The SHORT WAVE Magazine

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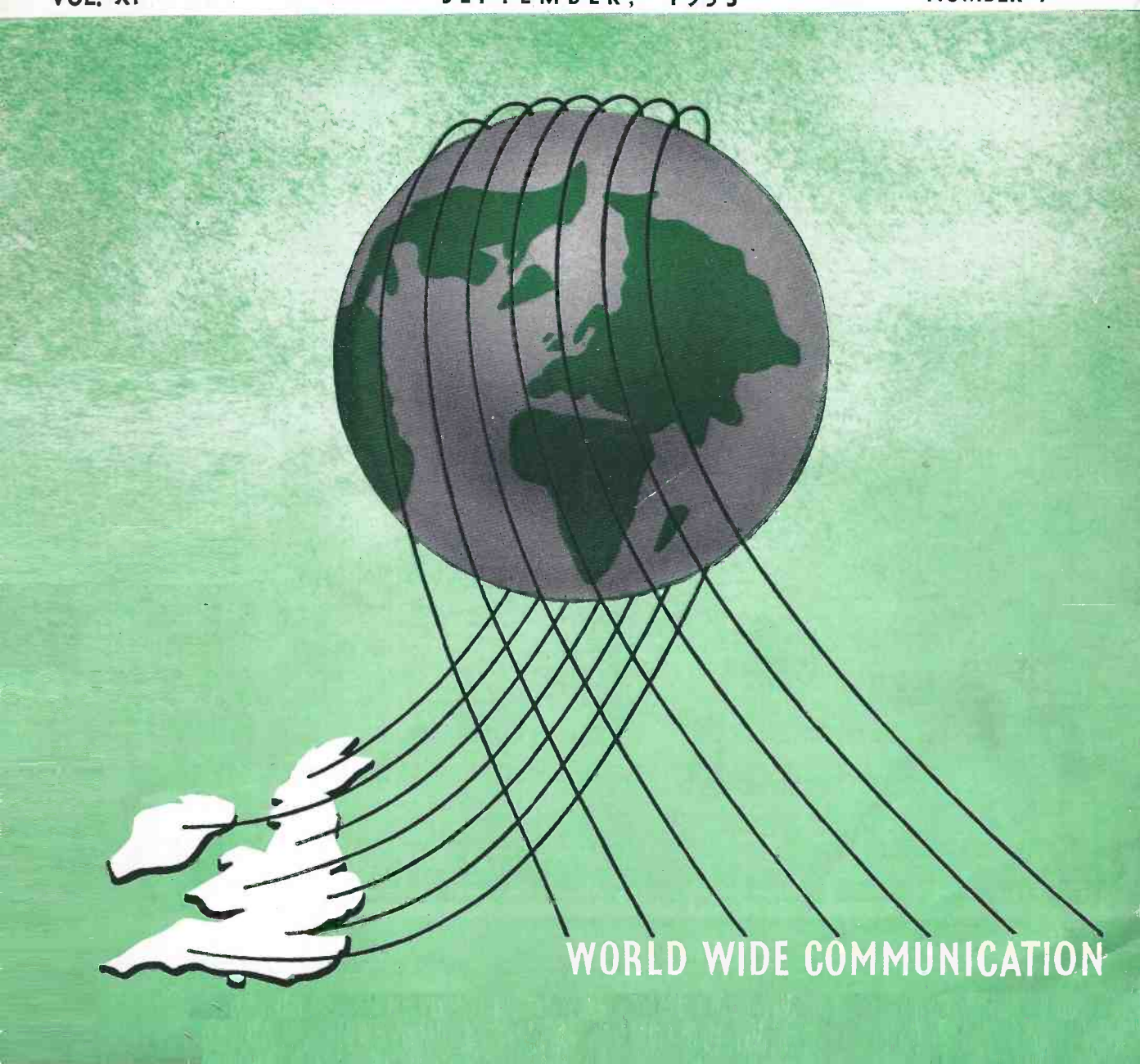
VOL. XI SEPTEMBER, 1953 NUMBER 7



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SHORT WAVE MAGAZINE

VOL. XI SEPTEMBER, 1953 No. 121

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AUTHORS' MSS

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FOR THE EXPERIMENTER AND THE RADIO ENGINEER

The SHORT-WAVE Magazine

EDITORIAL

Credit *Recently in this space (May and July issues) we have offered some opinions on the general subject of Interference, with particular reference to TVI.*

When the last paragraph of the July comment was written, we had not seen a very excellent, most informative and extremely interesting G.P.O. Memorandum entitled "Radio Interference Data," setting out the official findings for the year to January 1953. *Though this document—it runs to eight foolscap pages—would be well worth quoting in detail, there is space here only to give figures as they directly affect Amateur Radio activity.*

Of 47,152 *cases of BCI examined, only* 231 *were found to be due to amateurs. Of* 52,611 *investigated complaints of TVI, in* 424 *instances only were amateurs involved. These are most remarkable figures—so low as hardly to be worth expressing as a percentage—and they more than justify the statements made here in July. They reflect the greatest credit on British amateur transmitters, an active body more than eight thousand strong, distributed throughout the country, and using in the main self-constructed transmitting equipment.*

★ ★ ★ ★ ★ ★

Debit *Amateurs generally, and VHF operators in particular, will be alarmed and surprised to hear that—as warned in this space last month—an attack is about to be launched on our* 430 *mc band.*

It is proposed to meet the "increasing needs of low power civil land mobile services" (in other words, Business Radio) by letting them loose in the band 420-460 *mc, it having been noted "that amateur television* (sic) *has operated in the band for some years without any apparent interference"!*

These quotes are from a pamphlet circulated by the Ministry of Civil Aviation. While representations could be made through the proper channels, pointing out that nearly 100 *amateur stations are already in operation on the* 70-*centimetre band, with many more coming on in the foreseeable future, the fact is that* 430 *mc is allocated as a shared band—we only have it "subject to non-interference with other services."*

But it is to be hoped that Business Radio can be deterred, if not actually prevented, from establishing taxi-calling systems in the 432-438 *mc area, in which amateur stations are concentrated. "The pressure on frequencies in the VHF area" has developed rather sooner than we had anticipated.*

Austin Forbes G6FO.

Two-Band Switched Table Topper

100-WATT CW/PHONE TRANSMITTER FOR THE 14 AND 21 MC BANDS

J. N. WALKER (G5JU)

This is a new design, to SHORT WAVE MAGAZINE *specification, for the man who wants a neat table top transmitter, with a self-contained VFO and running a reasonable input, against the time when our HF communication bands will again yield DX. It has the additional merit of using readily available British valves and if constructed as specified will give ample RF output, under easy control; this can be matched into any end-on aerial system by means of the pi-section network incorporated as the PA tank. TVI-proofing has been fully considered, and ample drive is available for good phone working.—Editor.*

IN this article is described a cabinet or "table-top" transmitter designed for the two popular DX bands—14 and 21 mc. Either band can be chosen at will by the operation of two switches. A DC input of up to 100 watts is readily obtainable and this with a maximum anode voltage of 500, which is a great help towards an economical power unit. The latter is built into a second cabinet and full details will follow in a later article.

By the use of a pi-section output tank, the transformer matches well into almost any type of unbalanced aerial system, but a separate aerial tuning unit will be necessary where balanced feeders are used. Harmonic output is of a low order and unlikely to cause TVI in areas where a reasonable level of TV signal exists.

The main features of the circuits employed in the various sections of the transmitter are discussed in the following paragraphs.

Variable Frequency Oscillator

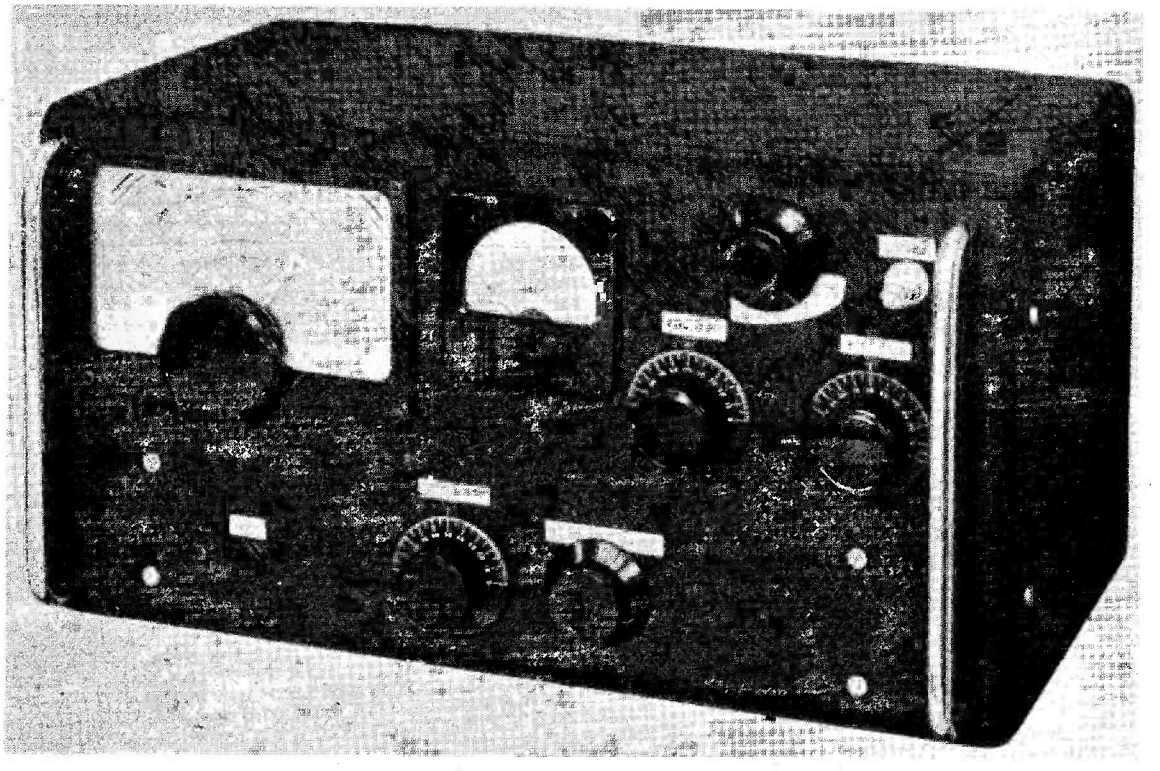
The circuit of the variable frequency oscillator is the standard one used by the writer in several similar instruments. It has been found to give complete satisfaction and other users, of whom evidently there are now quite a number, have reported very favourably on the excellence of such essential points (in a VFO) as frequency stability, clean steady note when keyed, ample RF voltage over the range covered, and generally freedom from any sort of trouble. An Osram Z77 valve (V1) is used, the fundamental frequency falling within the 3.5 mc band. All the components associated with the oscillator are mounted with adequate spacing between them and are away from sources of heat. The valve itself is mounted horizontally towards the rear of the chassis. No attempt has been made to screen the oscillator separately because, frankly, the writer cannot see that any good purpose would be served thereby! The circuit operates at a frequency well removed from that of the final power stages and proper decoupling ensures that no undesirable feedback effects occur.

A buffer valve (V2) follows and the type Z77 is ideal for this position. To build up a reasonable RF output voltage, the anode load at this stage is a coil wound to be self-resonant within the 7 mc band. The screen grid electrodes of both Z77 valves are held at a constant 150-volt potential, irrespective of variations in the HT line voltage, by the inclusion of a neon stabiliser valve (V7).

Sub-Amplifier Stage

A rather unusual feature is introduced at this point. In any transmitter, it is very desirable to have, if anything, more than enough drive, rather than have to strive for the last fraction of a milliampere in the PA grid circuit. Whilst admittedly overdriving is a bad thing from any point of view (and the more so when production of harmonics must be cut down to a minimum), an excess of drive originally does permit the introduction of anti-TVI features and any slight loss so introduced is of no consequence.

Again, there is the question of efficiency of the multiplier stage. As the handbooks will verify, a valve operating as a doubler or trebler requires much more drive than when it is functioning as a power amplifier. Therefore, whilst the N78 valve (V4) would probably function quite well if driven direct from the buffer stage, it will work all the better for having a higher drive voltage applied to it. Between the N78 and the buffer is inserted a



Exterior view of the VFO-controlled band-switched 14/21 mc transmitter. It gives about 60 watts of RF output with 500v. HT on the plates of the KT66's in the PA stage.

sub-amplifier, both input and output circuits being tuned to 7 mc. For the purpose an Osram triode type L77 (V3) has been chosen since the actual power level is low ; a triode is less prone to production of harmonics, and a high degree of stability can be achieved by neutralising. This neutralisation is carried out in the usual way and presents no difficulties.

Driver Stage

The amplified output from V3 is applied to the Osram N78 driver-*cum*-multiplier valve (V4), the anode circuit of which is tuned to either 14 or 21 mc, a ceramic Yaxley type switch being employed to select the appropriate coils. The output circuit is tuned to full resonance with a small variable condenser C20.

The key is inserted in the screen grid feed to this valve. It was found that the N78 is one of those valves which do not completely cut off the drive when the screen grid is at zero potential. The amount of residual drive is too small to be measurable but nevertheless it raises the standing current of the final valves by some 20 mA and may give rise to a "spacer-wave" signal under CW conditions. It can be prevented completely by providing some negative bias and this is accordingly arranged. The resistor used to feed in the bias voltage has a high value in order not to upset the working conditions.

PA Stage

A pi-section output tank circuit confers two major benefits—first, a good match can readily be obtained into aerials or feeders of widely varying impedance and, secondly, a worthwhile degree of harmonic attenuation is automatically achieved. This type of output circuit is therefore used here and, to enable an input of up to 100 watts to be realised at a comparatively low anode voltage, two Osram KT66 valves (V5 and V6) are employed, wired in parallel. The KT66 is an efficient generator of RF energy and the fact that it is of the single-ended type is not important since neutralisation would be required in any case,

to ensure full stability at the high frequencies involved. Naturally, the output impedance is low, which means that the circuit constants must be high capacity and low inductance—this, incidentally, is one of the factors which minimises the production of high order harmonics.

Neutralisation of the PA Stage

Whilst of course the same in general principle, the method of neutralising the PA is a little different in practice—it has to be, since both input and output circuits are unbalanced (single-ended). Special neutralising windings are put on the formers holding the V4 anode coils and these are connected, *via* the switch and neutralising condenser, to provide a voltage at the anode which is in phase opposition to that at the grid. Normally, neutralisation of a pentode valve calls for an extremely small variable condenser, since the grid-to-anode capacity is small. If, however, the RF voltage in the neutralising arm is of considerably lesser amplitude than that applied as drive voltage to the grid, the neutralising capacity must necessarily be larger than it would otherwise be, and the adjustment consequently becomes easier and more definite. To bring about this desirable state of affairs, the windings L6 and L8 are not tightly coupled to L5 and L7 and are also non-resonant, which latter fact also ensures that neutralisation holds good over an adequate range of frequency. It is, however, necessary so to proportion L6 and L8 that the same setting of the neutralising condenser C23 serves for both bands. Admittedly, two separate condensers could be used but that would mean more space and more wiring.

Grid Bias

There are several ways of ensuring that an undriven PA valve does not dissipate power beyond its rating, the two most common methods being fixed bias and the use of a clamp valve. Although the latter is popular at the moment, the writer for one prefers the simpler method of providing a moderate amount of "holding-off" bias, the extra bias for normal Class-C operation being obtained from the voltage drop across the grid resistor. This is the system adopted in the transmitter, a small portable HT battery (Ever-Ready B114 or similar) giving 67 volts meeting the case well, taking up but little room and having a reasonable life. For those who prefer it, there is no reason why a clamp valve should not be added, an Osram KT63 being recommended for the purpose.

Modulation

The transmitter is equally suitable for CW or telephony operation. For the latter the modulator output, of up to 50 watts, should be fed in series with the HT supply to the KT66 anodes and screens. The modulation transformer should be arranged to work into an impedance of approximately 2,500 ohms.

Power requirements

It is expected that full details of the companion power unit for this transmitter will be described in a later issue. In the meantime, for the benefit of those who may wish to carry out testing earlier or possibly to use power units to hand, the consumption is as follows:—Low tension heaters, 6.3 volts at 4 amperes; HT to exciter stages, 300 volts at 80 mA; PA stage, 500 volts at up to 250 mA—the Osram U52 valve is used to provide the

STAND 89, EARL'S COURT

By courtesy of the General Electric Co., Ltd., the prototype of the Transmitter described in this article will be on show in Demonstration Room D9 at the National Radio Exhibition

LIST OF PARTS

1	Cabinet and Panel Cat. No. 787	Eddystone
1	Chassis, Aluminium, 14" x 8" x 3".	Philpotts
2	Valves Z77 (V1, V2)	Osram
1	Valve L77 (V3)	"
1	Valve N78 (V4)	"
2	Valves KT66 (V5, V6)	"
1	Valve QS 150/45 (V7)	"
4	Valveholders B7G	
1	Valveholder Octal Bakelite (for V7)	
2	Valveholders Ceramic (for V5 and V6)	
1	Moving Coil Meter 0/200 or 0/250 mA flush mounting	Pullin
1	Full Vision Dial. Cat. No. 598	Eddystone
3	Direct Drive Dials " " 595 or similar	"
2	Knobs " " 2416P	"
1	Coupler " " 529 (for C1)	"
3	Couplers " " 50	"
1	Transmitting Condenser 50 + 50 $\mu\mu$F (C28) Cat. No. 612	"
1	Transmitting Condenser 500 $\mu\mu$F (C29) " " C12	J.B.
1	Variable Condenser 12.5 $\mu\mu$F (C1) Cat. No. 580	Eddystone
1	" " 100 $\mu\mu$F (C2) " " 585	"
1	" " 54 $\mu\mu$F (C20) " " 589	"
1	Neutralising Condenser 25 $\mu\mu$F (originally) C801 (C23)	J.B.
1	Neutralising Condenser 4.5 $\mu\mu$F (C14) No. 481	Eddystone
3	RF Chokes (Ch6, Ch7, Ch8) Cat. No. 1011	"
3	RF Chokes (Ch1, Ch2, Ch3) " " 1010	"
2	RF Chokes (Ch4, Ch5) " " 1022	"
1	Coil Former $\frac{5}{8}$" diameter " " 647	"
4	Coil Formers 1" diameter " " 646	"
3	Metal Brackets " " 708	"
2	Ceramic Switches 3 pole, 4 way	Webbs Radio
2	Lead-through Insulators Cat. No. 695	Eddystone
5	Miniature Ceramic Stand-off Insulators Cat. No. 1019	"
1	Telephone Jack (insulated)	Igranic
1	" Plug Cat. No. P40	"
1	10 way Socket " " 535	Eddystone
1	10 way Plug " " 534	"
9	Single-way Tag Strips.	
5	Three-way Tag Strips.	

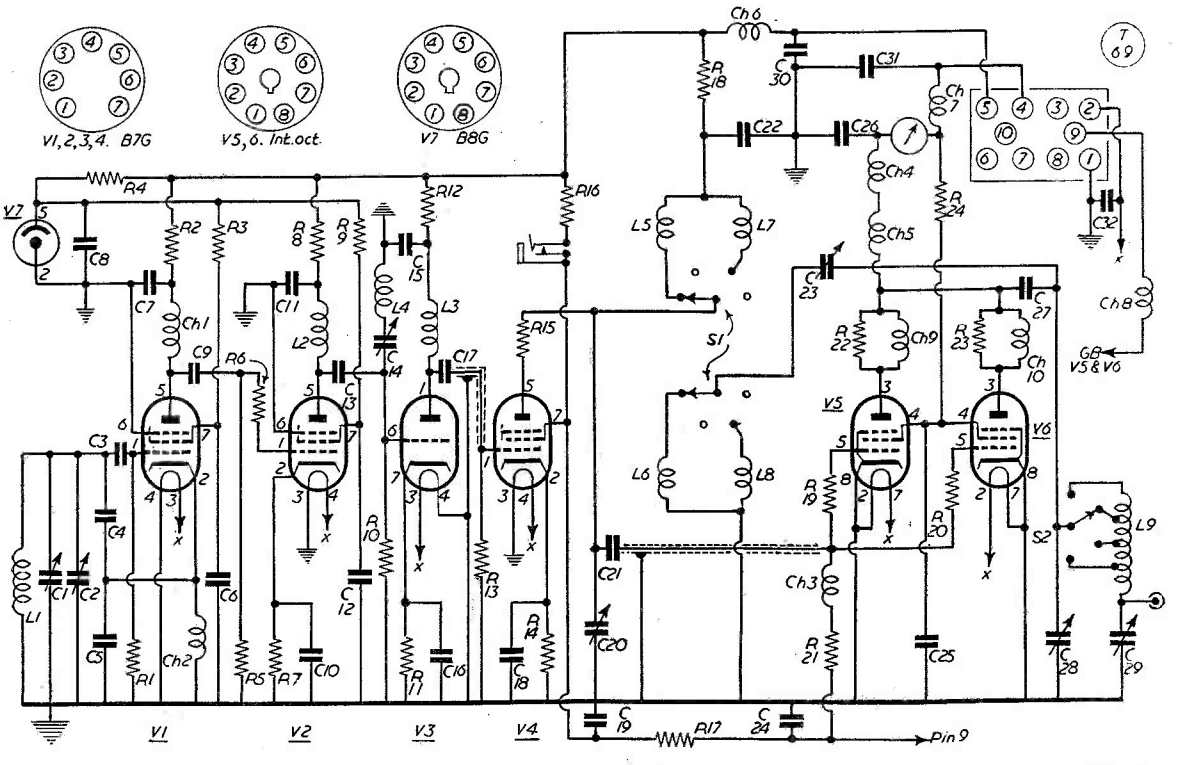


Fig. 1. Circuit complete of the Two Band Table Top Transmitter described in detail in this article. Ample drive is available for plate modulating the KT66's in the PA.

latter in the power unit to be described.

The connections to the power socket, as shown in the circuit diagram, may of course be varied where desired to suit existing power supply arrangements.

TVI Precautions

The leads to the power socket are each decoupled by what are in effect low-pass filters consisting of RF chokes (excepting here the LT supply) and Hi-K ceramic condensers, which latter have high capacity and very low inductance, and are therefore particularly effective in by-passing stray RF whether at harmonic or fundamental frequencies.

The lead to the grid of the N78 driver valve is made up of a length of coaxial cable which acts as a by-pass to high order harmonics and the same refinement is used in the grid circuit of the KT66 valves. Grid and anode stoppers are put in at various points to prevent any possibility of parasitic oscillation.

These precautions, added to the pi-section tank circuit, and with the transmitter totally enclosed in a metal cabinet, result in the harmonic output being low and no difficulty with TVI should be experienced except perhaps in fringe areas, where more stringent precautions will probably be necessary.

As shown, the output is fed to a lead-through insulator, for connection to a long wire aerial. This insulator can well be replaced of course by a coaxial socket, when the output can be transferred at low impe-

Table of Values

Fig. 1. Circuit of the Two-Band Switched Table Topper.

C3, C13, C17, C21	=	100 $\mu\mu$F Silvered Mica or Moulded Mica.
C4, C5	=	880 $\mu\mu$F Silvered Mica.
C6, C7, C10, C11, C12, C15, C16, C18, C19, C22, C24	=	.002 μF Moulded Mica Type M2N.
C8	=	.01 μF Metalmite.
C9	=	200 $\mu\mu$F Silvered Mica.
C25, C26, C27	=	.001 μF Moulded Mica, 750 v. working type M3U.
C30, C31, C32	=	.0011 μF Ceramic Hi-K.
R1, R13	=	33,000 ohms.
R2, R8, R11, R12	=	470 ohms.
R3, R9	=	1,000 ohms.
R4	=	7,500 ohms, wire-wound, 5 to 10 watt.
R5	=	100,000 ohms.
R6, R15, R19, R20	=	12 ohms.
R7, R14	=	220 ohms.
R10	=	22,000 ohms.
R16	=	20,000 ohms, 1 watt.
R17	=	470,000 ohms.
R18	=	500 ohms, 1 watt.
R21	=	10,000 ohms, 1 watt.
R22, R23	=	100 ohms.
R24	=	10,000 ohms, 2 watt.

dance to a separate aerial tuning unit or direct to a suitable aerial, *e.g.*, a dipole, through a length of 72-ohm coaxial cable. Where TVI is a problem, a low-pass filter (as recently described in these pages—see SHORT WAVE MAGAZINE, November, 1952) should be inserted in the output coaxial lead.

Construction

The drawings and photographs provide a good deal of information concerning the layout and construction. The following paragraphs are intended to make clear the finer details.

The cabinet is an Eddystone steel one, used in conjunction with a separate aluminium chassis measuring 14 in. x 8 in. x 3 in. deep. The two are fixed together with four 0 BA bolts at the chassis wall corners.

The holes as specified in the drawing are first made in the steel panel and, where necessary, holes to match then made in the wall of the chassis. The range switch S1 is mounted on a metal bracket set back about four inches from the panel and the variable condenser C20 is similarly fitted to a bracket three inches back. The spindles of these two components are aligned with the holes in the panel. These holes are bushed and short lengths of $\frac{1}{4}$ in. diameter brass rod used to complete the linkage with the flexable couplers and spindles.

Similarly the bandspread condenser C1 is mounted on top of the chassis to come into line with the spindle of the slow motion head. The PA tank condenser C28 is bolted to the chassis and again a flexible coupler and short length of brass rod used for control purposes. C29 is mounted directly on the panel with three 6 BA screws but it should be spaced back $\frac{3}{8}$ in. or so with small pillars, as also is the anode coil tapping switch S2.

Reverting to the VFO stage, condenser C2 is bolted to and above the chassis, so keeping the oscillator wiring short and practically all above the chassis floor. Details of the coil are given later—the one for the VFO is firmly secured on two small stand-off insulators. A small metal bracket measuring about $1\frac{1}{2}$ in. square supports the Z77 valveholder.

The components for the buffer stage are grouped closely around the valveholder. Tag strips are used liberally throughout the transmitter to hold small resistors and to act as anchoring points for decoupling condensers. The self-resonant anode coil L2 is held between the valveholder tag and a tag strip.

The former holding coils L3 and L4 is fixed with a 6 BA bolt in a position close to the front wall of the chassis and near it is the neutralising condenser. The coils for the N78 stage are near the associated tuning condenser and switch, and the wiring can be kept fairly short.

A ceramic lead-through insulator makes the connection through the chassis from the anodes of V5 and V6 (*via* C27) and small ceramic insulators are used to hold the Type 1022 RF chokes which feed HT to the PA valves. The grid stoppers are also held by a ceramic insu-

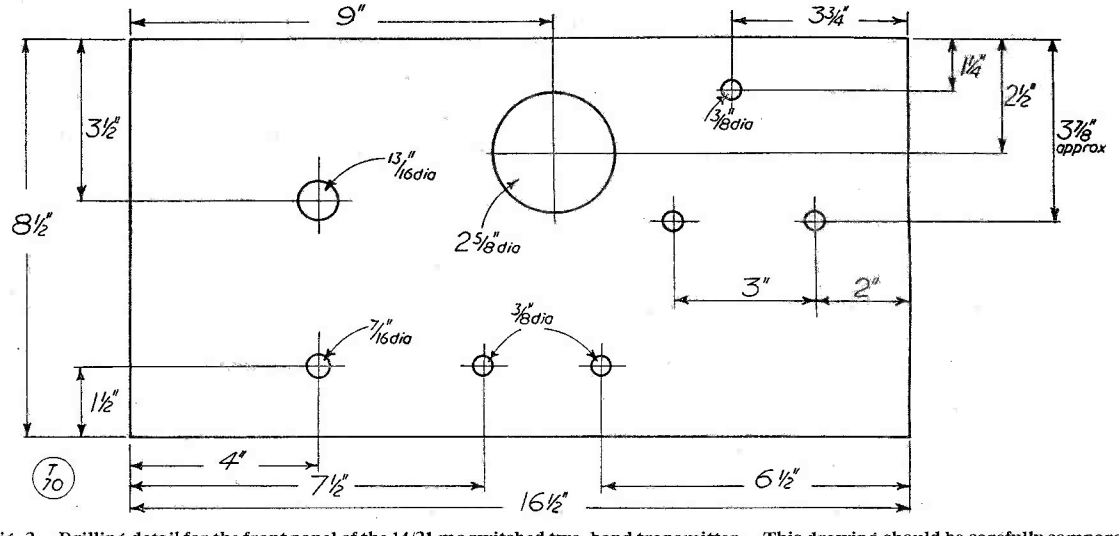
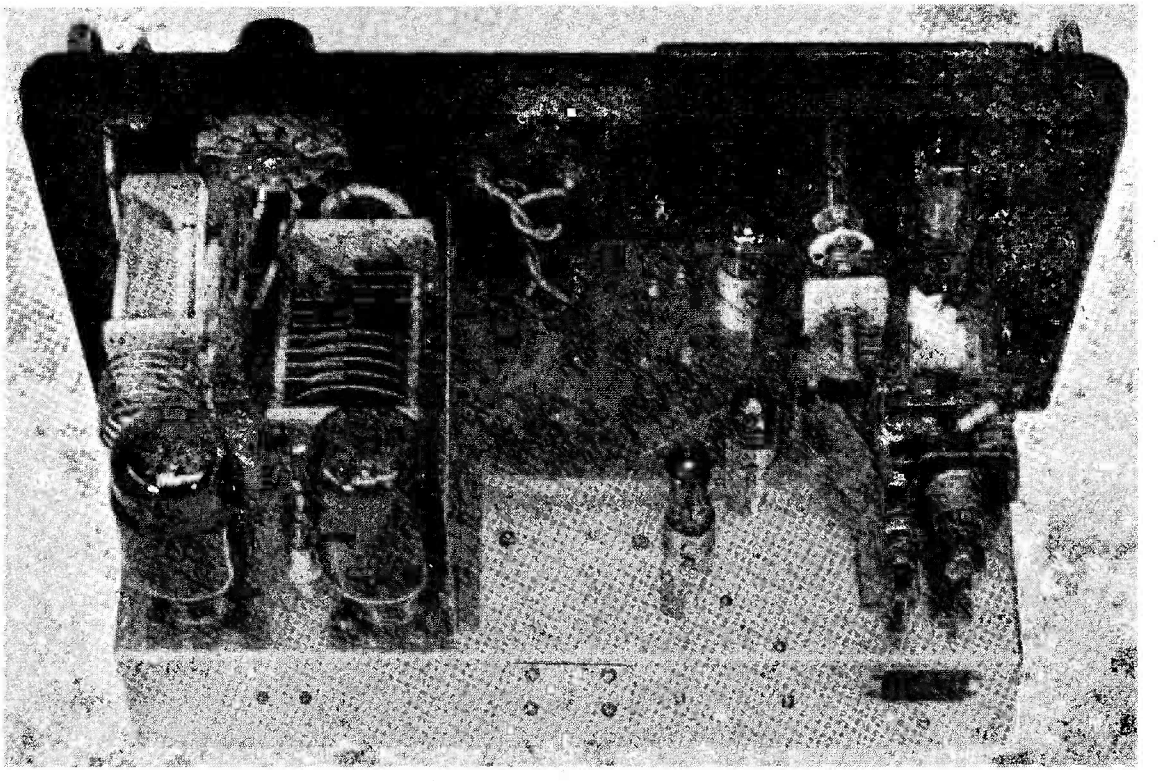


Fig. 2. Drilling detail for the front panel of the 14/21 mc switched two-band transmitter. This drawing should be carefully compared with the front panel view.



Rear chassis layout of the 14/21 mc band-switched transmitter, which runs Osram valves throughout with a pair of KT66's in the PA stage (left). This view shows many constructional details.

lator. The small chokes in the anode leads are formed by winding seven turns of 24 gauge wire on the ½ watt resistors R22 and R23—these chokes are marked Ch9 and Ch10 in the circuit diagram.

It is necessary to make up specially the mounting for the neutralising condenser, which is a JB type C801. As purchased, the capacity is 25 $\mu\mu$F and some of the vanes are removed to bring the capacity down to some 12 to 15 $\mu\mu$F. The condenser is bolted to a small piece of perspex, this being held off the chassis with a metal bracket. The requirements here are simply firm mounting, accessibility and short wiring. The neutralising condenser is so connected that no HT appears across its vanes—the spacing is inadequate for this.

Ceramic valveholders are used for V5 and V6—bakelite types will introduce too much loss. The two stator sections of C28 are wired in parallel and alongside the condenser and also shielding the valves is a metal screen measuring 6 in. x 4½ in. It is there mainly to minimise direct radiation on to the N78, since the latter has no screening can, and is undesirable because of the heat developed.

Incidentally, the transmitter is absolutely stable without any cans over the valves and heat dissipation is improved by omitting them.

The tank coil will appear to be on the small size—as it is—but, as mentioned earlier, this output circuit *must* have low inductance and high capacity. The coil is self-supporting, the ends being soldered to tags fitted on small stand-off insulators. Taps are taken each turn from the end remote from C29, to the ceramic four-way switch. All connections in this part of the circuit are made with ⅛ in. copper tape, since the current flowing can be quite high. The use of tape also minimises the inductance of the leads and it can easily be made by cutting up strips of copper foil. Where tape is not available, several strands of 18 or 20 gauge wire make a good substitute.

Wiring and Other Hints

Except in the RF circuits, the wiring is carried out with PVC covered flexible wire,

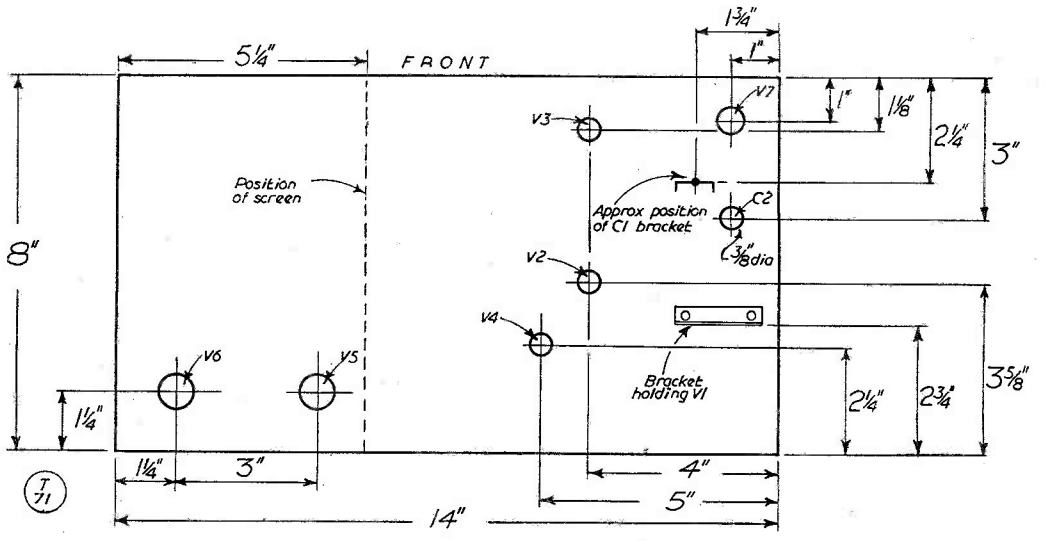


Fig. 3. Chassis drilling for the 14/21 mc Table Topper, which can be related to the half-rear view photograph. If the dimensions are carefully followed everything will fall nicely into place.

the leads being tucked away as far as possible around the sides of the chassis. All RF wiring is made as short as possible. A connection is taken from the rotor tag of each variable condenser to an earth point near the valve concerned, rather than reliance being placed on a random return path. The rotors of C28 and C29 are each provided with separate earthing tags and connections from these are taken down through, and insulated from, the chassis to the cathodes of the KT66 valves. Both spindles are insulated from the panel.

The hole specified for the meter is suitable for a 3 in. square flush mounting type but may of course call for variation in other cases. The single meter is adequate for making correct adjustments to the transmitter.

No key click filter is incorporated as it is assumed that such a filter will be fitted externally where required.

Notes about the Coils

Enamelled wire is used throughout, except for L9 which is bare copper. Details are as follows :

Oscillator Stage · L1 has twelve turns 24 gauge wire close wound on an Eddystone 646 former. The winding is situated centrally and kept as far away as possible from odd metal parts. An application of thin polystyrene varnish will hold the turns firmly in place. As mentioned elsewhere, one or two additional turns will be required if the full band is to be covered.

Buffer Anode · The L2 coil has 44 turns 30 gauge wire close spaced and centrally wound on a small 647 former, which is $\frac{5}{8}$ in. diameter. Thin wire is used to give a wide response within the 7mc band. A test with a grid-dip meter should show a rather broad resonance close to 7,000 kc, the valves, *i.e.*, V2 and V3, being in their sockets but not energised.

Triode Stage · L3 has 30 turns 24 gauge wire close wound towards one end (that remote from the fixing partition) of a 646 former (1 in. diameter). The second (neutralising) winding is commenced $\frac{1}{4}$ in. away from the inner end of L3 and is wound *in the same direction* to a total of 33 turns, 30 gauge wire. Care must be taken to make the connections the right way round—anode to outer of L3, HT to inner ; earth inner of L4 and take outer to C14. The coil former is mounted vertically with a single 6 BA bolt.

V4 Anode · Two 646 formers are required and they should be placed in position temporarily, when a mental note can be made of the points at which the windings should commence and finish, to give the shortest possible leads. The 14 mc coil—L5—has seven turns, 18 gauge wire and, spaced $\frac{1}{2}$ in. away, is the second winding L6, of nine turns, 24 gauge.

The 21 mc coil takes four turns, 18 gauge, for the main winding L7, and five turns, 24 gauge, for L8, again with a $\frac{1}{2}$ in. spacing.

As before, each pair of coils must be wound in the same direction and connections made, *via* the switch, as under "Triode Stage." Since only two points on each pole of the four-way switch are required, one tag is left blank between the two used, to give greater spacing.

PA Coil · For L9, a length of 30 in. of 14 gauge bare copper wire is straightened and polished. It is then wound around a former $1\frac{1}{4}$ in. diameter, and slipped off. The resulting coil will have six turns, the ends being soldered to tags fitted to two small stand-off insulators, these being bolted to the chassis $1\frac{1}{2}$ in. apart, behind L29. One end is taken to the stator of C29 and to the output terminal. The other end is connected to tag 4 on the switch, the other three contacts being taken to points on the coil one turn apart.

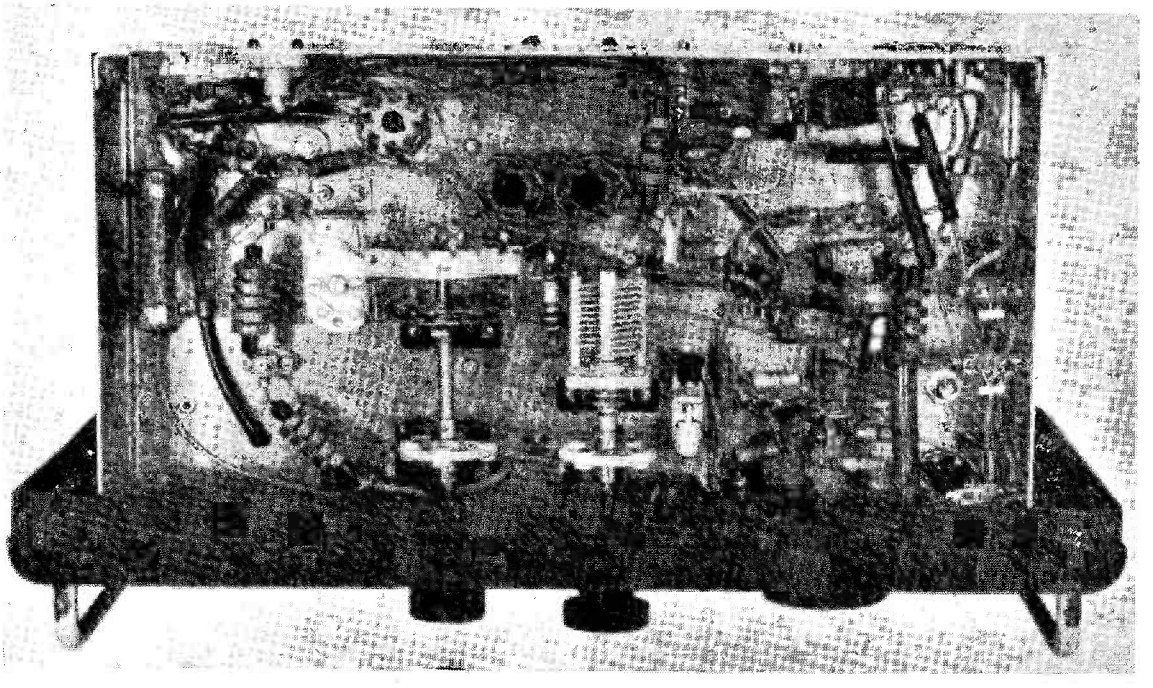
Testing

To begin with, HT (300 volts or less) should be applied only to the oscillator stage and adjustment made, by listening to the note on a calibrated receiver, so that with C1 at maximum capacity, the frequency is exactly 3500 kc. It is a matter of choice whether the dial pointer is made to coincide with the right-hand (100 degree) or left-hand (0 degree) extreme mark on the scale.

A point here is the amount of bandspread required. As described, the coverage is some 250 kc on 21 mc and about 170 kc on 14 mc, which is considered adequate for most purposes. If full coverage is the aim, then the two padding condensers C4 and C5 should be reduced to say 750 or 800 $\mu\mu$F and an extra turn or two wound on coil L1.

The buffer stage requires no adjustment and attention is next given to neutralisation of the triode sub-amplifier stage. To avoid possible confusion between true and spurious signals, it is well here to remove the Z77 oscillator valve (*not* the buffer valve) whilst tests are being made. The best place for an indicating meter is across the grid resistor R21; naturally, a return path should be completed for this resistor by connecting the lower end to chassis either direct or preferably through the 67-volt bias battery recommended for holding down the anode current of the PA valves. As yet of course HT must not be applied to the PA stage.

On applying HT to V3 and rotating C20, it is probable the meter (set to read 100 or 150 volts) will indicate that grid current is



Layout under-chassis of the Two Band Table Topper, which gives ample RF output on 14 and 21 mc by switch control, with VFO drive.

flowing, which is due to self-oscillation in V3 driving V4. Adjustment is then made to the neutralising condenser C14 until absolute stability is achieved—the meter needle should not give even a flicker when the HT is switched on and off. In the prototype model, the condenser is three quarters in or perhaps a little more and the neutralising process is quite positive and definite.

The oscillator valve is replaced when all stages up to and including V4 should operate normally. Readings taken at this stage, assuming an applied HT of exactly 300 volts, should approximate to those given in the table of measurements.

TABLE OF MEASUREMENTS

Across R7 (V2 cathode)	**1 volt**
Across R11 (V3 cathode)	**6 volts**
	(anode current around 12 mA)
Grid current to V3	**1.5 mA**
Anode current V4	**45 mA**
	(varies with frequency)
Grid current to V4	**3 mA**
Voltage across R21 (against 67 volts bias)	
14 mc	**70 volts**
21 mc	**63 volts**
(grid currents therefore 7 and 6.3 mA respectively)	
Screen voltage V4	**180/200 volts**

PA Stage

Next comes neutralisation of the PA stage. For this, the exciter stages should remain unenergised and the 300 volt supply can be transferred temporarily to feed the KT66 valves. The on/off switch should be handy, or an extra one placed in series with the supply. The grid bias battery is removed and the leads to it short-circuited. Tests for stability must be made quickly as the meter needle may swing to nearly full scale when HT is applied. C29 is set to full capacity and quick swings made of C28, with C20 at about half mesh, where it will be in normal operation (actual settings are 55 degrees on 14 mc and 45 degrees on 21 mc). Adjustment is then made to C23, switching HT on and off quickly to see the effect. At first it is probable the anode current meter will show large variations but at some point with C23 at nearly half mesh complete stability should be found on both bands. By the way, all of L9 is in circuit on 14 mc and about half (switch set at second or third tap) on 21 mc.

It was expected that the necessity would arise to screen the grid side of the valve-holders from the anode side but in actual fact, the stage can be made perfectly stable—that is, no variation in anode current and no volts developed across R21—without any screening.

Actual Operation

Before putting the transmitter on the air, it is well to carry out final full scale tests with a lamp load substituted for the aerial. The grid bias of 67 volts (it can be less down to about 45 volts) is restored, when the maximum of 500 volts may be applied to the KT66 valves. Undriven, a standing anode current of about 50 mA flows but this is no drawback—in fact, to the contrary, as it brings about an improvement in the regulation of the power supply and obviates the necessity for a high wattage "bleeder" resistor. With the drive applied and C20 tuned to resonance, the meter needle will go right over—in fact, it would probably be better to use a meter reading to 250 or 300 mA, although the actual anode current when loaded should not be allowed to exceed 200 mA. No time should be lost in bringing the tank circuit into resonance by rotation of C28. By decreasing C29 and re-tuning with C28, a setting will be found at which a 60-watt lamp lights to full brilliancy on 14 mc and to very near full brilliancy on 21 mc.

The aerial can now be connected and preferably a good earth taken to the terminal provided at the rear. Actual settings will depend entirely on the impedance of the aerial—if the latter is low, C29 will be well in mesh, and *vice versa*. It will be found quite easy to load the transmitter up to the full 200 mA mark for operation on CW, but when using telephony it is advisable to reduce the input somewhat by keeping the anode current down to the region of 175 mA.

XTAL XCHANGE

This space is free for those who wish to exchange crystals. Notices should be set out in the form below, on a separate slip headed "Xtal Xchange — Free Insertion," and all negotiations conducted direct.

G3AAE, 18 Fairfield Way, Barnet, Herts.
Has QCC Type P5 7069 kc crystal, certificated. Wants similar for any frequency 7008-7017 kc, or 7028-7034 kc.

G3IHT, 99 Woodfield Drive, Gidea Park, Romford, Essex.
Has Brookes Type S 3536 kc crystal, certificated; also 7070 kc, FT-243 fitting. Wants frequency 3506-7-8 kc, ¾in. mounting.

G4RS, 17 Tudor Avenue, Bebington, Cheshire.
Has ex-WD 3500 kc crystal, 2-pin mount. Wants 1.8 mc band crystal, any spacing.

SWL. 12 Shawclough Road, Rochdale, Lancs.
Has 3539 kc crystal, ¾in. mount; 5644 kc, B7G base; 6000 kc, ¾in. fitting; 9340 kc, 4-pin deaf aid; 465 kc bar, ¾in. pins; and 1000 kc bar on B7G base. Wants any useful frequencies in 1800-2000 kc band.

Practical Capacity Tester

CIRCUITRY AND CALIBRATION

C. M. FLATLEY

Every work-bench should be equipped with a test instrument for the measurement of condenser values. This useful article describes the construction of a capacity meter which can easily be calibrated to a very acceptable degree of accuracy if a few fixed condensers of known value are available.—Editor.

AT the writer's station there are (and have been for some time) a number of small, unclean, unmarked, unknown but probably not unwanted condensers; the fact that none of these could be used with any degree of certainty as to their value has long been a source of irritation and recently it was decided something must be done.

Of necessity the tester had to be simple, there not being much in the way of test instruments available, nor could it be allowed to become too big and so draw down the wrath of she who must be obeyed when it comes to keeping the place tidy.

Fig. 1 shows the circuit decided upon, a straightforward crystal oscillator feeding an absorption load with a microammeter as the indicating device. Great was the joy of the writer when it was found that everything needed was to hand in the junk box.

Construction

The first requirement was a case. The one used was of steel, 11 in. x 4 in. x 4½ in. with a hinged lid. The panel is of paxolin about ⅛ in. thick, and all components except the oscillator were mounted on it.

The oscillator was built on three small brackets which were then screwed to the bottom and one end of the case. A sub-chassis would be equally efficient if the case were deep enough but in this instance it was not. The power input socket, an octal valve base, was also fitted into this end and the whole oscillator screened by a flanged brass plate screwed to the case. The layout of components on the panel is not at all critical.

Power Supply

When this stage was reached a quick check with a Volt/mA meter showed 200 volts and nearly 10 mA going spare in the station receiver power pack. This, being ample for the modest requirements of the Tester, was promptly requisitioned and an "accessories" socket wired in.

When switched on a rise of the meter needle gives evidence that the oscillator "ackles." To protect the meter this reading should be kept low by means of R1 until the tank circuit has been tuned up. When this has been done there should be no further need to touch the oscillator and provided a variation of either C1 or C2 causes the meter reading to alter considerably it only remains to calibrate and bring the thing into use.

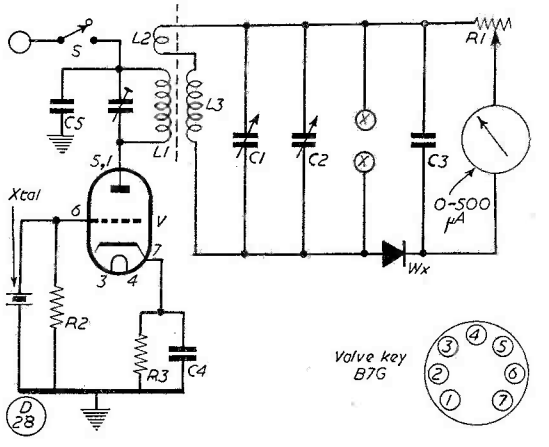
Calibration

A few 5% tolerance ceramic condensers were obtained and combinations of these gave

Table of Values

Fig. 1. The Capacity Tester.

C1	=	100 $\mu\mu$F variable.
C2	=	150 $\mu\mu$F variable Straight Line Capacity (*semi-circular plates*).
C3	=	0.005 μF mica.
C4, C5	=	0.001 μF mica.
C6	=	5-40 $\mu\mu$F ceramic trimmer, across L1.
R1	=	50,000 ohm potentiometer.
R2	=	47,000 ohm, ½ watt.
R3	=	500 ohms, 1 watt.
L1	=	45 turns 40 SWG enam., closewound on ⅞" ceramic former
L2	=	4 turns 40 SWG enam., around earthy end of L1.
L3	=	19 turns 30 SWG DCC, spaced to 1¼", on 1" former.
Meter		0-500 μA microammeter.
Xtal		3.5-4.0 Mc Crystal.
X		Two small screw terminals.
Valve		6C4, or anything available.
Switch		SPST.
WX		Westector WX6.



Circuit complete of the capacity meter suggested in this article. It can be calibrated by reference to a few good fixed condensers of known value. (*Note: Trimmer across L1 should be marked C6*).

sufficient plotting points for an accurate straight line graph to be drawn plotting capacitance ($\mu\mu$F) against settings of the 0—100 degree dial.

The values of the calibrating capacities used were 3 x 40 $\mu\mu$F, 3 x 50 $\mu\mu$F, 2 x 65 $\mu\mu$F, 2 x 75 $\mu\mu$F and 1 x 100 $\mu\mu$F. With these an average of four check points every 10 $\mu\mu$F from 13 to 150 $\mu\mu$F can be obtained. These, of course, are far more than are necessary. Sixteen values were found to be ample.

Operation

C2, the "measuring condenser," is set to full mesh so that 0 on the dial is opposite the reference point. The instrument is then switched on and the meter reading adjusted to about $\frac{3}{4}$ scale by C1, the "zero'ing capacity" and R1 "meter adjust" so that at the desired reading no further rise can be obtained by using C1 alone.

The unknown condenser is then connected between the terminals marked X. The meter reading falls as the circuit is now off resonance.

Resonance is restored by use of C2, C1 and R1 being left strictly alone. This having been done the dial reading is noted and checked against the calibration curve. The value of Cx is at last known.

Used in this manner the meter will give readings correct to within 1 $\mu\mu$F over the range 0—150 $\mu\mu$F. If it is desired to measure a condenser of greater value than 150 $\mu\mu$F the method, while more involved, is still quite simple.

A capacity of known value within, but near the upper limit, of the range of the tester is wired in series with the unknown and the combination placed across terminals X. The value of the series combination is read off the chart and the following equation worked out:

$$Cx = \frac{Ca \times Cb}{Ca - Cb} \mu\mu F$$

Where Ca is the known capacity and Cb the value given by the calibration curve, *e.g.*, an unknown condenser in series with a known of 150 $\mu\mu$F. Dial reading of 90 which shows on curve as 100 $\mu\mu$F.

$$Cx = \frac{150 \times 100}{150 - 100}$$

$$= \frac{15000}{50}$$

$$= 300 \ \mu\mu F$$

(Then work as for condensers in series.)

At the low capacity end of the scale direct reading was found to be sufficiently accurate after being checked in the following manner: Two pieces of PVC insulated wire, each about 2 in. long, were twisted together. One end of each wire was bared. They were then connected to the meter which showed a value of 1.25 $\mu\mu$F.

A fixed capacity of 65 $\mu\mu$F which had been carefully measured was then placed in parallel with the twisted wires and the value again checked; it now read 66.25 $\mu\mu$F.

Conclusion

Results obtained with the instrument have been gratifying, to say the least, and the writer feels well rewarded for the time and trouble expended. Mysterious colour codes now hold no terrors and silvered mica capacitors with the wax too dirty or defaced to be read no longer have to be put in the box marked ? ? ?

CARDS IN THE BOX

Operators listed below are invited to send us a large s.a.e., with name and callsign, for cards held for them in our QSL Bureau, the full address of which is: BCM/QSL, London, W.C.1. The callsign and address can be published in our "New QTH" feature and in the *Radio Amateur Call Book* (directory for the amateur stations of the world) if requested when claiming the QSL cards.

G3AVT, 3FT, 3IDN, 3INM, 3IQA, 3ITV, 3IUN, 3IXV, 3JAK, 3JKW, GW3IYI.

OUR YOUNGER READERS

The note on p.370 of our August issue has elicited the information that Tony Barr (Scunthorpe), aged 15 years, has recently passed the GPO Morse Test and is now second operator on G3IHZ. Then there is John McNaught (Sheffield, 8), who has but 12½ years and is also working towards a transmitting licence; he runs an R.1155 and "several bits of auxiliary gear." We shall be very glad to put our juniors in touch with one another, if they care to write in with details of their gear and their aspirations. Addresses will *not* be given in print.

PRICE CORRECTION — ALADDIN PARTS

The article on "Miniature Wide-Band Couplers" in the June issue of *Short Wave Magazine* was received with such interest that we are asked to state that the correct prices for the Aladdin parts required are as follows: Formers, PPF.5937/4, 10½d. each; Eyeletted Top Plates, PP.5973/4, 4½d. each; Dust Cores, PP.5839, 3½d. each; Insulating Pieces, PP.16040, 1d. each. They are obtainable from a number of retail stockists.

All Band CW Monitor

CIRCUIT AND OPERATION

N. P. SPOONER (G2NS)

Every experienced CW operator knows that the only way to acquire a good sending habit is to monitor the outgoing signal. Morse should always be sent in such a way as to be as legible as print at the receiving end, and for this the secret is even and accurate spacing. No learner, and very few of those who think they are operators, can acquire the art of good Morse sending without a monitor, and much of the bad or indifferent keying to be heard on the air nowadays is due simply to the fact that the operator is "sending blind." Described here is a small piece of auxiliary equipment which will make CW monitoring easy and pleasurable.—Editor.

IF during a contact one pays close attention to the incoming signal, then logically one should display an equal interest in the quality and continuity of what is sent in reply. By the time such a commendable habit has been fully acquired it will be apparent that *continuous monitoring* not only improves one's letter-formation and spacing with a straight key but also effectively curbs any lavishness with those nimble dots when handling a semi-automatic.

To check outgoing signals merely by listening to the clicking of key-contacts or the rattle of a relay is extremely primitive, to say the least; with a bug-key it is virtually impossible, even when using it legitimately for its sole intended purpose of avoiding tiring and unnecessary wrist-action and not (as so often imagined) for the attainment of incoherent speed.

Granted, therefore, that a monitor really should be employed on all bands, it only remains to be discovered that most of those ordinarily suitable for HF band work prove either very unstable, rough or weak on 144 mc and, be it added, in some cases even on 28 mc.

Better Circuit

In direct and pleasing contrast the circuit of Fig. 1 will be found to provide very pure and stable loud-speaker monitoring on two metres, for which band it was mainly set up, while the circuit of Fig. 2 will save the inclusion of a change-over relay or the necessity of manually switching headphones between monitor and receiver. As will be seen a 6J7 high-C Hartley oscillator on 1.8 mc is transformer-coupled to a suggested 6SN7. This operates in its first half as a normal triode amplifier and in its second half as a cathode follower if a very simple and convenient method of coupling to a small speaker or pair of low-resistance headphones is used. One of the chief features of a cathode follower is that of low output impedance—a matter of a few hundred ohms—which provides a good match into most of the low-resistance headsets obtainable at present on the surplus market. If however HR headphones are already in use with the receiver then the monitor will also cater for them if the 6SN7 is

Table of Values

Fig. 1. Circuit of the Monitor.

C1 = 700 $\mu\mu$F, mica.
C2 = 500 $\mu\mu$F, variable.
C3 = 75 $\mu\mu$F, mica.
C4 = 100 $\mu\mu$F, mica.
C5 = .01 μF, mica.
C6 = 8 μF, 450v. working.
C7 = .002 μF, mica (*see text*).
C8 = 2 μF.
R1 = 160,000 ohms.
R2 = 4,700 ohms.
R3 = 47,000 ohms.
R4 = 3,300 ohms.
R5 = 100,000 ohms.
R6 = 1,000 ohms.
R7 = 1.5 megohms (*see text*).
L1 = 18 turns, 18g. enam., tapped at 5th turn, on 1¼in. diam. former, spaced over 1½in.
T1 = LF type intervalve transformer.
SW1 = Toggle switch.
J = Output jack.
V1 = 6J7.
V2 = 6SN7, or 6J5(*see text*).

(*All resistors 1-watt rating*).

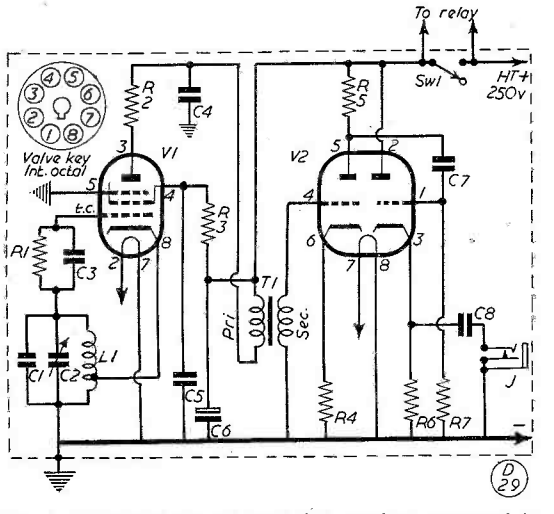


Fig. 1. Circuit of the all-band CW monitor suggested by G2NS.

replaced by a single 6J5, the output jack J substituted for R7 and the value of C7 increased to 0.25 or 0.5 μF. Alternatively, a small speaker with a matching transformer can also be used.

The construction of the monitor is simple, as the 6J7 and its components can be rigidly wired and conveniently housed in a metal cube with a slow-motion tuning-dial on its face. The 6SN7 or 6J5 may protrude through the centre of the removable lid while the underside will secure its associated components if flexible leads of sufficient length are provided.

With the original 6SN7 either a small loudspeaker or the one-to-one transformer with LR headphones of Fig. 2 can be plugged into the output jack J.

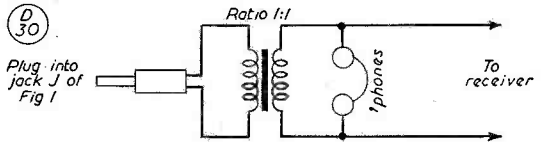


Fig. 2. Alternative output coupling circuit, permitting simultaneous monitoring and listening.

Working It

In operation the cube is placed wherever a comfortably strong signal from the transmitter can be heard in the monitor, with the beat from the monitor itself nicely audible in the receiver. Switch SW1 could be extended nearer to the operator if preferred, as it will allow the monitor signal to be heard in the receiver by manual control. The same operation is accomplished automatically if a relay is left permanently wired across SW1 to switch transmitter and monitor HT simultaneously when changing over. With a crystal-controlled transmitter the monitor of course is left constantly tuned to the transmitter frequency. In other cases on the LF bands the simplest procedure is first to heterodyne the received signal with the VFO alone (the rest of the transmitter being dead) and then in turn use SW1 to beat with the received signal on the monitor. Both VFO and monitor are thus ready for action close to the desired frequency when one changes over to call the distant station.

SW1 again proves its usefulness with VFO operation when the distant station becomes temporarily inaudible through QSB or QRM. There usually arises at such a moment a temptation to re-tune and search, and the received signal thereby becomes extremely elusive. If however this temptation is firmly resisted and instead the *monitor*, already set to the distant station's frequency at the time when contact was first made, is switched on its signal when found on the receiver dial will be an immediate indication of the exact spot where the distant station originally appeared. From there the lost sheep can with patience usually be coaxed back to the anxious fold.

Apart from the various advantages already mentioned there is no doubt whatever that continuous monitoring gives timely warning of any undesired breaks in transmission, lapses in quality of tone or irregularities in sending or procedure, and its adoption will always tend greatly to improve operating in general on all bands from 1.8 to 144 mc.

E.B.U. FREQUENCY MEASURING STATION

We are informed that the Official Receiving and Measuring Station of the European Broadcasting Union was opened at Jurbise, near Mons in Belgium, on July 22 last, in the presence of Sir Ian Jacob and other leading BBC representatives. It is much to be hoped that Jurbise will give urgent attention to unauthorised broadcast station operation on the amateur bands.

ERSIN FLUX NOW CONTAINS PENTACOL

Ersin Flux contained in the three cores of Multicore Solder has recently been reformulated by the development of a new chemical, Pentacol, discovered by Multicore Research Laboratories.

Substantial quantities of this new type of Ersin Multicore solder with non-corrosive flux have been shipped to many overseas countries, including U.S.A. and Canada. It is already in use for the production of most British-made radio and television receivers.

Prior to the granting of the trade mark Pentacol, the flux had been known as " N-type Ersin Flux " among the industry's engineers and chemists. It has received full A.I.D. approval.

All supplies of Ersin Multicore Solder in wholesalers' and retailers' hands should have the new Ersin flux incorporating Pentacol. The improved results obtained by activating rosin with Pentacol to form the new type Ersin flux has enabled Multicore to reduce the flux percentage in all gauges of their solder wire. The standard is now 2.2% instead of 3.4% and thus more solder and less flux is obtained for a given weight or length.

No alteration in prices is being made and the main packings of Ersin Multicore Solder which now incorporate Pentacol distributed through wholesalers include 5s. and 6d. retail cartons, the 1-lb. television engineers' reel and the 7-lb. reels which are available in five alloys and gauges.

Panoramic Reception

DESIGN FOR A PANADAPTOR

J. OSTLE (G2DYV)

The technique for the visual display of signals, using CRT presentation, is well known and panoramic receivers have long been in use at a number of amateur stations. What is not so clearly understood, however, is that by means of an additional external unit—termed a panadaptor—any ordinary communications receiver can be made to give a panoramic display. This article discusses the subject in some detail and describes a panadaptor, using a 3-inch CRT, with the associated circuitry. Though the design given here does not in any way envisage "the modification of surplus," those interested may like to know that the ex-R.A.F. units which were used for panoramic reception are the Receiver Type R.1624A and the Visual Indicator Type 206. —Editor.

NO originality is claimed by the writer for the basic circuit of the instrument to be described, which was designed and developed in the States. But as units as not generally available over here it was decided to see what could be done in building an adaptor from parts available. The majority of the components were obtained either from the junk box or Government surplus equipment.

In practice the instrument gives a visual indication of all signals on any frequency band which are plus or minus 100 kc of the one being received. Fig. 1 will make this clear. Line AB represents part of the frequency spectrum, say 6 mc to 7 mc. All signals within these limits are indicated by "blips," relative strength controlling the height of the blip. Now, if we are tuned on our receiver to signal C, normally we are only able to ascertain what signals lie on each side by retuning the receiver; if, however, we use a Panoramic Adaptor we are able to have all the signals which are plus or minus 100 kc of C displayed simultaneously on the screen of a cathrode ray tube, which is represented by the circle on Fig. 1. This is the basic principle of panoramic reception.

The use of the adaptor will become apparent at once. Sliding into a clear spot, getting as near as possible to the station calling CQ, giving strength reports relative to other signals on the band—to mention only a few—and all this without a touch on the receiver dial! It will be understood, of course, that as one tunes to a new signal it moves to the centre position on the screen, all others moving an appropriate degree plus or minus.

Theory of Operation

Now let us consider how the unit achieves this "view." Fig. 2 shows a block schematic of a Receiver and Adaptor, the latter being fed from the receiver frequency changer anode. At this point it would be well to digress a while and consider what signals we have present at this point.

Suppose our receiver is tuned to a frequency of 7 mc. All the RF circuits are tuned to this frequency, and selectivity will depend, to some degree, on the bandwidth of these circuits. The FC oscillator will be tuned to 7.455 mc and the two will beat together to produce the IF of 455 kc. Now if we leave the receiver tuned to 7 mc and consider what will happen to a signal of the same strength on 7.1 mc, it is evident that this signal will be attenuated by the time it reaches the FC grid, due to the selectivity of the RF circuits which, remember, are still tuned to 7 mc. However, its strength is still enough to beat with the FC oscillator (still tuned to 7.455 mc), and thereby it produces an IF or 355 kc, which will appear at the FC anode. Here, of course, is where the selectivity really begins and if the IF transformers are tuned to 455 kc, then the signal on 7 mc which produces the proper IF of 455 kc is amplified while the signal on 7.1 mc which gives an IF of 355 kc is suppressed.

The point to draw from this is that the signal at 355 kc does appear at the anode of the FC although it may be completely suppressed at the 1st IF valve grid due to the selective action of the tuned IF transformers.

Now we have only examined two frequencies as an example. But clearly all the signals within plus or minus 100 kc of the one which produces the proper IF will be present and therefore will be converted to some IF lying between plus or minus 100 kc of the receiver IF, in this case 455 kc.

We have mentioned a bandwidth of 200 kc and this is about the maximum usable at the popular IF of 455 kc. As the IF is increased

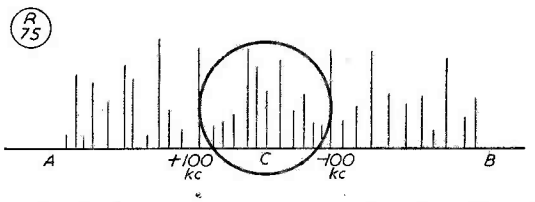


Fig. 1. Showing a section of the sweep obtained, over 200 kc of any band, with the panadaptor described in this article.

so the bandwidth will increase until, at an IF of 5 mc or so it is possible to have a bandwidth of 1,000 kc. However, for our present purpose we will consider only an adaptor used when the IF of the receiver is 455 kc. A small change, say to 465 kc, can be made without trouble and any necessary departure from the alignment procedure, given later, will be obvious.

We see then, that at the input of the adaptor we have a host of signals, supplied from the anode of the FC valve in the receiver, covering a band of 200 kc. Now any signal on either side of 455 kc will be attenuated, and the amount of attenuation could be represented graphically by the solid line in Fig. 3.

But we desire that all signals going into the Adaptor should be approximately the same strength, so that the height of the "blip" as it moves across the screen of the CRT is not small at each end and great in the centre, but remains as constant in height as possible all the way across. To do this we arrange that the input circuits of the Adaptor tune to plus and minus 90 kc of 455 kc, so giving amplification at these points to make up for that lost in the receiver. The input graph of the Adaptor is shown by the dotted line in Fig. 3 and the resultant characteristic by the dashed line in the same figure.

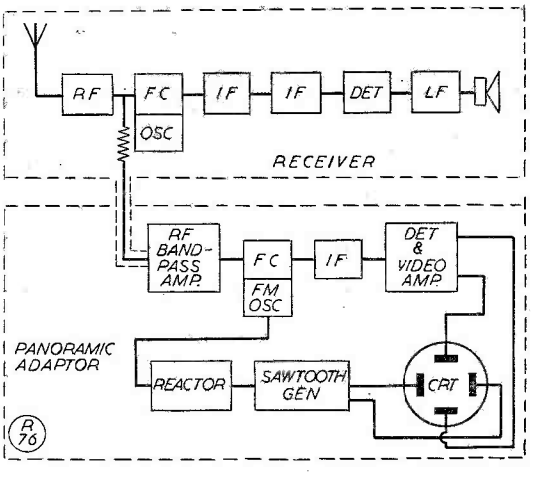


Fig. 2. Block schematic of the unit layout for a Panoramic Adaptor, which can be used with almost any receiver. The lower section is all covered by the circuit of Fig. 5.

The bandwidth of 200 kc is amplified by one stage and fed into the grid of another FC valve to be converted to an IF of 125 kc, but with the difference that this FC oscillator is frequency modulated and swept over 200 kc at 50 times per second, so that any signal between 355 kc and 555 kc will be converted in turn to 125 kc. Let us take an example to make this clear.

The centre frequency of 455 kc would require the FM oscillator to be tuned to 580 kc to produce the IF of 125 kc. The minus frequency of 355 kc would require the oscillator to be tuned to 480 kc, and the plus frequency of 555 kc would require it to be tuned to 680 kc, to produce respectively the IF of 125 kc. If, therefore, we arrange that the FM oscillator is swept in linear fashion from 480 kc to 680 kc and we detect the signals produced in the 125 kc IF and apply them to the vertical plates of a CRT, at the same time arranging that at the beginning of each frequency excursion the spot on the CRT is swept from left to right over the screen, then we would have each signal produced in turn as a blip on the CRT and so get the desired result of viewing the 200 kc bandwidth.

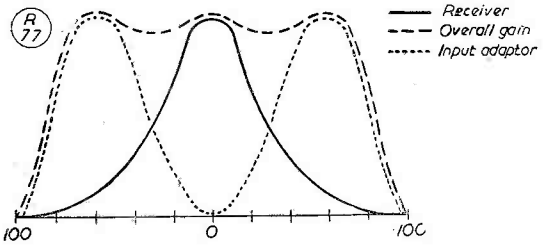


Fig. 3. The significance of the curves shown here is explained in the text.

Returning now to the schematic of Fig. 2. The local FM oscillator of the Adaptor is shown connected to the reactor valve. For those who have not met this circuit before it should be explained that if a valve is connected across a tuned circuit it presents an inductance or capacity to that circuit, and either is readily variable by arranging for the impedance of the valve to be changed; this can be done by feeding a signal into the grid.

Now as we require a linear frequency excursion we therefore require a linear change across the tuned circuit, and this change to be such that on completion of one sweep, it should return to zero to start the next in a fraction of the time. To obtain this effect the familiar saw-tooth time base is used and is depicted in the schematic as serving two purposes, one to feed the reactor valve and second to supply the horizontal sweep for the CRT. Consequently both operations are synchronous.

Practical Considerations

As previously stated the components used in construction were those readily available. Other types of valves could no doubt be employed provided that the characteristics are similar, but no experiments have been made in this direction.

The writer was fortunate in having a CRO available to check any distortion and it was found invaluable in tracing distortion of the saw-tooth waveform. However, for the reader who does not possess a CRO, distortion can be detected by examination of the line on the screen. For further information the reader is referred to the many text books on the subject. With the components specified and a 3-inch CRT no great distortion should occur.

Power supply was from a recovered transformer with a good primary. The secondaries were stripped and rewound as specified, the turns being calculated. It will be noted that part of the supply is stabilised, which is essential for good operation. A type 80 valve was used as an HV rectifier with 800-volt supply. If this figure is to be exceeded then it is advisable to use a suitable HV rectifier.

Time Base

This is of the blocking oscillator type and is synchronised with the mains frequency. The transformer was an old Ferranti intervalve job with a ratio of 2 : 1. It was found that the value of R22 was fairly critical and it should be changed if distortion of the saw-tooth occurs. Connections to the transformer should be as shown. If no saw-tooth oscillation results the connections to one winding should be reversed.

IF Transformers

An IF of 125 kc was chosen as these transformers were available. It could however be altered provided that suitable adjustments are made to the FM oscillator frequency. It is not, however, advisable to use an IF lower than 125 kc. The transformers are of the air cored, capacity tuned type.

Input Transformers

These are of the midget permeability tuned type and are rated at 456 kc to 475 kc ; in order to meet our requirements they have to be modified. In most types there is a fixed capacity of 100 $\mu\mu$F in parallel with each coil ; one should be removed from each transformer and a 50 $\mu\mu$F condenser substituted. This coil should then tune to 545 kc. It may be necessary to add 25 $\mu\mu$F across the other winding but this will depend on the manufacture of the transformer and it is best to " cut and try " until the secondary winding on each transformer tunes to 365 kc. It should be pointed out that it is not necessary to ascertain how the transformers are tuning with external equipment ; this is quite easily done on the instrument itself and will be described later. The small coupling condensers may be added externally to the pins of the transformers. Here again it will depend on the manufacture of the transformers as to what value of capacity is used and it is best to wait until the instrument is completed and then try various values until the required characteristic is obtained.

Frequency Modulated Oscillator Coil

This is designated L1 in the circuit diagram Fig. 5, and all the components associated with it and contained inside the screened can are enclosed in the dotted square of the diagram. This coil is the most important in the Adaptor and care must be taken to get it right. The writer has a wave winder and so the coil could be made in the proper self supporting manner. However, it can be layer wound provided that two discs are first fixed to the former to prevent the turns slipping off. The coil consists of 200 turns with a tap 45 turns from the start. If the tap is taken nearest the inside, the outside windings may be trimmed by removing or adding a few turns, if this is required, to reach the correct frequency. The outside diameter of the former is $\frac{1}{4}$ in. and the iron dust core is just small enough to clear the inside. The core used was removed from an old IF transformer and drilled for $\frac{1}{8}$ in. up its centre and a 6 BA bolt $1\frac{1}{2}$ in. long was cemented into the hole. The cheese head was cut off the bolt and a sawcut made across its diameter to make a slot for screwdriver adjust-

ment. Next, a 6 BA nut large enough to fit the top of the former was found, the bolt screwed through it, and the nut cemented into the top of the former.

One word of warning. For satisfactory operation this coil must be permeability tuned with a condenser of 150 $\mu\mu$F across it as shown in the circuit diagram. Any other values will upset the ratio of the sweep.

Controls

Three controls are brought out to the front panel. These are Centre Frequency adjustment, Sweep Width and Gain. Three are on the chassis deck : IF gain ; Plus frequency adjustment ; and Minus frequency adjustment. All others are mounted on the back of the chassis, those with high potentials across them being carried on an insulated panel.

Chassis

The chassis is aluminium and is 13 in. back to front, 15 in. wide and 3 in. deep. The placement of components is shown in Fig. 4. Components not shown are underneath. Leads, as usual, should be kept as short as possible.

The front panel is 19 in. x 7 in. and is $\frac{1}{8}$ in. sheet made for rack mounting. There is no reason, however, why the dimensions should not be changed to fit a standard cabinet if desired.

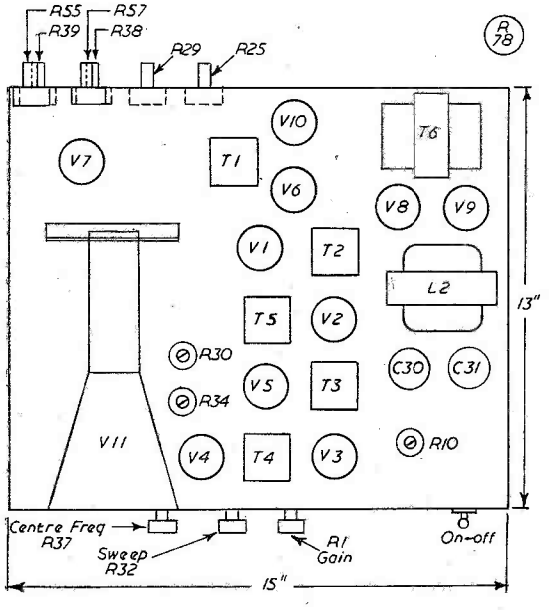


Fig. 4. Plan view of the general chassis layout, showing how the main parts can be disposed. Almost any convenient form of construction can be adopted.

CRT Scale

This is a circle of celluloid made to fit the tube escutcheon ; the scale is engraved on the back with a scriber and the lines filled in with white ink. A circle of green cellophane is placed between the scale and the tube face. This helps to remove the glare from the tube. The total width of the scale from plus 100 kc to minus 100 kc is $1\frac{3}{4}$ in. with the 0 in the centre. The vertical lines are marked at equidistant points to represent 20 kc each.

Coupling to Receiver

So that the input circuits of the Adaptor will not detune the first IF transformer of the receiver the unit is coupled by a coaxial cable to the anode of the receiver FC valve *via* a 50,000 ohm resistor, which should be located as near the FC anode pin as possible. Another method of coupling is to use a cathode coupled amplifier, as this gives greater sensitivity, and it will be described later.

Testing

When the unit is switched on and has warmed up a line should appear on the CRT. This can be adjusted by the controls provided to coincide in length and position to the bottom line on the CRT scale. If the IF gain control R10, located on the chassis deck, is advanced it will be found that the line will tend to curve upwards in the centre as maximum gain is approached. Correct setting for this control is the position which just gives a straight line.

The function of controls on the front panel are as follows. Gain—this is on the input valve and controls the overall gain of the Adaptor. Centre Frequency Adjustment—this serves to correct any displacement of the image due to mains voltage fluctuations, so that the signal being heard can always be adjusted to coincide with the centre of the scale. Sweep—with this control at maximum the sweep is the full 200 kc. By turning towards maximum the width is reduced until it reaches zero.

Before alignment it should be ascertained that the time base speed is 25 c.p.s., and this should be locked to the mains by means of the sync. control R25.

IF Alignment Procedure

Alignment of the IF transformers T3 and T4 is accomplished by feeding of 125 kc (or the IF chosen) into the grid of V2 and adjusting

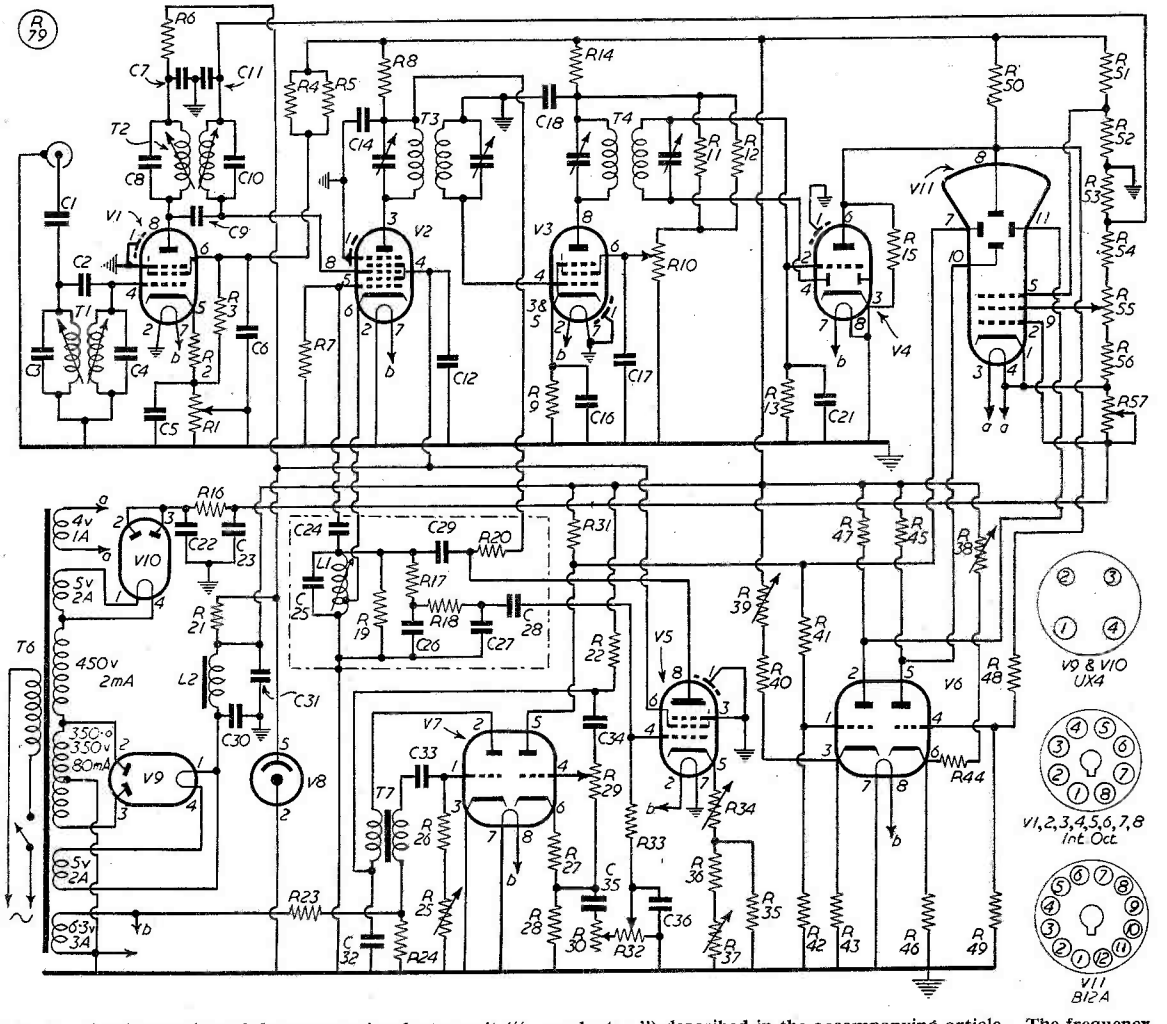


Fig. 5. Circuit complete of the panoramic adaptor unit (" panadaptor ") described in the accompanying article. The frequency modulator section is enclosed in the dotted square, and all values are given in the table herewith. *(Note: T5 is represented by the FM section).*

Table of Values

Fig. 5. Circuit complete of the Panadaptor.

C1, C33 = .01 μF, 350v. working.
C2, C9 = 15 μμF, 350v. working.
C3, C4, C8, C10 = *See text.*
C5, C6, C7, C11, C12, C14, C16, C17, C18, C32 = 0.1 μF, 250v. working.
C21 = 250 μμF, 350v. working.
C22, C23 = 0.25 μF, 1500v. working.
C34, C35 = 0.25 μF, 350v. working.
C24, C28, C36 = 100 μμF, 350v. working.
C25 = 150 μμF.
C26, C27 = 5 μμF, 350v. working.
C29 = 500 μμF, 350v. working.
C30, C31 = 8 μF, 500v. working.
R1 = 10,000 ohm pot'meter.
R2, R9 = 150 ohms, ½-watt.
R3, R4, R5, R11, R12 = 50,000 ohms, 1w.
R19 = 50,000 ohms, ½w.
R6, R8 = 2,000 ohms, 1w.
R7, R17, R18 = 20,000 ohms, ½w.
R10 = 100,000 ohm pot'meter.
R13, R50 = 150,000 ohms, ½w.
R14 = 5,000 ohms, 1w.
R15, R26 = 500,000 ohms, ½w.
R16 = 25,000 ohms, 1w.
R20 = 3,000 ohms, 1w.
R21 = 7,500 ohms, 10w.
R22 = 3 megohms, ½w.
R23, R35 = 500 ohms, ½w.
R24, R36 = 200 ohms, ½w.
R25, R30 = 1 megohm pot'meter.
R27, R43 = 5,000 ohms, ½w.
R28 = 25,000 ohms, ½w.
R29 = 2 megohm pot'meter.
R31, R47 = 250,000 ohms, 1w.
R33, R52 = 200,000 ohms, ½w.
R34 = 1000 ohms pot'meter.
R37 = 500 ohm pot'meter.
R38, R39 = 500,000 ohm pot'meter.
R40, R44, R45, R56 = 150,000 ohms 1w.
R41, R48 = 2 megohm, ½w.
R42, R51 = 100,000 ohms, ½w.
R46 = 3,500 ohms, ½w.
R49 = 75,000 ohms, ½w.
R53 = 1,000 ohms, ½w.
R54 = 500,000 ohms, 1w.
R55 = 250,000 ohm pot'meter.
R57 = 50,000 ohm pot'meter.
Coil L1 — *see text.*

V1, V5 = 6AC7.
V2 = 6SA7.
V3 = 6SG7.
V4 = 6SQ7.
V6 = 6SN7.
V7 = 6SL7.
V8 = VR150/30.
V9, V10 = Type 80 rect.
V11 = VCR139A.
T1, T2 = 455 kc midget IF transformer, modified (*see text*).
T3, T4 = 125 kc IF transformer.
T5 = FM transformer (*see text*).
T6 = Mains transformer, LT's as required, secondaries 350v. @ 80 mA, and 800v. @ 5 mA.
T7 = 2 : 1 intervalve transformer.
Choke L2-10Hy., 80mA.

the trimmers on T3 and T4 for maximum deflection of the line on the CRT.

Frequency Modulated Oscillator Alignment

When the Adaptor is used with a receiver a signal on the high frequency side of the one being heard will be seen on the right hand side of the screen, and a low frequency signal on the left hand side. When the unit is aligned with a signal generator the positions are *reversed*, HF being on the left and LF on the right.

During the alignment procedure it will be found necessary to repeat the adjustments until the desired bandwidth is covered, one adjustment affecting the other.

(1) ***Adjustment of Centre Frequency***—A 455 kc signal is used and fed from the signal generator *via* a 50,000 ohm resistor to the input of the Adaptor. If another IF has been chosen then substitute as required. Set sweep control to Maximum. Set Centre Frequency control to half-way position. Now adjust the core of the FM Oscillator, L1 until the deflection is in the centre of the tube, directly under the centre vertical line. It may be necessary to adjust R34 to achieve this. Rotate sweep control R32 towards minimum, at the same time adjusting the core of L1 to keep the deflection in the centre position.

(2) ***High Frequency Alignment*** — Feed in a signal of 355 kc. Set sweep control R32 at maximum. Now adjust R34 until the deflection appears at minus 100 kc mark on the screen. Repeat procedure as at (1).

(3) ***Low Frequency Alignment*** — Feed in a signal of 555 kc. Set sweep control R34 at maximum. Now adjust R30 until deflection appears at plus 100 kc mark. Repeat step 1. Repeat step 2. Repeat steps 1, 2 and 3 until all results are obtained simultaneously. Repeat step 1.

Alignment of Input Amplifier

Here again, a "cut and try" method is advised, each adjustment being repeated until the desired results are obtained.

When constructing the input transformers it is best to make the two top coils resonate at the same frequency, likewise with the bottom coils. This saves confusion when lining up. In the writer's case the core adjustments at the top of the transformer are the HF ones and those at the bottom the LF.

As was mentioned, the input circuits should tune to plus and minus 90 kc of 455 kc to help level the overall response of the unit. The alignment procedure is as follows :

(1) A signal of 455 kc is fed to the grid of V1 *via* a .01 μF condenser. Adjust the LF core of T2 for maximum deflection in the centre of the screen.

(2) Feed in 545 kc signal as at (1). Adjust HF core of T2 for maximum deflection at the left of the screen.

(3) Feed in a signal of 365 kc as at (1). Adjust LF core of T2 for maximum deflection at the right-hand end of the screen.

(4) Now transfer the signal generator to the input of the Adaptor *via* a 50,000 ohm resistor. Feed in a 455 kc signal and adjust the LF core of T1 for maximum deflection at the centre of the screen.

(5) Feed in 545 kc signal as at (4). Adjust HF core of T1 for maximum deflection at the left of the screen.

(6) Feed in 365 kc signal as at (4). Retune the LF core of T1 for maximum deflection at the right-hand side of the screen.

(7) Now, still feeding in the signal as at (4), trim the LF and HF cores in turn until the desired characteristics are obtained. (*See dotted line in Fig. 3.*) In other words, as the signal generator is tuned from 365 kc to 545 kc, the deflection on the screen should travel from right to left, maximum and equal amplitude being obtained between 80 kc and 100 kc each side of the centre line.

If during the last procedure outlined above it is found that a maximum deflection cannot be obtained by tuning the cores of the transformers, it will be necessary further to modify the transformers by adding or subtracting capacity until a peak is reached at some position of the core.

If the maximum deflection at each end disappears sharply as the line moves towards the centre it will be necessary to increase the value of the small coupling capacities C2 and C9 until a smooth curve from maximum to minimum is obtained.

Now the Adaptor may be connected to the receiver. If it is found that a signal does not stay at a fairly constant height on its travel across the screen it is an indication that the IF alignment of the receiver is not symmetrical and this should be touched up to compensate. Receivers with variable selectivity can usually be made to give the desired results by rotating the selectivity control.

Cathode Coupled Amplifier

As was previously mentioned the Adaptor may be coupled to the receiver by a 50,000 ohm resistor or, if greater sensitivity is desired, a cathode coupled amplifier using a 6J6 type valve may be used. The circuit diagram of this is shown in Fig. 6 and is self explanatory.

The unit uses very little LT and HT and in the majority of cases may be connected to the receiver power supply without causing any overload.

Conclusion

During operation it will be found that a certain amount of "grass" is present on the bottom line. This is quite normal and is due to the background noise always present in a receiver.

AGC action on the receiver may be observed by tuning to a strong signal and watching all the other signals decrease in strength.

In conclusion the writer would say that many hours of pleasure have been obtained, both in making the instrument and watching it operate. One does not realise how crowded the bands are today until all the signals can be observed at the same time—maybe, for this reason many will not construct the Adaptor, believing in the old saying that "What the eye doesn't see the heart doesn't grieve over"!

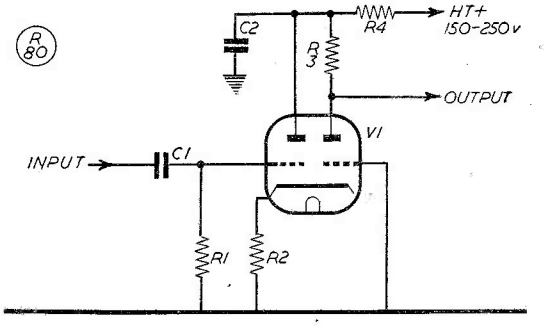


Fig. 6. Cathode coupled amplifier for the Panadaptor, values for which are given in the table.

Table of Values

Fig. 6. Suitable cathode follower circuit.

C1 = 100 $\mu\mu$F.	R3 = 200,000 ohms.
C2 = 500 $\mu\mu$F.	R4 = 10,000 ohms.
R1 = 2 megohms.	V1 = 6J6.
R2 = 25,000 ohms.	

STUDY FOR THE R.A.E.

As in previous years, details are given below of several classes and courses of instruction specially intended for those wishing to prepare for the Radio Amateurs' Examination in May next year. In most instances, these classes start with basic theory, so that they offer an opportunity to the absolute beginner to qualify for his transmitting licence. Since they are organised under the local education authority, fees are nominal, and qualified instructors (usually themselves holders of amateur transmitting licences) are in charge, with several years' experience of taking the course.

Chichester.—Evening Institute, Lancastrian Boys' School, Orchard Street. Wednesday, 6.30 p.m.-8.30 p.m., commencing Wednesday, September 16. Enrolment, evenings Monday and Tuesday, September 14-15. Instructor: E. J. Pearcey, G2JU.

Ilford.—Literary Institute, High School, Colnbrook Road. Morse class, Mondays 7.15-9.15 p.m. R.A.E. study course, Wednesdays 7.15-9.15 p.m. Enrolment, evenings September 7-9, at 7.0 p.m., classes commencing the following week. Fee for either course, 10s., of 15s. for both. (Those outside the Essex area wishing to enrol can obtain a letter from their own local education authority.) In charge: C. H. L. Edwards, A.M.I.E.E., G8TL. Over the last five years more than 100 students from these Courses have successfully passed out.

London (Grafton).—Under arrangements between the local education authority and Grafton Radio Society, Morse and R.A.E. study classes will be held at Grafton (Holloway, N.7) on Monday evenings, commencing on September 28. In the first instance, application should be made to the honorary secretary of the Grafton Radio Society: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middlesex.

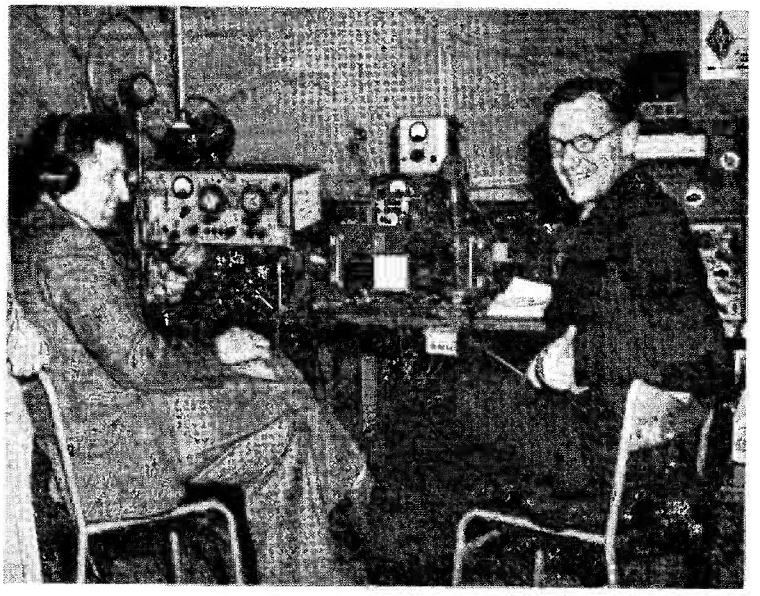
Wembley. — Evening Institute, Copland School, High Road. Morse class and R.A.E. study course, commencing on Monday, September 21. Morse 7.0-8.0 p.m.; Theory, 8.0-10.0 p.m. Enrolment, evenings September 14-18, 7.0-9.0 p.m. Fee for Course, 10s. In charge: A. Bayliss, B.Sc., G8PD.

CHANGING RECEIVER VALVES

A note by G3BAC (Nottingham) suggests that there may be disadvantages in using sharp cut-off pentodes in the RF stages of communication receivers. Substitution of high-gain low-noise valves such as the 6AC7, 6HS7 and 717A for variable-*mu* types like the 6K7, 6SK7 and 6SG7 may result in lower noise and more signals, but can also give rise to cross-modulation effects on signals formerly separated. Furthermore, AVC action can be affected, keeping the RF stage near cut-off and upsetting S-meter readings. The substitution types recommended are the 6AB7 or 1853, which should not give these troubles.

DX COMMENTARY

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



G5LP/A

OUR preamble to last month's Commentary, concerning sunspots, conditions and the like, has brought forth a few letters pouring scorn on the whole thing. The point of view of these correspondents is this: "I have worked seven new countries in the last two months—so how *can* you call conditions bad ? "

To them we reply that we can call conditions bad, and mean it, without the slightest effort at all. However many new countries they may happen to have worked, if they think these *conditions* are good, their memories must be awfully short!

The fact of the matter is that the bands are rarely closed to *all* DX, even on this part of the cycle. One or two enterprising travellers putting new countries on the air will, and do, start up a magnificent scrum. But what *would* it be like if a new one came on the air now, amid conditions of the 1947 standard? Why, we've hardly heard a California Kilowatt this year, and if conditions were good there ought to be at least a hundred of them buzzing round anyone of CEØAA's attractiveness!

The fact that anyone is working any DX at all is a pretty good proof that all-round efficiencies and operating standards have improved ; let us hope they stay that way even when the going gets easier.

Some Rare Ones

August has been a pretty exciting month, thanks to the efforts of two keen DX-peditioners. First, Luis of CE3AG pulled off his long-promised trip to the mysterious Easter Island, where he doubtless hung his radiators on the fabulous stone figures that represent roughly all that anyone knows about the place. Whatever the difficulties may have been, CEØAA duly showed up around August 5. His first G contact appears to have been G3DIY (Penzance), whose neighbour G2WW tells us that this was made at 1830 GMT on August 5

Thereafter most of the keen types shadowed him through thick and thin, caring naught for loss of sleep, meals and even jobs . . . and a batch of CEØAA cards will, we hope, shortly be crossing the ocean. Contacts have been noted on 21 mc, phone and CW, 14 mc, phone and CW, and we gather that G4CP and G3AAM both raised him on 7 mc on August 8.

Next came the even more exciting trip made by ST2UU, who decided to visit the Aldabra Islands and christen them with a VQ7 prefix — so all our past jokes about "the elusive VQ7" are now killed for good. VQ7UU's very first contact, on 14 mc, was G5BZ (Croydon), who also raised him under the titles of CR7UU, FB8UU and most probably VQ9UU. ('BZ was keeping his fingers crossed over the latter one when he wrote.)

Both these DX manifestations brought out the worst in human nature in terms of the behaviour of some of those chasing the DX, including a revival of an ancient pest—the man who just sits and calls hopefully, even if he has not heard the DX at all. One or two notorious cases just went on and on, above, below and *on* the frequency, obviously without a clue as to what was happening, because the DX man was making rapid and snappy contacts all through the QRM these types (we mustn't use the word Clot any more) were generating. Ah,

CALLS HEARD, WORKED AND QSL'd

well—such things will always be with us, although they certainly wouldn't be if our long-range death-ray were a little further advanced; trouble is that we can't get it TVI-proof. . . .

More to Come

By the time this reaches you, there will probably have been another session from Zanzibar, as VQ4RF was promising to become VQ1RF once again. There is also a strong rumour that he may show up as VQ8RF in Mauritius as well. We gather, too, that ST2UU will be on as I5UU.

We also learn (from KV4AA) that ZL3JA is considering a trip to Tokelau Island, in the Union Group (four atolls, one white man and 1,200 natives). Also that FK8AB was due to visit Wallis Island (FW8), and that EA2CN and another EA are eventually bound for Rio de Oro. So keep those PA heaters on *all* the time. . . .

News from Overseas

VS2BS (Penang) tells us that conditions are very good between Malaya and the States, but mighty poor for Europeans. W6's and 7's are often heard with S9 signals, but other DX—even VK's—is practically non-existent. 'BS is in trouble with SWL reports; he says that everyone asks for a QSL direct but no one ever sends IRC's. From now on, no IRC — no QSL! VS2's are still not cleared for phone operation on 21 mc; they are all ready, and awaiting the official signal.

ZS2AT (East London) has been very active on 21 mc and now clocks up 54 on the band. He still awaits a card from VE2JI (Zone 2) for his WAZ; the VE2 is in a remote location and no QSL's will be forthcoming until he returns home later this year. Incoming mails are made by air drop, but nothing comes *out!*

DL2SU (BAOR) says he is getting QSL's and reports on his British call, G3ICH, which is obviously being pirated. He asks us to state that G3ICH and G3JAA (his XYL) will not be on the air before June 1954. And he adds that the Control Commission will *not* grant permission for DL2's to use the Top Band—in spite of recent reports that they have been heard on One-Sixty.

4S7XG (Colombo) says that the odd country can usually be heard out there on 21 mc, even if only at S3. Peter is moving his QTH yet again, and hopes, by the time this appears, to be on with a decent aerial which will allow skeds on 7 mc. When conditions permit, he will be on 7050 kc at 1830 GMT every Saturday from September 5 onwards. He will be very pleased to contact anyone who does not call him when he is in QSO. And finally he asks that people who work him in the queue should *not* hold up all the others and start frayed tempers by discussing weather, aerials, movies and all the rest. Rag-chewing is all very well at the right time and place, but not in the DX queue.

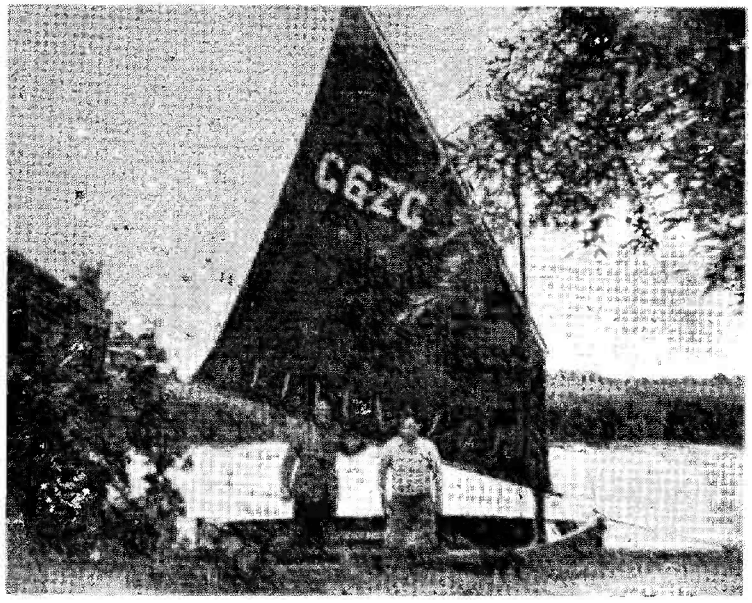
From ST2UU (Khartoum) comes preliminary news of a "possible" expedition to CR7, FB8, VQ7 (Aldabra Islands), VQ9, VS9, ET and a slightly doubtful VQ6! As we now know only too well, several of these came off almost at once and are only a very pleasant memory — for those who worked him. CR7UU, FB8UU, VQ7UU and VQ9UU caused a brief but concentrated stirring-up of the 14 mc band. ST2UU, at the home QTH, uses a T2FD aerial with a maximum of 15 watts. His first blast on 21 mc raised KV4BB, quickly followed by G's and lots of other Europeans, the band becoming rapidly like 28 mc in the "good old days." Much DX was heard on 7 mc but not raised.

Top-Band Stuff

Some very interesting stories are building up concerning Top-Band DX in the summer. G3GGN (Littlehampton) started them off by reporting that he worked W2EQS on Forty at the end of June; 'EQS then transferred to Top Band and was heard, but weakly.

On July 26, W3TBG was peaking at 589 around 0430 GMT; W1LYV was 579 from 0315 to 0400, and W4POB was working him. At the previous week-end W1LYV had been heard over here on *phone*. On August 2, G3GGN worked W2PEO on Eighty, and 'PEO phoned through to W1LYV to get cracking on Top Band again. The noise level was no worse than it usually is in the winter.

G3GGN tells us that the W's



During July, G3BRV (left) spent a week on the Norfolk Broads with G6ZG (white sweater). Though they sailed a lot, there were no observant amateurs around those parts to spot the sail number.

want us to work as near as possible to 1830 and 1870 kc.

Now we also hear, *via* G6GM (Holsworthy), that W3RGQ is pressing for tests in October, instead of waiting until the organised affairs from December onwards. Starting at the beginning of October, W3RGQ and others propose to be on every Thursday and Sunday from 0500 to 0700 GMT. W3RGQ's frequency will be 1823 kc.

TOP-BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
GM3JDR	82	82
GM3IGW	81	81
GI3HFT	79	80
GM3OM	79	79
GI6YW	79	79
GM3EFS	78	80
G6VC	77	78
G8KP	77	77
G2NJ	74	75
G3ELZ	73	76
OH3NY	73	75
G5LH	70	73
G4XC	69	72
G3HDQ	69	70
G6ZN	68	72
G3ESY	68	68
G3IAF	65	73
G3BJU	65	68
G4FN	64	68
GM3EHI	63	68
G3GZJ	63	63
G3IQO	61	67
G3HIW	61	66
G3AKU	61	63
G2AOL	60	70
G3FNK	60	69
G6KP	60	67
GI3CVH	60	64
G3HTI	60	64
G3BRL	60	61
G3AFL	60	60
G3IBL	60	60
G2YS	56	71
G2BJN	52	55
GW3CKB	48	61
G3AKY	46	55
G3ABG	44	57
G8JC	41	52
G3FTV	38	53
G3ITY	30	46
G3DO	30	39
G8VG	29	36
G3DVQ	27	30
G3NA	24	31
G3HWH	20	41
G5FA	20	38
G3FZS	20	33

Needle Match

There is a terrific fight for the top rung of the WABC Ladder. We thought GI3HFT (Belfast) had really got there when we read in his letter that GM3AWF (Rossshire) had given him 80 worked and 79 confirmed — the highest score received at the time. But then up came a report from GM3IGW (Alloa) staking a claim for 81 worked, 81 confirmed ; and by the next post, GM3JDR (Caithness) came in with 82 worked and 82 confirmed. So, for the moment, Caithness is Top Dog.

These sudden expansions 'way up north have been due to the portable operation of GM5RI/P, manned by G5RI and G5DQ, who ploughed through Ross and Cromarty, Inverness, Sutherland and Caithness. The latter was, in a way, responsible for giving GM3JDR the edge on the others ; being the only fixed station in Caithness, he was short of his own county, although everyone else had got it by working *him!* 'JDR had a personal QSO with the ops. of the portable, and doesn't say at what range his Caithness contact took place—but it would still be legitimate even if in his own back-yard.

GM3IGW has heard a buzz that some of the Chester chaps hope to organise a pilgrimage into Merioneth soon ; that should start the bugs vibrating again. GI3HFT was actually in Kirkcudbrightshire during August — but without any gear!

G3BRL (London, W.5) contacted G5PP/P in Westmorland and thus is on the 60 mark and all ready for the Certificate. G3AKY (Sheffield) will support the One-Watt effort this winter, since he only uses three of them now, and doesn't do too badly.

GC3EML (Jersey) regards the One-Watt suggestion with a very jaundiced eye and asks "Will it mean QSL-ing all over again ?" This, to one situated in GC, GD or any of the "rare ones" is an important question, and one that we shall have to study seriously. We suggest that something might be done with small "stickers" for those who have already received their QSL from the same stations.

G3HDQ (Cheshire) now has his last English county, thanks to G5PP in Westmorland, and has added one more to his score. He suggests that a lot of the WABC work has been done by skeds, and feels that this takes a lot of the interest out of it. He adds the crafty crack that perhaps the "sked types" are those who couldn't raise the rare ones the honest way, when they are much in demand. G3HDQ also brings up a very old phenomenon—one that used to happen to us while DX-chasing in the 'twenties. You call a DX station, purely on spec. (knowing that he *might* be around at the time), and you interrupt your call to listen. Lo! several others are calling the same station! What is really galling is that the DX man *may* be on, and one of these others *may* get him . . . all smart stuff, but perhaps not quite as clean as it might be?

GM3HBT (Lanarkshire) tells us that he carried out some daylight tests on the band in 1951, when he was GI3HBT. Aided by GI3GTR, he worked between 0900 and 1500 GMT and managed to raise quite a few G's. The more distant GI's came very easily. At the moment GM3HBT is off the air, but a combined station is being built with GM3AIH, and some Top Band activity should result before long.

G3ABG (Cannock) confirms that GM3AAU has moved to Kirkcudbright, but is not yet active. Best contacts of the month were G5PP/P (Westmorland), GM3AWF (Ross) and G2NJ/A aboard a house-boat in Hunts. 'ABG will be in Merioneth shortly, but, again, *not* with a rig (these XYL's!).

Our second Daylight Test (August 22-23) will have occurred shortly after we went to press, and will be duly reported next month. We have not yet formulated any complete plans con-

cerning this One-Watt WABC, but the following is the present idea: That it should all be carried out between One-Watt stations only (in other words it must be QRP at *both* ends); that some sort of initials like OWW should identify the participants; and that where QSL cards have been previously exchanged, a "sticky label" with date, time, RST and a definite statement of the One Watt should be sent. Any objections? (Or suggestions?)

Ten and Fifteen

Our two highest frequencies have been the principal sufferers from conditions, and everyone is agreed that the 15-metre band has not been a patch on last year. This time last year the activity was considerable, even VK's and ZL's not being unheard of, but nowadays only the North-South path seems to open at all, and not too often, at that.

G3HCU (Chiddingfold) has been striving manfully to convince himself that *Ten* has been alive, but has come out with only CR6, CT, DL, EA, I, LU, OH, OK, OQ, OZ, SM and a couple of MM's. *Fifteen* served him a little better, the DX worked being CE4BP, CR6BX, LU3DD and 9FAY, OD5BH, PY2AQ, VQ4BU and 4RF, VQ5CB, ZE2JK and 5A2CA. 'HCU does not say so, but we think this was all on phone.

G2YS (Chester) tells us that he did actually hear VK2UR on *Fifteen,* at 0945 on July 19, but couldn't raise him, and never heard him again. But he managed 3A2AY and TF5TP before the band went stone dead.

G3COI says that his main object in sending this photograph is to "convince us that there actually is a rural spot in the neighbourhood of Wolverhampton!" G3EHG is operating G3COI/P, consisting of an R.109, an 807 "spy-suitcase" transmitter, and 150 feet of wire slung up as supports allow. The whole outfit stows away in the car boot and is run from a 6-volt acc.

Multi-Band Work

On *Twenty* G2YS raised FP8AK (W2BBK) and PJ2CC late one night. Then he went up to *Forty* and got a 569 from CX1FY, followed by PY2QW and LU2AW. Finally he changed to *Eighty* to hook a couple of VE1's before 0200. He adds that both CX1FY and PY2QW say that they work on Eighty, and that G3HPM, a local, has worked a PY up there shortly after midnight.

GM3JDR has forsaken the Top Band for a blast or two on Eighty, and says he has often heard, but not worked, OY1P at the LF end thereof — but see OY2Z's remarks, further on.

G6QX (Hornchurch) heard CEØAA materialise on August 9, and says he was immediately collected by G2PL, 6ZO, 4CP, 2MI and others, but no chance for 'QX until the next day, when he changed aerials and got him first call. He gives CEØAA a hearty pat on the back for staying "put" under very exasperating conditions, and particularly for holding the W's off for a while so as to give Europeans a chance. (We sat back and listened for a long time and must compliment CEØAA on knowing all the answers. He wasted no time at all and never seemed flustered.)

Others raised on Twenty during late night sessions at G6QX were VP2MD (Montserrat, Leeward Is.), VP6PV, YV5FL and ZL4DV at midnight (579 both ways).

FIVE BAND DX TABLE

POST WAR

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries	Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countsrie
DL7AA	622	83	145	214	76	104	220	G4ZU	373	11	9	178	55	120	192
G6QB	573	52	103	215	68	135	231	G3ABG	326	36	81	147	32	30	155
G5BZ	516	57	101	221	72	65	225	G2BW	323	24	57	144	55	43	155
G2VD	468	46	84	175	55	108	184	G2YS	322	42	54	125	61	40	148
G2WW	462	23	70	189	73	107	196	G3GUM	317	31	38	168	79	1	177
G2BJY	449	48	77	141	67	116	179	G8VG	277	35	76	123	17	26	140
G3DO	424	24	45	192	56	107	219	G3FPQ	254	47	40	120	35	12	127
G3FXB	403	54	102	168	40	39	174	G4QK	217	21	45	137	11	3	132
G5FA	398	33	116	150	26	73	165	G2DHV	173	20	21	107	10	15	111
G6QX	384	50	91	143	43	57	166	4S7XG	121	1	17	93	7	3	93

Part of the set-up at VQ2RCC, the Northern Rhodesia Amateur Radio Society's station at Nkana for the Rhodes Centenary Celebrations, visited by Queen Elizabeth the Queen Mother. VQ2RCC was on the air for the period July 11-14, on 7 and 14 mc CW and phone, using 90 watts to a pair of 807's, into a Vee-beam with 200 feet of wire in each leg. VQ2HW is on the left in this photograph.

Short Wave Magazine DX CERTIFICATES

The following have been awarded since the publication of the last list, in the July issue :

WFE

No. 12 W3EVW (Lester, Pa.)

WNACA

No. 50 G2BOZ (Kidderminster)
51 G5PQ (Hull)
52 GM3AVA (Denny)
53 SM3AKM (Froson)
54 G2DPY (Shoreham)
55 G3EMD (Birmingham)

WABC

No. 35 GI3CVH (Lurgan)
36 G2AOL (Otford)
37 G6KP (Morden)
38 G3IEF (Aylesbury)
39 G3HCX (Castleford)
40 G6UT (Bishops Stortford)

FBA

No. 19 SM3AKM (Froson)
20 F9RM (Mantes)—*Phone*

General conditions for the issue of MAGAZINE DX AWARDS are given elsewhere in this issue.

G5BZ has already been mentioned in connection with the ST2UU epic. Other scalps for him on Twenty have been FP8AA, VP8AK, EL10A (phone), CP, ZP and CEØAA. On Fifteen he has worked VQ2 on phone, also PY, SU, OD and 3A (again). His score remains at 72.

G2WW managed one completely new one in the shape of EAØAC (Twenty phone). ZP5CF was another new phone but not a new country. New countries on Fifteen, in spite of poor conditions, were CE, SV, EA8, GI, 9S, LX, 3A, HZ and KP4—all on phone.

G3ABG was told by OY2Z himself that he is the only active one on the Faeroes at present, OY3IGO being in OZ-land. 'ABG's best on Twenty phone were YV5AB, ZB1BG and OY2Z, CW work giving him OD, FP8, TI, KP4, KV4 and HH, the latter being a new one. Heard, not worked, but badly wanted were CR5AC, HE9LAA and VP8AK.

G3EHT (Wadebridge) has stuck to Twenty phone and has worked VS1CP, 1FE, 2BS and 2UW; VP6GN, LU5XE, OA4BC, KV4BB, CE4BP and LU5GP. An unusual one was W9TYB/Airborne, somewhere between Scotland and Iceland. G2BW (Walton) has added EA9, LU and HE to his 15-metre score, but thinks the band has hit a new low. G2BJY (West Bromwich) concurs, and says he has hardly heard a signal on the band since about July 22. OA4C and 3A2AY did credit him with two new ones, though. Other contacts were TF5TP and SU1GG, ST2UU also being heard.

G2HKU (Sheerness) raised FP8AE and 8AK on Forty, and also heard a VP8 and an LUØ one morning. ZK1AB was another nice one to show up on

the band, but he faded out very quickly.

Correction

Last month, in good faith, we retailed a remark to the effect that GM3DHD had received the Phone Award for the 1951 *CQ* Contest. Apologies to GM2DBX, who *actually* received it! For the 1952 Contest 'DBX was the only GM entrant, but his all-band score of 11,220 was the highest in the U.K. (single-operator Phone).

'DBX thinks that seven entries from the U.K. for a contest of this sort is a Pretty Poor Show, and asks us to spread the news of the next one, to encourage a little more support. You will find the details in Contest Diary; but note that it is no longer the *CQ* Contest, but the World Wide DX Contest, not sponsored by *CQ* but run on similar lines to the now traditional event. Also that there is as yet no clue as to which week-end is Phone, and which CW.

21 MC MARATHON

(Starting July 1, 1952)

STATION	COUNTRIES
G3GUM } VQ4RF }	79
DL7AA	76
G2WW	73
G5BZ	72
G6QB	68
G2BJY	67
G2BW	62
G2YS	61
G3TR (Phone)	57
G3DO	56
G2CHL (Phone)	55
G4ZU (Phone)	55
ZS2AT	54
G8KP	50
VK2AWU	47
G3CMH	44
G6QX	43
G3FXB	40
G8OJ	37
G3ABG	32
G2DPY	32
G5FA	26
G3WP	24
G3HCU	21
GW3CKB	19
G8VG	17
G2DHV	10

General Notes

A note from GM3AAU confirms that he *is* now established in Kirkcudbrightshire, but "not yet sparking on Top Band." He is using a B2 on Forty. Anyone who is still short of his card from Dumfriesshire is asked to drop a note, and another will be forwarded.

G2NJ/A in Hunts. is not just an occasional effort — 'NJ lives partly at home and partly on the converted landing craft in Hunts. One of his first contacts from there was GM3AWF in Rossshire, not yet worked from the G2NJ QTH.

G8KP (Wakefield) added VQ7UU, VQ9UU and CEØAA to his score. Others heard making eleventh-hour contacts with the latter one were G6KP, G6XY, G3HLS and (at last!) your Commentator. By the time this goes to press Easter Island will once more be dreaming of its mysterious past, and there might even be a quiet spot on the low end of Twenty.

Towards Greater Comfort

People are always throwing out all kinds of half-baked operating hints, laying down the law on this and that, and, in general, issuing a bulletin that reads "Now if all you nitwits would only operate just as *I* do, there would be no more trouble on the bands." So it is a pleasant change to receive a really constructive suggestion, and one which, we think, would do more to improve the bands than any other single idea.

This suggestion comes from KV4AA and appears simultaneously in this month's issue of *CQ*. Read it, remember it, and act on it:

> LISTEN on your frequency for five minutes before putting your station on the air. This will allow you to hear at least one side of any QSO's which may be in progress. If your frequency is thus engaged, then shift to a frequency not in use. Outside of contests this can usually be found. The resultant decrease in QRM will be a joy. This goes for you, licensed in 1912; especially you, licensed in 1953. And me!

Contest Diary

October 24, 0200-October 26, 0200: World Wide (formerly CQ) DX Contest, First leg.

October 31, 0200-November 2, 0200: Second leg.

November 7-8: RSGB Top-Band Contest

November 14-15, 21-22, 1430-1830 each day: MAGAZINE Club Contest, MCC, (Top Band).

December 20, January 3, 17, 31, February 14 and 28, March 14: MAGAZINE Top Band Transatlantic Tests.

That concludes this month's epic, and please note that the deadline for the next issue is **first post on September 16.** The following one will be first post *on October 14.* Address your notes, news, claims, scores and everything to "DX Commentary," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1.

Short Wave Magazine DX CERTIFICATES

THE MAGAZINE DX AWARD

For confirmed QSO's with three continents and 15 countries on 1.8 mc, five continents and 40 countries on 3.5 mc, all continents and 80 countries on 7 mc, all continents and 180 countries on 14 mc, and all continents and 90 countries on 28 mc. The total of 405 QSL cards should *not* be sent in the first instance, but a full list forwarded with the claim. Cards will be selected for scrutiny.

WORKED ALL BRITISH COUNTIES

WABC, for 60 or more U.K. counties worked and confirmed on 1.8 mc band only.

WORKED NORTH AMERICAN CALL AREAS

WNACA, for confirmed contacts with W 1-Ø, VE 1-8, including both Yukon and N.W.T., KL7, VO1 and VO6.

WORKED FAR EAST AWARD

WFE, for 18 confirmed contacts from the following 23 prefixes: C, C3, C9, CR9, CR10, DU, FI, HL, HS, JA, KR6, PK1, 2, 3, PK4, PK5, PK6 (Moluccas only), UAØ (Zone 19 only), VS1, VS2, VS4, VS5 (Brunei), VS5 (Sarawak), VS6, XZ.

FOUR BAND AWARD

FBA, for twenty countries worked, and each of them confirmed on four different bands.

Claims for any of these Certificates must be accompanied by the appropriate batch of QSL cards (*except for the DX Award*). These, with a check list, should be sent (by registered post if from abroad) to:

DX Commentary,
Short Wave Magazine,
55, Victoria Street,
London, S.W.1.

All claims accepted will be notified by listings in "DX Commentary," and the cards will be returned at the same time as the Certificate is sent.

Improved Screen Grid Modulation

EFFECTIVE CONTROL WITH LOW AUDIO POWER

G. M. KING, M.D., B.Sc., D.M.R.T. (G3MY)

Though screen grid control certainly does not imply something for nothing, it is a method of modulation having great advantages where phone working is a secondary consideration—for instance, for local coverage or when good CW contact has been established and it is desired to try a few bursts of phone. On the other hand, things can go wrong in the adjustment of a screen-modulated PA, and all sorts of distressing noises be given off by it. This article contains a lot of practical advice as to how to set up a screen control modulator to avoid these pitfalls.—Editor.

SCREEN grid modulation of a tetrode power amplifier offers a number of advantages, particularly to the operator interested in portable work or the owner of a 150 watt "813 type" of CW transmitter, who wishes to make occasional appearances on the phone bands without too much added complication and expense.

The speech equipment can be made extremely simple and compact, outlay is kept to the bare minimum, and the heavy and costly power packs and transformers are eliminated. In addition, practically no extra drain is placed on the power supply which, in most portable installations, is already strained to the utmost. On the debit side, there is the inescapable disadvantage that any type of grid modulation is an efficiency system and the carrier output will be roughly one half of that which would be obtained from the same transmitter using high level plate control.

In SHORT WAVE MAGAZINE for September 1952, the author described a compact portable transmitter-receiver unit for the 144 mc band, in which use was made of the now well-known system of Clamp tube modulation. But it soon became apparent that this system as it stood was incapable of full, linear modulation. Considerable distortion and splatter were produced, mainly due to the fact that it was completely impossible to drive the screen grid potential down below about 30 volts positive with respect to the cathode, and any attempts to increase the depth of modulation in the negative direction merely resulted in the Clamp tube being driven into grid current with consequent clipping and squaring of the negative peaks resulting in severe distortion. Positive peaks on the other hand were reproduced fairly faithfully up to a level determined by the CW capability of the 832 final amplifier and were not subjected to this same limiting effect. The result was asymmetrical modulation with positive peaks of greater amplitude than the negative ones which were also clipped. This also produced a shift of mean carrier level with modulation, giving a "controlled carrier" effect which many operators found both disconcerting and in some cases difficult to read.

A search was made for a means of improving the method of screen modulation and the answer was found in a brief article on Gating modulation which appeared in the October 1952 edition of *CQ*.

Briefly, this system makes use of a triode or triode-connected pentode as a cathode follower, to replace the usual screen dropping resistor of the tetrode final amplifier. The only requirement of this modulator valve is that it shall be able to pass, safely, the normal screen current of the PA and it should have a plate dissipation at least equal to that of the resistor which it replaces.

Action of the Circuit

Examination of the circuit of Fig. 1 will show that the internal screen-to-ground resistance of the PA V1 appears as the cathode resistor of the modulator valve V2. Since this resistance is usually of the order of several thousand ohms, the current flowing through the modulator and this screen-to-ground path

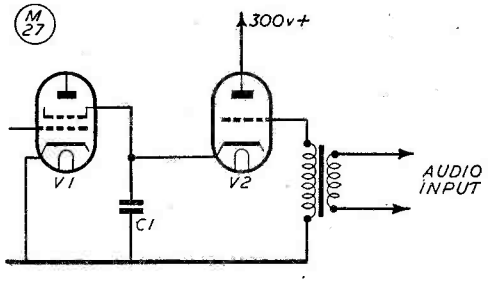
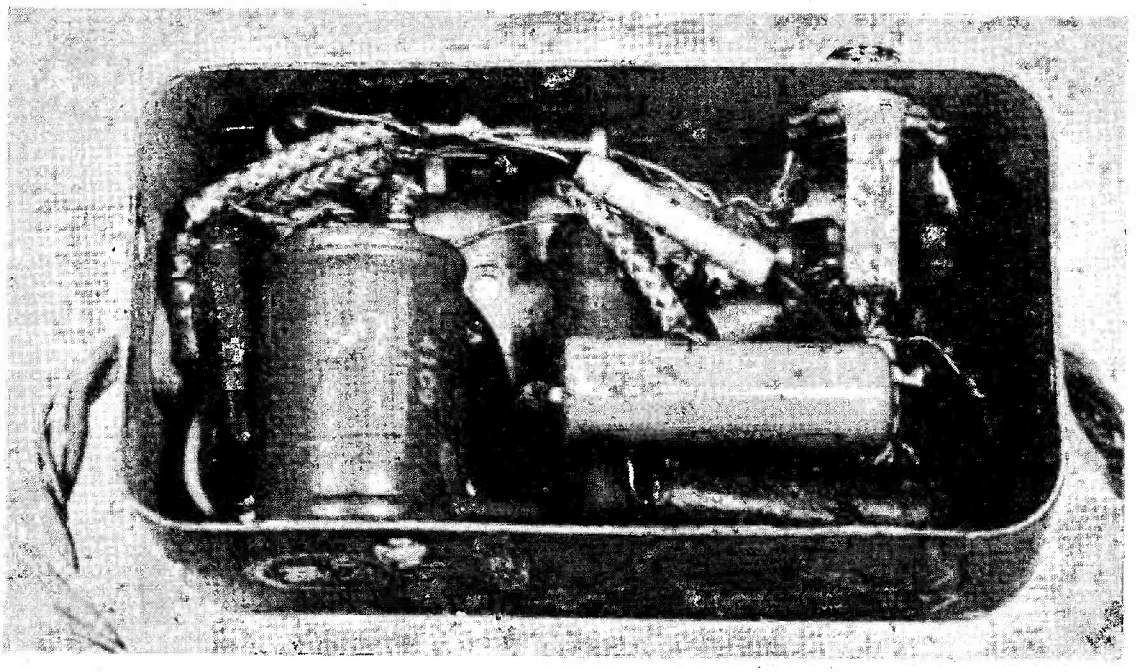


Fig. 1. The principle of screen modulation. V1 is the modulated stage, which can be an 807, 813, 829, 832 or similar; V2 is the modulating valve, such as a 6V6 or anything of that type; and C1 is the screen by-pass condenser, of some value between .0005 and .005 μF.



Construction underneath the little screen modulator unit discussed in this article.

will develop a bias voltage which brings the modulator very near to cut-off. This means that the internal resistance of the modulator will be very high and the screen voltage of the PA very low. When the audio voltage is applied to the modulator grid, the negative peaks will tend to drive the valve to cut-off whilst the positive peaks overcome some of the modulator bias.

If the DC grid return of the cathode follower is made to the chassis, the resting screen voltage of the PA will be very low—around 20 to 25 volts in the case of a 6SN7 or similar valve—and obviously the resting carrier level will be extremely low also. To overcome this, the return is made to a potentiometer across the high tension supply and by varying this control, the resting screen potential and hence the carrier level can be set to any desired value.

In the case of an 832 PA it has been found that the optimum depth and linearity of modulation occurs when the resting screen voltage is set to between 100 and 110 volts. If the carrier is to be fully modulated it is obvious that the screen voltage of the PA must be swung from 0 to 200 volts and to get such an output from a cathode follower requires a peak-to-peak input voltage to the grid of about 250 volts. For this reason it is necessary to use a step-up transformer from

Table of Values

Fig. 2. Circuit of the Screen Control Modulator.

C1, C2, C3	= 0.1 μF	R5	= 1 megohm
C4	= 25 μF, 25v. wkng.	R6	= 1,500 ohms
C5	= 500 μμF	R7	= 100,000 ohms, 1w.
R1	= 5 megohms	VR1	= 50,000 ohms
R2	= 470,000 ohms	T1	= 3:1 or 5:1 step-up transformer
R3	= 1.5 megohms	V1	= 6SJ7 (or 12SJ7)
R4	= 100,000 ohms	V2	= 6SN7 (or 12SN7)

(*All resistors ½-w. except R7*)

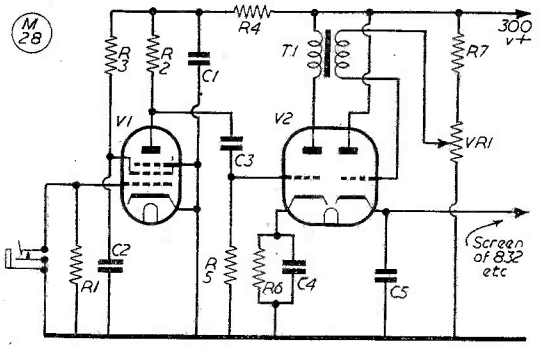
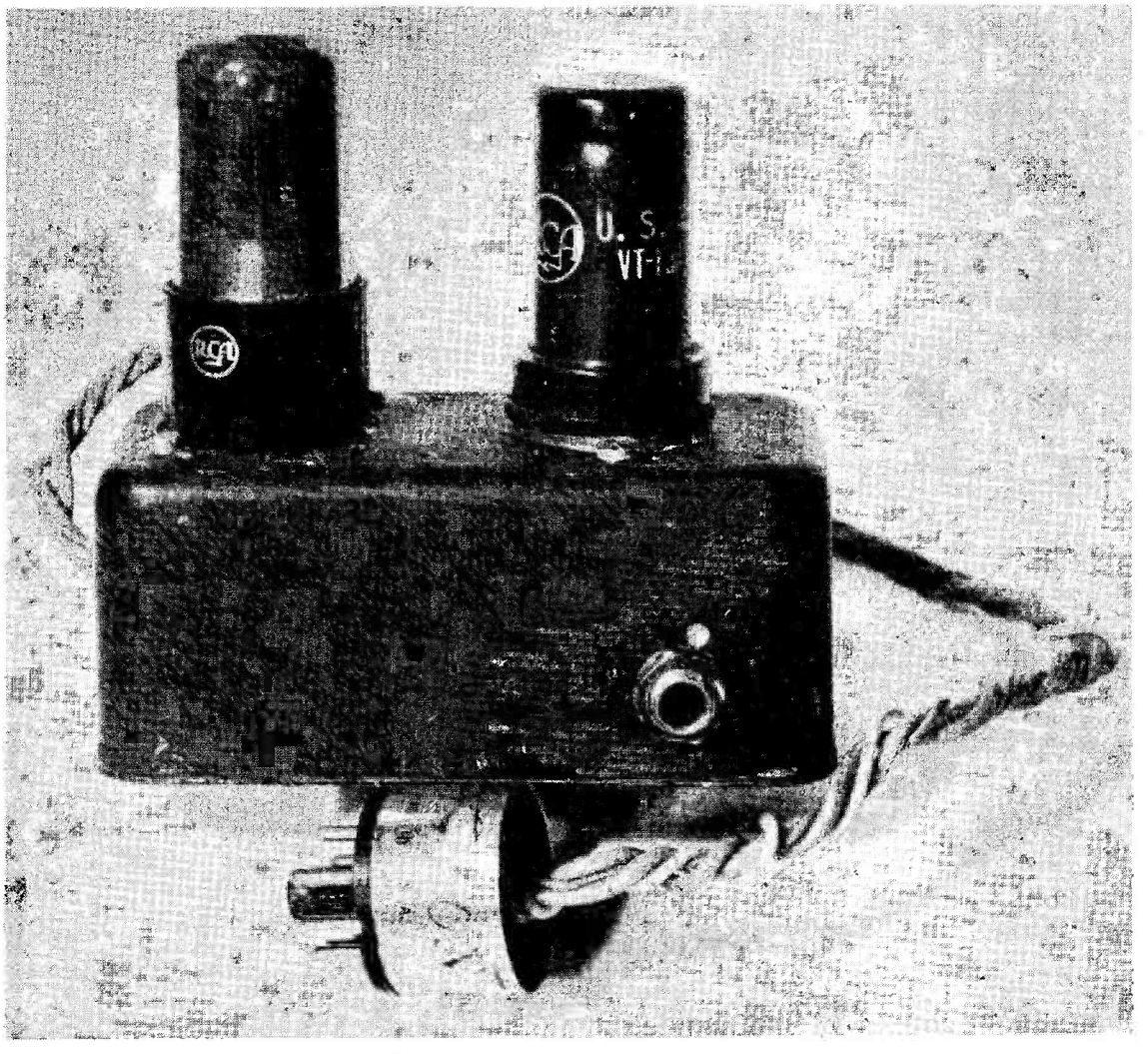


Fig. 2. Circuit complete of the screen modulator unit discussed by G3MY. Adjustment and operation are covered in the text, and values given in the table.

the plate of the last audio amplifier to the modulator grid. A small 3-to-1 or 5-to-1 interstage transformer will be quite satisfactory, providing that its primary inductance is at least 10 Henrys.

The circuit of the complete modulator is shown in Fig. 2, and as it stands it is quite suitable for modulating an 832, 829, or a pair of 807's, or with a larger modulator such as a triode connected 6V6, 6Y6 or 6L6, it can be used to control an 813 running up to 150 watts. As it stands, the full screen voltage of the PA appears across the heater-cathode insulation of the 6SN7, but no trouble has been experienced with breakdown due to this. For higher power, however (and those who have a conscience about subjecting valves to such indignities) it is a very simple matter to feed the modulator heater from a small separate transformer, the secondary of which is left floating above earth potential.

The speech amplifier circuit is perfectly straightforward, and requires no comment apart from the fact that the cathode bias resistor and by-pass condenser of the first stage have been omitted, a small amount of bias being developed across the high grid leak. No gain control has been incorporated as the gain is just right for the usual type of crystal microphone insert and the modulation depth



The screen modulator designed and described by G3MY. Though intended originally for portable gear, it is equally applicable to any PA stage using a tetrode—see Fig. 2 for circuit details.

can be controlled adequately by varying the position of the microphone and raising or lowering the voice!

In operation, it will be found that if the resting carrier level is set too low, modulation produces an upward carrier level shift as shown by a decided increase in the PA anode current, whilst if set too high, the shift is in a downward direction. In practice, it is quite simple to vary VR1 to the correct operating point. In the portable unit shown in the photographs, VR1 has been replaced by a fixed resistor network of the correct value as found by direct experiment.

For normal operation, the resting screen voltage for an 832 or 829 should be around 100 to 110 volts. For 807's, 140 to 170 volts is correct, whilst 813's need a value of 200 to 250 volts. As for all forms of screen grid modulation, the aerial coupling needs to be rather tighter than for CW operation, and the most linear modulation is usually obtained by setting the resting screen voltage to the correct level for the PA valve used and then increasing the aerial coupling until the RF output just begins to fall off.

Since this system of modulation was applied to the portable 144 mc transmitter, the number of telephony contacts has increased greatly and many people have commented on the quality of the signals. The big opening of early March 1953 brought many contacts with stations in PA, ON4 and DL3, and at no time did the RF output of the transmitter exceed 4 watts, a fact which speaks well for the depth of modulation produced by this simple unit.

Reference

"A Gating System of Modulation." C. O. Bishop. *CQ*, October 1952.

FROM BEHIND THE CURTAIN

NOTES ON RUSSIAN AMATEUR ACTIVITY

The joint authors of the series "Amateur Radio in Soviet Russia" — which appeared in our March, April and June issues this year — will from time to time contribute short notes on current Amateur Radio happenings in Russia and the Satellite Countries.—EDITOR.

MOST of us have at some time heard or worked UA3AW, operated by Yurii (George) Nicolævich Prozorovsky, one of the USSR's leading lights in Amateur Radio circles. Yurii has now been granted the call-sign UN1AF for operation in Finno-Karelia and we may expect soon to hear him working from this comparatively rare country. We might mention in passing that Yurii is a very keen Top Band operator and it would indeed be interesting to see whether he could resist a call from G's on 160 metres!

Other recent news is that Fedor Roslyakov, of high-speed CW fame, has been nominated "DOSAAF Champion for 1953" for traffic-handling services. The July issue of *Radio* carries a colour photograph of Roslyakov on the front page wearing over his shoulder the red sash of DOSAAF with the citation printed thereon.

Constructor Contests

The 11th Annual Radio Exhibition which took place in May of this year is briefly reported in the current issue of *Radio*, and a summary of prize-winning gear is given. Entries fall into two categories, one for receiving equipment, and the other for transmitters, test-gear, beam aerials and so forth. The Sumy Radio Club (UB5KAI) walked off with first prize in Class II with an impressive looking transmitter for operation on the bands 1.7-14 mc, running an input of 550 watts. No details are given beyond a sketch of the actual apparatus which is neatly assembled on a rack and looks very much like a typical "California Kilowatt" rig. On the receiving side UA3AW received first prize for an O-V-2 receiver for the HF and VHF bands, while V. Feklushchin of Stalingrad gained second place with a communications receiver, of very professional appearance, comprising 18 stages, crystal filter, S-meter and most of the other refinements one expects to find in this type of apparatus. There does not appear to have been any official easing-up of the regulations forbidding Russian amateurs to work stations outside the Soviet *bloc* but we hear many accounts of UAØ-W6 contacts and it may well be the case that officialdom does not penetrate so deeply into the Eastern Siberian area.

New Stations

A further batch of new calls has recently been issued and among them is UA9KXA, Syktyvkar Radio Club, located in the capital of Komi oblast, which puts this region on the Amateur Radio map for the first time. In the Call-sign Allocation Table which appeared on page 34 of the March 1953 issue of *Short Wave Magazine* Komi can be listed under UA9/UA9K-X.

The stamp collecting fraternity will be interested to know that our old friend Popov's memory is now perpetuated on some new Bulgarian stamps. The 4 leva stamp is inscribed in Russian characters while the 20 leva value carries a Romanised version of the same wording. The inscription at the top of the stamps reads: "Radio Day 7th May 1895-1950."

A.W.R.S. IN CAMP

CHESTER, JUNE 14 - 28

THE letters stand for Army Wireless Reserve Squadron, in Camp for signals training and exercise for a fortnight, with a lot of interesting radio activity and experience off the job as well as on it. And quite a lot of fun.

It was on June 19 that a lusty cheer rattled the ventilators of an Army truck, parked among sheep in a field in North Wales — a detachment of the Squadron had made contact with the Hq. of its American counterpart MARS (K4USA).

In the vehicle's command compartment G3EJF laid down the can of bully he was prising open with an earthing spike, and the Squadron's second-in-command G3FDU took over the key. G3DNQ offered up a sergeant's prayer over a gleaming new transmitter and hoped its PA meter would keep flicking till they had finished with Washington. Thanks to two of his mechanics (actually G3AMO and G3ICR disguised as corporals), who had spent the whole afternoon in getting the rig perking, it did. Thus it was that a message of greetings was copied from the upper floors of the Pentagon in Washington.

Back in camp, the C.O. of the Squadron (G3ADZ) was involved in an official function at which the Chief Signals Officer was present; when it was reported that contact had been made with Washington, the general was rather surprised. Under Queen's Regulations the transmitter with which the A.W.R.S. detachment had been provided has a range of 200 miles only—but it was on issue to amateurs, who can make all sorts of things happen.

On the way back to Chester many stories were recounted of the previous week's happenings. Like the one about the amateur in the Midlands who was so surprised when the QSO he started with G3EJF/P ended with GW3EJF/P. But a Signals Squadron has to "reccy" transmitter sites, and what better way to do this than in a jeep with a /P rig on the most convenient amateur band? It just happened that the jeep was in Blacon Camp when CQ was called—it had passed the border sign round the corner on the next over. And some of the back-chat overheard: "Hey, I'm running 10 amps. aerial current and I haven't switched on." "What do they think we're here for, brass pounding or polishing?" "Excuse me, sir, but I've lost my grid drive." ("Never mind, you didn't sign for it"). "This new lot, the amateur mob, seem to get results." "I don't remember seeing 'folded dipole' in the Signals Manual."

Altogether, it was a fortnight filled with a real sense of purpose, with many memorable occasions, for the licensed operators and SWL's who answered G3ADZ's call for volunteers for the Army Wireless Reserve Squadron. They are particularly grateful for the hospitality offered them during off-duty hours by members of the Chester and District Radio Society and other amateurs in the area, and also much enjoyed their official visit to the Mersey Port radio and radar station.

Throughout the year, the Squadron will continue to train on Service frequencies, maintaining personal contact on 3565 kc on Sunday mornings — until next Camp, to which all who were in khaki this year are already looking forward. Truly, the Army Wireless Reserve Squadron has got away to a flying start.

(NOTE: *Application to join the A.W.R.S. can be made direct to the Commanding Officer, Major D. W. J. Haylock (G3ADZ), 230 Devonshire Avenue, Southsea, Hants., while any of the amateurs mentioned in this story will also be glad to give full information on Squadron activities.—Editor.)*

RONEO ELECTRONIC STENCIL MACHINE

Years ago, we had a junior named Dencil who was in charge of the office stencil pencil. The cry was always "Dencil, where's the . . . stencil pencil?"—with such comic variations as wit could devise. The remarkable instrument now being produced by Roneo, Ltd., the world famous firm of office equipment manufacturers, would have spared poor Dencil much anguish. It is an electronic stencilling device with which originals can be copied direct and in exact detail without any intermediate photography. Scanning is at the rate of 500 lines per inch, which makes for fine work with good definition, and the stencil is cut electrically. On the duplicating machine, colour can be worked, which considerably extends the scope of stencil duplicating. The process is similar in principle to the facsimile transmission of photographs by radio, and the equipment is so simplified that even Dencil could have coped successfully with it. (*Exhibited at the National Radio Show by invitation of the Radio Industry Council*).

SUTTON COLDFIELD TV TRANSMITTER

The BBC's high-power sound and vision transmitters at Sutton Coldfield, which have now been in continuous operation for some 3½ years, were temporarily taken out of service about a month ago for maintenance overhaul and modification. The S.C. TV transmission has been carried on the medium-power stand-by gear.

THE G3JFP PUBLICITY

The article in our June issue—"Station G3JFP On The Air"—was intentionally written in such a way as to tell the story without involving G3JFP himself (or his benefactors) in personal publicity, which they did not want. However, the press got hold of it and managed to track him down. The result has been numerous visits — including one from Sir Ian Fraser, chairman of St. Dunstan's — and a mass of correspondence. So there is no point in concealing his address (see "New QTH's" in this issue) any longer, nor the fact that those who helped G3JFP on to the air were members of the Brighton & District Radio Club, of which the honorary secretary is R. T. Parsons. G3JFP's activities on Eighty have produced many successful QSO's all over G and with several European countries.

VHF BANDS

A. J. DEVON

ST2UU Reports Hearing PAØLDG—

And a Bit of History—

EDX Worked on Both Bands—

Story, Quick Contest No. 1—

Conditions, Activity and Station Reports—

THE history of radio exploration and development, particularly on the short waves, has been marked by a long sequence of unexpected results which always came as a complete surprise to The Experts. Just recently The Experts have been laughing their heads off at an episode they knew nothing about till they saw it (in English) in this space—and then they had to wait till they found out that the "claim" made by DL3QA was a hoax.

This was enough to let loose a lot of clever stuff about "We knew it all the time," "The technical details were too smooth," "Of course, the note would have been T3" (A.J.D. having shown years ago *why* a long-distance reflection of this sort would degrade the quality of the signal) and finally admitting, to be on the safe side, that naturally such a contact was not outside the bounds of possibility.

Fifty years ago, Marconi had much the same experience. When finally he did get results, The Experts set about proving that really it was all too easy when one realised that Clerk Maxwell had made the original suggestion —"postulated the hypothesis," in the jargon of The Experts—about 40 years before *that*. It is a safe bet that it will not be long before The Experts will be explaining that it was, after all, Sir Edward Appleton's original work on ionosphere sounding that gave Sir Robert Watson-Watt the clues to radar; at the moment, of course, Watson-Watt gets all the credit for radar.

To what, you may say, is all this leading? Well, on Sunday, July 26, at 1102 GMT, ST2UU in Khartoum heard PAØLDG on Two Metres, at RST-236/7. The distance is about 3,300 miles, beside which all standing VHF DX records pale into insignificance. It should, however, be explained that at the moment of writing this is a *report only*, from ST2UU, and it has not yet been confirmed — neither has the G3BNC/I1XV contact of July 22 last. Going further back still — much further back — to October 17, 1949—there is the case of the reception by G6UH of FA8IH on 144 mc. Credit where it is due; this reception was confirmed. But at the time there was a good deal of eyebrow twitching by The Experts, who gave quite a lot of reasons why it could not have happened.

One must keep an open mind about these things— and the older one gets, the wider one's mind must be. If the I1XV contact and the ST2UU reception can be confirmed beyond doubt then — taken together with the G6UH/FA8IH result of four years ago —it must be that on VHF there is some mysterious propagation phenomenon of which at present nothing is known. It might be sporadic-E; or perhaps reflection off high flying aircraft; or possibly the meteor showers continually entering the earth's atmosphere from outer space can become sufficiently dense to form, momentarily, a reflecting surface. Or perhaps it *is* moon reflection, after all. About the only thing we can be reasonably certain of is that it is *not* a weather effect.

Recent EDX Results

Coming down to shorter distances and EDX which *is* almost certainly due to propagation through the troposphere: On August 12 at 2340 BST GM3DIQ (Stevenston, Ayr) received DL1LB (Weener-Ems) at RST-339, distance just about 500 miles. As Weener will not be marked on most maps, take the pinpoint as 53° 10′ N, 7° 23′ E. Though this reception is not so very exciting in terms of mileage, it is of great importance from the point of view of the GM's and their chances for EDX, of which they have so far had very little. GM3DIQ says that he was unable to raise DL1LB.

EDX on 430 mc

Another outstanding result to report this month is a QSO G2WJ-DL3FM on August 10, 2300-2359 BST, on the 430 mc band, RST about 589 both ways. G2WJ (Great Canfield, Essex) was solid on phone and DL3FM (Mulheim-Ruhr) up to R5 at times. The input at G2WJ was 18w. to a DET-24 as a straight PA, giving 8w. RF out, but DL3FM had only two watts out of an 832 tripler. It is the G/DL "First" on 430 mc, and in this case the distance is 280 miles, near enough.

Then going back to August 1st, we find G2WJ again making history when during that evening he was transmitting TV to G3GDR at Abbots Langley, a distance of 30 miles, using only 2 watts of peak white power, on a frequency of 436 mc. The whole of the transmitter—pulse generator, camera unit and everything else—is entirely home built, and the G3GDR receiver was locking perfectly, giving a picture clear enough to identify all the subjects shown in front of the G2WJ/T camera. This contact between G2WJ/T-G3GDR is probably the greatest distance yet covered by amateur TV in this country.

Going higher still in frequency, we come to the achievement of G3QC-G8DD who — working /P

on July 26 last from high ground near Lancaster and Ludlow respectively — succeeded in obtaining two-way contact on 1250 mc (24 centimetres) over a distance of 100 miles, along what appears to have been a non-optical path. The photographs herewith indicate the essential simplicity of the gear they used, and details are given in the captions. So some more history is made—and who ten years ago would have been prepared to say that amateur two-way phone working would be possible on 24 cm over a distance of 100 miles?

Verily, it is becoming quite a thing to keep up with the detail of all this VHF achievement. And as your A.J.D. has recently been reading some radio history, it will be of interest just to add that St. Catherine's Point, Isle of Wight — from where G5TZ/A is now putting out such a fine signal on two metres—is the very spot from which in 1901 Marconi heard *his* first DX, at Poldhu 198 miles away. (It was this test that convinced him, in spite of The Experts, that the Atlantic could be spanned by wireless.)

Conditions and Activity

It was not until towards the end of the period that conditions started getting really good again, with EDX coming in most evenings from the southerly directions. In this connection, it is most interesting to note that during the fortnight July 30-August 12 G5YV (Leeds) and ON4BZ (Brussels) were able to keep schedule *every evening* at 2300 BST, with R5 signals both ways; the distance is about 330 miles.

Activity has been quite good when conditions have seemed right, with many new stations drawing first breath on the two-metre air. Hardly a month passes without several new VHF calls being reported. This is as it should be, and in due time will result in week-day evenings or Sunday mornings "without a signal on the band" becoming a thing of the past.

Results—Quick Contest No. 1

The table herewith tells most of the story, and very interesting it is, too. It has now become almost a tradition that conditions turn sour immediately on the eve of any contest we lay on, and Q.C. No. 1 was no exception! Poor conditions naturally lead to low activity — or apparent inactivity — and with not many stations within range, the majority of operators not unnaturally get a bit dispirited. So the general level of enthusiasm drops off. We can have no complaints on this score—after all, if you are on for a contest, you want to score some points; if the stations are not within reach (they are nearly always there, but not coming through) the whole thing begins to feel a bit flat.

TWO-METRE ACTIVITY REPORT

(Lists of stations heard and worked are particularly requested for this section, set out in the form shown below.)

GW3GWA, Wrexham, Denbighshire.

WORKED: G2CBR, 2CYN, 2FCV, 2HCJ/P, 2HGR, 2JT, 2OI, 3APY/P, 3ASC, 3ASG/P, 3ATZ, 3BKQ, 3BPJ, 3CSC, 3DA, 3EPW, 3FMI, 3GHO, 3IOO, 3IWJ, 3WW, 5YV, 6MI.

G6MI, Blackpool, Lancs.

WORKED: EI2B, 2W, 6A, G2ALN/P, 2CBR, 2CYN, 2FOS, 2FZU, 2HCJ/P, 2HGR, 2HIF, 2IN, 2OI, 3ABA, 3AOO, 3ARS, 3AYT, 3BOC, 3BW, 3CXD, 3DA, 3ELT, 3EPW, 3FMI, 3FVY, 3GFT, 3GGS, 3GHI, 3HII, 3IY, 3VX, 4PF, 5JU, 5KX, 5MB, 5TH, 5VN, 5YV, 6LC, 6NB, 6QT, 8KL, 8SB, 8TD, GM3BDA, 3OL, GW2FVZ, 3ENY, 3GWA, 5MQ.

HEARD: EI3E, G3GED, 3GOP, 3IWJ, 3WW, 4SA, 6BJ, 6LI, 6RH, 6VX, GD3DA/P, GW3INY.

G3FYY, London, N.W.2.

WORKED: G2ANT/A, 2DD, 2DVD, 3AGR, 3BLP, 3EYV, 3GBO, 3GDR, 3GHO, 3GSE, 3HBW, 3ISA, 3MI, 4KD, 4RO, 5DS, 5TZ/A, 6QN, 8SK. (*All July 7 to August 6*).

EI2W, Dublin, Eire.

WORKED: EI2A, G2DCI, 2FXK, 2HCJ/P, 2PU, 2XV, 3AOO, 3BKQ, 3FAN, 3FMI, 3FRY, 3GZM, 3WW, 4SA, 5TZ/A, 5ML, 5YV, 6NB, 6VX, 6WF, 6XX, 8DA, 8KL, GI3FZQ, 3GQB, 3IJM, 5AJ, GM3DIQ, 3FVX, 5VG. (*During August 1-10 only*).

G4OU, Sheerness, Kent.
NGR 917737.

WORKED: G2WF, 4FB, 5TZ/A, 6CH, 6NU.
HEARD: DL3VJ, F9RL, G2BBR, 2BYF, 5NF, 6AG, 6RH, ON4UD.

GM3DIQ, Stevenston, Ayr.

WORKED: EI2W, 6A, G5BD, GI3GQB, 5AJ, GM2BUD, 3BDA, 3DDE, 3ENJ, 3FOW, 3FVX, 3FYB, 3IBV, 4HX, 5VG, 6LS, 6WL, 6ZV.
HEARD: G3BW.

G6NB, Brill, Bucks.

WORKED: DLILB, 3VJ/P, EI2W, 6A, F9CQ/P, G2BAT, 2BMZ, 2FO, 2HCJ/P, 2UN, 3AOO, 3BJD, 3BW, 3CQC, 3CZY/A, 3HYH, 3HZH, 3IOO, 3IWJ, 4GR, 5MB, 5YV, 6LC, 6XX, GC3EBK, GW2ACW, 3BNQ, 3EJM/A, 3ENY, 8UH, ON4BZ. 4HN, 4UD, OZ3WK, 8JB, 9R, PA0EQ. 0FC, 0FP, 0HA, 0HAK, 0NL, PE1PL. (*During July 10 to August 10*).

G4RO, St. Albans, Herts.
NGR 51/147075.

WORKED: DL3FM, F8MX, G2ATK, 2BVW, 2DD, 2HCG, 2XV, 3AGA, 3BKQ, 3DIV, 3EPW, 3FAN, 3FYY, 3GDR, 3GHO, 3HAZ, 3HBW, 3HZK, 3IOO, 3IUD, 3JKW, 3YH, 4SA, 5BC, 5DS, 5TP, 5TZ/A, 5YV, 6QN, 6UH, 6XX, 8DL, 8KL, 8SK, 8WV, ON4HN, 4UD, 4YB.
HEARD: EI2W, F8GH, 9CQ/P, G2AIW, 2AHP, 2ANT/A, 2BAT, 2BFT, 2BMZ, 2BRR, 2CNT, 2CZS, 2DDD, 2DGY, 2DTO, 2FXK, 2FVD, 2HIF, 2HQ/P, 2MV, 2NM, 2OI, 2PU, 2TP, 2WA, 2WJ, 2YB, 3AGR, 3BA, 3BGR, 3BI, 3BLP, 3BNC, 3BRW, 3CAT, 3CGQ, 3DJX, 3EGV, 3ENI, 3EYV, 3FD, 3FIH, 3FOU, 3FUH, 3GBO, 3GVC, 3GZM, 3HVO, 3HWF, 3HXS, 3HZJ, 3IBY/A, 3IEX, 3ION, 3ISA, 3JMA, 3ML/P, 3SM, 3WS, 3WW, 4OT, 4PS, 5FF, 5HN, 5JU, 5LK, 5MA, 5ML, 5NF, 5QL, 5RW, 5RZ, 5US, 5WW, 5YK, 6AG, 6AG/P, 6CH, 6JK, 6LL, 6NB, 6OU, 6RH, 6SN, 6VX, 6WF, 6WU, 6XA, 6XH, 6YP, 8DL, 8DV/A, 8HY, 8OU, 8SC, 8SY, 8TB, 8VR, GW8UH, ON4BZ, PAØFP.

G3WS, Chelmsford, Essex.

WORKED: F8MX, G2HDZ, 3AJP, 3BNC, 3CGE, 3CZY/A, 3GAV, 3GSE, 3HBW, 3HCU, 3HWF, 3HZW, 3ISA, 5AM, 5MR, 5TZ/A, 5YV, 6LL, ON4BZ, 4HN, 4UD, PAOHA.
HEARD: DLILB, 3FM, 9SH, G2BMZ, 3ASA, 3AUS, 3BRW, 3GVC, 4AU, 5BD, 5JU, 5NF, 6LI, 8DL, I1XV, ON4YB, PAØFP. (*All July 15 to August 12*).

G8DA, Gloucester.
NGR 32/834167.

WORKED: EI2W, G2BAT, 2HIF, 2HQ/P, 3BGR, 3CVK, 3DJX, 3DVK, 3FRY, 3FSL, 3GEN, 3HAZ, 3IER, 3IOO, 3IUD, 3MA, 3NL, 3NL/P, 3YH, 4GR 5BD, 5JU, 5ML, 5YV, 6NB, 6VX, 6WF, 8SC.
HEARD: F9CQ/P, G2AHP, 2BFT, 2BMZ, 2BUJ, 2CXD, 2FJR, 2FTS, 2FVD, 2HOP, 2OI, 2PU, 2XV, 3ABA, 3AGA, 3AGS, 3ASC, 3AUS, 3BA, 3BKQ, 3BLP, 3BW, 3CCH, 3CUZ, 3DLU, 3EHY, 3EPW, 3FMI, 3FMO, 3FWW, 3FYY, 3GBO, 3GHO, 3GYQ/P, 3GZM, 3HBW, 3HWF, 3HYH, 3IWJ, 4AU, 4MW, 4RO, 4SA, 5DS, 5HB, 5MA, 5TZ/A, 6AG, 6AG/P, 6RH, 8DM, 8OU, 8SB, GW3EJM/A, 3ENY, 8UH.

G3HBW, Wembley, Middx.

WORKED: F9CQ/P, G2BAT, 2KF, 2OI, 2XV, 3AGA, 3CFK, 3DLU, 3DT, 3FIJ, 3FMO, 3FYY, 3GAV, 3GHO, 3HWF, 3IBY/A, 3ITF, 3IOO, 3JKW, 3WS, 3YH, 4GR, 4JJ/P, 4RO, 5BD, 5FF, 5YV, 6NB/P, 6OU, 6SN, 6VX, 8AO/MM, 8IL.
HEARD: F8GH, 8MX, G2BMZ, 2DDD, 2DSP, 2DSW, 2DVD, 2HCG, 2HQ/P, 2NM, 2PU, 3ABA, 3AUS, 3BKQ, 3BNC, 3DIV, 3DVK, 3FAL/A, 3FAN, 3FIH, 3GVC, 3HAZ, 3IIT, 3IUK, 4MW, 4SA, 5JU, 5ML, 5MR, 5TZ/A, 5YK, 6CI, 6XX, 8DL, 8MW, 8WV, GC3EBK, GW8UH, ON4BZ, 4HN, PAØFP, PE1PL.
(*July 4 to August 11*).

G2HDZ, Pinner, Middx.
NGR 51/126886.

WORKED: F8MX, 9DI, G2ANT/A, 2BAT, 2DDD, 2DSW, 2DTO, 2HIF, 3BNC, 3CGQ, 3ENI, 3FAN, 3FIJ, 3FUL, 3GBO, 3GHO, 3GSE, 3GVC, 3HVO, 3HZK, 3IAM, 3MI, 3SU, 3WS, 3WW, 4GR, 4JJ/P, 5DS, 5FF, 5MR, 5NF, 5TZ/A, 5WW, 5YH, 5YV, 6JK/P, 6JP, 6NB, 6XH, 8DL, 8IL.
HEARD: DL1LB, F3JN, G2BVW, 2FNW, 2FTL, 3IOO, 3JKW, 5ML/P, 6SN, 6WF, 6XX, ON4HC, 4HN, PAOEQ, 0HA, PE1PL. (*July 12 to August 8*).

70-Centimetre Band Only

G2HDZ, Pinner, Middlesex.
NGR 51/126886.

WORKED: G2DD, 3FP, 3HBW, 3MI, 4RO. (*July 12 to August 8*).

But let us look at the two top scorers, G5YV and G6NB, who certainly show that it is possible even to beat conditions. Harold at G5YV found no less than 19 stations worth 15 pts. (150-200m.) each to him. Bill of G6NB raised two (G2BAT and G3AGA) at 20 pt. distances (200-250m.) and made the largest number of actual QSO's with 56 stations worked; he only had two stations scoring 15 pts. each. Next best in terms of stations worked is G5DS, with 48, but 33 of them were only worth one point each.

For G2HIF (Wantage, Berks.) his best QSO was G2BAT (Falmouth) at 1620 BST on July 26; the latter also gave G2HDZ (Pinner) *his* best; a glance through the latter's log shows that, rather cunningly, he was looking for multipliers rather than local contacts; he made 20C for only 33 different stations logged.

It is clear that G2BAT himself worked very hard for his score—remote from the centres of activity, and with a bare half-dozen stations available that could be called "local." The only two portables, G3IRA/P and G4JJ/P, have been credited full points because (*a*) It makes no difference to their positions, (*b*) With but two /P's in, a "separate list" is hardly justified, and (*c*) They both took the trouble to come on in useful counties, Devon and Rutland respectively. Nobody will object if we say that henceforth the 25% handicap will not, repeat *not*, apply to portables; they will score on the same basis as everyone else.

G3CGQ (Luton, Beds.) could only be on for a few hours on the Sunday. G2DSW (Southampton) found but one station, again G2BAT, worth 15 pts. to him. G3FIJ (Colchester) had two 15-pointers. G5MR (Hythe, Kent) heard five stations in three counties (G3BKQ, Leicester; G3FD, London; and G6NB, Bucks.), which if worked would have pushed up his score considerably. And G8DA (Gloucester) lists G2AHP, G2FJR, G3IOO and G5YV for four lost multipliers.

As usual, many more stations took part than sent in scores; some of the "well-known calls" did not show up at all (we can never quite understand why this should be!); and as always there are the cheeful few who come on, do their stuff, and are not ashamed to put in a score which they must know can only bring them near the bottom.

So much for Quick Contest No. One. At the moment of writing, Q.C. No. 2 has yet to happen. Almost the only thing we can be sure of is that conditions were terrible again!

Some Station Reports

G6MI (Blackpool), from whom we have not heard for a very long time, puts in a calls list this month and remarks that he often hears distant phones who can be followed quite easily until it comes to getting the callsign — then they sign over so smartly that they are never identifiable. This has been commented upon so frequently! G6MI runs G2IQ-SX28, with a 4-ele Yagi at 45 ft., and 24w. input to the transmitter.

G4OU (Sheerness, Kent) has put away all his gear for the HF communication bands, and is now operational on Two Metres exclusively—this w.e.f. a few weeks' ago only. His transmitter is 6V6-6V6-832-832 running 20w. on CW and phone, and on the receiving side he has a G6VX CC converter into an HRO, with a 3-ele Yagi. So far, things are going well, some useful and interesting contacts have been made, several of the locals are getting VHF-interested, and altogether G4OU is looking forward to his sojourn on the VHF bands.

QUICK CONTEST No. 1

July 25-26, 1953

STATION AND LOCATION	CONTACTS	COUNTIES	TOTAL PTS.
G5YV, Leeds, Yorks.	41	26	10,322
G6NB, Brill, Bucks.	56	30	8,280
G2HDZ, Pinner, Middx.	33	20	3,000
G2BAT, Falmouth, Cornwall.	20	11	2,563
G2HIF, Wantage, Berks.	28	19	2,223
G5DS, Surbiton, Surrey.	48	17	2,091
G4JJ/P, Oakham, Rutland.	23	17	1,836
G3CGQ, Luton, Beds.	18	16	960
G2DSW, Southampton, Hants.	25	9	567
G3FIJ, Colchester, Essex.	12	7	420
G5MR, Hythe, Kent.	8	5	255
G8DA, Gloucester.	10	7	196
GM3DIQ, Stevenston, Ayr.	9	5	105
G3IRA/P, Nr. Teignmouth, S. Devon.	5	3	63
GW4CG/A, Port Talbot, Glam.	2	1	40
G2DHV, London, S.E.13.	3	3	21

Conditions: Poor

Activity: Rather Low

In case anyone thinks that this photograph has got into " VHF Bands " by mistake, let us hasten to assure him that it is the natural outcome of the note on p. 113 of our April issue. The men are, left to right: GM3BDA (Rev. W. M. Ferrier, officiating minister), GM3AUQ, GM3DIQ (the fortunate groom) and on extreme right, GM3DDE. All good wishes for their happiness to GM3DIQ and his charming bride.

G3FYY (London, N.W.2) is also a newcomer to Two but takes rather a different view — his intention is to work all bands 2-160 metres. Rather badly situated in the Cricklewood Basin, his radiation has to traverse miles of roof-tops on rising ground in all directions — nevertheless, G3FYY is getting out. He runs 15w. to an 832 on 145.08 mc, and the receiver is two EC91's in GGT with a triode-connected 6AK5 mixer and CCO giving an IF of 19-21 mc into a CR-100; though the RF stages are broad-banded, G3FYY finds it a distinct advantage to be able to peak up the mixer tuning. His best DX to date is G5TZ/A who, says G3FYY, "generously gave me 5 and 9."

G2XV (Cambridge) notched up two new counties with EI2W and GD3DA/P, and hits Countries Worked with 11C, some of the missing ones having been scooped in during the recent openings — and he has worked three countries (G, GW and ON) on 70 cm. Here is another well-known OT, who first came on the air about 30 years ago, with all his early enthusiasm for Amateur Radio still undimmed.

Edinburgh Activity

GM6LS (Edinburgh, 12) sends a budget of GM news, listing as active stations, on Two most nights from 2230 BST onwards: GM3DDE, GM5YW, GM6LS, GM6SR, GM6XI (Edinburgh area), GM3BDA (N. Berwick); GM3EGW, GM3ENJ, GM3FYB (in Fife); GM5VG (Glasgow); and GM3DIQ (Ayr). And for a new county, G3HYB has got going in Kinross. Another to change to a 12-element beam (see *Short Wave Magazine*, November 1952) is GM6LS, who finds it an improvement over a 9-ele Yagi; GI3GQB and GI5AJ have been worked, never previously even heard on the old beam. The GM's are trying hard for LA—so they may be interested in the following frequencies: LA1KB, 144.43; LA2JC, 144.20; LA4VC, 144.275; LA7Y, 144.58; LA8AB, 144.13; LA8RB, 144.50; and LA9T, 144.30 mc.

GM3DIQ (Stevenston, Ayr) also writes — and you see his photograph herewith!—with claims for the Tables, and mentions that the first station he found on his receiver after reading about G5BD's ½-wave phase inverter in this space last month, was G5BD! Naturally, an interesting QSO ensued.

South Again

G3WS (Chelmsford, Essex) puts in county claims and a calls h/w list. G8DA (Gloucester) is dismantling to move QTH down to Devon, so we shall not hear much of him for a while. G3HBW (Wembley, Middx.) had a good run with the Continentals during the month, and also mentions an interesting schedule maintained between PE1PL and G4HQ/A (London), which can be heard at 1315 BST on working days only; PE1PL always comes through at strengths varying between S7 and S3. On August 9, G2XV was logged on 70 centimetres at S8, testing with G8SK; for this band, G3HBW now has a QQVO6/40 as a straight PA taking 40w. input, with which locals and semi-locals have been worked; heard on 430 mc were G2WJ and G5TP.

G3DLU has now got going from Compton Bassett, and finds his chances much improved, first contacts being northerly GDX like G3FMI (Chester), G3IOO (Oswestry) and G6WF (Wolverhampton). To the South, GC3EBK has been worked, and the Isle of Wight stations heard. So now G3DLU is settling down to start all over again in the Tables!

G6RH (Bexley, Kent) has been having a crack at the portable stakes—on August 11, he and his son went out with some gear loaned by G6AG to a site on Well Hill, Orpington, Kent, the idea being to attract the attention of

EI2W and EI6A; this was not possible, but they got good contacts with G5YK (Bristol) and GW8UH (Cardiff), with a total of 14S worked in just about an hour. On August 13, they tried Westerham Heights which, though higher at 850 ft. a.s.l., turned out to be an inferior site due to local screening, only 7S being raised. G6RH says that he will frequently be out portable now that he has got the taste for it.

Louis of G3EHY stakes a new claim for the All-Time with 59C. G3BA (Daventry) spent much of his holiday getting going again on Two, and found conditions very good, with high activity. EI2W and G3BW represent his DX to the N-W, and he wishes he could get the former to respond to his CW calls! G3BA now has the 12AT7 converter going, into his S.640, with the addition of a 6AK5 broad-banded IF amplifier to boost the input to the receiver at 24-26 mc; he says this works *very* well (see *Short Wave Magazine*, July 1953). Having come from those parts, G3BA is very anxious to stimulate GM/G working, and he suggests that G's should head North and the GM's South at 1900 clock time and *call*. He feels that the lack of G/GM contacts could be partly due, at least, to the fact that most G beams are headed South or South-East when conditions are good and the band is open. In other words, the slogan at G3BA is "Seven p.m. is GM Time."

Another new correspondent this month is G3AGR (Streatham, S.W.16) who stakes claims for both Tables, having come on the band for the first time in January this year; his transmitter runs an 832 in the PA with 30w. input and the receiving set up is a 12AT7-6J6 cascode into an Eddystone 358X, with a 12-element stack at 30 feet. G3AGR is now scouting for VHFCC.

G4RO (St. Albans) is putting out an excellent signal these days, and found conditions good for the Continent during the period August 8-10. On August 8, the EDX paths appeared to be somewhat localised, as stations could be heard working OZ's not audible in St. Albans, and the weather conditions were again different at G2WJ (Dunmow). G4RO sends a most comprehensive calls h/w list.

The same can of course be said of G6NB (Brill, Bucks.) who this time makes it 9 countries worked in the month to August 10, showing remarkable coverage from EI in the West round to Europe and Scandinavia. Bill badly wants the answer to one simple question "When *do* the GI boys come on!" With him, EI2W and EI6A come in like the side of a house, but narry a GI. It will be noticed that he moves into the front rank in All-Time Counties, and is giving G5YV a

QUICK CONTEST No. 3

Week-end September 26 - 27. Rules on p. 239, June issue. Make it a Party!

SEVENTY-CENTIMETRE STATIONS— Fifth List

CALL	LOCATION	FREQ. (mc)	EQUIPMENT
DL3FM	Mulheim-Ruhr	434.2	Tripler, 32-ele stack, SEO Rx
EI2W	Dublin	432.54	Tripler, 16-ele stack, (? Rx)
G2BFT	Solihull	433.17	Tripler, 16-ele stack, (? Rx)
G2BVW	Leicester	432.60	Straight PA, 5ele Yagi, Special Rx
G2CNT	Cambridge Airport	435.2	Tripler, CC Rx, 12-ele stack
G2DDD	Littlehampton	435.6	Tripler, 16-ele stack, CC Rx
G2DHV	Lewisham	434.97	Tripler, CC Rx, 16-ele stack
G2FKZ	London	435.95	*no details*
G2FNW	Melton Mowbray	?	Tripler, 5-ele Yagi (? Rx)
G2HCG	Northampton	434.00	*no details*
G2MV	Kenley, Surrey	435.22	*no details*
G2RD	Wallington, Surrey	435.57	*no details*
G2WJ	Great Canfield, Essex	436.00	Straight PA, CC Rx, 16-ele stack
G2XV	Cambridge	435.10	Tripler, CC Rx, 12-ele stack
G3ABA	Coventry	?	Tripler, 16-ele stack (? Rx)
G3AOO	Denton, M'cr.	433.13	Tripler, 4/4/4, CC Rx
G3AYT	Hyde, Ches.	433.13	Tripler, City Slicker, CC Rx
G3BKQ	Blaby, Leics.	434.05	Tripler, 16-ele stack, CC Rx
G3CGQ	Luton, Beds.	434.10	*no details*
G3DA	Liverpool	432.6	Tripler, 6-ele Yagi, CC Rx
G3EOH	Enfield, Middx.	436.03	Tripler, G2DD C'vtr., 12-ele stack
G3EUP	Swindon, Wilts.	433.9	Tripler, 3 stk'd dipoles, CC Rx
G3FAN	Isle of Wight	435.80	*no details*
G3FFC	Leicester	?	Tripler, 16-ele stack (? Rx)
G3FIJ	Colchester	435.18	Tripler, SEO Rx, 5-ele Yagi
G3FP	Sidcup, Kent	436.04	*no details*
G3FZL	Dulwich, S.E.22	435.24	Doubler, CC Rx, 12-ele stack
G3GDR	Watford, Herts.	435.39	*no details*
G3GOP	Southampton	435.00	*no details*
G3GZM	Tenbury Wells, Worcs.	?	Tripler, 16-ele stack (? Rx)
G3HAZ	Northfield, Birmingham	435.00	Tripler, SEO Rx, 4/4 Yagi
G3HBW	Wembley, Middx.	434.61	Tripler, 12-ele stack, CC Rx
G3HTY	Kidderminster, Worcs.	?	Tripler (? beam array and Rx)
G3IAI	Northampton	433.80	*no details*
G3ILI	London, S.E.22	434.97	Tripler, 6-turn Helix, R.1294 mod.
G3IOO	Oswestry, Salop.	432.54	Tripler, 16-ele stack, SEO Rx
G3IRA	Swindon, Wilts.	436.50	Tripler, SEO Rx, 8 d'ples stk'd
G4AP	Swindon, Wilts.	436.50	Tripler, CC Rx, 3 stk'd D'ples
G4RO	St. Albans, Herts.	434.16	Tripler, 16-ele stack, CC Rx
G5CD	Hendon	435.66	*no details*
G5DT	Purley, Surrey	436.02	*no details*
G5YV	Leeds	432.72	Tripler, 8-ele stack, G2DD C'vtr.
G6CW	Nottingham	?	*no details*
G6NF	Shirley, Surrey	435.47	Straight PA, 5-ele Yagi, SEO Rx, ASB8 cavities
G6RH	Bexley, Kent	434.7	Tripler, 16-ele stack, ASB8 C'vtr.
G6YP	London, S.E.5	435.75	*no details*
G6YU	Coventry	434.10	Tripler, CC Rx, 16-ele stack
G8QY	Birmingham	?	Tripler, 24-ele stack (? Rx)
G8SK	Enfield, Middx.	433.15	Tripler, G2DD C'vtr., 8 ¼-waves stk'd
G8VR	London, S.E.22	435.0	Tripler, SEO Rx, 12-ele stack
GW2ADZ	Llanymynech, Mont.	432.90	Doubler, 32-ele stack (? Rx)
GW5MQ	Mold, Flints.	432.58	Tripler, 3-ele Yagi (? Rx)
ON4UV	Fayt-lez-Mange, Nr. Charleroi	434.7	Straight PA, CC Rx, 32-ele beam

This list is incomplete as regards some stations known to be equipped for the 70-centimetre band. All 430 mc operators are asked to forward details for inclusion in this Table, under the headings given.

hard run in the Annual Table.

Up North

G3IOE (Newcastle) has had a disappointing month, with nothing of DX interest penetrating into his valley. He has the 12AT7 converter going now and is checking it against the G2IQ; to get the 12AT7 job (as described in our April issue, p. 114) going really well, he makes the following suggestions: Screen anode from cathode circuit in the RF stage; couple RF anode and mixer grid very tightly; use .01 μF as by-pass (C2) in the mixer anode; omit the cathode follower, as it does nothing but degrade the noise factor.

G5YV (Leeds) managed to raise GW8UH (Cardiff) for a new county, so gets that vital one for both Tables — but we shall not know how matters finally stand in the Annual Table until all results to August 31 are received.

Yet another new correspondent —GW3GWA (Wrexham) in the rare county of Denbighshire; he is on 144.792 or 145.710 mc, with a 4-ele Yagi and 15w. to an 832, and a G2IQ-BC348 receiver. He started by working the locals (in neighbouring counties) off an indoor dipole suspended by cords, and on the Yagi, which likewise is indoors, he can hear G3BA, G2HOP and G6NB.

And another! G3EGE (Beeston, Notts.) is on 144.56 mc with 18w. to an 832, a 4-ele Yagi and a G2IQ-HRO receiver; he is also getting going on 70 centimetres. G3GFW (Tollerton, Notts.) will be in his correct Zone shortly, and has 25w. in the PA, with a 12-ele stack, the receiver being G2IQ-CR100; in hand here is a pot oscillator (see *Short Wave Magazine*, June 1952) for the 430 mc band. Other stations active are G3HMH (Clifton, Notts.) and G3EEO (Derby), and there are some 8 locals in the area who are building for Two — starting, quite properly, with the receiver. G3EGE/G3GFW run a Thursday evening schedule for their benefit, cross-banding with them on 160 metres for converter tests. A nice co-operative effort this, which is sure to accelerate progress. Thanks, G3EGE, and please keep A.J.D. in the picture.

More Reports South

G5MR (Hythe, Kent) is naturally a little depressed to realise that he must be screened off completely from Scandinavia—though on while this very desirable EDX was coming through to southern parts of the country, he could get no share in it. On the other hand, he has a wonderful take-off, straight across the Channel, for France and Southern Europe; he is on 145.152 mc during 1830-1930 and 2200-2300 clock time most days.

G2HDZ (Pinner, Middx.) found conditions very poor until August 8, when DL, F, ON and PA stations suddenly appeared at workable signal levels; Cambridge stations (and of course G6NB) were heard in palaver with OZ's, but they were not coming through to G2HDZ.

G2AHP (Perivale) took a spell of leave down in Swansea, and had a converter with him — with what results, we have not yet heard. From the home station, G2BAT was worked on July 28 for a new county.

Doings in EI, ON, ZB1 and ZS

EI2W (Dublin) writes confirming that the EI's intend to give the Zone Plan, as advertised, a trial—but we gather that there is some opposition to it. However, all carefully thought out schemes, such as the Zone Plan, are always worth a trial, as what at first blush appear to be difficulties or disadvantages may never arise in practice. On August 1st, EI2W got himself going again with a new 16-ele wide-spaced stack, with very encouraging reports in the early stages. For him, conditions improved considerably on August 9 and 10, with big signals from G5YV, and G3FAN and G5TZ/A in the Isle of Wight, both worked at RS - 58 in each direction. G3BLP (Selsdon, Sy.) was RS-58 in Dublin around midnight on the 10th, and G6VX (Cheltenham) was also very good — but G5YV and G6NB are always the loudest of them all. Others heard have been GW3ENY and G8OU (Ashtead), and on August 10 EI2W worked three Cambridge stations in successive QSO's.

The EI's now reported on are: EI2A, Co. Meath, 145.2; EI3W, Co. Donegal, 145.908; EI4E, Co. Kerry; EI4N, Co. Clare, 144.13; EI5Q, Co. Donegal, 145.00; EI5Y, Co. Dublin, 144.19; EI7A, Co. Donegal, 145.20; EI9U, Co. Limerick, 144.13 mc.

And up in GI, there is activity — GI3GQB (Newtonards, Co. Down) is getting G6VX at S9

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1952

Starting Figure, 14

Worked	Station
55	G5YV
54	G6NB*
49	G3GHO*
45	G2HDZ, G3BLP,* G3WW*
42	G2XV, G3IOO, G5DS
39	G4SA, G5BM, G5ML
37	G2AHP, G2FJR, G4RO
35	G3HBW, G3HWJ
34	G3FAN
32	G6TA, G8IL
31	G8DA
28	G2HOP
27	G6YU
26	G3GVL, GC3EBK
25	G3DO, G3HCU, G3HXO
24	G3WS, G5MR, G6CI
23	G2DCI, G2FCL
22	G3AGR
21	G3FIJ, G3GJZ, G8VR
20	G3ISA
18	G2CZS, G3EOH, G3IRA
17	G3YH, G6MI
16	G3IWJ, G3JMA
15	GM3DIQ
14	G2BRR, G3DMK

Note: This Annual Counties Worked Table opened on September 1st, 1952, and closed on August 31st; all operators are requested to send in their final claims (for 14 or more Counties Worked) as soon as possible. These will appear in the Final Table for The Year in the October issue. The Table reopened w.e.f. September 1st, 1953, for the year to August 31st, 1954, and new claims are now invited.

* Cards held for Annual 40 Counties Worked Certificate.

on phone, and would like a QSO; and G6NB would like to work *him!* There are other stations on in GI—see EI2W's calls h/w list in the "Activity Report."

A letter from Guy at ON4BZ (Brussels) was too late for our last; with LA worked, he goes up another peg in the Countries table, and makes a new "First" for LA-ON, which will be noted in the appropriate panel at the next appearance. On the slight controversy as to the parentage of the "ON4BZ converter," ON4XB has now said, in evidence at an enquiry arranged by ON4YV, that the original work on it *was* done by ON4BZ. We do hope that honour is now satisfied! In any case, everyone calls it the "ON4BZ Converter"!

The little team in Malta, G.C., has recently been fortified by the appearance of ZB1BU, with 100 watts on 144 mc dead, a wide-band aerial and a fine location, with 500 feet start in height over ZB1BZ and ZB1KQ. Tests with I1CVY and 3V8BB have been arranged, and will be continued for as long as the co-operation can be held. (We hope to hear many more G's calling "CQZB1" on a beam heading of 150°. The ZB1's are there every evening from about 1900 onwards.)

ZS5MR called in the other day with some news of VHF activity in ZS. He himself is using the 12-ele stack as described in our November issue; there is a fair amount of local working round the main centres of population, and the present ZS ground record for Two Metres is held by ZS4H-ZS6GX over a distance of 270 miles. The July issue of *Radio ZS*, the official organ of the S.A.R.L., is a VHF number, compiled mainly by ZS2Y, and describing converters, transmitters and beam systems, including some very useful material for the VHF beginner — all very nicely done. All G's will wish our ZS *confrères* luck in this fascinating game, and we hope to hear more of their activities as they get down to the serious business of working distances.

Strange Manœuvres!

The Zone Plan having been agreed upon in an atmosphere of goodwill and cordiality (so 'tis said), parts of the editorial in last month's issue of our RSGB contemporary make odd reading. To introduce at the present stage, as a minority opinion, the suggestion of an "escape region" (specifically turned down at the meeting, mark you) will, if it is adopted, cause such confusion that the Zone Plan itself might well be wrecked. Our positive recommendation is that the suggestion be ignored, in accordance with the decision of the meeting.

As to the comments upon the birth of the Zone Plan itself, readers will be astonished to hear that in the first instance it was offered to RSGB Hq., but rejected! That was more than four years ago. Actually, its only advocate at that time was the Editor of *Short Wave Magazine*, who recast G3CYY's original ideas to make them workable and brought the Plan to fruition with the collaboration of G2XC, then in charge of "VHF Bands." Had it not been for this, the Plan would never have seen the light of day.

To settle the communication areas for both VHF bands, it was a foregone conclusion that the only basis for discussion at the recent meeting could be the *Short Wave Magazine* Two-Metre Zone Plan. In the general interest, we freely agreed that this be adopted as the "British Isles Two-Metre Zone Plan" — which in effect it always has been. And that is about all there is to it, except to say that these points would never have been raised here had it not been for the mischievous and misleading comment to which we refer.

G8DD in action on 1250 mc at his /P site on Brown Clee Hill, near Ludlow, Worcs., on July 26 last, when he and G3QC/P were in QSO to raise the 1250 mc world record to 100 miles. Gear used was the same as at G3QC/P.

Crax Out of Context

"When there's a fool moon perhaps I may get a W6" (G2AHP) . . . "Lightning has just knocked the chimney pots off a house down the road, but my beam is OK" (G3IOE) . . . "Let's hope *all* two-metre

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

13	G3BLP (DL, EI, F, G, GC, GD, GI, GM, GW, ON, OZ, PA, SM). G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, ON, OZ, PA, SM). G6NB (DL, EI, F, G, GC, GD, GM, GW, ON, OZ, PA, SM, LA).
12	G2HIF, G3GHO, G3WW, G5BD.
11	G2AJ, G2HDZ, G2XV, G3ABA, G5UD, G6LI, ON4BZ.
10	G2FQP, G3BK, G3EHY, G3GHI, G5DS, GW5MQ.
9	EI2W, G4RO, G4SA, G5MA, G6RH, G6XM, G8IC.
8	G2AHP, G2XC, G3BNC, G3FAN, G3GSE, G3HCU, G3VM, G5BM, G5BY, G5ML, G8SB.

Other end of the 1250 mc 100-mile QSO. G3QC/P on Higher Fair Snape, near Lancaster on July 26, when at 1225 BST contact was effected with G8DD/P near Ludlow. Equipment at both stations consisted of a CV90 in a cavity oscillator, a super-regenerative receiver, and paraboloid beams. Each station had three helpers. It was in October, 1950, that the same two operators worked over a 75-mile path in the 1250 mc band, setting up a new record.

operators will observe the Zone Plan; the days have passed when any particular individual can decide that the band is dead and no harm will be done by going into a Zone that is DX to his district" (G2DSW) . . . "It appears that in a gross dereliction of duty you failed to advance me one step in Countries Worked; however I am prepared to accept your abject apologies and reconsider my first hasty decision to abandon the search for new countries" (G2HDZ). (*A.J.D. had his leave stopped for a week.—Ed.*) . . . "I find the VHF Weather Reports of great interest" (G4RO) . . . "Very pleased that so many people do work right through TV hours; I can get some excellent contacts while the family and neighbours get square eyeballs" (G3BA) . . . "One of my main complaints is that I often hear stations not in the *Call Book* and in nearly every case they are pre-war callsigns; why are some of the older hands so shy of their identity being published?" (G3FYY) . . . "I will appreciate QSO's with the old stagers on VHF for their advice and guidance" (G4OU).

Honours and Awards

In recognition of their having shown proof of working 40 Counties since September 1st, 1952, Certificates of Merit have been awarded as follows: G3WW, Wimblington, Cambs.; G3BLP, Selsdon, Surrey; G3GHO, Roade, Northants.; G6NB, Brill, Bucks., in that order.

New members of the VHF Century Club this month are: G3FIH, Radstock, Somerset, No. 150; and DL3NQ, Weinheim, No. 151. The break-down of the cards sent in by the latter is interesting; he worked 68 DL's, 3 F's, 4 G's, 4 HB's, 1 OE, 8 ON's and 14 PAØ's. This brings out the fact that though DL activity is at a fairly high level, the number of them able to penetrate into the U.K. even when the band is open has always been small — offhand, we can only remember about ten callsigns that have ever been reported.

The Tables and Calls Heard

These appear as usual, though with a "short month" and the best conditions not coming until the end of the period, the movements claimed are not as many as in some previous months this season.

Once again, however, your A.J.D. would enter his humble plea for claims to be put on a

TWO METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14
From Fixed QTH Only

Worked	Station
61	G3BW, G5YV, G6NB
60	G3BLP (629)
59	G3EHY
57	G2OI (349)
56	G8SB
55	GW5MQ
54	G2HIF (200)
53	G2AJ (519) G4CI
52	G2HDZ (398), G2NH, G3WW
51	G4SA
50	EI2W (162), G3ABA, G5BM, G5DS (496)
49	G3GHO
48	G5BD, G5MA
47	G3FAN, G5WP
46	G4HT (476), G5BY, G6YU (205)
45	G2XC, G6XM (356)
44	G3BK, G5ML (250), G3HAZ (194)
43	G3BA, G3COJ, G4RO, G5DF
41	G2FQP, G3DMU, G6CI (167)
40	G3CGQ, G5JU, G8KL, G8OU
39	G2AHP (338), G2FJR, G2IQ, G3GSE (405), G3VM, G8DA, G8IL (325)
38	G3APY, G3HBW
37	G2FNW, G2FZU (180), G3HBW
36	G3CXD, G6CB (312), G6TA (259), G8IP
35	G3FZL, G3HCU (224), G3HWJ
34	G2FCL (182), G3BKQ
33	G3BNC
32	G2FVD, G8IC, G8VR, G8QY
31	G3GBO (364), G3HXO, G5RP
30	G2HOP, G5NF
29	G3AGS, G3AKU, G3BJQ, G3WS (125), G5MR (164)
28	G3FIJ (163), GM3BDA
27	G3DAH, G3FIH, G6GR, GW8UH
26	G3AEP, G3CFR (125), G3DO, G4MR (189)
25	G5SK
24	G3FD, G3FXG, GM3EGW
23	G3CWW (260), G4LX, G5PY, G6PJ
22	G3AGR (135), G3ASG (150), G3BPM, G3FRY, G3GOP (122), G3HIL, G3ISA, GM3DIQ
21	G3SM (180), G6XY
20	G3EYV
19	G2AOL, G3FEX (118), G3GCX, G3YH, G5LQ (176)
18	G2CZS
16	G3FRE, G3HSD, GC2CNC
15	G2DVD, G3IWA
14	G2DHV, G3GYY

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.

BRITISH ISLES
TWO-METRE ZONE PLAN

(This is reproduced here for the benefit of newcomers to the band).

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

separate piece of paper, headed with callsign and the table for which the movement is intended; you have no idea how much this helps when working under the pressure of the dead-line—as we always do in compiling "VHF Bands."

The same applies to Calls Heard—and here we particularly ask that the callsigns should be written legibly, and sorted into strict alphabetical and numerical order, as given in the "Activity Report." If you write your list out as you expect to see it in print, you cannot go wrong—and neither can we. If everything is set out in the way we ask (which can only take you a few minutes) then any mistakes are our fault. But if calls h/w lists are run into the text of letters, and claims for the tables made as a casual p.s. on the back of a sheet, then they can be missed in compiling the tabular matter, which *must* be done before the text is written. Certainly, we find everything when the letters are gone through — but by that time the Tables and the Activity Report are with the printers! So, please . . . !

Finally—

And that, friends, just about winds it up for this month. Plenty of interest, and the general feel of the correspondence is that, for many people, working over what three years ago would have been exciting GDX distances is now almost common-place. And it is this that encourages more operators to come on VHF, thus increasing the interest and keeping up a high level of activity.

For next month, the dead-line for all your news, views, ideas, claims, complaints and suggestions is **Friday, September 18, certain**—addressed A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. With you again on October 9, which is as late in a month as we can be.

NATIONAL RADIO SHOW
September 2-12, Earl's Court, London. Open daily except on Sunday. More than 100 exhibitors, including a large BBC demonstration area.

VHF WEATHER REPORT

PERIOD JULY 16 TO AUGUST 12

A. H. HOOPER (G3EGB)

For the regularly active VHF operator, careful study of this report—particularly the data given in Fig. 1 and the information set out in the Table—will be well worth while. To assist us in establishing a reliable statistical basis for the correlation of results, all VHF operators are asked to note carefully dates and times in their reports to "VHF Bands."—EDITOR.

POOR at first, then occasional brief patches, giving way to an excellent although fluctuating spell over the last week. For the first twelve days the report is of a series of depressions arriving from the Atlantic and then turning North-eastwards into the Norwegian Sea. Each influenced us for several days, and between the departure of one system and the arrival of the next a ridge of high pressure passed briefly over the country. The evenings so favoured were July 19 and 23 and they marked also the formation of successive anticyclones North of the Alps over F, DL and OE. A change in the atmospheric flow then became noticeable, for the next depression was very shallow and followed an Eastward path along the South coast during July 31 and then onward into Germany. It was followed by the development of an anticyclone just West of the British Isles which later, on August 3, drifted South-eastwards over us into Europe. A sequence of fronts in the circulation of a vigorous depression near Iceland passed over us during August 4-5 to be followed by an anticyclone which drifted over us from the South-west. We remained under its influence until August 8 when passing to the North Sea it left us in a col, between one anticyclone to the West-south-west and another to the East. This curved belt of high pressure with minor centres remained until August 11 when the main centre of high pressure drifted East-north-eastwards over Sweden opening up, apparently, the LA path for the first time since last month. Over Britain a thundery low developed and the reflecting layers were disrupted over many areas, but at the time of writing, the end of this fine spell is still in the future.

Interpretation

The presence of modified refractive index (MRI) discontinuities over East Anglia has been deduced from the results of radio-soundings reported in *The Daily Aerological Record* of the Meteorological Office, London. The results are shown in Fig. 1 and it can be seen, for example, that one of these reflecting surfaces developed on the afternoon of July 24 near 4,000 feet and slowly rose to beyond 8,000 feet before fading away twenty-four hours later. The very favourable spell during the last week in this period is also apparent and it will be

Date		JULY 16	17	18	19	20	21	22	23	24	25	26	27	28	29
Pressure system over Southern England		D	D	A	A	D	D	D	A	D	D	D	D	A	D
Radiation over Bedfordshire, GMT		—	04	21	—	00	—	—	00	02	03	02	00	05	19
Discontinuities aloft, from East Anglia to the countries indicated	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		—	—	—	—	—	—	—	—	**OZ**	—	—	—	—	—
	E	—	—	—	—	—	—	—	—	**DL**	—	PA	—	—	—
	SE	—	—	—	—	—	—	—	—	DL	—	—	—	DL	—
	S	—	—	—	43	43	—	—	—	47	—	45	—	45	—

Date		30	31	AUGUST 1	2	3	4	5	6	7	8	9	10	11	12
Pressure system over Southern England		A	A	C	A	A	A	A	A	C	C	C	A	A	C
Radiation over Bedfordshire, GMT		—	**00**	**06**	**04**	**05**	23	03	**06**	**05**	**05**	**05**	**05**	**06**	04
Discontinuities aloft, from East Anglia to the countries indicated	NE	—	—	—	—	—	—	—	—	—	—	—	—	LA	LA
		—	—	—	—	—	—	—	—	SM	OZ	OZ	SM	SM	SM
	E	—	PA	—	DL	—	—	PA	**DL**	**DL**	**DL**	DL	DL	DL	DL
	SE	—	ON	—	—	—	—	—	—	DL	OE	—	—	—	ON
	S	—	47	—	47	—	43	43	43	45	47	47	47	45	—

TABLE 1

Setting out the possibilities for EDX working at VHF from July 15 to August 12. Especially good dates are shown in bold type, underlined, approximate directions and distances to which conditions are thought to have extended being shown by country prefixes. Calculations are outwards from the area of South-East England.

Notes—(1) *Conditions listed are for the evenings of the dates shown.*

(2) *D = Depression. A = Anticyclone. C = Col, slack pressure gradient.*

(3) *Times in the second line mark the fading of inland super-refraction.*

(4) *Country prefixes indicate the approximate limit of conditions.*

(5) *For the southern path, which is wholly over France, it has been necessary to indicate limits in two-degree steps of latitude. The latitude of Paris is about 49°N, and that of Marseille 43°N.*

(6) *Occasions of particularly marked discontinuities are printed in heavy type and are underlined.*

remarked that, although well established, the discontinuities underwent considerable fluctuation. A number of short-lived surfaces marked with letters in the figure, and rising during their existence, illustrate an effect referred to in an earlier *Magazine* article (February 1953, p. 745). It is that of subsidence near to the air mass boundaries known as fronts. In that the effect is associated with fronts it is usually present for a few hours only at any one place and, moreover, is highly directional. The letters indicate roughly the direction concerned and reciprocal directions should be inferred. As can be seen, the effect is of frequent occurrence and is thought by the author to account for reports from time to time of communication by means of reflection from a frontal surface. To try and establish this point reports of QSO's at the times shown from stations in the Southeast, East Anglia and the East Midlands, are sought. The low-level entries, shown between 300 and 600 feet above MSL, occur only with night-time soundings. It is apparent that they are associated with radiation cooling, and further reference to this point is made later.

In an attempt to ascertain the extent of the discontinuities shown in Fig. 1 a similar study was made of radio-soundings over other areas of the British Isles. The result suggests GDX was possible from Lancashire, the South and Southwest on July 23 and again on July 24 with the addition of the Southeast. On the evening of August 4 all areas of the British Isles except the Southwest were affected. A prolonged spell from the evening of August 6 to August 10 inclusive followed, and extended over all of the British Isles, with the exception of the Northwest and GI, from August 7 to August 10. On the evening of August 11 the discontinuities were restricted to the Southwest, the East, and the GM/GI path. While for the last evening of this period only the South and East were fortunate. Throughout the whole period from July 30 radiation cooling was very marked and may well have masked these fluctuations aloft.

Table 1 is partly derived from the weather charts

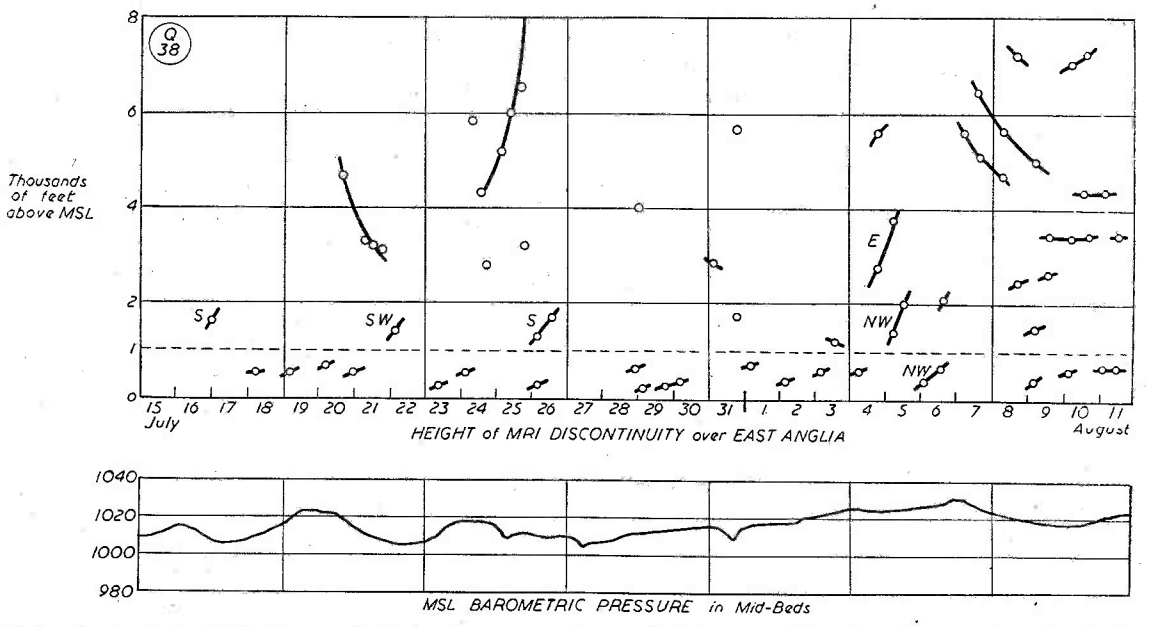


Fig. 1. Showing the reflecting layers which formed over East Anglia during the period July 15 to August 11. Occasionally they extended out along paths in various directions from the U.K., producing EDX conditions. The relevant dates are summarised in the Table.

in the *Daily Weather Report* of the Meteorological Office. All entries are for the evenings of the dates quoted. The first line shows the type of pressure system over the Home Counties. The classification is into anticyclones (A), depressions (D) and cols (C). The last, being areas of slack pressure gradient between the main types of pressure distribution, suggest erratic and ill-defined conditions.

Super-refraction, or enhanced propagation, can arise by means of radiation cooling at night-time in the surface layers of the atmosphere. It is an inland effect which develops during suitable evenings until the time that saturation in the lowest layers is reached. Thereafter the layer within which super-refraction occurs lifts off the surface. The second line of the Table shows, as far as can be ascertained, the time of onset of saturation on the evenings when significant radiation cooling was experienced. Where the time is after midnight the figures are still placed under the pre-midnight date. Some of the evenings suitable for enhanced propagation over inland paths are seen, for example, to have been July 20, 27 and August 2. Continued cooling after the stated times results in saturation extending upward to a progressively greater height. The refractive index structure then shows a discontinuity at this height and one then looks for reflection effects to occur. The low level discontinuities shown in Fig. 1 between 300 and 600 feet aloft are of this type. In that they arise from surface effects their horizontal extent cannot be inferred from a study of the relatively widely separated radio-soundings.

The remaining lines of Table 1 show the occasions when MRI discontinuities, observed at intervals of about 250 miles, are thought to have extended continuously out from East Anglia in the stated directions to the countries whose prefix is given. Open paths to intervening countries are implied. It can be seen, for example, that favourable conditions existed as far as Germany on the evening of July 24, but only as far as Holland on July 26. By comparison with last month's report the southern path has been open frequently. The North-eastern path to Norway is the most difficult to assess as it is largely over the North Sea with no intervening observations available.

Certain entries are in heavy type and underlined. The dates indicated in this way correspond, for easy reference, with occasions of particularly significant MRI discontinuities in Fig. 1. Those evenings with exceptionally marked radiation are shown in the same way, while country prefixes similarly stressed show when the reflecting layer aloft is thought to have been particularly effective for contact in those directions.

In Retrospect

The first of last month's reports for comment is that of G5YV who mentions good conditions developing Northwards to GM, at the end of June. The period implied in the written GDX summary for this path is June 28 to July 3 with the exception of July 1 (when the layer was more than 6,000 feet high over the Midlands and tentatively regarded as ineffective). It would be interesting to have more details.

G3GHO worked ON4HN on June 28 with nothing shown in Table 1 for the South-east path. The detailed analysis for this time shows the reflecting surface at between 2,000 and 3,500 feet along the path from Roade, shown in Fig. 1 at 3,400 feet over East Anglia, but ceasing before reaching the

Continent to the South-east. As the Table is prepared for operation from Southern England no entry was made. For operation from Northants., however, the layer extended out more than half way along the path.

A similar explanation accounts for the reception of DL and PA signals in Gloucestershire on the evening of July 1. On this occasion there was recorded at 1,500 feet over East Anglia the most intense *duct* the writer has yet computed. Its vertical extent was just over 300 feet in all and so was not large enough to duct two-metre energy. It furnished, however, the most effective discontinuity yet encountered. Not extending eastwards over the Continent no entry was made in the Table. For operation from Gloucestershire, however, results were different.

The layer was present throughout July 2 but by the early hours of July 3, although still a marked discontinuity, it had extended to a depth of 900 feet and just failed to qualify in intensity as a duct (for any wavelength). It is highly probable that the G3IOO-PAØNL 70 cm QSO on July 2 took place *via* this layer.

It is hoped in future to rearrange the presentation of Table 1 in such a way that the possibilities for GDX and EDX are shown, for operation from any of the areas presented.

In a very informative letter G6LI remarks that on the evening of June 30 SM6QP in Gothenburg reported three stations then active in Stockholm. In common with the other evenings of that good spell an anticyclone was centred over the Norwegian Sea to the West of LA. A ridge extended from it South-eastwards into the North Sea and we can see that its reflecting layers extended only sufficiently to open up the path to OZ and Gothenburg while leaving Stockholm beyond its influence. If this is representative then for the longer path we need a subsiding anticyclone to the South or South-east of the Norwegian mountains.

G3BNC/I1XV

Although certain features of this QSO suggest another phenomenon the author has been asked to examine the tropospheric possibilities. At the time of this QSO the contrast between the weather North and South of Alps could not have been more marked! The British Isles was under a cyclonic circulation, with a combination of fronts lying in a shallow trough of low pressure from OZ southwards through DL and then curving south-westwards over F to Biarritz, while south of the mountains a clear calm night with radiation cooling was in progress. A detailed analysis of this part of Europe reveals no MRI discontinuity for any observation from Southern U.K. South-eastwards through the trough to the frontal system. In the narrow belt between the surface position of the front and the Alpine ranges only a weak discontinuity at about 2,000 feet over Switzerland and at 6,000 feet over Southern Germany existed. Beyond the Alps there was nothing, either over the plain of Lombardy or further south towards Rome. The conclusion is that should the QSO be confirmed then an alternative mechanism to tropospheric propagation must be sought.

The Atlantic Tests Again

With detailed material for the further portion of the path Kilkee-Boston now available it has been possible to ascertain the far limits of "open" conditions along this path with much greater accuracy. Accordingly, the further limits of the path, as shown in Fig. 2 on p. 366 of the August issue of *Short Wave Magazine,* should be amended as follows:

June 6 should extend further Westwards beyond Boston to about Long. 73°W.

June 7 should be shortened so that its westward limit just reaches Newfoundland, about Long. 53°W.

The three occasions when signals were heard have been closely examined. At 0014 GMT on July 7 there remained two cold fronts approaching Kilkee from the West. At this time one would have to rely on propagation continuing eastwards from the reflecting layer lying some way beyond them. On July 8 at 1200-1400 GMT, the reflecting layer, as shown last month, failed to extend to Newfoundland, where the effect of a depression was by then being felt. For July 11 at 0001-0200 GMT the route to W4 has been similarly examined. A depression was centred at 53°N 19°W with a warm front sufficiently close to give rain along the Irish coastline. About 400 miles out lay the associated cold front followed later by another warm front, from a depression near Greenland. Finally there was a cold front from this last position, to just off Newfoundland, where it crossed the path obliquely, and then turned south-westwards into Florida and the Gulf of Mexico.

From the evidence it appears that the sector of warm tropical air between the first two fronts had only a weak discontinuity at about 8,000 feet. The following ridge of high pressure (cool air) developed a reflecting layer below 2,000 feet. Conditions in the second patch of warm air near 40°W were varied, with a layer at 3,000 feet to the East fading to nothing in the West. Beyond, a few isolated discontinuities were found at first until over the final leg from 70°W to 80°W no trace of a layer existed. It is felt that it is this highly varying structure that is typical of long distance paths over the North Atlantic.

While discussing the Atlantic path it seems worthwhile to consider this particular period in 1953, with the results given two months ago for the whole of 1951/52. Surveying the period of the Tests by the same method one finds that only at noon on July 7 was the path Eire/Newfoundland free of fronts with an anticyclone extending over all but the extreme ends of the route. That this coincided with an MRI discontinuity at 20°W but not over Valentia, Eire, classifies it as a doubtful case, by comparison with the four possible days of 1951/52. It is hoped to survey later the whole of the present year on the same basis, and in the meantime it is left to the reader to judge whether the appearance of such conditions during the EI2W Test indicates that either the 1951/52 survey or the 1953 result was unrepresentative—or that a measure of good luck occurred!

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.

DL2UQ, Cpl. L. H. Stafford, Signals Centre, H.Q. 2nd A.T.A.F., Bad Eilsen, B.A.O.R. 29.

EI5P, P. Fitzsimons, 67 Nephin Road, Dublin.

EI6I, J. Owens, 23 Dargan Street, Bray.

G2DHV, G. V. Haylock, 63 Lewisham Hill, Lewisham, London, S.E.13. *(Tel.: Lee Green 6589.)*

G3BYO/A, J. A. Bointon, B.Sc., 70 Imperial Road, Beeston, Nottingham.

GM3HQN, A. Rennie, 20 Gibsongray Street, Falkirk, Stirlingshire.

G3IIB, J. T. Bradford, 77 Branthwaite Crescent, West Derby, Liverpool, 11.

G3IJQ, F. H. Turner, 75 Glenwood Gardens, Ilford, Essex.

G3ILN, H. L. Ramsden, B.Sc., 57 Dewsbury Road, Ossett, Yorkshire.

G3IOH, R. H. Matthews, 174 Hart Road, Central Estate, Hartlepool, Co. Durham.

G3IRO, H. W. Roud, 29 Vicarage Lane, Ilford, Essex.

G3ISV, F. H. Lindsey, 254 Grange Road, Middlesbrough, Yorkshire.

G3IUJ, R. A. Rogerson, 51 Eastman House, Poynders Road, Clapham, London, S.W.4.

GI3IWK, H. E. C. Hicks, 10 Lothair Avenue, Antrim Road, Belfast.

GD3IWP, A. Parr, 14 Hango Crescent, Castletown.

G3IXF, G. A. Palliser, 18 Regent Street, York.

G3IXY, D. Gabbitas, c/o Robinson, 10 Broadview, Stevenage, Herts.

G3IYX, G. J. Leask, 32 Queen Anne Street, Bradwell, Wolverton, Bucks.

G3IZH, P. F. Hughes, 35 Byng House, New Park Road, London, S.W.2.

G3IZW, D. J. Weaver, 34 Leaver Gardens, Greenford, Middlesex. *(Tel.: WAX 5133.)*

G3IZZ, A. Preston, 31 Durham Street, Bolton, Lancs.

G3JAN, P. Masters, 62 Battenburg Avenue, North End, Portsmouth, Hants.

G3JAU, C. R. Davies, 62 Eldon Road, Winton, Bournemouth, Hants.

G3JBC, J. W. Cox, 170 Queen's Drive, Nottingham.

G3JBJ, F. N. Mathers, 18 Calderstones Road, Allerton, Liverpool, 18.

G3JBK, Lt. H. E. Duthie, Whitehill Cottage, Fairway, Bexleyheath, Kent.

G3JBL, G. A. Millray, 2 Toll Bar Crescent, Scotforth, Lancaster, Lancs.

G3JBN, Slade Radio Society, Church House, High Street, Erdington, Birmingham, 23.

G3JBQ, L/Tel. J. S. Munn, c/o 29 High Street, Stamford, Lincs.

GI3JCD, G. Graham, 24 Huguenot Drive, Lisburn, Co. Antrim.

G3JCH, J. Harvey, 192 Wood Lane, Dagenham, Essex.

G3JCQ, W. H. Morris, 7 Westbourne Crescent, Barrow-in-Furness, Lancs.

G3JDG, D. Gibson, 52 Westland Drive, Brookmans Park, Herts.

G3JFP, J. F. Proctor, Briar Rose, Bevendean Avenue, Saltdean, Brighton, 7.

G3JHL, J. H. Lepper, 56 Forest Drive East, Leytonstone, London, E.11.

G3JNB, V. E. Brand, 137 Surbiton Hill Park, Surbiton, Surrey. *(Tel.: Elmbridge 1941.)*

CHANGE OF ADDRESS

G2DJA, J. H. Palmer, 32 Neasden Lane, London, N.W.10.

G2FDF, W. F. Limehouse *(ex-YI2FDF),* Nearwood, Abbey Road, Ringwood, Newport, Mon.

G2FOS, K. Birch, 46 Moorfield Avenue, Denton, Manchester. *(Tel.: DENton 3603.)*

G2NA, H. Frost, Horsebrook Manor, Stretton, Stafford, Staffs.

G3ADS, R. Sawkins, 21 Newcome Road, Heath End, Farnham, Surrey.

G3BWX, Maj. A. L. Fayerman, 39 Crystal Palace Park Road, Sydenham, London, S.E.26.

G3DFV, F. N. Fovargue, Mirosa, Stallingborough Road, Healing, Grimsby, Lincs.

G3DOG, R. F. C. Crowther, Greensleeves, Silverdale Avenue, Walton-on-Thames, Surrey.

G3EZZ/A, J. Eaton, c/o 74a Station Road, Langley Mill, Nottingham.

G3FMA, T. A. Smith, 23 Newdown Road, Croxteth Estate, Liverpool, 11.

G3FWU, L. O. Richardson *(ex-MD5LR),* 72 Stanham Road, Dartford, Kent.

G3FXB, A. J. Slater, 86 Cross Road, Southwick, Sussex.

GM3HNE, G. Campbell *(ex-G3HNE),* 15 Low Road, Castlehead, Paisley, Renfrewshire.

G3HQF, H. Evans, 16 Oate Hill, Chippenham, Wilts.

GD3IBQ, K. Holt, Port-e-Vullen Hotel, nr. Ramsey, Isle of Man.

G3IMN, F. E. Perrisset, The Retreat, Martin Mill, nr. Dover, Kent.

G3IQV, J. V. Best, c/o 33 Lawrence Road, Tilehurst, Reading, Berks.

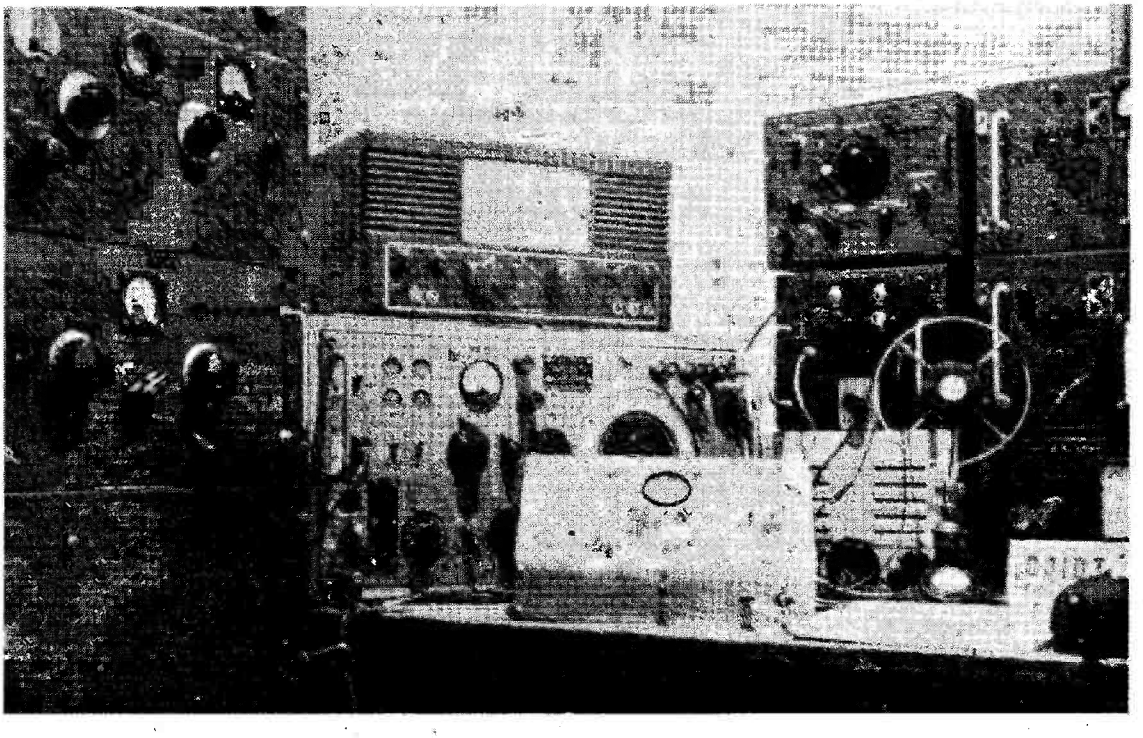
G3IXL, S. Horne, 4 Cherrydown Road, Sidcup, Kent. *(Tel.: FOO 1544.)*

CORRECTION

G4RO, A. E. Read, 6 Upton Avenue, St. Albans, Herts. *(Tel.: St. Albans 5468.)*

The Other Man's Station

G3IDT



DONALD I. THOMPSON, G3IDT, was first licensed in 1950 and the accompanying photograph shows part of the lay-out at his QTH, Strathmore, Baghill Lane, Pontefract, Yorkshire.

Main bands worked are 20 metres and Top Band, but occasional excursions on 80, 40, 15 and 10 are provided for. The main receiver up to the present time has been an R107, with converters to extend the tuning range; there is also an Eddystone S640 which is often used with the R107 for triplex working.

The transmitting rack includes three decks of power supplies, push-pull 807 modulator, a 5-band 70 watt 807 transmitter, a 4-band 140 watt push-pull 807 transmitter and an aerial coupling and relay panel. The ancillary equipment on the right of the photograph consists of a VFO (output on 160 and 80 metres), which also serves as a Top Band transmitter, another VFO (output on 40 and 20), a receiving converter, a slightly modified BC221, a speech-amplifier and Top Band rig modulator, with a bench power-unit to work them all.

Brought forward into the centre of the picture is the control unit which houses the master send-receive switch, monitor speaker, keying circuits and the station clock. Aerials tried have included dipoles and folded dipoles, long-wires, and a fixed 20-metre "ZL Special" of a slightly modified design.

G3IDT is not an ardent DX-hunter but takes what comes along. What has come along so far is a total of 71 countries in 29 Zones, most of them on 20 metres. Some of the gear described was used by the Pontefract Area Transmitting Group "B" Station (G6MF/P) during National Field Day, 1953.

On the bench and almost finished is a new 17-valve double-superhet which will eventually oust the R107, and from which great things are expected. Readers will agree that G3IDT is another of those workmanlike installations which are such a credit to the newer generation of radio amateurs, summed up by the description "Efficient without being fussy."

The Month With the Clubs

Holidays are with us, and many of the Clubs, as one Secretary puts it, suffer from "arrested development for a while." Those that decide not to close down for a month or so at this time of year are probably wise, even if their meetings are thinly attended, but local circumstances are always the deciding factor.

Clubs at seaside resorts, in particular, find it worth while to keep going, and are rewarded by holiday visitors who, even if they are not members of another Club, are at least interested in the common hobby.

Comments on the MCC rules for the Eighth Club Contest in November, as published in this space last month, have been uniformly favourable. We are therefore looking forward to another successful and, we hope, well patronised event. Copies of the Rules will be forwarded to all Club secretaries in ample time.

The following publications are acknowledged: News Bulletin *(Stockport);* "Deva Calls" *(Chester); and* "South Coast QRM" *(South Coast Radio Club, Union of South Africa).*

Next month's deadline for Club News is **first post on September 16.** *Secretaries should address their letters to "Club Secretary,"* SHORT WAVE MAGAZINE, *55 Victoria Street, London, S.W.1. And here are this month's reports, from 22 Clubs.*

Birmingham & District Short Wave Society

At the general meeting on August 10, a "Forum" was held, which promised to be of interest to all members and also to the visitors present. The Club wishes to welcome any visitors or prospective members to any of its meetings.

Brighton & District Radio Club

The September programme includes a talk and demonstration by G3GZT on a valveless electric bug-key that he has built. On September 8 a representative of Messrs. Cosmocord will talk on crystal microphones and pick-ups. Some 2-metre activity is forecast, with the help of G3GZT, 3EDG and ex-3DEU in a "campaign." A cross-band Two/Eighty sked between G2MC and the blind member G3JFP has already been successfully worked out. Meetings are at 7.30 on Tuesdays, The Eagle Inn, Gloucester Road, Brighton.

Clacton Radio Club

At the annual meeting it was decided that the transmitting licence should be retained, and that meetings should be held on alternate Fridays, beginning on July 31, at the Laxfield Guest House, Beach Road, Clacton. The Chairman is now Mr. W. A. Dobson, the Secretary Mr. R. J. Appleby, G3INU, and the Treasurer Mr. L. E. Healey.

Leicester Radio Society

Meetings are to be held on alternate Mondays, beginning on August 17, which will be an informal night. On August 31 there is a Junk Sale, on September 14 a lecture by G3GGK and another informal night on September 28—all at 7.30 p.m. Non-transmitting members are reminded that they may compete for the Thomas Trophy presented annually to the member who has produced the best constructed home-built apparatus.

Royston & District Radio Club

This Club is very active, with membership around 25, and regular meetings are held at the Community Centre in Melbourn Street. The Club Tx operates on Tuesday nights from 2100 to 2359, running about 30 watts on 40 and 20 metres, and 9 watts on the Top Band. Two-metre rigs are also in use. Visitors will always be welcome at the meetings, 7.30 on Tuesdays; workshop facilities, lectures and Morse are all laid on without a membership fee—a levy of 6d. is made on each person attending each meeting!

Torbay Amateur Radio Society

G2FDV has returned to Devon after a long spell in South London, and G5MU from Dorchester was a welcome visitor to a recent meeting. The Chairman reported at the last meeting that he has arranged for films to be shown in conjunction with the Short-Wave Hamfest, to take place in Torquay on October 11. Normal meetings are held at 7.30 p.m. on the third Saturday, at the YMCA, Torquay. The next is on September 19.

Norwich & District Radio Club

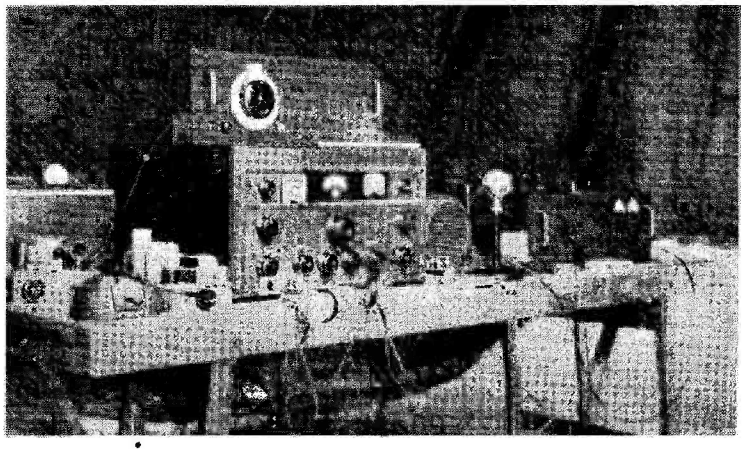
Now settled firmly in its new headquarters at the Old Comrades' Club, St. Faiths Lane, Prince of Wales Road, this Club is seeking to instal a work-bench and so to build and maintain its own gear. The next meetings are on September 11 (Film Show) and 25 (Exhibition of QSL's and competition for a Club QSL).

Dartmouth & District Amateur Radio Society

Meetings have continued every Monday evening through the summer and have been well supported. Several visitors have been welcomed, field days have been held, and QRP portable operations are carried out most Sunday mornings on 7 mc. A display of gear built by members was shown at a recent Arts and Crafts Exhibition.

Grafton Radio Society

On September 4 Grafton will be re-opening with an ordinary meeting, at which visitors and new members will be especially welcomed. The A.G.M. is a fortnight later (September 18). All meetings are at Grafton LCC



Over the week-end June 20-21, Grafton ran an all-band Club field day on Tumulus Hill, Hampstead Heath, signing G3AFT/P, G3HEA/P and G3IXE/P. Many good contacts were made on all bands and the outing was altogether a great success. This photograph shows the VHF/Top Band Station.

School, Eburne Road, Holloway, London, N.7.

Cannock Chase Amateur Radio Society

The monthly meetings are receiving strong support, and on September 3 there is to be a lecture on Relays by G3HVY. Preliminary plans are in hand for MCC. Members of neighbouring societies who wish to attend the Dinner and Dance on October 15 can obtain tickets from the Hon. Sec., G3ABG.

Kingston & District Amateur Radio Society

Attendances at the meetings have increased during the last few months. The future programme includes a talk by G5LC on September 9 and a Junk Sale on September 23. On September 6 a Sunday river trip has been arranged, in conjunction with the Sutton & Cheam and Thames Valley Societies. Details of all meetings may be obtained from the Hon. Sec.

Reading Radio Society

During the holiday months, activities consist of informal meetings twice a month, with evening visits to local technical centres such as the Admiralty Compass Station (Ditton Park) and the "GMT" Station at Abinger. The BBC Monitoring Station at Caversham Park is another possibility for the near future, and the September programme includes a Junk Sale and a talk and demonstration on remotely-controlled power-boats. The Annual Hamfest is at the Gallion Cafe on October 11.

Slade Radio Society

Forthcoming events are a lecture on the Electron Microscope (September 18) and participation in an exhibition to be held by the Sutton Coldfield and North Birmingham Model Engineering Society (October 8, 9 and 10). At the latter show a transmitting station will be put on, and radio and electronic equipment shown. Both events are at the Church House, Erdington, and visitors will be welcomed.

Warrington & District Radio Society

Meetings continue on the first and third Tuesdays at the Kings Head Hotel, Winwick Street (7.30 p.m.). Features of recent meetings have been lectures by W7OFU and G3FGI, and a Junk Sale. Future activities include lectures and demonstrations on VHF, Region 1 Field Day at Lower Whitley, and a Top Band Contest on September 26. An open invitation to meetings is extended to all interested.

British Two-Call Club

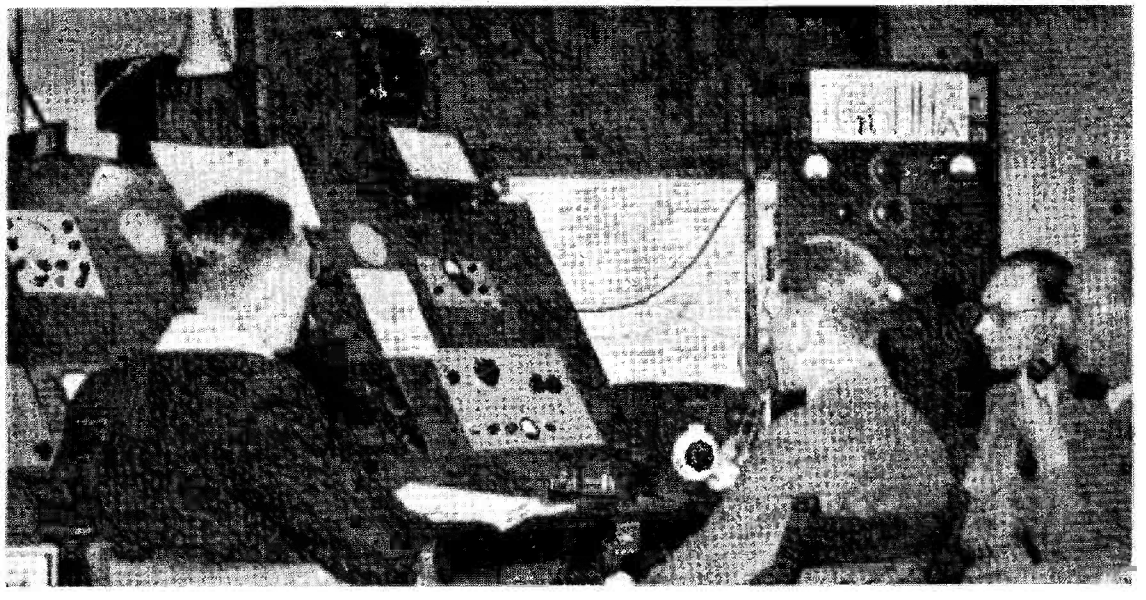
New members include VS6BE/VK2ACL, G3ECU / YI3ECU, G3ABF / SU1DM and others. Application forms are available from the Secretary—see panel for QTH. The annual subscription (2s. 6d.) includes the Newsletter, *QTC*, and various certificates.

Wirral Amateur Radio Society

Meetings for September are on the 9th and 23rd, and the Annual General Meeting has been fixed for October 7. All events take place at the YMCA, Birkenhead,

NAMES AND ADDRESSES OF SECRETARIES REPORTING IN THIS ISSUE

BIRMINGHAM : F. C. Cook, 67 Regent Road, Handsworth, Birmingham 21.
BRIGHTON : R. T. Parsons, 14 Carlyle Avenue, Brighton 7.
BRITISH TWO-CALL CLUB : G. V. Haylock, G2DHV, 63 Lewisham Hill, London, S.E.13.
CANNOCK CHASE : C. J. Morris, G3ABG, 58 Union Street, Bridgtown, Cannock.
CHESTER : N. Richardson, 23 St. Mary's Road, Dodleston, near Chester.
CLACTON : R. J. Appleby, G3INU, 95 Oxford Road, Clacton.
DARTMOUTH : B. Farleigh, G4RJ, Montpelier, Lower Contour Road, Kingswear.
GRAFTON : A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
KINGSTON : R. Babbs, B.Sc., G3GVU, 28 Grove Lane, Kingston, Surrey.
LEICESTER : W. N. Wibberley, 21 Pauline Avenue, Belgrave, Leicester.
MERSEYSIDE : B. Trueman, G3GJG, 141 Ince Avenue, Liverpool, 4.
NORWICH : D. Youngs, 53 Salisbury Road, Norwich.
QAU (JERSEY) : Miss V. Hunt, 5 Valley Gardens, Bel Royal, St. Lawrence, Jersey, C.I.
RAF A.R.S. (LOCKING) : Hon. Sec., RAF A.R.S., Royal Air Force Station, Locking, Weston-super-Mare, Somerset.
RAVENSBOURNE : J. H. F. Wilshaw, 4 Station Road, Bromley, Kent.
READING : L. Hensford, G2BHS, 30 Boston Avenue, Reading.
ROYSTON : F. A. M. Ashton, G3GIT, 115 Melbourn Road, Royston, Herts.
SLADE : C. N. Smart, 110 Woolmore Road, Birmingham 23.
STOCKPORT : G. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
TORBAY : L. D. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot.
WARRINGTON : G. S. Leigh, G2FCV, 49 School Road, Orford, Warrington.
WIRRAL : L. Roberts, G3EGX, 18 Croxteth Avenue, Liscard, Wallasey.



G6HH/A, the " Happy Hastings " station of the Hastings & District Amateur Radio Club, in action at the Hobbies Exhibition there during the week July 4-11, when 246 QSO's were obtained for the edification of visitors, mainly on 80-metre phone. The console pictured here was specially made for the occasion, being 6 ft. long, 5 ft. 6 ins. high, and 2 ft. 6 ins. deep, with a 45° slope and an operating desk 12 inches wide. This accommodated an impressive array of gear and the whole undertaking was such a success that not only did the Club gain ten new members but was also awarded the blue riband by the Organising Committee for putting on the best stand in the show. In our photograph are, left to right: Secretary W. E. Thompson, G3IIO (operating), G3BDQ, and extreme right (with pipe) G6QB, president of the Club. Among other Club members operating or helping were G2RG, G3CMN, G3HRI, G5RO and SWL R. G. Ford, who built the console.

and visitors will be welcome to any of them.

Ravensbourne Amateur Radio Club

The club station, G3HEV, has now worked over 150 contacts. Two members are building SEO's for 70 cm, and two receivers have been built in the clubroom. After the summer vacation, meetings will recommence on September 23 at 8 p.m. The location, as before, is Downham Men's Evening Institute, Durham Hill School, Downham, Kent.

Chester & District Amateur Radio Society

Owing to holidays, the full programme has not been maintained, but on August 25 G2YS lectured on Operating Aids, and the autumn Auction Sale was fixed for September 1.

Stockport Radio Society

Eight out of nine entrants were successful in the May R.A.E., and classes begin again in September. Membership is now over 80, and it is hoped to have a Club Tx on the air soon. September meetings are on the 2nd, 16th and 30th, at ATC Headquarters, St. Petersgate, Stockport.

Merseyside Radio Society

Meetings are held on alternate Saturdays, the next being on September 5 at 3.00 p.m., Room 7, Larkhill Mansion, Muirhead Gardens, Queens Drive, West Derby, Liverpool, 12. An earnest endeavour is made to cover all amateur interests and activities; new members and visitors are welcome. A copy of *QRZ* (the Club's own paper) is available on application.

QAU Club (Jersey)

Despite a very long silence, the QAU Club is still in active existence. During recent weeks there have been some very enjoyable meetings, with the visiting season in full swing. At one recent meeting, there were more visitors than locals, but that is no unusual occurrence!

RAF Amateur Radio Society, Locking

RAF A.R.S. operating G8FC, will be holding an exhibition on the Beach Lawns, Weston-s-Mare, during Battle of Britain Week, September 14-19. This is in aid of the RAF Association. Amateurs are invited to QSO and to visit G8FC, in action on 80-, 20- and 2-metre phone every day. All contacts will be QSL'd.

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

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

WANTED: RCA 4331 Transmitters. — P.C.A. Radio, Cambridge Grove, Hammersmith, W.6. (*Telephone*: *Riverside 3279*).

QSL CARDS AND LOG BOOKS. APPROVED G.P.O. SAMPLES FREE. — ATKINSON BROS., PRINTERS, ELLAND, YORKS.

45/- EACH offered for 813 type valves.—Pype Hayes Radio, 606 Kingsbury Road, Erdington, Birmingham, 24.

RADIO OFFICER'S Training. Day, Evening and Postal instruction. Supervisor, The Wireless School, Manor Gardens, London, N.7.

AR 88D, 540 kc to 32 mc. Excellent condition. Delivery free London area. £55. — A. J. Whittemore (Aeradio) Ltd., Croydon Airport, Surrey. (*CRO 5791*).

45/- EACH paid for new boxed 813's. 20/- for 811's, 24G's. — Box 1299, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

WANTED: BC610 Hallicrafters, ET4336 transmitters, SX28s, AR88s, receivers and spare parts for above, best prices. — P.C.A. Radio, The Arches, Cambridge Grove, W.6.

WANTED: R.C.A. Speech amplifiers Type MI-11220 J or K and aerial tuning units BC 939a. —Offers stating quantity and price to P.C.A. Radio, The Arches, Cambridge Grove, W.6.

WANTED: Power Supply units for No. 33 transmitters (Z.A.10729), call or ring. — P.C.A. Radio, The Arches, Cambridge Grove, W.6. (*Riv. 3279*).

WANTED: Three 50 ft. poles, also navigator's compass, pocket type preferred.—G3LB, Newlands, Lead Lane, Ripon, Yorks.

VALVES, Type 813, 832A, 833A, 250TH and 723 A/B, in any quantity, urgently required. High prices paid.—Pype Hayes Radio, 606 Kingsbury Road, Birmingham, 24.

COMMANDER Receivers by Radiovision wanted, clean and in good order, for an overseas buyer. State condition, price and date of purchase. — Box 1302, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

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.

READERS' ADVERTISEMENTS

SALE: surplus to requirements, R1155A rebuilt ; 6AC7 RF-1F, 6V6 output, xtal filter, internal P/Pack, new front, LS ; photos available ; £12 10s. plus carriage. — 233 Chelmsford Road, Shenfield, Essex.

SMALL ADVERTISEMENTS, READERS—*continued*

SALE: Viewmaster Table Model, complete but unused; cheap. — Details, write 12 Mattocke Road, Hitchin, Herts. (*Phone 1218*).

BEST OFFER: Marconi rotary converter for working CR100 (B28) from 6-volt supply, complete with leads and plug. Ex-RAF R.1481 receiver modified to cover 46 to 62 mc, with internal P/Pack. One complete set of HRO coils 50 kc to 30 mc. One 10m BS, 1 40m BS, 1 14/28 GC, 1 4/7 GC, 2 7/14 GC (soiled but tested OK). Two 500/900 kc GC and one 100/200 kc (cans rough but in good working order). Some low frequency coils available less cans; state requirements.—Savage, Burrow Hill Farm, Hemmock, Nr. Cullumpton, Devon.

SALE: AR77E, £22; Q5'er, modified 12v, £3; 813 new (not boxed), 30/-; RCA AVR-20-A1 mobile 80-meter receiver, £5; nearly complete 120-watt 14 mc phone transmitter, p/pull 807's in PA and modulator, three power packs, fully metered, 6 ft. rack, working order, £30. Offers and enquiries for these and other items to:—R. J. Athey, G3GRC, 331 Fulham Road, London, S.W.10.

CNY2 Tx/Rx, Xtals, Valves, various experimental Tx's, chokes, transformers, Pifco meter, AVO, bridge, condensers, CR100 coil pack, IF's, xtal, condensers, chassis and cabinet, power pack, signal tracer, 15-watt amplifier kit.—G3IDW, 136 Beech Avenue, Swindon, Wilts.

S.640, under 100 hrs use since new; B2Tx p/pack, coils, xtal; MCR1 Manuals, SCR-536; BC-221; sale or ex Eddystone 750. — Miller, 104 Lichfield Road, Brownhills, Walsall, Staffs.

NEW tested 832 (6), 25/-; RCA 807 (6), 8/-; 1155A new cond., spare IF's, £7; German E10L Rx, good cond., less valves, £1; spare set 7 valves for R.1155, £2. WANTED: UM2, UM1, 750-0-750v. 250 mA mains trans.; callers preferred for receivers. — 45 Dunbar Road, Forest Gate, London, E.7.

SELLING U.S.A. equipment, all in excellent condition. Ferris 22A signal generator as new, £50; Triplett 1183 valve-tester and multimeter, £12; Hallicrafters SX 28A, £55; Hallicrafter SX42 receiver, 540 kc-110 mc, with FM as well as AM, and CW on VHF frequencies, £95. — Box 1298, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

URGENTLY required: Canadian VRL receiver handbook, or circuit diagram with servicing data.—Power, 42 Talma Road, London, S.W.2.

MAGAZINES wanted. Your price, if reasonable. *Bulletin*—August 1926, February 1928, May and October 1934. *QST*—April 1945 and before July 1924. *CQ*—1945/6. 105 odd *Practical Wireless* pre-1938, and No. 441. Most *Radio, Amateur Radio* and *Popular Wireless* from No. 27. Any *Break-In, R/9*. Early *Call Books*, amateur handbooks, etc.—G3IDG, 95 Ramsden Road, London, S.W.12.

813's (4), 60/- each; 35T's (2), 30/- each; 6SK7's (3), 7/6 each, all unused. HRO tuning condenser, 25/-; HRO coils 100-200 kc, 15/-. 7-14 mc GC, 25/-; 14-30 mc BS, 20/-. Labgear 150 watt PA coils, with swinging links, 7-14-28 mc, 12/6 each, base 7/6. 1100-volt 500 mA P/Pack rack mounting complete, £4. Tx cabinet, black crackle, 30 in. x 21 in. x 20 in., £3. Buyer collects last two items.—G3EWZ, 16 Mendip Road, Liverpool, 15.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Wavemeters. One class "D," £5; one 1117 with charts, £4. R.1155 with internal power pack, £9. R.1116a battery Rx, £3.—67 Long Lane, Hillingdon, Middx. (*Uxbridge 5227*).

SALE: Eddystone 640, excellent condition, £20; R.C.A. Frequency meter TE-149, 2-30 mc, xtal cal, inst. book., spares, £10; MCR1 complete, p/pack, phones, £5; Woden UM2, 30/-. — Hutchison, 19 Muirbank Avenue, Rutherglen, Lanarkshire.

SALE: HRO full range of coils including band-spread and power pack. BC221Q frequency meter. DB20 megacycle signal generator, spare HRO valves. Offers lot or separately to: Wake, 366 Waterloo Road, Blackpool.

CR100 in very good condition, black crackle finish, S-meter, £25. BC221, £15. Or offers? — Burns, 24 Coniston Avenue, Little Hulton, Walkden, Manchester.

FOR SALE: Eddystone 750 receiver complete with S-meter, and matching speaker. Eddystone modulation meter, also Eddystone bug key, £45.—17 Nook Road, Scholes, Nr. Leeds.

TCS10 Receiver in perfect order, good condition, bargain, £4 10s. S441B power pack, brand new, input 200/250 AC, output 300v. DC 200 mA, 12.5v. 3 amps AC, 5v. DC, 1 amp, grey crackle cabinet, £2 5s. Commercial, small 2-valve amplifier unused, metal rectifier, 6F6 output, 200-250v. AC, £2 15s. R.A.F. 2-metre test oscillator, approx 142-148 mc, uses EC53 triode, perfect, with circuit, £1 5s. WANTED: Two-metre transmitter Phone and CW, preferably internal power pack and modulator (table top rig or compact rig ideal), high standard of construction and finish essential; excellent price paid for equipment to the above or similar specifications; details to: Box 1301, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

FOR SALE: Radiovision expander 5/10 metres. Wavemeter Class-D (with transformer). Receiver type R1147B. RF Unit type 26. All good condition. £15 the lot.—BRS 14996, 7 Boldmere Drive, Sutton Coldfield.

FOR SALE: Class-D Wavemeter, £3 15s.; .829B Valve, £2. Both perfect condition.—Box 1303, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: AR88LF manual (no copies), price to: A. Ashcroft, 1 Gaw Hill Lane, Aughton, Ormskirk, Lancs.

EDDYSTONE 640, £20; also Eddystone 750, £45, in mint condition; also Class-D wavemeter, £4 10s.—N. Graines, 10 Reidhaven Road, Plumstead, S.E.18.

CR100, Super Pro (20mc-2.5mc, less P/Pack and BFO switch). Collins TCS (modified). All good condition. Buyer collects. Offers?—C. Street, 20 East Comer, Worcester.

EDDYSTONE 680, good condition, £55. — R. Grain, 15 Waverley Gardens, North Stifford, Grays, Essex.

H.R.O. or AR88 wanted, please state price and full partics. (London area). All letters answered — Box 1300, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

EDDYSTONE S.640, new condition, little used, instruction book, £18 or offer.—Box 1304, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

COMPLETE Station for sale, Rx 750, mint condition. Table top Tx, VFO, 25-50 watt band-switched and with built-in power supply. Class-D wavemeter, AC Mains. Offers to: Y.M.C.A. Radio Club, Belfast.

BARGAINS: Amateur giving up HF work. Eddystone 750, fitted coaxial aerial/earth socket, otherwise perfect, unmodified, £35 carriage paid. Wilcox-Gay VFO, modified, good working order, £3 carriage paid. Labgear 5-stage wide-band multiplier unit with literature, perfect, list 90/-, for 60/- post free.—Abbott, 35 Spinney Crescent, Dunstable, Beds.

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