The SHORT WAVE Magazine

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VOL. XVI SEPTEMBER, 1958 NUMBER 7

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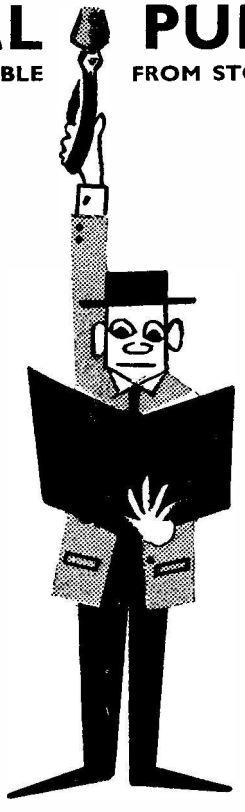

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The SHORT-WAVE Magazine

EDITORIAL

Pollution

During the recent "high-level exchanges" at the United Nations, there were several references to the radio jamming carried out, by both sides in different contexts, on the short-wave broadcast bands. Whatever may be the advantages of these tactics, to either side, what we in the radio world are certain of is their effect — the radiation of the dirtiest possible noises, which not only jam down the target transmission, but also pollute a wide range of frequencies (including the amateur bands) with vicious harmonics.

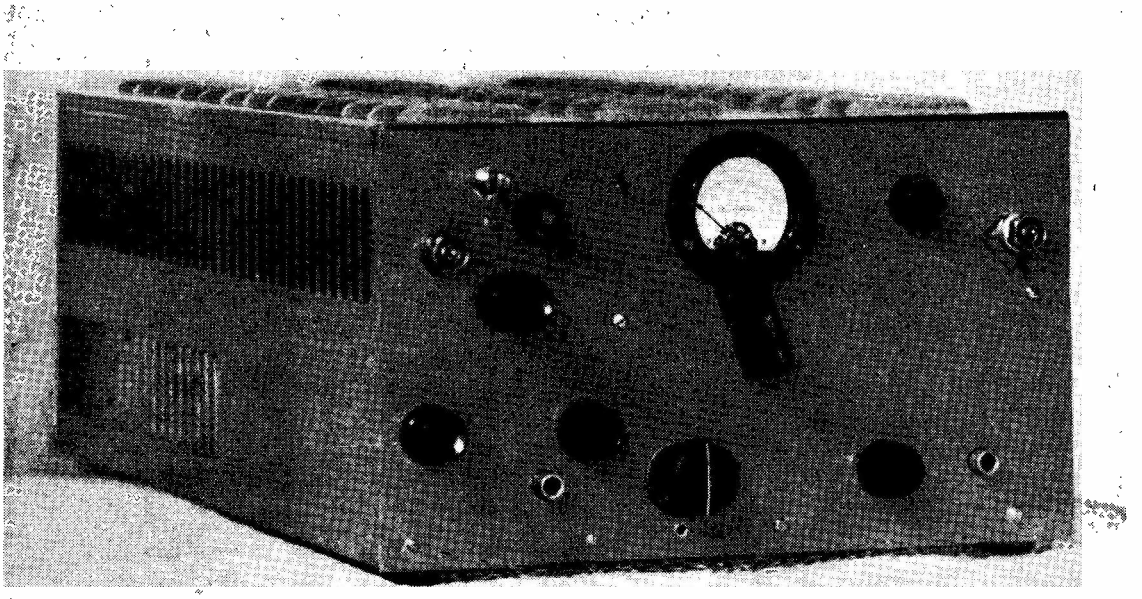
In these days, there are strong views about pollution, and laws have been enacted to control it — whether by sewage effluent into the rivers, by the discharge of radio-active waste from power stations or of sludge oil from tankers into the sea, or by smoke into the atmosphere in urban areas, and attention is now being given to the problem of exhaust fumes in crowded traffic thoroughfares.

As yet, however, nothing has been done about the pollution of the ether, which is just as serious, and will become very much more so. On the broadcast bands, from MF to HF, we are faced by a system of deliberate high-power jamming. We shall soon have, added to the general radio noise level over the country as a whole, the disturbance to be created along the track of the new 275,000-volt Super Grid system, and by the electrification of long stretches of British Railways at 25,000v. AC collected. Until these installations are actually working, it is impossible — whatever the authorities concerned may say, and they are hedging as hard as they can on the issue (see May 1957 SHORT WAVE MAGAZINE*) — to estimate what the area of pollution will be. It may then be too late to do much about it, and the solution will probably have to be the provision, by the BBC, of numerous TV and VHF slave transmitters to raise local signal level above noise in the affected areas.*

This is, of course, an entirely separate issue from the pollution of the ether by deliberate radio jamming, which can only be mitigated by international agreement. It is significant and interesting, as well as encouraging, that this aspect of the problem of pollution has been raised at the highest U.N. levels.

Whether anything will come of the proposal that jamming and counter-jamming should cease is, however, quite another matter. High-minded sentiment in political circles does not often go much further than the words spoken.

Austin Forbes G6FO.



General appearance of the Two-Metre Table Topper described in the article. It is complete except for the power pack, which was intentionally built as a separate unit to cut down on weight. The RF section is to the left of the meter, and the modulator is behind the panel on the right. The PA, taking a straight-driven QQV06-40A, runs a full 75 watts input. A pea-lamp, seen near the top left-hand corner of the panel, is loosely coupled to the output tank to serve as a visual modulation indicator ; the RF load it imposes is of no consequence.

Two-Metre Table Topper

75-WATT TRANSMITTER, MODULATOR AND POWER PACK

F. W. TYLER (G3CGQ)

AFTER a period of ten years' continuous operation on two metres, the rig at G3CGQ had boiled itself down to a transmitter and receiver assembly that contained a host of separate units, each one of which was the ultimate in its own way and had proved to be the best that the writer could produce in terms of operation and efficiency. For some time, efforts had been made to incorporate the transmitter and modulator, together with the necessary power supplies, in one case — but without a lot of success. It was then decided to build an entirely new transmitter and modulator in a single table-top container, incorporating all the " necessary refinements " which up till then had been in separate units, as they were designed and built.

This transmitter was to be of medium power input, about 80 watts to the PA, with ample modulation to meet the various situations that arise on the two-metre band.

The first such unit constructed was built into an AR88 receiver case, and contained transmitter, modulator, and power pack—the whole boiling, in fact. But this had so many drawbacks that it was abandoned in favour of the design as described and illustrated here. In the first place, the overall weight of the thing was something like 100 lbs., which meant that it was extremely difficult to move, let alone lift ; at the same time the heat generated inside the cabinet was excessive for continuous operation, resulting in crystal heating, and damage to small resistors and condensers.

In consequence, it was finally decided to exclude the power supplies from the cabinet, making the transmitter into two smaller units, switch controlled from the front of the table-top cabinet containing only the transmitter and its modulator. This approach has overcome all the previous difficulties.

The Circuit—General

It will be seen that the circuit (Fig. 1) follows fairly normal practice at VHF, and takes into account all those features which have been found to give freedom from TVI. The valves

used are the minimum, and the most suitable types have been selected for the job. Some of these points may perhaps be open to criticism, but taking all things into consideration, there is little that is unorthodox. The modern VHF transmitter, in its early stages, is basically similar to a transmitter operating on the HF bands, with the drive oscillator run preferably as a CO rather than a VFO for frequency control, the operating frequency being brought out by a series of multiplier stages, with close attention given to the suppression of unwanted harmonics.

Fig. 1 shows the method by which this is done from an 8 mc crystal, the stages being 8 x 3 x 3 x 2 = 144 mc. Stage 1, which is 8 x 3 x 3 = 72 mc, is achieved by the first valve, an ECC81, run at low power ; this takes the transmitter through the Band I TV channels ; at this point, an increase in power output is obtained from V2, QV03-12 (5763), acting as a buffer amplifier at 72 mc, to drive the QV04-7 doublers with good anode efficiency at 144 mc. This in turn ensures adequate drive to the final power amplifier stage, a QQV06-40A.

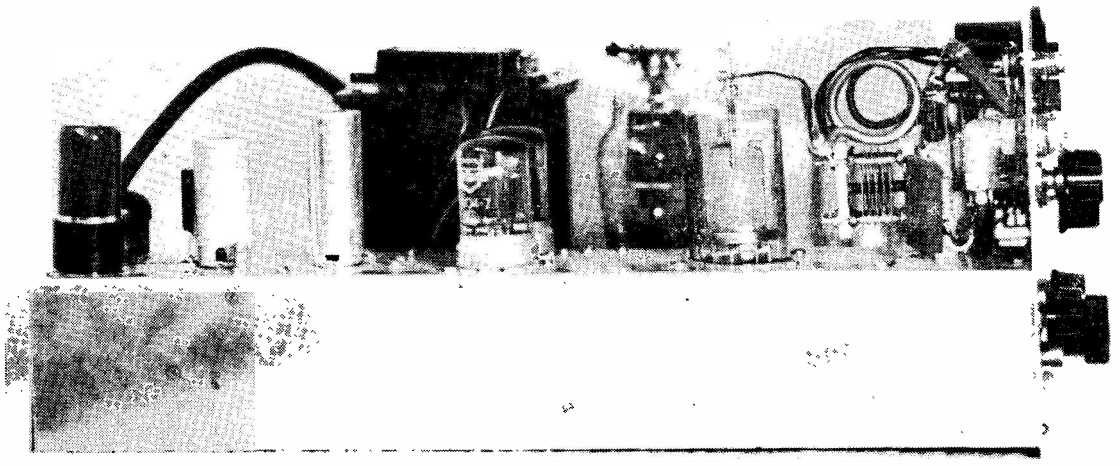
Oscillator Section

There are several popular VHF crystal oscillator circuits, and perhaps the one most used is the now-famous "Squier" arrangement, giving a fundamental output at the third, fifth, or seventh mode of the crystal frequency. To the writer, this system has many drawbacks, foremost of which is the fact that not every "surplus" type of crystal *will* oscillate in the overtone mode, and it is often necessary to introduce a large amount of feedback to ensure the crystal going off promptly each time it is switched on ; from this arises the danger that unwanted self-oscillation of the CO stage may be started, giving a bad note and spurious sidebands to the final carrier. To avoid this, the crystal oscillator shown in Fig. 1 is favoured at G3CGQ — it has been found to assure a clean note and complete stability. This oscillator is sometimes known as the "modified Pierce"; the anode circuit is tuned to the third harmonic of the crystal, and sufficient output is given adequately to drive the other half of a double triode valve to the ninth harmonic of the crystal—thus the 8 x 3 x 3 Stage 1 multiplication is achieved.

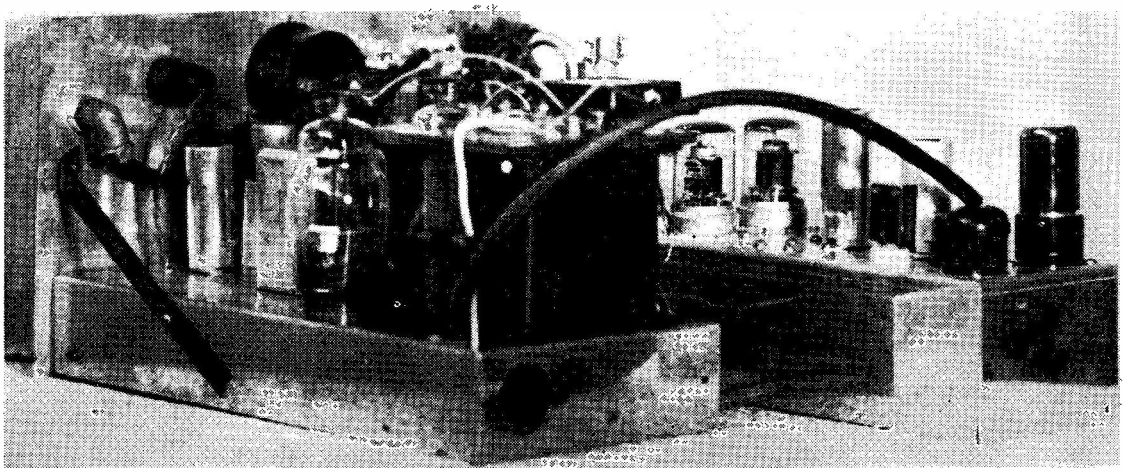
The assembly discussed in this article—by an active operator who has spent many years almost exclusively on the VHF bands — has been designed to give easy, trouble-free, TVI-proof working on two metres, with adequate power output on CW and phone, in much the same way as a similar type of HF-band transmitter is expected to function. The model as described here is giving very satisfactory results on the air, as anyone who has heard G3CGQ recently will know.—Editor.

Multiplier Stages

Following the initial stages of the transmitter,



Side view of the RF section of the Transmitter. The PA is driven by a pair of QV04-7's connected as push-push doublers. The PA anodes are taken to the lugs of C25 — see circuit Fig. 1 — by 16g. copper strips 3in. long by ¼-in. wide, the connection to the anodes of the QQV06-40A being by means of brass screwed collars of the type found in porcelain connectors. In the background is the modulator section, on a separate chassis.



Half-rear view of the Two-Metre Table Topper designed by G3CGQ showing, in the left foreground, the speech-amplifier/modulator unit, consisting of a pair of 807's in AB1 in the output stage, to the circuit of Fig. 2. The modulator gives about 45-50 watts of audio, and the inter-connecting cable between the two units carries power and the modulated HT.

it is essential to develop some power in order to gain higher anode efficiency in the later stages. To do this a buffer amplifier is introduced at 72 mc, as it is desired to deliver the maximum of the fundamental, with a minimum of the sub-harmonic, to the PA stage. At the same time it is necessary to employ high-Q inductively-coupled circuits between the later stages of the transmitter. Capacity coupling between the multiplier stages allows the easy passage of unwanted frequencies, whereas to inductively couple with high-Q tuned circuits will attenuate the unwanted frequencies.

The 72 mc buffer amplifier employs a Mullard QV03-12 VHF power tetrode; this valve is quite stable so that no neutralisation should be necessary; ample drive is given into the grid of the QV04-7 push-push doubler, the input side of which is self-resonant if the size of L4 is closely followed—alternatively, a 3-30 $\mu\mu$F trimmer can be placed across L4 to avoid a lot of cut-and-try work. The Mullard QV04-7's are used in this position to the exclusion of all other types, on account of their comparative cheapness and their performance as doublers to 144 mc, which is excellent. The anode circuit of these valves is series-tuned to obtain maximum transfer of power to the grids of the final amplifier, the method of coupling being as shown in the coil data.

The RF Power Amplifier (Final)

This stage takes a Mullard VHF double tetrode rated for a maximum anode dissipation

See p. 349 for Coil Data

Table of Values

Fig. 1. Circuit of the two-metre transmitter

C1, C2, C9	= 82 $\mu\mu$F, ceramic	C21	= 8 $\mu\mu$F trimmer	R14	= 33,000 ohms, 2w.
C3, C8, C10	= 30 $\mu\mu$F trimmer	C22, C23	= .001 μF min., Hunts W99	R15	= 1,500 ohms, 1w.
C4, C33, C34	= .005 μF, mica, 600v.	C24	= 500 $\mu\mu$F, mica	R16, R19, R21	= Meter shunts (*see text*)
		C26	= 60 $\mu\mu$F var., Eddystone 815	R17	= 30,000 ohms, 1w.
C5, C6, C7	= .001 μF min., Hunts W99	C27, C28	= .005 μF mica, 1000v. wking.	R18	= 200 ohms
				R20	= 30,000 ohms, 10w.
C11	= 30 $\mu\mu$F	C29, C30, C31, C32	= .001 μF min., Hunts W99	Ch	= 10 Hy., 50 mA
C12, C13, C14, C15	= .001 μF min., Hunts W99			RFC1	= 2.5 mH RF choke
		R1	= 47,000 ohms	RFC2, RFC3	= 20in. 20g. enam., $\frac{1}{4}$in. dia., self supporting
C16	= 5 $\mu\mu$F	R2, R3	= 1,000 ohms		
C17, C25	= 15+15 $\mu\mu$F split stator, Eddystone 476	R4	= 3,000 ohms	Xtal	= 8 mc, freq. to Zone Plan
		R5	= 330 ohms	V1	= ECC81, Mullard
		R6	= 82,000 ohms	V2	= 5763 or QV03-12, Mullard
C18, C19	= .001 μF min., Hunts W99	R7	= 10,000 ohms		
		R8	= 200 ohms		
C20	= 20 $\mu\mu$F var., Eddystone 815 stripped to 4 fixed and 3 moving plates	R9	= 22,000 ohms	V3, V4	= QV04-7, Mullard
		R10, R11	= 1,000 ohms	V5	= QQV06-40A, Mullard
		R12	= 8,200 ohms	V6	= 6V6 or 6L6
		R13	= 500 ohms		

(*Note*: Relay is single-pole with coil DC resistance of 500 ohms, acting as bias resistor in V3, V4 cathodes. Operates as aerial change over, and is mounted closely adjacent to L8).

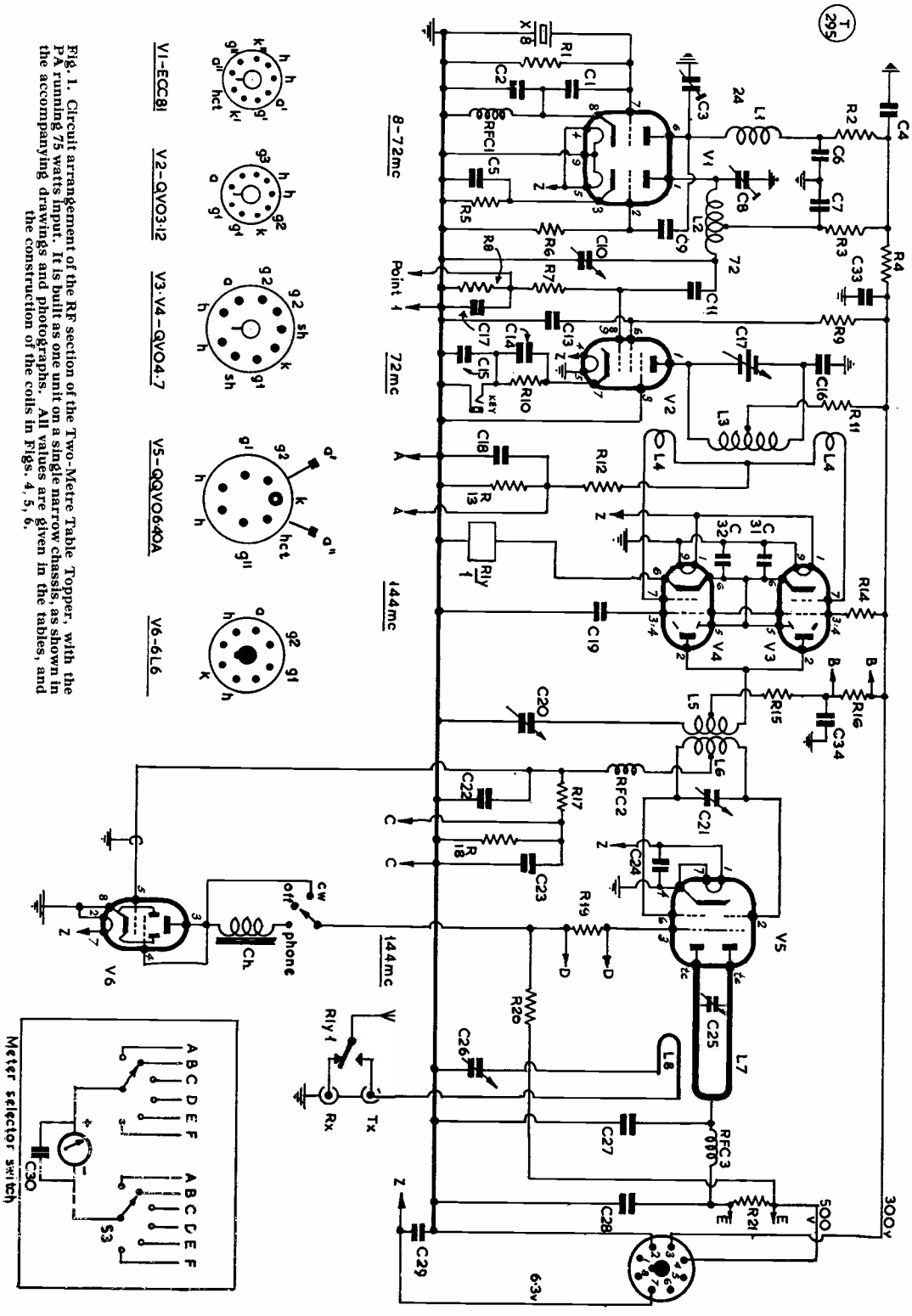
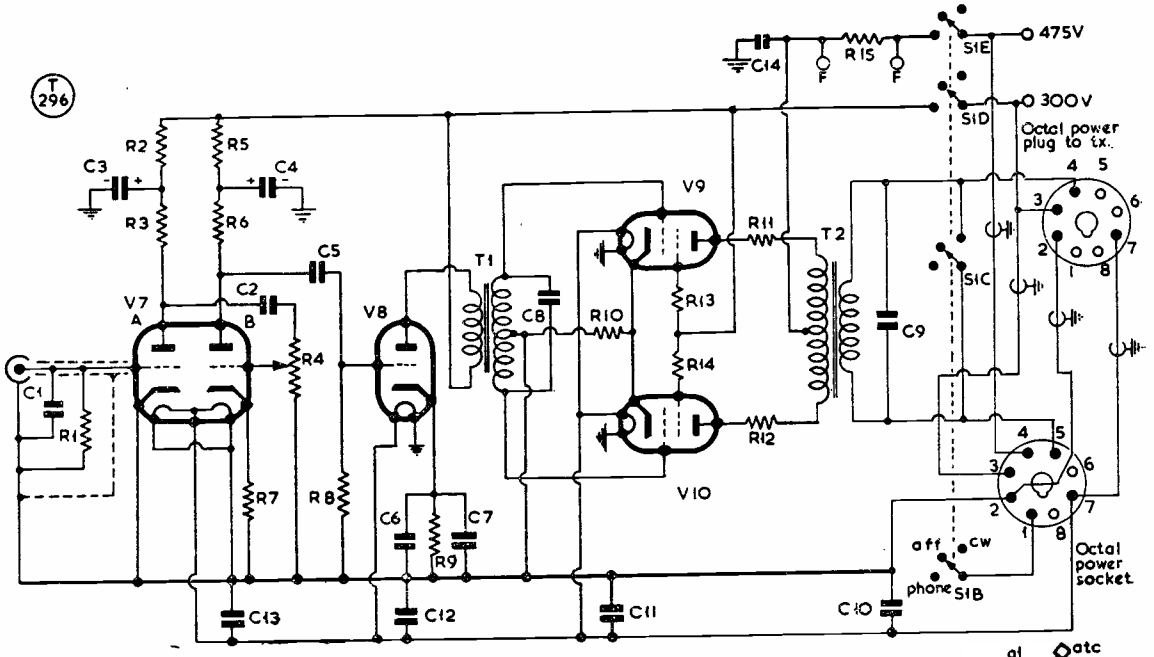


Fig. 1. Circuit arrangement of the RF section of the Two-Metre Table Topper, with the PA running 75 watts input. It is built as one unit on a single narrow chassis, as shown in the accompanying drawings and photographs. All values are given in the tables, and the construction of the coils in Figs. 4, 5, 6.



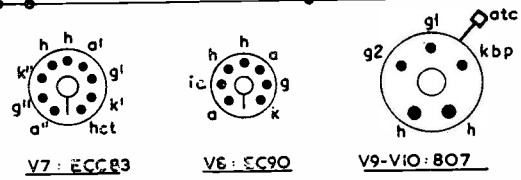


Fig. 2. Speech-amplifier/modulator unit for the Two-Metre Table Topper described by G3CGQ. Ample gain is obtained with a standard crystal microphone, the audio output of the modulator itself being about 45 watts. For satisfactory hum-free operation, without RF feed-back effects, it is essential to screen the microphone lead right into the first grid of the ECC83. For T1, a standard Woden driver transformer could be used, and for T2 the optimum coupling is 4500/4500 ohms, which means that some fixed-ratio surplus item around this value might be suitable, provided it can carry the power on both windings.

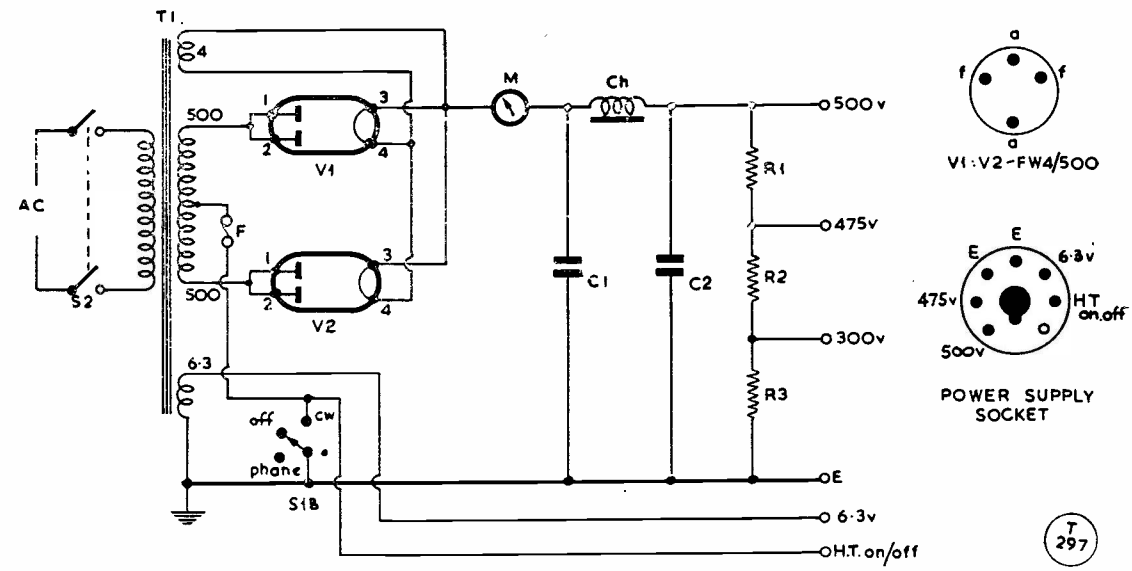


Fig. 3. Suitable power pack for the Two-Metre Table Topper, using Mullard FW4/500 hard rectifiers in the half-wave connection these valves are now listed as "maintenance types," and could be replaced by G.E.C. U18/20 rectifiers, which also run 4v. filaments. The transformer should be rated 500-0-500v. at 500 mA, with 4v. 6A. and 6.3v. 8A. LT windings. Other values are: C1, 7 μF, 1000v. DC; C2, 11 μF, 1000v. DC; R1, 150 ohms, 10w.; R2, 1500 ohms, 20w.; R3, 10,000 ohms, 25w.; and Ch. 10 Hy. at 350 mA. In the G3CGQ set-up, the power pack is built as a separate external unit.

Table of Values

Fig. 2. Modulator section, two-metre transmitter

C1	= 100 $\mu\mu$F	R8	= 1 megohm
C2, C5	= .005 μF	R9	= 1,000 ohms
C3	= 32 μF, 250v. elect.	R10	= 250 ohms
C4	= 16 μF, 250v. elect.	R11, R12	= 20 ohms
C6	= 25 μF, 25v.	R13, R14	= 100 ohms
C8	= 500 $\mu\mu$F, 1000v.	R15	= Meter shunt (*see text*)
C9	= .005 μF, 1000v.		
C14	= .002 μF, 1000v.	T1	= Driver xformer (mod. xformer ex-SCR522)
C7, C10, C11, C12,			
C13	= .001 μF min., Hunts W99	T2	= Mod. xformer, Woden UM2, or 4500/4500 ohm fixed ratio
R1	= 2 megohms		
R2	= 47,000 ohms		
R3, R6	= 100,000 ohms	Sw.	= 6-pole, 3-way Yaxley type
R4	= 1 megohm potentiometer	V7	= ECC83
		V8	= EC90
R5	= 15,000 ohms	V9, V10	= 807's
R7	= 1,500 ohms		

of 20 watts at each anode up to a frequency of 500 mc—which is more than adequate for the job in hand. It is the most effective valve of its type obtainable today for use as a medium-power two-metre PA. The RF circuitry follows normal practice for this type of valve at such a frequency, and the general arrangement of the PA section is shown in the sketches.

Clamping Valve

When a transmitter has to be keyed and modulated there are certain difficulties to be overcome and points to be watched as regards the protection of the final valve, particularly in the key-up condition. In the absence of drive and protective bias on the grid of the valve, the anode and screen dissipation are easily exceeded, and in the case of the QQV06-40A this can prove an expensive mistake to make. The writer is of the opinion that taking all things into account the keying of a VHF transmitter is best carried out in the early stages of the chain of frequency multiplication, and that the degree of current change throughout the whole transmitter, between key-up and key-down, be kept to an absolute minimum. The clamping valve shown in Fig 1, a 6V6, with the circuit given maintains the PA screen at 200 volts during keying, while the anode varies only 20 volts between "up" and "down." By this method the screen and anode dissipation of the valve are not exceeded, at the same time the CW note is clean. It is also ensured that the variation of current through the power pack is small, and hence large surges are avoided.

The small audio choke in the anode of the

COIL DATA—TWO-METRE TRANSMITTER

L1 — For 24 mc: 17 turns 24g. enam., close spaced on 3/8-in. diameter former.

L2 — For 72 mc: 10 turns 14g. enamelled, ½-in. diameter, centre tapped and self supporting.

L3 — For 72 mc: 8 turns 14g. enamelled, 7/8-in. diameter, centre tapped and self supporting.—*see sketch Fig.* 6.

L4 — For 72 mc: 5 turns 14g. 1¼-in. diameter, split 2½ turns each side of L3 — *see sketch Fig.* 6.

L5 — For 144 mc: 4 turns 14g. enamelled, 7/8-in. diameter, centre tapped — *see sketch Fig.* 5.

L6 — For 144 mc: 2 turns 14g. enamelled, 7/8-in. diameter, closely coupled to L5 — *see sketch Fig.* 5.

L7 — For 144 mc: 14½-in. of 3/16-in. soft drawn copper tube, bent U-shape to ½-in. separation, coiled to 1½-in. diameter, to form coiled Lecher line — *see sketch Fig.* 4.

L8 — For 144 mc: Aerial loop, 8-in. of 14g. enamelled, bent U-shape to ¼-in. separation, closely coupled to L7 — *see sketch Fig.* 4.

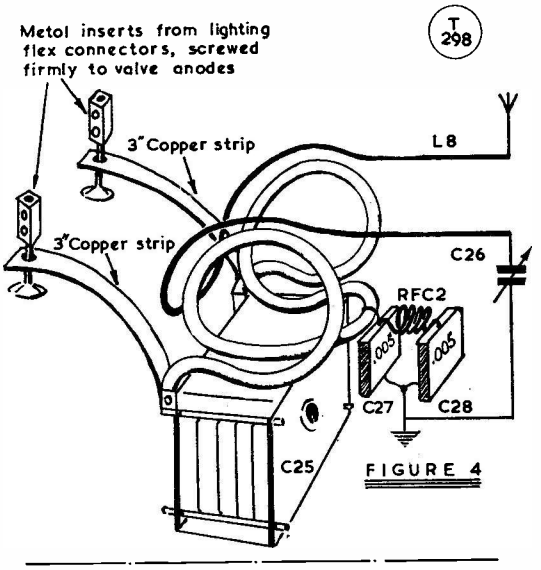


FIGURE 4

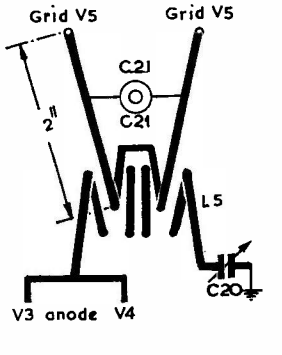


FIGURE 5

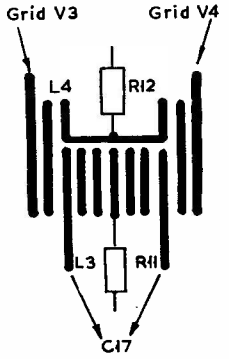


FIGURE 6

Showing the physical arrangement of the coils for G3CGQ's Two-Metre Transmitter. Fig. 4. Coils L7, L8 for PA tank and aerial pick-up loop. Fig. 5. L5, L6 for the doubler tank-PA grid assembly. Fig. 6. L3, L4, for V2 anode and V3, V4 grids on 72 mc. Full winding details for all coils are given in the opposite table.

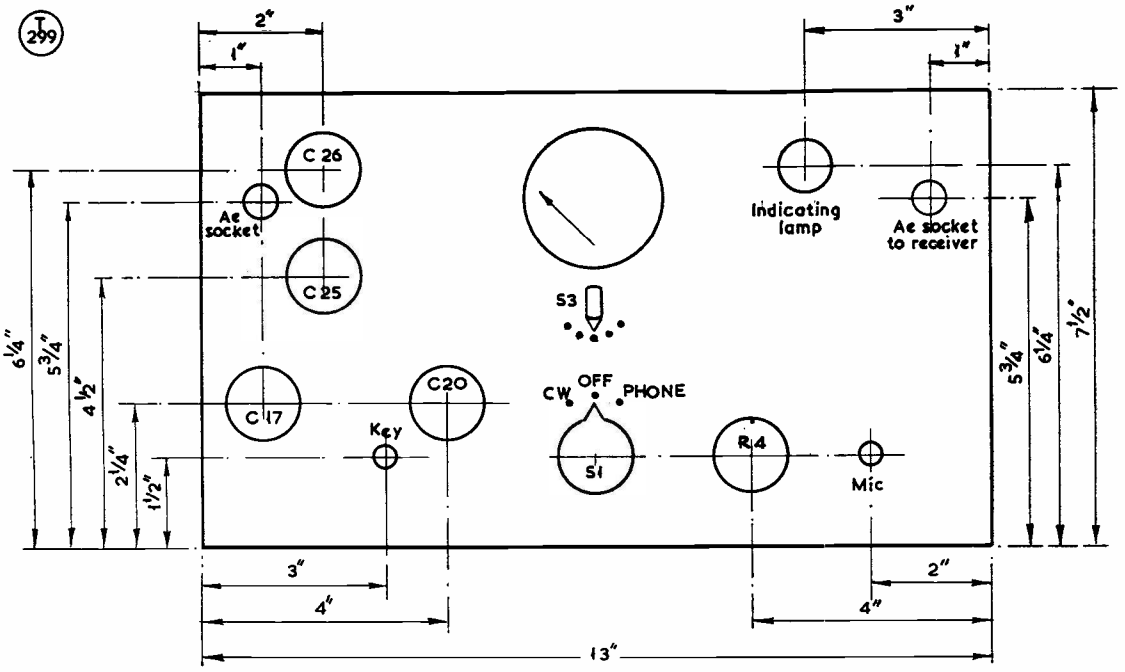


Fig. 7. Front panel layout for the Transmitter, which is built into an AR88-type cabinet, in two separate sections, RF side and modulator. The RF chassis is behind the left-hand section of the panel. Other layouts, to suit individual requirements or chassis assemblies are, of course, possible.

clamping valve is to avoid clipping during telephony, and ensures a linear response to the audio at the screen of the PA ; over-the-air reports show this to be worth-while—in fact, with the choke shorted out, the phone quality is pretty horrible !

Tuning Procedure

This is done by switching the meter progressively stage by stage along the circuit and tuning for maxium drive at each grid. It is, however, not good practice in VHF transmitters to have meter leads threaded indiscriminately between, say, each check point and a two-pole switch and meter ; despite every precaution, by filtering and by-passing, RF will be induced into the leads, with some very unwanted coupling effects ! Consequently, it will be observed from Fig 1. that the first stage that is metered on the switch (pos. A-A) is the grid drive to the 72 mc doubler, with provision made at point 1 to clip on a meter in the initial setting up of the transmitter ; this point is not wired in permanently.

The meter used has a full scale deflection of 100 mA, and in order to make use of this meter (which has a specially handsome face!) it was decided to remove the internal shunt

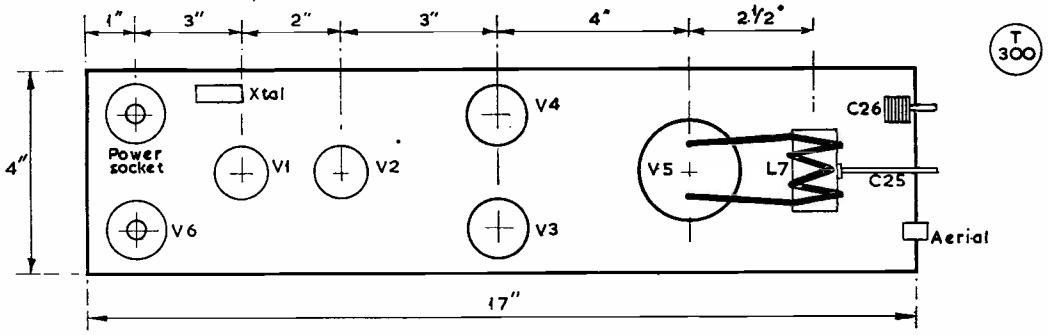
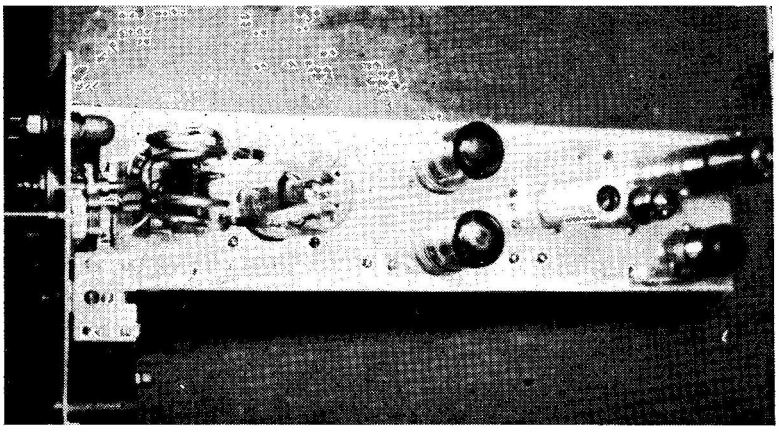


Fig. 8. Plan view of RF chassis layout, which demands symmetry at the PA end, since the RF amplifier is a straight-driven QQV06-40A twin tetrode ; the tank circuit must be arranged so that it is as near the valve as possible, with connection strips of equal length to the anode pins — see Fig. 4 and photograph opposite.

resistance, which gave the instrument a resistance of 2·1 ohms with a full scale deflection of almost 20 mA. In order to make use of the original scale, the various shunt resistances for a given full-scale deflection were calculated from the usual formula. The shunts were made from some 28 g. Eureka wire which was on hand; this has a resistance of 3·91 ohms per yard, or 1·3 ohms per foot, and the necessary fractions of ohms were measured off by ruler and then wound on a 1-megohm ½-watt resistor body.



Plan view of the RF section of the Two-Metre Transmitter discussed in the article. The crystal-oscillator frequency-multiplier portion is at the right, with the QV04-7 push-push doublers at the centre. Note the folded Lecher line PA coil mounted above the tuning condenser C25, forming the tank for the QQV06-40A RF amplifier. This tank section is the only part of the circuitry which is above chassis level.

The initial tuning of the transmitter is done with the ECC81 and QV03-12 only plugged into their sockets and a 200-volt HT supply connected. A 500 μA meter is put in across point 1, and L1 and L2 are adjusted for maximum deflection; when this has been achieved, and with the 200-volt supply still connected plug in the two QV04-7's and switch the meter fitted to the transmitter to point A, and again tune for maximum deflection. Having set up the transmitter thus far, plug in the QQV06-40A and the clamp valve 6V6, connect the power supplies and first switch the meter to position B, and then position D; with a 60-watt lamp plugged into the aerial socket tune the final stage rapidly to resonance, when the lamp should light up brightly.

The Modulator

The companion unit to the transmitter is the modulator, the circuit of which is shown in Fig. 2. This unit is built on a chassis size 13 in. x 6 in. x 2 in., and mounted on the front panel as far as possible from the transmitter. There are no complications in the circuit, which is quite straightforward. The speech amplifier takes a high-μ triode ECC83 as a two-stage resistance coupled amplifier, followed by a medium-μ triode EC90 transformer-coupled to the grid stages of two 807's in Class-AB1. The gain is ample for the normal type of crystal microphone, and the inter-stage coupling C2, R4 ensures that the frequency response is restricted approximately within the 400-2000 cycles range. This is more than enough for speech communication; the higher frequencies are also attenuated by the condensers across the secondaries of each transformer.

With the power input to the transmitter of something like 70-80 watts, it is necessary to have a *minimum* of 40 watts of audio avail-

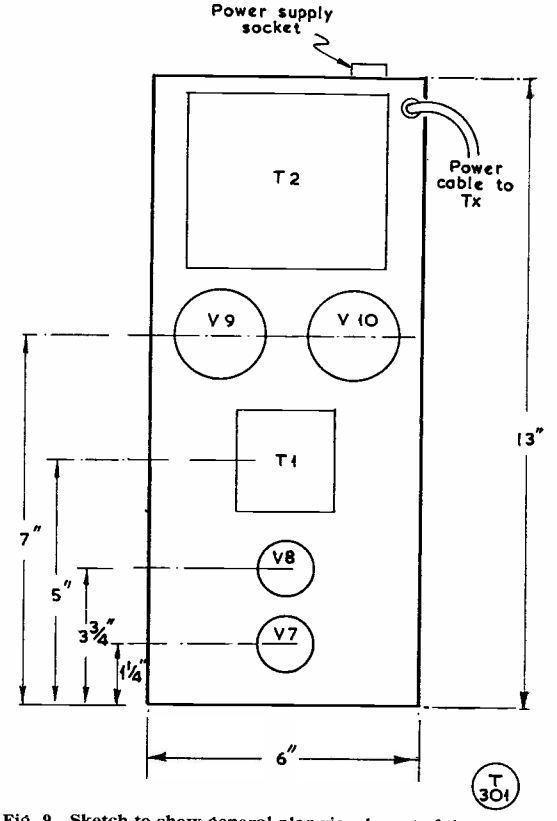


Fig. 9. Sketch to show general plan view layout of the speech-amplifier/modulator section of the Transmitter.

able. Though it is now recognised that on VHF, and particularly UHF, more audio power than the usual 1 : 2 ratio is necessary to achieve full and satisfactory modulation up to 100%, in the case of this modulator, it has been designed for an input of 45-50 watts to the two 807's in Class-AB1, this being a compromise reached taking into account all possible approaches to the matter.

It will be seen that a 10 Henry audio choke has been incorporated in the anode lead of the clamper valve V6. This is there solely to give a more linear audio response on the modulated carrier than is otherwise possible with a clamping valve buttoned to the screen. Optional switching out (or short circuiting of this choke) can be incorporated for the use of the transmitter on CW, but tests show this to be not entirely necessary, as the variation of current through the clamp valve is only a matter of 20 mA during keying.

One of the essentials to be achieved so far as the modulator is concerned is the total exclusion of RF from the input side of the first speech amplifier stage. The microphone input must be absolutely screened to RF and to achieve this the lead right up to the grid of the input valve is run in screened wire, well bonded to the chassis.

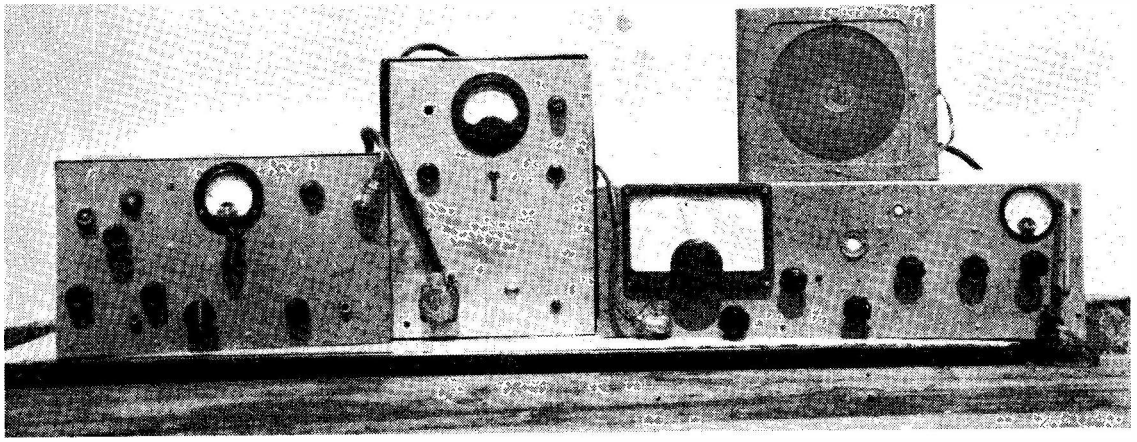
Modulation of the PA is *via* the modulation transformer which can be of any make providing it is capable of handling up to 50 watts of audio with a reasonable impedance match to the PA stage. For example, a very good match is achieved with this transmitter/modulator by a 1 : 1 ratio of 4,500 ohms and most multi-ratio modulation transformers will give this.

The Power Pack

As previously stated, this has been excluded from the main cabinet in order that the gross weight of the complete outfit can be divided into two parts ; thus, the whole thing becomes manageable, allowing easier movement, *plus* the fact that the heat generated by the power supplies themselves is excluded from the main cabinet—always a good thing in any circumstances, and particularly so on VHF.

A single large transformer giving 500 volts at 500 mA is used to run both the transmitter and modulator and the power requirements are controlled from the front of main cabinet. The output voltages are taken from a voltage divider chain of resistances across the high tension output which, in addition to giving pre-determined potentials, assists with the regulation of the supplies under the varying conditions demanded by both phone and CW operation.

Provision is made in the power pack to read the overall current in the rectified output from the two Mullard FW 4/500's, which is a good thing when working under comparatively low-voltage high-current conditions, and gives a picture of what is taking place in the complete unit. This metering point is in addition to those provided by the meter switching to selected stages in the transmitter and modulator, used mainly for tuning purposes and



The complete two-metre station at G3CGQ. On the left the transmitter unit described in the article, then the power pack and main control, with the VHF receiver and speaker on the right. This is the result of tidying up on a number of odd units, to make a completely self-contained two-metre station.

day-to-day touching up of the transmitter.

The power pack follows normal medium voltage/high current practice, and full-wave rectification is obtained by the parallel connection of two normal 500-volt 250 mA rectifiers to give something like 350 mA when telephony is being used. A point that must not be overlooked is the provision of really heavy interconnecting cable between the various units, capable of carrying *10 amps* of heater current without serious voltage drop—a factor which from experience has been found to reduce the efficiency of the transmitter as much as 20%. The heater voltage *at the valve bases* should be checked to make sure it is the full 6·3 volts.

Construction

Construction of the transmitter/modulator is on half-hard 16 g. aluminium, the transmitter chassis being 17 in. x 4 in. x 3 in., and the modulator chassis size 13 in. x 6 in. x 2 in. Both chassis are secured to a front panel of 12 g. aluminium size 13 in. x 7½ in. The cabinet is a well-ventilated steel box 18 in. x 13 in. x 7½ in., on the base of which are secured four rubber feet which stands the whole assembly half-an-inch off the table and allows a free passage of air all round.

The construction of the power unit is on a steel chassis size 17 in. x 9 in. x 2 in. to take the weight of the transformer and choke, and this chassis is contained in a steel cabinet size 18 in. x 9 in. x 10 in., again well ventilated and standing on four rubber feet.

All units are finished with grey cellulose paint, which gives quite a nice look to the job, if it adds nothing to its general efficiency.

JODRELL BANK AND LUNAR PROBE

The Radio Telescope at the University of Manchester's Jodrell Bank Experimental Station will be used to track any Lunar Probe launched from the United States. Being fully steerable, the Telescope will be able to follow the Probe throughout most of the time that it will be above the horizon.

The Lunar Probe carries a small transmitter, on 108·30 mc, and the function of the Radio Telescope is to receive its signals. There are two aspects: First, the Telescope will give the position of the Lunar Probe in space, and this data will be transmitted by teletype to America immediately. It will not be possible to give other than a rough approximation of the Probe's position from Jodrell Bank; the exact position will be worked out by computer in the U.S.A. The second purpose in recording the signals is to pick up the telemetered information, that is, the coded signal which gives information about the measurements which are to be made as the Probe approaches the moon — these are of the moon's gravity, the meteorite bombardment on the space vehicle itself, and the level of cosmic radiation. This data will also be teleprinted to Los Angeles.

The advantage of using the Radio Telescope is that it has a very great sensitivity and can therefore pick up these weak signals to great distances; also, the beam width of the telescope is small enough to allow the position of the Probe in the sky to be determined very accurately.

At the moment there are very few instruments in the world which have sufficient sensitivity to pick up the faint radio signals emitted at great distances from the earth. The Jodrell Bank Telescope has by far the narrowest beam width of any steerable instrument in the world, and can therefore be used with considerable effect. The Telescope is completely steerable, and can be directed with great precision to any part of the sky.

The task of following the Lunar Probe is an entirely different proposition from that of tracking satellites. Once the batteries failed in the satellites there were no transmissions from them which could be picked up. So in that case a radar system was employed in which, of course, the Telescope was operated as a transmitter/receiver. The difficulty here lay in the fact that the signal scattered from an object the size of the satellites is very feeble indeed.

If the Probe goes off course, the advantage of using the big Telescope at Jodrell Bank is considerable. It should be possible to track it out into space for distances of one million miles or so. It is likely that the batteries in the Probe would fail before it got out of range of the Telescope.

SHOT AT THE MOON

The next American attempt to set a Lunar Probe on its mission is expected about September 14. If all goes well, its signal on 108·30 mc should be audible in the U.K. for much of the journey.

AUSTRALIAN RADIO TELESCOPE

It is announced that a new Radio Telescope is to be built in Australia, at Parkes, N.S.W. It will be several times more effective than the instrument now in operation at Jodrell Bank, in that it will have a much higher resolving power. The reflector dish will be 210ft. in diameter and it is intended that one of the operational tasks for this new Telescope will be the closer exploration of the Milky Way, in which there are several sources of radio noise. It is hoped that it will be on the air by the end of 1961.

NEW ANGLE ON THE QSL CARD

It is reported that the U.S. Army Signal Engineering Laboratory at Fort Monmouth, N.J., returns a special QSL card to amateurs who are able to report reception of a 108·30 mc signal bounced off the moon from Fort Monmouth. This is actually a special transmission for the particular purpose of getting receivers, over the widest possible area, accurately calibrated to the satellite (and lunar probe) transmitter frequency.

Multi-Range Test Meter

FOR THE AMATEUR BENCH

S. J. WHITFIELD

In amateur circles there is always interest in and need for general-purpose test meters of various kinds. Here are details for the construction and calibration of such an instrument, the layout and boxing-up of which can be varied to suit the constructor's requirements.
—Editor.

THE 32-range meter described in these notes has been designed to fulfil the writer's need for an instrument which could cope with a wide range of measurements. It is strictly a general-purpose meter, having a resistance of only 1,000 ohms/volt.

The completed instrument with leads, prods, and lid weighs under 2½lbs. and measures 6⅝ in. x 5½ in. x 5⅛ in. overall.

In the preliminary design, it was decided to provide AC and DC voltage ranges to 1,000v. and DC current up to 0·5 amps., together with resistance ranges of 1,000 ohms, 10,000 ohms, 100,000 ohms and 400,000 ohms, each to be individually calibrated, with a graph for each range. All the AC and DC voltage ranges can be doubled by a switch. A buzzer circuit for continuity testing is also included.

The basic movement is a 2½ in., 0-1 mA, 100-ohm, moving coil type; for the AC rectifier, four germanium diodes are used instead of the conventional bridge meter type; 5% precision resistors are employed throughout, except for the shunts and in the resistance potential divider. The circuit complete is shown in Fig. 1.

General Construction

The panel is of ⅛ in. paxolin. A piece of thick paper of the same dimensions as the panel was marked for the drilling and 1/16 in. acetate sheet was cut out to the area of the top of the box (5⅛ in. x 6⅝ in.). The acetate and paxolin sheets were then clamped together for piercing to the general layout, as shown in Fig. 2. The actual panel arrangement and dimensions will depend on the size of meter

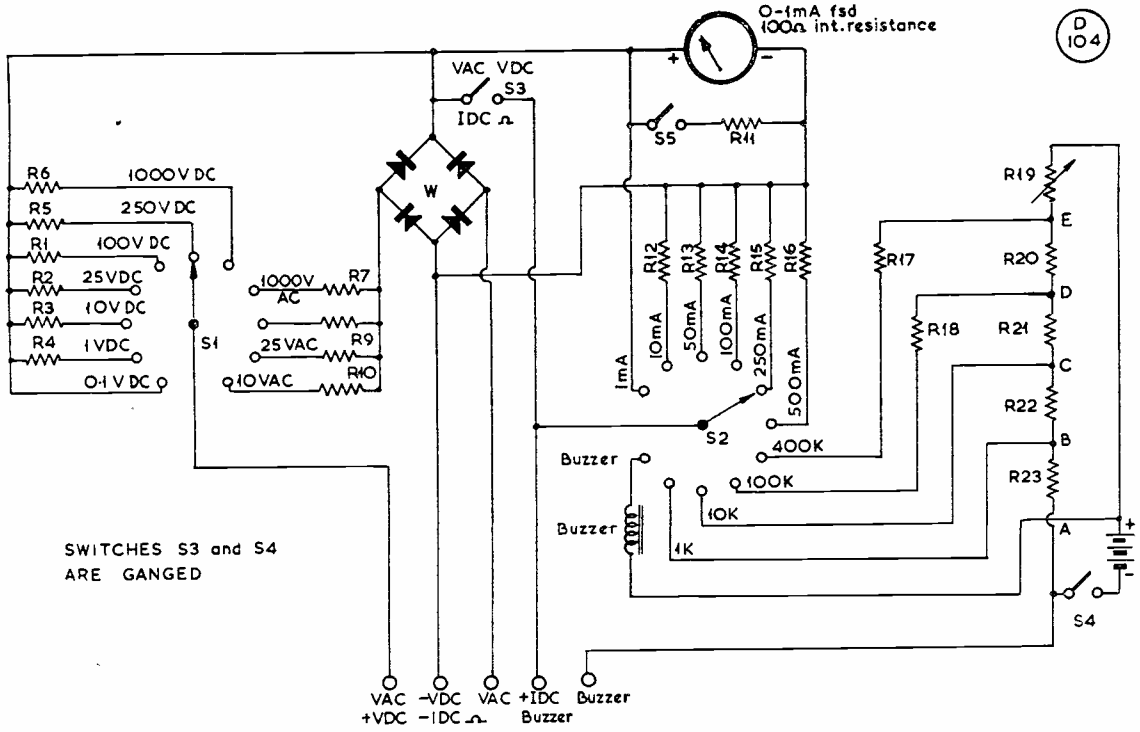


Fig. 1. Circuit of the Test Meter described in the text, the general construction of which is shown in the drawings. It gives AC and DC ranges and resistance readings, and incorporates a buzzer circuit. Standard resistors can be used for the higher ranges, and the low-value shunts can be home made, as explained in the text.

and panel fittings to be used. In the writer's case, the hole for the meter was cut with an Abra file. The box is made from 5/16 in. plywood and plain butt joints were used. The pieces were prepared as in Figs. 6 and 7 and were glued and pinned. The exterior of the case was painted and case clips were screwed to each side, enabling the lid to be completely detached when required.

Wiring Up

Two tag strips were used to carry most of the resistors, as shown in Figs. 3 and 4. This will prevent short circuits due to having too many resistors closely wired together. The resistors were soldered on to the tag strips and the smaller tag strip was bolted over the larger one with a pillar separating them; then one end of the larger tag strip was fastened to the bolts in the range switch. The meter was then mounted, together with the tag boards and switch assembly and toggle switches.

The wiring of the AC and DC potential ranges is quite straightforward and was carried out with 20 g. insulated wire. The shunts for the current ranges were made up according to the lengths below:

11.1 ohms, R12: 22 in. of 18g. Eureka wire.
2.1 ohms, R13: 4.2 in. of 18g. Eureka wire.
1.0 ohms, R14: 2 in. of 18g. Eureka wire.
0.4 ohms, R15: 0.8 in. of 18g. Eureka wire.
0·2 ohms, R16: 28 in. of 32g. Copper wire.

The 0·4 and 0·2 ohm shunts were wired to the tag board, as in Fig. 3. The remaining shunts were wound over 1-megohm resistor bodies and soldered to their ends. When soldering in the diodes for the AC range circuit, care must be taken that excessive heat is not applied, or else damage may result.

The resistances in the potential divider circuit were made as follows:

60 ohms, R20: 14 in. of 22g. Eureka wire.
18 ohms, R21: 4¼ in. of 22g. Eureka wire.
2 ohms, R22: 4 in. of 18g. Eureka wire.
0.2 ohms, R23: 28 in. of 32g. Copper wire.

(It should be noted that the apparent disparity in length of wire required for R12 and R20 is due to the fact that 22g. Eureka has about nine times the resistance of 18g.)

The 0·2 ohm resistor was mounted on tag board 1; the rest were wound over a piece of ⅛ in. paxolin 3½ in. x 1 in. wide with eight 1/16 in. diameter holes drilled along one edge; short lengths of tinned copper wire inserted through the holes and twisted together form excellent soldering terminations for the resistors, as shown in Fig. 5.

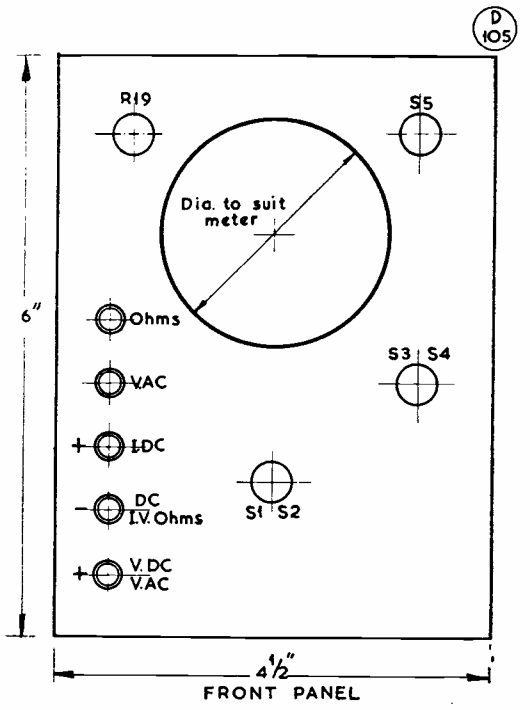


Fig. 2. Practical layout for a panel 6in. by 4½in. wide for the Test Meter described in the text. The actual hole positioning will depend on the diameter of the meter used, and the type of terminals.

Table of Values

Fig. 1. Circuit of the AC/DC Test Meter

R1 = 100,000 ohms
R2 = 24,900 ohms
R3 = 9,900 ohms
R4 = 900 ohms
R5 = 250,000 ohms
R6 = 1 megohm
R7 = 840,000 ohms
R8 = 84,000 ohms
R9 = 21,000 ohms
R10 = 8,400 ohms
R11 = 100 ohms
R12 = 11.1 ohms
R13 = 2.1 ohms
R14 = One ohm
R15 = 0.4 ohms
R16, R23 = 0.2 ohms
R17 = 3,900 ohms
R18 = 900 ohms
R19 = 25-ohm potentiometer
R20 = 60 ohms
R21 = 18 ohms
R22 = 2 ohms
Meter = 0-1 mA, 100-ohm, m/c
Diodes = G.E.C. GEX-64 germanium, or 1 mA meter rectifier unit
S1, S2 = Double-bank selector switch
S3, S4 = DPST toggle
S5 = SPST toggle, range double

Clix plugs and sockets, miniature 4½-volt buzzer, 4½-volt battery, 5-way tag board, 12-way tag board.

(*Note:* Resistors R12-R16 and R20-R23 are home-made — see text. All other fixed resistors should be good quality 5% tolerance 1-watt types).

Calibration and Test

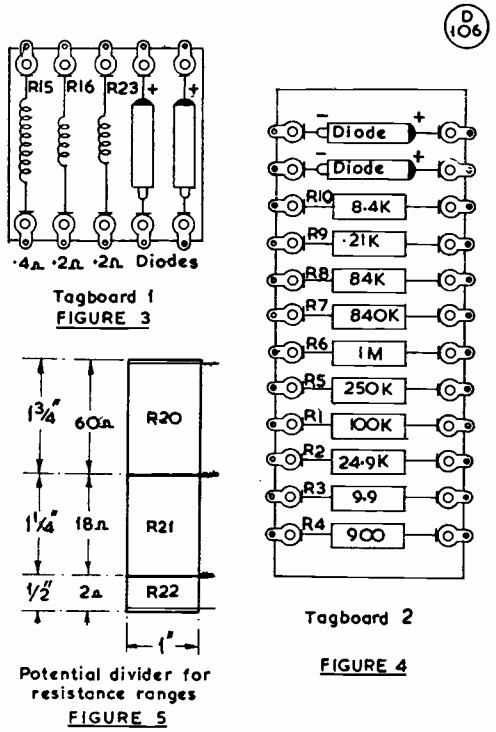
The DC voltage ranges were checked against batteries and accumulators, and the alternating voltages against every available transformer secondary. In the case of the 10v. range, various measurements were taken with heater secondaries delivering their correct current, and these were plotted on a graph against the 1000 microamp. meter scale, which is actually

marked (on the writer's instrument) in 10ths and 50ths of one milliamp.

For the 10 mA range, a new 9-volt battery was connected in series with the meter and a 1,000-ohm resistor; the shunt was adjusted until the meter showed a deflection of 0·89 on its scale. To check the 50 mA range a 50-ohm resistor was put in series with a new 1·5 volt cell and the meter; the shunt was adjusted until the meter read 0·29 scale. For the 100 mA range a 25-ohm resistor was used instead of a 50-ohm one; the meter should read 0·58. To check the 250 mA range a 2,000-ohm resistor was put in series with the meter and a 250 volt supply; the shunt was adjusted until the meter read 125 mA. For the 0·5 amp. range the meter was checked with a ½-amp. 3-volt torch bulb, admittedly only a very rough method of doing it, but sufficient for a preliminary check.

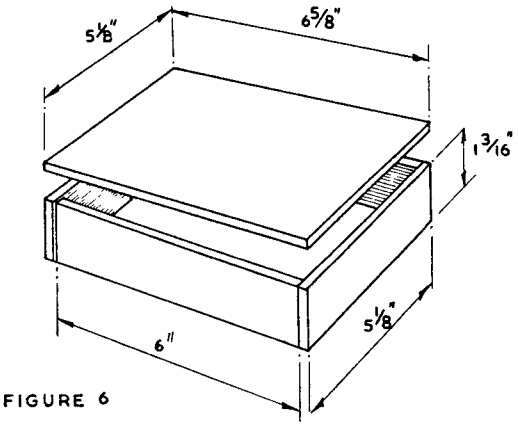
The only other remaining ranges were those for resistance. At the points B, C, D and E (*see* Fig. 1) the voltages present should be ·01v., 0·1v., 1·0v., and 4·0 volts respectively. When wired in the potential, as measured by the partly completed meter, was found to be ·01v. across A-B, 0·1v. across A-C, 1·0v. across A-D, and 4·0 across A-E. When completed, various known values of resistor were measured and the meter deflection was noted. A graph plotting the resistance value against the meter deflection was then drawn for each range.

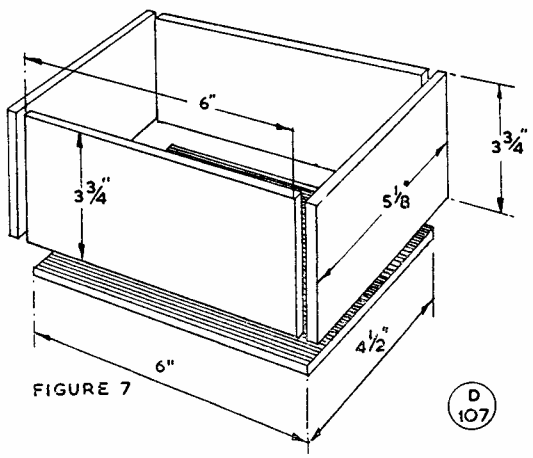
Of course, much more accurate calibration would be possible by direct comparison with a standard instrument, such as an Avometer, and the writer advises this wherever possible.



Tag board layout and potential divider arrangement for the Test Meter.

Some preliminary calibration work along the lines suggested in this article is in any case necessary, to get the shunts near the correct values. Another method of getting more accurate first calibrations is to have some sources of AC and DC accurately measured on





Construction of a suitable wooden box for the Test Meter. Fig. 6 shows the main dimensions of the author's model, and Fig. 7 the lid. The base fits flush, and all joints are glued and pinned to make a neat job, the material being 5/16-in. wood. A metal box of about this size would be just as suitable.

a standard instrument. This can usually be arranged by taking the sources along to the local radio/TV dealer, who is almost certain to have an Avometer, or similar instrument. He might also be persuaded to assist with the final calibration.

Lastly, the small brackets to locate the panel flush with the top were secured to the box and suitable clearance holes drilled in the panel to register with the tapped holes in the brackets fitted inside of the box. The various components passing through the panel were then temporarily disconnected and removed, and a sheet bearing the necessary lettering was inserted, and covered by the perspex over-panel.

Compressed Beam for 20 Metres

PRACTICAL THREE-ELEMENT DESIGN

N. M. BUTTON (G3BG)

WHILE many operators would like to use a beam, especially on 20 metres, the size of the assembly overall, and its overhang, are serious deterrents. If the element length could be cut down by, say, one-third, it would be a much more attractive proposition. On 14 mc, for instance, this would mean a reduction from about 33 feet to around 22 feet, making the whole thing more manageable and easier to construct and keep airborne.

A shortened 20-metre beam, worked out around an original design by WØQFG and WØVZC, has been in use at G3BG for the last four years ; a photograph which gives a general impression of this array appeared on p.139 of the May, 1956, issue of *Short Wave Magazine*.

On many occasions results with the compressed beam have been better than with a full-sized beam, and they are at least comparable at all times. Many VK, ZL and ZS stations have confirmed this. A front-to-back ratio of 20-28 dB can be obtained with a narrow forward angle. Tests made with two locals, G2OC and G3QD, give head-on signal reports of S9 + 10 dB, S3 on the side (90° off) and S6½ off the back (180° off) this representing about 25 dB front-to-back. Some tests were done with lengthened and shortened elements and it was found that increasing the reflector, while improving forward gain, spoilt the back-to-front ratio.

The dimensions given in Fig 1, which shows the plan layout, can be taken as being the optimum by test. As can be seen, the elements are loaded with inductance to get the shortening effect, which is the whole point of using a beam of this type.

Loading Coils

Construction of the element inductances is shown in Fig. 2. The necessary polythene tubing can usually be obtained from any shop-fitting establishment (it is the sort used for connecting up barrels to draw beer !) and is of ¾in. o.d., cut to 7in. lengths for the present purpose. An 11in. wood dowel, ⅝in. o.d., is a force-fit in the tube and serves to give it the necessary support ; the 2in. projection of dowel at each end of the rigid former thus produced fits into the beam elements, of thin-wall steel conduit, or dural tubing, of ⅝in. i.d. The dural elements are, of course, much to be preferred, as they are lighter and have a better electrical characteristic.

Having produced the formers, each about 7in. long, they are wound with 14g. enamelled wire, spaced to one wire diameter. (It can be done by winding on two wires in parallel, and then removing the unwanted winding ; this leaves a neatly spaced single layer.) The precautions to be observed in winding the coils are that they must be good and tight, with evenly spaced turns, while it should be noted that the coil with the larger number of turns goes on the director element. When

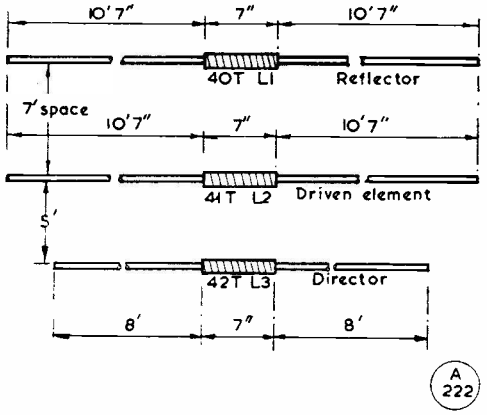


Fig. 1. Layout of the 20-metre three-element beam described by G3BG. By using inductance loading of the elements, the span is reduced from about 33ft. to less than 22ft., simplifying construction and erection. The elements are of 5/8-in. i.d. dural tube, supported as shown in Fig. 3, and the making up of the loading coils is as in Fig. 2.

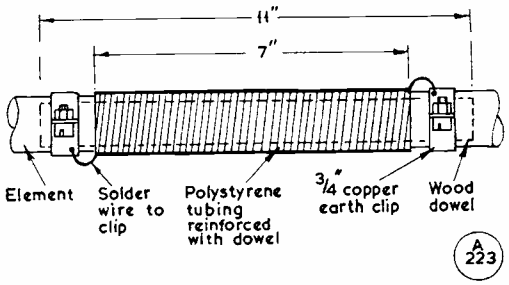


Fig. 2. Construction of the element loading inductances for the compressed beam. The former is built up from polythene tubing on a wood dowel, which gives the necessary rigidity and serves also as a fixing for the ends of the element tubes. The turns values for the elements are given in Fig. 1 and a detailed description of the winding of the coils in the article.

completed, the coils are painted with polystrene and well covered with narrow polythene tape, of the kind obtainable from most radio dealers. They are then doped once again, and the final result is a coil assembly which is so well protected that no detuning can occur in wet weather or under accumulations of snow. It is just as well to make a really sound job of the weather-proofing while one is about it.

Connection of the coils to their elements is by the method suggested in Fig. 2. Copper $\frac{3}{4}$in. earth clips are fitted on the dural elements, the clips being first carefully tinned all over to prevent galvanic action; after the connections are made, by heavy soldering, the joints are given a generous coat of good varnish, with a top coating of Bostik for additional protection. They can also be bound with polythene tape to give a tidy finish.

Feeder Connection

Since we have inductance right where we want it — at a current antinode — the feeder connection is quite easy, no matching complications being involved. It is simply a matter of a link winding fed by 75-ohm cable.

The link is made by thickening the loading coil section of the driven element by building it up with plastic tape to a diameter of $1\frac{1}{2}$in. A 6-turn link of single PVC is then put on at the centre of the section, liberally weather-proofed, and the ends of the winding are terminated on a small terminal block, to which the feeder is connected. The result is a perfect match, and any adjustment for power transfer can be made at the station end of the 75-ohm feed line.

Some General Points

While this article is concerned mainly with the electrical design and layout of the beam, rather than the construction of the array as a whole with its supportnig structure (which will vary widely in individual cases) it should be mentioned that the 12ft. main boom must be rigid enough to hold the element assembly in the same plane under all weather conditions; it also hardly needs saying that sufficient strength to withstand maximum windage in the area must also be built into the structure.

In the writer's case, the element support arrangement is shown in Fig. 3; this is quite simple, using hard wood treated against the weather, with stand-off insulators. These cross-pieces are fixed to the main boom, to the separation shown in the layout plan at Fig. 1. Yawing in the horizontal plane can be minimised by a system of wire stringers from the ends of the cross-pieces to the supporting tube or pole on which the beam is mounted, the whole thing turning as one. The boom carrying the element assembly should be mounted on the mast at the point of balance, and wire stringers can also be used to keep the boom level fore-and-aft.

On the experimental assembly, on which the finalised design described here is based, the beam was tuned at a height of about 20ft. above ground, using a field strength meter placed 100 yards away. As this experimental assembly had telescopic element ends, and it was possible to vary the spacing between the elements, it can be taken that the dimensions now given need not be varied, and that the beam will perform satisfactorily without further adjustment.

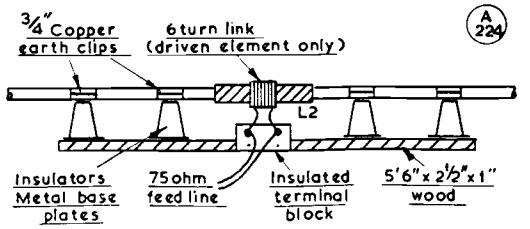


Fig. 3. Mounting of the loaded elements, the driven section being shown to illustrate the feeder arrangement. A 6-turn link over L2, the loading coil for the driven element, is all that is required; this matches into 75-ohm line, the loading adjustments being made at the transmitter end.

QRO AT BLAEN-PLWYF

The power of the BBC TV station at Blaen-Plwyf, near Aberystwyth, has been doubled; the station was opened in April, 1957, with an effective radiated power of 1 kilowatt and this is now increased to 2 kW. This increase in power should improve reception, particularly on the fringes. It will not, however, materially enlarge the area served by the station.

LF Band VFO-PA

SIMPLE TRANSMITTER UNIT

S. G. WOOD (G5UJ)

HERE are some details of a simple VFO-PA transmitter, with modulator, suitable for the LF bands. Appearing originally in the July, 1949, issue of *Short Wave Magazine*, the modulator and PA section is to the design by G6AB — *see* Fig. 1. His original arrangement incorporated a crystal oscillator; the writer modified the basic design for the use of a VFO instead of the CO. Nothing is claimed for the originality of this (*see* Fig. 2) except that it does work, and enables one to QSY with the minimum of fuss.

As will be seen from Fig. 2, the circuit is an electron-coupled oscillator; either a 6L6 or an 807 is suitable. An 807 was used by the writer, merely because it happened to be available, but a 6L6 is shown in Fig. 2 as it is the more appropriate type to use in this position. The necessary components are all easily obtainable—indeed, most of them will be found in the average junk-box. The condenser Cv in parallel with the cathode coil L1 should be of good mechanical design, and fitted with a smooth slow-motion drive, such as one of the Eddystone types. Also in parallel with it are C1, a ·001 μF silver-mica, and C2, the value of which was found by experiment to be 75 $\mu\mu$F. The coil L1 worked out at 16 turns of 18g. enamelled on the 3in. diameter former that happened to be available; a neater and more compact assembly would be 36 turns on a 1½in. former, for which the winding space would be just under 2in. The cathode tap is taken out one-third of the way up the coil from the earthy end. The RF choke in the anode of the 6L6 in Fig. 2 came from a TU5 unit—a "surplus" item full of useful components of excellent quality—but any efficient 2·5 mH RF choke would do, such as the standard Eddystone variety.

Merely for convenience at G5UJ, the VFO was built as a separate unit; the whole transmitter could, of course, be put together on one chassis, if due care is taken as regards screening and layout. As used by the writer, no trouble has ever been experienced with parasitic noises, frequency modulation, or instability, even when driving straight through on Top Band. The same input, about 10 watts, was used on both 80 and 160 metres.

The transmitter is set up by adjusting the VFO control Cv till a beat at the required fre-

Table of Values

Fig. 1. Modulator/PA section of the LF Band Transmitter

C1	= 8 μF, elect.	R7, R9	= 10,000 ohms
C2, C3	= .05 μF, mica	R8	= 27,000 ohms
C4, C8	= .01 μF, mica	RFC	= 2.5 mH RF choke
C5	= 25 μF, 25v. elect.	Ch	= 20 Hy. 60 mA AF choke
C6	= 0.1 μF, paper	K	= Key and/or 0-50 mA meter
C7	= .001 μF, mica	L2	= 80/160 metre coil, 58 turns 20g. on 1½-in. dia. former (*see text*)
C9, C10	= .002 μF, mica	L3	= 4-turn link winding
C11	= 250 $\mu\mu$F var.		
R1	= 150,000 ohms		
R2	= 100,000 ohms		
R3	= 30,000 ohms		
R4	= 500,000 ohms		
R5	= 1,200 ohms		
R6	= 410 ohms		

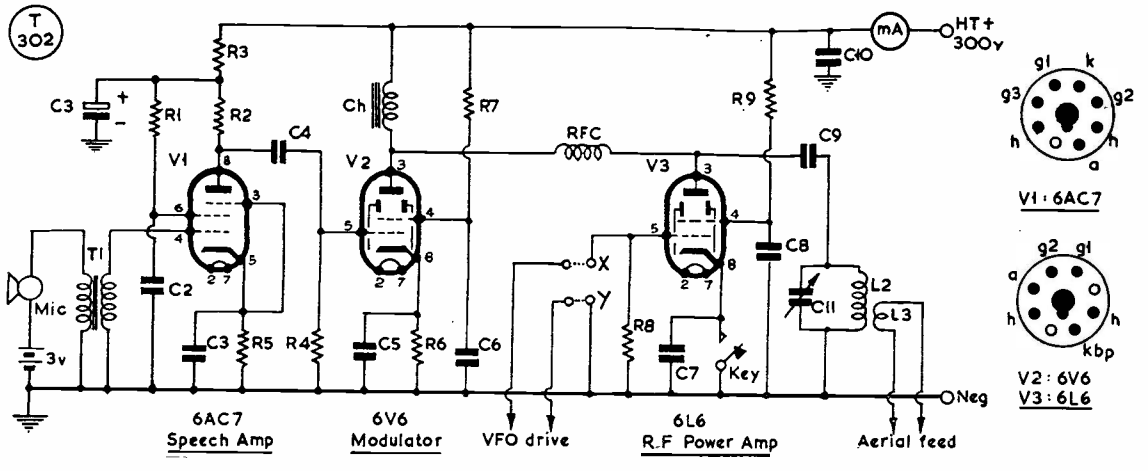


Fig. 1. Circuit of the modulator and RF power amplifier section of the LF Band transmitter, based on a design which appeared in "Short Wave Magazine" some years ago. Switching can be incorporated to cut the battery circuit for the carbon microphone, and for changing over from CW to phone. Keying is in the cathode of the PA, the drive for which is obtained from the VFO shown in Fig. 2. All values are given in the table above.

quency is heard in the receiver—say, at 1850 kc. (The fact that the VFO is in the band should, of course, also be checked by an absorption wavemeter or grid-dip oscillator.) During the initial adjustment of the VFO, HT should be kept off the PA; when the VFO is driving, and HT is applied to the RF stage, a meter in the plate or cathode of the PA will read very high, perhaps off-scale; the tuning condenser C11 should be quickly adjusted till the PA plate current is a *minimum* with no aerial connection; a loop lamp held near L2 should light up brightly, and a final check for output in the band should also be made at this point. The aerial can now be connected and tuned, the arrangement as shown on p.321 of the August issue of *Short Wave Magazine* being as used by the writer and very suitable for 80-160 metre working, if there is no garden space for something more elaborate.

For 80-metre operation, both VFO and PA will probably tune into that band with the values given. That is to say, Top Band ought to be found with Cv and C11 near maximum capacity (HF end) and 80 metres with these condensers near minimum capacity (LF section of 80 metres). If things do not quite work out like this, the VFO can be kept on 160 metres, and the PA made to double to 80 metres; in any event, it may be necessary to experiment a bit with the PA tank values—L2/C11 in Fig. 1—to get coverage on both bands. Either a fixed condenser can be switched (or clipped) in and out for changing bands, or better still L2 can be made plug-in, with a separate coil for 80 metres; this can be 30 turns of 20g. on a 1½in. diameter former. Coil values are always somewhat affected by layout and circuit capacities, which can vary quite a lot in individual cases!

Modulation

While the speech quality will be almost entirely dependent on the microphone used—it will be appreciated that the arrangement as given is about the simplest possible—the depth of modulation should be found quite adequate. If the carbon microphone is a good one, and sensitive, it may even be necessary to keep the speech input down, as well as handling the microphone gently to prevent odd noises appearing in the carrier; all this is a matter of test and experiment with the locals on Top Band and 80 metres, while some idea of the speech signal as radiated can be obtained by the old dodge of listening to the second harmonic on the receiver, *e.g.*, on 3700 kc when the transmitter is on 1850 kc, with the RF and

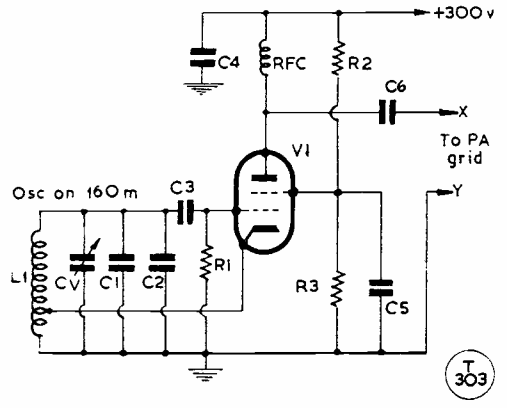


Fig. 2. The simple ECO-type variable frequency oscillator for driving the LF band PA shown in Fig. 1. Some circuit points are discussed in the text.

Table of Values

Fig. 2. VFO circuit for use with LF Band Tx.

Cv	= 500 μμF var. *see text*	C4	= .001 μF
		C5	= .01 μF
C1	= .001 μF silver mica	R1	= 50,000 ohms
		R2	= 7,500 ohms
C2	= 75 μμF silver mica (*see text*)	R3	= 50,000 ohms
		RFC	= 2.5 mH RF choke
C3, C6	= 100 μμF, silver mica	V1	= 6L6, or 807
		L1	= *See text*

audio gains turned down so that the signal in the headphones is not too strong. Then, it will be possible to tune across the carrier and hear the modulation at zero beat as a distant station would receive it; the carrier should be steady, sound to be "full of speech" and clean at the edges; then, by switching off the receiver BFO, a good idea of the speech quality as actually radiated will be obtained. If the carrier is not clean, it will probably be due to insufficient smoothing in the power supply.

For the writer, this little transmitter has produced many pleasant local phone contacts on 160 metres, while reports from all over Europe have been received on 80 metres—and using the 67ft. end-on aerial already mentioned, Trans-Atlantic working with W/VE has even been possible on several occasions. On CW, a total of 11 European countries was raised in 18 months of spasmodic operation. CW has also been attempted on the 40-metre band (with the PA doubling), but the RF power output available under these conditions was hardly sufficient to make it worth while. This is essentially an LF-band local-natter transmitter, and as such it should perform very well.

Will your Station pass an Insurance Inspection?

During a recent visit to the Plessey factory at Ilford, a number of Service representatives were given a demonstration of the new Plessey military-vehicle VHF communication equipment. This is designed to withstand hard usage and certain of the sets have already been adopted by the Army and the Royal Air Force.

PLESSEY SERVICE EQUIPMENT

Officers of the Commonwealth Armed Forces recently visited Plessey's at Ilford to inspect a comprehensive selection of military VHF mobile transmitter/receivers designed for medium and short range communication. Members of the Royal Corps of Signals effectively demonstrated the correct use of the apparatus, the British Army having already adopted the complete range of VHF equipment. Some UHF transmitter/receivers for R.A.F. ground use and Admiralty installations were also displayed.

The C.42 set is designed as a VHF transmitter/receiver for short range communication from tank to squadron. It provides facilities for FM speech on 241 separate channels at 100 kc separation and has built-in crystal calibrators; netting is therefore not necessary to set up communication. The transmitter operates on 15 watts (full power) with a range of about 15 miles using an 8 ft. aerial rod, or on 0.25-0.5 watts with a range of up to 5 miles. Power supply for the set can be obtained from either a 12 or a 24-volt DC source. (A power pack for operation from AC mains will also be available.)

The B.47 is a VHF transmitter/receiver for short-range speech communication. It is intended primarily as the third, or "C," set in an armoured vehicle installation, for use as a tank-to-infantry link. It provides 181 separate 100 kc channels, and also has built-in crystal calibrators. The power output is 0.5-0.75 watt with a range of up to 5 miles using an 8 ft. rod aerial. Power can be drawn from a 12 or 24-volt DC source and alternative power units are available for each of these voltages.

The B.48 VHF transmitter/receiver was developed simultaneously with the B.47 for communication over short distances, such as between O.P.'s and artillery batteries. It provides facilities for speech on 121 separate 100 kc channels.

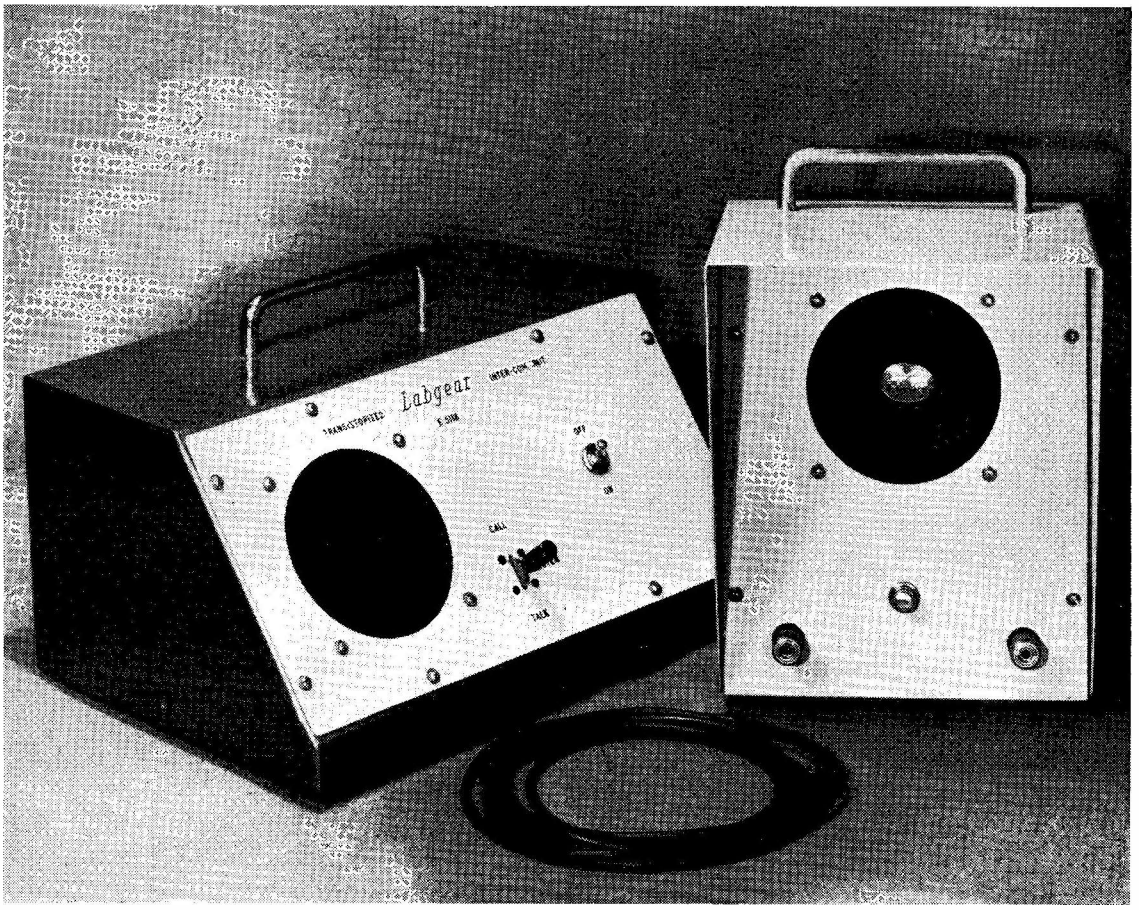
WE PAY FOR THEM

While we are always interested to see articles suitable for paid publication—and almost anyone is capable of writing one article on some subject of which he has close and expert knowledge—we do ask that the material as turned in to us should be in usable form. This means "typed double-spaced with wide margins, on quarto or foolscap sheets, on one side of the paper only, with diagrams shown separately from the text, and tables of values (or components lists, or lists of parts, or the shopping list) given on separate sheets, headed or identified so that they can be related to the text and the diagrams to which they refer." *This does not mean squeezing everything up on to the same piece of paper!*

In processing an article for publication—and all articles require a great deal of experienced editorial attention, however well they may be presented—the work of preparing the material for the printer (which is only the first stage in getting it ready for publication) is greatly simplified if the rules stated here are observed.

It is most regrettable that a lot of material we are now being offered for publication is poorly presented, inaccurate in detail, not properly checked through, sloppily written, and set out in such a way that it cannot be marked up for the printer without reducing the copy almost to illegibility. Such articles can only be rejected out of hand or, if containing some useful idea, have to be re-written and edited to such an extent as to make them worth only a guinea or two as payment to the originator. Yet, if he had taken some trouble, his effort might have been worth a great deal more.

Since we pay well—something over £1,000 in a year, in fact—for contributed material, we feel entitled to lay down the form in which articles should be presented! It can be taken as axiomatic that the contribution that earns most is that which demands the minimum of editorial attention. For the contributor, this means a careful study of how technical articles are presented in print in SHORT WAVE MAGAZINE, with particular attention to the sign convention.



The fully transistorised speech inter-communication unit — for office, home or workshop — now offered by Labgear, Ltd., Cambridge. Their range includes a number of items for the electronics market, outside the Amateur Radio field.

CITY & GUILDS TECHNICAL EXAMINATIONS

As is, of course, well known, the City & Guilds of London Institute offers a wide range of qualification certificates (by examination) in a great variety of technical and engineering subjects. A City & Guilds certificate in any subject is a recognised qualification in its field not only throughout the U.K. and the Commonwealth, but in many other countries as well. The great step-up in technological education—largely through the efforts of the City & Guilds itself—is exemplified by the fact that during the C. & G. year ending June, 1958, some 135,000 candidates presented about a quarter of a million examination scripts. All these are worked over, by a great team of expert examiners in the various subjects, during the summer period (when the hopeful candidates are having their holidays).

The City & Guilds does not itself teach the subjects—what it does provide is the syllabus upon which a course of study can be based, leading up to the examination in that subject. The teaching is done locally, at technical colleges, evening institutes and adult education centres, all over the country. Practically every town in the Kingdom has some sort of evening-class organisation, even if only to teach a few subjects out of the 180 or so in which the City & Guilds of London Institute can examine. Under *Section C — Telecommunications and Electrical Subjects*, there are 14 different examination courses, including the one we know so well, Subject No. 55 (the R.A.E.). For juniors embarking on a career in radionics there is No. 49, the Telecommunications Technicians' Course, leading to a certificate, and for more advanced students, Subject No. 300, which covers supplementary courses in such specialised branches of the art as Communications Radio, Microwave Technique, Radar and Radio Navigational Aids, and Sound and Television Broadcasting. For those in the radio trade who wish to improve their prospects there are also courses in radio and TV servicing, electrical installation and illumination engineering.

A prospective candidate for any of these examinations, or a student wishing to embark on a course, should consult the principal of his nearest Technical College or College of Art, or enquire at the office of the local Education Authority. Nearly all courses are either evening or part-time, and fees are nominal, as the greater part of the cost is borne by the Education Authority.

RADAR ASSOCIATION LECTURES

It is announced that the lecture season of the Radar and Electronics Association will open at the Royal Society of Arts, John Adam Street, London, W.C.2, on September 23, the next dates booked for these very excellent and well attended lectures being October 22, December 3, 1958, and January 26, March 2 and April 6, 1959. Full details respecting membership of the Association can be obtained on application to: The Secretary, Radar and Electronics Association, 83 Portland Place, London, W.1.

NOTE FOR SWL's

It has been suggested that, as a means of identification on their own QSL cards, SWL's who have no personal sign but are direct subscribers to SHORT WAVE MAGAZINE—and therefore entitled to both-way use of the QSL Bureau we operate—could have a permanent number issued to them by us for the purpose. This could be printed on the card as a "callsign," *e.g.* G-3112, or GM-3112 for an SWL living in Scotland, the U.K. prefix being used as appropriate. Those SWL's who wish to may adopt this idea forthwith, as some personal identification is essential if return cards are to be delivered correctly. SWL direct subscribers, *i.e.* those who pay a subscription to us in advance for a year of 12 issues (33s.), or 16s. 6d. for six months, may apply for a number, with an s.a.e. It should be noted that this arrangement is in respect of direct subscribers *only* — we cannot entertain applications from, or extend both-way use of the QSL Bureau to, readers who obtain SHORT WAVE MAGAZINE otherwise than by direct subscription.

OBITUARY

We very much regret to have to record the deaths of:

Leonard Groves, G4GT, of St. Albans, at the age of 45 years. Licensed in 1938, he was interested in all aspects of amateur activity, including DX and the VHF's. G4GT was with Marconi Instruments, Ltd., of St. Albans.

* * * *

William Henry Winchcombe, G6ZH, of Devizes, Wilts., and a well-known old-timer, on August 17, following an operation. During most of his working life employed by the Post Office, G6ZH served in both wars—in 1914-18 in the old Royal Flying Corps, and for 1939-45 as a civilian instructor at No. 2 Electrical & Wireless School, Yatesbury, Wilts. Before 1939, the main interest for G6ZH was in 160-metre working, on which band he was very well known to all the active operators of those days; he was a particularly fine telegraphist, having served at the G.P.O. stations at both Devizes and Highbridge. After the war, he turned his attention to the HF bands, running CW and phone on 10-80 metres. A sincere churchman and a staunch patriot, G6ZH was always interested in youth activities and education, devoting much time to the local Army Cadet and A.T.C. units. One of his sons is G3BCW (who is to become G6ZH), and another is commissioned in R.E.M.E.

* * * *

We offer our sympathy and sincere condolences to the family and friends of G4GT and G6ZH in their sad bereavement.

DX COMMENTARY

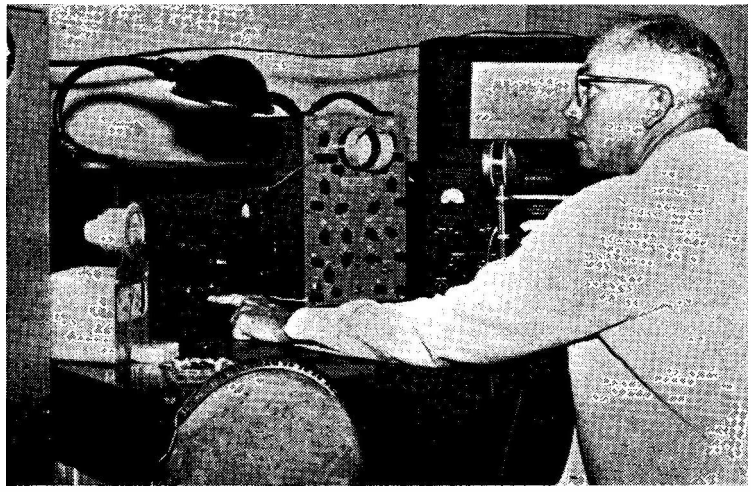
L. H. THOMAS, M.B.E. (G6QB)

ALTHOUGH propagation conditions seem to have been excellent for most of the last four weeks, the actual DX activity on the bands has been below par. Possibly some countries have been having real summer weather while our own climate has been giving its celebrated imitation of a perpetual November. Whatever the cause, the fact is that the activity level has been pretty low.

Even the arrival of a real plum, in the form of FO8AT on Clipperton Island, didn't appear to start up a vast panic, and very few of our correspondents seem to have worked him.

Of course *Ten* has been completely off colour, but there has been no shortage of DX on *Fifteen* and *Twenty* if one looked at the right times. Openings are becoming more frequent, and the Contest season is approaching, so we may expect some pretty good times from now on. What happens to the sunspots after this year is anyone's guess . . . we have seen suggestions that we may be in for some very lean years, following the sensational maxima of 1947 and 1958.

One or two of our regular readers have suggested that we might try *opening* this Commentary with all the DX Gossip, so that the individual reports can be referred back to what has been happening. Always anxious to oblige, we are doing just this very thing ; and so we start with all the DX news, with the usual acknowledgments to the many sources of inspiration—particularly to W6YY, the West Gulf DX Club, the Ohio Valley *DX Bulletin* and the *Western Radio Amateur.*



OA4G

CALLS HEARD, WORKED and QSL'd

DX Gossip

The big thrill of the month was provided by FO8AT on Clipperton Island, sponsored by the San Diego DX Club. He was knocking them off in fine style during mid-August — further comment elsewhere.

VK2FR is active from Lord Howe Island, but pretty elusive over here . . . FB8BK is expected back on Tromelin Island soon . . . VK9XM is said to be on from Christmas Island (the one in the Indian Ocean which also houses ZC3AC).

W6ITH's trip to Anguilla (VPØRT) has been held up for a month or two, on account of an outbreak of *smallpox* on the island —just as well to dodge that . . . VP2VB was due to arrive on St. Kitts, but that may be all over by the time you see this . . . His operation from the British Virgin Islands sounded like bringing in a few thousand contacts !

VQ9GU has been busy from the Seychelles, mostly on 21 mc phone . . . W3ZA/XV (formerly XV5A) has been heard as W3ZA/3W — whether from Cambodia or Vietnam we know not . . . CEØAC is said to be operating on Mondays and Saturdays ; 14 mc CW definitely, and perhaps other bands as well.

FK8AS was all set to work from FW8—nothing through yet . . . For two weeks from September 15 there may be some activity from the Galapagos Islands, whence three WØ's expect to be working under an HC8 call . . . Possible operation from the Andaman Islands—look out for VS1GL/VU5, or VU5GL . . . VQ4ERR promises to go to VQ9 —in August 1959 !

VS9MA has been on 21 mc phone from the Maldives. The chief op., Don, is ex-4S7AD . . . The recently publicised PYØ expedition did not take place, but is still "on"—for October or November ; calls will be PYØNA and ØNB, duration a week or ten days.

HV1CN is on 14 mc phone at 0600 GMT, except Sundays . . . WØDWN will be operating as XEØDWN, probably about now

. . . : ZS6AQQ will be on SSB from ZS9-land, early September . . . ZL1AAX is sending SSB gear to ZL3DX for use on Chatham Island . . . AC4AX (ex-FN8AD) is said to be on the air from 1200 to 1230 GMT on 14100 kc.

XW8AL has been around on 14120 kc . . . KS6AG (YL operator, name Dotty) has been consistently heard on 14060 kc; not easy to work from here!

ZD7SA, who started up on 28 mc only, is now on 21 and 14 mc regularly, and also said to be on 7015 kc. And when the last mail boat came in he astounded his neighbours by receiving a delivery of 2500 QSL's! So if yours is in that lot, give him time.

VP2LO is active from St. Lucia, one of the "new new ones"; mostly 14060 kc CW . . . ZD1FG is now said to have some Vee-beams—we hope they are not all directed on USA!

There is *no* mail service to Macquarie Island, so those who work VKØTC must be patient . . . Likewise LA2JE/P (Svalbard) necessitates a little patience. LA5HE is no longer handling his cards, which must now go *via* the NRRL Bureau.

Last month's suggestion that ZK1AK was thirteen years of age was 'way off the beam! He is ex-ZL1FT, whose DX-ing dates back to the 1920's . . . ZM7F and FU9AY are both phonies . . . Jan Mayen activity is promised once more, when a new gang arrive there and will be active for a year. Call at present unknown.

Long-Range DX Tour

More news of the Czecho-slovakian DX-pedition, briefly mentioned last month. It now appears that OK2HZ and OK2ZH will cover a terrific itinerary during a five-year tour, *via* the Middle East, Yemen, Kuwait, Persia, Afghanistan, Sikkim, Nepal, Burma, Thailand, Malaya, Java, Sumatra, Borneo, Celebes, New Guinea, many islands in Polynesia, Philippines, China, Tibet, Mongolia, Korea and Japan. Two trucks and two Collins KWM-1's will be in use. Calls will be OK7HZ or OK7ZH with the appropriate suffix. Of course we don't yet know from how many of those countries they will actually be able to operate, but it's a pretty comprehensive list to choose from. OK1MB will be QSL manager and will doubtless act as M.C. on the frequency when occasion arises.

Last month we warned that UAØGP/Ø was worth watching, having been reported in Zone 23. Now we hear another rumour that UA1GR/Ø is not only in Zone 23 but possibly in Tannu Tuva. No further gen. on this one at all . . . VPØAA has been heard and worked by W's, and he says "QSL *via* VPØAB," which is either a terribly funny gag or a blatant attempt to disguise a phoney status.

The ARRL have announced that Chatham Is., off New Zealand, will count as a new country, from October 1, 1958—credits will be given for QSO's back to 1945. Now to find out whether you have ever worked 'em!

VK2AYY/LH worked for two weeks from Lord Howe Island, and made 1911 QSO's (1428 of them with W's). At the peak he worked 170 stations in one hour. The black list was pretty active and there are quite a few stations who will never have a card to show for their sharp-practice tactics. VK2AYY visited VK2FR (resident on the island) and indoctrinated him on the subject of pile-ups, so we hope VK2FR will now keep the flag flying.

ZL1ABZ on the Kermadecs doesn't get on very often; he explains that they work a seven-day week out there. In any case he's not interested in DX and just comes on "to do the decent thing." Don't scare him off, or he'll probably take up some less strenuous hobby. (Not that anyone over here ever hears him!)

HI7LS, one of the three active U.S. operators in the Dominican Republic (the others are HI8BE and HI8RM), promises activity from Navassa, KC4, in September or October.

VS9MI should be on from the Maldives by the time you read this; he left the U.K. on August 15 and hoped to be on the air a

FIVE BAND DX TABLE
(POST-WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries	Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
DL7AA	884	113	170	238	190	173	254	G3JZK	316	16	55	73	110	62	154
W8KIA	802	68	148	271	171	144	271	G3IGW	314	44	65	91	66	48	122
G3FXB	766	73	131	215	197	150	245	G6TC	302	17	67	127	59	32	143
G5BZ	738	64	118	254	181	121	260	MP4BBW (Phone)	276	1	5	88	117	65	141
G2DC	683	77	102	207	158	139	225	G2BLA	272	32	50	66	69	55	110
G3DO	648	24	46	240	169	169	264	G3LET	270	11	49	136	57	17	147
GW3AHN	606	16	55	187	216	132	239	G2YV (Phone)	267	12	26	83	93	53	137
G3WL	519	41	90	174	123	91	201	G3JJG	265	38	45	94	53	35	113
W6AM	512	30	58	282	86	57	282	G8DI	256	25	56	71	60	44	109
G2YS	491	71	87	162	109	62	179	G3HQX	242	15	37	74	52	64	109
G3ABG	490	45	83	167	109	86	191	G3DNR	231	10	21	86	53	61	110
GM2DBX (Phone)	425	34	31	160	102	98	176	G2DHV	231	21	27	126	42	15	135
G6VC	391	34	49	147	93	68	168	UR2BU	217	12	24	71	50	60	?
W6AM (Phone)	361	13	32	256	39	21	256	VO2NA	169	13	17	85	40	14	91
G3JLB	358	43	50	88	87	90	156	W3HQO	139	3	5	18	71	22	86
G3INR	332	46	59	128	62	37	138	G3IDG	112	11	15	28	26	32	49
G3FPK	319	30	70	116	70	33	139	G3DNF	109	5	29	38	27	10	49

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

week later . . . FU8AG is ex-F9MO and genuine; he is reported on 21 and 14 mc CW; not DX-minded, and prefers rag-chewing . . . VK9LE (Cocos) works phone on 21220 most days, 1500 GMT . . . A new VP5 on Turks Island may be showing up, operated by the former VP2LU.

Apparently the ARRL have decided to recognise Trinidade Island, PYØ, as a new one from December 1st, with credits back-dated. Another rumour concerns the United Nations extra-territorial ground at Geneva, whence a station has been operating with the 4UZ prefix. This one may have the same status as ZC6UNJ, Jerusalem.

VS1FJ says that the only legitimate VS5 at present is VS5AT—VS5AA is no good . . . Operation from XE4 (Socorro) is planned for the later months of the year by some hopeful W6's.

Not Allowed

Several DX'ers in the U.S.A. have been receiving pink slips from the FCC for failing to transmit the call-sign of the station being called. In other words they used the snappy, time-saving, QRM-saving expedient of sending just "de W6 . . ." when taking their place in a pile-up. We always looked on this as good operating practice and a notable QRM-reducer, but obviously the FCC think otherwise. If the DX stations themselves come under this ban, it puts paid to any further operation of the 120-contacts-per-hour type, and the pile-ups will be higher, wider and longer.

Talking of pile-ups, we were glad to find FO8AT (Clipperton) using a new technique. From time to time he would send a short QST and say "DX up, USA down"; after which he would call QRZ DX and QRZ USA alternately, listening 10 kc HF for the DX and 10 kc LF for the USA. Naturally this foxed all the Klots, who couldn't read or understand what he was trying to convey anyhow; but late-comers on the scene didn't know what was happening and called on the wrong side. His own frequency was clearer than any other DX-pedition we have heard, though, and there was never any trouble in copying his signal.

DX on 28 mc

The doings on *Ten* can still be dismissed in a very small space; the band has not really been awake for many hours during the four weeks under review.

ZD7SA has been around quite a lot, and was an all-time new one for G2DC (Ringwood). GW3AHN (Cardiff) raised CR6DA and VQ3PBD on phone; and G3FPK (London, E.10) worked FF8AJ on CW and mentions that ZD7SA's key has been quite potent at times.

DX on 21 mc

Here on *Fifteen* we have had quite a different story. There have been a few of those freakish days, when the band has been packed with JA and KR6 signals for a few hours; sometimes VK and ZL have been abnormally good; and on the many days when the W's did not break through at all, there was plenty of interesting DX to be heard in their place.

VQ9GU (Seychelles) was the sensation of the month, and he really put that rare and beautiful spot on the map, getting S9 phone through to Europe many times. (Probably creating one of the biggest phone pile-ups in history!)

G5BZ (Croydon) missed him, and is still waiting for a CW type to show up from VQ9! But 'BZ did get VP2VB, VS1GL, TI2LA, VQ4EV, PY, LU and some VK's.

GW3AHN has a long list for this band, as usual. CW catches were CT2AI, FM7WU, KB6BJ, UAØGF, UL7HB, VP2VB, VP8DK, VR2DG and VS9MA. His phone raised ET2US. KB6BH, VK5BV and 5NE (both Darwin), VK9CP (New Ireland), VK9LE (Cocos), VP2VB, VQ9GU, VR2DE, VS9MA, 9G1BV and 9K2AZ. Who can say Fifteen is dull after reading that lot?

G3ABG (Cannock) raised ZD7SA, MP4BCL, ET2US, VS9MA and EL2N on phone: CW gave him W7FYV (making him WAS), ZD6RM, CR7, KP4, HC4IM, VS9MA, EA6AM and ST2AR. VQ9GU gave him an incomplete QSO on phone; the DX was being called incessantly by Italians with their "'Allo Jeemee" and was thus QRM'd out.

G6VC (Northfleet) worked EL1X and VP2VB for new ones on the band. G2DC worked VP2VB on both CW and phone, also TI2LA, VPØAA and CT2AI for new ones. Among the others were CT3, CX, EL, HC, KH6, PJ2, ST, VP4, 5, 6, 7, 8 and 9, VS1, 6 and 9 and VK's.

G3FPK raised SM1BSA, ST2AR, VP2VB and 3A2CF. The latter was operated by G3ZY on his holiday from the same spot in which G3FPK himself ran 3A2BT some time back.

DX on 14 mc

It's fair to say that *Twenty* is no longer the best band for all-round DX, but if you are interested in nothing but new ones, it is still the band to stick to.

GW3AHN collected FO8AT on CW (hard on our heels around 0800), and also worked VP2VB. G5BZ accounted for FO8AT (within three minutes of first hearing him!) so he is another satisfied customer. Others were VP2VB, VS1FJ, VQ6AB, XW8AL, ZK1AK (*via* the South Pole again),

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
G6VC	96	96
G3JEQ	96	96
G3JHH	92	93
G3FNV	91	92
G3AKX	90	91
G2AYG	88	88
G2CZU	78	78
G3DO	75	75
GM3COV	68	70
G3LBQ	61	67
G2CZU (Phone)	60	60
G3KEP (Phone)	54	61
G3JSN	49	62
G3LEV (Phone)	39	47
G3LNR	36	48
GW3HFG (Phone)	30	40
G3LNO	23	41

VE8's and KH6's, VP7BT, UAØ, JA and YV . . . a nice mixed bag.

G5BZ tells us, by the way, that a KL7 recently informed him that Alaska counts as another State of the USA from January 1 next. So . . . if you haven't yet worked KL7 you had better hurry up. Likewise we presume that it will be needed for WAS in the future.

VP2VB, on both CW and phone, was another all-time new one for G2DC. He tells us that Danny is now equipped with a portable tower and a beam suitable for use on 28, 21 and 14 mc, which accounts for his greatly improved signals.

Short Wave Magazine

DX CERTIFICATES

The following have been awarded since the publication of our last list, in the June 1958 issue:

PRA
No. 1 W6YY (La Canada, Calif.)

WFE
No. 36 VK3YL (Murrumbeena)

FBA
No. 123 EA1CP (Santander)
124 HB9NL (Knutwil)
125 OK3EA (Bratislava)
126 UC2AA (Minsk)
127 CE3AG (Santiago)
128 DJ2BW (Trier Mosel)

WNACA
No. 173 DL1YA (Munich)
174 LU6AJ (Buenos Aires)
175 OY7ML (Thorshavn)
176 UC2AA (Minsk)
177 OH3TH (Tampere)
178 G2AFQ (Bury)

WABC
No. 170 G3LIQ (Hull) (*Phone No.* 2)
171 G4FD (Blackburn)
172 G3LBQ (Brentford)
173 G3JKY (Beckenham)

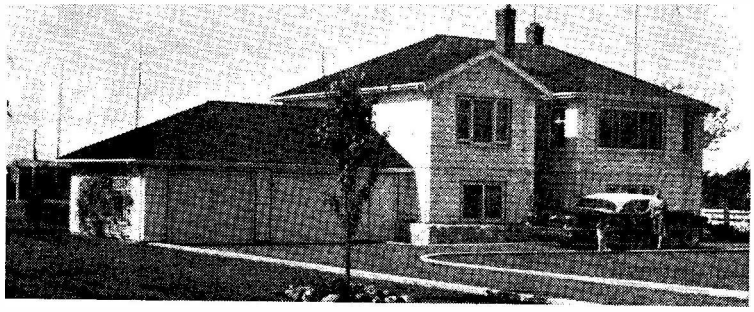
WBC
No. 106 HA5BI (Budapest)
107 W3BQA (Dillsburg, Pa.)
108 LA5HE (Oslo)
109 SM5BCE (Huddinge)
110 DL3HZ (Ingolstadt)
111 OZ5JE (Brondersley)
112 SM7EH (Huskvarna)
113 W6YY (La Canada, Calif.)
114 I1FT (Gradisca)

Details of MAGAZINE DX AWARDS and CERTIFICATES, and the claims required for them, appeared in full on p. 84 of the April, 1958 issue.

Overseas claimants (*only*) may send either (*a*) A check list, without cards, duly certified by the Hq. of their national Amateur Radio Society, of (*b*) An uncertified check list, from which any or all cards may be called in by us.

U.K. claimants should send the relevant cards for each award.

A full list of U.K. Counties appeared on p. 82 of the April, 1958 issue.



VE7KX at Richmond, Vancouver, runs high power — his driver stage on 3.5, 7, 14 and 21 mc takes an 813, with a separate PA (either a pair of 450TL's or 6C21's) for each band, modulated by a pair of 450TL's. VE7KX is a keen teletype operater and only needs Europe for WAC-RTTY, which would be the first-ever such WAC to be achieved. He has an elaborate array of equipment for teletype working, and he also runs mobile on 75 metres. The radio room is at the back of his house shown here, from which an extensive aerial system — including a six-wave rhombic for 15 metres — is energised on five bands.

G3FPK sums up 20 metres by saying "early mornings find it bursting at the seams with W6 and W7, whilst later on the KL7's and KH6's give the local Europeans a run for their money. KL7CDF is the most consistent and loudest Alaskan and gets through at any time." FO8AC was heard, bu. usually swamped out by Klots calling on his frequency. G3FPK managed to work F2CB/FC (new one). KØEPH (Colo.) and UAØAG. Gotaways were FB8BS, OR4VN, PZ1AP, VKØWT and VP9AK/P.

G6VC heard HC4IM at 1040 GMT and thought he must be phoney with a 589 signal at that time. As a matter of fact he was genuine ! G3IGW (Halifax) collected HK4JC and XE3BL for new ones. Interesting stuff heard but not worked included XE1YF and 2HN, FO8AT, HR2FG, YN1AA, VP2VB, PJ2ME, VS9AS, HP. ZP, FM7 and others.

G3ABG roped in VP2VB for a new one ; G3LET (Westcliff), back on the air after two months off, worked FG7XF (2300), PJ2CJ, ZP5LS, OR4VN (1900), 9G1CR, WØBKL/KG6, 9K2AN and UL7GL, among others.

G3HGD (Wakefield) writes in for the first time. After being a Top-Band-only man for many years he has started working DX with 10 watts and a 68-ft. centre-fed wire. This QRP has fetched in all W districts (38 States), VE's, UA9 and Ø, KZ5, LU, ZC4, EL, VP7, VP2VB, VK and ZL. G3HGD remarks that it's encouraging to know that you can do this sort of thing with ten watts, despite the wolf-pack tactics—but one needs endless patience and, of course, the urge !

G3LUY (New Barnet) raised SVØWT/Crete, 3A2CF, TI2OE, YV5HT, HK4DP, CO2BL and PJ2CE (all phone).

40 Metres

Precious little news of *Forty* this month, although G3FPK worked 3A2CF on sked for a new one on this band (No. 70). G3IGW has found it excellent for W's between 0200 and 0500 GMT, with little QRM or QRN. At peak times, he says, they can be worked at one per minute. PY's have been heard at 599 around midnight, and Central American DX has also been there.

G5BZ wanted to check that the rig and the long wire still worked on 7 mc, so he got going and raised SM8AIG (near Canary Is.) and a couple of W's.

G2DC is the only one to report working VP2VB on this band. but in view of his skeds it's not surprising ! G3LNR (Nottingham) uses QRP on 40 in the early mornings and has been working W's with 10-13 watts Also heard

—KG1, KP4, EA9, FA8 and AP5B. So it's worth being there in the early mornings !

G3LPS (Blackburn) found the band better than last month, and picked up some " rare " Europeans such as UR2AO, HE9LAC and 3A2CF. Good DX included UM8KAB (2345 GMT), ZL4IE, PY, VO1, EA9, 4X and plenty of W's. Heard but not worked were KP4, CR6, TF and CT2.

Top Band Topics

G3IGW has an end-fed 550-ft. wire for this band and looks forward to some DX in the coming months. He says stations are not DX-minded just now, and they won't scrape about in the noise hunting for replies to their calls. G3IGW worked VE2AZI (who is ex-G3GGN) on Forty and had a long chat about Top Band prospects. VE2AZI is all lined up and is already calling and listening on 1804 kc ; he says there is hardly any QRM at his QTH, and he can work W9 and W4 on phone. He passes his 73 to old friends of G3GGN days over here.

G3AKX (Sale) put his counties score up by working GW3HGY/P, operating under canvas near Towyn, Merioneth. G3AKX, with a score of 90 confirmed and 91 worked, is having to scratch for the remainder, and he would like to hear of any activity in Stirling or Peebles, not to mention Orkney and Sark !

Note from Overseas

MP4BBW (Awali) has been putting his phone around on 14 and 21 mc, with quite an increase in his score as a result. All-time new ones on 21 mc were VK9BS, VQ9GU, VS9MA and VK9CP ; and on 14 mc HB1TL/FL, VP2VB and HL9KR. He tells us that 9K2AM/M is back in Teheran, but no sign as yet of an EP/EQ call-sign. 'BBW says he doesn't know how VQ9GU put up with things, with everyone grinding out zero-beat calls.

W6AM (Long Beach) hops up to 282 with VP2LO (St. Lucia) and VP2VB ; and to 256 on Phone with the same VP2LO and also VP2AB (Antigua). He still needs VP2D, 2K, 2M, 2S and Anguilla, so a score of 286 is possible.

Miscellany

G2BLA (Welwyn) is not yet active from his new QTH, but he is 320 feet up, with room for a 132-ft. wire—also the gardening that goes with it . . . G3MJL (London, W.7) reports for the first time. He is on Forty only at present, where he has worked W and is hearing lots of DX late at night. This winter he hopes to start collecting it . . . G3HWF was re-allocated to RAF Yatesbury in February this year. They have recently been troubled by people telling the stations they work that G3HWF is a pirate, and request that they should note this re-allocation of call.

G3JUX (Stone) moved to a new QTH, put up a long wire, had his power-pack go up the creek, and heard loads of DX which is never on the air at the same time as he is ! He intends to rebuild and go DX-hunting.

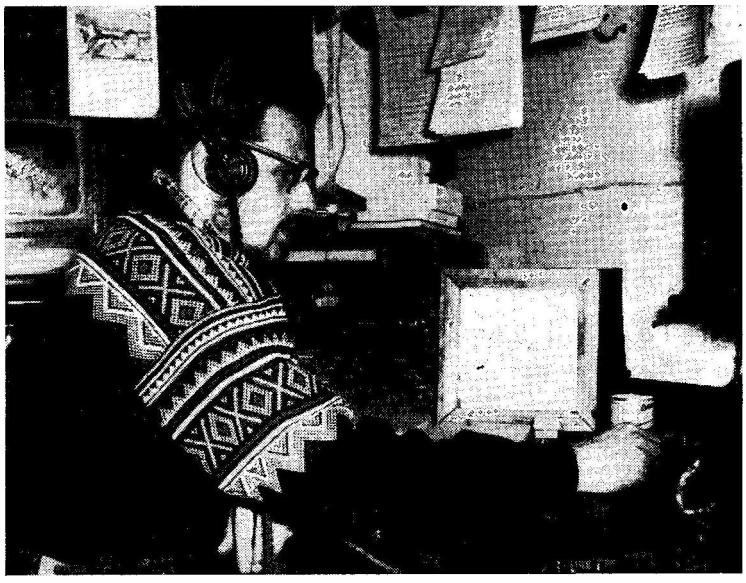
G3INR (Hereford) worked W6SAI/OH, who is touring OH9, SM5 and HB. Bill of W6SAI asked him to pass his 73 to all who know him. He hopes to be over here next spring.

Alec Foxall (m.v. *Baltic Merchant*) recently made a trip to Latvia, and he still finds that most of the DX up the Baltic comes from Central and South America. His new receiver (an S.77a) has shown him that 28 and 21 mc are far pleasanter to cover than 14 mc these days, but unfortunately the Rx went bad on him half-way through the voyage. A notable gotaway for him was a G3 on Top-Band phone, while he was off the south coast of Sweden. SWL Foxall is amazed at the way all the Europeans either call CQ DX or work each other, while the DX is actually there, underneath them. It was ever thus! To many an EU, " CQ DX " is what you call just automatically, even if it only brings back a station in the next parish (which it nearly always does !).

Sheepskin Directory

The Certificate racket (for we can call it nothing else nowadays) is becoming so complicated that we can't give more than the briefest mention to any new ones. We haven't the faintest idea how many there are nowadays, but it's probably between 300 and 400 ! Here's another batch . . .

WDT is for working five OH's in Tampere. Cards and four IRC's to TRA, r.y. Tampere, Box



G3LWS, now of Loughborough, Leics., " in costume " when operating VP8CZ at Admiralty Bay, King George Island, in the South Shetlands. He went out to Antarctica in the R.R.S. " Shackleton " and did a good deal of operating ; he says that G's are hard to find out there under the blanket of W stations chasing after every VP8.

179, Finland . . . *OHA 100* and *OHA 300*; the first is for working 100 OH's in 10 OH districts on each of two amateur bands, and the second for working 300 OH's in 10 OH districts on each of three bands. List of cards, declaration, and five IRC's to SRAL Awards Manager, Box 306, Helsinki.

P6K is a Russian award for which you have to show proof of working stations in all six continents plus one with USSR in Europe and one with USSR in Asia. Claims to UA3GM, Box 88, Moscow, and *no* IRC's required. This certificate, says G3LET, is made out in gold and two colours, and he can't understand a word it says !

Still on the subject of sheepskins, G3FPK tells us that he now has his DXCC (with 110 sticker); 50 countries and 126 QSL's towards "WAE II"; and all cards except one for "WASM II". A card direct from F2CB/FC has completed the batch for DPF.

SWL Corner

P. Day (Sheffield) records the "Klot" of the month, on *Forty*. This station was 579c, signing FE7BL, and during the next thirty minutes the same station, on the same channel, signed FB8BL, VP8KN and FB8FN ! (G3FPK was listening at the same time and confirms the first two calls.) However, P.D. logged ZD7SA on Forty, and he was genuine enough and a very nice catch. Other loggings included W's on SSB, around 3960 kc; VQ9GU (SSB on 14 mc); KB6BH, VR2DE, VS9MA, VP2VB, FS7RT and JZØPB (all 21 mc phone).

M. J. Prestidge (Birmingham) has notched up 199C in 40Z all-time, and 165 this year. Recent good ones were VP2VB, ZD7SA and VQ9GU (21 mc); SVØWT/Crete, UAØFF (Zone 19), F2CB/FC and KM6AX (14 mc); and he passes on sundry useful items of news, most of which figure in "DX Gossip."

G. P. Watts (Norwich) has the phenomenal score of 243 *confirmed* in 40 Zones. Recent cards to arrive for him have included XW8AI, LA2JE/P, VR3A, VQ8AS, VKØKT, HS1C, KC4AF, KS6AD, VR6TC and ZC3AC—to name only some of them. There may

A "self-take" of G3LB, Ripon, Yorks., who runs a Viking SSB transmitter and 20A Exciter, built from kits, with a modified BC-458 as VFO. The receiver is an Eddystone 888, and the aerial system includes a 3-band beam and a ground plane for 10-15-20 metres. The main interest at G3LB is SSB operation on the 10-metre band.

be other SWL's with higher claimed scores, but we have never come across one with so many confirmations to show for it . . . congrats, G.P.W. !

S. R. Smith (Crewe) logged HP1JF, HR1JC, HR2BK, XE1CC, XE1HC, YS1JR and YS1MM (all 14 mc phone); also FB8BQ, FM7WQ, VS9MA, VK9CP and ZD7SA (21 mc phone); and VU2CQ (1015) on 28 mc.

R. Baines (Gillingham) scores 147C in 39 Zones, and recently logged HV1CN, DL4TU/AM and DL4TC/AM (14 mc phone); HR4WH, 9G1AB, HL9KT, ZD1FG and ZP5CT (21 mc phone); and ZS3AG, ZE, LU and short-skip on 28 mc.

L. D. Strange (Sutton Coldfield) found KP4AOO (7 mc CW); HH2FB, VQ9GU, VS9MA and WV6BDA (21 mc) and ZD8JP (28 mc phone). The "WV" call is the new novice prefix in California and L.D.S. comments on the fact that the WA prefix will be in general use in the 2nd and 6th districts, with WV for the novices. There may be some ambiguity, since WV is already the novice prefix for KV4, although there won't be any WV4's in the 4th district for a long time—only in the 2nd and 6th.

C. N. Rafarel (Birmingham) wonders why so many stations still call CQ twenty times and sign once, just when a burst of static hits them ! His loggings include ZK2AM, VK9CP, VR2DA, XE1OU, ZD7SA and OR4VN (21 mc phone); and OZ4GO (Bornholm), YS1IM, YN1EW, HC1AH and SM5AGT/LA/P (Spitzbergen) on 14 mc phone.

G. J. Priest (Tamworth) heard VQ9GU, TF2WDC, HB9JB and sundry W's on 21 mc SSB; on AM he found OA4IGY, VK9CP and EL2N. Several SSB stations were heard on 14 mc, too.

V. Porter (Loughton) was getting a fairly weak signal from ZE2JE, and it turned out that he was using 6 watts to a new mobile Tx . . . Noticed on 14 mc phone were CR4AS, FP8AO, HI8's, HR2MT, KM6AR, VS9MA, VQ9GU and ZP5CF. V.P. remarks that 21 mc phone has been so prolific that one can leave the receiver on one frequency and hear quite a lot without going near it !

That Country List

Comments on the country-counting business still come in thick and fast, but no one gets nearer to solving the problems it has created. Most sensible remark of the month is that the ARRL list is for the purposes of DXCC, which is strictly an ARRL award; they therefore have every right to produce whatever kind of a list

they think fit. But there is no need for anyone else to accept it as infallible for their own purposes. Thus one can have worked "180 DXCC Countries" although one may think the true figure is 176 or, possibly 184.

VK2BA (Balgowlah, N.S.W.) discusses the whole thing at length, and makes some very interesting suggestions which we haven't the space to dilate on here, unfortunately. We shall have to deal with them under a separate heading when we have collated and compared them with all the others.

Best of all is the idea of a *physical* division of the globe into arbitrary areas, of 10° or 20° squares, about which there could be no possible argument. All islands and odd places would be taken in automatically. Lots of the squares would be full of nothing but sea, of course, but that would be the same for everyone (as well as giving some scope for the /MM's) and there would still be plenty to go for (about 320 is the figure suggested).

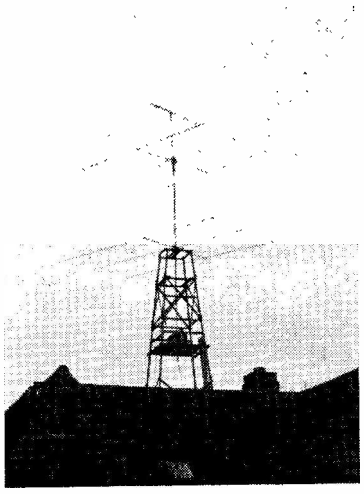
Late Flashes

VS2DQ (Langkawi Is.) says that with him *Ten* went out two months ago and that even *Fifteen* has been very poor for G's, but things did seem to be improving by mid-August. And he passes on the following items: VK2FR (Lord Howe Is.) is on 14 mc phone and says he will be more regular from now on . . . ZC3AC's receiver is now repaired, and he is on 14100 kc. at 1230 GMT some week-days . . . XW8AL is very active on 14 mc phone but needs a better receiver and aerial . . . VS2DW (Tan) now has his son (Kamal) on the air as VS2FX . . . AC4AX *is* genuine, and works around 1200 GMT, Sundays 14100 kc . . . FK8AU is on 21 mc phone at 1030 GMT and should be workable from G *via* long path . . . FR7ZU is very active on 14 mc phone, 1500 GMT . . . VS5AT is also heard more often, same band. Finally, VS2DQ himself is coming home on his long leave very soon.

G3DO (Sutton Coldfield) worked VP2VB (14 mc) and JZØPB, VP2DA, VS9MA and VQ9GU (21 mc)—all phone and all new ones for him.

That's the end of this month's offering, and we have to remind you that next month's deadline is earlier than ever, the date being **Friday, September 12,** first post. The following one is kinder to us and will be Friday, October 17—overseas readers please note. Address all your notes and news to "DX Commentary," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1, and the more the merrier, but *do* get them in on time, or they will be out of date by the following month.

Thanks to all our correspondents for their help—this feature could not be written without them! Good Hunting, 73, and BCNU.



Beam system at G3HCU, Peaslake, Surrey. This is a 2-10-15 metre array, the height to the top 2-metre section being 57 ft. The whole assembly is home-built, including the tower itself and the turning gear; it is the fruit of three months' spare-time work, and the tower first went on G3HCU's drawing board some three years ago.

GOT YOURS YET?

Now available are the Summer Edition of the *Radio Amateur Call Book,* listing by call-sign and full postal address about a quarter of a million amateurs all over the world, and the *Radio Amateur's Handbook,* the latest technical compendium on the art of Amateur Radio. The *Call Book* is 41s. 6d., and the *Handbook* 34s., both post free. Orders, with remittance, to Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. Delivery is immediate, ex-stock.

AMATEUR RADIO at PAN-PACIFIC JAMBOREE

We have been asked to announce that for the Pacific Scout Jamboree at Auckland, New Zealand, during January 3-10 next, ZL1PPJ will be installed and operated for the duration of the meeting by members of the N.Z.A.R.T. It is anticipated that some 10,000 Scouts from the Pacific region will be attending. ZL1PPJ will operate on all bands from 80 to 2 metres between 2100 and 0900 GMT daily; radio amateurs, especially those interested in or connected with the Scout movement, are asked to make schedules through any ZL1 in the Auckland area, or write to: J. Freeman, ZL1VA, 7 Ranfurly Road, Auckland, S.E.3, New Zealand. Special QSL cards will acknowledge all contacts; it is hoped to be able to give further information about the ZL1PPJ set-up in the December issue of SHORT WAVE MAGAZINE.

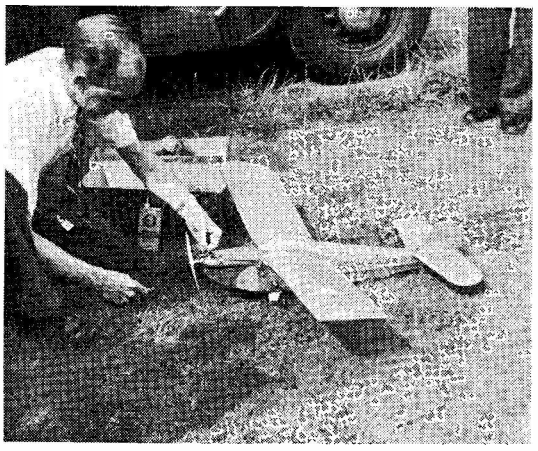
CONSULTING THE "CALL BOOK"

We are frequently presented, by hopeful correspondents, with long lists of amateur callsigns, asking that we let the sender have their addresses! For many reasons, not all of them obvious, we cannot possibly accede to such requests, whatever the circumstances. For those without their own copy of the *Call Book,* or unable to borrow one, we suggest that an application to their local public library should produce a copy for reference—the librarian can be given our address for the supply of the *Radio Amateur Call Book,* or any other book advertised by our Publications Department (*see* any issue).

MOBILE ACTIVITY REPORT

THE DERBY RALLY — THIRD LIST FOR THE REGISTER — LINCOLN MEETING ON SEPTEMBER 21

IT is a fact that the first amateur wireless society in the world was formed at Derby, in 1911, and called the "Derby Wireless Club." Now, the tradition is carried on by the Derby & District Amateur Radio Society, with Mr. A. G. G. Melville, FRCS, as president and F. C. Ward, G2CVV as hon. secretary. On Sunday, August 17, **Derby** held their first Mobile Rally, in co-operation with the Amateur Radio Club of the local T.A. Signals Unit, the Derby Short Wave Experimental Society, and the Derby Model Aeroplane Club.



One of the several attractions at the Mobile Rally organised by the Derby and District Radio Society was a demonstration of radio-controlled model aircraft flying. Here a member of the Derby Model Aeroplane Club fuels his model for a flight; the engine is a 1.5 c.c. diesel, and the aerial is run from the tip of the fin to a terminal on the port side of the fuselage, under the main plane.

The day turned out bright and warm (about the third fine Sunday we have had this year) and 150 cars were checked in, of which 83 were equipped for mobile operation. The total number of visitors, estimated at 350, included "children, family and friends." The programme had been arranged to provide something for everyone—a treasure hunt, a film show for the young, an auction of surplus equipment (another form of treasure hunt, as it included a number of items of purely domestic interest, which got the YL's and XYL's bidding, too!), a prize draw, and a display of radio-controlled model aircraft flying by a member of the local aero club, R. Cullen; he gave a very impressive demonstration of aerobatics with the model under full radio control all the time, from take-off up to the moment of landing with the engine run out of fuel.

There were two /M competitions. The first, judged by G3BA, was for the best mobile aerial assembly, and went to G5PP/M (Coventry), his prize being a Multiminor Test Meter, donated by Avo, Ltd.; second place in this event was given to G3GWR (Sheffield).

[*Over*

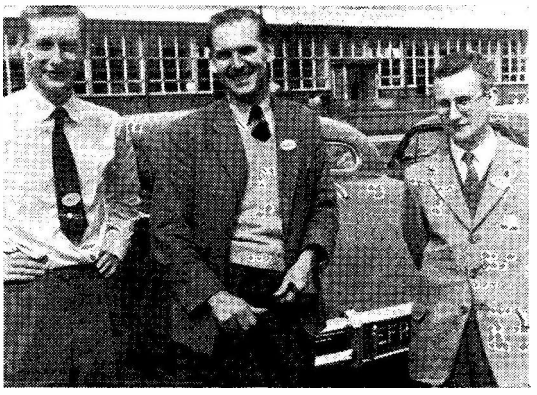
THE MOBILE REGISTER—Third List

With the following, we now have 85 mobiles identified for the Register. The first two lists appeared in the July and August issues of SHORT WAVE MAGAZINE. If you are operational /M, all we want is your QSL card, endorsed "Mobile," with a note of the band(s) worked, and the make and registration number of your car, van, buggy, waggon, motor-cycle or scooter.

Callsign & Home QTH	*Band(s) Worked*	*Vehicle & Regn. No.*
G2AKR, Moston, Manchester	160m.	Ford Consul RNB-406
G2CAJ, London, S.W.10	80m.	Austin A50 Van TYX-252
G2HAP, Davyhulme, Manchester	10, 15m.	Jaguar Mk. V EFR-420
G3BZT, Greasby, Cheshire	160m.	Morris Oxford MLV-733
G3DO, Sutton Coldfield	?	? NGP-881
G3EGX Wallasey, Cheshire	160m.	Ford Prefect SKC-658
G3FNZ, London, S.E.6	160, 80, 10m.	Morris Ten DGY-605
GC3KAV, St. Martin's, Guernsey	80–10m. incl.	Austin A40 3996 (GBG)
G3KPM, London, N.7	160, 80, 40m.	Austin A35 Van 802-SHX
G3HRE, R.A.F. Watton, Norfolk	160–10m. incl.	Morris 1000 XVF-482
G3LBS, Hednesford, Staffs.	160, 80, 40m.	Austin A40 LOB-470
G3MVU, Dagenham, Essex	160, 80m.	Standard HXR-254
G3MVV, Romford, Essex	160, 40, 10m.	Ford Thames 903-FVW
G4AP, Wootton Bassett, Wilts.	160, 80m.	Ford Eight FPL-325

LINCOLN MOBILE RALLY

The Lincoln Short Wave Club invites mobile visitors to a meeting on Sunday, September 21, at the Technical College, Cathedral Street. The programme includes a lecture on Transistors (by B.T.H.), a tour of the City, raffles, a competition for the best home-built mobile installation, and high tea. Tickets are 8s.; apply, with s.a.e., to R. W. Sadler, Hon. Treasurer, Lincoln Short Wave Club, 14 Hainton Road, Lincoln. G3IXH will be on the air from 10.0 a.m. for talk-in on Top Band.



Among those at the Derby /M Rally on August 17 were, left to right: G3KZA, G3JMA and G3HBW.

The other mobile contest was of rather a different kind—for the *worst* and most slap-happy /M set-up! —and none of the competitors knew they were in for it, as the judging was done by stealth! It would be unfair to name here the /M operator on whom the judges' decision fell; suffice it to say that to make up for the shock of being told that he had the roughest-looking outfit on the ground, he got a very handsome prize—a brand-new and boxed 813!

The wives, daughters and YL's of members of the Club undertook the catering arrangements, and the firm of Norman Birkett, Ltd., of Derby, laid on an exhibition of radio and amateur band equipment. The talk-in stations were G3ERD/A for Top Band, G3LTL/A (of the T.A. Unit club) for 80 metres, and G3EEO/A (of the other Derby club group) for two metres. The whole affair went off very well and Derby & District Amateur Radio Society, with their collaborators, are to be congratulated on having organised and carried through a most successful meeting.

At the Derby Mobile Rally, left to right: G3IR, YL unidentified, G3HZ and G2HAP.

Is Your Mobile Installation Safe to Operate Under All Driving Conditions?

DX-PEDITION PROBLEMS

WHY SOME FAIL

THERE has been some disappointment and a certain amount of criticism recently as to advertised DX-peditions that have failed to materialise, in spite of a good deal of advance publicity on both sides of the Atlantic—why, people ask, did nothing happen after all?

The following may suggest some of the answers: These expeditions vary, from the one-man car excursion (with equipment) across a nearby frontier for operation from an accommodating local amateur station, right up to the highly-organised group activity involving the use of chartered aircraft or ships. Although expeditions vary in character, there are several administrative factors that are common to all and often cause difficulties, *e.g.* Customs formalities, the licence, and finance.

It is usually one or more of these deterrents that cause expeditions to be cancelled—sometimes at a late stage of planning, when either the licence is refused or the monetary consideration becomes too large. The Customs problems can usually be overcome without too much trouble, and in many cases these difficulties only exist because the expeditioner failed to seek advice during the early stages of planning. The licence question is not always so easy to resolve, as many countries do not license foreign nationals; others insist on full reciprocal rights for their own nationals; while some permit short-term holiday operation but impose special conditions that are hard or impossible to meet.

No licence problem exists for operation from Monaco, as their Ministry of Telecommunications freely grants operating permits to holders of current British amateur licences. The cost of a two-man visit to 3A2 based on an overall fourteen-day period of holiday, using car transport from the U.K., works out to around £70 per person (Casino factor excluded, of course!) Andorra is a little cheaper (if you can get a licence), and £60 per person should see you through on the same basis as 3A2.

All these costs are minor compared with the recent Ohio A.R.A. jaunt to Navassa Island in the West Indies. Operating under the call KC4AF, this project cost over £1,500, which was nearly *four times* the expected figure! Even so, this group are gluttons for punishment, and although they say that at present they are "broke," they have already started planning another expedition—this time to Clipperton!

The reader may ask where SHORT WAVE MAGAZINE comes into all this? The answer is that advance publicity (given always in good faith by all concerned) must be laid on during the early stages of planning, or it appears too late to be effective from the point of view of the DX-operating reader; if the proposed expedition is subsequently cancelled, it can happen either that we are not informed, or advice of the cancellation is received after we are committed to press.

VHF BANDS

A. J. DEVON

Perseids Yield to G3HBW!—

Plenty of VHF Interest—

New Record on Four Metres—

IN round terms, VHF conditions have been just about as depressed and depressing as the weather. During the week-end August 2/3 things did open up a bit, but then only in a limited way for GDX working, with very few EU contacts possible. Of course, there have been one or two bright flashes, but without a lift in conditions over a period of a few days, there is not the sustained activity to keep the two-metre band really interesting. On the other hand, the abiding mystery of the success of the long-haul schedules continues, which may seem to contradict these opening remarks! But the fact is, of course, that when conditions are such as to make the DX good, there is much more of it workable, and the whole band sounds livelier. It has often been brought out here that the well-placed stations using plenty of power and *good receivers* can work up to distances of 200 miles and more under apparently dead conditions. With PE1PL back in circulation again, anyone can check the truth of this by listening on the regular daily schedules maintained with U.K. stations at distances well over 200 miles.

However, even if general tropospheric conditions have not been so good, there is one very interesting subject to discuss. Take a shifty at the Activity Report and note the last entry in G3HBW's list. The meaning of this will instantly be clear to those who understand, or have read up, the VHF propagation phenomenon associated with reflection, or scatter, by *meteor shower*. It is, indeed, no new thing, in the sense that a good deal of commercial effort has gone into investigating meteor reflection, and in the States the high-power VHF boys have made a very useful study of the possibilities.

Briefly, what happens is that at certain periods of the year the path of a meteor shower crosses, or meets, the orbit of the earth. These meteor showers themselves travel in known and predictable orbits, so it is possible to say, with a reasonable degree of accuracy, when they will appear. Some of these showers, which can be described as being composed of the dust of outer space, have a density high enough to reflect radio waves over a wide band of frequencies — say, 40 to 400 mc, taking it that waves from about 40 mc up are those that normally penetrate the ionosphere.

The object of the recent exercises now becomes clear: It is to attempt to use the meteor-shower phenomenon to obtain long-distance VHF communication. Apart only from the fact that the appearance of the meteor showers is predictable, this system of communication is of somewhat limited practical value, because it is effective for but a short time, the reflecting efficiency is usually low and the path that may be obtained very erratic. Nevertheless, the idea is obviously of great interest, and is one aspect of the problems associated with the mechanism of VHF propagation over long distances, which are now being so actively investigated by the professionals, on both sides of the Atlantic.

G3HBW/SM Results

Coming now back to G3HBW (Bushey), what Arnold and his SM collaborators did was to take the opportunity of carrying out a communication test during the advent of the meteor shower known as the Perseids, which the astronomical references said should appear during August 10-13. This shower was a good choice because it is one of the densest and those who follow W1HDQ's excellent VHF feature in *QST* will know that the W's also were on the *qui vive* for this one (with what results we do not at the moment know).

With SM's 4BIU, 5BDQ and 6BTT lined up, G3HBW kept vigil with them during 0500-0645 GMT on each of the mornings August 10-14. Results were most interesting. SM6BTT, at 650 miles, was heard every morning 10th-13th, "with many bursts, the best being on the 13th, lasting nearly one minute, peaking S6-7". SM5BDQ, at 940 miles, was received on the 11th and 12th, being better on the first morning, but SM4BIU, at 810 miles was not heard at all. Arnold suggests that the success with SM6BTT was probably due to the fact that he has a large beam, which is tiltable — for the tests, it was given a tilt of 10° to the horizontal. An actual QSO G3HBW/SM6BTT was very nearly achieved on August 12, and if they had had a little more experience, contact with SM5BDQ could have been made on the 11th, when he was a

BRITISH ISLES TWO-METRE ZONE PLAN

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

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

good signal; had this QSO materialised, it would have broken the present European record by about 200 miles! (And for another sort of record, G3HBW taped all he heard from August 12 to 14.)

All readers of "VHF Bands" will congratulate Arnold of G3HBW on these very interesting results — so far as we know, the first of their kind obtained by amateurs in Europe, achieved by careful planning with a proper understanding of the principles involved, and the possibilities.

The first question many readers will now ask is — When is there going to be another chance of trying an MS test? The answer is that the next best period will probably be during December 10-13, when the meteor shower known as the Geminids will be in contact with us; this is suggested (by your A.J.D.) as the "next best period" because the density of the Geminids is about 20% greater than the Perseids, and so should give better results, apart from the fact that relative velocities (earth/meteor shower) are less than in the case of the Perseids. There are other MS expected before Geminids, but their densities are a good deal less than either of the two mentioned, *e.g.* Orionids during October 18-23 (30% Perseids density), and Leonids during November 16-17 (25%).

For those acquainted with navigational calculation and astronomical plotting, the right ascension of Geminids is given as 113° and the declination as +32°. For finding your way about the heavens, and for much interesting practical information on radio measurements already made on meteor showers and the associated technique, readers are referred to Prof. Lovell's excellent book *The Exploration of Space by Radio* — from which your A.J.D. devilled much of the foregoing.

Reports and News

G3GFD (Bradford) is now on regularly with 50w. to a new QQV06-40A PA, and a cascode converter having a 6AM4 g.g. RF stage, into an ECC84 with a 6AM4 mixer; he remarks that local activity is very good, with several stations on most evenings, including G8CB from a particularly favourable QTH 1,200ft. a.s.l. G3KUH (Rotherham) remarks, and we agree, that Aurora reflection occurs much more frequently than is supposed; he quite often hears "well known T9x signals, such as G5MA" go rusty for half-an-hour or so, but the period is so short that no useful activity has time to develop; under these conditions, G3KUH immediately calls "CQ ADX" in the hope of stirring up something.

Another to report from the North is G3HA (Bradford), who has a slot-fed 4/4 and a modified S.440B as Tx, running 20w., with the RK-34 output stage connected as a push-push doubler; this is to be improved with an 832A as a straight PA; his receiver is 6J6-12AT7, giving a 10 mc IF into a TCS Rx unit. G3HA also has a little single-valve converter using a 6J6 in SEO — this has produced signals from such distant stations as F8MX, G2XV, G3IRS, G3LTF and G5MA, with G3JMA/P worked from near Hull.

G3LTF/A (Chelmsford) finds F8MX, G3IRS, G3JWQ and G5YV his most consistent signals "audible under any conditions"; the aerial there is now a 7/7, slot-fed. G3MED (Northwich) puts in claims and explains that when he was GW3MED/P he was 7m. south-west of Conway, at 2550ft. a.s.l., from where 93S were worked, including no less than ten GM's — probably all there were on the band at the time! The home-station Tx runs 100w. to an 829B, with a 4-ele Yagi at 45ft., and the converter is EC91 g.g. into ECC84 cascode, with a 12AT7 mixer and 12AT7 crystal chain. G3MED is also on 70 cm, with a G3BKQ-type converter (as originally described in SHORT WAVE MAGAZINE, July 1954), an 832 tripling in the Tx, and a slot-fed 6/6 aerial.

G5MA (Great Bookham, Sy.) had a rewarding session on July 31, when he worked GM3GMX/P in distant Kincardineshire over a path length of 400 miles, after several evenings of hard trying. The contact was made under indifferent conditions, and signals were weak, but it shows what can be done by *trying;* it was an arranged attempt, in that G3GMX (who is normally at Sale, Cheshire) had told Bob he would be on the summit of the Cairn o'Mounth pass and would be looking for G5MA every evening. (According to Bob, who has been there, the Cairn o'Mounth must be

TWO-METRE ACTIVITY REPORT

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

G3IRS, R.A.F. Locking, Som.
WORKED: F8MX, G2AHP, 2BVW, 2FJR, 2FNW, 2JT, 2NY, 3APY/P, 3ARK, 3AST, 3BA, 3BOC, 3CO, 3DKF, 3DOR, 3EJO, 3EKX, 3EVV, 3GSO, 3GTN, 3GUX, 3GYQ, 3GZK, 3HA, 3HBW, 3HCU, 3HRH, 3HYH, 3HZK, 3ICO, 3IER, 3IKV, 3IRA, 3IWJ, 3JMA, 3JQN, 3JXN, 3JZN/P, 3KEQ, 3KHA, 3KMT, 3KPT, 3KQF, 3KUH, 3KYT, 3LCK/A, 3LTF/A, 3LZP/A, 3MA, 3MED, 3MLS, 3MNM/M, 3MNQ, 3PD, 4DC, 4MK, 5DF, 5DW, 5GN, 5YV, 6AG/P, 6JP, 6JS, 6SC, 6SN/M, 6YU, 8DR, 8ML, 8QK, 8SK, 8VZ, GC2FZC, GD3UB, GI3GXP, GW2HCJ/P, 3MFY, 8UH, PE1PL. (*July* 9 *to August* 9).

G3KPT, West Bromwich, Staffs.
WORKED: G2ADZ, 2ATK, 2CDB, 2HCG, 2NV, 2NY, 3AVE, 3BA, 3DJJ, 3EJO, 3EKX, 3ENY, 3FIH, 3FTN, 3GGR, 3GSO, 3GYQ, 3HA, 3HAZ, 3HHD, 3HIV, 3HRH, 3HYH, 3IKV, 3IOO, 3IOO/P, 3IRS, 3JAZ, 3JGY, 3JWQ, 3JZG, 3KBA, 3KEQ, 3KFD, 3KHA, 3KQF, 3LAY, 3LDW, 3LDY, 3LHA, 3LKV, 3LNN, 3LTF, 3LZH, 3MA, 3MED, 3MHS, 3MNM/P, 4DC, 5GN, 6RH, 6SN, 6XM, GI3GXP, GW2HIY, 3GWA/P, 3MFY, 8SC/P.
70 Cm: G3JZG worked: G3EJO, 3HAZ, 3KBA, 3MYD/T heard. (*July* 15 *to August* 17).

G3KQF, Derby.
WORKED: G2CRL, G2DSP, 2FNW, 3BNL, 3DBM, 3DKF, 3EEO/A, 3EKX, 3FUA, 3FUJ/P, 3GSO, 3HHD, 3HYH, 3HZK, 3IKV/A, 3IOE, 3IR, 3IRS, 3JAZ/P (Rutland), 3JWQ, 3JZN, 3KPT, 3KYT, 3LCV, 3LSA, 3LZH, 3MED, 3MNQ, 5CP/M, 6XM/A (Co Durham), 6YU, 8CB, GI3GXP. (*July* 19 *to August* 18).

G3KUH, Rotherham, Yorks.
WORKED: F8MX, G2FJR, 2LG, 3ATM, 3BA, 3BNL, 3DVK, 3EVV, 3FDW, 3FQH, 3GFD, 3GSO, 3HA, 3HBW, 3HRH, 3HYH, 3IWJ, 3JMA, 3JMA/P (Hunts.), 3JMA/P (Yorks.), 3JWQ, 3JZG, 3KFD, 3LLE, 3LSA, 3LTF/A, 3MED, 3MNM, 3MNQ, 4BD, 5CP, 5DS, 5HB, 6JS, 6XM, 6XM/A (Durham), 6XT, 8CB, 8DR. (*July* 20 *to August* 18).

SWL Winters, Melton Mowbray, Leics.
PHONE: G2BVW, 2DMN, 2FMO, 2FNW, 2HCG, 3APY, 3APY/M (Leics.), (Notts.), (Rutland), 3AYT/M, 3BA, 3BNL, 3DVK, 3EEO/A, 3ENS, 3FAN, 3FGT, 3GSO, 3HBW, 3HYH, 3HZK/M, 3IRS, 3JMA/M, 3JWQ, 3KBA, 3KEF, 3KQF, 3KUH, 3KYT, 3MNQ, 4JJ/A, 5CP, 5CP/M, 5GN, 5HB, 5JU, 5KG, 5ML, 5YV, 6XM, 6XT, 6YU, 8CZ, 8VZ, GB2RS. (*July* 15 *to August* 18).

G3HBW, Bushey, Herts.
WORKED: G2HGR, 2NY, 3ATM, 3FAN, 3GNR/P (Suffolk), 3GNR/P (Hunts.), 3GSO, 3HZK/P (Oxon.), 3IRS, 3IUD, 3IWJ, 3JGJ, 3JHM, 3JWQ, 3JZG, 3KUH, 3MED, 6JS, 6JY, 6XM, 6XM/A (Co. Durham), GD3UB, GW2HIY.
HEARD: F8MX, G2DMN, 2FJR, 3APY/M, 3BA, 3EJO, 3ENY, 3GYQ, 3HYH, 3JZN, 3KHA, 3KPT, 3PD, 5YV, 6XT, GI3GXP, GW3GWA. (*July* 19 *to August* 19).
HEARD: SM5BDQ, 6BTT. ***Perseids,*** *August* 10 *to* 14.

one of the best /P sites in all GM — it is 1475ft. a.s.l., and accessible by car.) The G5MA/GD3UB nightly schedule has produced 37 actual contacts, with GD3UB heard on ten occasions when no QSO was made. G5MA has also had two QSO's with GW8MQ, a new permanent station in Carmarthen and one of the rare Welsh counties, as well as contacts with GI3GXP and GW2HIY; so for Bob, at least, conditions have not been at all bad during the period — but then, he's on every evening!

EI2W (Dublin) writes that he will be there every day 0900-1200 BST until the 10th of this month, and also during the whole period of the Contest week-end, September 6/7. Look for Harry's phone on 144.085 mc. G3JWQ (Ripley, Derbs.) is now working PE1PL twice daily, morning and mid-day; and by August 18 the G3JWQ/G8VZ schedule had reached the very satisfying total of 503 contacts made over their 100-mile path. G3JWQ has also been busy on 70 cm, on which band he now stands at 17C, and he mentions that there seems to be some confusion about the first-across-the-Pennines contact on that band! (It was actually made by G5YV, 'way back in 1953.) Incidentally, for those interested in Seventycems, a three-way schedule G3JWQ-G5KG-G5YV is in progress each evening at 1900 BST, starting up on two metres; so far, results have been practically 100% successful.

It is some time since we have seen anything in the post from Mac of G3GHO (Roade), who has written in this month to stake a few claims and explain that he has not exactly forsaken two metres — it is just that he is "giving the DC bands a run"! Quite a new operator, but not a new correspondent, to report this time is GW3MFY (Bridgend), who is ex-SWL Lee and a follower of this piece over many years. He has made a good start on two metres, with 17C worked from the hinterland of Glamorgan; the Tx has an 832A PA, taking 28w., and the Rx is a G2IQ-type converter with a CV53 as pre-amplifier, into an HRO as main receiver; his beam is a 5/5 at 30ft.— and, needless to say, GW3MFY would "like to be remembered" when beams are being turned west.

G3KQF writes "we in Derby missed the opening last month, or the opening missed us; stations from the north can often be heard working down south to people we cannot receive"; G3KQF was very pleased to have a personal QSO with G3HBW at the Derby Mobile Rally, and to hear Arnold's tape recordings of the SM meteor scatter signals. G3WS (Chelmsford) writes again after a long break, with claims for the tables, including a new country in the shape of GD3UB. Likewise G3MAX (Manchester), who reports hearing G3LTF (Mill Hill) and G3FAN (I.o.W.) at RS-57 on August 17; he also remarks that he is "greatly looking forward to the next 12 months of VHF."

High Power on Two

Yet another from whom we had not heard for some time is GM3DIQ (Kilbarchan); Clarke gets himself up-to-date in the tables, and says he is still just as active on two metres — there every evening from 2230 BST onwards, and occasionally during 1900-2100; he nearly always catches the Aurora openings, and is one of the most reliable and consistent of the GM's looking for DX. Clarke has a QRO permit for VHF, and is building a 400w. RF amplifier running a pair of 4X150's — should be nice! He says GM activity is "fairly good, with a few new faces showing up on the band."

G3IRS (Locking, Som.) is doing very well on two metres — *see* Activity Report. The new Tx there runs a pair of QY3-65's (all-same 4-65A's) in the PA, with a QQV06-40A as buffer driver; modulation is by a combination of anode control and an HK24G swinging on the screens of the PA; the modulator runs a pair of TZ40's. This outfit is capable of 150 watts fully modulated on the Zone frequency of 144.96 mc, and 375w. CW on the IGY frequency of 145.80 mc, in connection with which (only) these high-power permits are granted. The G3IRS

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
31	G2XV
26	GW2ADZ
25	G3HBW
23	G3BKQ, G6NB
21	G3KEQ
18	G2CIW, G3IOO
17	G3JWQ
16	G6NF
15	G4RO, G5YV
14	G2HDZ
12	*G5BD*
10	G2OI, G3IRW
9	G2DDD, G3LHA, G5DS
7	G2HDY, G3JHM
6	G3FAN, G3JMA, G3KHA G3MED, G3WW
5	G3FUL, G3IRA, G3IUD, G5ML
4	G3JGY

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

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

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

TWO METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14

From Fixed QTH Only

Worked	Station
78	G5YV (787)
73	G3CCH, G6NB
70	EI2W (316), G6XM
68	G3BW, G3GHO
67	G5MA
66	G3IUD (302), *G5BD*
64	G3BLP, G3HBW, G3KEQ
63	G2FJR (542)
60	G2OI (402), G3DMU
59	G3EHY, G4SA
58	G3FAN (637), G3IOO, G8OU
57	G8SB
56	G3WW (770), G5DS (654)
55	G2HDZ (495), G2HIF, G5BM, GW5MQ
54	G8VZ
53	G2AJ (519), G4CI, GM3EGW (196)
52	G2NH, G6RH, G6XX, GW2ADZ
51	G3JWQ (395)
50	G3ABA, G3GSE (518)
49	G3HAZ (358)
48	G3FIH, G5ML, G6TA (487)
47	G2CIW (264)*, G3DKF, G5WP
46	G3LHA, G4HT (476), G5BY, G6YU (205)
45	G2AHP (647), G2DVD (362), G2XC, G3BJQ, G5JU
44	G3BK, G8DA
43	G2DDD, G3BA, G3COJ, G3DLU,* G3HWJ, G3KHA (262), G3KUH, G3WS, G4RO, G5DF
42	G2HOP, G3BNC, G3GFD, G3IER, G6CI (220)
41	G2CZS (282), G2FQP, G3DO
40	G3CGQ, G5MR (366), G8KL
39	G2IQ, G3DVK (208), G3GBO (434), G3VM, G8IL (325)
38	G2FCL (234), G3APY, G3CKQ, G3HTY, G8VN (190)
37	G3FNW, G2FZU (180), G3DLU, G3LTF, GC3EBK (260)
36	G2DCI (155), G3CXD, G3DLU*, G3IIT, G3KQF, G6CB (312), G8IP

beam is to be rebuilt to a slot-fed 8/8 stacked at three wavelengths with another 8/8 — so that signal should become even more potent! G3IRS is on daily during 1230-1300 BST and 1900-2300 BST, and is another who is interested in meteor shower tests; he asks for schedules for the Geminids period, December 10-14,

Worked	Station
35	G3FZL, G3FYY (235), G3HCU (224)
34	G3AEP, G3CKQ (162), G8IC, GM3DIQ
33	G3FUR, G3GSO, G3HHY (125)
32	G3HIL, G8QY, G8VR, GC2FZC
31	G3HXO, G3KPT (180), G3KPT*, G5RP
30	G2AHY, G3FRY, G3GOP (208), G3GVF (129), G3IRA, G3KEF (110), G5NF, GW8UH
29	G3AGS, G3AKU, G3FIJ (194)
28	G3ITF, G8DL, GM3BDA
27	G3CVO (231), G3DAH, G3ISA (160), G6GR, GI3GQB, GW3GWA
26	G2BRR, G3CFR (125), G3MED, G3SM (211), G3YH, G4LX, G4MR (189)
25	G3JMA, G3JXN (220), G5SK, G6PJ
24	G3FD, G3FXG, G3FXR, G3JHM
23	G3CWW (260), G3HSD, G4JJ/A, G5PY
22	G2DRA, G3AGR (135), G3ASG (150), G3BPM, G3IOE, G5AM, G8NM
21	G2AOL (110), G3DVQ, G3IWJ, G6XY
20	G3EYV
19	G3FEX (118), G3GCX, G5LQ (176)
18	G2HDR, G3DBP, G3JGY, GC2CNC
17	G3EGG, GW3MFY
16	G3FRE, G3MAX, G3MLS
15	G3IWA
14	G2DHV, G3CYY

Note: Figures in brackets after call are number of different stations worked on Two Metres. Starting figure for this classification, 100 stations worked. QSL cards are not required to verify for entry into this Table. On working 14C or more, a list showing stations and counties should be sent, and thereafter added to as more counties accrue.

* New QTH

over distances greater than 500 miles.

G3KPT (West Bromwich) claims for the tables, as does G2XV (Cambridge) for 70 cm; Gerry is now nicely out in front on that band. G3JGJ (Paignton) is still on schedule with GC2FZC at 1830 BST daily, and mentions that G8DA has now moved to Bristol, where he hopes soon to be active from a better QTH than he had in Exeter.

Four Metres

G3CLW (Bromley) has kept very consistently to the 70 mc band, and on August 10 had his reward, when he worked FA9VN and F9BG, and heard CN8CK and FA3JR — which is *very* nice DX by any VHF standard, and establishes a new record for the 4-metre band; but only just! The difference in latitude between G3CLW and G5KW (who has also worked FA9VN, and has the card to prove it) is only a matter of 3 minutes, which puts G3CLW about 3 miles further north than G5KW with respect to FA9VN, making the new distance 1,119 miles. G3CLW is on 70.23 mc most evenings from 1900 BST, and runs 50w. with a 3-ele beam; he has worked a total of 26S on four metres.

G5MR (Hythe, Kent) also reports on 4-metre results. Between June 10 and August 10 he worked FA9VN five times, and on occasions both CN8CK and CN8MG have been very well received — the only reason they have not been worked is that too many French operators still do not search outside their own 72.0-72.8 mc band; however, they are gradually becoming indoctrinated to the idea of looking for G's around 70 mc, and G5MR mentions an interesting four-way round-table with F3RA, F8GH and F9CZ. Of the 26 F's heard by G5MR, 15 have been worked; of the five FA's received, only FA8BG has not been worked.

Conclusion

It had been intended to say something about several other matters of current VHF interest — but here we are where we must stop. Get wound up for the VHF Contest this week-end, and take a note that the next dead-line is **September 17.** 73, *de A.J.D.*

More Selectivity for the BC-312/342 Receivers

FITTING A BAND-PASS CRYSTAL FILTER

From Notes by G3IHI

In the July issue we ran an article on BC-312/342 conversions in general, these being applicable to both versions of the type, which differ only in their power supply requirements. Arising from that article, a further and very much worth-while modification is suggested here.—Editor.

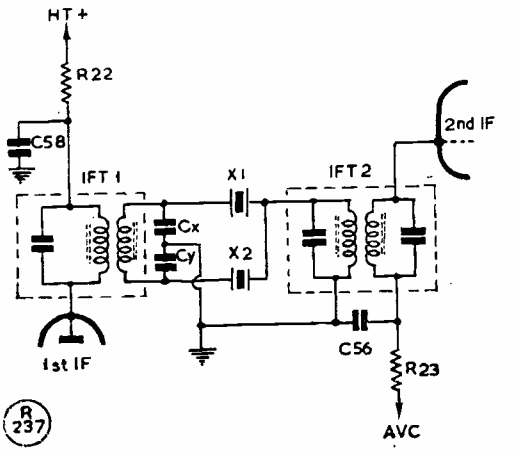
THE ideal solution to the selectivity problem in the BC-312/342 is the incorporation of a band-pass crystal filter. This can be added easily and at low cost by replacing the second IF transformer in the original by a pair of modern miniature IF transformers, coupled by two suitable FT241A crystals. For instance, in this type as advertised, the markings and actual frequencies are as follows:

Channel 53, 25.3 mc — 468.55 kc actual
Channel 54, 25.4 mc — 470.40 kc actual
Channel 55, 25.5 mc — 472.20 kc actual

Hence, by selecting, say, Ch.53 and Ch.54, or Ch.54 and Ch.55, with the appropriate IF transformers, a band-pass unit can be built up and fitted in the receiver. It is necessary to centre-tap, in the radio-frequency sense, the secondary of the IF transformer coupled to the crystal unit by replacing the built-in capacity, usually 100 $\mu\mu$F, by two close-tolerance 200 $\mu\mu$F condensers connected in series across the winding, with their junction earthed—*see* sketch.

The two miniature IF transformers are mounted on a sub-chassis, which makes it easier to put everything back if the modification does not work ! At G3IHI, no attempt has been made to switch the filter unit, as it has not proved necessary—but it does quite often happen that retuning is called for when stations in a multi-way QSO are not well netted.

To obtain maximum benefit from the modification for both CW and phone reception, it is important that the HT feed to the receiver local oscillator and BFO be stabilised. In the receiver at G3IHI, the send-receive switching



Rearrangement of the BC-312 IF section for crystal filter selectivity. Cx, Cy are close tolerance 200 $\mu\mu$F condensers to centre-tap the secondary of IFT1, the fixed capacity right across which is removed. IFT1/IFT2 are standard miniature IF transformers, and X1, X2 are FT241A type crystals. Other values and circuit elements are as in the original receiver.

is arranged so that both these oscillators remain operative during transmission periods. If a really sharp IF response can be achieved—say, within 3 kc, which is ideal for phone reception on the amateur bands — a drifting oscillator can nullify the effect of the filter; similarly, on CW, the BFO needs to be absolutely stable. If the receiver is thus well stabilised, it becomes possible to evaluate the stability of distant signals; and it is surprising how often, in a QSO, the station being worked does not come back on tune !

It should be noted that a filter unit similar to that shown here could be fitted, with the appropriate crystals, to most receivers having an IF in the 455-470 kc region. As already indicated, the most important consideration in deciding whether the modification is really worth while is the local oscillator stability.

In the same context, very good results can also be obtained with higher frequency filters; for instance, using 2·1 mc IF transformers with the 10X type crystals, choosing, say, the 2065·75 kc and 2067·5 kc channels. All these items are available as " surplus," and the result is excellent selectivity combined with the negligible image response to be expected from a 2 mc IF channel.

For those unaccustomed to these filters and their adjustment, recommended reading on the subject will be found in recent editions of the ARRL *Handbook;* in the 14th edition of the *Radio Handbook;* in Sect. 6 of Chapter 26 of the *Radio Designer's Handbook* (4th edition); and in the ARRL's *Single Sideband for the Radio Amateur.*

HISTORY IN A SHOE-BOX

Part III

THE DX OF THE 'TWENTIES

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

THIS is a personal narrative, based on the actual QSL cards available, and G6QB was by no means a DX ace in the 'Twenties, since power was never more than 10 watts until about 1927, after which it sometimes got as high as 50, but never above, in the pre-war period.

So, DX being a relative term, the formidable collection of W5, 6 and 7 cards was regarded as pretty good at the time. Anything from Oceania was very acceptable, with Australia and New Zealand in the majority. The few British amateurs who had high-power permits were working the A's (Australians) and Z's (New Zealanders) in 1924 and 1925; by the time G6QB got that far it was 1927 and they had become OA's and OZ's. Around that time we find OA-2NO running 150 watts to a TPTG oscillator, and the receiver was to his own design with two screen-grid RF stages. OA-3CP (the present-day VK3CP) also had a TPTG with a UX-210; and was WAC on both 20 and 32 metres (yes—there *was* a 32-metre band once).

Across in New Zealand the universal TPTG seems to have been putting out some good signals by 1928 or so, and most of the stations whose cards are in the box are still active. OZ-1BA boasted a TPTG with *four* 201A's in push-pull parallel and an input of "about 15 watts"; OZ-2XA used more power than they are allowed now, with 220 watts to a Type 203; he was one of those who were heard and worked in the U.K. in 1925. On the other hand OZ-3AW, the very first New Zealand QSO for G6QB, seems to have been using 7 watts from 230-volt DC, with an aerial 20 feet long and 20 feet high. Sunspots must have been pretty active in 1927-28! OZ's 4AA, 4AI and 4AO were a famous trio over here.

Asia yields a most interesting batch if the story is extended as late as 1931. VS3AB and 3AC were in the "Unfederated Malay States" and were rarities. VU (formerly AI) cards were numerous, among them being one from VU2FP, now GW6HB in Cardiff. A much earlier one from Y-DCR proves to be from none other than our friend G2DC, still hard at work on the DX bands. AI-2KT was a very well-known DX'er of the time, and VT-VVZ was one of the more improbable call-signs.

AR-8UFM was in Beyrouth, Lebanon; AP-6JM was in Palestine, and ZC6FF had a card with "X" stencilled before the call, and "Palestine" crossed out—we never found out where *he* was.

Among the more exotic USSR stations, AU-1DE and 1DF were both in Omsk, Siberia; AU-1AI, 1AK and 1AP were in Tomsk; and AG-7AS was in Tiflis. Most of them were using between 20 and 50 watts, with not a T8 or T9 among them!

The Far East

AC-3GB was a strange one, whose QTH was given as "The Lighthouse, Chefoo, China," and name George Broomfield. He ran 12 watts input from dry batteries.

Ceylon was well represented, and one of the cards is from VS7GT, whom we worked as G3BFN only a month or so back. Numerous YI's were on the air, and there was a time when Iraq represented most people's "best DX," thanks to RAF activity from those parts. YI2DC and 6KR were among the most active stations there.

Japanese stations do not seem to have been worked in any numbers from the U.K. until 1930-31. For April 1931 we have a card from J1DO, whose name was Y.T.Yagi—we believe him to be *the* Yagi. Prominent DX'ers were J1DP, 2CC, 2CL and 5CC, the latter being one of the only three stations in the world to collect a WAZ before the war.

South Africans were a mixed bag, for they originally used "O" as their identification, in front of calls like A4G, B3F and so on. Then this became FO-A3G, FO-A7D and similar calls. Eventually they had three official prefixes in use—ZS, ZT and ZU, each of which could crop up in any district. Two or three of them became famous for the early use of 10 metres—the first U.K.-South Africa contacts on that band were in 1928, thirty years ago! ZS4M and ZS1H were well-known exponents, the former with a wonderful QRO "rock-crusher" note.

The Algerian stations were FM's before turning into FA's; FM8IH is still active as FA8IH. Egypt was first E and then FE, and we have a remarkable picture of the Pyramids behind the call-sign on the card of FE-EGEZ. When they became SU's they were nearly all RAF types, and we note that SU6HL (the present G6HL) was using 300 watts in 1930, to a push-pull TPTG; he also showed up as ST6HL from Khartoum. Y16KR, later SU6KR, claims to have been the "first ZC station to be licensed" (as ZC6KR in Palestine). The most famous Egyptian station of all was perhaps SU1EC—the present G2EC.

From Kenya emerged calls like FK-4MS (later VQ4MSB), who had made his WAC in 1928 with 80 watts, but FK-5CR appears also to have been in Nairobi. FO-9SR was in Southern Rhodesia, which later became VP9, of all things. FB8AD, FB8C and others were active from Madagascar, and V8AC (later VQ8AC) was on from Mauritius—still rare DX for most people.

The strange call FR-EAR149 emanated from the Canary Islands; CT3AA and 3AB were using EP3 calls from Madeira; EP2's were in the Azores. Our present regular correspondent G2DC crops up first as Y-DCR and AI2KX from India, and then as "2DCR" (no prefix) from British Somaliland, whence, in 1930, his card tells us he was the first to operate from that territory.

FI-1CW was in Libya, and a curious one signing OCRB was in Rabat, Morocco.

South America

The first stations to break through from South America were the B's, later SB's, in Brazil. The A's were in Argentina with calls like AA1, and, in point of fact, the present LU1AA still uses his "AA1" cards, which were printed in 1925! Strange-sounding combinations like SA-DE3 and SA-DQ4 became rationalised into LU3DE and LU4DQ. Some of them were working the U.K. in 1926. The SC's, in Chile, included 7AA right down at the sharp end—the same one that has been active as CE7AA in the post-war years. And we even had a card from Uruguay (SU-1NA) in 1929. He ran a Hartley transmitter with 40 watts, and the receiver was "Hartley and one-step."

Central Americans were pretty hard to come by, but a card from K4KD (the present KP4KD) showed him using 65 watts on 10, 20 and 40 in 1928.

Rarish ones out in Oceania and the Pacific included OP-1CM, later K1CM in the Philippines, OM-1TB on Guam, and some K6's in Hawaii. We note that K6ERH was crystal-controlled with an 852 final in 1931.

Iceland is represented by a 1925 card from NI-2SH (G2SH), and Labrador by a 1926 QSL from NE-8WG, the station of the Grenfell Expedition. C-8RG (later VO8RG) was in Newfoundland, and K7MN was just about the only station in Alaska in 1929. NY1AE would be a hard one to guess . . . the answer is Panama Canal Zone.

North America

From the mass of U.S.A. cards one can draw only a few stray remarks—between 500 and 600 cards take some going through (especially in the middle of spring-cleaning, which is what started all this!). What is surprising now is the amount of information given on the cards themselves, concerning rigs and circuitry. For instance, here is W1FM, transmitting in 1931 with "250-watt Recto-Bulbs," and a "Schnell and One Step" receiver; while W1IZ was using three '210's in the final for a stated input of 23 watts. W1BW, in 1928, ran 200 watts to a Hartley, feeding a 45-ft. single wire; W1BXC had "power available up to 1 kW," but W1FH, of all people, used 60 watts to a '210 and had only worked 36 countries in 1931! Two of the most consistent stations over here were the Borden brothers, W1BUX and '1CMX (the latter is now W1TW).

W2CUQ, in 1928, had a grand piano on his card and was described as "internationally known" as a pianist . . . he certainly was as a signal! NU-2CVJ's legend in 1925, runs "one 50-watt tube with 1200 volts, 150 mA, R.A.C. by S tubes." (We make that 180 watts!). W3ZX had a card inscribed "This confirms our recent QSO" without a single written word on it . . . NU-4NL was getting across in 1928 with 7½ watts . . . NU-4TO (the present W4TO) was very active in the same year with 55 watts.

NU-5EK was famous for his rendering of that call on a fast bug. In 1924 he sported 2500 volts, 100mA input (described as 50 watts!) on 78 metres to a 4-wire aerial on 12-ft. spreaders which "sure works FB."

West Coast stations were pretty rare birds, but the California Kilowatts were radiating even in the mid-twenties. NU-6DBO had 250 watts in 1928 (14 mc); NU-6IH was the first-ever 6th District station for G6QB; NU-6WB used an Ultraudion circuit in the transmitter and a "superdyne" receiver.

Among the 7's, our very first contact was NU-7FE—and when we worked W7FE in March this year he had our original QSL card all ready to hand. W8JK (1931) needs no introduction, and W8GZ/8ZG was none other than Mr. Windom in person. There were plenty of 9's, but no Zeros, which were a post-war innovation.

In Canada the NC-5's (VE5's) were the West Coast stations, and NC-5AW (now VE8AW) was in Yukon even in 1929. VE6, 7 and 8 did not exist, although there were actually some 9's, which were listed as experimental stations.

Two of the most famous Canadians of all were C-1AR and C-1DQ, who were among the very first to contact the U.K. As far as we can check, they were the first and second Canadians to work Europe.

And now all that remains in the box is a miscellaneous bundle which cannot really be classified, consisting of SWL reports and pirate cards with incredible call-signs. (The number of unlicensed stations who used to QSL direct, by open post-card, was one of the phenomena of the times).

Worthy of note as peculiar ones (not necessarily pirates) were XW-7EFF (N. of Ascension Is.), XG2GX (G2GX in Reval, Estonia), X-ZN2A (near Port Said), XEL-AWV (Norwegian ship), XG5SV (H.M.S. *Queen Elizabeth*), X3OK (well-known G who had his licence cancelled!), X-GB1 (we never even found out where he was, but he was DX), and GHH (Mosul), who was perhaps the first real DX we ever heard—new country, new continent, new sensation, and all on one bright-emitter valve!

Now, having got all this out of our system, we hope to resume the onslaught on spiders, dirt, moth-and-rust-doth-corrupt and so on. Maybe we shall find our 1932-39 bunch of cards in another corner, which will be bad for progress but interesting for us That story, however, must wait until 1960 or thereabouts.

[*Part I of this article appeared in our April issue, and Part II in July.*]

Modulator for the Small Transmitter

TELEPHONY OPERATION FOR THE NEWLY-LICENSED

D. M. PRATT (G3KEP)

Though the speech-amplifier/modulator shown here will only give about 5-6 watts of audio, it is adequate for a low-power or Top Band transmitter and would be an effective audio driver unit for a later high-power modulator.
—Editor.

THERE are more and more amateur licences being issued and it is very often a case of newly-licensed stations getting going on telephony immediately, using some kind of temporary modulation system with the idea that "so long as the other chap can hear me, what does it matter?" One must bear in mind, however, that many of these "temporary" modulation methods can cause very severe interference to other stations.

The writer has, on a number of occasions, lost contact with a DX station just because some local using a "lash-up" rig has switched on at the other end of the band. Some time ago, he worked a station who claimed to be using NBFM—the FM was about ± 20 kc of the nominal frequency, and was very difficult to resolve. However, it was later revealed that cathode modulation of the PA was being employed, and it was called NBFM just because it happened to frequency-modulate the carrier! Newcomers to Amateur Radio should note that it is good practice to carry out tests on transmitters and modulation systems using an "artificial aerial" load, and only to radiate a signal if the gear is known, by monitor checks, to be working correctly.

The circuit of a simple plate-and-screen modulator is shown in the accompanying diagram. It consists of a 6J7 microphone amplifier, a 6J5, and a metal 6L6 output valve —all these valves are readily available, and are cheap to buy from *Magazine* advertisers. Using a deaf-aid crystal microphone, this modulator gives quality reported as "excellent," and provides ample modulation for a ten-watt carrier.

An RF24 unit chassis and cabinet were adapted for the construction, making use of the three valve-holder holes originally occupied by the SP61's. Any convenient form of construction can be followed, provided only that the grid and anode leads are, of course, kept as

Table of Values

Fig. 1. Circuit of Simple Modulator by G3KEP

C1, C5, C8 = 25 μF, 25v. wkg. electrolytic
C2, C6 = 8 μF, 350v. wkg. electrolytic
C3 = .01 μF paper
C4 = 0.1 μF, 350v. paper
C7 = 0.05 μF paper
VR1 = 500,000 ohms variable
T1 = Modulation transformer, *see text*
R1 = 2.2 megohms, ½-watt
R2 = 2,200 ohms, ½-watt
R3, R9 = 220,000 ohms ½-watt
R4 = 1 megohm, ½-watt
R5, R8 = 47,000 ohms, ½-watt
R7 = 100,000 ohms, ½-watt
R6 = 1,000 ohms, ½-watt
R10 = 330 ohms, 1-watt
V1 = 6J7, EF37A
V2 = 6J5, 6C5
V3 = 6L6, 6V6

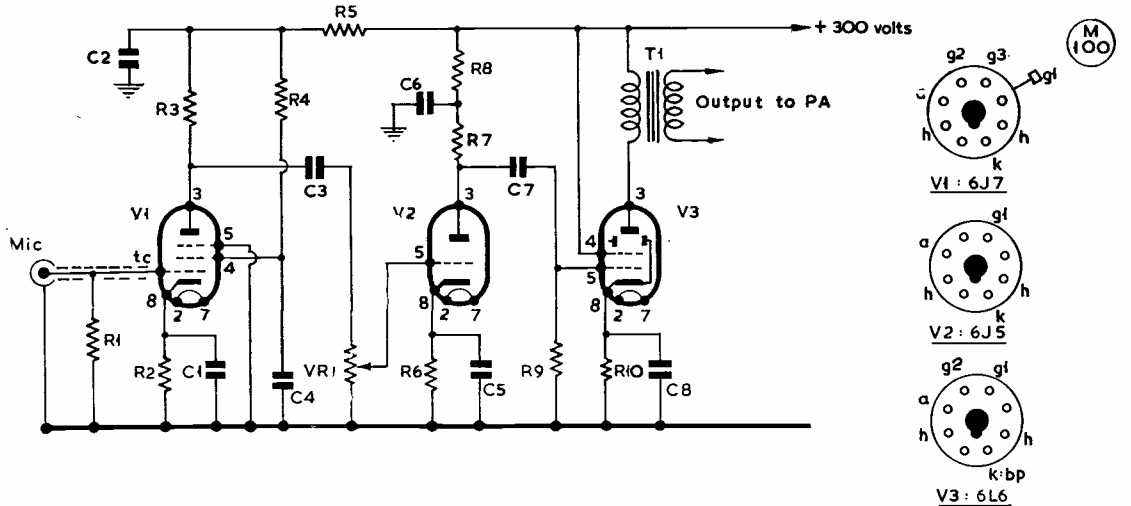


Fig. 1. Circuit of the simple modulator described in the article by G3KEP. With this unit an audio output, of good quality, of about 5-6 watts should be obtained This is, sufficient to modulate fully a standard 10-watt carrier on Top Band, or to drive a high-power audio amplifier for a more ambitious transmitter.

short as possible, and screened wire used where necessary. Any small modulation transformer capable of handling about 6 watts of audio may be used. The old Ferranti OPM1 is available from most "surplus" stores, and provides ratios of 1:1, 1:1·6 and 1:2·7.

Power Supply

It is preferable that the power for this modulator be taken from a separate power supply and not from the one which supplies the transmitter. However, if a common power unit has to be used, it is essential that it has good regulation, with the HT to the VFO satisfactorily stabilised, or frequency modulation will result.

It should be stressed here that unless the RF side of the transmitter is working correctly, much time and effort are likely to be wasted in trying to produce satisfactory results under modulation. Hence, the rig should be set up under artificial load conditions, with local monitoring. The artificial load can be a lamp, or a link-coupled tuned circuit with a lamp in series with the variable condenser, and monitoring can be on the station receiver, using headphones. For adjustment of the transmitter on the aerial, the Radiation Meter, as described by G5GQ in the July 1958 issue of *Short Wave Magazine*, can be used.

The writer would like to express his thanks to G3MAL and to the Bradford Grammar School Amateur Radio Club (G3MHB) for using a modulator circuit to the accompanying design, and for carrying out extensive tests of its capabilities under on-the-air conditions.

NEW G.P.O. MICRO-WAVE LINK

The Southern Television programmes are being carried to the ITA transmitter at Chillerton Down, I.o.W., over a link provided and operated by the Post Office. This link is in two parts. One carries the ITA national network programme from London to the Southern Television studio at Southampton. The other pipes the locally-provided programme and advertising material, inserted at the studio, to the ITA transmitter at Chillerton Down on the Island.

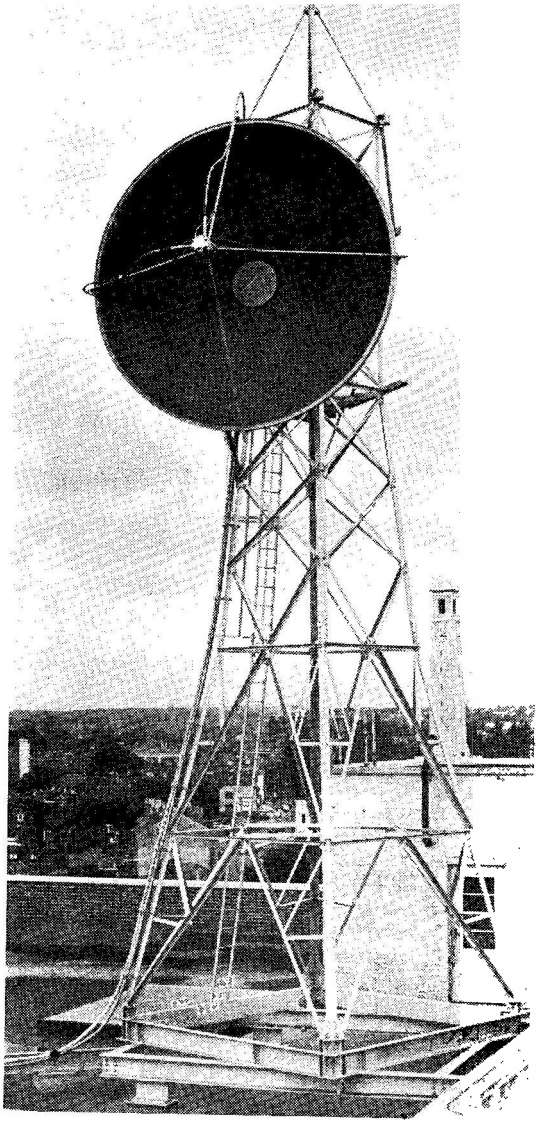
These links total some 125 miles, mostly by microwave radio relays, but partly by coaxial cable at the Southampton end.

The London-to-Southampton system comprises a two-hop microwave radio-relay link, 83 miles in length, operating in the 4000 mc band and installed on the existing route from Museum Telephone Exchange, London, *via* a repeater station at Golden Pot, near Alton, Hants, to the receiving terminal situated in the BBC's TV station at Rowridge, Isle of Wight; the signal is then passed on coaxial cable from Rowridge to the ITA station at Chillerton Down. A single-hop microwave radio-relay link, 18 miles in length, operates in the 2000 mc band to pass the signal to the ITA station at Chillerton Down from the Post Office terminal in Southampton.

To guard against equipment failures during programme time, all the apparatus, with the exception of aerials, is duplicated throughout to provide two independent signal paths.

Some Technical Details

The 4000 mc radio equipment serving the Museum-Golden Pot-Rowridge link was designed, manufactured and installed by the Radio Experimental Branch of the Post Office Engineering



The 30ft. tower and 2000 mc dish at the Southampton radio terminal for the ITA link to the Isle of Wight, provided by the Post Office.

Department. At each transmitter the video signal is arranged to frequency-modulate an intermediate frequency carrier of 60 mc which in turn phase-modulates a travelling-wave valve driven by a 4000 mc carrier. A second travelling-wave valve further amplifies the microwave signal to produce an RF output power of about 1 watt, which is fed to the high-gain paraboloid aerial. At each terminal receiver the microwave signal is translated to the 60 mc intermediate frequency range by a crystal mixer; amplification at this frequency is followed by demodulation to recover the video signal. At each repeater similar techniques are used except that the intermediate frequency signal, instead of being demodulated, is amplified and caused to re-modulate the travelling-wave valve. The frequency of the microwave carrier driving this valve differs by 72 mc from that incoming to the repeater. Waveguide branching filters are used for combining the outputs of the transmitters and repeaters with those of the radio link provided on this same route for the BBC. The inputs of the receivers and repeaters are combined in similar fashion. This enables the use of common aerials and aerial feeders for the ITA and BBC links.

The aerials are paraboloid dishes each of 10 ft. diameter, with waveguide feeders. The aerial at Museum Exchange is 70 ft. above roof level, at Golden Pot 200 to 300 ft. above ground, at Rowridge 70 ft. up the BBC mast.

The 2000 mc radio equipment serving the links between Chillerton Down and Southampton was provided and installed by the General Electric Company, Coventry, under Post Office contract. At each transmitter the video signal is arranged to frequency-modulate a 70 mc intermediate frequency carrier which is amplified and then translated to 2000 mc by means of a triode valve mixer. Amplification at this frequency is by use of triode valves in two stages to produce a carrier output power of about 2 watts RF. At each receiver the signal is translated to the 70 mc intermediate frequency range by means of a crystal mixer; and, after amplification, is demodulated to obtain the video signal.

Coaxial-type branching filters are used for combining the transmitter outputs at each station. The receiver inputs are combined in similar fashion. At each station two coaxial aerial feeders are used, one serving the transmitters and the other the receivers. The 12 ft. diameter paraboloid dish acts as a common aerial for transmitting and receiving. The feeders enter the launching units which illuminate the paraboloids so that the radio signals being sent and received at a station have "orthogonal" polarization, thus avoiding interference between transmitters and receivers.

COURSES FOR THE R.A.E.

Further to the centres listed on p.325 of the August issue of SHORT WAVE MAGAZINE, the following additions are notified:

Bognor Regis: At the Technical Institute, Southway, enrolment September 15-17, 5.30 to 8.30 p.m., for evening Theory Course and Morse Class starting towards the end of September. The lecturer is E. J. Pearcey, G2JU.

Wembley (London): At the Wembley Evening Institute, High Road, Wembley, Middlesex. Enrolment September 15-18, 7.15 to 9.15 p.m., for classes in Radio Theory and Morse. In charge of instruction is A. J. Bayliss, B.Sc., G8PD.

Wirral (Birkenhead): At the Birkenhead Technical College, with classes in Morse. Apply to the College, or write: H. V. Young, G3LCI, hon. secretary, Wirrall Amateur Radio Society, 9 Eastcroft Road, Wallasey.

Wymondham (Norwich): At the Evening Institute; enrolment particulars from G. Edwards, G2UX, The Bungalow, Chapel Street, Barford, who is organising the course.

If no R.A.E. course has been mentioned for the district in which you live, apply to the Principal of your nearest Technical College or Evening Institute, or to the local office of your Education Authority, saying that you are interested in "Subject No. 55, Radio Amateurs' Examination" in the City & Guilds of London Institute's examination curriculum. In fact, nearly all the big Technical Colleges throughout the country now run classes of instruction for the R.A.E., or can lay them on if asked to do so. In districts where no such course of instruction has already been organised, the local Education Authority will probably be able to make arrangements for a course if three or more students undertake to present themselves.

WARNING ON UNLICENSED TRANSMISSION

We have been asked by the Post Office to draw the attention of all concerned to Sec. 1 of the Wireless Telegraphy Act, 1949. This provides that "no person shall establish or use any station for wireless telegraphy or instal or use any apparatus for wireless telegraphy without a licence in that behalf granted by the Postmaster-General." Though the word used is *telegraphy*, the courts would undoubtedly hold that the Act also means telephony. The need for publicity on the matter has arisen by reason of the enquiries now being received by the Post Office from uninformed people wishing to operate "surplus" transmitting equipment, especially walkie-talkies. Under the Act, a licence must be obtained for the use of any such equipment, whether for private, commercial or business purposes. But, the Post Office points out, in the majority of cases the PMG would not be able to grant a licence anyway, because of "the technical characteristics of the equipment and the frequency bands in which it works." (That item on p.326 of the August issue has a bearing on all this!)

AMATEUR RADIO EXHIBITION

This year's Amateur Radio Exhibition will be during November 26-29 at the same place as last year—the Royal Horticultural Society's Old Hall, Vincent Square, London, S.W.1. We shall be there, as usual, and once again look forward to meeting many readers at Stand 14.

NEW QTH's

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

G3CJG, J. R. Farr *(ex-VU2JG/MD4JG/VQ4CJG),* Highwayman's Cottage, Fetcham. Leatherhead, Surrey. *(Tel.: Bookham 2505.)*

G3GOG, R. Mallinson, 38 Ingleton Avenue, Welling, Kent. *(Re-issue.)*

G3HWF, Amateur Radio Club, R.A.F. Station, Yatesbury, Calne, Wilts. *(Re-issue.)*

G3LUY, E. W. Brett, 28 Edward House, Edward Grove, New Barnet, Herts. *(Tel.: Barnet 1059.)*

G3MHN, B. J. Hitchens, 74 Christchurch Lane, Lichfield, Staffs.

G3MIB, S. R. J. Walters, c/o 179 Walsall Road, Great Wyrley, nr. Walsall, Staffs.

G3MJK, J. C. Clinch *(ex-G5PM/VS2ER),* Mile Hill House, Fivehead, Taunton, Somerset. *(Tel.: Ile Brewers 277.)*

G3MJW, D. Edmunds, 14 Hope Street, Bozeat, Wellingborough, Northants.

G3MLC, Sqdn. Ldr. K. B. Pearse, R.A.F., 48 Barry Road, East Dulwich, London, S.E.22.

G3MLO, P. W. Weatherall, 35 Vauxhall Avenue, Canterbury, Kent.

G3MNW, F. Halfacre, Oakmead, Minley Road, Cove, Farnborough, Hants.

G3MPN, D. E. Johnson, Melton Road, Hethersett, Norwich, Norfolk.

G3MTD, B. V. Kissack, 7 Water Road, Stalybridge, Cheshire.

G3MVA, G. A. Martin, 18 Milton Lane, Wookey Hole, Somerset.

G3MVO, G. G. Wray, 93 Wolfreton Lane, Willerby, Hull, Yorkshire.

G3MVQ, G. W. Medhurst, 1a Lascelles Gardens, nr. Rochford, Essex.

G3MVU, A. J. W. Adkins, 216 Sheppey Road, Dagenham, Essex.

G3MVV, N. O. Miller, 55 Kingston Road, Romford, Essex. *(Tel.: Romford 7089.)*

G3MWG, D. E. Bootman, 18 Worcester Crescent, Mill Hill, London, N.W.7. *(Tel.: MIL 5156.)*

G3MWN, E. D. Rogers, 46 Sandygate, Wath-on-Dearne, nr. Rotherham, Yorkshire.

G3MWQ, P. J. Groves, 53 Hemming Street, Kidderminster, Worcs.

G3MWV/T, D. G. Blake, Rectory Cottage, Gresham, nr. Cromer, Norwich, Norfolk.

GM3MWX, A. C. M. Winton *(ex-ZC4AW),* 146 Broomagebank, Larbert, Stirlingshire.

G3MWZ, P. Casling, 35 Hotson Road, Southwold, Suffolk.

G3MXL, A. Aldous, 3 Market Street, Gainsborough, Lincs. *(Tel.: Gainsborough 2528.)*

GM3MXN, T. Sorbie, 13a Argyle Street, Stonehouse, Lanarkshire.

G3MXQ, W. A. J. Smith, 57 Oakwood Crescent, Winchmore Hill, London, N.21.

CHANGE OF ADDRESS

G2ANB, K. Brand, 33 Willingale Road, Loughton, Essex.

G2BZQ, R. Q. Marris, 93 Marlborough Road, Southall, Middlesex.

G3BAC, R. A. Bastow, 31 Canterbury Road East, Ramsgate, Kent.

G3GIE, 2nd Lieut. J. D. Munns, Officers' Mess, 3 Trng. Bn., R.E.M.E., Arborfield, Berks.

G3IRM, P. Lumb, 10 Lake Avenue, Bury St. Edmunds, Suffolk.

G3IVB, L. R. Beeson, 9 Woodside Avenue, Stoke-on-Trent, Staffs.

G3JCW, B. E. Greville, 15 Cissbury Drive, Findon Valley, Worthing, Sussex.

G3JPI, P. E. Hale, 74 Cedar Road, Romford, Essex.

G3JUX, J. McFarlane, 27a West Close, Walton, Stone, Staffs.

G3JYT, F. Jeanmonod, 10 Green Lane, Eltham, London, S.E.9.

G3KBB, G. P. Winters, 13 Ashridge Green, Bracknell, Berks.

G3KVT, A. G. Smith, 12 The Market Square, Wolverton, Bucks.

G3LOL, K. S. Livermore, 1 Chestnut Avenue, R.A.F. Station, Topcliffe, Thirsk, Yorkshire.

G3LZV, C. Berry, Elizabeth Block, R.A.F. Detachment, Labuan, British North Borneo.

G3MAC, P. Bates, The Coppice, Tower Hill, Horsham, Sussex. *(Tel.: Horsham 3800.)*

CORRECTION

G2FHK, D. A. Smith, 18 Lucas Avenue, Harrow, Middlesex.

G3MVD, A. Redfern, 26 Lancaster Street, Dalton-in-Furness, Lancs.

NEW SHIP FOR G8AO/MM

The new London collier *Camberwell,* of 2,780 tons, is commanded by Capt. E. Clarke, G8AO, who is holder of the very first /MM licence issued by the Post Office. His ship is one of the latest of her type, and is designed to negotiate London River under all the bridges up to Wandsworth, bringing coal from Tyneside down to the generating stations of the South-East Gas Board at Greenwich, Rotherhithe and Wandsworth. Thus, G8AO/MM is on a regular run up and down the East Coast; the *Camberwell* is fitted with radar aids to navigation, as well as being most modern in every other respect: she has all-electric deck machinery and each of her crew of 17 has a single-berth cabin—which, as a British collier, must make her unique.

JOINING THE MAGAZINE

Though it is often suggested, we have no membership system. Those interested in Amateur Radio, in all its various aspects, can find all they want to know by regular reading of SHORT WAVE MAGAZINE, which costs 33s. post free for a year of twelve issues, by remittance to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

The Other Man's Station

G3MTX

THIS is a rather unusual station description, for John Pointon, G3MTX, 2 Holmesdale Road, Bexhill-on-Sea, Sussex, is one of our sightless amateurs—probably the most recently licensed—and his station is naturally in the very early stages of development.

G3MTX passed his R.A.E. and Morse Test in May, 1958, after having been seriously interested in Amateur Radio only since the previous January. With the co-operation of G6QB, who read and discussed with him the early chapters of the ARRL *Handbook* (and himself learned quite a lot in the process !) and G3HRI, who filled tapes with slow Morse and also gave much advice on the practical side (he, too, is blind), John Pointon worked through the whole curriculum in roughly four months. This would do credit to many an aspirant without the handicap of blindness, and represents a pretty concentrated effort by all concerned !

An AR77 had been in use for some time, and this is still retained as the station receiver. The first piece of transmitting gear to go with it was a simple CO-PA Top Band rig, its 6L6 PA being modulated by a three-stage speech-amplifier-modulator which ends up with two 6V6's, strapped as triodes.

A certain acquaintance with the K.W. "Vanguard" had proved to G3MTX that here was a transmitter which was not too touchy about its controls, and so a recent model was decided upon for use on the other bands.

In the photograph, G3MTX is operating the K.W. "Vanguard," the Top Band rig being out of sight on the left. The aerial tuning unit, seen on top of a small power pack, is designed to cover all bands in conjunction with the 136-ft. aerial and 30-ft. Zepp feeders. As a "Zepp" this works extremely well on Eighty and Forty; on Top Band the dead feeder is disconnected and the full length of 166 feet of wire is series-tuned against a direct earth connection.

A number of non-visual measuring instruments are being either developed or contemplated. G3MTX already has a milliammeter (direct reading 0-5 mA) which gives an *audible* indication of reading by means of a bridge circuit and a vibrator; this, in conjunction with shunts, could eventually be used to tune almost any type of transmitter. Another device which is under way is a field-strength meter giving an audible output, which will be invaluable for checking overall tuning, and especially aerial resonance.

Meanwhile, as with most sightless persons, G3MTX's highly developed sense of touch and retentive memory serve him well in such matters as frequency measurement (fractions of a turn on the

bandspread dial of the AR77), setting of the transmitter VFO accordingly, and his contacts are logged directly on to a typewriter, to be transcribed into his log book on a later occasion.

Results have been excellent; Top Band phone has reached as far as Yorkshire, and 40-metre phone to twelve or fifteen European countries. Since the aerial is only about 20 feet high and runs practically *underneath* some massive overhanging trees, these contacts give grounds for optimism, and the erection of a better radiating system later on should bring G3MTX up among the DX fraternity.

Meanwhile he is delighted to make contacts with all and sundry; please call if you hear him on either One-Sixty, Eighty or Forty, and you will be assured of a friendly contact.

HOW'S YOUR DX-MANSHIP ?

INTRODUCING THE "D" CODE

WE are all "DX Types" in some degree or another, DX communication being one of the chief aims and joys of Amateur Radio. Even the hundred-per-cent VHF enthusiast seeks DX by working a few more countries or counties than his nearest neighbour; and the Top-Band ten-watter may by the most rabid of DX 'chasers in his particular way.

Prolonged study of the habits of the *genus* has made it possible to classify its members in a way that may possibly be useful. Readers can assign the relevant "D" number to themselves, their friends and even other operators whom they have heard but never worked.

The traditional 1-to-9 scale has been used, but it is of interest to note that it is by no means wholly desirable to become a D9 type—in fact most of us would hate it. The type does exist, but the D7 and D6 categories would seem to be preferable, and the maximum of enjoyment comes even lower down the scale. (At times one feels that D1 is definitely the type to be—but it's too late).

Change will occur during the years . . . the D2 or D3 man will probably climb as high as D7 or D8, and may thereafter deliberately drop down to a lower figure. The D9 type we regard, in general, as beyond hope and completely a prisoner in a cage of his own building.

So here we have the nine types :

D9: The 250-plus man. Only works "new ones," and will lurk in silence for months just waiting for them. QSL's by airmail and keeps on doing so until the other card finally arrives. Appears as if by magic when each new DX-pedition comes on the air. Is also known to work skeds with a few very favoured friends, but only for the purpose of finding out the latest gen. on new ones. Aerial farm, rotary beams, maximum power, rapid band change, a high-speed bug and all the aids.

D8: Always there when anything new shows up, but will also take relative rarities such as VR3, VQ9, ZC3 and the like, even if he has worked them before. In fact he is usually the one who snatches them from someone who hasn't. . . In other respects as D9, except that he will work practically anyone when there's nothing new around.

D7: Prominent in the chase, but is also heard working W6, VK, ZL and so on quite frequently. Can also be heard on 7 and 3.5 mc working W's and PY's on CW, and even local phone on odd occasions. Has been heard calling CQ DX or even CQ. Spends far more time actually on the air than the previous types.

D6: Is often heard working the less usual DX and having long ragchews with other DX-chasers. Works anything over 3,000 miles and will even reply to calls from inside this radius if there is a good reason. All bands, phone and CW, DX and local, and spends even more time on the air than D7; is liable to disappear completely for long spells when tired of it all.

D5: Has a score between 100 and 200 and is always looking for additions, which are still fairly easy to come by. Regards VK, ZL, South America and South Africa as DX and still works them just for the hell of it. W6's and 7's are popular, but the East Coast stations count as locals. Calls CQ and takes whatever comes—if it's outside Europe.

D4: Anything outside the 1,000-mile radius is still DX. CN's, FA's, 4X4's replying to his "CQ DX" will *not* get a rude answer. All W's are included, and worked in scores or hundreds.

D3: Works almost anything with equal enjoyment. Uses lowish power or a fairly poor aerial, so that OH and UA really *are* DX for him. W's or PY's are an event requiring a direct QSL. Still has to look up the *Call Book* for some of the more obscure prefixes.

D2: Never knows if anyone will come back to his call, and is delighted when someone does—which is not always, by any means. Anything not worked before is DX to him. Doesn't know his score, as it's not worth starting to count up yet.

D1: "What *is* DX ?"

L.H.T.

COSSOR VALVES — New Address

We are asked to say that the new address of the Cossor Valve Co. Ltd., is 445 Holloway Road, London, N.7 (*ARChway* 0551), to which all communications relating to Cossor Valves and CRT's should be sent.

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Deadline for October Issue: SEPT. 12)

THE time for the Thirteenth MCC **(Magazine Club Contest)** is drawing near, and the dates, as announced last month, will be **November 15 and 16, 22 and 23,** between the hours of **1600 and 1900 GMT.** This event, as ever, is purely a Top-Band CW affair, and its main object is to bring the Clubs together over the air for as many inter-Club contacts as possible.

The rules will be entirely unchanged from last year. They will be printed in full next month, but meanwhile Clubs who are new to this event, and are thinking of entering for the first time, should refer back to p.440 of the October, 1957, issue, where the rules for last year's Contest appear. They hold good in every respect except for the dates as given above.

Every year we are asked why a list of competing Clubs cannot be circulated! We always have to make the same reply—most Clubs who decide to compete would not necessarily be able to let us know in sufficient time for us to compile a list for publication. (We would need to know by about the second week in October.) In any case there are always last-minute entries and changes of callsign which would be held out by such a rule. What we want is to get as many Clubs on as possible, and to make it as easy as we can for them to enter! From past experience, we know that a comprehensive advance-entry list is just not possible unless a lot of probable starters are to be left out.

The rules insist that competing Clubs should exchange "QRA" with the word "Club" sent each time, and this alone will differentiate them from non-competing stations who will merely give "QTH" on request.

Clubs are strongly urged not to leave their preparations until the last minute. There is a lot more to a Contest like this than merely having the gear ready to come on the air at the appropriate time. Operators and log-keepers must be organised, and a team of "tea-boys" is useful, to say the least of it!

We have every hope of a record entry this year (last year's was a total of 39 Clubs). And how about some new names in the Roll of Honour?

Cambridge will meet on September 19 for a talk by old-timer G2XV on a TVI-proof 28 mc Transmitter. The meeting-place is The Jolly Waterman, Chesterton Road, and the time 7.45 p.m. **Cornish** met at Falmouth on August 6, when varied topics were discussed. The September meeting QTH is not yet decided, but the October meeting will again be in Falmouth—probably for a talk on Marine Radio, which is appropriate to the locality.

Derby will have an Open Evening on September 10 and a Beginners' Night on the 17th. The subject for September 24 is Simple Equipment for Servicing, and on October 1 there is a "Sale of Members' Useful Items"—*not* a Junk Sale!

Flintshire's September meeting fell on the 1st, and so is now ancient history. The subject was Getting on Two Metres. On October 6 (7.30 p.m.) GW3FPF will be conducting a Junk Sale and Auction.

Gravesend continue to meet every Thursday, 7.30 p.m. at The Old Sun, Greta Hall Road, Northfleet. Seven members recently took the RAE, and *all* passed—a very fine record. Great credit is due to G3FST and the other senior members who did the coaching.

Halifax have just formed an Amateur Radio Society, which met for the first time on August 5. They are going to arrange regular meetings on the first Tuesday of the month at the Sportsman Inn, Bradshaw, Halifax. Other meetings will be held at the nearby club rooms. Anyone in the neighbourhood who is in any way interested in Amateur Radio is assured of a welcome.

Lothians "went into recess" after their June AGM, but will be meeting again on September 11 at 25 Charlotte Square, Edinburgh. The opening meeting will begin with the president's address, followed by open discussion. Note new secretary's QTH—in panel.

Mitcham meet on September 12 for a Mullard lecture on Oscilloscopes, and on the 26th for a talk on Spanning the Globe (Cable and Wireless, Ltd.). **North Kent** meet on September 25 for a Mullard film on Transistors. They recently had a very successful day at Erith Show and Sports, with GB3ENT on the air. Fifty QSO's were made, mostly on 7 mc, but some DX was worked, including 9G1AA. All QSL's will be acknowledged with their specially-printed card.

Norwich sent in their monthly magazine, *Forward Gain*, a nice production, from which we note that RAE Classes will be run at Wymondham Evening Institute next term, organised by G2UX, from whom enrolment particulars may be obtained. They had a

Reports for this space must reach us by the date given each month at the head of the article. The club honorary secretary's name, callsign (if any) and full address must be included in the report, which should be sent to: "Club Secretary," Short Wave Magazine, 55 Victoria Street, London, S.W.1. There is no charge for insertion, and we welcome reports from any club group.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ABERDEEN: W. K. Heggie, 80 Leslie Terrace, Aberdeen.
CAMBRIDGE: H. Waton, G3GGJ, New Road, Barton, Cambridge.
CANNOCK CHASE: G. Cleeton, G3LBS, 8 Lower Road, Hednesford, Staffs.
CORNISH: J. Brown, G3LPB, Marlborough Farm, Falmouth.
DERBY: F. C. Ward, G2CVV, 5 Uplands Road, Littleover, Derby.
FLINTSHIRE: J. Thornton Lawrence, GW3JGA, Perranporth, East Avenue, Bryn Newydd, Prestatyn.
GRAVESEND: L. C. Bodycombe, 21 Grieves Road, Northfleet.
HALIFAX: A. Robinson, G3MDW, 7 Upper Brockholes, Ogden, Halifax.
LEEDS: J. R. Hey, 40 Richmond Avenue, Headingley, Leeds.
LINCOLN: F. B. Travis, G3BCA, 202 Monks Road, Lincoln.
LOTHIANS: L. Lumsden, 33 Hillview Drive, Edinburgh 12.
MACCLESFIELD: B. Haywood, G3MKR, 15 Tunnicliffe Street, Macclesfield.
MITCHAM: D. Johnston, 23 Woodland Way, Mitcham.
NORTH KENT: D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.
NORWICH: O. F. Simkin, G3HYJ, 15 Hillside Road, Thorpe, Norwich.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
SOUTHGATE: A. G. Edwards, G3MBL, 244 Ballards Lane, North Finchley, N.12.
TEES SIDE: A. L. Taylor, G3JMO, 12 Endsleigh Drive, Middlesbrough.
WIRRAL: H. V. Young, G3LCI, 9 Eastcroft Road, Wallasey.

" Bucket and Spade Party " scheduled for August 31 at Hunstanton, and were hoping to operate on August 24 (dependent upon wind and weather) from Scroby Sands, off Great Yarmouth.

Tees-Side meets at Settlement House, Newport Road, Middlesbrough, at 8 p.m. on September 12 for a talk by G3LXG on Instrumentation; and on September 26 for a tape-recorded lecture—subject not stated. A " Pie Supper, with liquid refreshment " is being arranged for October 25—further details next month.

Aberdeen's four September meetings cover Modern Building Techniques, by GM2FHH, on the 5th; a Junk Sale on the 12th; a Mullard Film Show on the 19th; and a visit to Granitehill TV Link Station on the 26th. Normal meetings are at 7.30 p.m. in the Clubroom, 6 Blenheim Lane.

Cannock Chase gather on the first Thursday at the Castle Inn, North Street, Bridgtown, New Cannock, at 8 p.m. They have recently held " get-togethers " with the Burton-on-Trent and Sutton Coldfield societies. Their AGM will be in October, but before then they hope to hold a picnic, with some mobile stations in the picture, on Cannock Chase.

Leeds re-open on September 24, when they look forward to welcoming some new members. In future they will meet on Wednesdays at 7.45 p.m., at Swarthmore Educational Centre, 4 Woodhouse Square, Leeds 3. A full programme is being arranged.

Lincoln hold their Hamfest and Mobile Rally on September 21 at the Technical College, Cathedral Street. Tickets are 8s., available from R. W. Sadler, 14 Hainton Road, Lincoln. The event includes high tea, a lecture on Transistors (BTH), a tour of Lincoln, a competition for the best mobile, and a raffle. G3IXH will be on Top Band from 10 a.m. The next normal meeting is on September 10 at The Percolator, Monks Road.

Welcome to **Macclesfield,** who though they held their inaugural meeting last June, now report for the first time. G3JQ is chairman, and G3MKR secretary. Meetings are held on alternate Tuesdays at the Bruce Arms, Crompton Road, Macclesfield, the next being on September 9 and 23, when G3GKG will continue his talks on SSB. All visitors welcome. And plenty of room for new members.

Purley were very successful at the Summer Fair, when they were operating G3DPW/A and two mobiles. At the August meeting G3DPW talked to the newcomers, and on September 19 G3KXT will be giving a practical demonstration of mobile equipment. Visits to places of interest are now being planned.

Southgate, Finchley and District will meet on September 11, 7.30 p.m. at Arnos School, Wilmer Way, Southgate, for a talk on Radio Astronomy by Mr. I. A. Davidson, B.A., ex-Jodrell Bank Observatory. On September 12 and 13 GB3SRA will be operating from the Wood Green Show and Fete, Town Hall Park, Wood Green. Top Band and the HF bands will be used. Visitors welcome—including mobiles.

Wirral are arranging for another RAE course to be run at the Birkenhead Technical College, and it is hoped to organise Morse classes at the same time. On September 5 they meet for a talk on Earthing Problems, and on the 19th the subject will be Frequency Measurement.

Amateur Operation from Lundy Island

From Notes by G3IQO

THE island of Lundy, in the Bristol Channel, is three miles long by a mile wide, and is about 11 miles off Hartland Point, on the North Devon coast. Lundy has a lighthouse and is a Lloyd's signal station, in touch with the Hartland Pt. coastguard by radio-telephone. The island, which can show some wonderful coast scenery, is privately owned, has a hotel and a population of about 20 people. It is a famous bird sanctuary, some 140 different species having been identified. The owner of Lundy has taken the puffin bird as his symbol and, unofficially, prints his own stamps and mints local coinage, on which the puffin appears. The easiest way to get to Lundy Island is by the daily Campbell steamer from Ilfracombe, a crossing of about two hours.

Very early on June 20, G3IQO/M, with SWL Robinson, set off from Liverpool for North Devon ; the crossing to Lundy was made the next day in the *Bristol Queen* paddle steamer and immediately on arrival a survey, in which the owner of the island assisted, was carried out for a suitable site. It was decided to operate G3IQO/A from the crest of a hill facing the North Devon coast, and a 246-ft. wire about 20 feet high, was put up. The gear consisted of a Type 62 transmitter-receiver, operated on the 160, 80 and 40 metre bands. The first " CQ de G3IQO/A Lundy " went out on Top Band at 1900 BST on June 21, producing an immediate QSO with G3JMQ/M, who had been standing by at Coombe Martin, N. Devon ; GM3AUD and GW5VX were also worked

on 160 metres, and OZ1MJ on Eighty; EI8J and GD3UB were heard and called, but without success. In the end, a total of some 50 contacts was made, and all G3IQO/A-Lundy QSO's have been, or are being, QSL'd with a card bearing the puffin stamp.

On the way to and from North Devon, a number of contacts were made /P and /M by G3IQO, with the gear mounted in a Morris Traveller.

Editorial Note: Some months ago, when a Lundy expedition was first mooted, G5JU contributed a few notes on his own early experiences on the Island—he was there as long ago as 1933, operating as G5JUP (no /P in those days!) with QRP crystal-controlled gear on the 7 and 14 mc bands; the receiver was a 1-V-1 with plug-in coils, power was derived entirely from a standard 120v. HT battery and 2v. accumulator, the input was about 2 watts to the PA, and 2v. receiving-type valves were used throughout. During a stay of about a fortnight, many contacts were made over the U.K. and Europe on 40 metres, and though the PA had to double to 14 mc, some 20-metre DX was also worked.

Later still, in the summer of 1936, Lundy was again visited with Amateur Radio in view—this time by our contributor who now writes "VHF Bands" under the pseudonym of A. J. Devon. He took 5-metre portable gear, which consisted of a two-stage super-regenerative receiver, an SEO transmitter—all battery-powered and also using 2v. valves—and a 5-metre dipole, with two 10-ft. poles to hold up the ends of the aerial. The crossing to Lundy was made, in very bad weather, in a diesel launch hired from Appledore, N. Devon. However, one day's portable operation was achieved, and 5-metre stations in Bristol, Torquay and along the South Wales coast were easily worked with high signal levels both ways. The trip back was made under even worse conditions, with the Appledore Lifeboat alerted and standing by in case the launch could not negotiate Bideford Bar.

All this activity from Lundy was well over 20 years ago, with G5JU the first visitor to operate the HF bands, and A.J.D. the first to use what might fairly be called VHF; so far as is known, there has been no other amateur operation from the Island until G3IQO's trip this year, he being the first to use the LF bands from Lundy.

BBC's NEW SANDALE VHF STATION

The BBC's latest VHF sound broadcasting station, which has been built on the same site as the BBC television station at Sandale, near Carlisle, was brought into service on August 18. It is the first VHF station in the world to radiate four transmissions simultaneously off a single aerial. The new station operates on 94.7 mc, 92.5 mc, 90.3 mc, and on 88.1 mc, each with an effective radiated power of 120 kW, making a total of 480 kW in the aerial! The transmissions are all horizontally polarised, as at other BBC VHF sound broadcasting stations.

SMALL ADVERTISEMENTS

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

SITUATIONS VACANT

TECHNICAL ASSISTANT required in Service Dept. with a good working knowledge of radio and allied subjects. Duties include the handling of technical correspondence, preparation of literature and liaison between Dept. and factories. Should have a wide knowledge of English and good appearance. Education to ONC or equivalent. Permanent staff position with good prospects. Apply: Siemens Edison Swan, Ltd., Ref/JAR, 155 Charing Cross Road, W.C.2.

WAR DEPARTMENT, Broadcasting Technical Assistant required for temporary post in London for operation and maintenance of studio and recording equipment. Quals.: Radio II of C. & G. or equiv. normally required. Sal. £510-£770 p.a., starting point according to age and exp.—Apply to any Employment Exchange quoting *(Westminster 3278).*

Box No. 2026. Respondents to this advertisement in the August issue of *Short Wave Magazine* are thanked for their letters. The large number of replies received makes it impossible to answer each individually. Those whose applications can be further considered will be communicated with in due course.

TRADE

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

CRYSTAL Microphone Inserts with exceptionally high output (Cosmocord Mic. 6). Guaranteed newly made and boxed 15/6 post free.—Radio-Aids Ltd., 29 Market Street, Watford, Herts.

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

SSB AUDIO PHASE SHIFT NETWORKS Octal base; built with 1% high stability components; 52/6.—Reidhill Electronics, 55 Niths:ale Drive, Glasgow.

WANTED FOR CASH: Good clean Communication Receivers and SSB Equipment.—Short Wave (Hull) Radio, 30/32 Princes Avenue, Hull. *(Telephone No. 18953.)*

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

SMALL ADVERTISEMENTS, TRADE—*continued*

G3CGD QSL's. Fixed and mobile samples on request. Printing enquiries welcome.—30 St. Luke's Road, Cheltenham.

READERS' ADVERTISEMENTS

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

HALLICRAFTERS, HT11 Transmitter/Receiver (1.5-3.0 mc) and power unit (12v.), ideal for mobile, £14.—J. E. Cronk, 93 Thurlow Street, Walworth, London, S.E.17.

GETTING MARRIED, must sell: LG300, power unit, modulator unit, control unit, £45. 160m. Tx, AM/CW, monitorscope, with an extra frequency modulated output to drive QRO HF bands Tx, £15. Stacks of other gear.—G3IUW, 50 Byron Avenue, Cranford, Hounslow, Middlesex.

BENDIX TA12G for sale, VGC, 80 and 40 mtre., £7 or offer ? — G3LOL, 1 Chestnut Avenue, R.A.F., Topcliffe, Thirsk, Yorks.

5-8 Mc XTALS, 4 for 11/-; 6-8 mc for 2 metres, 5/- each; 50 valves, 2/6-10/-; 80m Command Tx. built-in mod, 55/-.—Box 2028, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

VALVES for sale, including brand new QQVO6/40; send for list to: GW3ITD, Rhoslwyn LLanybyther, Carms.

FOR SALE: 640 Rx, S-meter and manual, £18. Can be seen evenings or week-ends.—Pomroy, 41 Lonsdale Road *(side entrance)*, Barnes, London, S.W.13.

ALL FOLLOWING FOR SALE: Sectional tubular mast 36ft., £6; R107 and manual, £12; 19 Set variometer, junction box and headset with mic., £3. Trans. 500v. and 12v., suit 19 Set, 30/-; Morse training set, Mk. III, 25/-. All following wanted: UM1, UM2 or UM3, BC453 (Q' Fiver), *QST's* before Jan., 1957, in exchange for *Practical Wireless, Wireless World, Popular Mechanics,* or *Radio Electronics.* — Moore, 30 Abbey Crescent, Sheffield, 7.

WANTED: Manual, complete set of coils, frequency calibrated dial and assembly for CR100.—I. Cooper, 124 Groveley Lane, West Heath, Birmingham 31.

SALE: Unused Valves, guaranteed new: QQVO6-40A, £4; QQVO3-20A, £3; QQVO2-6. £3; QVO6-20, £1 10s.; QVO3-12, £1. WANTED: 2-metre converter in good working order.—Box No. 2029, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

CR100, with S-meter, £15. WANTED (or exchange): Eddystone S.640, HRO; or W.H.U.?—R. M. Jones. 64 Lexton Drive, Southport, Lancs.

SMALL ADVERTISEMENTS. READERS—*continued*

LG300, perfect, 'scope Type II. pre-selector; table-top cabinet; 110v. transformers.—G3FMY *(Hillside 6994)*.

EXCHANGE: Two 58 walkie-talkies, mint condition, with aerials, vibrator supply units, HR phones, mikes, spare valves, vibrators, batteries cases, etc., for 20- and 40-metre Phone/CW Tx, with mike; or offers?—D. Doyle, College Street, Ballyshannon, Donegal, Eire.

5IN. OSCILLOSCOPE, converted 182A unit, *Radio Constructor* circuit; time base to 100 kc; works well; cost £12 to build. Any offers?—Holley, 152 Leigh Road, Eastleigh, Hants.

AMATEUR requires British Colonial stamps in bulk from overseas in exchange for credit; details contact.—Irving, G3IJX, Kidside, Milnthorpe, Westmorland.

AR88 TUNING DRIVE wanted. Can anyone help, please?—G2BPF, Whitehaven, Sycamore Road, Farnborough, Hants.

SALE: Signal Generator, 120 kc-40 mc, brand-new and perfect, £4 5s., including postage. WANTED: Hallicrafters S.20R or S.38C, must be mechanically and electrically sound. Please state price.—Box No. 2030, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Taylor 110A, R. & C. Bridge, £8; AVO 7, £10; E. & V., 500v. Megger, £7; E. & V. Circuit Testing ohMeter, £5. All as new in fitted cases. Amplifier in ventilated metal case (P/P 807's) with 3 speakers on baffle, £10; Midget Mains TRF, £2 10s.; ITV converters with power pack (2), £2 10s. each. Newnes *Radio & TV Servicing*, 6 vols., £5. BC-453, £2; 10in. PM speaker, 12/6.—Box No. 2031, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Minimitter Multi-Q, as new; owner purchased 680X; first £5 secures; bargain. Ellison Mains Transformer, 250-0-250v., 125 mA, just the job for Top Band, £1. Two L.F. chokes, 350 ohms, 80 mA, 5/- each.—Box No. 2032, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

AR88D, unscratched, S-meter, manual, 8in. chrome handles on front panel, mint condition, black crackle, £46.—Morton, Bath House, Barrow-in-Furness, Lancashire.

WANTED: CR100; must be in excellent condition. — Particulars to G3ELJ, Claypole, Newark, Notts.

WANTED: Panda ATU 150 unit, and Low Pass Filter; all must be in new condition; no alterations.—Box No. 2033, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Eddystone 640 Receiver, Q5'er, BC221, with stabilised power pack, £42, or would separate. Offers?—G3BDT, 31 Crossways, Southcard, Somerset.

RA1B RECEIVER, 160-20 metres, £8. Transmitter power pack, fully metered, in 14-inch rack-fitting chassis, £5. — G3MMP, 28 Rosecroft Walk, Pinner, Middlesex.

SMALL ADVERTISEMENTS, READERS—*continued*

150W. ELIZABETHAN Tx, Clamp mod., with moving-coil mic., 1,200 + 300v. P/supply. All in one unit. Owner going abroad. Offers around £30. — Harris, 110 The Drive, Northampton *(Northampton 5906).*

GRUNDIG TK5 with condenser mike, 1 year old, £37 10s. Electronic Key, £2 10s. Johnson's 200 DD35, 15/-; Parmeko transformer, 620v. and 375v., 250 mA simultaneously, 30/-; matching swinging choke, 250 mA, 10/-; 600v. at 120 mA, 6.3 and 5v., 15/-; 450v. at 200 mA, 3 x 4v., 12/6; 450v. at 200 mA, 10/-; 6H. 200 mA choke, 5/-; Collins mod. tran., 7/6; 4 mF 1000v. oil, 4 for 12/-; 4 mF 750v. paper, 3 for 7/6.—Hill, 23 Horner Road, Taunton.

CR100, with speaker, £15; spare coil pack, £1. Bendix RA1B, p/pack, speaker, £10. TU9B, TU10B, 7/6 each. Class-C Wavemeter, 15/-. *Short Wave Magazine*, Vol. IV (1 missing), Vols. V, IX (bound), also Vol. X; *RSGB Bulletin*, Vols. 24-28 (bound). Offers ?—Brown-Greaves, 32 Mount Close, Crawley, Sussex.

ST2AC, dirt-cheap, Tiger 60B 6-Band Tx, little use; recently obtained "second-hand, as new, mint condition," from manufacturer. Possible wire cover 6 bands and work CW, FB cabinet, £45.—Apply Box No. 2035, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Station, late GW6OK: Valve-testers (2), exciter, PA, mod. crystal calibrator, power supplies, numerous other items; s.a.e. for details.—GW3LCQ, 12 Penrhos Avenue, Llandudno Junction, N. Wales.

FOR SALE: BC-342 with handbook, £15; Transmitter, CRV 22815, 50w. phone, 3-9 mc, suitable mobiles, 10¼ x 7½ x 13½, with test instruments, minus Ae. load coil, £6; Wavemeter, 15 kc-24 mc, 250v. DC, 4v. AC, 35/-; Xtal marker, 1 mc-100 kc, battery operated, 25/-; VFO 200-1500 kc, frequency standard, 6 bands, 17/6; Xtal oven, 100 kc xtal, 50/-. Aerial relay, vacuum type VS2, contacts unused, 20/-; 50w. TA12 modulator, with 24v. dynamotor, 50/-; aerial tuner, Standard Radio, 200 mA, 2A., meters, 30/-. Wavemeter, variable coil, with scale, 10/-; TU5B, 15/-; R.1155 chassis, 40/-; T19/ARC5, 3-4 mc transmitter, brand-new, 45/-; modulator for same, 20/-: 1in. Oscilloscope, 19in. rack mounting, 230v. AC, 55/-. Valve, 100TH, 30/-. Collins Ae. load coil, 25/-. Furzehill Wobbulator, 230v. AC, 75/-; 100w. mod. trans. p/p, 4:2:1, 15/-; 3in. 'scope unit, 35/-. Hundreds transformers, chokes, transmitter coils, condensers, meters.—J. E. Price, Underwood House, 110 Harestone Valley Road, Caterham, Surrey *(Tel. No. 5085).*

FOR SALE: All-band Transmitter, 160-10m. band-switched, pair 807's, 75 watts, complete with power supplies, modulator 807's, UM2 transformer, in three-tier rack, £35 (o.n.o.).—Box No. 2034, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

LIGHTHOUSE TUBES, new, boxed, 446A and 464A, 10/- each. RCA enclosed transformer, 200/240v. prim., 115v. at 17.4A sec., £8.—Bavister, 70 Crawley Green Road, Luton, Beds.

SMALL ADVERTISEMENTS, READERS—*continued*

AMAZING OPPORTUNITY: G5GQ complete console station offered at bargain price through sudden removal. Console contains exceptional AR88D receiver, transmitter comprising original multi-band NBFM exciter, 1.8, 3.5, 14, 21 28 mc, with separate power unit, plus matching band-switched 150-watt PA with 750-volt 250 mA supply; variable bias supply, relay supply, fully metered control panel; ATU relay unit, keying unit, mike pre-amplifier, D.1 wavemeter; 150-watt UM3 Class-B modulator with separate power unit. Spare cabinet for AR88D. Absolute bargain at £89.—G5GQ, 59 Eton Place, Eton College Road, London, N.W.3, *after 17th September.*

HALLICRAFTERS SX28 (£32) and/or CR100 (£15), in good condition.—Graham, 31 High Street, Wick, Caithness.

AERIAL MASTS: Urgently required, 1in. tubular steel masts (sectional ex-R.A.F. type), or lengths of duralium tube, 1in. to 1½in. dia. — Watts, 62 Belmore Road, Thorpe, Norwich.

SALE: Vanguard Tx, as brand-new, with filter and spares, crated, £40. SX24, good condition, accessories, £15. G8KW Trap Aerial, £3. All carriage extra.—Box No. 2027, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

PANDA CUB, with low pass filter, perfect condition, £45 (o.n.o.).—G3KYN, 18 Tyndalls Park Road, Bristol, 8. *(Tel. 3-3368.)*

WS53 POWER PACK, 1,500v. 500 mA, plus 450v. 500 mA double-smoothed, appearance rough, £13. Army 12 Set, rebuilt, 6AG7 osc., 6AG7 doubler, pr. 1625's output, CW only, £6. TU5 Top Band Tx, with power pack, £3. T.1154, unmodified, with valves, 10/-. Heterodyne frequency meter 1185A, 20 mc to 100 mc in 4 bands, crystal check, MCW output, £10. Buyer collect. — V. Evans, 2 Shakespeare Dr., Cheadle, Cheshire.

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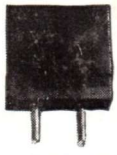

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1408.5	1680	2067.5	3440	10,501	11,526
1550.62	1680.5	2087.5	3630	10,511	11,587
1554.4	1700	2089	3850	10,534	11,751
1561.1	1727	2118.25	3920	10,545	11,788
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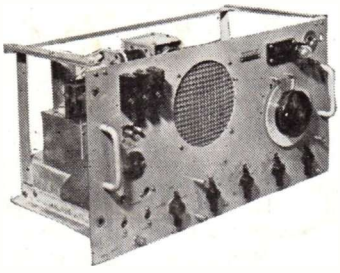

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