over an isotropic source (whatever that is) than anyone else's, and, as any Ph.D. will confirm, omnidirectional radiation is best for general coverage.

(VQ4KPB, in "QTC," East Africa)

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In the February issue of *CQ*, W6AJF describes the Overtone-Harmonic crystal oscillator, which is of special interest to designers of VHF receivers because it reduces the length of the "oscillator string." This oscillator will operate at the third overtone of a crystal and also multiply to the second or third harmonic of that frequency. In the final design a 6CW4 Nuvistor is used for the crystal oscillator stage, and another for the mixer. A 6DS4 Nuvistor operates as an RF amplifier. A noise figure on a par with that for a 417A converter is claimed.

— • • • —

Not many readers came up with the correct answer to last month's Quiz Question. The complete sequence is as follows: G2, GC5, GD6, GI8, GM3, GW4. The prefix letters are in alphabetical order, the numbers in the order in which they were originally issued by the GPO. Incidentally, how many of our regular readers know that Scotland once used the prefix GC?

— • • • —

A rather easy Quiz question for this month . . . find the Odd Man Out:— 5R8, 5T5, 5U7, 5V4, 5X5, 5Y3.

— • • • —

A reader reports a CW contact with a WB2 station who had a 599 signal, beautifully operated, head-and-shoulders above all the other signals on the band at the time. In QSO he said he was using the Collins S-Line, complete with 1 kW final, with a three-element beam on a fifty-foot tower. The sting in the tail was . . . age 12! But he did turn out to be the son of a well-known Old Timer.

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"Learning code is not too hard—I waited eight years, during which time I also complained about the need for getting the 13 w.p.m. for a licence. Finally, one of my good amateur friends said 'Why don't you simply get busy with it and get the job done?' This was a new thought. I borrowed a set of code-practice records and two months later went down and took my amateur test . . ."

(Letter in "CQ," from WOECN)

DINNER-MEETING FOR SIDEBANDERS

We are asked to announce that an SSB Dinner—with G3FPK and G3KZL as the organisers—is being held on May 11, at the Waldorf Hotel, Aldwych, London, W.C.2. Assembly will be from 3.30 p.m., and there will be an informal display of SSB equipment; the dinner is timed for 6.45 p.m., followed by dancing, a cabaret and late-night refreshments. The programme will include spot prizes, gifts for the ladies, and a raffle. The inclusive cost of tickets is 50s. per person, and it is hoped that this First London Sideband Dinner will be supported by all with an interest in SSB—and indeed, in Amateur Radio. Applications for tickets, with remittance at 50s. each, should be made to: N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.

NOT BY AIR MAIL

We are often asked by readers overseas, when sending in their subscription, if we can post them the *Magazine* by airmail each month. The answer is that we can, but look at the facts: even the 2nd class airmail rate averages 6d. per ½-oz., making the postage per copy 5s., which is a good deal more than the cover price! Hence, for copies to be airmailed overseas, the subscription rate becomes 96s.—though this may be more or less as, depending on destination, the rate varies between 5d. and 7d. the ½-oz. The odd fact is that there are some readers prepared to pay for postage at this extortionate rate. As it involves a special mailing arrangement at our end, readers who wish their copies airmailed are asked to add the full amount for a year's postage to the subscription of 36s.

MOBILE RALLY CALENDAR

This is beginning to fill up, and the dates notified to us as booked as at close-of-press are now as follows: North Midlands Mobile Rally, *Trentham Gardens*, April 21; International Mobile Rally, *Verviers, Belgium*, April 28; Peterborough A.R.S., *Hunstanton*, May 26; Northern A.R.M.S., *Harewood Park, Leeds*, also May 26; Reading A.R.C., *Pangbourne*, June 2; A.R.M.S., *Barford*, June 16; *Bridlington*, June 23; *South Shields*, July 7; *Chiltern, High Wycombe*, July 14; Torbay A.R.S., *Royal Naval College, Dartmouth* (with R.N.C. Amateur Radio Club), August 11; *Derby*, August 18; Reading A.R.C., *Pangbourne*, August 25 (2nd event); and *Lincoln*, September 15.

Applications to join the *Verviers* party under ON5 licensing conditions must be in before April 1st—see p.643, February *SHORT WAVE MAGAZINE*, for details; the enrolment fee of 100 Fr. Belgian can be remitted by international money order; to facilitate Customs procedure on the other side, when applying to the A.A. or R.A.C. for the usual car documents, have your gear listed as "special equipment, part of car." And do not display your whip until you are on

Use the Readers' Small Advertisement section of "Short Wave Magazine" for anything radio you may want to buy, sell or exchange — see pp. 50-56

NEW QTH'S

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

G3RDL, C. W. Campbell, 22 Marloes Road, Earls Court, London, S.W.5.

G3RKW, Amateur Radio Club, R.A.F. Station, Scampton, Lincoln.

G3RXX, D. M. Thompson, 233 Ruskin Road, Crewe, Cheshire.

G3RML, D. W. Trowell, 49 Mollands Lane, South Ockendon, Romford, Essex.

G3RMQ, J. T. Ingham, Lambert House, Greetland, Halifax, Yorkshire.

G3RNI, D. G. Wilkinson, 84 Avondale Road, Shipley, Yorkshire.

G3ROF, Amateur Radio Club, R.A.F. Station, Topcliffe, Nr. Thirsk, Yorkshire.

G3RPL, T. A. Neyland, 68 Ferrier Road, Elm Green, Stevenage, Herts.

G3RPO, F. Seddon, Addises Cottage, Over Hulton, Bolton, Lancs.

G3RQX, P. R. Lewis, 56 Westbourne Road, Penn, Wolverhampton, Staffs. (Tel.: *Wolverhampton 38131.*)

G3RRL, W. S. Teanby, Orchard House, Ealand, Scunthorpe, Lincs.

G3RRN, Dr. K. E. Jones, Greystones, Shrewsbury Road, Church Stretton, Salop. (Tel.: *Church Stretton 3140.*)

G3RRR, H. W. Merry, Nutfield Court, Church Hill, Nutfield, Surrey.

G3RSB, R. Scaife, 75 Orchard Road, South Ockendon, Essex.

G3RSE, C. J. Cheney, Cherry Orchard, Ellesmere Road, Weybridge, Surrey.

G3RSI, I. Trays (*ex-5A3CAD*), Hut X-60, 2 Sqdn., R.A.F. Station, Yatesbury, Calne, Wilts.

G3RSJ, R. H. Williams, Mill Cottage, Ketsby Mill, Nr. Louth, Lincs.

G3RSN, S. H. Nankivell, Brodick, High Lea Road, New Mills, Stockport, Cheshire. (*Also operating in Bristol.*)

G3RST, R. V. Southern, The Bungalow, Steel Cross, Crowborough, Sussex.

G3RSW, W. J. Mullarkey, 59 Brompton Road, Rusholme, Manchester, 14.

GM3RSZ, W. K. Findlay, 42 Hanover Street, Stranraer, Wigtownshire. (Tel.: *Stranraer 2134.*)

GW3RTA, W. J. Lewis, 5 Galon Uchaf Road, Merthyr Tydfil, Glam.

G3RTB, R. Bell, 2 Great Gutter Lane, Willerby, Hull, Yorkshire.

G3RTG, R. Chambers, 80 Derby Road, Spondon, Derby.

G4UZ, H. W. Leonard, 47 Windsor Road, Bristol, 6. (Tel.: *Bristol 43487.*)

CHANGE OF ADDRESS

G2HMG, F. H. Palmer, St. Mary House, Bury Road, Thetford, Norfolk.

G2JM, H. A. Musgrave, 133 Brooklyn Road, Cheltenham, Glos.

G2TT, A. W. Blow, 105 Monkhams Lane, Woodford Green, Essex.

G3BJN, T. L. Johnson, 14 St. Winifred's Road, Harrogate, Yorkshire.

G3GJG, B. Trueman, 10 Castle Lane, Westhead, Lathom, Nr. Ormskirk, Lancs.

G3JBG, S. E. Harding, 13 Waterloo Drive, St. Neots, Huntingdon.

G3KMY, D. G. Radford, c/o C. Farmer Ltd., Matlock Street, Bakewell, Derbyshire.

G3KQQ, C. A. Mattacks, 68 Middlesex Drive, Bletchley, Bucks.

G3OIW, R. G. Dawson, 15 Banbury Way, Prenton, Birkenhead, Cheshire.

G3OJ, C. W. Packe, Keepers Cottage, Levington Heath, Levington, Ipswich, Suffolk.

G3PCG, D. M. E. Askew, Ebenezer Cottage, 28 Bolehill, Wirksworth, Derbyshire.

G3PNM, P. D. Smith, 19 Horsforth Avenue, Bridlington, E. Yorkshire.

G3PNM/A, P. D. Smith, Welbeck College, Worksop, Notts.

G3PSY, J. G. Cottrell, 43 Colbert Avenue, Thorpe Bay, Southend-on-Sea, Essex.

G3RKC, W. J. Bryan, 125 Belgrade Square, Corporation Street, Coventry, Warks.

CORRECTION

G3RAE, R. A. Eldridge, Portree, Smallfield Road, Horley, Surrey. (*February issue.*)

Belgian territory. There will be ten ON stations operating from Verviers on April 28, in the 3.5 and 144 mc bands only, and they will be on the air during 0800-1100 local time, their objective being to work as many incoming mobiles as possible, as frequently as they can at 25 km. intervals on the approach, *i.e.*, /M's should call the Verviers stations, giving an RS report and a speedo' reading in kilometres, with location; a similar sort of contact should be attempted 25 km. further on, and each QSO will count 5 points. The eventual meeting point is on the edge of La Tourelle Park, behind the Civil Hospital, Verviers. Assembly is 1100-1300, for meeting and picnic; there

will be a rally drive from La Tourelle during the afternoon, to the Barrage d'Eupen, with refreshments at the Hotel du Barrage; the prize-giving will be at 1700. We are hoping to hear from all G/M's who make the trip and to have an illustrated report of this first international rally event in the June issue of *SHORT WAVE MAGAZINE*.

And for those who like to keep notes for the record, the total for U.K. mobile licences in issue as at December 31, 1962, was 1,251—which means that about 13% of all British amateur operators are now interested in mobile to the extent of taking out the special licence for it.

THE CERTIFICATE ISSUES

LATEST LISTINGS REVIEWED—WFE RATIONALISED

SINCE the last Certificate Listing, in the September, 1962, issue of *SHORT WAVE MAGAZINE*, another 82 have been awarded, of which 13 (being in the VHF category) have already been covered in "VHF Bands."

Here we look at the issues under the FBA, WABC, WBC, WFE and WNACA heads. Taking first the WFE (Worked Far East) because it is at once the most difficult and has recently been criticised as "now impossible to obtain by a newcomer": This is quite true, and we said as much on p.141 of the May, 1962, issue! But the fact is that the odd claim does still come in, from operators of sufficient seniority in the DX field, and only the day after reading a letter remarking on the "impossibility" of WFE and asking for a revision of the rules, we had DL1QT's claim, exactly meeting the requirements, for No. 66 in the WFE series. However, it is fair to say that his 18 contacts took him from June, 1950 (PK1LK) until November, 1962 (VS4RS) to make. So WFE is being kept as it is, but in the strictly geographical sense only. This means that contacts with Laos (XW8), Cambodia (XU) and Vietnam (3W8) will now count for what used to be French Indo-China, giving three prefixes for the original one, FI—thus we keep up with the political changes in that area. This also involves some difficulty with the PK districts; at present, there are no known amateur stations under the Indonesian régime, though PK2HT was on until about two years ago. As regards China, the amateur prefix is now BY, and BY1PK in Peking is a genuine and active station (though he is said to keep his QSO's mainly to his own side of the Bamboo Curtain!). The nett result of the amendments now taken into the WFE rules is that though it is still very difficult, it is not impossible.

Now let us look at some of the other Certificates, and those who have won them. Nineteen

more FBA's (Four-Band Award) have been issued and of these six go to U.K. operators; one of them is GI6TK, to whom we are particularly glad to send FBA No. 263; until he became afflicted by blindness, he was a flying member of the B.O.A.C. staff . . . FBA No. 249 goes to SM2ALU, who already holds WNACA No. 320 . . . In the current listings, UA3FT

SHORT WAVE MAGAZINE DX CERTIFICATES

RULES

WNACA (Worked North American Call Areas)

Twenty-two cards to be held, for contacts with stations in ten U.S. Districts (W1-0); nine Canadian (VE1-8 with one 8 in Yukon, one in North West Territories); Alaska (KL7), Newfoundland (VO) and Labrador (VO). Contacts may have been on any band, phone or CW. Operators in W, VE, VO or KL7 are *not* eligible for this Award (331 *WNACA Certificates issued to March, 1963*).

FBA (Four Band Award)

Cards to be held with confirmation of contacts with 20 different countries, *each* country to have been worked on four different bands. Any four bands will qualify, e.g. 160-80-40-20, or 80-40-20-10, or 160-40-20-15 — and so on. Entrant's own country may count as one of the 20 countries. (267 *FBA Certificates issued to March, 1963*).

WFE (Worked Far East)

Eighteen cards to be held for 18 different countries selected from among the following: BV, BY, C9, CR8, CR9, DU, HL9/HM, HS, JA/KA, KR6/KR8, PK1-2-3, PK4, PK5, PK6, UA0 (Zone 19), VS1, VS4, VS5, VS6, XU, XW8, XZ, ZC5, 3W8 and 9M2. All bands, any mode, and original prefixes for any part of the area accepted. (66 *WFE Certificates issued to March, 1963*).

WABC (Worked All British Counties)

Sixty cards to be held, from sixty counties of the British Isles, all to have been worked on the 160-metre band since January 1, 1952. Counties to be as shown in any standard atlas, *not* "administrative counties" such as the three Ridings of Yorkshire, East and West Sussex, County of Bristol, and so on. Isle of Wight counts as Hampshire — not separately. Isle of Man does score separately, as do all the Channel Islands. Scilly Isles also count separately. For London the L.C.C. area scores as one County. (298 *WABC Certificates issued to March, 1963*).

WBC (Worked British Counties)

Open only to claimants *outside* the United Kingdom and Eire. Cards to be held from 50 different counties of the British Isles, worked on any band 3.5 to 28 mc inclusive, phone or CW. The definition of U.K. counties is the same as for the WABC Certificate above. (310 *WBC Certificates issued to March, 1963*).

PRA (Polar Regions Award)

Claimants must be able to show cards as follows: (a) Arctic—QSL's from six of the areas Alaska, Canada, Finland, Greenland, Norway, USSR *all lying north of the Arctic Circle*, Jan Mayen and Spitzbergen (incl. Bear Is. and Hopen Is.) — making eight possibilities from which the six cards can be derived. Also (b) QSL's from any six of the following eight Antarctic areas: Antarctica, Falkland Is., Heard Is., South Georgia, South Orkneys, South Sandwich Is., South Shetlands and Macquarie Is. Cards must not be dated earlier than January 1st, 1955, and contact can be on any band, CW or phone. (26 *PRA Certificates issued to August, 1962*).

CONDITIONS

Claimants in the U.K. are required to send all cards in support, by registered post with a check list, when making their claims. Overseas claimants (*only*) should send either (a) A check list, without cards, duly certified by the Hq. of their national Amateur Radio Society, or (b) An uncertified check list, from which all or any cards may be called in for scrutiny by us. Cards are *not* required from overseas applicants unless asked for to verify a claim, and we can accept no responsibility for unwanted QSL packets. In no case will any Award be issued without proofs we consider to be good and satisfactory. No correspondence can be entered into regarding individual claims.

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

Short Wave Magazine

DX CERTIFICATES

The following have been issued since the publication of our last list, in the September, 1962 issue :

FBA

No. 249	SM2ALU (Bergnaset)
250	HA5KFR (Budapest)
251	W1WLW (Topsfield, Mass.)
252	UA3FT (Moscow)
253	G3HZL (Isleworth, Middx.)
254	G13CDF (Portadown, Co. Armagh)
255	W3RZL (Philadelphia, Pa.)
256	DL6FF (Langenargen)
257	UA2AB (Kaliningrad)
258	G3GGS (Chorley, Lancs.)
259	G13JEX (Belfast)
260	OZ3LI (Vaerslev)
261	W5WZQ (Houston, Tex.)
262	K2ZRO (Endicott, N.Y.)
263	G16TK (Holywood, Co. Down)
264	OK2KJU (Prerov)
265	YO2BU (Timisoara)
266	G8VG (Dartford, Kent)
267	SP6AAT (Warsaw)

WABC (Top Band only)

No. 283	G3MGI (Leeds)
284	G3OZN (Workshop)

285	GD3EGF (Douglas, I.o.M.)
286	G3OKJ (Hatch End, Middx.)
287	G3CRJ (Kendal)
288	G3RBP (Abingdon)
289	G3IMV (Bletchley)
290	G8GG (Lytham St. Annes, Lancs.)
291	G2AHP (Greenford, Middx.)
292	G3PEO (Cheltenham)
293	GW3OJB (Pembroke Dock)
294	G8VG (Dartford, Kent)
295	G3PWK (Aldershot)
296	G3PUW (Bletchley)
297	G3OKY (Beckenham, Kent)
298	G2CUZ (Ainsdale, Lancs.)

WBC (Overseas only)

No. 289	OK1ZL (Chotebor)
290	ZB1A (Malta, G.C.)
291	OK1KKJ (Prague)
292	W3AYD (Rockville, Md.)
293	5A5TY (Idris, Libya)
294	I1LCF (Bologna)
295	UB5DW (Kiev)
296	UA3FT (Moscow)
297	HA5KBP (Budapest)
298	HA8KCU (Szeged)
299	DL4PW (Munich)
300	SM5BGB (Bandhagen)
301	ZB1RM (Malta, G.C.)
302	OH2SB (Helsinki)
303	VE7CE (North Vancouver)
304	DJ4HR (Duisburg)

305	DL2AB (BFPO 24)
306	YO3CR (Bucharest)
307	PA0NU (Zeist)
308	OK2OQ (Ostrava)
309	K8GJH (Euclid, Ohio)
310	5N2RSB (Kaduna)

WFE

No. 66	DL1QT (Krailing/Munich)
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WNACA

No. 322	UB5DW (Kiev)
323	DL3RK (Kaufbeura)
324	DL11P (Schleswig)
325	G3IFB (Harrow, Middx.)
326	G3FPK (London, E.10)
327	YO2BU (Bucharest)
328	DJ5JM (Pivilsheide)
329	G3BWW (West Wickham, Kent)
330	G31LS (Birmingham)
331	DJ3GJ (Oberhochstadt/Taanus)

Overseas claimants should send either (a) A check list, without cards, duly certified by the Hq. of their National Radio Society, or (b) An uncertified check list, from which any or all cards may be called in for scrutiny by us. U.K. claimants must send the relevant cards for each award.

All claimants must include sufficient return postage for the cards and Certificate — five IRC's in the case of overseas claims.

gets FBA No. 252 and also WBC No. 296 . . . The FBA claim (No. 250) from the Hungarian club station HA5KFR covers contacts in the bands 3-5-21 mc, their only country outside Europe being the U.S. . . . W3RZL, awarded FBA No. 255, used the 10-15-20-40 metre bands, and so has taken some years to establish his claim . . . UA2AB, for FBA No. 257, found all his 20 countries inside Europe . . . W5WZQ used 7-28 mc for his FBA No. 261 ; he shows a most varied 10-metre list, with ZB2AD worked on all four bands . . . Similarly, it is interesting to see that club station OK2KJU worked G13IVJ on all four bands 3-5-21 mc as one of the 20C for their FBA No. 264 ; it was done over the two days November 25/26, 1961 . . . YO2BU, for FBA No. 265, includes four different EI's in the bands 7-28 mc, the period covering October, 1949, to July, 1960 . . . SP6AAT worked both UA6LI and UNIAH on all four bands 3-5-21 mc for two of the 20C for his FBA No. 267 ; he also shows W10GU worked on three bands.

In the WABC series, G3RBP with No. 288 is the first of the G3R's to gain this certificate. No. 291 is awarded to G2AHP, who will be well remembered by many Home Counties VHF operators as having at one time been very active on two metres—he probably has enough counties on that band to make a VHF/WABC ! When you look at the QTH of GW3OJB, WABC No. 293, you realise that he is one of the most westerly G's on Top Band.

Of the ten WNACA's sent out this time, only four go to U.K. stations. And of the 19 WBC's in the present list, five go to British operators. As regards U.K. activity as seen from the point of view of those

who have claimed WBC for this batch, it is interesting to find that GD is represented in nearly all lists, whereas GC appears comparatively infrequently ; the other U.K. prefixes are mentioned in them all.

Finally, we would once again draw the attention of those overseas operators and authorities who are interested in our Certificates to the fact that we do *not* require packets of cards in support of claims—the procedure is to ask to see certain cards selected at random from the check list, and this only applies in the case of uncertified claims. There is thus a safeguard against possible loss of cards, and a considerable saving in postage charges and handling time. So far as we are concerned, bundles of cards with Certificate claims are an embarrassment to the point of being a nuisance, and this has been said often enough—yet at least half the overseas claims we receive are still accompanied by cards.

SPECIAL-ACTIVITY STATIONS

We shall be glad to have details for publication, under this heading, covering radio amateur stations to be established for some special purpose or event involving the general public—such as exhibitions, fêtes, appearances in the local town hall, agricultural shows and similar engagements. Special call signs can usually be obtained, issued for the period of the event, and the information we want for publication is a note of the occasion, the date, the call to be used, the bands to be worked, the individual or Club responsible for the installation of the station, and the QTH for QSL's.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for April Issue: March 15)

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

IF it were possible to obtain the statistics, it would be immensely interesting to find out just how many newly-licensed amateurs managed to pass their R.A.E. and Morse test *without* belonging to their local club. We would hazard a guess that the proportion must be very small indeed. It seems to us that it is *essential*, these days, for the keen youngster to avail himself of this means of getting in touch with others, listening to talks, joining in ragchews, and absorbing the general "feel" of Amateur Radio through the club movement.

Frequently the editorial department, or one of our contributors, receives a letter from a reader which can *only* be answered in the words "Join your local club and ask some of the active members about it." These letters are usually from someone who has read a constructional article and then wants to know "Where can I get OA79 diodes?" or "What is a swinging choke?" or "Can I use another make of 10 μ F condenser?" or (most often) "Can you advise me about getting a transmitting licence?" The simple questions are always the most difficult to answer, because they arise from total ignorance! This is not the questioner's fault, but the process of enlightening him by correspondence would be difficult and laborious, and even after that it is obvious that he would be in trouble from sheer lack of knowledge on the practical side. So—off to the club and learn something, and we might justifiably add, "the *easy* way."

If you want to get ahead—join a Club!

Edgware, at their recent AGM, elected G4KD president, G3BZG chairman and G3VW secretary. They get together on the second and fourth Monday at the John Keble Hall, Church Close, Deans Lane, Edgware; on March 11 there will be a talk on D/F.

Lincoln are now meeting on the first Monday of the month, in Room 19 of the Technical College; the AGM will be held on March 6, and all members are specially asked to attend; their Annual Rally and AGM has been fixed for September 15.

Lothians, who meet in the YMCA, 14 South St. Andrew Street, Edinburgh, will be hearing about The History of Automobile Communications (Mr. Russell) on March 14, and Electronics (GM3OWI and GM3LCP) on the 28th; for April 11 the subject is Ancient Radio at Sea (GM3OWI).

Barnet will gather on March 26 to hear G3HRH

on "A Survey of VHF during the Past Decade"; at their April meeting, on the 30th, G3DZW will be talking on Home-Constructed SSB Gear. **Barnsley** report a highly successful Annual Dinner, with an attendance of 60; it was most unfortunate that the bad weather and illness kept their president, G2BH, away, as this was the first such occasion he has missed since the club was formed *fifty years ago*. However, in the autumn they are holding another dinner to celebrate their jubilee, as well as various other events throughout the year.

Civil Service will meet (at the Science Museum) on March 5 for a lecture on The AA Communications Network. Their AGM and Handicrafts Exhibition will be held on April 2; and March 19 is the date of their informal meeting, with GB2SM and a tape recorder available to members.

Midland will be at the Birmingham and Midland Institute on March 19 and April 16—on both dates at 7.30 p.m. **Mitcham** are due to meet on March 1 (publication day) for a talk by G3NFV on The Joystick.

Morecambe have a Film Show on March 6, and on April 3 they will be paying a visit to some local works (details to be announced later). May 1st is the date of their AGM. **Northern Heights** have a Junk Sale on March 13; and on the 27th they will hear a talk by Mr. L. Dougherty of the Halifax Technical College; the AGM is on April 10.

Portsmouth held their AGM, electing a new committee and several new officers; at their next meeting they will be arranging the year's programme. See panel for new secretary's QTH.

Rotherham held their AGM at the new clubroom—the Temperance Hall, Wellgate, Rotherham—and elected a fresh committee and secretary (see panel for QTH). A full programme is being arranged, including operation of the club Tx, G3OAM, and R.A.E. instruction and Morse will be available for those who require them; meetings will be on alternate Fridays (March 1, 15 and 29).

Scarborough also had an AGM, electing G5VO president, G3JTG chairman and G8KU secretary; a full weekly programme is being drawn up for some time ahead, with meetings on Thursdays, 7.30 p.m. at Chapman's Yard, Waterhouse Lane, North Street.

Slade gather for a Mullard Film Show on Friday, March 8, and this meeting will be at 7.45 p.m. in the Great Hall of the Birming-

ham and Midland Institute; on March 22, at their own club-room, G3JZF will give Part V of his series on Radio Fundamentals. **Spenn Valley** will be hearing about Direction Finding on March 7, and on the 21st they will visit Messrs. Ultrasonics, High Street, Yeadon. **Wessex** will have a talk on Electronics (National Radio Co., Bournemouth) at 8 p.m. on March 4; on April 1 their secretary will give a Film Show and Lecture on The Steam Locomotive.

West Kent are booked for a Film Show on March 8 and an Informal Evening on the 22nd, both at their Hq. at Culverden House, St. John's, Tunbridge Wells. **Clifton** will be hearing G3NWF on Transistor Transmitters on March 15, and on April 5 they have arranged a Quiz, to be conducted by G3OGE. Several members are building 80-metre receivers for this year's series of D/F Contests. **Crystal Palace** hold Round 1 of their inter-Club Quiz with Clifton on March 16—on the home ground. Round 2, away, will be on April 5.

Derby have their AGM on February 6, and their annual dinner on the 16th. March 6 is booked for a Junk Sale; the 13th for a talk on Car Radio Interference Problems (G3FOP). March 20 is an Open Evening, and the 27th is the occasion of a Hot-Pot Supper. All meetings at 7.30 p.m. in Room No. 4, 119 Green Lane, Derby.

Halifax have a "Queries Night" on March 5, and their annual dinner is booked for April 2; they meet on the first Tuesday, 7.30 p.m. at the Beehive and Crosskeys Inn, King Cross Street. **Kingston** had a talk on SSB on February 7, and another talk by a member on the 21st. Following activities are not definite as yet, but meetings are at 7.45 p.m. at the YMCA, Eden Street, Kingston. **Nottingham** will be meeting on Tuesdays and Thursdays (7.30 p.m.) at the Sherwood Community Centre, Woodthorpe House. New members are always welcome, but they are advised to turn up on a Tuesday. Junk is sold, and even given away to the younger members; raffles and free "surprise parcels" are also organised.

Plymouth report a very successful annual dinner, with an attendance of 57 despite the weather conditions; for March 5 they have organised an event with slides and tape recordings called "Round the Ham Shacks". **Reading** held their AGM, electing G5TP chairman and G3EJA secretary. They reported an increase in membership, necessitating the use of a larger room for future meetings, which will still be held on the last Saturday of the month; the March meeting will be devoted to Contest and Field Day arrangements, and the new Club Tx will be on view.



Station of the Dartmouth Royal Naval College Radio Club, from where they now sign G6VJ. Back in the old 45-metre days, it used to be BVJ, when the R.N.C. had a regular Naval shore-station callsign. Their present equipment includes a B.40 (R.N. type) receiver, with a modified TGS transmitter into a 300 ft. aerial. A Heathkit DX-100U has recently been installed to extend scope. On the right is G3NBR, who stands in for the G6VJ licence.

Peterborough organised a film show at the Technical College on February 1, when members invited their YL's and XYL's. Planned for next month are visits to the local electricity generating station, and the British Radio Relay TV station. **WAMRAC** give details of their net, which is on 3600 kc or thereabouts—Tuesdays and Sundays at 1900 GMT, and Saturdays 0900 GMT. They also plan to hold an Activity Week-End, May 24-26.

Acton, Brentford and Chiswick, at their AGM, elected G3IGM chairman, G6RC vice-chairman and G3GEH secretary; next meeting, March 19 at the AEU Club, 66 High Road, Chiswick. **Chesham** report that training still dominates their activities, and a 14-year-old member recently passed his R.A.E. The following schedule is now operating: Tuesday, 7.30 p.m., Practical Work at the Radio Station, Chesham; Wednesday, 7.30 p.m., Morse (all speeds) at the Community Centre, Amersham-on-the-Hill; Friday, 7.30 p.m., R.A.E. Theory (Telephone Chesham 213); and Sunday, 10.30 a.m., Operational activity at the Radio Station.

Dorking are re-applying for their old call G3CZU, for use during contests and local activities; they have been invited to take part in a local Hobbies Exhibition, and are also holding a Junk Sale on March 26 at the Star and Garter, Dorking. Meetings are on the second and fourth Tuesdays, the net, Fridays, 1910 kc, 9 p.m.

Greenford have arranged March 15 and 29 for a talk and demonstration on Closed Circuit TV, by G3MMQ; April 26 is the date of the Construction Contest; G3OZY's sterling work in preparing

members for the R.A.E. has borne fruit in two new calls—G3RHM and G3RRK.

Hull held their AGM on January 29, and elected a new secretary (see panel for QTH). **Liverpool** have a Junk Sale for March 5, a Film Show for the 12th, a talk on Third Method SSB (G3PLX) on the 19th and an Open Discussion on the 26th—all at St. David's Mission Hall, Queen's Drive, Childwall, Liverpool, at 8 p.m.

Newbury have had to cancel their last two meetings, since their members come from rather a wide area and the weather made travelling impossible. On March 29 they are holding their AGM at 7.30 p.m. in the canteen of Elliotts of Newbury Ltd., West Street. As their secretary, G3JTK, recently departed for East Africa with his family, the former secretary, G3LLK, is now filling the gap for the time being (see panel for QTH).

Reigate held their AGM in January, with 24 out of 41 members attending. Their chairman is Mr. C. T. Cowan, and secretary as before, G3NKT. A week later their annual dinner and dance was held—another successful function. On March 16 they will be meeting to hear G3HGE on Withers VHF Equipment.

South Manchester announce Activity Nights on March 8 and 22; "More on AC Theory," by

G3HZM, on March 15; and the Hot-Pot Supper on March 29. The latter will be held at "The Swan with Two Necks," Wither Grove, Manchester, and tickets are available from the organiser, G3KIQ, or from G3MAX. **Wirral** report good attendances despite appalling weather conditions. On March 6, G3ERB and Mr. H. G. Shaw will take part in a discussion on The DX Bands; and on the 20th the subject will be Direction Finding.

Caithness held their AGM on January 29 and elected a new committee and officers. GM3GUJ is the new president, and GM3NQB secretary-treasurer. Meetings are on the second Tuesday from now on. A Club Tx is planned, and it is hoped to have it operating later this year.

Coventry continue their Monday meetings; on March 4 the subject is "Ham-Hop Holiday," by G3CZS, and on the 25th Mobile Operation, by G3NAP. March 11 is a night-on-the-air for G2ASF, the Club station, and the 18th a Junior Quiz Night.

Crawley have recently had a lecture from G3GVV on Unusual Radio Equipment; the main March meeting will be on the 27th, when G3FRV will be lecturing on SSB. **Flintshire**, at the AGM, elected GW3JGA/T chairman and Mr. A. Antley secretary (see panel for QTH). Meetings continue—last Monday of the month at the Railway Hotel, Prestatyn. On

Names and Addresses of Club Secretaries reporting in this issue :

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, W.3.
 AINSDALE: Dr. J. C. Craig, G3LMD, 352 Liverpool Road, Southport.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 79 Murchison Road, Leyton, London, E.10.
 BARNET: F. Green, G3GMY, 48 Borough Way, Potters Bar.
 BARNSELY: P. Carbutt, G2AFV, 19 Warner Road, Barnsley.
 CAITHNESS: W. Hardie, GM3NQB, 24 Brownhill Road, Thurso.
 CHESHAM: Capt. C. G. Stephenson, G3CLJ, 21 Lynton Road, Chesham.
 CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley.
 CLIFTON: E. Godsmark, G3IWL, 211 Manwood Road, London, S.E.4.
 COVENTRY: A. J. Wilkes, G3PQQ, 141 Overslade Crescent, Coundon, Coventry.
 CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
 DORKING: J. Greenwell, G3AEZ, Eastfield, Henfold Hill, Beare Green, Dorking.
 EDGWARE: R. H. Newland, G3VW, 10 Holmstall Avenue, Edgware.
 ENFIELD: R. Langston, 54 Poynter Road, Bush Hill Park, Enfield.
 FLINTSHIRE: A. Antley, Fairfield, Fairfield Avenue, Rhyl.
 GREENFORD: E. Gray, G3CPS, 111 Ravenor Park Road, Greenford.
 GRIMSBY: B. Walster, 47 Richard Street, Grimsby.
 GUILDFORD: D. Hobden, 121 Great Goodwin Drive, Guildford.
 HALIFAX: J. Ingham, G3RMQ, Lambert House, Greetland, Halifax.
 HARROW: A. C. W. Biddell, G3GNM, 114 Hingshill Avenue, Kenton.
 HULL: B. W. Woodfield, G3REL, 26 Endike Road, Beverley High Road, Hull.
 KINGSTON: A. G. Wheeler, G3RHF, 22 Meadow Road, Ashford, Middx.
 LINCOLN: Mrs. F. E. Woolley, G3LWY, 10 Sturton Road, Saxilby, Lincoln.
 LOTHIAN: T. Simpson, GM3BCD, 118 Braid Road, Edinburgh 10.
 MAIDSTONE: E. J. Bonner, G8LZ, 9 Allington Way, Maidstone.
 MIDLAND: C. J. Haycock, G3JDJ, 360 Portland Road, Birmingham 17.
 MID-WARWICKSHIRE: T. Inkester, 13 Dormer Place, Leamington Spa.
 MITCHAM: B. Blanford, 1 Biggin Avenue, Mitcham.
 MORECAMBE: K. J. Singleton, G3NLM, 8 Westmoor Grove, Heysham.
 NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Crookham Common, Newbury (acting).
 NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogdon, Halifax.
 NOTTINGHAM: F. White, G3JFW, 82 Nottingham Road, Hucknall, Nottingham.
 PADDINGTON: B. R. Timms, G3MLE, 7 Nottingham Street, London, W.1.
 PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
 PORTSMOUTH: H. Woodman, G3ORR, 71 Gladstone Street, Mile End, Portsmouth.
 PLYMOUTH: R. Hooper, 2 Chestnut Road, Peverell, Plymouth.
 PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
 R.A.I.B.C.: Mrs. F. E. Woolley, G3LWY, 10 Sturton Road, Saxilby, Lincoln (acting).
 READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
 REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
 ROTHERHAM: M. Parkin, 51 Far Lane, Rotherham.
 SCARBOROUGH: P. Briscoe, G8KU, Roseacre, Irton, Scarborough.
 SLADE: D. D. S. Williams, 117 The Boulevard, Wyld Green, Sutton Coldfield.
 SOUTHGATE: K. Spicer, G3RPB, 22 Clifton Avenue, London, N.3.
 SOUTH HANTS: P. A. L. Shoosmith, G3MDH, 7 Fairfield Close, Hythe, Southampton.
 SOUTH MANCHESTER: M. Barnsley, G3HZM, 11 Cemetery Road, Denton, Manchester.
 SPEN VALLEY: L. A. Metcalfe, 1a Moorlands Road, Birkenshaw (acting).
 THAMES VALLEY: K. Rogers, G3AIU, 21 Links Road, Epsom.
 W.A.M.R.A.C.: Rev. A. Shepherd, G3NGF, 121 Main Street, Asfordby, Melton Mowbray.
 WESSEX: G. J. Fowle, 138 Surrey Road, Branksome, Poole.
 WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
 WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Behington.
 YEOVIL: D. McLean, G3NOF, 9 Cedar Grove, Yeovil.

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of the following Club Publications: **Crystal Palace** (*Newsletter*, Nos. 86 and 87); **Enfield** (*Lea Valley Reflector*, January); **Mitcham** (*Newsletter*, February); **RAIBC** (*Raial*, January); **West Kent** (*QLF*, January); **Derby** (*Newsletter*, No. 1, 1963); **WAMRAC** (*Circular Letter*, No. 27); **Reigate** (*Feedback*, January); **Guildford** (*Natter*, No. 1, 1963); **South Hants** (*QUA*, February); **Wirral** (*News Letter*, Vol. 16, No. 3); **Slade** (*Contact*, January); **Southgate** (*Newsletter*, February); **Plymouth** (*QUA*, August-January); and **ARMS** (*Mobile News*, January).

March 25 there will be slow Morse at 7.30 p.m., Simple Hints and Kinks, by GW3PCZ/T at 8 p.m., and Fault Finding, by GW3JGA/T at 8.30 p.m.

Grimsby will be holding an "Old-Fashioned Hamfest" on May 12, at the Birds' Nest Café, Boating Lake, Cleethorpes—assembly at 2 p.m. Tickets, 10s., obtainable from the secretary. **Guildford** will be meeting on March 14 and 29 at the City Café, Onslow Street, Guildford.

Harrow hold a Junk Sale on March 15, and on the 29th G3HBR will talk on Portable and Mobile operation. G2TA is coaching R.A.E. candidates every Friday evening at 7.30 p.m. All meetings at Roxeth Manor School, Eastcote Lane, South Harrow.

Paddington, meeting every Wednesday, announce the following: March 6, Any Questions; March 13, Activity Night; March 20, Lecture by G3MLE; March 27, Construction Night. CW classes are held before the main item at each meeting.

South Yorkshire have moved to new premises, and now meet in the Lord Nelson, Printing Office Street, every Thursday at 8 p.m. (in the upstairs clubroom). The programme for the coming months has not yet been fixed.

Ainsdale, at their AGM, elected G2CUZ chairman and G3LMD secretary; life membership was bestowed on G3LWQ as a token of appreciation for his services, particularly with Morse tuition. Meetings are on alternate Wednesdays, 8 p.m. at 37 Hawthorne Grove, Southport, and on March 6 G3LMD will talk on Amateur Radio in Newfoundland.

Mid-Warwickshire, after their AGM, have started an R.A.E. course, which will run at the College of Further Education, Leamington Spa. Club nights will now be alternate Mondays at 8 p.m.

Purley meet on March 1 (G3OST on Communications Receivers) and March 15 (Junk Sale); both meetings at the Railwaymen's Hall, Whytecliffe Road. **Thames Valley**, at their February meeting, heard G2NH give a talk on the subject of SSB Developments, which was followed by a lively discussion. The TVARTS Top-Band Net is being re-started, on the third Wednesday of the month at 9.30 p.m.

Yeovil have heard Tape Lectures on the subjects of Transistors and Music Concrete. Their Tx. G3CMH, is on the air on Wednesdays, Phone and CW, Top Band from 8 p.m. onwards. Future activity includes a visit to a Forward Scatter Radio Station (date to be announced); this should be very interesting.

At **Maidstone** they are forming an Amateur Radio Society, and the inaugural meeting was held on February 6; a committee was elected to make plans, and there is another meeting on March 6 (YMCA Institute, Union Street, Maidstone, 7.30 p.m.) for the election of officers and to reach decisions about future meeting arrangements. All in the district interested in Amateur Radio are asked to get in touch either with G3ERY or G8LZ (*see* panel). We wish this venture success and hope to hear of further progress in due course.

WOULD YOU HAVE KNOWN?

If somebody asked you off the cuff, "What is a fathometer?" could you have said that it is the American term for what has always been known as an echo-sounder? Nowadays, they are fitted to marine craft of every description, are transistorised, and work on the broad principle of radiating pulses from some point beneath the water-line; these are reflected back from the sea-bed, submerged objects, shoals of fish, or whatever, and the time taken for the pulse to return can be expressed as a distance (or depth), and displayed on a dial as so-many feet (or fathoms).

THE BASIC FACTS

For those feeling the need for a handy reference containing tables, design data and formulæ relating to radio and electronic equipment—with particular emphasis on Amateur Radio and the practical information required by amateurs—we can recommend a new R.S.G.B. publication called *Radio Data Reference Book*. Compiled by G6JP, in its 130 pages it gives just the range of information required, and is adequately indexed. *Radio Data Reference Book* costs 13s. 3d. post free, and is obtainable through our Publications Dept., from stock.



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EXECUTIVE AIR ENGINEERING offer crystal checking with Marconi Digital Counter for 5s. each. **FOR SALE:** Hallicrafters SX43, £25, BC-221 with power supply, accurate, £12. Marconi TF1152 transmitter output meter, 50 ohms, 25 watts 500 mc, £15. Furzehill BFO, £15. R.209 Mk. II, 12v., £12. BC-348, £12/£15. TU units, £1. Crystals of all types.—(Apply: Toll Bar 2439, Coventry.)

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COMMAND Rx BC-946B required, reasonable price, condition—or just RF coil set and IF coils from it might suit.—Hosking, Braeside, Melton Mowbray, Leics.

FOR SALE: Hammarlund HQ-180E Rx, virtually new, £120.—Box No. 2750, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: HRO-MX, mint condition, 9 GC coils, S power pack, speaker, £21 o.n.o.? R.1155L, 200 kc-19 mc inclusive, excellent condition, power pack, output stage, speaker, £12 o.n.o.? Carriage extra.—T. Eyre, 22 Bents Drive, Sheffield.

FOR SALE: Hallicrafters 101A Rx, new condition, £110.—Box No. 2751, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: CR-100 £8, and R.107 £7.—McClellan, 18 Dickens Drive, Basildon, Essex. (Phone: Laindon 3284.)

WANTED URGENTLY: Manual or circuit for CR-100, loan or purchase.—G3MKU, 22 The Fairway, Keyworth, Notts.

SALE: Eddystone S.640, good condition, £16. TCS Rx, 1.5 mc to 12 mc, with complete set of 12v. and 6v. valves, £5. PSU for TCS, £2. Mosley V-3 Jr. Antenna, £4. Unused mains transformer for Eddystone S.640, £2. Prefer buyer collects.—G3OCY, 56 Lumley Crescent, Ferryhill, Co. Durham. (FH 311.)

COMPLETE STATION in full working order. CW and phone, all bands 10 to 160 metres, Rx G.E.C. BRT-400 with matched phones and speaker; Tx Panda Cub, with xtal mike, key and low-pass filter; Minimitter amateur band converter; operating desk 7 ft. x 3 ft., cupboards and drawer; wired complete, 6 power points to master safety switch. Delivery arranged. £125 or best offer.—GW3OJB, 42 Front Street, Pembroke Dock, Pems.

TWO-METRE CONVERTERS: One, crystal controlled, 1F output 14.7-16.7 mc, £8; another, SEO, output 24-26 mc, £6. Both have in-built power units.—Jeapes, 165 Cambridge Road, Great Shelford, Cambridge.

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SALE: S.640, good cond., no mods., perfect order, £20 o.n.o.? 870A, brand new, £20.—G4OK, Flat 1, 19/21 Church Street, Wath-on-Deerne, Nr. Rotherham, Yorks.

RF METERS, ½ amp. 2½ in. sq., new condition tested, 9s. 6d. each, post paid; two for 18s.—Price, G3MTQ, 69 Pershore Road, Birmingham, 5.

WANTED (buy or borrow): *Short Wave Magazines* April 1960, March 1961, August 1962.—Farman, 6 Ash Grove, Enfield, Middx.

SALE: Mullard 4 in. Oscilloscope, GM3156 with instruction/circuit/spec. book, full external facilities, amplifier sensitivity 1 mV RSM/Cm., Time-base range 0.25-2000 c/s. Photo, details, s.a.e. Deliver 50 miles B'Ham, £35 o.n.o.?—Box No. 2752, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

CRYSTALS WANTED for G2DAF Receiver. Eddystone 740, offers? Exchanges considered.—GW3KYT, 101 Penrhyn Avenue, Rhos-on-Sea, Denbighshire.

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SALE: R.1155B. good working order. complete with speaker/power unit. D/F immobilised, £8. R.308, in working order, £6. Buyer collects.—M. Simpson, 21A Upper Richmond Road, Putney, London, S.W.15.

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FOR SALE: Hallicrafters S-38E Receiver in perfect working order. adapted for 240 volts, £10.—Henry, 12 Church Road, Cadoxton, Neath, Glam.

"FRED." operator of ex B5J and 6V, wishes to correspond with anyone who has worked or heard him.—Box No. 2756, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Eddystone 358X Rx, all coils 40 kc-31 mc, xtal filter, internal PSU and ANL, good condition, £14. Also 3 in. 'scope (Mawse *Short Wave Magazine*, April 1958), £3 10s. Carriage by arrangement.—G3PTB, 6 Winders Lane, Histon, Cambs.

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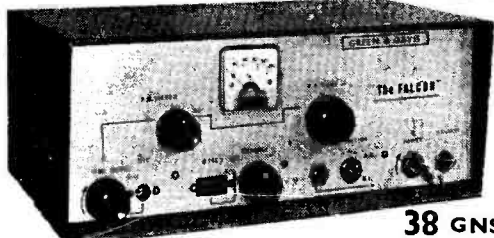
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WANTED: Command Top Band Tx; Vibroplex or similar key; R.209 with original phones, all items in working order; all letters answered.—Gillham, 33 Masefield Avenue, Southall, Middx.

50 WATT Tx and modulator, Top Band to Ten, power and relay supplies, in two cabinets, £40. Buyer collects.—G2BNZ, 29 Rumworth Street, Bolton, Lancs.

PANDA CUB Tx, £22 10s. CR-100 (broken dial cord), £10. R.209 Rx, 1-21 mc, 12v., AM/CW/FM, £12. R.209 front-end, £3 10s. Home-brew 160m. Tx, with heavy duty rotary PS, 12v., high-level mod. and all caoles, £10. All good, plus carriage, or £50 lot.—G3MAD, 70 Arnold Road, Binstead, I.O.W. (Ryde 3231.)

EDDYSTONE 888A and S-meter, grey finish, in mint condition, price £65; carriage extra.—Haestier, 39 Wilver Road, Newport, I.O.W.

EDDYSTONE 750 Receiver, works maintained, really good condition, 50 kc intermediate frequency (for increased selectivity), otherwise standard, £40.—Box No. 2757, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TX 750 watts CW, 300 watts phone, VOX, two VFO exciters, PA pair 813, pi-output, with PSU 2150v. 500mA, 525v., 450v., 385v. stabilised, 425v. neg. and heaters. Unused, unmodified, manuals, spares, ideal conversion 400-watt SSB rig. Buyer collects (3 cwt.), best offer over £20 accepted. Host other gear, state wants.—G3IWR, 108 Old Oak Road, Acton, W.3. (SHE 3955.)

SALE: Labgear Topbander Mark II, plate and screen modulation, used for 60 QSO's since purchase, £18, plus half carriage; send £1, any balance returned.—Box No. 2758, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: HRO Senior, 9 coils (three BS), PSU. Manual, good condition, £18 o.n.o.? Buyer collects. Taylor Sig. Gen. 100 kc-160 mc, mint condition, £7. 100 kc Crystal Marker (*Wireless World*, Dec. '60) with PSU, £3.—Bagnall, 12 The Crescent, Donnington, Wellington, Shropshire.

FOR SALE: HRO-MX, 8 coils, bandspread 80, 20, 15, 10 metres, PSU, loudspeaker, £20. AVO 7 with case, £10; both in excellent condition; buyer collects. Call after 7 p.m.—L. Hogan, 42 Chepstow Road, London, W.2.

L.G.50 Tx For Sale, 80 to 10 metres, 60 watts CW. As new, for quick sale, £28; to view apply—Box No. 2759, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

OWNER EMIGRATED: Offers for Avometer 8. Advance P1 signal generator, Roneo 250 Duplicate, 34 *Practical Wireless*, 26 *CQ's*, 56 *R.S.G.B. Bulletins*. Consider exchange for FB Rx (Scotland).—Box No. 2760, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 840C, perfect condition, as new, one year old but very little used, £40. Collected Middlesex.—Box No. 2761, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: K.W. "Valiant," less PSU, preferably with 160m., must be in perfect condition, or an undamaged kit.—Details and price to: Shepherd, 3 Cearn Way, Coulsdon, Surrey.

SALE: HEATHKIT GDO, GD-1U, £9.—Stancey, 61 Astley Lane, Swillington, Leeds.

SMALL ADVERTISEMENTS, READERS—*continued*

URGENTLY REQUIRED: Hallicrafters HT11/HT11A or any Marine Radio Telephone, any condition considered, exchange or cash.—Cain, 18 Oaky Balks, Alnwick, Northumberland.

SALE: Oscilloscope Model 1200B and Wobbulator, £14 o.n.o.? SW receiver R.109A, as new, £7. P.24A receiver, £5. AN/APN/1 receiver, £5.—Forgan, Cherry Lane, Lymm, Cheshire.

BC-348 BANDSPREAD 40, 20, 15 metres, 1.5-6.0 mc. L.W. with manual, £10. CR-150 double superhet. 1.9-60 mc. £20 o.n.o.?—G3IAG, 22 Ely Road, Littleport, Cambs.

HEATHKIT MOHICAN, good condition, with instruction book, offers or exchange SSB equipment with cash adjustment.—Fare, 4 Dial Street, Warrington (Phone: 31127).

AR 88D, IMMACULATE, unmodified, £30, prefer buyer collects.—Pain, 58 Durnsford Road, Bounds Green, London, N.11 (Tel.: Bowes Park 1355).

K.W. "VANGUARD" 10-160 metres, in mint condition, as new, few hours use only; latest style of cabinet; delivery can be arranged; £42 10s.—G3BJN, 14 St. Winifred's Road, Harrogate (Tel.: 83492).

FOR SALE: Cossor 1035 double beam Oscilloscope, in perfect condition, overhauled and recalibrated October 1962, £42, or exchange, what-have-you?—G3KPF, 100 Evelyn Road, Dunstable, Beds. (Tel.: Dunstable 63749).

AR 88 WANTED: Preferably type "D," reasonable price; state condition, price, etc. Sale: PCRI receiver, built-in PSU and speaker, £5.—Green, 50 East View, Barnet, Herts. (BAR 5106).

SSB MOBILE RIG (Collins mechanical filter), £60. SAVO Model 7 (requires attention), £4. Transistor Tape Recorder, £12. VHF Frequency Meter, £6. Pair 811A GG Linear Amplifier (new valves), £15.—G2MF, 51 Townhead Road, Dore, Sheffield.

TWO 19 SETS Mk. III, £3 each. Wavemeter Type W.191A, 130 kc-20 mc, with charts, £3 10s. Crystal Calibrator No. 10, non-working, £1. R.107 RF Unit, less valves, £1. Mains PU for 19 Set receiver, 30s. Will exchange AR88D and S27, both in excellent order, for 888A, 888 or 680X. Please call and inspect.—Hardcastle, Rigton Grange, East Keswick, Leeds. (Tel. Rigton Hill 205.)

BARGAINS GALORE: Complete mobile station including Minimitter Tx, PSU, relay switch unit and Pye modified car radio Rx covering MW and Top Band, 80/20/15/10 metres, £30. Would sell Rx separately. Table-top Tx, Geloso VFO, 807 PA, mod. pair 6L6's, working but requires finishing touches, £10. BC-342 Rx, gift at £8 10s. Carriage extra, or cash-and-carry.—D. Gordon Spencer, Paladyn, Lyons Hall Road, Braintree, Essex.

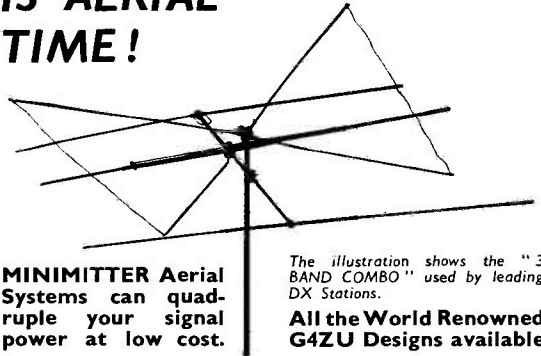
SALE: Home-built 144 mc receiver, 12 valves, requires completion, and PSU, £6. Receiver P.40 with PSU and handbook, £3. Xial Calibrator No. 10, mod. 1.5v. and 90v., £4.—Bowling, 103 Winkworth Road, Banstead, Surrey. (Burgh Heath 2107.)

SALE: Eddystone S.750 Receiver, reconditioned, price £48, buyer collects.—Johnston, Great Hallinebury, Bishops Stortford. (4785.)

AIRMEC C864 Rx in top condition, accurate continuous bandspread, 7 bands, 100 kc to 30 mc. manual, £75. Carriage by arrangement.—Berry, 12 Warwick Crescent, Harrogate, Yorks. (Tel. 3807.)

FOR SALE: BC-348 Receiver, complete with S-meter and converter unit, £12.—M. McVerry, 335 Deane Church Lane, Bolton, Lancashire.

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OSCILLOSCOPES, DUMONT, model 208 for 230 volts a.c., in good working order, £17/10/-, carriage £1. Two only.

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AERIAL TUNING UNITS. Rotary inductor, 6" dia., 45 turns will handle 100 watts, in case with turns counter, 10/-, carriage 7/6.

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AERIAL INSULATORS ribbed Pyrex glass 3", 9d. each, post 1/-, 6 or more free.

RECEIVER 48. American version of the 18 set. Covers 6 to 9 mc/s. 6 valves. B.F.O. R.F. stage. Power required L.T. 3v. at 150ma, H.T. 150v, at 8 ma. Complete with handbook, 42/6. Headphones to suit lightweight "Deaf Aid" type with lead and plug, 6/6. 10 spare valves in steel case, 10/-, partly stripped transmitter chassis, 10/-, 500 Microamp 2" meter, 9/6, 1000 kc/s. Crystal, 7/6. All above in new condition. Postage 2/6 per order.

VALVES: ARB, ARP12, ATP4, 1/-, post 9d. 6 or more free.

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REMOTE CONTROL UNIT. No. 1, made by R.C.A. Contains morse key, bell, hand generator, microphone and pair fine quality chamois padded headphones, low impedance, as new, 27/6, carriage 7/6.

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VALVES: EA50, EF50, 1/6. 6H6M, EB34, 6K7G, 2/-; 2X2, 688G, 12SC7M, EF36, EF50(S), 2/6. 6AL5, 6AM6, ARP12, AR8, EAC91, EB91, EF91, EL32, TT11, VP23, Z77, 3/-; 1L4, 6C4, 6J6, EF39, 3/6. 6AC7M, 6SN7GT, 1626, 1629, DC70, DF73, DL70, 4/-; 6AK5, 6J7G, 6ST7M, 12A6M, 12K7G, 12Q7G, 12SJ7M, 35Z4G, 959, EB3C3, 5/-; 3Q4, 6BH6, 6B16, 6F6M, 6K8G, 6SJ7M, 6SL7GT, 6X4, 5/6. 155, 1R5, 6AU6, 6/-; 12AU7, 12AT7, 80, KT33C, ECC81, ECC82, PY80, 6/6. 12AT6, 6L6G, 6V6G, 12AU6, 12BE6, 12CBM, 42, GTIC, PCF82, PY83, VR150/30, 7/6. 2A3, 6L7M, 12SQ7M, ECC84, EBF80, EAF42, 8/6. 3A5, 6K8M, 6L6M, PCC85, 9/-; 50L6GT, EM80, 5R4GY, 6Q7GT, EL84, 9/6. 12K8M, 836, EABC80, EC80, GZ32, VLS631, 10/-; 5763, 446A, ECH42, 10/6. 805, 3E29 (829B) 25/-; 4E27 (HK257B) 40/-; Post/packing 6d. per valve. Free over £3.

SPECIAL QUANTITY OFFERS!!!

EC80 (GGT, 12 m/a pv), 4 for 20/- (P/P 1/6); £20 per 100. 446A, 4 for 20/- (P/P 1/6); £20 per 100. EF91, EB91, 6AM6, 15/- doz. (P/P 2/6); £5 per 100.

AR88 cer. tub. trimmers, 4 for 6/-; AR88 smoothing chokes (10H 100 m/a), 3 for 21/-; 65/- doz. ET4336 Transformers, 190-250v. input, 10v. CT 10A, 2 1/2v. CT 10A twice, 35/- each; £16 per doz. Potted U.S.A. xfms. 230v. input; 32, 34, 36v. 2A output, 17/6.

MC METERS 3 1/2" rd.fl. (2 1/2" dial) 0-500 m/a, 12/6; £6 per doz. 0-15v. AC (MI Cal. at 50 cps), 12/6 each; £6 per doz. 2 1/2" rd.fl. (2" dial) 0-1 m/a, 22/6, 2" rd.fl. 0-500µ amps, 17/6. 0-30 m/a (5 m/a basic), 10/6. 2 1/2" rd. plug-in electrostatic 0-1500v., 16/6 each; £8 per doz.

B9A moulded valveholders and cans, 11/6 doz.; 75/- gross. Micalex ditto, 13/6 doz.; 90/- gross.

GEC Pyranol 10 mfd. 2Kv. condensers, oil filled, 27/6 each. 25 pfd. ceramic air spaced trimmers, 4 for 5/-; 14/- doz.

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GUNFIRE TIME SWITCHES 200-250v. 50 c/s, 20 amp contacts, 1 make 1 break every 24 hours, 65/- (2/6 p.p.)

EDDYSTONE RECEIVERS — FERROGRAPH TAPE RECORDERS — LEAK — QUAD — GOODMAN'S — WHARFEDALE, ETC. HI-FI EQUIPMENT. FINEST SELECTION IN THE COUNTY.

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SMALL ADVERTISEMENTS, READERS—continued

CO-AXIAL Relay, Londex 24v. DC, takes standard Belling Lee coax plugs, £3. Control Unit CU-310, mains input, reversible 24v. DC output, also 1000-cycle note. £3. Carriage extra. Minimitter X-array, £5, plus carriage. Audio filter (FL9 type) with plug. £1.—Bazley, Three Willows, Rushock, Nr. Droitwich, Worcs.

WANTED: Hammarlund HQ170 or Drake 2B, London or near; all letters answered.—Tomes, 9 Laitwood Road, Balham, London, S.W.12.

CONSET 10-80m. mobile Tx, 6 or 12 volt power supply, offered for Heathkit Mohican Rx or W.H.Y.? R.C.A. 200-250v. AC Panoramic Adaptor, offered for Heathkit Mohican Rx or W.H.Y.?—G3PPK, 2 Fairfield Road, Uxbridge, Middx.—Ring Uxbridge 36989 (night), or Hayes, Middx. 5033 (day).

COMPLETE STATION 160-10 metres, in console cabinet. Panda Cub and Filter; Eddystone 640. LS and phones; Class-D Wavemeter (mains); 15-metre beam and mast; other gear, bargain, £60.—G3ONQ, 21 Church Lane, Mt. Pellon, Halifax.

2-METRE commercial equipment: Cascade nuvistor 2 converter, £9 10s. 5-element Yagi 30s.; 8-element, 50s.; all brand new. BC-348Q, internal AC power pack, otherwise unmodified, excellent condition, £15 10s. Manual for N, P and Q models, 35s. Commercial general-coverage Rx, double S/H, 100 kc-30 mc, brand new with manual, £60. S.A.E. for details. New Command Rx's, unmodified, complete with dynamotor, 3-6 mc and 6-9 mc. 80s. each. 24-volt 10 amp. DC power supplies, AC mains input, new in transit case, £6 10s. R.1475 power pack, 30s. TCS 1F's, 3s. 6d. TCS speaker xformer, 6s. All items plus carriage.—Box No. 2762, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO OCTAL VALVES, 9 coils 21-14 and 3-5 mc bandsread, power pack, brand new 1962, £37; receiver and 6 GC coils only, £30. 34-ft. sectional mast, complete all guys, £5.—G2ABK, Hundleby, Spilsby, Lincs.

WANTED: Power Pack for B2 Tx/Rx, comprising 6-volt DC vibrator, with provision for mains, as used with the above set. Also RF meter, square 0-2.5 amp. first-class condition, please.—R. E. Hurst, 93 Meryley Ways, Wimborne, Dorset.

GREY TYPE 680X, wooden cabinet, speaker, £66. 840C, £38. Buyer collects. Essex. Handbooks CR-300, CR-100. 30s. each (send P.O.).—Box No. 2763, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HEATHKIT MOHICAN Rx for sale, excellent condition, £30 (plus carriage).—Smith, 31 Courtenays, Selby, Yorks.

EFFECTS OF The Late G3NME: HRO-MX, with PSU, 9 coils and matching speaker, £20. Two No. 19 Sets, Mk. II, with cables and p/packs, £4 each. Labgear Top Band Tx, £20. Heathkit R/C Bridge, assembled, £6. GDO, with LF coil and 0.5 mA meter, £1. Power pack, 620-0-620v. 200 mA, plus LT's and pair 5R4's, £5. Offers accepted for the following: Pullin Series 100 Testmeter, 10K o.p.v.; two APS-13 Rx's, complete; medium rating power pack, with 6X5, VR-150/30; two heavy-duty 1100-0-1100v. xfomers, with chokes; xformer 650-0-650v. 150 mA; pair PJ5 o/p valves; UM3 mod. xformer, perfect; Geloso 4/102 VFO, less valves, with dial assembly; numerous small items.—Apply P. West, G3JPN, 188 Warwick Road, Sparkhill, Birmingham, 11.

MANUAL for National NC-46 Receiver wanted, state price.—C. W. Swift, 13 Thropton Terrace, High Heaton, Newcastle-on-Tyne.

SMALL ADVERTISEMENTS, READERS—continued

100 KC Crystal Calibrator wanted.—T. E. Sloan, 5 Anne Street, Enniskillen, N. Ireland.
SALE: 888A with mounting blocks, mint cond., one owner, sensible offer, please? Compact mobile 160m. Tx, circuit as per *Short Wave Magazine*, August '62, s/m VFO, PA lock, mod. gain, mic. socket, PA meter, net, all front panel, less PSU, first-class job, £8.—A. Crook, 39 Tonge Park Avenue, Bolton, Lancs.

FACTORY-BUILT "Mohican" for sale, latest mods. including dial, £30 or nearest.—G3HCM, 321 Tile Hill Lane, Coventry. (Tel. 65548.)

JOHNSON "Viking Invader" SSB transmitter, 200 watts SSB/CW, 90 watts AM, as new, with auto-transformer; cost £285, offers around £175. Also many components, valves, etc. List from—G5RP, Old Gaol House, Abingdon, Berks. (Tel. Abingdon 380.)

GENUINE COLLECTOR requires all types of miniature or suitcase Tx/Rx—as were used by the Polish, French, Dutch Resistance—such as type A.1, A. Mk. II, BP5, Type 3/Mk. I S-Phone, etc. Also accessories, attachments, and handbooks relating to this type of equipment. Good price paid.—M. Gee, Whitehorse Lane, Stepney, London, E.1.

EDDYSTONE S.640 with matching S-meter and speaker, £20. Hamobile Mk. I 2m. Rx/Tx, 20-valve, Rx with ECC84 front-end, £30. 2m. converter (E88CC) with p/pack, £6.—Whateley, 16 Ellesmere Road, Oxford.

EDDYSTONE 680X and matching speaker in immaculate condition, performs as new, £60 o.n.o.? Delivered 30 miles.—G3LPY, 20 Bramley Road, London, N.14. (Barnet 3238.)

WANTED: Standing wave meter Heathkit AM2; also SB-10U and field strength meter. Full particulars and price to—Box No. 2764, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WIRE RECORDER, good condition, 30 or 60 min. play, dynamic mic., spare valves, 16 reels of wire. £10 o.n.o.?—G300Q, 14 Townsend Road, Tiddington, Stratford-on-Avon.

SUPER-PRO Power Supply, £7 10s. **WANTED:** Good receiver front end. The last word in hi-fi amplifiers, £60 or exchange receiver or transmitter similar value. Brown and blue Burmese kittens for sale. 8 gns. each.—Fletcher, 62 Moorbridge Lane, Stapleford, Notts. (Sandiacre 3446.)

WODEN Transformer, 1000-0-1000v. 250 mA, ex. cond., for AVO Multiminor, or W.H.Y.? Or reasonable offer.—Maxwell, 367 Gower Road, Killay, Swansea.

RECLAIMED TV VALVES and Spares. Example: Valves 2s. 6d., line transformer, 10s.; deflector coils. 12s. 6d.; frame blocking osc. and frame output. 5s.; turret tuners (new). Ch. 1 to 5 and 8 to 11, IF 34-38 mc (some 16-19.5 mc). Send your requirements, p./p. extra.—T. Wood, 23 George Avenue, Mile Oak, Tamworth, Staffs.

WANTED: Collins KWM1, KWM2, with DX Adaptor, or similar easily portable equipment.
FOR DISPOSAL: Heathkit "Apache" transmitter, SB10 adaptor (both works-constructed); Drake 2B receiver with multiplier; Eddystone 750 receiver; K.W. "Valiant" transmitter; KW76 receiver; Dependapac transistor power supply; K.W. AC power supply for "Valiant" and K.W. 76; Webster "Bandspanner" antenna with bumper mount; TH2 beam; G4ZU Minibeam. 10/15m., coaxial fed; CDR rotator and indicator. Offers please, sale or exchange.—Murray-Stone, 5N2AMS, 14 Lennox Gardens Mews, London, S.W.1.

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Frequency coverage 1.2 to 17.5 mc/s. on 3 bands. Operation A.C. mains or 12 volts. Built-in speaker. Offered brand new, £12/10/0. Carr. 3/-

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Type PCR.3. Requires external speaker. Covers 190-550 metres and 2-7 and 7-22 mc/s. As new condition, £8/8/-.
 All models carr. 7/6 extra. External plug-in power units, 35/- extra or internal power units, 39/6 extra, Circuits Supplied.

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Guaranteed perfect condition, with leads/batteries. Model 'D' 34 range, £8/19/6. Model '7' 50 range, £11. Registered post 5/- extra, either model.

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JEMCO 4,000 OHM/VOLT TESTMETER

Highly accurate and sensitive A.C./D.C. Testmeter. Resistance 0-3 megohm. A.C. volts, 0-1,000v. D.C. volts, 0-1,000v. Current, 0-500 mA. Brand new, guaranteed, with batteries, leads, instructions. S.A.E. for full details and other types. 59/6 Each. P/P 2/6.

PARMEKO TABLE TOP TRANSFORMER

Primary 230 volts. Secondary 620/550/375/0/375/550/620 volts, 250 mA. 5 volt, 3 amp, 5 volt, 3 amp. Boxed 29/6. Carr. 5/-.

AUTO TRANSFORMERS

Step up Step down: 110-230 volts. All types brand new. 15w., 9/-; 60w., 12/6; 150w., 18/6; 200w., 27/6; 300w., 42/6; 500w., 67/6; 1,000w., 99/6; 1,500w., £6/19/6; 3,000w., £7/10/-; 7,500w., £15. Carriage extra.

R.C.A. PLATE TRANSFORMER

Primary 200/250 volts. Secondary 2,000/1,500/0/1,500/2,000 volts, 500 mA. New, unused, £6/10/- Carr. £1.

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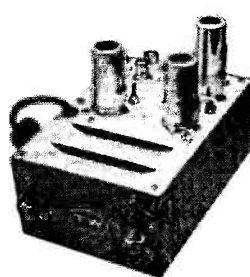
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 G3HGE Tel. Waltham Cross 26638 G3HGE

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: For short wave listener, grid-dip oscillator. Heathkit if possible.—G. Horsham, 42 Devonshire Road, Hornchurch, Essex. (*Hornchurch 41481.*)

150-WATT Labgear LG.300. modulator 807's with UM3; two power packs, aerial relay and spares, including five 813's. Delivery 60 miles or buyer collects. £35.—G3HCL, 15 Avon Road, Devizes, Wilts.

SELL OR TRADE: Tiger 200/HF transmitter, as new, £60 o.n.o.? **WANTED:** Good communications receiver, mobile and SSB gear.—GM3AKN, 4 Woodside Drive, Penicuik, Midlothian.

WANTED: Tiger 300 Tx, original model, give details; valves 7094, 811A. **FOR SALE:** T.W. 2-metre converter, unused, £8.—G3NZT, 794 Bury Road, Bolton, Lancs.

RTTY for sale. Complete RTTY station, 7B page printer complete with silent cover and AC motor, in mint condition; 2-speed governors and operating table; converter unit (W2AJV). 6S auto-transmitter, AC motor (2-speed governors) Mk. II Perforator modified AC. 80 + 80v. rectifier. K.W. "Viceroy" Mk. III, as new with mod. VFO for FSK, £230.—J. A. Steele, G3KZI, 12 Broadwalk, London, E.18.

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G3BXI TOWER

50ft. SELF-SUPPORTING. TILT OVER,
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All Steel Electric Arc Welded
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These Towers have two telescoping sections, winching up to 50 feet. At the top is a Rotator Mounting Platform for a C.D.R. or Prop Pitch Motor. The sections hinge on a 6ft. ground post with a winch to tilt the tower over to ground level for easy fixing and adjustment of Antenna.

Will support full size 3 Element, 20 Metre Beam or Tri Band Quad.

Price: Complete with Ground Post and two Winches.

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Demonstration Tower: Can be seen at my QTH.

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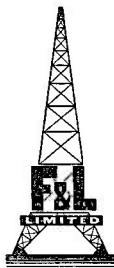
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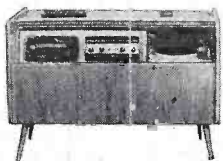
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