The SHORT WAVE Magazine

2/6

VOL. XIV NOVEMBER, 1956 NUMBER 9

WORLD WIDE COMMUNICATION

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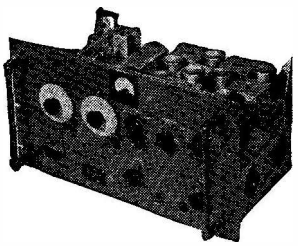

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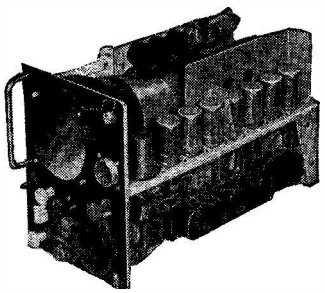

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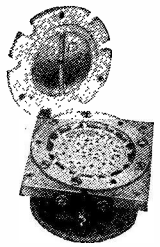

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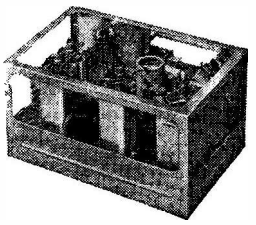

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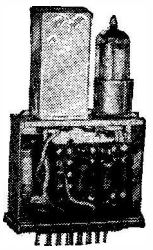

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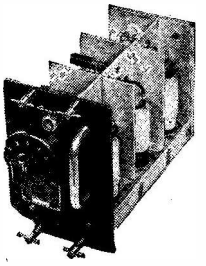

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FOR THE EXPERIMENTER AND THE RADIO ENGINEER

The SHORT WAVE Magazine

EDITORIAL

Yasme *For nearly six months, the owner of the ketch " Yasme "— attempting to sail round the world single-handed — has been the centre of some controversy in the Amateur Radio world. There is no need to recount here the details, which in any case can be found in the July and subsequent issues of* SHORT WAVE MAGAZINE.

On September 15 *last, " Yasme " was towed into Port Moresby, in Papua Territory, with her engine disabled and her sails blown out. Her calls for assistance had been heard by a VK*9*, who arranged the tow in. Her owner was completely exhausted after four days of struggle in very heavy weather, during which the yacht nearly foundered.*

" Yasme " was able to leave Port Moresby, in a sea-worthy condition, towards mid-October. Then on October 24 *came news that she was " wrecked on a reef* 200 *miles from Port Moresby." This time it was a VK*2 *in Sydney who heard her calls for immediate aid. A Lincoln aircraft of the R.A.A.F. had to be sent to search for her — fortunately, she was quickly located, and a rubber dinghy was dropped for the survivor. Then a Catalina flying-boat had to find the dinghy, land alongside it, and take the occupant on board. He was flown back to Port Moresby on October* 25*, and " Yasme " was left breaking up on a New Guinea reef, to become a total loss.*

Thus ends in disaster, disillusion and disappointment yet another attempt to sail single-handed round the world. This expedition is said to have cost £2,000 *to promote, and has been supported by American aid worth at least as much again. Leaving England in August,* 1954*, the voyage had already taken two years and even then was less than half completed. In that period, " Yasme " and her owner had become the focus of keen interest in the Amateur Radio world, for it was the first of such attempts in which the amateur angle has been so much publicised.*

From the bare facts as recounted here, it is clear that in the space of less than six weeks the life of Danny Weil, the Bournemouth watch-maker, has twice been saved by Amateur Radio. He alone can say whether his round-world attempt, and all that it has involved for himself and so many others, has been worth while. But what we can be sure of is that he now has a much clearer appreciation of what is meant by Amateur Radio.

Austin Forbes G6FO.

The "All-Pi" HF Band Transmitter

BAND SWITCHED FOR TEN, FIFTEEN AND TWENTY METRES—FULLY TVI-PROOFED—MAXIMUM INPUT, CW AND PHONE—A MODERN DESIGN DESCRIBED IN DETAIL

J. D. HEYS (G3BDQ)

This transmitter will appeal immediately to the keen DX man as just the thing for making the most of the new opportunities on our 14, 21 and 28 mc bands—now open for world-wide DX, and likely to remain so for some time to come. But to be sure of having the fullest scope under present-day conditions, it is essential that the transmitter be absolutely TVI-proof. Living as he does in a TV fringe area, our contributor was not TVI-proof until he had provided himself with the transmitter described here. Now, he is able to operate freely on the three preferred DX bands during peak viewing periods. By using the right valves and a properly thought-out design, electrically and mechanically, he has produced not only a very effective but also a nice-looking piece of apparatus, and largely from "surplus" items at that.—Editor.

HAVING used an all-band transmitter of the "Elizabethan" type for the past four years, the writer found that it possessed a number of serious drawbacks. Living on the south-east coast on the outer fringe of the Alexandra Palace (and later the Crystal Palace) TV area, operation on 14 and 21 mc was limited to early morning and late night sessions, despite the use of low-pass filters, balanced aerials and similar recommended expedients. The parallel 807 valves certainly did *not* like being run at full licensed input, and everything got very hot. On 21 and 28 mc the grid drive to the PA was too low and this, together with other features of the design, made operation on these bands very inefficient.

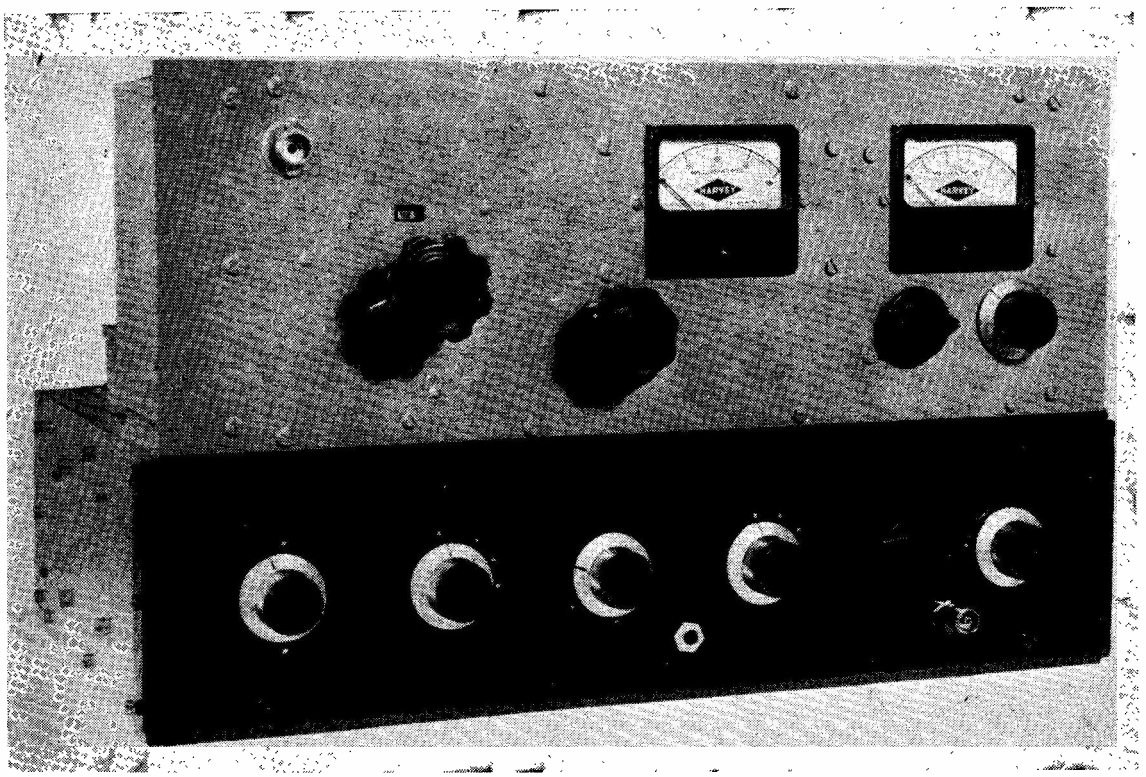
Some time was spent perusing Amateur Radio journals, but nothing really suitable turned up to take the place of the fast-tiring "Lizzie." After several weeks of head-scratching, many references to the A.R.R.L. *Handbook* and the excellent *QST* article by George Grammer on the applications of the Pi-Network circuit[1], a design eventually took shape, on paper. The search for suitable components then followed, ex - Government "surplus" providing all the major items.

PA Design Requirements

The new transmitter had to be capable of running at the full licensed power with the maximum efficiency, so the first step was to eliminate the 7 and 3·5 mc bands and to abandon 807's as PA valves. An "all-band" transmitter had to mean compromises somewhere, especially on Ten.

Previous experience had taught the worth of the 813 which just idles along at 150 watts, and the PA was designed around this valve. Pi-network tank circuitry was a "must," but the odd effects of anode choke resonances within the amateur bands had to be overcome. This was easily achieved by series feed to the PA. An ex-Government rotary tank coil (of the type made by the American firm of Johnson) was found at the local junk shop and was purchased for a few shillings. The use of a "mangle," as they are locally known, cut out a band-switch and its associated leads, which can be very lossy at the higher frequencies. A small separate coil was included to provide most of the inductance required on 28 mc. An important point to remember here is that this small coil must be on the anode side of the main inductance, so that the larger self-capacity of the latter is on the output side of the circuit. It is difficult enough keeping stray capacities down on 28 mc without needlessly adding to them, for the 813 itself has an anode-to-filament capacity of 14 $\mu\mu$F.

With series HT feed there is DC at the output end of the PA coil so a blocking condenser, C24, must be provided. Its use means that the loading condenser C25 does not have



General view of the All-Pi Transmitter described in the article; it covers the 14, 21 and 28 mc bands with an 813 in the PA. The controls are, left to right, top row: Rotary PA coil; PA tank condenser C20; PA grid band-change switch Sw3; PA grid tuning condenser C15. Bottom row: Output loading condenser C25; function switch Sw2; drive control R4; meter switch Sw4; driver grid coil switch Sw1; tuning condenser C8. The RF input socket for the VFO connection is at bottom right of the front panel. The transmitter runs easily at 150 watts, CW or phone.

to withstand any DC voltage and so need not have widely spaced vanes. It is important that C24 be of a high voltage rating, for should it break down the full HT voltage appears on the output co-ax socket. As an added protection, a small 2·5mH RF choke could be added in parallel with the loading condenser. Then, should C24 break down, the DC path through the choke would blow the HT power pack fuse.

Most harmonic troubles originate *before* the PA stage, and if they can be eliminated at its grid the TVI battle is almost won.

By using Pi-section coupling between the driver and the PA it is possible to have a 68 $\mu\mu$F mica condenser, C16, strapped between the 813 grid and earth. This is a most effective by-pass for harmonics.

The Driver Stages

The VFO in use at this station is an old timer built in 1947 around the TU5-B Unit. It had given sterling service and shows no sign of wear and tear, so the decision was taken to retain its services a little longer. By having the VFO outside the transmitter the heat problem and consequent drift can be almost forgotten. The station layout is also more versatile. With the VFO unit on top of the receiver a rapid QSY can be achieved with the minimum fuss and movement. The 2 to 3 watts output from the VFO is on 3·5 mc and is at high impedance through a short length of co-ax.

The first stage of the transmitter is a frequency multiplier using a 5763 valve. The 5763 is an excellent multiplier and is vastly superior to the conventional 6V6 or 6AQ5 types. This stage doubles to 7 mc, triples to 10·5 mc, and quadruples to 14 mc. To hardened users of the 6V6 it may come as a surprise that even as a *quadrupler* the 5763 can give up to 3 mA grid drive to the following stage! A potentiometer R4 in its screen supply provides adequate control overdrive.

The input circuit of the 5763 follows con-

ventional lines and provision is made for keying in its cathode return lead, J1 in the circuit. Its anode side, however, makes use of the Pi-network circuit and has a tapped coil, L1, to provide output on the three necessary frequencies.

Although Pi-coupled RF stages are not a new idea, few people seem to have had experience with them. Apart from the more obvious advantages of harmonic suppression they create the conditions for efficient matching between the anode and grid of the respective stages. The coupling circuit is usually designed to provide some small step-down in impedance from anode to grid. In effect, this is comparable to the more usual practice of tapping down a parallel tuned anode circuit, so reducing the loading on the driver. If the step-down is too great there will be insufficient drive voltage on the grid of the second stage. Ideally, the fixed output capacity of the Pi-coupling stage, C9 in the circuit, should be changed for each band, but to reduce switching on band change a single mean value condenser can be used. This results in some reduction in drive to the 813 on 28 mc, but even so about 8 mA grid current can be obtained on ten metres.

Full details of the principles and practice of Pi-section interstage coupling can be found in the A.R.R.L. *Handbook*[2].

The choice of valve for the driver stage was quite a knotty problem. An 807 would have served here, but its physical size proved to be far too much for the layout envisaged. A second 5763, a TT11 or similar small valve would not provide adequate drive to the 813 under all conditions, and we all know what it is like to be "drive starved" when phone working is contemplated. The final choice was the 6146. or Mullard QVO6/20 which is its direct equivalent. Small physically (only 3 inches tall) it is nevertheless capable of inputs up to 90 watts. Of course, as a doubler driving an 813 such an input power would be absurd, and by running it at from 15 to 20 watts it gives all the drive necessary and is under-run and does not get very hot.

Once again the use of Pi-coupling permits one to have a substantial fixed capacity between the 6146 grid and earth, thus helping to attenuate VHF harmonics. In the doubler anode circuit is its tapped Pi-network coil, outputs being on 14, 21 and 28 mc.

It may be noted that both stages of the exciter are always worked as frequency multipliers. This lessens the likelihood of regeneration and parasitic oscillation, and does away with any need for neutralisation. In the case of the PA, careful layout and the high capacity from grid to earth renders neutralisation also unnecessary.

Other Circuit Considerations

A dual bias pack has been incorporated in the transmitter. By using a small receiver-type mains transformer, T1, and two half-wave selenium rectifiers (MR1, MR2) – 90 volts for V2 and – 80 volts for V3 can be obtained. The 6146 and the 813 each have adequate protective bias with this system, which is also available completely to cut off these valves in the "tune" positions of the function switch. (In these positions negative bias voltage is also

Table of Values

Fig. 1. Circuit of the All-Pi Transmitter

C1 = 200 $\mu\mu$F mica
C2, C3, C6, C10, C11, C13, C17, C23, C26 = .001 μF disc ceramic
C4, C7, C14, C18, C19, C27, C31, C32 = .005 μF disc ceramic
C5, C12, C21 = .002 μF mica. 1000v.
C8 = 140 $\mu\mu$F variable
C9 = 125 $\mu\mu$F mica
C15 = 50 $\mu\mu$F variable (*low power transmitting type*)
C16 = 68 $\mu\mu$F mica
C20 = 77 $\mu\mu$F variable. (*Ex-TU6 or TU9B units*)
C22, C35, C37 = .002 μF mica. 2250v.
C24 = 0.1 μF mica, 1500v.
C25 = 350 $\mu\mu$F variable
C28, C33, C34, C36 = Mica feed through condensers (*see text*)
C29, C30 = 16 μF electrolytic, 350v. working
C38 = 100 $\mu\mu$F mica, 2500v.
R1 = 100,000 ohms, ½w.
R2 = 220 ohms, ½w.
R3 = 3,300 ohms, 2w.
R4 = 20,000 ohms pot'meter, wire-wound, 4w.
R5 = Meter shunt (*see text*)
R6 = 10,000 ohms, wire-wound, 10w.
R7 = 22,000 ohms, 2w.
R8 = 500 ohms, 2w.
R9 = 15,000 ohms, wire-wound, 5w.
R10 = 1,000 ohms, wire-wound, 5w.
R11 = 4,700 ohms, wire-wound, 5w.
R12 = 500 ohms, wire-wound, 5w.
R13 = Meter shunt, (*see text*)
R14 = 1,700 ohms, wire-wound, 20w.
R15, R16 = 5,000 ohms, wire-wound, 10w.
R17, R18 = 2,500 ohms, wire-wound, 10w.
R19 = 1,200 ohms, 2w.
R20 = Meter shunt, (*see text*)
R21, R22 = 20 ohms, wire-wound, 5w.
J1 = Keying jack
SW1, SW3 = Band selectors. Single wafer ceramic, single-pole three-position
SW2 = Funtion switch. Double-wafer paxolin, each, single-pole four-position
SW4 = Meter switch. Double-wafer ceramic, each single-pole three-position
RFC1, RFC2, RFC3, RFC4 = 2.5 mH. RF chokes
RFC5 = 813 anode feed choke (*see text*)
RFC6, RFC7, RFC8 = VHF chokes, (*see text*)
RFC9, RFC10 = VHF chokes, (*see text*)
LFC1 = LF choke, 50 mA. 10H
T1 = Bias transformer. 250 - 0 - 250v, 60mA. (*other windings not used*)
T2 = 813 filament transformer. 10v. 5A.
M1 = 0-10 mA, m/c meter
M2 = 0-400 mA, m/c meter
B = Blower motor. (*see text*)
CS1, CS2 = Input and output co-ax sockets
MR1, MR2 = Selenium ½-wave, rectifiers. 250v. 50mA. Brimar RM1
V1 = 5763 Brimar
V2 = 6146, or Mullard QVO6/20
V3 = 813 Brimar

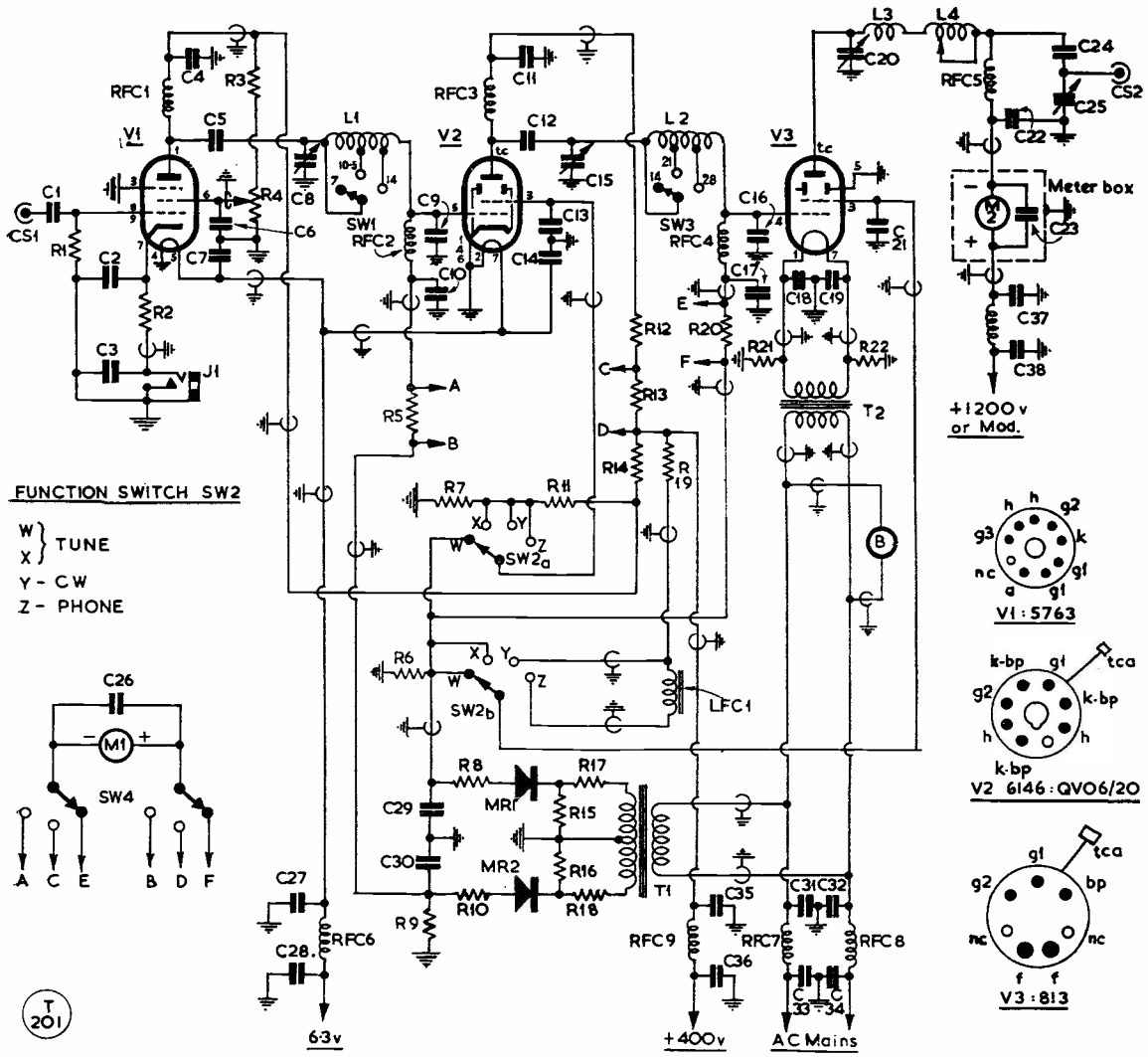


Fig. 1. Circuit complete of the All-Pi HF Band Transmitter designed by G3BDQ, of which full details are given in his article. The feature of this circuit is that pi-coupling is used throughout, with the advantages discussed in the text. The 813 tank circuit is fitted with a rotary coil, L4, with a secondary winding L3 used exclusively on ten metres. Since the transmitter is totally enclosed to ensure full TVI-proofing, a small blower motor — shown at B across the mains supply lead — is used for cooling. The fabrication of this blower is quite simple and is explained in the text. Internal bias supplies are provided, and the function switch Sw2 is so arranged that both the PA and the driver stage can be cut when setting up.

applied to the valve screens.)

Having had considerable experience with clamp type protective systems and finding them always far from satisfactory, the writer was obliged to use a grid bias pack. With clamper operation the anode dissipation of the PA remains quite heavy during stand-by periods, and this gives rise to excessive transmitter heating and reduces valve life. In the "Elizabethan" transmitter it was found necessary to use a small bias supply in addition to the clamper to overcome the harmful and wasteful consequences of 45 watts anode dissipation. The 6146 valve is easily damaged when its anode and screen dissipation figures are high. It is less rugged than the 807 in this respect.

The 813 screen supply is derived from the 400-volt HT line through R19 and/or LFC1. When the function switch is in the "phone" position a 10H 50 mA LF choke, LFC1, is introduced into the PA screen circuit. This enables one to achieve plate-and-screen control merely by modulating the 1200-volt supply to the anode.

[over

Two meters are used, one being a 0-400 mA instrument (actually a 0-200 mA meter shunted) for reading the 813 anode current, and the other a 0-10 mA movement which is shunted to read the grid currents of the 6146 and the 813 and the anode of the driver. The shunt resistance, R5, can be any small resistor with 15 to 20 times the internal resistance of the meter. Thus, a DC path is provided for the grid current of V2 when the meter is out of circuit, and such a value will scarcely affect the full scale reading of the instrument when it is in circuit. A shunt giving a multiplication factor of 2 is used in the grid circuit of V3, and a multiplier of 10 is brought in when reading the 6146 anode current. The shunts were home-made by "cut-and-try" methods and were wound on ½ watt high value resistors.

It will be seen from Fig. 1 that the 813 filament transformer, T2, does not have a centre-tapped secondary. The transformer was on hand, and to save expense R21 and R22 were used to give earth balance to the valve filament. Of course, a transformer with the more usual centre tap could be used and the two resistors omitted.

Cooling

As the transmitter is completely enclosed some form of forced cooling is necessary. Considerable thought and much searching failed to produce a suitable small motor until at last an old and obsolete record player was dug out. The shaded pole AC motor was removed and a 2-in. diameter four-bladed fan (fabricated from the lid of an Oxo tin) was fitted. Completely silent operation was ensured by mounting the motor on rubber grommets. The air intake is through a 2-in. circular hole covered on the inside with copper mesh. As usual, when using copper mesh for screening, the outer ¼-in. of the mesh was tinned with a hot iron to ensure good conductivity at VHF. This hole in the side of the chassis is the only air inlet.

Air is blown through to the upper screen box *via* the 813 drop-through hole and a series of holes below the 6146 base, and its exit is through copper mesh immediately above these two valves. No other holes must be left in the chassis or screening box or the fan will fail to maintain correct circulation.

COIL DATA

L1 = 29 turns, 22 SWG enam., close wound on 1⅛in. ceramic former. Taps, from C8 end of coil = 10.5 mc, 10 turns; 14 mc, 17 turns.

L2 = 12½ turns wound on 1⅛in. ceramic former (8 turns, 22 SWG enam., spaced over ¾in., and 4½ turns 18 SWG enam., close wound). Taps, from C15 end of coil = 21 mc, 5 turns; 28 mc, 8 turns. (The 4½ turns of 18 SWG are at the C16 end of the coil).

L3 = 4 turns of ¼in. flat copper strip spaced over 1½in., 1in. diameter, self supporting.

L4 = 5 μH rotary variable inductor (made by Johnson, but Govt. surplus—*See text*).

Metalwork and Chassis Construction

The main chassis measures 16½in. x 10½in. x 4½in. and was built up from ⅛-in. aluminium Such a heavy gauge is not essential, but it was used because a number of 16½in. x 10½in. sheets were available locally at the right price.

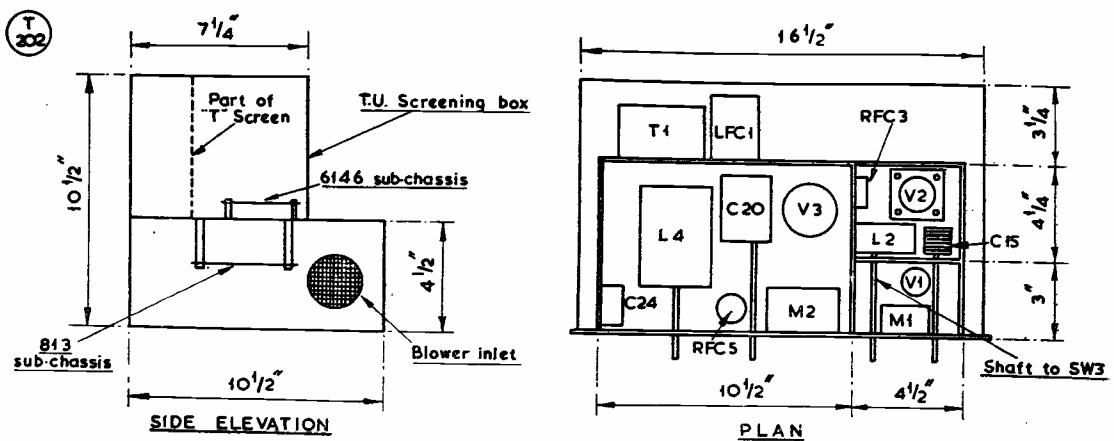
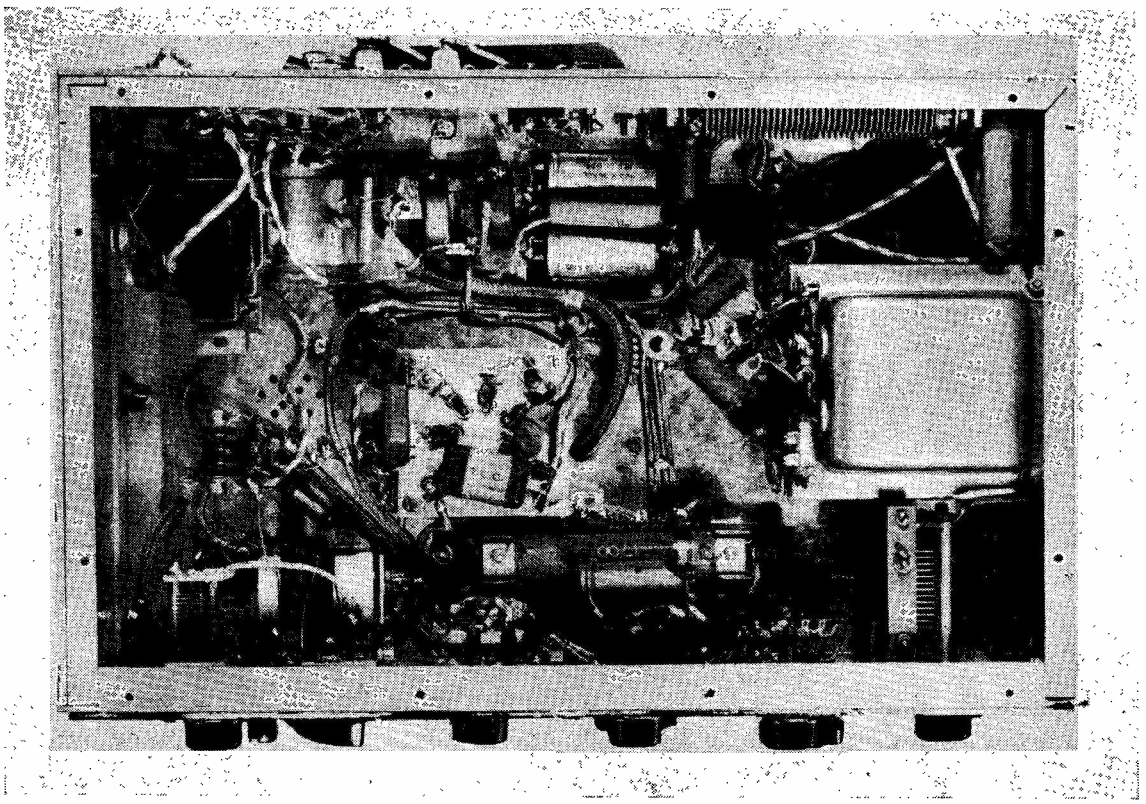


Fig. 2. Simplified drawings showing general arrangement of the chassis and screening compartments, with dimensions, and the placing of main parts. The upper screening box is from a TU unit and the chassis is made from heavy-gauge aluminium. The V1 compartment also serves as a screening box for meter M1.



The main base-plate is removed to show the under chassis construction of the HF band-switching transmitter described by G3BDQ. The bias rectifiers MR1, MR2, are mounted on the rear wall of the chassis. Ventilation holes for the 6146, V2, can be seen left centre, and C16 is mounted to the left of the 813 sub-chassis. The shunts for meter M1 are placed across switch Sw4. Screened wire is used for all connections cold to RF.

and it gives real "battleship" solidity to the finished transmitter. The heavy 813 filament transformer was mounted on one side below the chassis. This cannot be done if the metal is lighter than 16 SWG. All the corners were sealed to RF with lengths of aluminium angle strip. A main base plate is essential, and its fixing holes can be seen in the underside view of the transmitter.

After much cajoling a neighbouring amateur was induced to part with a TU Unit screening box, and this was bolted to the top of the chassis. Inside the screening box a T-shaped screen was introduced which provided three "above deck" compartments. The small front compartment houses the 5763 valve and also behaves as an effective meter box for M1. M2, with C23 across it, was provided with a surplus mu-metal screening box, earthed, but aluminium would serve here so long as the box is well-made and "RF leakproof."

T1 and LFC1 were mounted on the chassis behind the TU box, and a terminal block fitted on the rear of the chassis.

The front panel was another sheet of $\frac{1}{8}$-in. aluminium, which at first induced a headache when the cutting out of the two square meter holes was contemplated. This was got over by using piercing saws in a fretsaw frame. These saws are quite cheap and very effective even on heavy gauge metal. (Most model supply and engineering shops keep them in stock.) The only power tool available was a small electric hand-drill, which although not essential, certainly took a lot of the hard labour out of the constructional work.

When using a rotary inductance some form of turn counting mechanism is necessary. For some time work was held up by the lack of this item, until at last another Good Samaritan helped out with the counter from the ex-A.M. Transmitter Type T.1083. The paxolin front panel of this counter was removed and the transmitter front panel took its place. As high voltage is present on the spindle of the rotary coil, an insulated flexible coupler is needed

between it and the counter spindle. Once again the TU unit proved its value in providing useful spares !

Home-made RF Chokes

Some mention has already been made of RFC5, the 813 anode choke. This item was bench-constructed by putting three-quarters of the wire from a TU5-B Unit choke on to a 1-in. diameter ceramic pillar. Because series feed to the PA is used RFC5 is in no way critical regarding its size or inductance. The RF anode choke from the T1154 would serve admirably in this position.

RFC7, 8, 9 and 10 are VHF stoppers in the AC mains and DC supply circuits. They were made by close-winding 14 inches of 22 SWG enamelled wire on short lengths of $\frac{1}{4}$-in. Tufnol rod. RFC6 is in the 6·3 volt heater supply line and was similarly constructed, but using 16 SWG enamelled wire to carry the current.

It should be noted that no so-called " parasitic stoppers " were used in the valve anode circuits. Such stoppers, if not carefully designed and checked with a grid-dip oscillator, can actually give rise to TVI troubles. The use of heavy copper braid, from old co-ax cable, in the anode lead of the PA results in very low lead inductance and provides an easy path to ground *via* C20 for the VHF harmonics. The anode lead for the 6146 valve was made from the braid of ordinary screened cable.

Constructional Notes

V1 was mounted on the chassis, and its associated tuning components C8, L1 and Sw1 are just below the valve socket. Consistent with modern practice V2 was raised above the chassis proper on a small aluminium submounting. This was done to ensure the efficient by-passing of harmonic currents from anode to cathode of V2. VHF currents pass on the surface of a conductor, and when the more usual constructional technique is employed they often have to flow over the entire chassis surface to reach the cathode pins below. The 6146 has three cathode connections, each of which must be earthed to the sub-chassis with short lengths of copper strip. Such copper strips, made from flashing copper, were used extensively in the RF circuits of the transmitter where short non-inductive paths were needed.

Owing to the physical size of the 813 it was not possible to fit it above the main chassis. It was dropped through and mounted so that its circular internal shield was level with the chassis. C22 was earthed down to one of the bolts running through to the 813 sub-chassis below.

The loading condenser C25 was housed beneath the chassis between T2 and the front panel. A strip of copper was taken from its rotor connection to the chassis, the earthing contact through its spindle *not* being relied upon.

As indicated in Fig. 1, screened wire was used for all leads " cold " to RF. Altogether almost 12 yards of screened wire was used. It is essential that this should be rubber covered beneath the screening, or disaster is certain when attempts are made to solder to the braid. Every screened lead is earthed at each end and also at several points along its length. For the 1200-volt leads screened ignition cable would be ideal. Alas, in the writer's locality it seemed unobtainable, so a substitute had to be devised. Heavy 52 ohm co-ax was used despite its thermo-plastic disadvantages. The outer plastic covering was first ripped off, then the braid was carefully removed. All soldering was done to this braid before the re-insertion of the conductor and its polystyrene covering. Heavy co-ax seems to have a will of its own, and it must be firmly anchored to the chassis with copper straps.

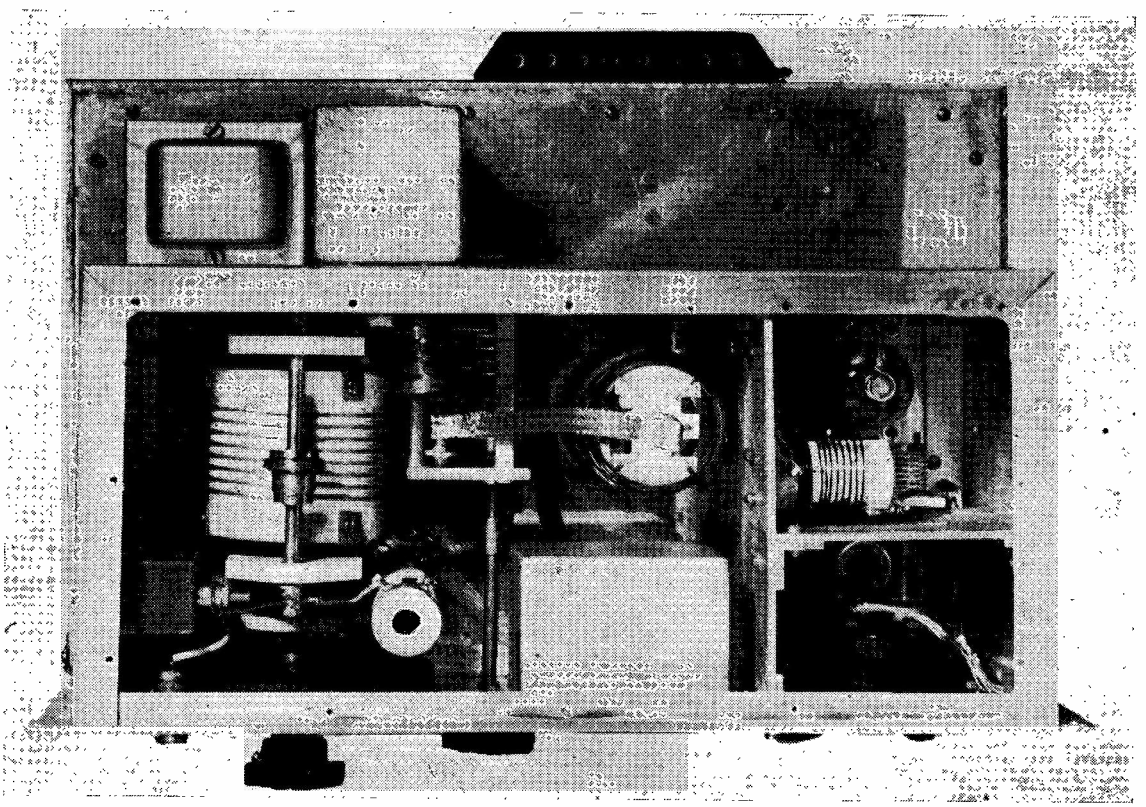
Care must be taken to mount C29 and C30 on an insulated base strip, for their cases are at potentials negative with respect to earth. R14, R7, R11, R19 and R12 were mounted together on a paxolin sheet below the chassis, near Sw2 and Sw4.

Almost the last line of defence in the TVI struggle is the filtering of the power leads into the transmitter. Home - cooked feed-through condensers (C28, C33, C34, C36) were made and fitted. They consist of aluminium plates each measuring 1in. x 2in. with thin mica sheets insulating them from the rear wall of the chassis. In the case of the 1200-volt inlet a high voltage rating mica condenser of the CM45 casing type (C38) was used. This was mounted so that its lead lengths were almost zero.

Aluminium paint was used to " beautify " the transformers, LFC1 and the meter box. It was also applied to the knob skirts. A Valspar lacquer finish embellishes the front panel, the colours being grey and black. The clean dividing line between the two colours was obtained with the help of temporary strips of Sellotape.

Power Supplies

The external power requirements are 400



Top view of the All-Pi Transmitter with the upper shielding plate removed. The metal braid anode leads on V2 and V3 can be seen. Beneath the spindle of the tank condenser C20 is the by-pass condenser C22. Sw3 is mounted below L2 in the V2 compartment — see circuit diagram Fig. 1 for references.

volts at 200 mA, 6·3 volts for the heaters of V1 and V2, and 1200 volts at 150 mA. The 813, of course, will work very well at lower HT voltages, and during the testing through of the transmitter it was operated at 750 volts with an input power of 75 to 80 watts. The 6·3 volt winding on T1 was not heavy enough to supply V1 and V2 so an external supply had to be brought in. If a suitable heater transformer had been on hand it would have been built into the transmitter.

When arranging the switching sequence it must be remembered that the mains supply to the transmitter must come on first. This ensures that the blower motor and the bias supplies are operating before any HT is applied.

Testing and Operation

Before any power is applied to the transmitter the usual routine checks with a meter must be made. If all is well the AC mains should be connected and the correct functioning of the blower and the bias pack tested.

Set the function switch to the first "tune" position "W," and the meter switch to read V2 grid current. Connect CS1 to the VFO and switch on the 6·3 and 400 volt supplies. With Sw1 in the 7 mc position tune C8 for maximum current on M1. With the aid of the station receiver, an absorbtion wavemeter or a grid-dip oscillator, ensure that output from V1 is actually on 7 mc and not some other harmonic. The total cathode current of V1 can be read by plugging an 0-100 mA meter into the keying jack. At resonance it should not be more than 25 mA when this stage is doubling. It will be higher when the valve is tripling or quadrupling. About 2 to 3 mA of grid current is required by the 6146 and it can be set to this figure by adjusting the drive control R4.

This procedure is repeated with Sw1 in the 10·5 and 14 mc positions. When satisfactory grid current to V2 has been obtained on all three bands, switch Sw1 back to 7 mc and

tune up again to resonance.

Change the function switch to the second "tune" position "X" and switch M1 to read V2 anode current. Make sure that the 813 filament is alight, but that its HT supply is not switched on. Turn Sw3 to the 14 mc position and tune C15 for resonance by looking for the characteristic dip in V2 anode current. Its anode current should go to about 40 mA from an off-resonance value of 80 mA. By switching M1 to read V3 grid current, the maximum will be found to correspond with V2 anode resonance. A grid current of from 15 to 20 mA should be obtained on the PA. Repeat this tuning sequence with Sw3 on the 21 and 28 mc positions, remembering to re-adjust Sw1 and C8 as the bands are changed. On 21 and 28 mc V3 grid current will be lower than the figure already suggested for 14 mc. However, as 6 to 8 mA is ample drive for an input power of 150 watts, there is no need to be fussed if a much higher figure cannot be obtained. Over-driving is anyway bad and can result in the generation of unwanted harmonics.

When satisfactory grid drive to the 813 has been obtained on all bands the PA can be tuned and tested. It is best to begin with reduced HT voltage, about 700 volts being a suitable figure, and a dummy load should be connected to the output socket CS2. Before HT is applied the rotary coil must be turned to its approximate setting for the band in use. On *no account* must L4 ever be adjusted with HT applied to the PA, or irreparable damage could result to the coil and its roller contact. On 14 mc about 4½ turns of L4 are needed.

Tuning up follows the familiar Pi-network procedure, the loading condenser C25 being first set to maximum capacity. The correct setting of L4 can be ascertained by reference to the capacity of C20 at resonance. On 14 mc C20 should be at about half-mesh, on 21 mc it should be one-third mesh, and on 28 mc it should be just under one-quarter mesh. With M1 reading V3 grid current and the function switch set to the "CW" position, tuning up can take place. The loading is adjusted as necessary, and with reduced HT voltage the PA anode current can be brought up to 100 mA. With full HT voltage this can be raised to 125 mA for 150 watts input.

Results Obtained

With a home-made low-pass filter followed by aerial tuning units with Faraday links, no TVI has so far appeared on any of the three bands 14, 21 or 28 mc, and the transmitter has been in frequent use during peak viewing periods over three months. The aerials available have been a general-purpose 66ft. Zepp and an indoor 10-metre beam. With these radiators and very variable conditions, considerable DX has been worked with excellent reports. It is hoped that a Quad Beam for 21 mc will soon be in operation at G3BDQ, and the Winter DX season is anticipated with pleasure.

BIBLIOGRAPHY

1 "Practical Applications of Pi-Network Tank Circuits for TVI Reducation." QST, Jan. 1952.

2 The Radio Amateur's Handbook, 31st Edition, 1954, pp. 143-4.

THE MAGAZINE CLUB CONTEST

During the early evenings of November 17/18 and 24/25 the 160-metre band will be pulsating with CW stations calling "CQ MCC"—for our eleventh annual Top Band Club Transmitting Contest will be taking place. The object is for Club stations to work one another for 3 points during each session, 1600-1900 GMT, on those days, and non-Club stations once during the whole period of the Contest, for one point. As the results of previous years have shown, these single-point contacts are of vital importance to the leading stations—so it is hoped that, once again, as many 160-metre CW operators as possible will be on to produce these QSO's. Rules in full were given on p.441 of the October issue of SHORT WAVE MAGAZINE. Check logs from non-Club stations will be welcomed, and credited.

TV DX FOR THE BBC

It was mentioned in the News on October 25 that the BBC had just had a report that the TV programme from Crystal Palace that afternoon had been seen in New York.

In 1947-48, when we had the 50 mc (6-metre) band, it was possible to work most W call areas, the frequency actually being some 8 mc higher than that of the Crystal Palace TV transmitter. Of course, for recognisable pictures to be received, much greater field strength must be laid down than is needed for an RS-58 amateur band signal.

VISITOR LICENCES IN GERMANY

It is reported that the German authorities will grant a temporary local licence to any visiting foreign amateur who already holds a transmitting licence under his own nationality prefix. Call-signs issued to visiting amateurs will be in the distinctive DJØ series, so that those signing them will be recognisable as foreign visitors. The DL authorities are to be congratulated on their very helpful and co-operative attitude, following representations by the D.A.R.C., the German Amateur Radio organisation. It was G2DHV (who himself holds the German call DJØAA) who drew our attention to this announcement in the October issue of *Das DL-QTC*. It is to be hoped that other administrations will be persuaded to adopt the same enlightened policy towards visiting amateurs.

The BC-453 as a "Q5'er"

FOR IMPROVED RECEIVER SELECTIVITY

THE use of a BC-453 as a second IF unit off the IF output of the existing station receiver will produce a very marked improvement in selectivity—the main problem on our communication bands to-day. The BC-453 is in itself a medium-long wave receiver with an IF of 85 kc. With proper adjustment and tuning of the normal station receiver and the BC-453, considered together as one receiving unit, single-signal reception is easily possible.

It is intended in this article to discuss the BC-453 in detail and to provide the necessary information for its conversion to the "Q5'er." (This was described very briefly in *QST* for January, 1948.) The BC-453A (or B) is part of a multi-band Service installation and covers the frequency range 190-550 kc. It is a 6-valve superhet having a 12SK7 RF amplifier, 12K8 mixer and oscillator, 12SK7 1st IF amplifier, 12SK7 2nd IF amplifier, 12SR7 2nd detector and BFO, and 12A6 audio amplifier. The intermediate frequency is 85 kc and the HF oscillator coil L5 has a lower inductance than L3 and therefore tunes to a frequency equal to Fs+Fi.

So as to obtain a reasonably uniform sensitivity over the tuning range, C39 across L2 serves to tune L2 to a frequency lower than 190 kc and by so doing, increases the amplification at the low frequency end of the band covered.

The intermediate frequency consists of six tuned circuits and two valves; L6 and L7, 12SK7, L8 and L9, 12SK7 and L10 and L11. In this receiver the magnetic coupling between coils in each IF transformer is variable between an over-coupled value (bakelite rod, protruding through the top of the IF transformer, "down") or an under-coupled value (bakelite rod "up"). When the receiver is purchased it will have the rods in the following positions: 1st and 3rd IF transformers, rods down; 2nd IF transformer, rod up. During alignment all of these rods should be *up*. (This will be described later.) Care should be taken to use a screwdriver with an insulated shank when adjusting these transformers, as the rotors of trimmers C36. C37 and C38 are not earthed.

The second detector is one diode of a 12SR7; resistance coupling is used to the input of the 12A6 audio amplifier, which has a 2·2: 1 step-down output transformer in its anode. The triode portion of the 12SR7 is used as a BFO and is composed of L12 and L13, the grid and plate coils of a tuned anode oscillator; C27 and trimmer C28 are tuning capacities; C33 is connected between the anode of the 12SR7 and the grid of the 2nd IF amplifier. The junction of R15 and R17 goes to a contact on a switch in the control unit (not shown on the circuit diagram, but called Adaptor FT-260-A and it replaces Adaptor FT-230-A which will be found in the front of the receiver). The other side of the switch is connected to ground. This control works in reverse to normal; when the switch is *closed* the BFO is off, the junction between R15 and R17 having been grounded and the HT removed from the 12SR7 anode; therefore, for CW reception, the switch is opened. The 2nd diode of the 12SR7 is earthed.

The gain control is a 50,000-ohm variable resistor; again, this is not shown on the circuit diagram as it is located in unit FT-260-A. The cathode circuits of the RF and 1st IF amplifiers are completed to ground through this resistor; as it is increased in value the cathode/ground voltage increases and therefore the gain is reduced.

V1 and V2 are small neon lamps protecting the receiver when exceptionally strong signals are received; they strike at about 80 volts and any increase in voltage increases the current.

The difference between the BC-453 (A) and (B) type receivers is a very minor one. In model B, the secondary winding of T1 has a tap for use if low impedance headphones are employed; normally, the set will be found with two wires on terminal 3 of T1, for 8000 ohm impedance headphones. To convert to 600 ohms, remove these two wires and connect them to terminal 6.

The full circuit diagram is shown in the drawing.

Conversion to Q5'er

When received, this set will be wired for 25 volts, *i.e.*, the six twelve-volt valves are wired in series/parallel. As it is much easier to find 12 volts than 25 volts, the heaters were all wired in parallel. There are a few components and some wiring which are not required; but a potentiometer, switch and jack for volume control, BFO On/Off and headphones, not incorporated in the set, are necessary additions.

Turn the receiver upside down and remove

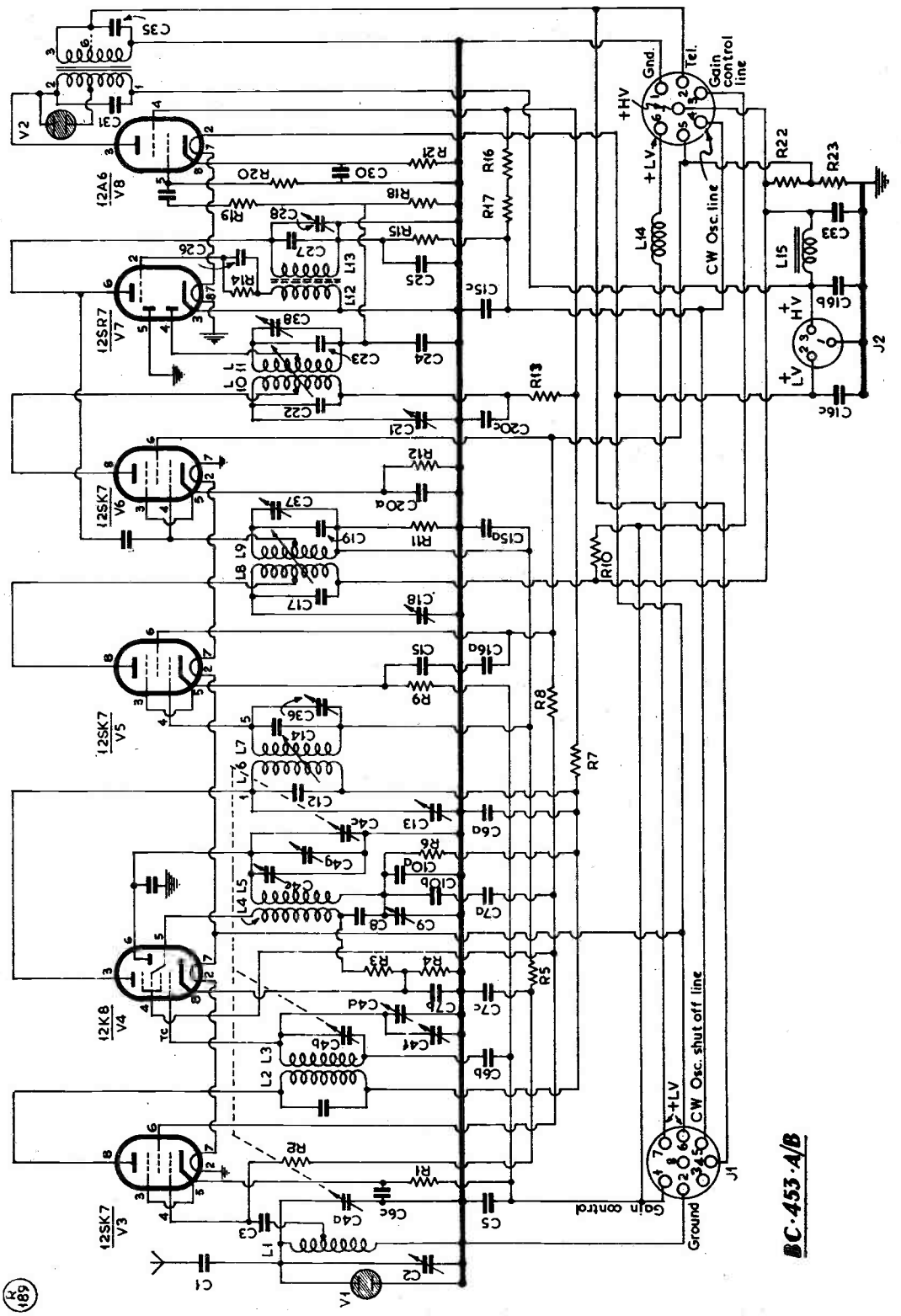

BC-453-A/B
12A6 V8
12SR7 V7
12SK7 V6
12SK7 V5
12K8 V4
12SK7 V3
V2
V1
+HV
+LV
Gnd.
Tel.
Gain control line
CW Osc. line
CW Osc. shut off line
Ground
J1
J2
L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R20 R21 R22 R23
C1 C2 C3 C4a C4b C4c C4d C4e C5 C6a C6b C6c C7a C7b C7c C8 C9 C10a C10b C12 C13 C14 C15a C15b C15c C16a C16b C16c C17 C18 C19 C20a C20b C21 C22 C23 C24 C25 C26 C27 C28 C30 C31 C33 C35 C36 C37 C38 C41 C42 C44 C49

Fig. 1. Circuit diagram of the BC-453, equally applicable to the "A" and "B" versions of the receiver. The article discusses the necessary modifications for converting it to the "Q5'er" application, by which considerably improved receiver selectivity can be obtained.

the baseplate by means of 14 bolts round the sides. Now, with the set placed so that the front is towards the left, the following operations are carried out. (The drawings will assist in the location of the components mentioned.)

(1) Remove choke L14 by undoing two screws at sides, replace screws to hold two soldering tags in place, remove white leads from choke; one goes to pin 6 on J3 at the rear of the chassis, the other to pin 7 on J1 at the front end.

(2) *Conversion of filament wiring to 12 volts.* Now that L14 has been removed, the 3-pin power plug to the dynamotor is visible; in the writer's case this was left in as a 12-volt dynamotor was available. Black lead on pin 1 is negative, white lead from pin 2 is positive filament, going to pin 2 of V8 *via* condenser C16C. Remove white lead from pin 7 of V8 and earth this pin, replace white lead on pin 2 of V8, thereby joining positive filament to pin 7 on V7, earth pin 2 of V7. On V5 remove white lead from pin 2 and join to pin 7, earth pin 2. Remove white lead from pin 7 which goes to pin 6 on J1. On V4 remove bare wire from pin 2, cover with sleeving and join to pin 7, earth pin 2.

(3) J1 complete with can is now removed to make room for BFO switch, volume control and headphone jack, which will all need to be small components to fit in. The leads to be located are: Black lead from pin 4; red lead from pin 5; green lead from pin 1; and an earth in place of pin 2. The leads from pin 6 and 7 have already been removed.

(4) The construction of the panel for the extra controls should be such that it fits on the front of the receiver, under the main dial. It can utilise the small front panel of FT-230 A. The circuit of Fig. 3 (A) is drawn round J1 for clarity.

Now replace the baseplate and turn set up correct way.

(5) Normally, the dial is driven by means of a cable from the remote control unit, or by a local control unit MC-237-A, either of which may be found on the surplus market. If not, an adaptor can be made by getting a piece of $\frac{1}{4}$-in. copper tube, cutting four slots 90 deg. apart in one end and forcing this over the toothed drive visible in the hole to the right of the dial. A small $\frac{1}{4}$-in. spindle knob is put on the other end. This modification is only necessary if the set is required as a separate receiver.

Table of Values

Fig. 1. Essential Details of the BC-453

C1	=	11 $\mu\mu$F mica
C2	=	15 $\mu\mu$F variable
C3	=	100 $\mu\mu$F ceramic
C4 (A-G)	=	4-gang 346 $\mu\mu$F
C5	=	3 μF elect ; 300v.
C6, C7, C15 (A, B, C)	=	3 x .05 μF, paper 300v.
C8, C24, C26	=	200 $\mu\mu$F ceramic
C9	=	40 $\mu\mu$F variable
C10 (A, B)	=	690 $\mu\mu$F total, mica
C11, C33	=	3 $\mu\mu$F ceramic
C16	=	3 x .22 μF, 300v. paper
C20 (A, B, C)	=	.05 + .01 + .05 μF, 300v. paper
C27	=	345 $\mu\mu$F mica, 400v.
C29	=	.006 μF mica, 400v.
C30	=	15μF elect ; 35v.
C31	=	.001 μF, mica, 400v.
C32	=	5 μF elect ; 300v.
C35	=	720 $\mu\mu$F mica, 400v.
C39	=	120 $\mu\mu$F ceramic
C12, C13, C14, C36	=	Part of 1st IF
C17, C18, C19, C37	=	Part of 2nd IF
C21, C22, C23, C38	=	Part of 3rd IF
C25, C27, C28	=	Part of BFO assembly
L1	=	Input
L2, L3	=	Mixer
L4, L5	=	RF Osc.
L6, L7	=	1st IF 85 kc
L8, L9	=	2nd IF 85 kc
L10, L11	=	3rd IF 85 kc
L12, L13	=	BFO 85 kc
R1, R4, R9	=	620 ohms $\frac{1}{2}$-watt
R2, R20	=	2 megohm $\frac{1}{2}$-watt
R3, R14	=	51,000 ohms $\frac{1}{2}$-watt
R5	=	150,000 ohms $\frac{1}{2}$-watt
R6, R18	=	510,000 ohms $\frac{1}{2}$-watt
R7, R8, R13	=	200 ohms $\frac{1}{2}$-watt
R10	=	360,000 ohms $\frac{1}{2}$-watt
R11, R19	=	100,000 ohms $\frac{1}{2}$-watt
R12	=	510 ohms $\frac{1}{2}$-watt
R15	=	20,000 ohms $\frac{1}{2}$-watt
R16, R17	=	150,000 ohms $\frac{1}{2}$-watt
R21	=	1,500 ohms $\frac{1}{2}$-watt
R22, R23	=	7,000 ohms 7-watt

(6) Remove cover to give access to valves and IF transformers. Now, as has been stated before, the IF transformers have provision for two settings of coupling, the idea being that normally the set is aligned with loose coupling and then the coupling is increased to give a broader band. Unscrew the caps from the top of each IF can and beneath will be found the bakelite rod mentioned earlier. Carefully pull these out about a $\frac{1}{4}$-in., their maximum travel. The centre transformer is already set in this way and does not have to be touched.

Receiver Coupling

Coupling the BC-453 to the normal station receiver depends on whether it has double- or single-ended valves. If they are double-ended,

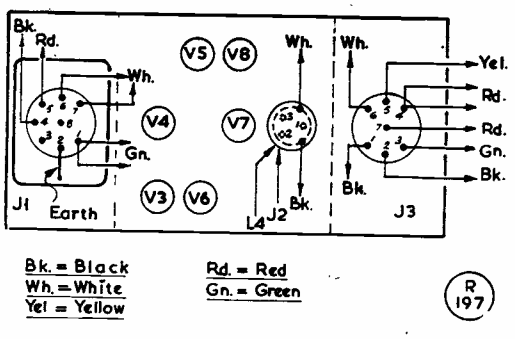


Fig. 2. Guide sketch to the general component layout, under chassis. This will enable the various items involved in the modification to be located.

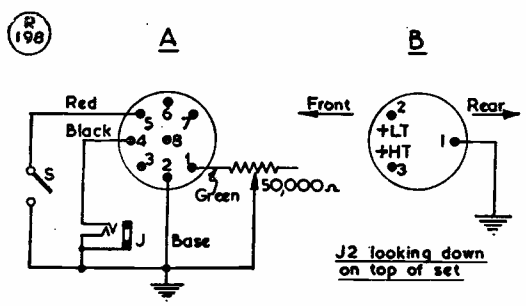


Fig. 3. (A) Circuit diagram of the gain and BFO control wiring, as described in the text. (B) Re-arrangement of connections for the entry J2 in the circuit of Fig. 1.

twist an insulated wire round the grid lead to the last IF valve (HRO and similar types). If it has single-ended valves the same is done to the detector diode plate pin. This lead should then be screened (to stop break-through by direct pick up) and taken to the aerial terminal on the BC-453. Use very loose coupling, otherwise the BC-453 will overload.

Now connect, through J2, a power supply delivering 12 volts AC at 0·9a, and 200-250 volts DC at 40 mA ; connections are shown in Fig 3(B).

There is a choice, on CW reception, of using either the BFO in the station receiver or that in the BC-453. It has been found that for optimum selectivity it is best to use the one in the normal receiver. At the same time, the AVC can be left on if the BFO in the BC-453 is used, and the S-meter also becomes operative.

Actually, to get the best from the AVC, the line voltage should be taken from the 12SR7 in the BC-453, but even without this modification the gain is exceptional. To obtain AVC control is simple, as there is a spare diode on the 12SR7.

Operation of the Unit

Tune a signal in on the station receiver using the S-meter, then carefully tune the BC-453 to the IF of the receiver (crystal in " sharp " position) ; it will be found that with an S9 signal real single-signal reception is possible, there being *no signal* on the other side of zero after setting the " rejection notch " of the crystal to take out the remains of the signal.

It is possible to obtain a form of *selectable* single-sideband reception with the combination receiver. By detuning a telephony signal one kc from the centre position *towards* the *unwanted* signal, the wanted signal is attenuated by 5dB, but the unwanted signal is attenuated by 30dB.

One further minor modification is to replace J3 with an octal socket and feed the power in there. Changes in wiring are as follows: Same pin numbering used as on J3. Take lead from pin 3 of J2 and join to pin 6 of (octal) J3—this is positive HT. Remove red lead from pin 7 which goes to one end of L15 ; remove red lead from pin 5 to joint at top terminals of R22, R23 ; remove both red leads from pin 4—then the one which goes to C15C is cut out ; the one going to the front panel BFO switch is joined to C15C in place of the one taken off.

BOOK REVIEW

TRANSISTORS FOR THE EXPERIMENTER

Mullard Ltd. are offering a very well produced booklet on transistors for the experimenter. It covers the whole subject in such a way as to put the uninitiated in the picture. From basic circuits and small signal AF stages, the booklet goes on to cover stabilisation, output stages, various oscillators, diodes and photo-transistors. Characteristics are dealt with in some detail, and all relevant equations are given a place. An appendix on " Understanding Semiconductors " summarises existing theory. Practical details on soldering and base connections precede the last section " Circuit Diagrams and Notes."

It is to this last section that the experimenter will turn first. Preamplifiers, 200 mW amplifiers, voltmeters and a signal tracer are among the 17 practical circuits. The only RF applications of transistors mentioned are to receivers for the Light Programme (200 kc). Junction transistors available at present are not suitable for use at much higher frequencies. HF junction types are said to be on the way, and so point-contact transistors are not included.

While the booklet is to replace the earlier *Junction Transistors for the Home Constructor*, it is on an entirely new plane. All the original circuitry has been revised and the booklet now numbers 30 large pages. Taken with the 17 tested circuits, we have an abbreviated text book giving circuit design from first principles. Included between the covers is all that most professional electronics engineers need to know, and so this publication should appeal to a much wider field than its predecessor.

Transistors for the Experimenter, pp.30, prepared by The Technical Service Department, Mullard Ltd., Century House, Shaftesbury Avenue, London, W.C.2, from whom copies are obtainable on request.

J.M.O.

Triple-Leg Ground Plane

NOTES ON A THREE-BAND SYSTEM

T. VOGEL (HB9OP)

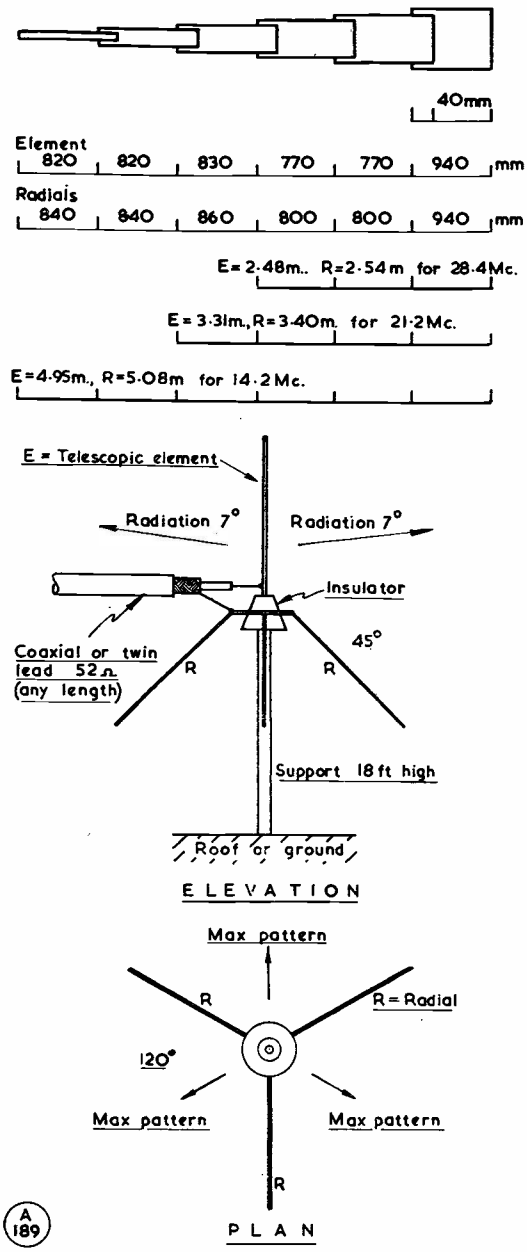
While the arrangement described here is based upon the ground-plane, the author's variation lies in the fact that his version can be operated multi-band by the use of telescopic elements, and he also shows that a noticeable directional effect is obtainable by changing the plan layout of the radials. The ground-plane is, of course, a well-proven system for DX working and the data given here will enable a one-band array to be constructed, if telescopic elements are impracticable.—Editor.

THE system described here has been evolved from tests and experiments with vertically polarised aerials in general. In order to get the desirable low angle of radiation, it has been found that the radials should be drooped at 45°. The input impedance of the system as a whole then becomes 50 ohms approximately, so that it can be fed, without any mismatch, with 50-52 ohm twin lead or coaxial cable. The length of feed line is not critical, but it is desirable that it be kept as short as possible, without any violent kinks along the feeder run.

Electrically, the radials are 3% longer than the vertical "driven element," which is made an exact quarter-wave at mid-band. For a telescopic multi-band system such as is used by the writer, the tubes are of light aluminium. Since good electrical conductivity in the "telescope" is essential, steps must be taken to guard against corrosion, either by regular cleaning or treating of the metal. The centre insulator and its mounting must be strong enough, and the vertical element sufficiently well braced, to withstand high winds.

Radials, the main element and the supporting boom are all *separately insulated*. If coax feeder is used, the centre conductor goes to the vertical member, and the outer to the ring or central connector holding the radials. The guy wires, to support the system as a whole, are fitted a little below the main insulator, and play no part in the electrical performance of the array.

It would, of course, be an easy matter to apply these principles to a one-band system, with non-telescopic elements cut for the desired band. The sketches give all the necessary information for either a single-band or multi-



General arrangement of the ground plane transmitting aerial system described by HB9OP. Dimensions are given in metres and millimetres (one metre = 39.4 inches) and from the data, either a multi-band or a single-band ground plane can be designed. As explained in the text, it is essential to make the radial angle with the horizontal 45°. With a 120° plan angle between them, some control over directivity is possible, as shown by the "max. pattern" indication — and see text.

band system. (One metre = 39·4 inches.)

SWR Factors

When telescoped to operate on 14·2 mc, the SWR is 1 : 1·8. If the elements are *not* adjusted for the change in frequency, the SWR becomes 1 : 4 on 21 mc, and 1 : 3 on 28 mc, *i.e.*, with the elements set for 14·2 mc. Thus, by accepting some loss in efficiency for a quick change from band to band, the system can be used multi-band without adjusting the element lengths.

However, to make the most of it on all bands, the radials and the vertical element must be of the correct length for each band, as shown on the drawing. On any one band, the SWR should be better than 1 : 2 in the case of the average amateur installation.

Angle of Radiation and Directivity

So far as the system described here has been tested the angle of maximum radiation is about 7° from the horizontal. With three radials, as actually used at HB9OP, the arrangement is distinctly directional. The gain has not been measured, but it appears to be a maximum, appearing three times, *i.e.*, between every two radials, of about 5-10 dB. That is to say, signals at DX are this much better if the system is correctly orientated (see below). It is intended to check more accurately on this effect by means of a model system on the 430 mc band.

The best plan positioning for the array has been found to be with one radial wire making 105° with the N/S line. With this layout, signal strength in all continents has been found to be the optimum. The effect of directivity can be noted by altering the radial layout so that one of them is making 45° with the N/S line ; there will be a loss in DX signal strength, though local European signals will not be much affected. In the layout of the radials, the 120° angular separation must, of course, be preserved.

Operating Results

Proof of the effectiveness of the system as described here lies in the fact that after having used it at different locations, at varying heights and on different bands, the results have always been consistent. A DX report of S9+20 or 30 dB is quite usual, and some comparative tests with beam aerials have been most encouraging.

Some 3,000 contacts have been worked in the six continents, with reports averaging up to S9 and over. WAC has been made on 21 mc in 46 minutes. For five months, in periods of about two weeks each, the system has been used every day on the same frequency at the same time, and the same DX in all continents has been worked. From general comments, it appeared that with the DX the signal strength from HB9OP was, on average, above the mean of other signals coming through from Zone 14 at the same time. The power input to the transmitter during this 5-month period was never more than about 150 watts.

THE NEW CALL BOOK

The 24-page G section of the Autumn ("Fall") issue of the *Radio Amateur Call Book* contains in its 69 columns the call-sign/addresses of over 8,000 licensed amateurs in the United Kingdom, and the listings include all QTH's and changes of address as published in SHORT WAVE MAGAZINE up to and including our July 1956 issue—so if *your* call has appeared in "New QTH's" at any time in this period, you can use the procedure signal "QTHR latest Call Book" with confidence. As usual, the new edition is a monster compilation of some 576 pages. The Abridged ("Foreign") edition, which excludes only the 375 pages of W station listings, runs to 167 pages; all the usual *Call Book* data, as given in the front and back pages of the Full edition, are included. The price of the *Radio Amateur Call Book*—the only directory to the amateur stations of the whole world—is: Full Edition, 37s. 6d.; Abridged Edition. 17s. 9d., both post free, of our Publications Dept., and delivery is from stock.

POSTAGE, PLEASE

We are getting an increasing number of enquiries omitting the necessary stamped addressed envelope. Because of the heavy cost of postage, we must ask all readers who write in expecting a reply to enclose an s.a.e., or I.R.C. Thank you!

CARDS IN THE BOX

We are holding, in our QSL Bureau, cards for the stations shown below, for which we have no forwarding address because their QTH's do not appear in any Call Book and they are not on our address lists. Please send a large, stamped self-addressed envelope, with name and call-sign, to: BCM/QSL, London, W.C.1, and the cards will be forwarded on the next fortnightly G clearance. Please note that this is the *sole* and only address required for the QSL Bureau operated by us. If publication of the call-sign/address is desired, this should be mentioned at the same time. It will then appear in "New QTH's" in the *Magazine*, and also in due course in the *Radio Amateur Call Book*.

G2HHM, 3BGY, 3CCR, 3CWB, 3DRB, 3JSC, 3KSW, 3KVX/A, 3LAD, 3LGT, 3LHD, GB3GPM, GI3JQB, 3LCE, GM3JVH, 3KXM, GW3JNT, 3KIR.

DX COMMENTARY

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

THE traditional preamble about DX conditions in general would be rather a waste of space this month, since there is only one word to describe all bands—*Terrific!* Nothing like this has been experienced by any of us since 1947-8 . . . and many readers have *never* encountered such conditions before. They don't stop at the ten-metre band—we gather that 6-metre records are being smashed all over the world. And some of the DX that jams TV reception in a fringe area has to be heard to be believed—just have a look after the BBC goes QRT.

Coming down to authentic details—it may be news to some readers that the present sunspot cycle has already broken all records. During this past summer the Solar Observatory at Zurich predicted a smoothed sunspot number of 170 for a period of three months around February/April 1957. The maximum of the last cycle (which itself was the highest recorded since 1778) was only 152, occurring in June 1947.

Truly we may be entering upon a spell of conditions that only occur once in a lifetime, when the MUF may rise higher than ever before, and openings may develop on frequencies hitherto undreamed of for consistent DX.

Six metres? Well, already QSO's have been reported between Japan and Argentina (11,000 miles), starting as far back as last March; Mexico works Argentina and Chile almost daily; and W6 hears and works most of the South Americans.

Because of the TV frequency allocation in this country, all this is closed to us, but there is nothing to prevent the keen listener doing his stuff—and we quite expect someone to report that he has already heard all Continents on Six. If you have a receiver like an S.27 or a National 1-10, it should be easy.

Ten, of course, is as wide open as it has ever been, and if your receiver goes up to 32 mc, you might be interested in the police cars in New York, Chicago, St. Louis, Denver and many other cities that can be heard around that part of the band.

One final thought—for some 70 years prior to 1936, the sunspot cycle never rose above the figure of 120. Already it is well over this, and the maximum may not occur until as late as August 1957, with the figure of 170 predicted for the Spring.

And so to our usual conducted tour around the bands, as described by the travellers themselves . . .

W6EFR

CALLS HEARD, WORKED and QSL'd

Ten Metres

From 0800 until 2100 GMT this band has often been wide open for all parts, with the usual preponderance of W's from the afternoon onwards. Even the CW end has been crowded on occasions, and we're not grumbling about it.

GM3BCL (Aberdeen), using phone the whole time, has raised CN8, CR7, HH2W, KA2WK, KR6GL, OA4EE, OQ5, TG9AD, VE, VK, VP6, VQ2 and 4, VS6, UA, UC, ZE, ZL and ZS, as well as seventy or eighty W's in all districts. Fifty-six countries in all, including the Europeans.

G3FPQ (Bordon) got his phone into CR9AH, FB8BZ, TA3EL, KG6, ZD3, ZD8SC, 4S4YL as well as JA's, KA's, VS6's and the like. A spot of CW brought him ST2NG and XW8AB. G3BHW (Margate) had one short session in which successive QSO's were 4X4BD, 4S7YL, VK6KW, W5YGI, CX5CV and VQ2JN — just like that. A new one for the band was VP6GT.

G5BZ (Croydon) collected KP4, VP6, KL7, KH6, ZL, VK, JA and VE5, 6 and 7. GM2DBX (Leven) says he has "worked half the Call

Book," and quotes KG6, KH6, VK, ZL, VS1, 2 and 6, VU, MP4, SVØWE (Rhodes), and loads of W's with a few VE's. More DX than he has heard since 1950—and all on phone.

G3JNX (Manchester) tried 30 watts of phone into a 3-element beam, and in thirty days he collected KA, KR6, YN, VO, VK, ZL, SVØ, ST2, MP4, PY and many others in 39 countries, 20 Zones and 32 States.

New ones for G6VC (Northfleet) were HP1EH, LZ1KDP and UA6KTB. G3JEQ (Great Bookham) weighed in with FB8BZ, CE, ZE, KL7BJW, EA8, ST2, YN4CB, ZD2, FQ8AF, VK9DB, VP6, VS6, MP4 and others—all with a Top-Band half-wave wire, worked end-on, and 75 watts.

G2DC (Bulford) asys the band is already rivalling 21 mc for DX, and quotes QSO's with VK (all districts), ZL, JA, VU, VS6, VE8, UA9 and UAØ, all between 0700 and 1300 GMT. The evenings have been just as good, but the "solid wall of W's" has made it hard for CR6, CR7, OQ, ST, ZD6 and the like, which have been coming through.

G3FXB (Southwick) has enjoyed himself—it's the first time he has experienced the band wide open since he has had a beam up. To prove it, he mentions CR7, CR9AH, CO, CX, FB8BZ, HK, KZ5, MP4, PJ2AA, SVØWE, TI, VK9DB, VS2 and 6, 4S7YL and VP2KB (Leewards)—all on phone. CW fetched in PX1EX (his first ten-metre contact), ST2NG, VS1GV and TF3KA. G3FXB also tells us that FU8AC, ZM6AH and ZK1BS are all active on phone.

G3GGS (Preston) raised VP2KB (St. Kitts) and YN4CB for all-time new ones, both on phone, as well as 3V8AP. KG4AN, ZD6BX, EA8, CE, UA and KH6 were worked on CW. G3GZJ (London, S.E.) found ST2NG on Ten, with a few U's to bring up the scoring.

Fifteen Metres

This band is doing things that it has never done before, such as letting in the East Coast W's in the early mornings (before 0900). West Coast W's have been heard and worked at 0800, 1000, 1400-1900 and 2300 GMT! Mornings are probably the best time for assorted DX, including the Far East and the Pacific, since the W's tend to swamp everything else from 1300 onwards, except on the occasional day when conditions lock them out.

G2DC says it is the leading DX band just at present, and his description of it is "open at 0530 GMT for VK and ZL, and very often closing well after midnight, with South America holding the fort." Early mornings have given him all VK and ZL districts, plus KL7, JA, VE5, 6 and 8. New ones worked were UA, DU6IV, VK7UW and VK9XK, others of interest being CR7BS, VE8OW, VK9DB, XW8AB and ZD2DCP.

G3FXB got his phone through to CR7, FF8, HH7YL, KL7ALZ, KH6BPF, VP5FH and VR2BZ; CW brought him KW6CA, UJ8AF and ZD1FG. He adds that JZØDG and ØACK have both been active, as well as ZC3AB.

G3JEQ raised KH6AYG, VE7 and 8, W6 and 7, JA, VK, ZL and ZS. G6VC worked W4IIJ/Aeronautical Mobile, 25,000 ft. above the North Atlantic and a very good phone signal.

DL2ZO had transmitter trouble for some time, and then worked OQ5CX, VQ2GR and KH6BHZ. G3BHW gave little time to the band, but raised VP6FR, ZD4BR, HZ1AB, KL7's, VQ's and ZS's, all on phone.

G5BZ collected XE, VP6, CE3ZO, VE5, 6 and 7, CR7, KL7, JA, VK6 and ZL. G3FPQ tells us that ZM6AS, who has been on 21 mc phone, is returning to New Zealand shortly. 'FPQ worked him, also KX6ZB and a bunch of KH6's.

G3GGS neglected 21 mc in favour of Ten, but did work HA for a new one, also VK1GU (S9 both ways); he missed on VK9DB (CW) and HZ1AB (Phone). For G3GZJ, interesting phones were EA8BV and SV1AE, with CR7BS, PJ, VK, XE and ZD2 on CW; he remarks that with 14, 21 and 28 mc all wide open together, it is difficult to know which band to choose!

Twenty Metres

Twenty is at last displaced from its position as the premier DX

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	21 mc	Countries
DL7AA	765	103	162	222	157	121	232	G3IUW	212	30	37	65	58	22	100
W8KIA	657	61	145	258	84	109	258	GM3EFS	209	25	39	97	27	21	107
G5BZ	562	64	115	238	138	97	244	G3JLB	206	32	36	57	50	31	89
G3FXB	622	67	124	193	153	85	212	MP4BBW (Phone)	201	1	5	53	85	57	111
G3FPQ	564	60	76	183	151	94	201	ZB1HKO	200	18	29	73	53	27	88
G3DO	543	24	46	218	126	129	236	G3GZJ	199	18	42	65	55	19	96
W6AM	497	30	58	267	85	57	267	G3JWZ	190	43	50	56	32	9	83
W1VG	480	25	113	188	100	54	193	G2DHV	181	19	26	114	10	12	116
ZB1AJX	457	6	56	119	143	133	189	DL2ZO	160	2	33	93	31	1	100
G2YS	436	62	79	146	94	55	163	G3JVJ	146	23	57	38	24	4	73
K2BZT	422	65	66	187	79	25	193	G3JJZ	128	21	32	65	8	2	80
GM2DBX (Phone)	398	34	31	158	84	87	171	G3JZK	116	14	17	30	51	4	67
W6AM (Phone)	332	13	32	227	39	21	227	DL2ZS	101	1	21	66	11	2	69
G3INR	303	44	53	119	58	29	129	G3HQX	97	9	30	29	20	9	49
G6VC	297	30	39	134	60	34	139	G3HEV	67	10	20	17	16	2	40
G2HPF	293	28	48	140	45	32	155	MP4BCA	60	1	2	9	32	16	45
JA1CR	290	15	49	158	58	10	160	G3IDG	54	11	14	6	3	20	28
G3IGW	231	42	60	74	46	9	98								

band, and short-skip and interference are making it definitely unpopular compared with the higher frequencies. Despite this, it is, of course, better for DX at the present time than *any* band has been for the last five or six years!

DL2ZK (RAF Butzweilerhof), in his first four weeks of operation, has stuck exclusively to *Twenty* and worked 88 countries. The list includes KA, KG1, AP, UAØ, ZL, KL7, VK, 3W8AA, VS6, CE, FL8AB, UL7, SVØWN, VK9TW, XE, YV and HK, to mention a few. Not a bad start off for anyone!

G5BZ worked VP8BC, 8BR, 8BY, CE, CP, PJ, LX, HI, JA, ZS7, PX, CX, YV, FC, KH6 and others well spread around the world. G3BHW managed FL8AB at last, also PZ1's, UI8, UL7, UJ8, VP8BK and all the usual stuff—all on CW. He received his card from 3W8AA—direct.

G5UJ (Rotherham) has been using a simple CO/FD (6V6/807) with 45 watts input to an indoor dipole, and with this he raised several W's and VE's. These results, after a long absence from the HF bands, have aroused his interest in DX once again, and we shall doubtless be hearing more.

DL2ZO (Butzweilerhof) had a nice bag, which included FL8AB, FB8ZZ, KH6, KL7, VS5BS, UL7, UH8, SV1, 3A2 and many others, bringing the score to 100 since he started up in July.

G3JEQ collected ZD9AE, YV, VS1, KL7, CR7, JA and many of the "U" districts. G3FXB's CW snared BV1US, SM8KV/P and VQ1JO for new ones. Others were UH8, VP8BK (South Georgia), ZD9AE, VK9TW (but only at Port Moresby!) and VK1RW.

G2DC's opinion is that Twenty has been knocked from its top place among the DX bands. Out of 48 VK/ZL contacts in their contest, only 14 were made on this band.

G3FPQ confirms that JZØADM (formerly PK7ADM) is active on both phone and CW, and tells us that ZS2MI (Marion Island) is on phone again with an S9 signal. He can't operate on Fifteen, as his transmitter only goes up to 20 mc!

The station of G3JYS, Coventry, is a neat writing-desk layout, with a home-built CW transmitter operated on the LF bands.

G3FPQ worked phone with CR5SP, FM7WQ, KH6, XE, ZK1BS, ZM6AT, ZS2MI and 4S7YL; his CW raised FE8AE, FL8AB, JZØADM, VR3B, YJ1RF and VK1RW.

G3GGS thinks Twenty *is* still the best CW band, and collected eight new ones to prove it: PJ2CK, 3W8AA, UA1KAE, UP2, UI8, UN1, FG7XD and XE2FL. Gotaways were impressive and included PJ2ME, UL7, FP8, YA1AM, FL8AB and a mystery station signing UA1KTO/FJ, who sounds to us like Franz Josef Land.

The Other Bands

Forty and Eighty come in for very few comments this month—hardly surprising in view of what is going on elsewhere. An hour's CW on *Forty* fetched in UAØAG, YI2AM and 3A2BH for G3FPQ, who also confirms that XW8AB will be on *Eighty* this winter.

G2DC found Forty disappointing, mainly on account of apathy among DX stations. VK9XK showed up but didn't stay long, leaving it full of Europeans chatting amongst themselves. But U.K. operators should note that W6 and 7 signals are still good, around 0600-0700 GMT. On *Eighty*, G2DC has heard ZS2HI several times (2300), and East Coast W's come in well in the early mornings. In recent QRP tests, G2DC made 97 contacts with 0.7 watts input, including PA, DL and ON.

G3KOC (Barrow-on-Humber) had W3EIV back to a CQ at 2230 GMT, and UB5DW half an hour later. This was on *Forty*, and not very remarkable (you might be saying)—but he is using 15 watts to 30 feet of wire, only 20 feet high. Other W's co-operated later. Don't despair, says G3KOC to the QRP fraternity—just wait for conditions and dig in.

G6VC found new ones in the guise of UA9CM, TF5TP, OE5GR and 3A2BH, all on Forty; also TF5TP on *Eighty*.

DL2ZO spent a bit of time on Forty and was rewarded with YI, GC, GD, UC, UR, UO, 3A2, ZB1 and UAØAG, whom he worked for an hour (she is a YL!) The latter is very interested in Top-Band working and has promised to notify DL2ZO of her possible times of activity, or of a cross-band sked. Who's for Siberia on One-Sixty?

G3GGS reports the East Coast W's on Forty every evening, but not so many Asiatic Russians this month. He called UL7DA but missed him. However, YI2RM, UQ2AK and 9S4DF were worked.

Top-Band Topics

Quite a tonic for the Top-Band

DX fraternity will be the news from W1BB, who scored another resounding "First" by working ZS2GE and ZS2KZ, an OM/XYL team; first contact was on July 11, repeated on September 8; times, 0400-0500 GMT. Band conditions were studied by observing WWV on 2.5 mc, and many discouraging early-morning skeds were run before success made the whole thing worth while.

Stew of W1BB points out that the first W1/ZL contacts were also made in the month of July, and now we have the first W1/ZS in the same period — remember that the DX ends are both well down in the Southern Hemisphere.

Strangely enough, ZS2GE worked W1BB on One-Sixty in 1937, but under his former call of G6SQ. And, by the way, down in ZS they still have to use 10 watts on 160m.

Other news from W1BB: They now have a new Loran chain operating on 1850 kc, and strongly recommend that Europeans this year should *go no higher than 1830 kc* when calling W's.

W1JNO is suggesting that USA stations look for DX between the hours of 2100 and 0100 GMT, as he logs signals from over 1000 miles on 2185 kc at good strength around that time.

W9PNE, during the DX Contest week-end last season, worked KH6, KP4, KV4, KZ5, VP9 and XE . . . W4PJW, now stationed in Ethiopia, is interested in making another country available to the Top-Band DX'ers this winter.

DL1IX tells us that DL stations will be on the band from November 1 until February 28; they will be allowed to transmit from 0200 to 0730, and from 2000 to midnight GMT, daily.

Operation is limited to the band 1825-1835 kc. DX is the main intention, so local QSO's will not be indulged in (meaning inter-DL and similar short haul contacts). DL1IX himself is out for his WABC, so G's should find him anxious to work them.

G3FPQ says that several Russian stations are going to be very active on One-Sixty this winter . . . ZB1HKO reports that he will be making a "special effort," starting now, to work G's on Top Band on Friday, Saturday and Sunday evenings, 2000-2200 GMT; so there's your chance for another country. HB9T has already been on (working G6GM and G2NJ), and he also can be expected to appear regularly. As many G's can testify, DL2UY is yet another interesting Continental contact, "handling his queue in a masterly fashion," as G2NJ puts it.

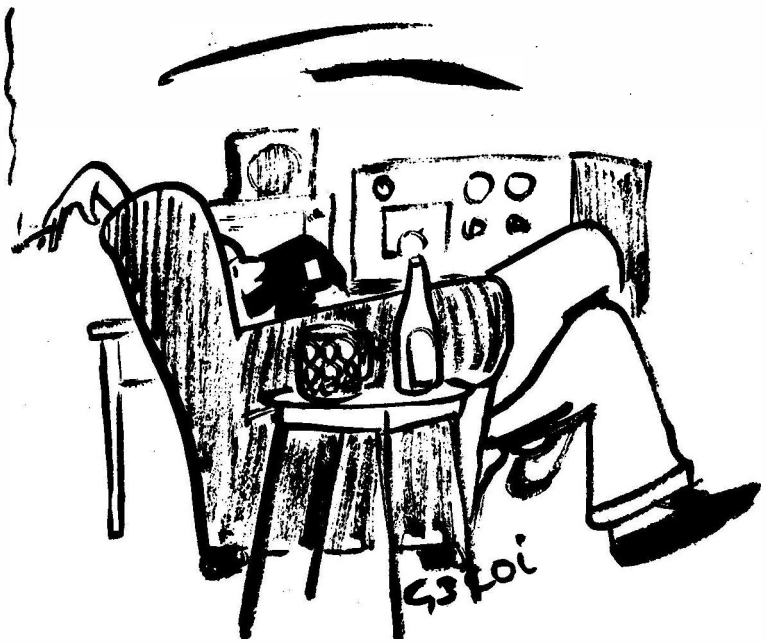
So, whatever the other bands may be doing, there is going to be plenty of life on 160 metres as well this coming season. It means that those with only limited operating time will have to plan their activity rather carefully if full advantage is to be taken of all the opportunities.

Coming back to more or less local news, GM3KHH (Elgin) writes that he is active from Morayshire and will be making excursions into Nairn and Banff as soon as possible. GM3AUD is going into Sutherland, and GM3COV is already active from Caithness. GM3KHH works a net with the other two, and says WABC 'chasers should have no trouble finding them, as G's are getting up there at S8-9. G3HEK (nr. Oswestry) and very near the top of the 160-metre Ladder, reports GM8DF/A for Kincardine and DL2UY for a new country. G3HEK will give Salop, on about 1850 kc, for anyone working for a phone-WABC.

G3KSU (Chelmsford) says that those who find Suffolk difficult should take heart, as he is prepared to operate from Ipswich

21-28mc MARATHON, 1956

Station	28 mc	21 mc	Total
	Phone Only		
G2CDI	81	146	151
MP4BBW	57	77	95
GM3BCL	56	15	69
G3HCU	45	120	125
GM2DBX	37	63	71
G3KHE	29	90	97
	Phone and CW		
VQ4RF	80	74	111
G3GGS	50	39	71
G5BZ	43	75	89
ZB1HKO	19	39	42
G3GZJ	19	55	55
G3JWZ	9	32	32
G3JVJ	4	23	23



". . . . . Yes, old man, I keep very active here. . . . . "

any week-end if there is sufficient demand. Those who would like a sked should drop him a line direct at 45 Langton Avenue, Chelmsford.

GW3LFM is radio officer of s.s. *Jason*, and writes from Capetown to say that he heard G3CPA, 3GVM, 3JVR, GC3KAV and GW3HFG on September 28, and G3KTJ on September 30. On the first day the ship's position was 430 miles north of Las Palmas, and on the second day 280 miles to the south. He will listen for anyone on any band (phone only on 28 mc) if they will write an *air letter form* to GW3LFM, s.s. *Jason*, c/o 20 North Drive, Rhyl, Flintshire. The ship is on the England-Australia route, *via* the Cape, and due back in the U.K.

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	97	97
G5JM	97	97
GM3EFS	96	96
G3JEQ	95	95
G6VC	94	94
G3HEK	90	93
G2AYG	88	89
G3JHH	87	87
G3GGS	86	92
G3BRL	84	84
G3FNV	83	88
G3KEP	80	81
G3AKX	78	80
G3DO	74	74
G3KOG	72	77
G2CZU	67	69
G3KOC	65	67
GM3KLA	62	67
G3EJF	60	64
G2HDR	60	60
G2HPF	45	60
G3ICH	42	58
G3KNG	35	46
G3JZP	30	42
G3KXT	26	37
G3KMQ	24	54

about the second week in January.

After all this Top-Band news, it is surprising to find very few of the usual letters discussing GDX and WABC-chasing. Many of the habitués have been attracted to the HF bands, it seems.

G3ITY (Chester) tells us that he has had a long spell QRT but is now active on the band again. During the summer he caught G3ELZ/M and his XYL, working mobile outside Chester Station. Recent QSO's include G3CHN/A in Devon, GW3DKC/A in Pembroke, G3JW in Staffordshire and G3KXQ/A, Wilts.

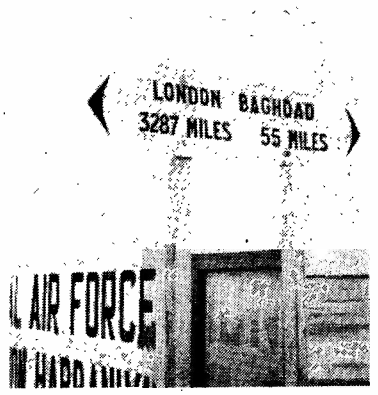
G3JHH (Hounslow) collected GI6TK/P from Armagh; a QSL from this contact and also from Kirkcudbright brings him up to the 87/87 level. G3JHH finds conditions on Top Band improving steadily, but thinks the GM's are not at the peak of their form yet; G3HEK makes the same comment.

Working DX Mobile

Two very interesting reports are in this month from mobileers who are working DX, while actually on the move, in the 21 mc band. G3KHE (Birmingham) has got up to 17 countries /M, with an RS-57 report from ZL2BE! For a lot of people, this would be no ordinary QSO from the home base, let alone under mobile conditions; he has also had contacts with W's and VP6, as well as Europeans. The G3KHE/M transmitter runs 18w. to an 807, into a 12-ft. whip.

The /M DX achieved by GI3CWY was first mentioned on p.312 of the August issue. Since then, he has worked VK1GU with an RS-58 report, on a reply to a CQ call. And GI3CWY has also made what is almost certainly the first Trans-Atlantic mobile-to-mobile QSO, with VE3BIK/M. All this on 15 metres under good conditions, as GI3CWY himself points out; he thinks that /M DX on Ten should be even better, and is building a converter for that band, on which the transmitter "goes" already. Input is 25w. to a 6146 in a CO-PA rig, and the 21 mc aerial an 8-ft. loaded whip mounted on the bumper.

We expect to be hearing of the first mobile WAC before long—



The compulsory closing-down of YI2AM, the well-known DX station — as reported in this issue — gives point to the famous sign-post known to so many Service men who have been posted to, or through, R.A.F. Habbaniya.

GI3CWY is already very near it—and no doubt there will soon be other mobileers on the DX bands. As things are now, Ten is probably the best bet, as, for one thing, the aerial installation is so much simpler.

Miscellany

G3KNG (Wolverhampton) says pirates have been using his call for the last ten months and that he has several cards from stations he hasn't worked . . . GM3LFK (Dunoon) must be one of the newest call-signs we have yet reported in these columns. He has just started up, almost entirely on *Forty*, and has been happily working Europeans, but reports hearing PJ2ME calling CQ there without any replies.

G3LHO (London, S.W.20) has an even later call-sign, but is no novice, having previously been MI3TM and VQ4EG. From Kenya he worked 110 and had 99 confirmed, so he is naturally anxious for one more QSL. MP4QAL or MF2AG could help . . . G2DHV (Bromley) had a holiday on the Continent, where he was assigned the special call of DJØAA and visited DL1JM, DL1OY and PAØPUY; he also worked as G2DHV/A from Lowestoft, Suffolk, and tells us, too, that DJØUU is DL6EN and DJ3LQ is G3KCE.

G3AJP (Great Yarmouth) reports for the first time in many years, to

160-Metre DX Tests, 1956-57 Season

The U.S.A. stations have decided this year that they prefer special "Test" days to the principle of working every week-end, and have suggested the following dates for Organised Tests:

December 2, 16 and 30;
January 13 and 27;
February 10 and 24.

Special attempts will be made to contact Europeans between 0500 and 0800 on these mornings. EU stations should call at 5, 15, 25 minutes past the hour, and so on, with the W's on the hour and every ten minutes thereafter.

All EU stations are asked to operate **between 1820 and 1835 kc;** the W's will be mostly in the 1800-1825 kc segment, and Loran causes trouble around 1850 kc. West Coast stations will be in the 1900-1925 kc area.

Synchronise your clocks with WWV just before each Test begins, and stick to the five-minute calling and listening periods (unless a QSO results, when the routine must be broken). Reports to "DX Commentary" by the usual dead-line dates.

say he is back on the bands and chasing DX again. He takes it easy, because (we quote) "I am still youngish, and hope to be looking for an AC4 long after G9BF is a Silent Key, which, by the sound of operating practices at present, may be many years hence." One of the practices he slams at is that of calling DX that you can't hear — more common than might be supposed! (Sundry Europeans were doing this with VK9TW.) G3AJP has raised FG7XC, VQ1JO and FL8AB, among others, but he doesn't say on which bands, so we can't include them in the "classified" section. For the Top Band 'chasers, he adds that he is actually in Suffolk, despite his postal QTH.

New Country?

When the Gold Coast becomes an independent African state (to be known as Ghana) next March, there will be no more ZD4's. ZD4BM/G2ATU mentions this for the benefit of all those who would like to work two countries for the price of one. Apart from this, there are many newcomers who haven't yet worked a ZD4, and their time is limited. He is in the U.K. at present, but shortly returning to Takoradi, and promises to be very active on Ten.

One Less?

At the end of the year the Saarland becomes absorbed into Western Germany, so there will be no more 9S4 stations around—or so we presume. So there is another one that all the 'chasers will want to work on all bands before it vanishes from the lists. Keeping up to date with this country business reminds us of the (proverbial) Irishman who couldn't count his pigs because they wouldn't keep still long enough . . .

European DX Contest

We are now able to give details of the **SECOND EUROPEAN (WAE) DX CONTEST.** Dates and times are as follows:

'Phone: **December 8, 1200, to December 9, midnight; and January 19, 1200, to January 20, midnight.**

CW: **January 5, 1200, to January 6, midnight; and April 6, 1200, to April 7, midnight. Times GMT, in which form all logs are to be kept.**

The frequencies comprise all bands from 3.5 to 28 mc, and the Region I 'phone bands must be strictly observed for the Phone Section.

Contacts are between a European amateur and a non-European amateur, exchanging a six- or five-figure number representing the RST (or RS) report, and a three-figure serial number for the QSO, starting at 001.

Each station may be worked once per band *per week-end.* Each confirmed exchange of serial numbers will count one point. T7 reports or worse will *not* count.

European stations use a multiplier consisting of the number of countries worked per band, with the addition that W, VE, PY, CE, VK, ZL, ZS and VO *districts* each score as *countries.*

Each station worked on three different bands gives a bonus of five points; four bands, ten points; and all five bands, twenty points—to be added *before* multiplication.

Logs to be sent to DARC before January 31 (Phone) or May 15 (CW). Full details (on four printed pages) obtainable from DARC—we haven't space for the full text. For those who want all the details, the address to which to apply is: D.A.R.C., DX Bureau, Fuchsienweg 51, Berlin-Rudow — and enclose an IRC.

Another DX Tour

G3IDC is shortly off on another tour of RAF stations in the Middle East and Far East, and wherever he is he will use that call with the correct suffix, *e.g.* G3IDC/VS6. Input will be 25-30 watts CW and frequencies 14050. 21050 and 28100 kc, crystal controlled. Present schedule looks like this: November 5-8, VS6; November 10-13, VS1; November 15-16, AP2; November 17, YI2AM; November 21, ZC4; November 22 and 23, ZB1; November 24 and 25, ZB2. It will be remembered that G3IDC, who is an official of the very active R.A.F. Amateur Radio Society—which enjoys the powerful support of the Air Ministry—was once before able to make a trip of this sort. It was fully reported in the June 1955 issue of SHORT WAVE MAGAZINE—"Journey with Iris."

Mention of YI2AM reminds us that we have heard from the chairman of the RAF Amateur Radio Club, Habbaniya, which runs the station, that the club may be disbanded because of the activities of pirates signing YI2DX, 2BN, 2OT and 2RM. These customers have been interfering with Service traffic and YI2AM has been getting the blame. At the time of writing, YI2AM was closed down, but the club had not been disbanded. Perhaps G3IDC's visit

will help to clear the matter up.

Double Trophy

In the September issue we listed, under "WBC Certificates," No. 39 to W6ZZ and No. 40 to W6ZZ for W1WV. Those not in the know might have wondered what was happening, but W1WV, operated by Miles W. Weeks (now W6ZZ) was famous in pre-war days for the terrific number of G's he worked, and was "first W contact" for a great many. His present combined total for the two stations is 1347 of them! So, when he applied for W6ZZ's WBC, we suggested that he should look to his pre-war cards, and it turned out that he had easily worked the fifty required counties from W1WV. This is the first case that comes to mind of such a handsome double. Miles is very active now, mostly on 21 mc, and is always looking for G's.

Operating Note

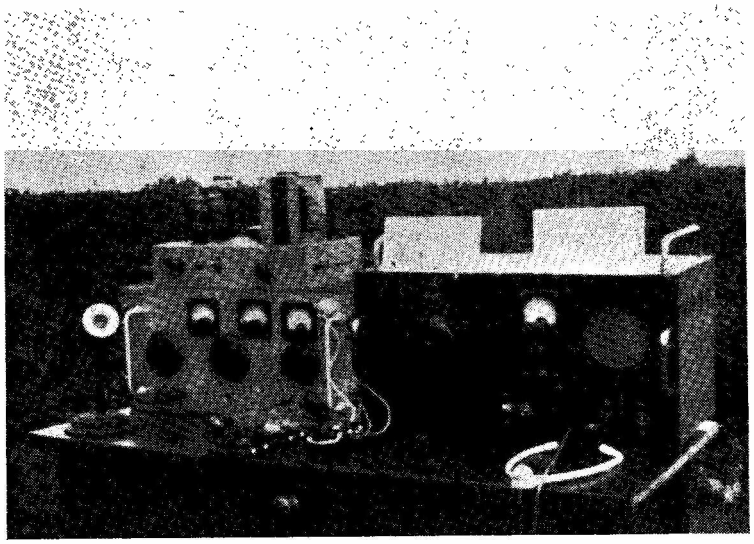
How to increase the QRM on all bands: It is only necessary for *everyone* to adopt the growing habit of replying to a station with "OK ur 150 watts, FB; OK ur rotary beam; OK ur wet Wx; OK about my being your first G station," and so on. This procedure should roughly double the length of a QSO and, thus, double the QRM. An almost equally good practice is the older one of sending every word twice after receiving a 579 or 589 report—there are signs of a revival of this procedure, too.

DX Shorts

YVØCT is described by other YV's as "not good" . . . **CR5SP** is on 14150 kc phone . . . **ZD8SC** works 28300 kc as well as the other bands . . . **KC6UZ** (Truk) has been worked by Europeans on 14070 kc (1100) . . . **PJ2ME** is being extensively reported, mostly on 14040 kc—probably no longer there.

DL7AA (Berlin) has worked XW8AB on *five bands* and reports that Marcel will be on Top Band during the winter and on 50 mc next year, so he has hopes of another two!

W6SYG told W6AM and W1FH that he will beat their record score



Top Band gear used by G3IDF/G3IDG on their GW/A foray into Anglesey during August 4-20 last. The CO-PA transmitter ran an EF91 into a QVO4-7, the speech side consisting of EF37A-EF37A-EL33 with a moving coil microphone; the receiver was a modified R.103 and two end-fed aerials were used, one 400ft. long and the other 175ft.

—because he will outlive them! Rather gruesome but probably true, because he is 25 years younger than either of them. Sounds rather like tempting Providence, though . . .

JZØACK (Dutch New Guinea) is on 21 mc phone, but with low power and a poor aerial . . . The former PK7ADM is now **JZØADM** . . . ZE3JO, working as VQ1JO, made about 350 contacts with 45 countries . . . **YA1AA** was reported again in early October, 14070 kc . . . **ZC3AC** showed up for a short time, but the pile-up scared him off; he was around 14080 kc . . . **YJ1DL** and **YJ1RF** continue to keep New Hebrides on the map, mostly 14 mc.

AC3SQ has been heard and worked on 14020 kc (1200) . . . **HI8FR** gave a chance of a pretty scarce one (21080 kc CW) . . . **UAØKTT,** when he shows up, will be in Tannu Tuva, Zone 23; he expects to be on 14 and 21 mc during December . . . **FB8YY** is on Adelie Island, Antarctica . . . **VS4BO** and **VS4NW** are both active on 21 mc phone . . . **VS4FS** said to be on 14 mc CW . . . **VK1RW** is on Cocos-Keeling, 14 mc CW.

VP5ML is on Turks Island and is ex-K2SRN. He has just started up and wants all QSL's to go to W2OVF, New York (thanks to G2BVN for this one).

FU8AC has been off the bands but is returning right away . . . UAØ's in Zones 18 and 19 are almost commonplace nowadays, mostly on 14 mc.

"Tahiti-Nui"

We are now informed by the R.E.F. that the call of the Tahiti-Nui Expedition will be FO8AP/MM, not FO8AD/MM as previously announced by them. Frequencies will be 7015, 7030, 14042, 14103 and 21042 kc, CW only, with an input of *two watts.* They were supposed to leave Tahiti around October 20, to reach Chile by the end of January. A photograph of the raft appeared in the *Daily Telegraph* of October 23.

Late Flash

G3GGS confirms the rumour about possible activity from UAØKTT in Tannu Tuva—he had it from W2EMW—and suggests that we prepare for the biggest pile-up in history! He's probably right—not only is it a new country for everyone in the world, but it's Zone 23 . . .

[over

Further Operating Notes

G3JEQ says he's often wondered if those types who call CQ on the key for six or seven minutes without signing ever work anyone, and, if so, is it ever DX? He (like ourselves) can never stand the strain of waiting to find out what the call-sign is. If anyone can, they must be badly in need of a QSO.

Phone-operator's nightmare assailed us the other day. There was a hefty network consisting of Fred, Charlie, Bill, Bob and assorted Franks and Cyrils, when a newcomer, after working each of them by name, asked them one by one for their call-signs—just to make a note of them in his log! Perhaps we should put down the names in the "Station Worked" column, and just make an *aide-memoire* note of their call-sign?

That's the lot for this month, and a very full month it has turned out to be. Keep the fire in and the pot boiling, and let us have even more mail next time. Address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1, before the deadline, which is **first post on Friday, November 16.** And will those correspondents who are so often a day late *please* post on Thursday and not Sunday evening! The more mail we have, the more difficult it is to write in late items. (Overseas readers, please note that the deadline for the January issue will be *Friday, December 14.)* So 73 for now, Good Hunting, and BCNU next month—on time, it is to be hoped!

EAST TO ZANZIBAR

THE VQ1JO EXPEDITION

M. GEDDES, ZE3JO (ex-G2SO)

WITH the prospect of a six weeks' holiday and a desire to try the effect of operating under the influence of an exotic call-sign, three interesting possibilities were considered by the writer early this year: It could be either the Seychelles (VQ9), Mauritius (VQ8) or Zanzibar (VQ1).

For various reasons, the latter was decided upon. With the experienced advice of VQ4RF, who had been to Zanzibar as VQ1RF during 1951, an immediate application was made to the Public Works Dept. there for an amateur licence. This was granted without delay under the requested call-sign of VQ1JO, no charge being made because of the short stay proposed, but the limitation was the 14 mc band and CW only, with 150 watts input.

Having arranged the licence, the hotel booking, boat passages and the necessary import-export permits from the Rhodesian Government, the next thing was the gear.

Apparatus and Location

ZE2KV was good enough to make available a B2 Mk. III Tx/Rx, capable of running 20 watts on 14 mc, and ZE6JL loaned a number of crystals for it. For those who may not be familiar with this version of the B2, the transmitter is a two-stage CO-PA, using EL32 into 6L6, integral with a seven-stage superhet receiver, which certainly pulls in the stations, though it suffers by reason of lack of bandspread on 14 mc. The transmitter section will load into any aerial over about 100 ft. long, and the power unit can be adjusted to work from AC supply voltages over a wide range.

It was possible to have the B2 at ZE3JO for a few weeks before leaving; during this "period of indoctrination" it was thoroughly tried out so that the writer could become familiar with its operation and capabilities, and get *au fait* with the rather critical receiver adjustment on 20 metres. Using the large home-station aerial system, good reports were obtained throughout the world.

The trip to Zanzibar was *via* Beira in Portuguese East Africa—where ZE3JJ, CR7DQ and CR7LU were met—and the gear was checked by the Portuguese Customs authorities there. The journey to Zanzibar itself from the home QTH in Rhodesia took about four days, by train and boat.

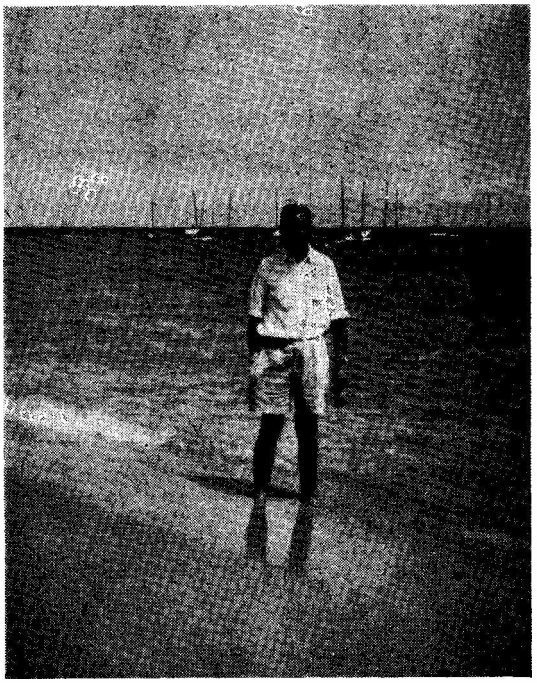
From the hotel room, the best aerial that could be arranged was a 100 ft. wire 60 ft. high at the station end, sloping down to a height of only 12 feet at the far end. The first call under VQ1JO was put out at 1130 GMT on August 14 and was answered by a welter of stations, of which W5BNO was the most readable; he gave an RST-579 report, which seemed reasonable in view of the location and power. In this first session of about three hours, some 60 DX stations were knocked off, which was very encouraging.

Operating Results

For about five days until August 20, DX conditions were quite good and many contacts were being made—in spite of the awful pile-ups on the frequency, which continued despite repeated requests to QSY. Another particular annoyance was the tendency for some of the waiting operators to keep calling continuously, thus breaking up a QSO already going on, making it difficult to exchange reports and sometimes even to get a call-sign. It became a matter, every time, of picking out only the best R5 signal after each call—anything less was certain to be lost in the QRM. In fact, it can be said that VQ1JO experienced to the full all the sensations of a wanted DX station!

After August 20, conditions on 20 metres deteriorated sharply, and from then until the 30th, when the VQ1JO visit came to an end, it was hard going to raise anything. Subsequent checks with other stations after the return to Rhodesia confirmed that conditions generally were poor during this ten-day period—which was a pity, because it coincided with what would have been VQ1JO's spell of maximum activity.

However, the log shows that VQ1JO worked 45 countries and 350 stations during August 14-30; for 52 of them, it was a first contact with VQ1, the only



VQ1JO (ZE3JO, ex-G2SO) cooling his ankles during his convalescing holiday at Zanzibar during August this year, when he made 350 contacts in 45 countries in 16 days under the temporary VQ1JO call.

U.K. station in this category being G3JKF. Eight W call areas were worked for first contacts, the missing two being W1 and WØ.

For the record, it should be explained that the very first amateur station operated from Zanzibar was VQ1RF, who was followed by VQ1RO (G2RO), but for a short time only, with VQ1JO on the present occasion as the third inhabitant.

Some General Impressions

Zanzibar is a large island some 23 miles off the East African coast, 53 miles long by 24 wide. It is part of a British Protectorate, which comprises Zanzibar itself and the neighbouring island of Pemba, with all the islets within their territorial waters. Of the total population of over a quarter of a million, only some 500 are Europeans, engaged mainly in the spice trade. The Protectorate is a prolific producer of coconuts and cloves, and one can get the scent of cloves on the off-shore breeze when miles away at sea. The Island has good roads, and the swimming and fishing are excellent. As there is no indigenous amateur population, Zanzibar would indeed be a DX paradise for a permanent VQ1 resident!

Both as a holiday trip with the XYL and as a DXpedition, the whole experience was certainly well worth while. By the time this appears in print, all VQ1JO QSL's will have been sent off direct to every station worked. If anyone should not have received the expected card, write ZE3JO, Box 2462, Salisbury, Southern Rhodesia.

FOR AN INVALID AMATEUR

We are informed by J. E. Hodgkins, G3EJF, chairman of the Bury Radio Society, that they have available for long loan, *to a bed-ridden amateur either in or out of hospital,* a specially-made table of the type which can be wheeled over the end of a bed and right up to the occupant so that it is facing him at a comfortable height. This particular table is very strongly constructed and will take the weight of heavy gear, such as an AR88. Anyone desirous of taking advantage of this generous offer by the Bury Radio Society is invited to write to G3EJF at 24 Beryl Avenue, Tottington, Nr. Bury, Lancs.

CAREFUL WITH REPORTERS!

It sometimes happens that a licensed amateur is prevailed upon to give a press interview at his station, perhaps working some demonstration QSO's, hoping that thereby he may be doing his bit towards the advancement of Amateur Radio. What actually appears in print is usually a garbled "story," so called, which makes him blush for shame! More often than not, it distorts the facts and conveys an impression totally different from what was intended.

A recent case, when a weekly periodical reported a visit to an amateur station, is an illustration. Apart from the embarrassment it caused him amongst his friends, the amateur concerned had to write to the editor of the paper pointing out that unless some of the reporter's statements were withdrawn or corrected, he would probably lose his licence. The moral is obvious—keep away from press reporters! It is very nearly impossible to put Amateur Radio over with the popular press, which can get no further with it than to paint a ridiculous picture round that idiotic word "ham."

"VERY SAD STORY" — SEQUEL

The item under this heading on p.357 of the September issue of SHORT WAVE MAGAZINE gave rise to a certain amount of correspondence. As a result, we are glad to be able to report that our original correspondent is now happily organised with local contacts determined to register a success with him at the next R.A.E.

KEEP TO THE BAND ALLOCATIONS

With the opening of the HF bands for DX and the large and increasing number of operators taking advantage of it, the need to observe the internationally-agreed CW/Phone divisions on these bands is more than ever necessary. Full details of the band allocations were given on p.649 of the February 1956 issue of SHORT WAVE MAGAZINE, to which reference should be made. And remember that we have a clear patch from 29.7 to 30.0 mc, as the American 10-metre allocation ends at 29,700 kc. W stations can also be found in the area 26.96-27.23 mc ("11 metres"), where they have a special allocation, from which they listen for replies in our 10-metre band—*see* letter from W1AHX in the May 1956 issue of the *Magazine*.

Two-Element Beam for Twenty Metres

SIMPLE SYSTEM FOR ENHANCING DIPOLE DIRECTIVITY

AMATEURS restricted in space to the average suburban garden for aerial systems are always confronted with a problem—that of how to get the highest efficiency from whatever radiators are used, and at the same time to keep them compact. The operator with acres of ground in all directions has no such worries; the only problem is that of erecting the necessary hefty poles at appropriate positions to support rhombic or Vee systems, with perhaps thousands of feet of wire in the legs. Long-wire directive arrays, especially when fed by tuned lines, are flexible enough to give good all-round working over a wide range of frequencies, and if a change of direction *is* considered essential, there are still acres of territory available !

The suburbanite centres his attention, naturally, round the smaller systems, of which there are several. The choice narrows down to a close-spaced beam of some kind, preferably rotary. But that feature in itself presents mechanical problems, not the least of which is the design and erection of a supporting structure, well braced to withstand high winds.

Fixed Beams

There are many operators interested mainly in good communication on, say, 14 mc in a preferred direction, and to that end there are solid advantages in the use of a *fixed* beam. For the alternative directions and the small amount of time spent in seeking contacts in them—well, a simple half-wave dipole will fill the bill nicely.

In the June, 1956, issue of the *Short Wave Magazine* a small beam array of the single section " 8JK " kind was described briefly ; in this a form of inductive coupling was applied at the termination of a stub. Irrespective of the feeding method the system is essentially bi-directional. That may or may not be an advantage. Although the array gives excellent results, the bi-directional feature was found to be rather a nuisance, because no discrimination could be expected in the other direction, so that signals from Mittel-Europa arrived with unwanted intensity at the same time as the band was opening for West Coast DX. It was therefore decided that a radiating system with considerable discrimination to the south-east and with plenty of gain to the north-west would be more suitable for the required purpose.

Folded Dipole Radiator

There is nothing new about the folded dipole scheme introduced in pre-war days by W8JK. The folded dipole is made up of two or more half-wave aerials connected together at the ends, with the feeder taken to the centre of only one of the half-wave sections. The spacing between the sections should be of the order of the spacing used in a transmission line. To make up a folded dipole using wire, the construction calls for a system of spreaders and insulators so that the aerial looks like a length of Zepp feedline arranged horizontally, shorted at the ends, and with a similar kind of feedline tee'd-in at the centre of one side. The centre impedance of the two-half-wave folded dipole may be considered to be around 300 ohms. This can be raised by adding half-wave sections, but whatever the impedance characteristic, it will be obvious that an aerial made up from 14-gauge copper wire is likely to be rather heavy. If supported between poles with halyards, there may be a large degree of sag in the middle, unless poles and halyards are designed accordingly.

With Telcon 300-ohm twin feeder, using ribbon for the element and the non-hygroscopic circular section for the transmission line, it was realised that here was a means of making up a simple lightweight but effective " foldi-pole " that should be just as good as the spaced wire affair.

Folded Dipole with Director

It was decided to construct a simple beam array, using 300-ohm Telcon as the combined radiator and feedline, and reference to the sketches will show how this was done. (A) is the general arrangement. According to formula, a folded dipole works out at 31ft. overall length to resonate at 14,200 kc ; in practice it was found that a radiator made up of 300-ohm Telcon, and fed with the same material, is widely resonant over the whole band with very little change in transmitter loading. A length is cut to 31ft., and the wire bared of insulation material at the ends for about ¼in. Two light brass or copper plates are cut to ½in. square, and a 3/16-in. hole is drilled in each near to one side. The bared wires of the twin-lead are soldered to the plates

at the side opposite to the drilled hole, which is there merely to bind twine through to an insulator for support at each end. In the exact centre of one side of the now folded-dipole radiator, a cut is made in the wire, and at that point the feeder of 300-ohm tubular line is tee'd-in by twisting the wires and soldering. It will be obvious that such a joint is not by itself strong enough mechanically, and if left thus will very quickly result in tearing of the insulation at the centre of the radiator, with eventual breakage of the wire. The method of safeguarding against this is indicated in (C).

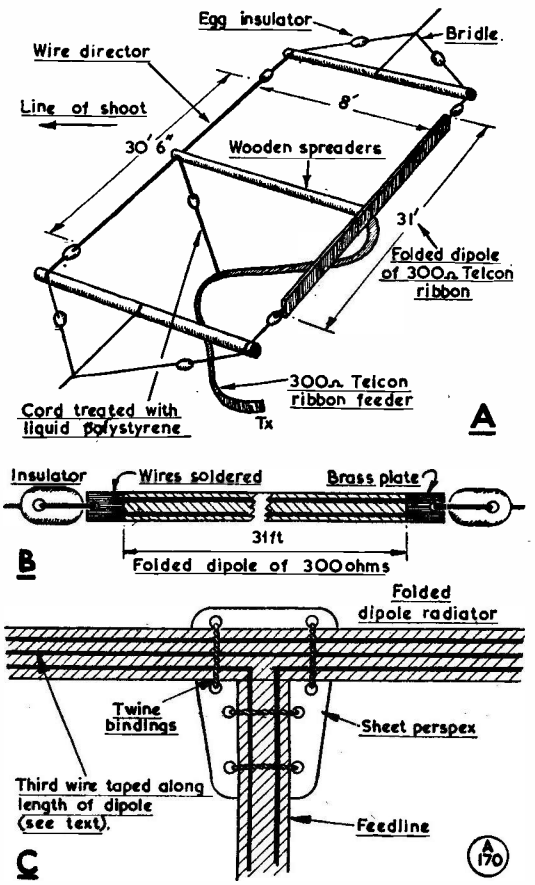
A piece of sheet perspex or polystyrene is cut to appropriate size and holes are drilled through at positions a little wider than the 7/16-in. spacing of the Telcon. This sheet is arranged behind the joint and is bound in position with waxed twine. If polystyrene tape is available, it is a good plan to wrap on the feedline and radiator at suitable positions before binding over. Finally, a coating of suitable insulating cement (liquid polystyrene) will make a good solid job of it. A simpler method is to make a T-piece of perspex and to bind this into place behind the T-joint.

It will be found that a folded dipole made up as described will load a 14 mc final stage nicely with a two- or three-turn link coil. As the radiator stands it is a good proposition for the amateur wanting a highly effective half-wave system for bi-directional working—and it is light.

Adding the Director

It was decided, after having tested the plain radiator, to make up a simple beam array on the lines shown. Three spreaders of ¾in. light timber were used, 8ft. in length, and the radiator was arranged with a director in front, consisting of a wire 30ft. 6in. in length. The whole was supported by making bridles for attachment to pole halyards.

With the close-spaced parasitic element there is the usual change of impedance at the centre of the radiator. It is estimated that the impedance in this case dropped to around 150 ohms, which is quite a mismatch. It was found in practice, however, that the standing-wave on the line was not so serious as might have been, and that with 100 watts input to the 813 final, there was plenty of RF in both radiator and director. However, to be on the right side of the RF ledger, the centre impedance of the radiator was brought up to an approximation of the line. An insulated wire was cut, 31ft. long; this was bound in position with poly-



Layout of the simplified fixed-beam system for the 20-metre band. (A) is the general arrangement, (B) the make-up of the folded dipole using 300-ohm ribbon, and (C) the method of increasing the impedance of the driven element — see text.

styrene tape at intervals so that it lay in the *centre* of the twin-lead radiator throughout its length, as shown in (C). The ends of this extra wire were soldered to the brass shorting plates supporting the twin Telcon. The result was a better impedance match and even more RF up aloft.

VHF BANDS

A. J. DEVON

New Band at 70 mc—
Another Big EDX Opening—
News, Views and Comment—
Station Reports and The Tables—

THERE is much to discuss this month on the VHF front. First, the new band, as announced elsewhere in this space : The intention is that the frequency of 70.3 mc—the allocation is actually spot, *plus* or *minus* 100 kc, thus making a band of 70.2-70.4 mc—should be used by amateurs for the researches to be conducted in connection with the International Geophysical Year, the most important concerted scientific effort yet attempted internationally. The "year" extends from July 1957 to December 1958, during which more than 30 nations will investigate, together, a wide range of natural phenomena relating to the world as a whole. The programme in its entirety is costing something like £40m. and radio is only one of many subjects on a very big agenda.

Presumably, other administrations will likewise licence their amateurs for 70.3 mc so that, with the high and constantly rising MUF, the potentialities of this frequency for international communication can be fully investigated under the particularly favourable propagation conditions that should obtain.

At present, the only other European country in which amateur operation is permitted near the frequency is France ; the F's have always had a band around 72 mc, which is in regular use.

The nearest the new band comes to having a true harmonic relationship with any other of our bands is that it is 7030 kc *x* 10, or 3515 kc *x* 20 ; alternatively, a 7811 kc crystal tripled twice comes out at 70.299 mc. The receiving side is easy enough for anyone who has ever built a two-metre converter—as a first approach, double all 144 mc values on the RF side. It looks as if the transmitter need not be an entirely separate item if one stage of the exciter section already gives output on 72 mc—it would probably accept a crystal multiplying to 70.2-70.4 mc with slight re-tuning through, leaving it only necessary to provide a buffer-PA for the output. The one item that cannot be contrived is the aerial system ; this will have to be constructed for the frequency.

So far as 70 mc activity is concerned—we will call it the four-metre band—all operating results and reports will be dealt with in this space. The Editor has wished it on to your A.J.D., so all we can do is to get cracking. If necessary, Four will be covered under a separate heading, but this will depend upon how much activity the new band attracts. In the meantime, let us have full details of your equipment and results as soon as you are there.

Great October Opening

It is by now well known to all the VHF fraternity that during October 12-14 we had another spell of splendid DX conditions on Two Metres and 70 Centimetres, extending almost from Central Europe to Northern Ireland, and south-west at least to the French Atlantic coast.

Some remarkably fine EDX contacts were made. F8XT was there again, and LX1SI on 144.38 mc, stalked by many, worked several G's (but none of the four who need him most !). ON4BZ worked GI3GXP and F8MG (Arcachon) ; the latter represents a 495-mile QSO right across France, well to the south-west, and for Guy it is only about another 150 miles on to EA1CO, in the same direction. The latter has been reported heard near 145.3 mc under French QRM, but as far as we know he made no G contacts.

The Guernsey stations, GC2FZC and GC3EBK, coming in strongly all over EI, G and GI, were kept hard at it, and were also working Continentals well to the east of them, as far as DL1LB (Weener/Ems). For GW8UH in Cardiff, October 14 was a red-letter day—he accounted for ON, PA and five F's. EI2W and EI9C, the other Dublin station and new on the band, were in great demand, and GI3GXP had half the U.K. after him ; GW3GWA, in North Wales, also did well. And G6NB (Brill) worked 25 Europeans over the week-end.

But every success-story has some twist in it, and in this case it is the fact that once again the GM's were out of it all. Behind the barrier of the Cheviots they got very little GDX, and none of the Europeans. The only firm report we have is that on the 14th G5MA (Great Bookham, Sy.) was heard by GM3EGW—a nice piece of GDX, as on that line Dunfermline is fully 70 miles north of the Border.

GW5SA/P was in Carmarthenshire and though he had quite a number of GDX contacts, he was missed by many people who kept their beams headed on the Continent. Another very interesting GDX possibility was GI8DV/P, giving Londonderry, and booked in by G5MA ; Bob always does work hard on the GI's and GM's when the band is open. With the visit of GI8DV/P, this is believed to be the first time that Londonderry has been available on two metres.

On 70 cm, conditions were as good, but activity poor. G6NB managed F8LO and PAØWAR on the 14th. G3HBW had some good GDX contacts, and G3JHM/G3GDR found they were getting S9 signals, the best they have ever had in 18 months of schedule keeping, over their very difficult path from the South Coast across London.

Many other QSO's could be mentioned, and much of interest will be found in the Activity Report. Of course, one result of the opening and the better conditions generally during October is that some substantial claims have been made for the Tables—in fact, nearly 60 movements are recorded in this month's showing, of which no less than ten are advances in Countries Worked.

Some Station Reports

One of the more northerly G's to succeed with GM was G3IOO (Oswestry), who got GM3FGJ/P, with G3KFD as linking station. Much EDX was heard at G3IOO during The Opening, but Nat says that without an EI or GI prefix there was not much chance of getting a QSO ! On 70 cm, G5BD (Mablethorpe) has been received by G3IOO.

Reporting for the first time is G3KEF (Coventry) who has been exclusively on Two for about a year. In the twelve months, he has worked 110S in 30C and six countries, with 23C already logged for the Annual. The transmitter at G3KEF is an SCR-522 running 30w., modulated by a pair of 6BW6's, and the receiver is 6AK5/6J6 cascode, 6AK5 mixer and 6J6 local oscillator, giving an IF of 4-6 mc tuned on a BC-454. Aerial is a 3-ele flat top, delta matched, fed with 300-ohm tape.

Near neighbour and sparring partner of G3KEF is a very new station on the two-metre air—G3LHA, none other than our old friend SWL Bastin of Coventry, who for years has been very active on the VHF bands, both as a listener and as 2nd operator to G5ML. G3LHA opened his envelope from the GPO at 1225 on September 25 ; by 1240 he had made his first two-metre QSO, with G3KEF ! The measure of G3LHA's activity since then can be seen in his calls-worked list—by October 21, he had had 198 contacts with 102 different stations (all on phone), with 32 counties and six countries worked. Of course, G3LHA was lucky in that he came in for the openings ; nevertheless, it is a very creditable performance and a measure of his real enthusiasm for VHF. In welcoming him as a VHF-only operator fully equipped for both bands, we also congratulate him on his success so far.

In passing, we might also mention that an even newer station is G3LIM, who is understood to be a branch of the G2AIW trunk. While not expecting to see reports from G3LIM for these pages, we welcome him nevertheless—and would like to add that in G2AIW he could not have a better mentor.

The openings brought G2CZS (Chelmsford) much-needed contacts in new directions, but when it came to hunting EDX, he found he was on a congested frequency ; added to that, G2CZS feels he has a poor location, because G5KG, only a matter of four miles or so away, can work stations not even audible at G2CZS. G5KG (Danbury) did very well during the October opening, and on the 14th worked five countries.

Freddy of G5ML (now at Blackdown, nr. Leamington Spa) was one of those who got LX1SI, putting him up to 9 in the Countries Table. Not far away and trying hard for LX1SI (whom he could not even hear) was G3GHO (Roade), who is one of the four G's in the front seat in Countries ; all these four have now to work two new prefixes to get ahead of ON4BZ. G3GHO remarks that while on October 13 he could not hear much of the EDX apart from F's, on the 14th it was coming in well ; yet during both sessions stations to the north, south-west and south-east were working the DX freely. To Mac, it felt as if he was in the skip on the 13th.

G3CKQ (Rugby), in putting in his claims for the Tables, makes only one comment : " Nothing like it since I came on two metres." This feeling about the recent openings has been echoed by many correspondents this month. GC3EBK (Guernsey) sent his slips in with only this remark in his covering note : "All I can say is, What a Month ! "

Where's the Activity ?

In spite of all the happenings reported during the few openings we have had this year, there can be no doubt that in total there are now fewer stations actually operating on two metres than there were, say, three years ago. A spell of good conditions will always bring on a great many people who otherwise do not seem to be heard, and appear to come on only when there is a chance of working DX. In other words, though we may well have QRM conditions on Two during a good opening—as was certainly the case during this last one—the fact still remains that there are fewer stations operating than the total of known VHF people would suggest should be on.

In a very thoughtful contribution, EI2W analyses this situation ; Henry's location and his placing in the Tables make him well qualified to offer an opinion on any VHF matter. During the recent openings —when he could hear signals from all over the U.K. as well as the Continent—his observations were that it was in the Midlands and towards the North that activity was lowest. Maximum activity was in the south-east area of England, *i.e.*, nearest the Continentals. As one listened North, so the activity

NEW 70 Mc BAND OPENED — OFFICIAL

We are officially informed by the G.P.O. that with immediate effect the new band **70.2-70.4 mc ("4 metres")** is open for U.K. amateur operation, using A1, A2 and A3, with certain limitations. These are : A maximum input of 50 watts ; a total prohibition on the use of the band by any amateur station within 50 miles of the Radio Observatory, Jodrell Bank, Cheshire ; and withdrawal of the band at December 31, 1958. All existing licences have been amended by *London Gazette* notice ; new permits and renewals will incorporate the amendment.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

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

thinned out.

EI2W holds that the reason for this is that a large number of erstwhile two-metre enthusiasts have either given it up altogether to go back to the HF bands or, in feeling that they have now done all they can expect to accomplish on two metres, have settled on 70 centimetres, with a trend towards 25 centimetres. This leaves on two metres (*a*) Those who still have a certain amount of scoring to do, (*b*) The newcomers, to whom it is all a new experience, anyway, and (*c*) Operators whose main interest is in a DX opening. Henry goes on to say that, in his opinion, this makes it a bleak outlook for stations in the West Country, Scotland and Ireland, who do not anyhow get much of a cut at the Continentals (unless conditions are exceptional) and who, being what he calls "far removed from the axis of VHF coverage," find that, relatively, their contacts are few and far between. This leads to frustration and disappointment. He cites certain GDX stations in outlying parts whose operators have laboured incessantly to improve and perfect their gear, but for whom the one or two openings we have had this year are not sufficient encouragement to sustain a real interest in VHF working. EI2W also holds that the rules for the various contests are framed in such a way that there is no inducement to "perimeter" stations to take part.

The solution to all this, suggests EI2W, is that we must get away from the tendency to be satisfied with an 832 or an 829 in the PA, the simple beams most people use, and the present not-so-hot receivers. Equipment of this sort is all right for those who are prepared to wait for a weather build-up to produce an opening, but no good at all for consistent long-range working. What we ought to be doing is building bigger and better high-gain beams, receivers with a much lower noise level, and looking round for PA valves that will give a better input-output ratio, in terms of higher DC power input and more RF into the aerial.

It does not need your A.J.D. to tell anyone that there are certain operators who have adopted these principles already and, where the location is also a good one into the

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).

G3GHO, Roade, Northants.
WORKED: DJ1DC, DL1LB, EI2W, F3XY, 8LO, G2ADZ, 2AHP, 2ANS, 2DDD, 2DVD, 2HGR, 2JF, 2NY, 2YB, 3ABA, 3DKF, 3DOR, 3DOV, 3FAN, 3FKO, 3FMI, 3FP, 3FPV, 3GWB, 3HXS, 3HZF, 3INU, 3IRA, 3IWJ, 3JGY/P, 3JR, 3JWQ, 3KEF, 3KHA, 3KPT, 3KQC, 3KUH, 3LAY, 3LHA, 3LIM, 3YH, 4MK, 5UM, 5VN/A, 6NB, 6NF, 8KW, 8VZ, GC2FZC, GI3GXP, GW5SA/P. (*October 7 to 21*).

F8XT, Chillac, Charente.
WORKED: G2ADZ, 2JF, 2WJ, 3AUS, 3CGQ, 3DKF, 3FIH, 3FZL, 3GNR/P, 3JGJ, 3KEQ, 3KFD, 3KHA, 5KW, PAØGER, ØIKS.
HEARD: G3FAN, 5NF, 6NB, PAØFB, ØWAR. (*October 13-14 only*).

G3KHA, Knowle, Bristol.
WORKED: DL1LB, F8XT, G2FNW, 3GPT, 5UM, GC2FZC, 3EBK, PAØFB.
HEARD: DJ1DC, EI2W, G5PR, 6UH, GI3GXP, GW5SA/P, ON4BZ. (*Short DX list only, October 13-14*).

G2DVD, Slinfold, Sussex.
WORKED: EI2W, F3NJ, 8GH, 9AJ, G2AIQ, 2CIW, 2DCI, 2HCJ/P, 3AUS, 3CCH, 3DVK, 3EJO, 3EPW, 3FFV, 3FGT, 3GFD, 3GHO, 3GPT, 3HBE, 3HHY, 3HVX, 3HWS, 3IOO, 3IWJ, 3JWQ, 3JZG, 3LHA, 3WW, 5BD, 5SK, 6SN, 6SN/M, GW2ACW, 3GWA, GC2FZC. (*All over 100 miles, during period*).

G3HHD, Erdington, Birmingham.
WORKED: F3NJ, G2ADZ, 2CIW, 2DCI, 2DVD, 2FNW, 2YB, 3BFP/P, 3DKF, 3DLU/P, 3DOV, 3GKZ, 3GPT, 3HBE, 3HBW, 3JWQ, 3KEF, 3KUH, 3KSR/P, 3LAY, 3LIM, 5KG, 5ML, 6OX, 6SN, 8VN, GC2FZC, 3EBK, PAØNO.
HEARD: EI2W, F8GH, 8MX, ON4BZ. (*September 1 to October 16*).

G3JGJ, Plympton, S. Devon.
WORKED: F8GX, 8XT, 9AJ, 9XY, G3FZL, 3GAO, 3HBW, 3KSR/P, GC2FZC.
HEARD: F3MJ, 8GV, 8MW, 8NS, G2ADZ, 3AUS, 3FCQ, 3FIH, 5KW, 5US. (*October 13-14 only*).

EI2W, Dublin, Eire.
WORKED: F3JN, G2ADZ, 2DVD, 2HCJ/P, 3ABA, 3FAN, 3FZL, 3GPT, 3GQN, 3HBW, 3KEQ, 3LIM, 5DW, 5KW, 5MA, 6AG, 6NB, 8KW, GC2FZC, GI8DV/P, GM3DIQ. (*October 13-14 only*).

F8NS, Prefontaine, S-et-M.
WORKED: G2FMJ, 3FIH, 3GHO, 5KG, 5KW, 5MA, ON4BZ, PAØFB.
HEARD: G2ANS, 3EMU, 3FCJ, 3FCQ, 3KSR/P, 5YV, PAØGER. (*October 13-14 only*).

G3FIH, Bath, Somerset.
WORKED: DJ1DC, EI9C, F3NJ, 3XY, 8GH, 8NS, 8XT, 9DI, G2ADZ, 2DVD, 2CIW, 3AYT, 3BW, 3CCH, 3CKQ, 3DA, 3DVK, 3EPW, 3FCQ, 3FFV, 3FGT, 3FKO, 3FMI, 3HWS, 3JQN, 3JUG, 3JWQ, 3JZG, 3KEF, 3KHA, 3KPT, 3KUH, 3LAY, 3LHA, 4PS, 5KG, 5MA, 5OB, 6QT, GC2FZC, GW2ACW, ON4BZ.
HEARD: EI2W, F3CA, 3JN, 3LP, 3LQ, 8EB, 8NS, 8OB, G2BRR, 2FNW, 2UJ, 2YB, 3AUS, 3EMU, 3FAN, 3GHO, 3GPT, 3HHY, 3IER, 3IWJ, 3YH, 3LIM, 5BM, 5DW, 5ML, 5YV, 6AG, 6OX, 8MW, GC3EBK, GW5BI, 8UH, ON4HS, PAØBL, ØNO, PE1PL. (*October 10 to 14 only*).

GC2FZC, St. Peter Port, Guernsey.
WORKED: DJ1DC, EI2W, G2NY, 2ADZ, 2AHP, 2AIQ, 2ANS, 2BVW, 2CIW, 2DCI, 2DVD, 2HGJ/P, 2HGR, 3JR, 3AUS, 3DKF, 3EGG, 3FAN, 3FGT, 3FIH, 3FQS, 3GDR, 3GHO, 3GOP, 3GPT, 3HAZ, 3HBE, 3HHD, 3HHY, 3HTY, 3IER, 3IEX, 3IUL, 3IWJ, 3JFR, 3JGJ, 3JWQ, 3JZG, 3KEF, 3KEQ/P, 3KHA, 3KSR/P, 3LHA, 3LIM, 5BD, 5BM, 5DW, 5KG, 5KW, 5MA, 5MR, 5PP, 5SK, 5US, 6AG, 6LL, 6YU, 8DA, ONB4BZ, PAØNO. (*All phone, October 13-14 only*).

SWL Smith, Diss, Norfolk.
HEARD: G2FJR, 2HQ, 3AR, 3CCH, 3DLV, 3DOV, 3FGT, 3GHO, 3IEX, 3JWQ, 5BD/M, 5KG, 5KW, 5LL, 6LI, 6NB, PAØFB. (*September 23 to October 11*).

G5MA, Gt. Bookham, Surrey.
WORKED: EI2W, 9C, F3JN, 3NJ, 8NS, 9AJ, G2CIW, 2FNW, 2FO, 2HGR, 2XV, 3AGA, 3ALC, 3AST, 3BOC, 3FGT, 3FIH, 3GPT, 3HBE, 3IRW, 3IWJ, 3JGY/P, (Hereford), 3JWQ, 3KUH, 3LHA, GC2FZC, GI3GXP, 8DV/P (Co. Londonderry), GW2ACW, 3GWA, 5BI. (*All during period*).

G3CKQ, Rugby, Warwicks.
WORKED: G2ANS, 2CVD/P, 2CIW, 2CZS, 2FJR, 3ABA, 3ALC, 3BJQ, 3DKF, 3DKF/P, 3DLU/P, 3EJO, 3EPW, 3FAN, 3FCQ, 3FIH, 3FUW, 3FZL, 3GHO, 3HVX, 3HXS, 3ION/P, 3IWJ, 3JWQ, 3JZG, 3KEF, 3KEQ, 3KSR/P, 3LHA, 3LIM, 4JJ/A, 5JU, 5KW, 5ML, 5SK, 5SV, 5YV, 6OX, 8KW, 8VN, 8VZ, GC3EBK, GW3GWA.
HEARD: DL1LB, F3NJ, 8GH, 8MW, 9AJ, 9OB, G2FNW, 2HOP, 2XV, 3CCH, 3GFD, 3GPT, 3GVK, 3HBW, 3HHD, 3IEX, 3IEY, 3IRS, 5BD, 5MA, 6AG, 6LL, 6XX, 6YU, 8MW, GC2FZC. (*All during period*).

G3IER, Cheltenham, Glos.
WORKED: G2ADZ, 2BVW, 2HCJ/P, 2UJ, 3EPW, 3FCQ, 3IOO, 3JWQ, 3KEQ, 5DW, GC2FZC, 3EBK, GW5SA/P (Carmarthen).
HEARD: EI2W, F8MW, G2CIW, 2DVD, 2FJR, 2FNW, 2HGR, 3ABA, 3AGA, 3CCH, 3GPT, 3IWJ, 3JZG, 3LIM, 5AU, 5US, 5KW, 5MA, 6AG, 6FO, GW2ACW, 8UH. (*All over 50 miles only*).

SWL Lee, Bridgend, Glam.
HEARD: EI2W, G2ADZ, 2DVD, 2UJ, 3ABA, 3CGQ, 3FAN, 3FCQ, 3FIH, 3FZL, 3GHY, 3GOP, 3HKW, 3KEQ, 3KHA, 3KSR/P, 3LIM, 5DS, 5DW, 5KG, 5KW, 5MA, 5ML, 6AG, 6NB, 6OX, GC2FZC, 3EBK, GW8SU, 8UH, ON4BZ. (*October 13-14 only*).

G3KUH, Rotherham, Yorks.
WORKED: G2ADZ, 2BVW, 2CVD, 2FJR, 2FNW, 2FO, 3ALC, 3EPW, 3FAN, 3FIH, 3HBW, 3HHD, 3IOO, 3IRA, 3JXN, 3KEQ, 3KFD, 3LHA.
HEARD: EI2W, F3LZ, 8GH, G2DVD, 2NM/P, 3ABA, 3BJQ, 3CGQ, 3KSR/P, 3LDW, 3LGJ, 3LIM, 5BM, 5JU, 5ML, 5UM, 6FO, GC2FZC, GI3GXP, ON4HN, PAØBL, ØFB. (*Over 50 miles only. 20 September to 22 October*).

G3LHA, Coventry, Warwicks.
WORKED: F8GH, G2ADZ, 2ANS, 2ATK/M, 2AUD, 2BVW, 2CIW, 2CVD, 2DCI, 2DVD, 2FJR, 2FNW, 2HCG, 2HCJ/P, 2HOP, 2JF, 2XV, 2YB, 3ABA, 3AYL, 3BA, 3BJF, 3BJQ, 3CGQ, 3CKQ, 3DKF, 3DKF/P, 3DLU, 3DOV, 3EJO, 3ENY, 3EPW, 3FAN, 3FGT, 3FIH, 3FKO, 3FUL, 3FUW, 3FZL, 3GGR, 3GHO, 3GKZ, 3GPT, 3GVK, 3HAZ, 3HBW, 3HHD, 3HVX, 3HXS, 3HZF, 3IER, 3IEX, 3IIT, 3IRA, 3IWJ, 3JGY, 3JQN, 3JWQ, 3JXN, 3JZG, 3KEF, 3KEQ, 3KFD, 3KFT/P, 3KPT, 3KSR/P, 3KUH, 3LAY, 3LAY/P, 3LDW, 3LIM, 3WW, 4MK, 5BD, 5DW, 5KG, 5KW, 5MA, 5ML, 5SV, 5US, 5YV, 6AG, 6CI, 6JK, 6NB, 6OX, 6SN, 6XA, 6YU, 8MZ/M, 8VZ, GC2FZC, 3EBK, GW3GWA, 5SA/P, ON4BZ.
HEARD: EI2W, F3NJ, 3XJ, 8MW, G2CZS, 2FCQ, 2FMO, 2FXK, 2NV, 2OI, 3ALC, 3BVU, 3FFV, 3GHI, 3HBE, 3HTY, 3IOO, 3KHA, 4JJ/A, 5AU, 5BM, 5JU, 5SK, 5UM, 6NF, 6SN/P, 8BP, 8KW, 8VN, PAØFB, PAØWAR, PE1PL. (*September 25 to October 21*).

G2CZS, Chelmsford, Essex.
WORKED: G2AIQ, 3CKQ, 3EPW, 3FVK, 3GFD, 3HA,

3KSR/P, 6SN, GC3EBK, ON4HN, PAØFB.
HEARD : DJ1BC, DL1LB, EI2W, F3JN, 3LQ, GC2FZC, ON4UD, PAØBL, ØNO, ØSK. (*DX interest, September 19 to October 24*).

GC3EBK, St. Martins, Guernsey.
WORKED : DL1LB, F3CA, 3LQ, 8GH, 9QE, G2BRR, 2CIW, 2CZS, 2FJR, 2JF, 2NM/P, 2NV/A, 2RD, 3AL, 3CGQ, 3CKQ, 3COJ, 3DF, 3DOV, 3EPW, 3FQS, 3FUL, 3GPT, 3HAZ, 3HBE, 3HHY, 3HWJ, 3HXS, 3IER, 3IIT, 3ION, 3IUL, 3JFR, 3JGT, 3JHM, 3JQN, 3JWQ, 3KEF, 3KHA, 3KSR/P, 3KVH, 3LAY, 3LHA, 3LIM, 3WW, 4IB/M, 4MK, 5BD, 5BM, 5KW, 5ML, 5PP, 5UM, 5YV, 6AG, 6JK, 6LL, 6NB, 6OX, 6XX, 8LN, ON4HN, 4UD, PAØBL, ØFB, ØNO, ØSK.
HEARD : EI9C, GW8UH, ON4BZ, 4ZH, PAØNAR. (*During October openings*).

70 CENTIMETRES ONLY

G2CIW, Cambridge.
WORKED : G2RD, 2WJ, 2XV, 3FOQ, 3HAZ, 3HBW, 3KBS/P, 3KHA, 5UM, 6NB.
HEARD : G2BVW, 2DUS, 2FNW, 3FZL, 3IRW, 5BD, 5DT, 5YV, 6NF. (*September 20 to October 21*).

G3KHA, Knowle, Bristol.
WORKED : G2CIW, 3HBW.
HEARD : G3KEQ.

bargain, consistently they are getting outstanding results. To this extent, then, Henry's points are already proved. But only a small minority have approached the problem along these lines. Not every VHF operator can adopt all these principles—but most could tackle the aerial with greatly improved results. This is within the reach of almost everybody, and let it be said that even from what appears to be a poor location, a *startling* improvement *can* be obtained by putting up a high-gain beam that really is working properly. Everyone who has changed from a flat-top to a correctly matched and fed multi-element array would confirm this.

Well, there's food for thought. . . .

Round the Country

G3HHD (Birmingham) writes again after a year's absence, and reports that G3IRS, at the R.A.F. station at Locking, is temporarily off two metres—because somebody's boned the crystal out of the receiver. G3DVK (Rotherham) reports active, and says that in working GC3EBK and GW3BOC/P on his indoor beam he got two new countries ; if GI3GXP had also responded, he would have made a " welcome third." G3DKF is yet another of the Coventry group and enjoyed himself when the going was good ; his EDX includes DJ1DC and F8XT, at over 500 miles. G3JGJ (Plympton, S. Devon) gives us a QSP from F8XT ; this appears in the Activity Report. It seems that during the October opening, F8XT could hear nothing of EI2W or GI3GXP ; on the 14th, Sunday, G's were coming through all day, of whom G3AUS was the most consistent. G3JGJ himself worked and heard a lot of F's during that week-end.

For Vernon of G5MR (Hythe, Kent), the most exciting occurrence during the period of excellent conditions was his QSO, at last, with GI3GXP, for a new country and another county ; for GI3GXP, G5MR is probably the most distant G it is possible to work from GI. Vernon first heard GI3GXP, for a fleeting instant, in October *last* year. Another good QSO for G5MR, and a new county, was G3IWJ (Liverpool) at RS-56 both ways.

G2FJR keeps the jolly roger flying at Sutton Bridge, and says that though he could hear a lot of EDX working going on, he did'nt get much of a share of it (this is rather like G3GHO's experience on October 13). To take a real step forward, G2FJR needs a QSO with GD—so does ON4BZ ! During the opening, Guy was heard enquiring about the " callsigns and frequencies of any possible GD stations." Unhappily, there are none. Most of the VHF activity from the Isle of Man has been by visiting /P's who went over specially for the purpose. G2FJR had a visit from F8FV who was much impressed by the QSO's they were able to make on two metres.

G3KUH (Rotherham) has been on the two-metre band since receiving his licence on January 31 this year, having been a keen SWL, right back to 5-metre days, before that. So he came to VHF with plenty of fundamental experience. He runs 21w. to an 832 with a 4-ele at 40 ft. and sums up his experiences during the opening by saying that GC2FZC—called for four hours, on and off—was his most-chased station ; he also has a crack about those who promise QSL's they fail to send ; and suggests that all two-metre

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1956

Starting Figure, 14

From Home QTH only

Worked	Station
42	G3GPT
41	G3KEQ
35	G3GHO, G5ML
32	G2DVD, G3DKF, G3LHA
30	GC3EBK
29	G3IOO
28	G2CIW
25	G3CKQ
23	G3KEF
20	G3KUH
19	G3FIH
18	G5MR
15	G3IER

This Annual Counties Worked Table opened on September 1st, 1956, and will run till August 31st, 1957. All operators who work 14 or more Counties on Two Metres in the year are eligible for entry in the Table. The first claim should show a list of counties with stations, which can be added to thereafter as more counties are worked.

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
27	G2XV
26	GW2ADZ
23	G3BKQ, G6NB
20	G3HBW
19	G3KEQ
18	G3IOO
16	G6NF
15	G4RO, G5YV
14	G2HDZ
13	G2CIW
10	G2OI, G3IRW
9	G5DS
7	G2DDD, G2HDY
6	G3FAN, G3JMA, G3WW
5	G3FUL, G3IRA, G3IUD, G3JHM, 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

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14

From Fixed QTH Only

Worked	Station
75	G5YV
70	G6NB, G6XM
68	G3BW
66	EI2W (286), G3IUD (302)
65	G3CCH
64	G3GHO, G5BD (435)
62	G3BLP (630)
60	G2FJR (427), G2OI (402), G3DMU
59	G3EHY, G4SA
58	G3IOO, G8OU
57	G8SB
56	G3WW (770), G5DS (654)
55	G2HDZ (495), G2HIF, G5BM, GW5MQ
53	G2AJ (519), G3FAN, G4CI
52	G2NH, G5MA, G6RH, G6XX, GW2ADZ
50	G3ABA, G3GSE (518)
49	G3HAZ (358)
48	G3FIH, G5ML, G6TA (487)
47	G3HBW, G5WP
46	G4HT (476), G5BY, G6YU (205)
45	G2DVD (362), G2XC, G3BJQ, G3KEQ, G5JU
44	G2CIW (184)*, G3BK, G8DA
43	G2AHP (500), G3BA, G3COJ, G3HWJ, G4RO, G5DF
42	G2HOP, G3BNC, G3DLU*, G6CI (220), GM3EGW (146)
41	G2FQP, G3DO, G3WS (255)
40	G2DDD, G3CGQ, G3IER, G8KL
39	G2CZS (275), G2IQ, G3DVK (208), G3GBO (434), G3VM G8IL (325)
38	G2FCL (234), G3APY, G3CKQ, G3HTY, G5MR (336), G8VN (190)
37	G2FNW, G2FZU (180), G3DLU, G3JWQ
36	G2DCI (155), G3CXD, G3IIT, G6CB (312), G8IP
35	G3FZL, G3FYY (235), G3HCU (224)
34	G3AEP, G3BKQ, G3KHA (174), G8IC, GC3EBK
33	G3HHY (125)
32	G3HIL, G3LHA (102), G8QY, G8VR, GC2FZC
31	G3HXO, G5RP

stations should call CQ at least once a day, even if the band does sound dead. G3KUH also has a query about QSL's for VHFCC—Do cards from stations working /P count ? The answer is Yes. Do cards obtained by working oneself from a /P site count ? The answer is No, unless the claim is for VHFCC when portable only, *i.e.*, you cannot add your cards obtained by working from two different sites, home and portable.

G3FIH (Combe Down, nr. Bath) made full use of his opportunities during the October opening by working 7 countries, including DJ1DC, S9 both ways on phone, for a new one ; and G3FIH was

Worked	Station
30	G3FRY, G3GOP (208), G3GVF (129), G3IRA, G3KEF (110), G5NF, GM3DIQ, GW8UH
29	G3AGS, G3AKU, G3FIJ (194)
28	G3ITF, G8DL, GM3BDA
27	G3CVO (231), G3DAH, G3ISA (160), G6GR, GI3GQB, GW3GWA
26	G2BRR, G3CFR (125), G3SM (211), G4LX, G4MR (189)
25	G3JMA, G3JXN (220), G3KUH, G5SK, G6PJ
24	G3DLU*, G3FD, G3FXG, G3FXR, G3JHM
23	G3CWW (260), G3HSD, G3YH, G4JJ/A, G5PY
22	G2DRA, G3AGR (135), G3ASG (150), G3BPM, G5AM, G8NM
21	G2AOL (110), G3DVQ, G3IWJ, G6XY
20	G3EYV, G3IOE
19	G3FEX (118), G3GCX, G5LQ (176)
18	G2AHY, G3DBP, G3JGY, GC2CNC
17	G3EGG
16	G3FRE, GM3DIQ*
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 are worked.

* New QTH

S9+20 dB with F8XT, so wonders how much further south his signals might have been getting. Interesting contacts were also made with Lancs/Yorks stations and with EI9C. In Bristol, G3KHA got his share of EDX worked and heard, and is among the many who have commented upon how stable conditions remained for DX all through the Sunday morning and afternoon, October 14, when DJ1DC and ON4BZ were S9+ and GW5SA/P in Carmarthenshire was able to work PAØ's, representing very good DX in terms of distance. G3KHA has made some progress on 70 cm, with G3KEQ (Sanderstead, Sy.) heard.

G3JHM (Worthing), who is normally more in touch with the F's than he is with the G's, worked a nice selection of new GDX over October 13-14, and for the first time heard G3JWQ, G3GPT and GW8UH, all in wanted counties. G3JHM is getting on with CC gear for the 25-cm band ; his aerial, already finished, is a pyramidical horn, to the design of F3SK, and is expected to give a gain of 18 dB. G3JHM is one of those who is *not* in favour of time and effort being spent on SEO gear for the 1250 mc band.

G5MA says that GI8DV/P intends to be on from Co. Derry again, and also to try a site in Co. Tyrone — so with an active /P station like that, it should be possible to fill some of the gaps in GI counties. G5MA had ten other good DX contacts during October 12-14, including EI9C and four F's. G3IER (Cheltenham) was glad to hear some EDX in the shape of F8MW, and managed two more counties in his " difficult " direction ; stations down in Cheltenham itself hardly ever get a DX break, because the town lies in a deep hollow. On the other hand, people like G5BM, only a few miles away, are much more favourably located ; in fact, G5BM worked three F's in a row.

A West Country station new to two metres is G2HDR, near Bristol, who has started up with 15w. to an 832, a 4-ele flat top, and a CC converter into an S.640. As he is still at the stage of " testing the site," reports *and* QSO's will be very welcome. Going right up to Preston,

Lancs., we find G3GPT, a very active VHF station, with 42C already worked for the new Annual — and, for a very good piece of DX, he heard EI4E (Killarney) at RST-549 on October 14. This should hearten EI4E, who is one of those who, working very hard at VHF, is so far out on a limb that (apart from his very solid schedule with G2ADZ in N. Devon) he does not often get a contact. G3GPT got in with GI8DV/P and GW5SA/P for two new counties, and also worked five GM's over the period. During the opening, he noted that the GC's were actually stronger than the much nearer Midlands stations.

G2CIW (Cambridge) has had some very good 70 cm contacts — *see* Activity Report — and remarks that conditions and signal levels on the 430 mc band have never been better than on Sunday, 14th. On two metres, he also managed some nice GDX, including G2FO, who is the active two-metre station in rare Co. Durham. G2DVD (Slinfold, Sussex) is now fully equipped for 70 cm, with gear entirely separate from the two-metre outfit. He remarks that he was " pleased and surprised " with the European Contest results, as reported last month. We hear occasionally from G3IRW (Hoddesden, Herts.) and this time it is to report three more counties on 70 cm, putting him at 10C.

F8NS (Préfontaine) sends a calls h/w list, and says that he heard many more G stations than he could log ; his location is 60 miles south of Paris, and he only runs 15w. Guy of ON4BZ has great hopes of working OE, to make himself safer in the hot seat ! He has heard, and has been heard by, OE9BF ; a 40-element beam is going up and a new pre-amplifier on the converter !

GC2FZC (Guernsey) who worked a fine list of DX during the opening, mentions his best QSO's as EI2W, DJ1DC, G3GPT, G3IWJ, ON4BZ and PAØNO — and very nice, too. The actual total of stations worked, all on phone, was 63.

Three-Band Station

G3HBW (Bushey, Herts.) who is now involved on all *three* VHF bands, gives his best two-metre QSO's during the opening as EI2W, F8LO, G2FO, G3AGA, G3NT, G5VN/A and GI3GXP ; on 70 cm he worked G2BVW, G3HAZ, G3JHM, G3KHA, G5BD, G5LL and G5YV, with the latter, at 160 miles, the loudest 430 mc signal ever heard from beyond the horizon ; reports each way were S9+30 dB ! On 25 cm, Arnold has heard G3GDR at 27 miles, and his own phone (from G5DT) at 22 miles. These results are strictly QTH-to-QTH, and it is G3HBW's opinion that they could be repeated at any time. He evidently has a very good 25 cm converter, and is to be congratulated on his results. The G3GDR, G3HBW, G5CD, G5DT group are all CC only on the 1250 mc band.

This might be a good time and place to put forward the firm suggestion made by G6NB about what part of the 1250 mc band to use. His idea is that all 25 cm CC stations should congregate in the first two megacycles at the LF end — that is, 1215-1217 mc. The total allocation of 1215-1300 mc is embarrassingly wide, as obviously it is quite impracticable to search 85 mc. Unless all active stations *are* concentrated in some known frequency area, it will be impossible to find them. Experience on 430 mc, also a band which is really much too wide for our needs, has already shown the difficulties involved in searching a wide band with a sharp beam — CQ calls, and direct calls, are missed often enough on *two metres*, on which beams are much wider on a relatively narrow band. By taking the two LF megacycles at 1215-1217 mc, we also get the advantage of maximum valve and RF efficiences. But it does mean jettisoning any idea of trebling from existing 430 mc gear.

Dead-Line—

With a very heavy mail to cover this month, there is now space only to say a quick *au revoir*, CUAGN on December 7, all being well, and the final date is **Wednesday, November 21 certain,** addressed A. J. Devon, " VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Please use the full QTH as given.

TWO-METRE FIRSTS

G/DL	G3DIV/A-DL4XS/3KE	5/6/50
G/EI	G8SB-EI8G	23/4/51
G/F	G6DH-F8OL	10/11/48
G/GC	G8IL-GC2CNC	24/5/51
G/GD	G3GMX-GD3DA/P	29/7/51
G/GI	G3DA-GI2HML	29/6/49
G/GM	G3BW-GM3OL	13/2/49
G/GW	G5MQ-GW5UO	22/10/48
G/HB	G6OU-HB1IV	12/9/53
G/LA	G6NB-LA8RB	29/6/53
G/LX	G5MR-LX1AS	23/7/55
G/ON	G6DH-ON4FG	25/9/48
G/OZ	G3WW-OZ2FR	1/6/51
G/PA	G6DH-PAØPN	14/9/48
G/SM	G5YV-SM7BE	1/6/51
GC/DL	GC3EBK-DL3VJ/P	22/3/53
GC/EI	GC2CNC-EI2W	8/10/51
GC/F	GC2CNC-F9OK	17/11/53
GC/GI	GC3EBK-GI3GXP	14/9/56
GC/GW	GC2FZC-GW8SU	16/6/54
GC/ON	GC3EBK-ON4BZ	4/3/53
GC/OZ	GC3EBK-OZ2FR	2/3/53
GC/PA	GC3EBK-PAØHA	16/7/55
GD/EI	GD3DA/P-EI2W	30/7/51
GD/GM	GD3DA/P-GM3DAP	29/7/51
GD/GW	GD3DA/P-GW5MQ	28/7/51
GI/DL	GI3GXP-DL1SE	5/1/56
GI/EI	GI3GQB-EI2W	13/6/51
GI/GD	GI2FHN-GD3DA/P	29/7/51
GI/GM	GI2FHN-GM3OL	1/7/49
GI/GW	GI2FHN-GW3ELM	8/7/49
GI/ON	GI3GXP-ON4BZ	5/1/56
GM/DL	GM2FHH-DJ1XX	29/5/55
GM/EI	GM3BDA-EI2W	12/6/51
GM/ON	GM3EGW-ON4BZ	21/11/53
GM/PA	GM3EGW-PE1PL	22/4/53
GW/DL	GW5MQ-DL4XS	22/9/51
GW/EI	GW2ADZ-EI8G	19/4/51
GW/F	GW2ADZ-F3LQ	14/5/50
GW/HB	GW2ADZ-HB1IV	14/9/53
GW/ON	GW2ADZ-ON4YV	13/5/50
GW/PA	GW2ADZ-PAØHA	13/5/50
GW/SM	GW2ADZ-SM6QP	1/7/53
DL/OZ	DL6SW-OZ2FR	4/3/51
DL/SM	DL2DV-SM7BE	10/3/51
EI/DL	EI2W-DL3VJ/P	29/8/52
EI/F	EI2W-F8MX	9/8/56
EI/ON	EI2W-ON4BZ	21/9/51
EI/PA	EI2W-PAØFC	10/10/53
ON/LA	ON4BZ-LA1KB	4/7/53
ON/LX	ON4TR-LX1MS	? ?
ON/OZ	ON4BZ-OZ2FR	3/6/51
ON/SM	ON4BZ-SM7BE	2/3/53
ON/9S4	ON4BZ-9S4BS	8/9/56

***STOP PRESS* — MIDDLE EAST SITUATION**

Just as this issue was going to press, it was announced that SU, YI, ZC4 and 4X4 stations were prohibited from further amateur activity. It is probable that the close-down will be extended to all Middle East amateurs.

Interesting HT Supply Circuit

TWO DC VOLTAGES FROM ONE SET OF RECTIFIERS AND SINGLE HT TRANSFORMER

The circuits illustrated here have been developed by The General Electric Company Limited and are taken from their latest Technical Data Sheet on the DA42. Details of the DA42 used as a triode modulator were given in a recent SHORT WAVE MAGAZINE *design.—Editor.*

THE rectifier circuit shown in Fig. 1 is somewhat unusual in that one set of rectifier valves and one HT transformer are connected to provide two DC voltages, one of which is twice the value of the other.

It is evident that this circuit offers certain advantages over the conventional HT power pack arrangement, as regards both initial cost and component space required. The rectifiers are not equally loaded, but by using U19's this is no disadvantage, since the maximum rating for four U19's, in this type of circuit, is 500 500 mA at 4000v. DC.

Operation of the circuit is shown more clearly in Fig. 2. Two of the U19's and the components dotted in take no part in supplying the low voltage HT so that the arrangement resolves itself into a two-valve full-wave connection with the rectifiers inverted. The HV side utilises the four U19's but L2, L3, C5-C6 and C7-C8 (which are series connected condensers) take no part in the operation of supplying the high-voltage HT.

For C1, C2, C3 and C5-C6 with C7-C8, series-connected electrolytic condensers are recommended. With proper choice of values, the necessary working capacities are easily achieved. On the LV side, the input choke L2 must not be omitted.

Operating Notes

In a Class-B audio amplifier, for which this particular power pack was designed, a very large variation of anode current is called for as the drive (input) signal changes. The swing may be anything from 50 to 300 mA.

Since the internal impedance of the power

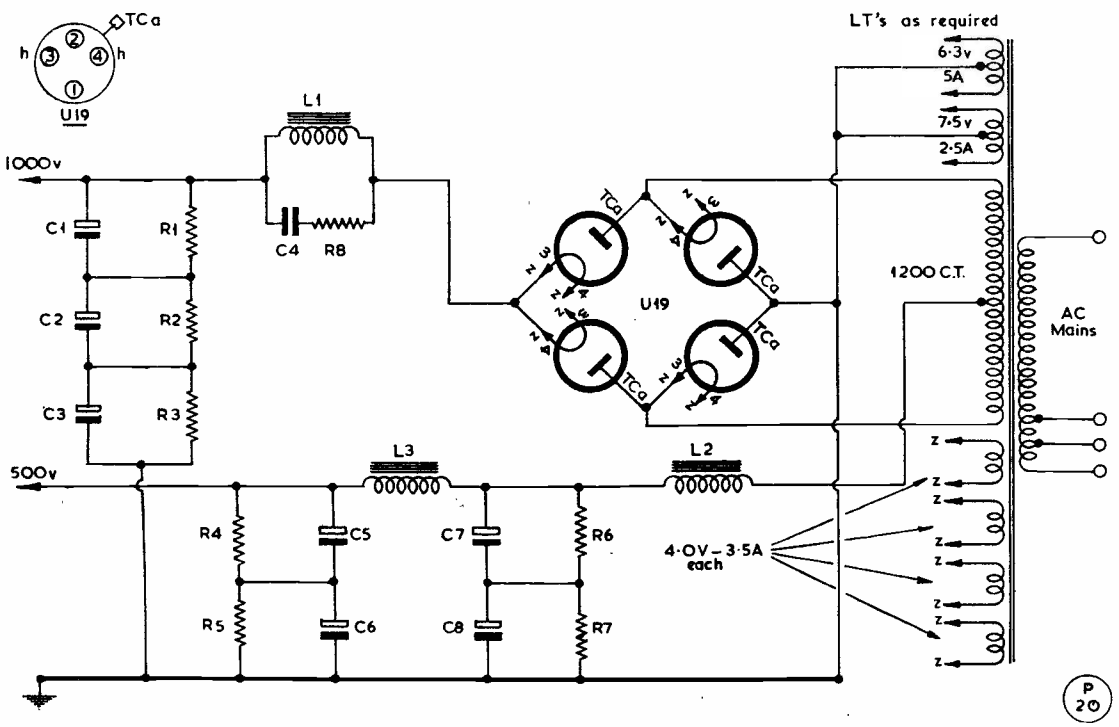


Fig. 1. The two-voltage HT supply circuit designed by The General Electric Co., Ltd., and described in the article. The system permits the use of one HV transformer to obtain two voltage outputs.

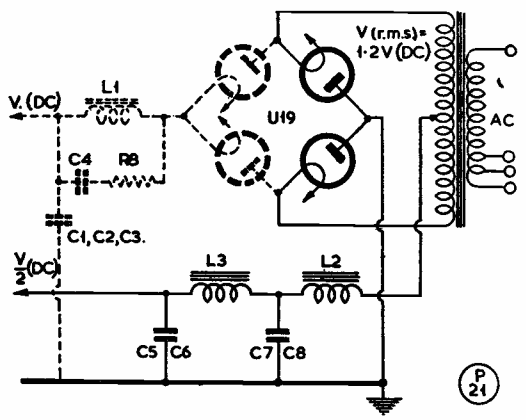


Fig. 2. This drawing divides the two circuits electrically, to show how each operates — see text.

unit produces some interaction between the 1000v. and 500v. supplies (in the circuit of Fig. 1) a sudden demand for maximum current would cause a reaction on the 500v. output if conventional condenser capacities were used for C1, C2, C3. The solution is to use three 450v. working 160 μF condensers in series, to give an effective 50-60 μF at 1350v. working. Resistors R1, R2, R3 across these condensers equalise the applied voltage. C5-C6 and C7-C8 are similar condensers.

Another circuit developed from the arrangement of Fig. 1 is shown in Fig. 3. In this, three bi-phase rectifiers are used. If the HV and LV DC outputs are similar, each valve is equally loaded. In this circuit, three G.E.C. U52's would provide 250 mA at the two voltages given by the single HT transformer, the rating of which must be equal to the total current load at the maximum required voltage.

Table of Values

Circuits of Fig. 1, Fig. 2 and Fig. 3

C1, C2, C3, C5, C6, C7, C8 = 160 μF, 450v. wkng, electrolytic

C4 = .01 μF, 1,500v. wkng, paper

C9 = .01 μF, rated for voltage used

C10, C11, C12 = Rate for circuit

R1, R2, R3, R4, R5, R6, R7 = 100,000 ohms, 1-watt

R8, R9 = 10,000 ohms, 1-watt

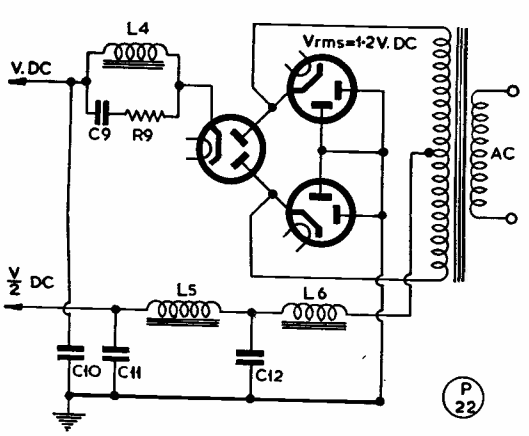


Fig. 3. With this arrangement three full-wave rectifier valves will give two voltage outputs at different current loadings from the one transformer.

NEW AUDIO OUTPUT VALVE — THE G.E.C. KT88

A new audio output valve, the KT88, with an anode dissipation of 35 watts, has been introduced by The General Electric Co. Ltd. This valve is a higher-power version of the familiar KT66, although it is smaller in size. It does not replace the KT66, but is complementary to it for output powers in excess of those readily available from existing KT66 circuits. An example of the usefulness of this new valve for public address equipment and modulator applications is that, at a supply voltage of 500v., with auto-bias operation, the available power output is 50w., or twice that obtainable from a pair of type KT66. At a supply voltage of 560v., with fixed bias operation, audio output power of 100w. is obtainable.

The KT88 has a larger cathode, allowing for a higher mutual conductance, and a more modern type of construction permitting the use of higher anode voltages and dissipations. It is designed for use mainly in a push-pull circuit and will operate satisfactorily as either a triode or a pentode. In the ultra-linear (UL) circuit satisfactory operation is obtained with the screen grids connected to tapping points including from 20% to 40% of the total turns of each half-primary. (KT66 on right, below.)

Conversion for the TA-12B Transmitter

CHASSIS CONSTRUCTION—WIRING UP—TESTING, AND COIL DATA

PART II

R. T. TORRENS (GI3FWF)

The first part of this interesting conversion appeared in the October issue of SHORT WAVE MAGAZINE. *It dealt with general principles and explained the necessary circuit modifications.—Editor.*

Before embarking upon the second part of this article, it is necessary to draw attention to the fact that the clamp valve V7 on the PA is a 6BW6, and not as given on the circuit diagram on p.402 of the October issue. It should also be noted that on p.400 the reference ought to have been to a 60-*ohm* load, and not as stated, while the PA drive current for 160-metre operation should have been given as 0·1 mA.

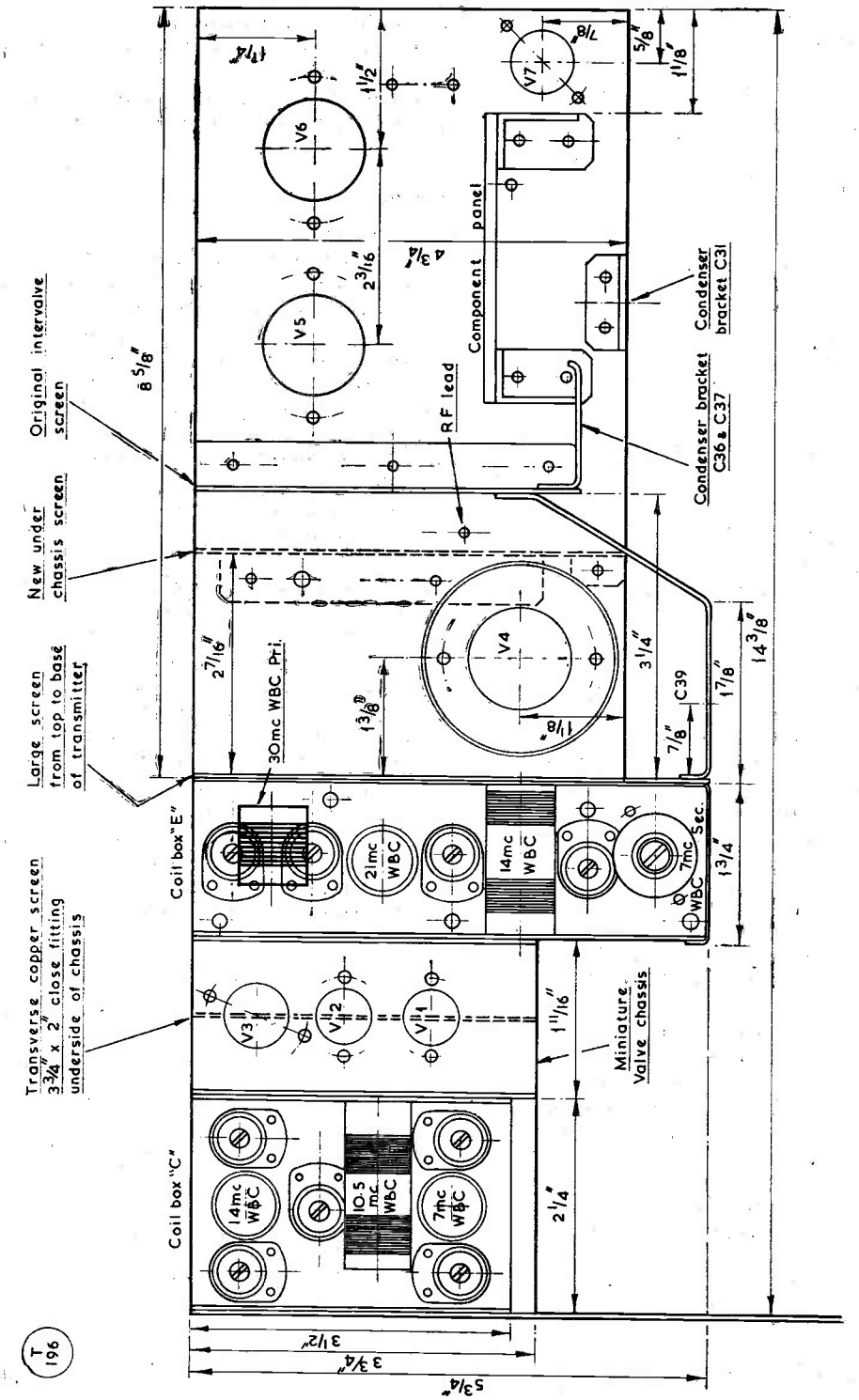
ALUMINIUM in 18g. is used for all screens and new chassis construction. The original chassis is removed completely and, after modifying the PA tank circuits, a large screen is made to the dimensions in Fig. 3 and bolted to the side of the VFO housing as illustrated in the photographs. This sheet completely screens the multiplier chain from the power stages. A new chassis, $8\frac{5}{8}$ x $4\frac{3}{4}$ inches, is made with all sides turned down $\frac{1}{2}$-inch and holes are punched for the valves and other items, as in Fig. 2. The new chassis is bolted in place 4 inches above the base of the transmitter, which is about the position occupied by the original chassis. An apron is made for each side of this chassis, Fig. 5, and an under-chassis screen, Fig. 4. The chassis for the miniature valves is 1 11/16 inches by $3\frac{3}{4}$ inches and is made from an aluminium sheet $5\frac{3}{4}$ x $2\frac{3}{4}$ inches; the sides are turned up $\frac{1}{2}$-inch and notched out 2 inches from one end so that the end can be turned up 2 inches and bolted to the VFO housing—*see* Fig. 2. Two coil boxes are made so as to finish $3\frac{1}{2}$ x $2\frac{1}{4}$ inches and $5\frac{3}{4}$ x 1 11/16 inches respectively. The sides are turned up $2\frac{5}{8}$ inches and the ends are left open, except in the case of coil box "C," which requires the floor turned up $\frac{1}{4}$-inch at the VFO end to allow space for the RF leads to pass down to the switch, below, from the VFO. The coils and condensers are mounted in the boxes and wired up before the boxes are bolted into place, as in Fig. 2. The coil turret, section "G," for the PA grid compartment is built round two ceramic switch wafers which are bolted to the screen illustrated in Fig. 4 and wired up; the screen is not fitted to the chassis till most of the wiring is complete. Two small brackets are required for the Eddystone variable condensers C31, C36 and C37.

Band Selector Switch S1

Switch manufacturers seem prepared to supply switches to specification. A great variety of standard wafers is available from which to choose, and these are spaced out, on side rods, to suit requirements. At first it was intended to control all wafers associated with band changing from a single knob. However, one supplier drew attention to the heavy torque, suggesting that it was unlikely that the index mechanism would register properly and that "such a switch would never be allowed to leave the factory." In the meantime, a switch had been made up from "surplus" wafers. It proved quite easy to add the necessary extra contacts, by using 8 BA brass screws instead of the usual rivets; this works very well provided the nuts are locked with a drop of solder. Thus, four-way wafers were converted to eight-way and the index mechanism locks nine wafers, including two ceramic wafers, quite accurately. This switch is operated from the side of the transmitter and an additional switch, S2, is used for tank selection and operated from the front panel — *see* p.401, October *Short Wave Magazine*. The two extra contacts on S1 wafers are not required for the circuit as described here and are fitted for the possible addition of a VHF section which, at the time of writing, is not complete. Perhaps a disadvantage of the home-made switch for S1 is that it does not short out unwanted coils; however, no trouble is caused provided the coils are *all* tuned properly and mounted alternately vertically and horizontally, as mentioned in the circuit discussion in Part I.

Wiring

The transmitter is very stable and no trace of parasitics can be found. This result was obtained partly by the layout and screening described and partly by certain precautions, which were found necessary, during wiring.



BENDIX TA12-B NEW CHASSIS PLAN

Fig. 2. The modifications for the main chassis layout for the TA-12 conversion, discussed in the text. This sketch should be compared with the plan view photograph in Part I, on p.405 of the October issue. Detail dimensions for the various screening partitions are given in the other drawings. The general arrangement will be clear by examining an actual TA-12 chassis.

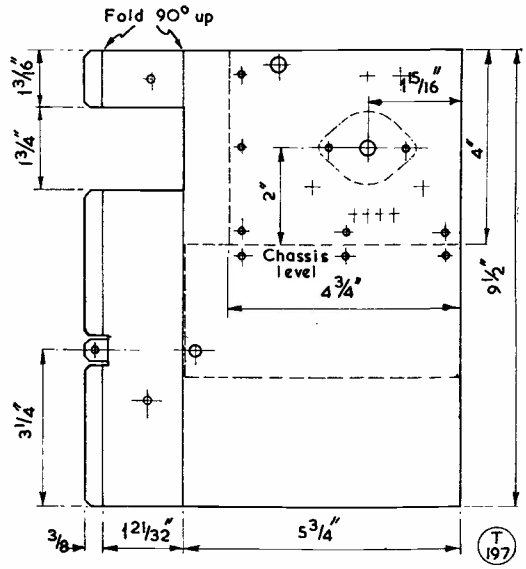


Fig. 3. The large dividing screen, as viewed from the VFO side with the transmitter inverted.

The ceramic trimmer condensers for wide-band couplers are earthed by plastic covered leads of about ¼-inch in length. Holes are drilled, where necessary, so that these very short leads can be taken through to the underside of the chassis and grounded. This method works well, and, at the frequencies concerned, is satisfactory. Any attempt to wire the trimmers right back to the common grounding point for the appropriate valve seems hopeless from the point of view of stability, owing to the length of lead required.

Transverse Screen. A very useful device is the transverse copper screen 3¾ x 2 inches (*see* Fig. 2 under miniature valve chassis), which divides each miniature valve holder and does a lot towards isolating the anode circuit from the grid side of each valve. It is very carefully cut out to fit close to the chassis and the under side of the ceramic valve holders. The screen is rigidly mounted and grounded to chassis, by ⅜-inch copper strip, at each valve. Copper is used in order that all connections to the screen can be soldered, *e.g.*, valve holder, spigots, etc. The screen also helps to simplify wiring as it is quite in order to ground DC circuits, such as grid and cathode resistors, to it.

Decoupling Condensers. C15 and C19 are mounted inside their respective coil boxes and are secured to the side of the box. Grounding is by the method described for trimmers. C124 and C28 are also earthed in this way, except that brass strip is used instead of plastic covered wire.

Screen and, especially, cathode by-pass condensers, are not permitted even ⅛-inch of unnecessary lead.

Tuning

A BC221 frequency meter is used to calibrate each VFO for the bands which it controls. Some of the wide-band couplers and coils are not easily accessible for adjustment by grid dip oscillator and these are peaked with the aid of a calibrated receiver while observing the grid current to V3 and V4; S3 is left open for this operation, *i.e.* no HT applied to V4 anode or screen. The VFO, in each case, is set a little higher than mid-band frequency and all coils in section "C" are peaked first, followed by those in section "E." Next, switch S3 is closed and grid current to the PA is observed while coils in section "G" are peaked. Starting with the ten-metre band, the 28 mc inductance is adjusted till best results are obtained with C39 at maximum capacity, in which position it remains permanently. All peaking of drive during operation within the ten-metre band is by C40 only. The 15-metre band is then tuned by adjusting the ceramic trimmer at the anode end of the 21 mc inductance and C41 alternately till drive is maximum; subsequent tuning within the band is by C41. This arrangement works well and is perfectly satisfactory. Alternatively a wide-band coupler may be used for 15 metres with good results, as the band is narrow. The 20-metre WBC is very easy to tune. However,

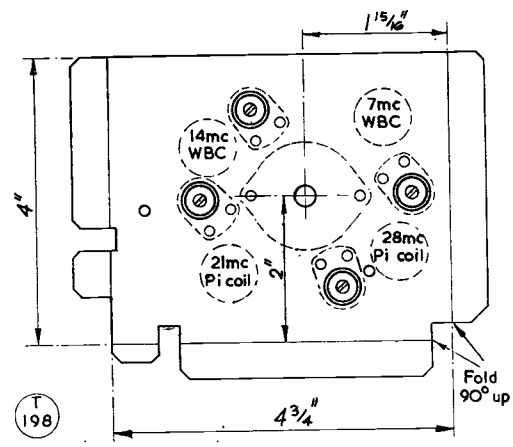
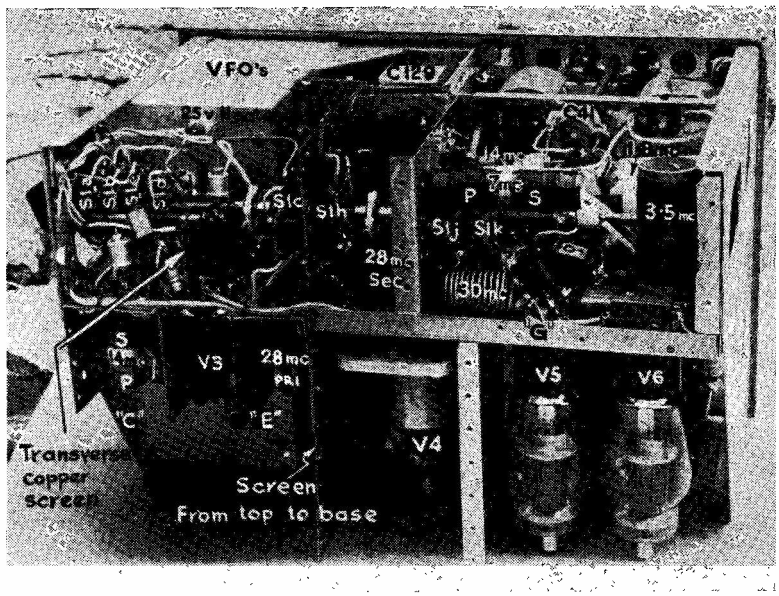


Fig. 4. Under chassis screen seen from the VFO with the transmitter inverted. The components are mounted on the reverse side.

the Forty, Eighty and One-Sixty metre WBC's can be quite difficult owing to the close coupling. The formers are cut in half and arranged to slide on a cylinder rolled from drawing paper, as described by G3ESV in a very useful article on the subject of wide-band couplers in *Short Wave Magazine* for July, 1951. Tuning adjustments are completed with loose coupling and then coupling is increased till the necessary band width is obtained. When tuning is complete, drive remains reasonably constant at different frequencies within a given band.

Section "K". With 350 volts HT applied to the PA, 4 mA drive and a 70-ohm lamp load connected *via* a short length of co-axial cable to the output socket, the PA pi-network tank circuits are easily tuned by normal procedure. C142 is set at 28 degrees and, commencing with the ten-metre band, C31 is adjusted for maximum dip in anode current followed by a slight adjustment of C142 for maximum output to lamp load and readjustment of C31 for maximum dip. A check on anode and screen current shows 125 mA and by swinging C142 about two degrees, either way, a very good demonstration is obtained of its loading effect on anode current, which will swing from about 100 to 150 mA. Next, the 28 mc inductance L3 is adjusted so that C31 is very close to maximum capacity for resonance at the low edge of the band (79° on VFO dial). The output is now connected to the aerial coupler unit and the link, aerial inductance tuning and feeder taps, are adjusted for maximum field strength, or aerial current, obtainable with 125 mA anode current.



Rear side-chassis view, showing the S1 switch assembly. S1h is in the grid compartment of V4, and the 10-metre WBC secondary is also visible, with the ceramic trimmers for 10 and 15 metres. In the PA grid compartment, the coils mounted to switch S1 are, in front, the WBC's for 40 metres, with the 20-metre coil behind and the 10 metre pi-coupling inductance below. On the right are the WBC's for 80 metres (mounted vertically) and 160 metres (horizontal white winding). An aluminium cover fits over the whole of this side of the tramsmitter.

The other bands are adjusted in the same way. Settings for the original tank inductances and condensers are given in Section "K" of the Circuit Description. For 160 metres switch S7 is closed and S6 open; grid drive is 0·1 mA and anode current 28 mA. (The meter reading includes also 14 mA absorbed by screen resistance network and screen current, so that the reading is actually 42 mA.) On all the other bands HT is increased to 600 volts and the PA loaded up to 200 mA.

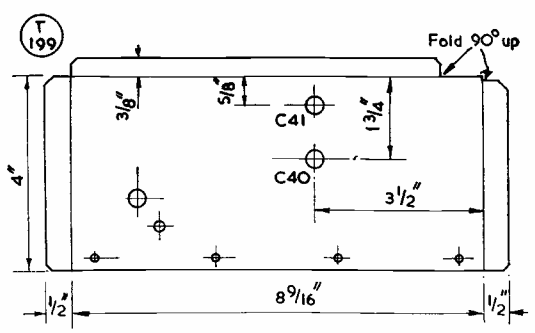


Fig. 5. The apron for the PA chassis, viewed from the rear with the transmitter inverted. The correct positioning of this, and the screens shown in Figs. 3 and 4, will be evident by examination of the actual transmitter chassis.

Screen Supply For PA

The PA anode supply can be put up to 750 volts and 150 watts input, *provided* R29 is increased to 35,000 ohms (by adding a 10,000 ohm 10-watt resistor) *and* a voltage stabilizer (CV188 or similar, or small 100-volt neon bulb) is included to act as an electronic switch, as explained in the A.R.R.L. *Radio Amateur's Handbook*, 1956, p.150. V4 is keyed and the circuit is very good for CW. A difficulty is

COIL WINDING DATA

Wide Band Couplers

(Circuit Fig. 1 p. 402 October refers)

Section "C" 7 mc = Pri 35 turns 32g. enam. close-wound on ¾-in. diam. former. spaced ½-in. from Sec. 28 turns on Sec.

10.5 mc = Pri 22 turns 28g. enam. on ¾-in. diam. former, spaced ½-in. from Sec. 22 turns on Sec.

14 mc = Pri 17 turns 24g. enam. on ¾-in. diam. former, spaced ⅜-in. from Sec. Spacing adjustable. 13 turns on Sec.

Section "E" 7 mc = Pri 30 turns 32g. SC/E on ⅜-in. Aladdin former, dust cored. Sec. 35 turns 28g. enam. on similar former at right angles to Pri. Coupling Pri/Sec. by single-turn links at coil centres, one side earthed.

14 mc = Pri 15 turns 26g. enam. on ¾-in. diam. former, spaced ½-in. from Sec. 15 turns on Sec.

21 mc = Pri 10 turns 24g. enam. on ¾-in. diam. former, spaced ⅜-in. from Sec. 8 turns on Sec.

28 mc = Pri 8 turns 20g. DCC on ¾-in. diam. former. Sec 7t 16g. enam. on ¾-in. diam. former 1-in. long. Coupling Pri/Sec by single-turn links made from light coax cable.

L4 = Suggested TVI trap coil: 8 turns 14g. enam., ¼-in. i.d., 1-in. long, pressed into Eddystone Type 763 former, fitted into Sec of 28 mc WBC. L4 tuned by 3-35 $\mu\mu$F ceramic trimmer.

Section "G" 1.8 mc = 37 turns 32g. SC/E on 1¾-in. diam. former, spaced ⅜-in. from Sec. Spacing adjustable. 41 turns on Sec. Mutual coupling coil 45 turns 34g. DSC on ⅜-in. diam. Aladdin former.

3.5 mc = Pri 32 turns 24g. enam. on 1¼-in. diam. former, spaced ⅜-in. from Sec. Spacing adjustable. 32 turns on Sec.

7 mc = Pri 28 turns 24g. enam. on ¾-in. diam. former, spaced ½-in. from Sec. Spacing adjustable. 28 turns on Sec.

14 mc = Pri 12 turns 24g. enam. on ¾-in. diam. former, spaced ½-in. from Sec. 11 turns on Sec.

21 mc = Pi-coupling, 14 turns 16g. enam., ¾-in. i.d. by 1½-in. long.

28 mc = Pi-coupling, 11 turns 18g. silver plated, ¾-in. i.d. by 1¼-in. long.

Section "K" (PA) L1, 12 turns 1-in. i.d. by 2-in. long, 14g. silver plated.

L2, 7½ turns ¾-in. i.d. by 1⅛-in. long, 14g. silver plated.

L3, 8 turns ¾-in. i.d. by 2-in. long, 11g. silver plated.

RFC1, RFC2, RFC3 = 2.5 mH 250 mA Eddystone Type 776.

RFC4 = 32 turns 16g. enam. ½-in. diam., close-wound.

RFC5 = 10 turns 14g. enam. ⅝-in. diam., 1½-in. long.

RFC6 = 1.25 mH Eddystone.

RFC7, RFC8 = 5 turns 22g. enam. ¼-in. diam., ⅜-in. long, in parallel with original anode stoppers.

that when the PA screen potential is 250 volts, the final potential at the anode of the 6BW6 clamp is 340 to 350 volts, which is above the manufacturer's 315 volt rating. However, the current is less than 3 mA and trouble is, perhaps, unlikely. It may be eliminated by slight increase either in R29 or in grid drive. The clamp is working extremely close to cut off, which is ideal as any decrease in drive results in heavy clamp current and fall in PA screen potential. A two-pole switch is required to restore the correct resistance for R29 and short circuit the CV188 for phone operation at 600 volts HT. There is no difficulty with the clamp on phone as the drive is then 9 mA and the 6BW6 (connected as in Fig. 1, p.402, October issue) remains cut off up to 600 volts PA screen potential. An actual test indicated 0·4 mA at 620 volts.

For Class AB1, with −30 volts fixed grid bias, the 250-volt stabilized supply is preferable for the screen, provided this and the BA anode supplies are controlled by a single On/Off switch.

THE RADAR ASSOCIATION

In the 1956-57 lecture programme organised by the Radar Association, under the chairmanship of Sir Robert Renwick, Bt., K.B.E., the next, to take place on November 14 in the Anatomy Theatre, University College, Gower Street, London, W.1, is on "Infra-Red — Its Problems and Possibilities," by Dr. F. E. Jones, M.B.E., B.Sc., Ph.D., A.M.I.E.E., of Mullard Limited. It might not appear that the subject has much bearing on radionics, but Dr. Jones will show that it has. His lecture, to which non-members of the Radar Association are equally welcome, starts at 7.30 p.m.

BVA PRICE FIXING ABANDONED

The British Radio Valve Manufacturers' Association announces that it has discontinued all arrangements for collective resale price maintenance on the part of member firms. But the BVA also points out that although prices are no longer fixed by any Association agreement, it does not necessarily follow that there will be any change in prices in the immediate future. The radio valve and CRT manufacturers are faced with rising costs in what is at present a period of recession.

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.

DL2ZT, F/Sgt. Allenden, M., 149 A.M.Q., R.A.F. Station, Oldenburg, B.A.O.R. 25.

DL2ZY, Cpl. Dale, G., Signals Section, R.A.F. Station, Gatow, Berlin, B.F.P.O. 45.

G2ATS, T. H. Felton, The Priory, Laceby, Grimsby, Lincs. *(Tel.: Laceby 330).*

G3BOQ, H. Griffiths, 28 Benson Road, Birmingham, 14.

GM3FLY, N. Jaap, 156 Adamton Road, Prestwick, Ayrshire.

G3JAZ, B. M. Poole, 1 Wayfield Grove, Harpfields, Stoke-on-Trent, Staffs.

G3JIO, P. R. Killner, 10 Stainburn Drive, Leeds, 17, Yorkshire.

G3JSW, D. K. Clarke, 188 East Common Lane, Scunthorpe, Lincs.

G3KKW, W. Willims, 15 Thornden Avenue, West Horndon, Brentwood, Essex.

G3KNQ, C. A. Bassford, 144 Alan Moss Road, Loughborough, Leics.

GM3KSI, R. Anderson, 25 Spylaw Park, Kelso, Roxburghshire.

G3KTK, A. Rozier, 4 Orchard Road, Icomb, Stow-on-the-Wold, Cheltenham, Glos.

G3KWO, K. W. Dawson, 41 Longton Street, Blackburn, Lancs.

G3KZR, I. S. Davies *(ex-ZB1ZR),* 19 Ridings Avenue, Winchmore Hill, London, N.21.

G3LBT, R. G. Storey, 1 The Hedgerow, Vange, Basildon, Essex.

G3LBZ, L. F. Jones, 55 Boma Road, Trentham, Stoke-on-Trent, Staffs.

G3LCJ, R. J. E. Mills, 251 Loughborough Road, Mountsorrel, Leics. *(Tel.: Quorn 28).*

G3LCU, E. Greaves, 47 Anchor Grove, Darwen, Lancs.

G3LCW, L. A. Hood, 45 Diana Gardens, Deal, Kent.

GW3LDC, J. T. Phillips, 19 Avondale Road, Pontrhydyrun, Cwmbran, Mon.

G3LDG, B. E. Gee, 12 West Grove, Bedford, Beds.

G3LDH/A, A. C. Wright, The Shack, Queen's Park Nurseries, Cross Hay, Handbridge, Chester, Cheshire.

GW3LDH, A. C. Wright, 17 Mainwaring Drive, Saltney Ferry, nr. Chester, Flintshire.

G3LDI, R. J. Cooke, 128 Drayton Road, Norwich, Norfolk.

G3LDK, Mrs. D. Anthony, 53 Stafford Road, Ruislip, Middlesex.

G3LDM, E. B. Mason, 158 Lower Richmond Road, Putney, London, S.W.15 *(Tel.: Putney 6187).*

GM3LDR, R. C. Rule, 12 Marchmont Road, Edinburgh, 9.

G3LDT, L. Bond, 16 Lowerfield Road, Macclesfield, Cheshire.

G3LDV, D. Aston, 7 Diana Gardens, Deal, Kent.

G3LEC, B. E. Waite, 62 Duchy Drive, Heaton, Bradford, Yorkshire.

G3LEE, G. L. Sharpley, 14 The Crescent, Flixton, nr. Manchester, Lancs.

GW3LEF, J. Wylie, 5 Boncath Road, Gabalfa, Cardiff, Glam.

GI3LEG, D. Wilson, 189 Cregagh Street, Belfast.

G3LEL, R. G. Lunt, 10 Hillside Close, Ronkswood Farm, Worcester, Worcs.

GI3LEP, A. Brown, 44 Scrabo Road, Newtownards, Co. Down.

G3LEQ, G. L. Adams, 5 Byng Road, Tunbridge Wells, Kent.

G3LEV, A. W. Parker, 31 Bournevale Road, Streatham, London, S.W.16.

GW3LEW, G. Weale, 25 Dyserth Road, Penarth, Glam.

GW3LEW/A, 4174298 J/T Weale, G., c/o "Transmitters," R.A.F. Station, Pembroke Dock, Pembs.

G3LEX, Sgt. R. Reed, 34 Sandyleaze, Elmbridge Road, Gloucester, Glos.

GM3LEY, J. Dunlop, Snr., 29 Douglas Street, Milngavie, *by* Glasgow.

GW3LFC, R. R. Copestake, 19 Glan-pwll, Nevin, Pwllheli, Caerns.

G3LFE, R. T. Clark, 176 Balmoral Road, Watford, Herts.

G3LFF, R. W. Chapman, 131 Worcester Road, Witton, Droitwich Spa, Worcs. *(Tel.: Droitwich 3348).*

GI3LFH, S. Allan, 18 Strandburn Street, Sydenham, Belfast.

GM3LFK, A. Ford, Heatherdale, Ardnadam, Nr. Dunoon, Argyllshire.

GW3LFM, M. F. Taylor, 20 North Drive, Rhyl, Flintshire.

G3LFP, J. Balderstone, 2 Elms Hill, Slaithwaite, Huddersfield, Yorkshire.

G3LFQ, P. C. Frizzell, 72 Glen Park Avenue, North Road, Plymouth, Devon.

G3LFR, I. A. Bunney, 25 Beaconsfield Place, Newport Pagnell, Bucks.

G3LGC, F. Collinge, 6 Harton Close, Shaw, Oldham, Lancs.

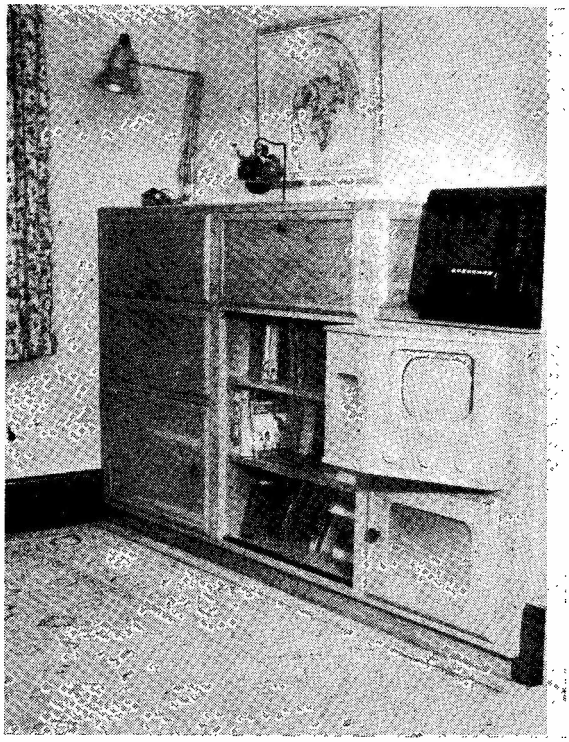
GM3LGM, W. McGill, 32 Devonview Street, Airdrie, Lanarks.

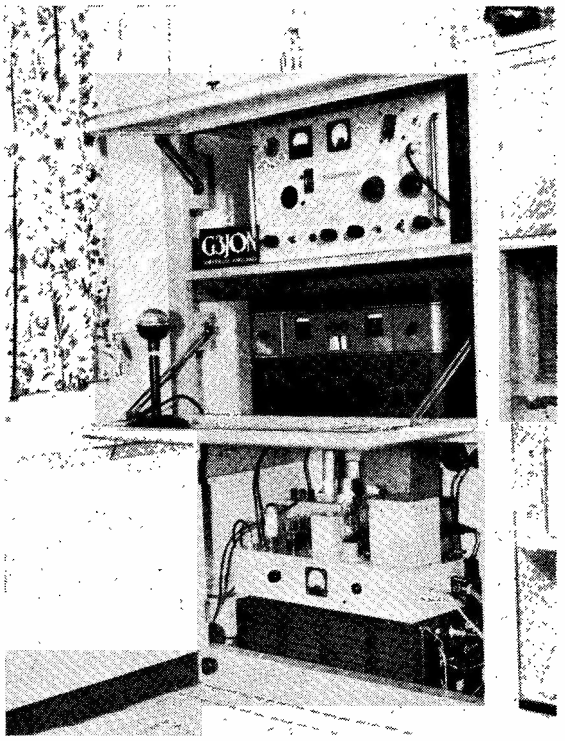
G3LGR, M. Hooles, 97 Ealing Road, Wembley, Middlesex.

G3LGU, R. I. Pryde, Ashleigh, Ellington, Morpeth, Northumberland.

G3LHA, R. L. Bastin, 112 Attoxhall Road, Coventry, Warks.

G3LHO, M. Oliver *(ex-MI3TM/VQ4EG),* 108 Cannon Hill Lane, Merton Park, London, S.W.20. *(Tel.: LIBerty 7810).*





The Other Man's Station

G3JON

HERE we have a fine example of a fully-operational amateur station designed to harmonise with the domestic scene, tailored to fit the space allowed by the XYL, and becoming part of the *décor* of a comfortable living-room.

The photographs show very well how G3JON—owned and operated by J. Bell, 25 Edale Road, Sheffield, 11—is laid out. When shut down, the only evidence of an amateur station in the corner of the room is the (rather nicely) framed copy of our *DX Zone Map*, trimmed to eliminate the lettering down the sides.

As G3JON puts it, there must be many other readers (and potential amateurs) who, living in the conventional semi-detached house and having a family to consider, are hard put to it to find space to instal a station without having to go out into the garage, or a shack in the garden. If the XYL insists on "all wires being concealed," the problem becomes even more difficult.

G3JON solved it by building a cupboard 7 ft. long into a corner of the room. Though very much a novice at woodworking, he did the whole of the construction himself—he says it took him the best part of two months, during which the room looked like a joiner's shop! The frame-work is of solid oak, with veneered plywood for the panels, the whole being finished to tone in with the decorations.

As regards the radio equipment, the transmitter is a G5RV-type, for which the wide-band couplers are of the home-made miniature variety (as described by G3JAM in the June 1953 issue of SHORT WAVE MAGAZINE) and the VFO is a Tesla, also based upon a *Magazine* design. The receiver is an AR77E and aerials in use are (1) a 102 ft. centre-fed wire, (2) a 21 mc ground-plane, and (3) a ZL Special in the roof space, cut for 28 mc. A Type 78 coax relay provides the aerial switching, and send-receive is controlled by the T/R switch on the AR77.

At first, modulation was by clamp control, as described by G3DIR in SHORT WAVE MAGAZINE for January 1954; this worked very well, the best DX with it being a ZL phone on 21 mc. Later, the modulator became the present push-pull 807 arrangement in AB2, and can be seen at the front of the bottom compartment; the speech-amplifier valve sequence is EF37A-6SN7-6SN7. The power supplies are fitted in convenient spaces, with 600v. as the maximum HT for the transmitter.

Since no wires must be exposed, the aerial feed

leads pass through a hole in the floor in a corner of the cupboard, and outside *via* a convenient air-grate. All power leads are screened and filtered, with external leads in coaxial cable. Full TVI-proofing has been achieved, it being possible to watch the picture while transmitting on 14 mc. On other bands, there is some slight "patterning" which is of no consequence.

Though G3JON does not pursue DX for its own sake, 52 countries have been worked, QSO's being taken as they come, whether DX or otherwise. Constructional work is preferred to DX-chasing—and in case anyone asks how he manages *that*, G3JON explains that he has yet another such built-in cupboard, used as a workshop, in an upstairs bedroom! In the book-case he has a complete file of issues of SHORT WAVE MAGAZINE since June 1946, and, in fact, has been a reader since his school-days, before the war.

AMERICAN MAGAZINE SUBSCRIPTIONS

Readers are reminded that we can accept, in sterling, subscription orders to American magazines such as *CQ* (44s.) and *QST* (36s.). Orders are remitted by us to the States, and though it may be up to three months before the monthly copies start coming through, there is no easier or quicker way of doing it. The same procedure applies to nearly all subscription orders to American periodicals, and not only to those we handle, which are technical and professional only, in all spheres of industry and engineering.

MOBILE RADIO COMMITTEE REPORT

The PMG has approved the recommendations in the 2nd Report of the Mobile Radio Committee, set up to advise him on matters affecting the users of VHF mobile services ("Business Radio"). This committee's 1st Report—*see* SHORT WAVE MAGAZINE, May 1955, p.143—was published in April last year, and made the much-discussed and strongly opposed recommendations about moving the mobile services out of Band III. The second report incorporates the revised allocation of frequencies amongst the various categories of users—such as industrial undertakings, ambulance and medical services, taxis and public utilities—which were laid down last year. This second report also makes proposals for introducing improved equipment to permit narrower operating channels; it is intended that 50 kc channelling (not much at 170 mc) should be adopted and become compulsory for all new services and equipment as from January next.

RCA TRANSMITTING TUBE MANUAL

We are glad to draw readers' attention to the latest edition of the *RCA Transmitting Tube Manual*, TT.4. This is a well-produced 250-page publication containing much engineering information and practical data on the application of RCA valve types, from both the amateur and professional points of view. In this country, copies can be obtained, price 12s. 6d. each post free, from the Engineering Products Sales Dept., RCA Great Britain Ltd., Lincoln Way, Windmill Road, Sunbury-on-Thames, Middlesex.

ALUMINIUM OFF-CUTS

Those who prefer to bend their own ali-chassis and panels may like to know that any local garage which undertakes body repair work usually stocks aluminium sheet in workable gauges. It follows that unwanted odd-shaped pieces, left over from various jobs, can often be had for a shilling or two, if not for the asking. Some of these pieces will certainly be large enough for radio chassis work.

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Dead-line for December Issue: NOVEMBER 16)

THERE is still time for any Club in the country to enter for MCC, the Eleventh Annual Top Band Transmitting Contest. Rules were printed in full on p.441 of last month's issue, and no prior notification of entry is necessary. *There are no log-sheets or entry forms.*

All that your Club has to do to become a participant in MCC is to have its Top Band station on the air for the Contest periods on November 17 and 18, 24 and 25. Contacts with other Club stations may be made four times—once in each of the four late-afternoon sessions, between the hours of 1600 and 1900 GMT. Each contact will score three points, giving a possible maximum of twelve for inter-Club contacts.

Stray contacts with non-Club stations are allowed only once during the whole duration of the contest, and score only one point—but as MCC is usually won or lost on these single-point contacts, do not neglect them.

Club stations call "CQ MCC"—non-competing stations are asked *not* to do this. Further, Club stations, instead of giving "QTH Surrey" or the like, give "QRA . . . *Club,*" always using the word "Club"" as their confirmation of the fact that they are actually competing.

So look up the rules in the October issue, get that Club transmitter radiating, and there's nothing to stop you from being one of the high scorers in this year's MCC. And even if you are not, remember that participation in the event as a Club is good all-round contest experience, and that the more of your operators who can be given this experience, the better chance your Club will have of winning the event on a future occasion. Position in the final table is not the *only* criterion of a Club's efficiency or interest in the event.

Note *para.* 8 in the rules, and see that the log reaches us by Monday, December 3. And so to this month's activity reports from the Clubs themselves . . .

Lancaster met on October 3 for a very informative lecture on Tape Recorders, by Mr. T. Halstead. The November meeting is devoted to two tape-recorded lectures. **Rotherham** have just published their first Club journal, containing all the local news as well as features of technical interest. Its title is "QTC."

Bradford have been welcoming members from Leeds, Halifax and Huddersfield to their meetings, and would be glad to see others from neighbouring areas. During the last month they have had lectures on a Simple Transmitter for Beginners (G3KEP), and An Introduction to Two Metres (G3GFD). Tape-recorded messages from G3HA, G5YV and G6BX were heard at the latter event. Next meeting is on November 20, and consists of a visit to Burley Street Repeater Station, Leeds (meet at Broadway, 7 p.m.). Normal meetings on alternate Tuesdays, 66 Little Horton Lane, Bradford, 5.

Gravesend meets every Thursday, 7.30 p.m., at 36 Pelham Road. All are invited. They will be taking part in MCC. **Liverpool** recently held a very successful AGM, and have changed their title from "Club" to "Society." They announce the A.N.W.R.S. Construction Contest, to be held on January 16, 1957, at the Wirral HQ. Note new secretary's name and address, in panel. Next meetings: November 13 (Inter-Club Quiz); November 20 (Constructional Contest); November 27 (Rummage Sale).

Brighton held their AGM on September 25 and elected their new officers (*see* panel for hon. secretary). An extensive programme of talks and demonstrations has been arranged for the coming season, when meetings will be held every Tuesday at the Eagle Inn, Gloucester Road. New members will be sure of a warm welcome.

Purley hoped to have a Two-Metre talk by G3JQN and G3KEQ at their meeting on October 19, but had arranged a discussion on Converters and Preselectors as a stand-by. The recent visit to the BBC Receiving Station at Tatsfield was very successful.

Wellingborough announce the following events: November 10, visit to works and shack of G3ICK, meeting at Kettering Station at 2.30 p.m.; November 29, talk on 70 and 25-cm Technique, by G3CGQ, of Luton, 7.15 p.m.

Sutton and Cheam will meet on November 20 (7.30 p.m. at the Harrow Inn, Cheam Village), and G3JXQ will speak on Mobile and Portable Working. This Club, too, will be active in MCC.

MULLARD FILM AT GRAFTON

Grafton extend a hearty welcome to other Club members and all who may be interested to attend their Special Meeting at 7.30 p.m. on November 22, at the Manor House Hotel, Finsbury Park, London, N.4. On this occasion the Mullard film, "Made for Life," a detailed story of their long-life TV Tubes, will be followed by a talk on the same subject by one of the firm's technical executives.

Light refreshments will be served, and anyone wishing to attend should write without delay to: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middlesex.

Belfast (City of Belfast Y.M.C.A. Radio Club) return to the fold after a long absence. They recently held their AGM and elected new officers—*see* panel for secretary's QTH. On September 19 they heard a talk by W1ZJQ on Amateur Radio in the U.S.A., and on October 17 a programme of recordings, including one of a BBC broadcast from the Club.

The *British Amateur Tape Recording Society* invites readers with tape recorders to apply for membership. Tapes of every kind are available for exchange among members—from a society bulletin right down to Rock 'n' Roll! There are vacancies for ordinary members, officials and area representatives. Apply to the hon. sec. (*see* panel) for full details.

The British Two-Call Club now boasts a membership of 164, many with a real multiplicity of calls such as GM3IAA/VS1AA/VS2AA/VS2AF, who is a recent recruit, together with G3AKX/VS1BS, G3KWJ/VP6NV, G3KYP/EI4BC, and VK9OQ/VK2AOQ.

Clifton have Constructional Evenings and Ragchews on November 9 and 23, a talk on the Progress of the Avometer on November 16, and a Junk Sale on the 30th—all at 225 New Cross Road, London, S.E.14. **Coventry** held their AGM at the end of September, and elected new officers, involving a change of secretary (*see* panel for name and address). Meetings continue, every Monday at 9 Queens Road, Coventry.

Cray Valley meet on November 27, 8 p.m., to hear Mr. L. Clinch talk on Natural Sound in the Home. He will demonstrate, with home-built equipment, how amateurs can make the best of the high-quality transmissions and recordings of to-day. Visitors will be welcomed. **Neath and Port Talbot** elected its officers at the AGM on October 2, and meets on the first Tuesday of the month at the Royal Dock Hotel, Briton Ferry. Several talks have been arranged, and the Club proposes to visit the Cardiff Club for their December meeting. Neath and Port Talbot will once more be an entrant for MCC.

MCC

Opens week-end November 17-18. All Club groups eligible to participate. Rules p.441 October. This event is a first-class opportunity for contest operating experience.

Newbury meet on November 9 to hear G2UJ speak as "An Amateur in Peace and War." On December 7 they have a programme of films. All meetings are at Elliott's Canteen, West Street, Newbury.

Plymouth now have a T.1154 and a WS-36 for transmission on Eighty and Ten metres. Visits to local power stations and BBC stations, as well as lectures at the Clubroom, have been arranged. Next meetings are on November 13 and 27, 7.30 p.m., at Virginia House Settlement, Barbican.

Grafton are now in full swing again. At their AGM they elected G2AAN president, G8PL chairman, G2CJN secretary, with GW3ALE, G2AHB, G8PL, G3AFC, G3RX and Mr. C. T. Bird as vice-presidents (*see* panel, also, for special announcement).

This photograph is of an interested audience at George Watson's College, Edinburgh, watching GM3BCD operating the /A station he has installed for the instruction of those boys who may have a bent for Amateur Radio. A lot of the gear has been lent by former pupils of the College who are now licensed amateurs in their own right. With excellent aerial facilities and 100 watts to a screen-modulated 813 on 14 and 21 mc, much interesting DX has been worked. The membership of the school radio club, the purpose of which is to bring boys up to R.A.E. standard, is about 30 and includes another of the masters at George Watson's, GM3LGP (at back, in gown). Like most school stations, they are badly in need of additional gear, which has mainly to be found from the boys' own resources.

Mitcham were visited by G4ZU on September 28, when he lectured on his Minibeam. On October 12 G3KIK gave a talk on the Decca Navigational Aids. Scheduled for November 9 — G3BCM on his Miniature Transmitter-Receiver, and for November 23, G3IIR on "Dressing Up the Rig."

Walsall remind us that they are still active, despite the lack of reports for some time. Since the AGM on October 10 the Club is on a better footing, with a chairman, programme secretary, treasurer and secretary shouldering the work—instead of leaving it *all* to "George." They now meet on the second and fourth Wednesdays, 8 p.m., in the Bradford Place Technical College, Walsall.

West Lancs. have decorated their clubroom in readiness for the winter, and will be holding a series of informal talks interspersed with the popular Junk

Deadline for next month's reports is: **Friday, November 16.** They should be addressed to "Club Secretary," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. All Clubs invited to report.

Sales. Visits to local places of interest are also being arranged, including one to the Port Radar Station, Gladstone Dock. Visitors and new members will be welcome at the Clubroom, over Gordon's Sweet Shop, 157 St. John's Road, Waterloo, Liverpool.

The **Radio Amateur Invalid and Bedfast Club** continue to put out their very informative news-sheet, "Radial." From it we learn that they propose to circulate a photograph album among members and local representatives, the idea being that each member to receive it should add his own photograph, with or without rig. "Radial" also contains personal news of many members, as well as some technical notes.

Ravensbourne now have a rebuilt transmitter with a Mini-exciter and an 813 PA. Two members recently sat for the GPO R.A.E. Their meetings are every Wednesday, 8 p.m., at Durham Hill School, Downham, Kent.

Romford have arranged an autumn programme which includes talks on Test Equipment (November 13), Audio Equipment (November 27) and two film evenings (November 20 and December 11). Meetings are held every Tuesday, 8.15 p.m., at RAFA House, Carlton Road, Romford.

Slade meet on November 9 for a talk on Microwave Technique by G3HHD; November 23 is fixed for their AGM; and on December 7 G2PU will lecture on the Labgear LG.300 Transmitter. The Club station, G3JBN, is available for the use of members every day of the week.

Spen Valley opened their season with a very successful Social Evening, and during October they had a talk by G8OK on "Old Tyme Radio," and a visit to N.S.F., Keighley. On November 14 they are due to visit M.R.G., Bradford, and meetings thereafter will be fortnightly. Note new secretary's name and address, in panel.

Stockport gather for a Hot Pot Supper on November 7, and for a Mullard Lecture by Mr. R. Webb on November 21. Recent meetings have been well attended, but new members are always welcome. Morse classes are now held under G6NM, and all meetings are at Blossoms Hotel, Buxton Road, Stockport.

Aldershot will be holding an additional meeting during December, to hear G6MB talk on his Antennamatch. This meeting will be in Farnham, not at the Club Hq. in Aldershot. Entry by ticket only (obtainable from the hon. sec.) for this meeting, which will be at 2.30 p.m. on Sunday, December 9.

Cambridge will be given a demonstration of 70-cm Equipment by G2XV and G2CIW on November 30, when they will meet at 8 p.m. in the Jolly Waterman, Chesterton Road. Full details of this and all other meetings from the hon. secretary (*see* panel).

In the Canterbury area, **East Kent** have resumed regular meetings at the Technical College, Longport Street. Several new members have been enrolled, and there is one new call-sign—G3LIG. R.A.E. classes have been started, with which good progress is being made, and it is hoped to have the Club's own transmitter on the air before long.

At **Nottingham,** the new honorary secretary of the "& District Radio Society"—as distinct from the Nottingham University group, which runs its own club organisation—is G3IQM. A recent lecture, which was of great interest, was by G3GGK, G3JWU and G3JWQ on Mobile Operation.

It is the intention that **Surrey** Radio Contact Club (Croydon) shall again be represented in MCC—but not, this time, by G3BFP, who has asked for a respite, though he will be "assisting in the struggle." Next meeting is on November 13 (Blacksmiths Arms, South End), when the lecture will be on the experiences of a radio operator with the Dutch Resistance during the war—it seems that he has quite a story.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ALDERSHOT: A. E. Redman, G2FNQ, 19 South Street, Farnham, Surrey.
BELFAST: R. J. Boal, 127 Hillman Street, Belfast.
BRADFORD: F. J. Davies, 39 Pullan Avenue, Bradford 2.
BRIGHTON: J. Trangmer, 33 Lennox Street, Brighton 7.
BRITISH AMATEUR TAPE-RECORDING SOCIETY: E. Yates, G3ITY, 210 Stamford Road, Blacon, near Chester.
BRITISH TWO-CALL CLUB: G. V. Haylock, G2DHV, 63 Lewisham Hill, London, S.E.13.
CAMBRIDGE: F. A. E. Porter, 38 Montague Road, Cambridge.
CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
COVENTRY: H. J. Bond, G3IHX, 12 William Bree Road, Coventry.
CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.
EAST KENT: D. Williams, Llandogo, Bridge, Nr. Canterbury.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
LANCASTER: B. Parker, G3KOQ, 125 Regent Road, Morecambe.
LIVERPOOL: W. D. Wardle, G3EWZ, 16 Mendip Road, Liverpool 15.
MITCHAM: D. Tilcock, G3JYV, 67 Fleming Mead, Mitcham, Surrey.
NEATH AND PORT TALBOT: G. E. Evans, GW2AVV, 121a Penycae Road, Port Talbot.
NEWBURY: N.A.D.A.R.S., 83 Newtown Road, Newbury.
NOTTINGHAM: R. I. Sills, G3IQM, 38 Montfort Crescent, Sherwood, Nottingham.
PLYMOUTH: C. Teale, G3JYB, 3 Berrow Park Road, Peverell, Plymouth.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
RADIO AMATEUR INVALID AND BEDFAST CLUB: W. Harris, 25 Playford Lane, Rushmore, Ipswich.
RAVENSBOURNE: J. H. F. Wilshaw 4 Station Road, Bromley, Kent.
ROMFORD: N. Miller, 55 Kingston Road, Romford.
ROTHERHAM: B. Taylor, 3 North View, Swallownest, Sheffield.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SPEN VALLEY: J. Stubbs, G3KNA, 5 Manor Street, Hartshead Moor, Cleckheaton.
STOCKPORT: G. R. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
SURREY (Croydon): S. A. Morley, G3FWR, 22 Farleigh Road, Selsdon, South Croydon.
SUTTON AND CHEAM: F. J. Harris, G2BOF, 143 Collingwood Road, Sutton, Surrey.
WALSALL: F. J. Merriman, G2FPR, 123 Wolverhampton Road, Walsall.
WELLINGBOROUGH: P. E. B. Butler, 84 Wellingborough Road, Rushden.
WEST LANCS: K. Wright, G3KVE, 24 Stuart Road, Liverpool 20.

SMALL ADVERTISEMENTS

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

TRADE

TELEVISION INTERFERENCE: Receiver Filters — High-pass E.5037, 30/-; Low-pass E.5031, 30/-; Composite Band I/III, 49/6. Transmitter Filter E.5034, 80 dB, 1 kW., £6. — Labgear (Cambridge) Ltd., Willow Place, Cambridge.

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

WANTED: BC-610 Hallicrafter, ET-4336 Transmitters and spare parts for same. Best prices.—P.C.A. Radio, Beavor Lane, Hammersmith, W.6.

QSL's and Logs by Minerva. The best there are.—Samples from Minerva Press, 46 Queen's Road, Brentwood, Essex.

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

RF26 UNITS, tuning 38-52 mc, £2 12s. 6d. Other units as previously advertised. Power packs available for all converters, £3 10s. 0d.. S.a.e. details. —G3FXB, 86 Cross Road, Southwick, Sussex.

CHEAP QSL CARDS (duplicated), return of post service, 13/6 per 200.—C.W.O. to Worthaprint Q.S.L.'s, 9 Links Road, Penn, Wolverhampton.

SITUATIONS VACANT

RADIO MAINTENANCE ASSISTANT WANTED. —Applications are invited for a Radio Maintenance Assistant to maintain radio and radar equipment in Lighthouses and Light Vessels. Candidates must possess a knowledge of the fundamental principles of radio and radar and must have had practical experience in the maintenance and use of such equipment. When not engaged at out-stations successful candidates will be required to work at the Trinity House Depot, Blackwall, London, E.14. The post is permanent and pensionable, and the salary scale is £515 rising to £690 (maximum linked to age 25). Highest starting pay is £575 per annum.—Applications to be made in writing to The Secretary, Trinity House, London, E.C.3, not later than 19th November, 1956, stating age, present occupation, qualifications, experience, and enclosing copies of testimonials.

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

T-1131 Mod. P/Pack, with extra 150v. 30 mA stabilized line, £9 (o.n.o.). Also following Woden items, all new, unused, perfect: UM3, PCF 13 (12H, 250 mA), DT3 (3-to-1 Driver), PTF 15 (6.3v. 4A. c.t.), PTF 16 (2-0-2v. 6A.). Offers ?—30 Priory Terrace, Stamford, Lincs. (G3HEE).

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: 80- to 10-metre PA, parallel. 807's, 145-watt; BC-348Q Rx, internal p/pack, band-spread 20 metres; B2 Tx driver for PA, modified all bands 160 to 10 metres; VFO for B2, also p/pack built in TU5B case; Naval 5G Tx, 75-watt internal p/pack; 6L6 CO 807 PA; RF24 converter, 20-15-10 metres, for BC-348. Comprising complete station, the lot £40. Buyer collects.—J. Dobson, 33 Thompson Avenue, Ormskirk, Lancs.

BC348R, power/pack and output stage, £10 (o.n.o.); Class-D Wavemeter, 230-250v., £4 (o.n.o.). Also valves, meters, etc., very cheap; must be sold. S.a.e. for list. — Cowie (GM3HHL), 24 Garden Street, Macduff, Banffshire.

AR88D: Tuning meter, manual, excellent condition, £45. Spares available. — McEwen, Seletar, Loudhams Wood Lane, Chalfont St. Giles, Bucks. *(Little Chalfont 2866).*

10-40 WATT Tx, enclosed, 160-80 metres, modulator, p/pack on rack, VFO, £12; "Soundmaster" tape recorder, almost new, less case and speaker, £20; Bendix TA 12-C, £2. Transformers, chokes and much junk for disposal.—Read, 4 Wendover Drive, New Malden, Surrey.

FOR SALE: An almost new unmodified AR88LF in faultless condition, £40. A Hallicrafters SX-25, 540 kc - 42 mc, with instruction book, £20. A BC-348L, mods. per *QST*, £12 10s. A Hallicrafters S-38C, 540 kc - 32 mc, 110 - 230 AC/DC, £12 10s. WANTED (part-exchange above, cash adjustment): BRT400D, Eddystone 680X, Hallicrafters S27 or S36. To clear: Five Type 6 unit with VCR97, etc., 22/6 each; new.—J. Lodge, 291 Beverley Road, Hull, Yorkshire.

GONE QRT, must sell as one lot: Mint condition BC342-N receiver; 150-watt modulation amplifier, including Tx power pack and bias supply (W.36 Set). Other gear and valves, including new 813 and 832. First £15 (buyer collects).—G3FVF, 17 Cygnet Avenue, Feltham, Middlesex. *(Phone 6125).*

WANTED: AR88 or similar receiver; must be in perfect operating condition.—Jones, 20 Stirling Street, West Hartlepool. *(Phone Hartlepool 5509).*

EDDYSTONE 740, mint condition, 8-inch speaker in cabinet; S-meter (home-built), earphones; £26 (or nearest offers).—13 Lee Road, Grangetown, Middlesbrough, Yorks.

EXCHANGE: Two-metre Tx, mod., converter, valved, all Government surplus modified, for low-power portable Tx/Rx (battery).—Wilton, Reids Avenue, Pitsea, Essex.

EDDYSTONE 680 Receiver and BC221 (mains), overhauled Webb's, for sale or exchange tape recorder, Hi-Fi equipment.—Enquiries, please, to: D. Read, 24 Broughton Gifford, Melksham, Wilts.

AR77E, in good working order, £20; prefer buyer collect, or deliver Cheltenham, Worcester area.—Ingram, 49 Lime Tree Ave, Broadway, Worcestershire.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Eddystone 750 Rx, perfect condition, complete with speaker and S-meter, £40. Delivered London area.—G3INC, 72 Torrington Road, Ruislip Manor, Middlesex. *(Ruislip 2730).*

WANTED: Two-motor Tape Deck for speech recording; commercial or reliable home-built job; up to £8 paid.—Details to Nicolson, 76 Greenbank Crescent, Edinburgh.

PANDA CUB Tx, unmarked and as new, £50; also Eddystone 750, double superhet Rx, as new, £45. Lancs.—Box No. 1811, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED URGENTLY: SX28 or similar receiver; perfect condition essential.—Offers to GW3HFG, 49 London Road, Pembroke Dock, Pembs.

SCR-522 TRANSMITTER with meter, crystal, speech amplifier, 6-volt valves, £4; M/W Q-5'er for BC-348, etc., noise limiter, boxed power/pack, £4; CC 10-metre converter, 30/-; RCA Te149 wavemeter, 6-volt valves, £3; B and W. tank coils, 80, 40, 20 metres, 15/- lot; six EF50 (red), 15/- lot; manuals for AR88, BC221, BC224A, BC312c/342C, SCR522, 5/-.—G3BAC, 17 Leahurst Gardens, West Bridgford, Nottingham.

TAPE DECK, Clifton 3-motor type, with oscillator, £7; also R/P amplifier for above with power/pack and speaker built in, £4. — Oliver, Bonehill Lodge, Tamworth, Staffs.

ZC1 MARK II, phones-mike-book, AC power/pack, £12 10s.; 7500 kc, 8146 kc crystals, 6/- each; home-made wide-band coupler, 80-10 meters, £1.—Hodgson, Hundleby, Spilsby, Lincs.

RCA AR88 for sale (trial can be arranged), £60 (o.n.o.).—Davis, Largo, Camden Road, Bexley, Kent. *(Bexleyheath 1547).*

WANTED: Either AR88LF without speaker unit and S-meter, or AR77 with S-meter; must be in mint condition. Please state price.—Mansfield, 106 Field Lane, Burton-on-Trent.

HRO SENIOR; all bandspread coils and coil-box, power/pack; new valves and re-aligned; perfect condition; £20.—GW8NP, 90, Maesycoed Road, Cardiff.

MINIMITTER 150-watt Transmitter, £65; HRO complete, £25. Both in good condition; buyer collects.—Enquiries: G2APF, 33 Christine Avenue, Rushwick, Worcester.

B2, complete all coils, manual and power/pack in original metal case, £15 (carriage 10/-); xtals at 10/- each; 7010, 7005, 3522, 3535, 3550, 3574. all ¼-inch spacing; Type 247 power/pack, 600v. at 200 mA, plus stabilized outputs at 280v., 140v. and 70v. (twice), £5 10s. (carriage 10/-). Command Tx, 3-4 mc, 100w. 2 x 1625 final, 80-ohm output, mint, £5; 160 Tx, VFO-BA-PA (807), £3; power/pack for same, 300v. at 100 mA, 6.3v. 3A, £3 10s.—J. D. Pearson, New Holland, Barrow-on-Humber, Lincs. (G3KOC).

SMALL ADVERTISEMENTS, READERS—*continued*

1224 RECEIVER, 1-10 mc, mains operated, speaker, £6; Type 22 Set Tx/Rx, new, £3 10s.—2 Cedar Road, Bromley, Kent.

WANTED: *Short Wave Magazine* for July 1955 and August 1955.—A. J. Reynolds, 62 Croham Valley Road, South Croydon, Surrey.

FOR SALE: 1155A circuit, factory-built power pack, in perfect condition, £9 10s., carriage paid. —S. Lewis, 20 Limethwaite Road, Windermere, Westmorland.

VALVES: QQV06-40's, 30/-; 829's, 20/- (bases 3/6); EL32's, 4/-; EC91's, 5/-; ECC91's, 12AT7's, 6/-; EC53's, 7/6; 5763's, 10/-; VFO, 7 mc output, 5763's, 50/-; Eddystone S640, £16 (o.n.o.). Xtals 500 kc, 5/-; 100 kc, 10/-; xtal mixers CS2-A, 5/-. Two-metre double-section skeleton slots aerial, £1. Please add carriage.—Box No. 1810, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HELP! HELP! HELP!—Circuit and other relevant information required on the Hambander Communications Receiver (Serial No. on the set, 587). No replies to my September plea, so "What say someone, please?"—West, 23 Palmer Road, Poole, Dorset.

RX/Tx No. 22 Set, 2-8 mc mobile; complete with vibrator pack, phones, mic., key, circuit diagram and handbook; excellent condition; £7, including carriage.—Massie, Wanowrie, King's Drive, Kingshorn, Fife.

AVO VALVE TESTER, roller type; in wooden case; in new condition; £10. Transformers: 500-0-500v. 200 mA, 4v.-4a. CT, £2 5s.; 24v. 6a., £2. Woden DTF filament, £1 5s.; Woden PTF 20 filament, £1 5s. Meters: 0/500 mA, 0/200 mA, 0/500 microamps., 0/3 amps. RF, 0/3000v. electrostatic, 6/- each, or £1 the lot. TU5B, cased, 10/-; chokes, 400 mA, 20H, 5/-. Valves: 807, 5/-; 100TH and base, 7/6; 25Z6 GT, 21A6, 6AB8, 17Z3, new, 5/- each.—Collyer, 20 Craigmount View, Corstorphine, Edinburgh, 12.

CLASS-D Wavemeter with mains pack, £5; G2AK vibrator unit, 12-volt input, 300-v. output, £2; "Q-Max" absorption meter/phone monitor, coils 20, 40, 15/-; dynamotor, 6-v. input, 250-v. 80 mA output, 7/6. Postage extra.—Bailey, 13 Heywood Road, Alderley Edge, Cheshire.

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