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*The*  
**SHORTWAVE**

*Magazine*



**EXCLUSIVELY FOR THE  
RADIO EXPERIMENTER &  
TRANSMITTING AMATEUR**

**VOL. VI . No. 2 . APRIL 1948**

**Webb's** FOR DIVERSITY OF STOCK



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VALVES, Types EC52, EF50, EF54 . . . . .	3 0 11

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potentiometer for tapping off the required voltages for the 807 screen (oscillator plate) which, when doubling in position 3, is connected by S1c to the junction of R6 and R7. Higher voltage is required when trebling in position 4 and S1c therefore goes to the top of R6.

### Output Coupling

A 2-ft. length of Uniradio 43 was meant to couple the output of the Type 145 to existing transmitters if the following modifications were effected in the transmitter CO stage: (1) Removal of the feed-back condenser between CO plate and grid. (2) Removal of crystal-holder from crystal sockets, together with removal of lead from socket to earth. Crystal position taken by a 2.2  $\mu\mu\text{F}$  fixed condenser. (3) The insertion of a 150-ohm half-watt stopper in the grid of the CO, and (4) Insertion of a 68,000-ohm 2-watt resistor between screen and earth, to discharge the screen by-pass condenser in the key open position.

When the first stage of the transmitter was to act as a buffer, the RF output connector from the Type 145 was to be plugged into the originally earthed side of the transmitter crystal socket, so that the additional 2.2  $\mu\mu\text{F}$  condenser coming into series with the 145 RF output condenser C14 reduced the coupling between driver and transmitter. When, however, the first stage of the transmitter was to

frequency multiply, the RF connector was to be plugged into the grid side of the crystal socket in order to leave the 2.2  $\mu\mu\text{F}$  condenser out of circuit.

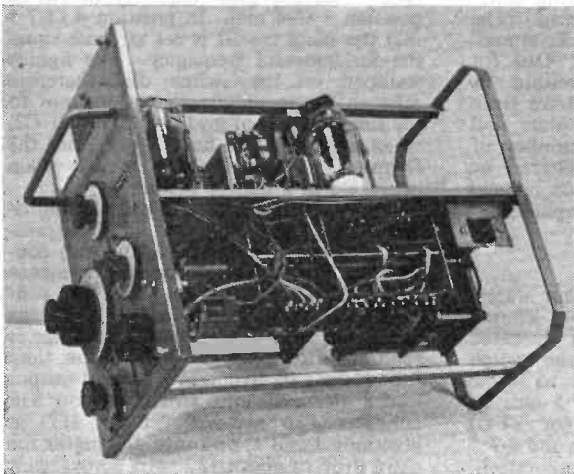
The Type 145 unit is supplied with two barretters, one of which is a spare; if these are removed with their holders, and also the bracket supporting the RF output socket and the keying relay connection panel, then a very useful space will have been cleared into which can be built another 807 buffer, doubler or final stage. An upright metal shield can be placed close up to the oscillator 807 and the plate coil L3, with the second 807 mounted horizontally behind it, so that its grid is close to the oscillator output condenser C14. The cabinet side-panel with the ventilation louvres can be removed (5 screws) and its place taken by a new piece of metal having the top right-hand corner cut out through which opening the new 807 stage can be tuned and coil-changed.

### Applications as Driver

Several methods of coupling to the transmitter are possible. Although not tested by the writer in such a manner there appears no reason why the unit should not be used as a single valve QRP ECO Tx for 3.5 and 7 mc by linking the aerial coupling coil to the cold or nearest chassis end of plate coil L3.

The other methods actually tested have been as follows:

With the oscillator on 3.5 or 7 mc straight into the grid of the suggested new 807 stage alongside. This can in turn pass on 3.5, 7 or 14 mc RF to the aerial coupling coil *via* link—or if a 14 mc doublet is in use, straight out to the aerial by one or two turns. Alternatively, the oscillator output on 3.5 or 7 mc can go straight into the transmitter crystal stage grid *via* co-axial. Again, if the transmitter happens to be CO, buffer or doubler and final the oscillator can drive the new 807 stage for doubling to 7 or 14 mc. This can skip the transmitter CO grid and be linked instead to the CO plate coil, which then acts as a tuned input circuit to the trans-



General arrangement of the parts in the Type 145 Oscillator. The keying relay is on the upper deck between the 807 (right-hand valve) and one of the four voltage stabilisers.

mitter buffer-doubler. This stage then doubles again for driving the final on 14 or 28 mc. This latter method may sound complicated, but it boils down to MO-Doubler-Doubler-Final and it works very well indeed on 28 mc.

The stability and clickless keying of the oscillator can be checked by switching to 3.5 or 7 mc VFO operation and listening to the 28 mc harmonic.

#### Calibration

The oscillator dial readings may be directly translated into kilocycles if a frequency sub-standard and the receiver are used to draw a graph. Alternatively, the frequency sub-standard (by which is meant a 1000 or 100 kc crystal and not "any old rock" used in the transmitter) can be switched on at the beginning of each session for checking the calibration of the receiver. Only if this is of the calibrated-dial communications type will such a check be accepted by the GPO for use with a VFO, the frequency of each and every transmission being logged in

kc directly from the receiver dial readings.

In conclusion, the only possible way in which to use the 145 AS A VFO is to abhor padded shoulders and scything across the bands with all spiv-guns blazing. A separate on-off toggle brought out to a convenient position will switch the oscillator HT independently of everything else in the station. After a signal has been tuned in on the receiver the oscillator alone can be switched on and its tuning dial rotated until the oscillator is heard some 3 to 5 kc away from the received signal. The oscillator is switched off and no one outside your station is even aware of what you propose to do! When the received station signs over all stages of the transmitter will follow the oscillator in calling up.

After contact has been established, the distant station can invite single-channel working. After the contact has terminated set your oscillator dial elsewhere if you are going to call CQ in order to leave the last station's frequency clear for others to work on it.

#### XTAL XCHANGE

Only a few in the market this month—please set out your own request in the form below, headed "Xtal Xchange Free Insertion" on a separate slip. All negotiations should be conducted direct.

G2AO, Branksome, Worcester Road, Malvern, Worcs.

Has 7170 kc crystal, mounted. Wants frequency between 1800 and 1900 kc.

G3CIM, 35 Melford Avenue, Barking, Essex.

Has 1,000 kc crystal, new, holdered,  $\frac{3}{4}$ -in. pin spacing. Wants similar 3550-3575 or around 7100 kc, or offers.

G8UA, 406 Higher Brunshaw, Burnley, Lancs.

Has 1850 kc crystal, mounted. Wants frequency between 7100 and 7200 kc.

SWL, 4 Phipps Terrace, North Road, Selsey, Sussex.

Has 1,000 kc, 4570 and 6735 kc crystals. Wants one in 7 mc 'phone band.

#### EDDYSTONE "640" ESSAY COMPETITION

The winner of the recent Essay Competition for the Eddystone 640 Receiver is R. C. Jennison, 28 Park Drive, Grimsby, Lincs. He is an undergraduate of the University of Manchester, and chose as his subject "The Application of Microwaves in Amateur Radio."

The judges specially commended four other entries: D. H. Johnson, West Byfleet, Surrey ("Relative Merits of British and American Communications Equipment"); K. Parvin, London, W.1 ("Band Planning"); H. Turner, G8VN, Rugby, Warks. ("Band Planning"); W. D. Old, Redruth, Cornwall ("Application of Microwaves"). Messrs. Stratton & Co. have generously decided to present suitable consolation prizes to these four entrants in special recognition of their work.

The winning article, which is a valuable contribution in the Amateur field to the literature on the subject, will appear exclusively in the next (May) issue of the *Short Wave Magazine*.

*For the Best Information on the Latest News,  
read the Short Wave Magazine*

## Twin Three-Element Beam System

General Description of the 14/28 mc Array at G8IG, Bromley, Kent

by C. G. ALLEN

THE wooden lattice tower is 31 ft. high with a base dimension of 4 ft. The main supports are bolted to channel iron sections, which are sunk in concrete blocks and hold the whole structure very rigid.

The lower beam is a 3-element close spaced 14 mc array, using a folded dipole as a radiator. The 3 elements and their supports are made from duralumin tube; each element is formed of three sections of telescopic tube. The centre section is  $1\frac{1}{8}$ -in. dia. and the end sections are a telescopic fit, suitably clamped to ensure good contact. The thinner element of the radiator is also in three sections with the centre section  $\frac{1}{2}$ -in dia.

The main boom is duralumin and all the elements are supported on and insulated from it by blocks made of gear fibre. Gear fibre blocks are also used for the minor horizontal tubes supporting the director and reflector. These minor tubes are 8 ft. long by  $1\frac{1}{16}$ -in. dia. Similar supports are used for the radiator spacers, but the end blocks are of duralumin.

All cables including the feeders are carried neatly to the eaves of the house on a steel stretch wire. The 2-element vertical beam on the side of the tower is a television receiving aerial.

### Dimensions—14 mc

The element lengths are as follows :—

Director—32 ft. 1 in.

Radiator—35 ft.

Reflector—36 ft.

The spacing between the director and radiator is 10 ft. and between the radiator and director, 7 ft. The elements of the radiator are spaced 6 in. from centres. The aerial is 33 ft. above ground. The whole 14 mc array weighs only 28 lb.

The smaller element of the radiator is fed direct with 45-ohm coaxial line and gives almost a perfect match with the above measurements on 14,200 kc. The measured standing wave ratio at this frequency is 1.4 to 1.

Standing wave ratios for other frequencies are :—

14,000 kc—4.2/1

14,100 kc—3.2/1

14,300 kc—2.5/1

14,400 kc—4.3/1

### Ten-Metre Beam

The 28 mc array is mounted 8 ft. above the 14 mc beam and is a half-size replica of it; it is also fed with 45-ohm coaxial line. It has almost identical characteristics and weighs only 7 lb.

Careful checks were made to ascertain if the mounting of the beams parallel to each other adversely affected them but no apparent effect was noticeable.

The driving shaft up through the centre of the tower is 2-in. water pipe and stands on a ball race. Half-way up the tower, the tube passes through a steadying bearing.

### Constructional Points

The boom of the 14 mc beam is clamped in a steel cradle, with the cradle fitted to a steel tube  $1\frac{1}{2}$ -in dia. and 8 ft. long. This tube is passed through a ball race sunk into the top platform of the tower; a heavy bolt through the driving shaft and this tube securely anchors it for rotation. A steel collar is fitted to the shaft and rests on the ball race in the top platform to stop it dropping through when the lower bolt is removed.

The 28 mc array is clamped to an 8-ft. length of 1-in. dia. duralumin rod which slips into a socket welded to the cradle supporting the 14 mc beam, and is held by three heavy grub screws tapped through the socket.

A  $\frac{1}{2}$ -h.p. reversible motor connected through suitable gearing housed at the base of the tower provides for rotation at a speed of one revolution per 56 seconds. Continuous rotation is not possible due to the method of feed, but this has not been found a disadvantage. The feeders are wound around the driving shaft three times, so that the arrays may be rotated continuously for six complete turns, if necessary, before reversing.

### Indicator Unit

The beam indicator unit is perhaps worth mentioning. A great circle map of the world was photographed down to 10-in. dia. and printed off on thin paper, suitably coloured to make the various

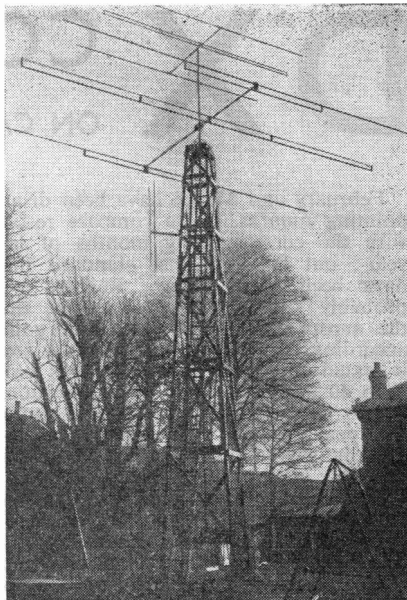


countries stand out. The print was then mounted on a 12-in. circle of aluminium in which holes had been drilled every 10 degrees and slots cut with a fret-saw from the drilled holes to within  $\frac{1}{2}$  in. of the centre.

Behind every other hole are mounted small 6v bulbs which are wired through a 6v mains transformer to a suitable multi-connector fitted to the case in which the assembly is housed. An 18-point stud switch is fitted to the centre of the tower and the main driving shaft passes through it. On the main shaft is fitted a wiper arm, with the blade just wide enough to touch two of the studs at a time.

The studs are connected to the indicator in the station via a multicore cable. When two lights show on the indicator, the beam is between them, so that indication of the beam is obtained every 10 degrees. The lights also illuminate the slots and show the path of the beam over the great circle route.

General view of the 14/28 mc twin-beam array at G8IG, Bromley, Kent.



#### THE SHORT WAVE LISTENER

A series now running in our companion *Short Wave Listener* covers a set of answers to the last Radio Amateurs' Examination; when all the questions have been dealt with, a new series will be started covering the preparatory work for those hoping to take the next R.A.E.

A regular VHF feature—the first in any periodical in the world devoted wholly to SWL's interested in VHF listening—has been successfully launched, and for the summer months some space will be devoted to portable operation on all bands. Regular features like "Have You Heard?" (the Amateur Band Commentary), Calls Heard, and "DX Broadcast" (for the SWL interested in S/W BC reception) enjoy wide support and have a very large following; it can fairly be claimed that for the short wave listener these monthly features are the most up-to-date, comprehensive and informative of their kind appearing in print to-day.

The *Short Wave Listener* is of 32 pp. with colour cover, published on the third Thursday of each month, price 1s. 3d., or by post 1s. 4d. The direct subscription rate is 16s. for twelve issues, post free. Write the Circulation Manager, Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1.

#### ATLANTIC CITY REPORT

A remarkable publication is the Final Report on the International Telecommunication and Radio Conferences at Atlantic City last year; printed page for page in English and French, it sets out in detail the decisions of the meetings on every conceivable point connected with the general use of the ether and proves—if proof were needed—the immensity of the task facing those responsible for reaching agreement on what in many cases were most conflicting needs or aspirations.

Among interesting points is the adoption of abbreviations like "NW" and "OK" as traffic signals, and a table of words to identify the letters of the alphabet. These are nearly all place-names, nicely blended to give equal prominence to all countries. The ones we don't like are "C for Casablanca," "U for Upsala" and—believe it or not—"X for Xantippe"! (*What's Xantippe, anyway?*)

#### LITTLE ERROR CREEP IN

In that diagram Fig. 2 on p. 44 of the March issue, the RF current paths should be shown dotted for the whole run, as it was not the intention to indicate a wire short across the RF chokes!

# DX COMMENTARY

## ON CALLS HEARD, WORKED & QSL'D

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

February and March have been disappointing months, if we compare results with the corresponding months of last year; but by any other standard they have been pretty good. Readers will probably know by now, however, that the sunspot cycle has not been going according to plan; in fact we have seen it stated that this year's numbers have been 40 per cent. down on expectations. So, to those of you who were expecting the peak period this spring, we can literally say "You've had it!" It was probably *last* spring.

But what is a mere packet of sunspots where the DX fraternity are concerned? There will always be someone to dive under the surface and emerge with some choice pieces, and if it can't be done on 28 and 14 mc, they will migrate to 7 and 3.5 mc and do it there. You just can't keep a good man out of the QRM.

And is it our imagination, or has there been a little less spivvery going on lately? Time and time again we have heard nice DX stations calling CQ, and waited on their frequency for the avalanche—but it has not arrived. The "pouncers" seem to have acquired enough common sense and operating ability to spread out a little. It's an amazing thing, but chaps like CR6AI seem to call CQ nowadays without making their part of the band curdle; perhaps everyone has worked them?

### What—No Heat?

Another remarkable fact is that, in spite of yet another record load of mail, no one has got really hot under the collar. There are mild grouses, it is true, but more in sorrow than in anger. Our objectionable friend the Concrete-Mixer, who causes a broad hash on 7030, 14060 and 28120 kc, has come in for his share of comment. One reader calls him a "resonant sink"—but we don't imagine he minds that. If only someone could give us his full QTH, and someone else present us with a teeny-weeny atom-bomb. . . .

G8UA (Burnley) is mildly indignant on the subject of QSL's from the various USSR countries, and asks us to issue a

GMTTCSU Certificate ("Got-more-than-two-cards-from-Soviet-Union")! On the other hand G8KP (Wakefield) has worked 15 of their countries and received 14 QSL's; while G2WW (Penzance) has cards from 15 of them! He says they seem to come if you don't mind waiting. (Ours don't!) And G3CVG (Wakefield) has sent them 50 cards and not received a single one in return. Better get the secret from G8KP. . . .

### Competitive Dept.

With a hot blush of shame, your commentator puts his own call at the head of the 1948 list this time. But he is rather cut up about it, because he knows several people with higher scores who have not sent them in. There it is, though—36 Zones have poured down the funnel so far, and if anyone in Zones 19, 23, 26 and 39 would like to communicate, we should be pleased to co-operate.

Most of the regular DX types are climbing steadily up the ladder but are not, we hope, bursting any blood-vessels in the process. Somehow the DX seems to come for you at its own speed, and any attempt to hurry it up produces a nervous wreck and nothing more!

### DX of the Month

Starting on the 3.5 mc band, we find the stalwarts still bringing in the W's in considerable quantities during the mornings; even more since the clock is now one hour kinder to us. G2BY (Cheltenham) reports working plenty of them, plus ZL2IC, ZL4IE and OX3MG. Proceeding to 7 mc, we find our old friend G2PL (Wallington) working VR6AA for his first European QSO—nice work for Pete! 'PL also raised FQ3AT/FE on the same band, and tells us that his WAZ Certificate has come through. He is therefore the first G to collect a post-war WAZ; and he also has the first all-phone DXCC outside USA. A very nice Double-First indeed, and congratulations from us all, G2PL.



W4BPD, Orangeburg, South Carolina, has an aerial farm on which he has planted 12 rhombics, one 10-element Sterba curtain, two  $\frac{1}{2}$ -wave aerials, two vertical  $\frac{1}{4}$ -wave wires for 14 mc, one full-wave 3.5 mc centre-fed aerial, a 4-element 10-metre rotary, a 4-element 6-metre beam, and a 16-element 2-metre array. The whole system covers 150 acres—we're not surprised!

G8HX (Mansfield) read some queries about the credentials of D4AWK/6; but he assures us that the station is genuine, as he has had some very fine QSO's with him, including a most unusual one of which we can't say more at present. On the other hand, G8HX asserts that HE1EC was a phoney, as he had his card returned. G3HK (Maryport) has worked 19 Zones (post-war) on 7 mc only, including KL7, VE8, CM, HH, KP4, VP2, VP5, NY4, PY, VS2, ZS and lots of others. But he wishes some of the local boys would take the trouble to *listen*, especially in the mornings, before they blot out the DX with their chatter. Most of 'HK's DX has been worked with a single 807.

G3PZ (Gloucester) knocked up the very fine score of 19,312 points in the ARRL DX Contest, using 7 mc mainly, but adding a bit of activity on 3.5 mc. G2WW (Penzance) has also been on 7 mc quite a lot, and collected ZS2EC (a YL), ZS2DR, TF3EA, OX3MG, and UA1KEC (Franz Josef Land). On 14 mc 'WW pulled out a brand-new country in the shape of

MP2BH, in the independent Sheikdom of Qatar (Persian Gulf). This has not been universally confirmed as a new country, but sounds good enough for us. 'WW has acquired an aerial pole at last, and now uses a 137-foot Zepp, 40 feet high, for all bands.

#### 14 mc DX

Now here's a fine thing! That hardened, dyed-in-the-wool 7 mc addict, G5FA (London, N.11) has migrated to 14 mc at last. In his first four weeks on the band he worked 49 countries in 19 Zones. On 7 mc only, however, he has 65C and 20Z to his credit, and he agrees with C5WC's dictum that anyone working 20 on that band is pretty tough.

Nice new ones from G6ZO (Totteridge) include ZD8B, who is ex-G5BO on Ascension Island and perfectly genuine (QTH in list), and CT3AB (Madeira), who is the old pre-war 3AB. CT3's have just been given licences again. 'ZO also worked VP7NG in the Bahamas, and found our old friend and predecessor in this space, Ham Whyte (VE3BWY), who



is on the air and looking for G's during weekday evenings on 14012 kc. Finally, G6ZO would like to know whether anyone has worked a genuine FB8 station since the war. The FB3AC who was on some time back has proved to be a phoney.

G3CSE (Hull) has been badly bitten by

### ZONES WORKED LISTING

Station	1948		Post-war	
	Zones	Countries	Zones	Countries
'Phone and CW				
G6QB	36	80	40	154
G8KP	35	88	40	165
G3DO	33	83	39	149
G3BI	33	61	37	103
SV1RX	32	82	38	137
G3DAH	31	64	31	72
G2HPF	29	48	31	90
G8IP	28	58	38	110
G2WW	27	71	39	154
G4CP	27	66	39	129
G3AAE	27	53	38	111
G3TK	26	55	39	120
G2AO	24	36	36	103
G5MR	23	27	38	104
G8PL	22	56	23	75
G3UA	22	49	34	99
G6PJ	22	38	39	76
G2BXP	21	48	34	87
G3BNE	21	40	23	53
G3BFC	20	34	34	87
G2AVP	20	31	37	98
G5FA	19	49	23	74
GM3CSM	19	29	21	46
G8KG	19	22	34	72
G3BDQ	14	28	35	81
G5HH	11	30	30	79
G3ACC	10	19	30	85
G3DCC	9	25	9	25
'Phone only				
G3DO	30	73	37	120
G3DAH	30	60	30	68
G2BXP	21	47	30	72
G8QX	19	30	34	107
G2VJ	16	24	25	56

the DX bug, having opened up on 14 mc with 8 watts and found that he can raise a W9! He agrees with all we say about local 'phone on a DX band. G3DCC (London, N.8)—it is he who complains about the gurglings of the resonant sink—is still working some nice DX with his "doubled doublet," which is a 14 mc aerial folded into 17 feet. He is now going to try another at right angles to it. Looks as though he may eventually have something very interesting to those who are short of space.

G3UA (Stockport) breaks into the Marathon List, and complains of a particularly spivvish piece of work. When a DX station comes back to him, he says, but calling "G3U?", QRZ G3U?", why do G5's, G6's and W2's all go back? Obviously it's at least a G3 that's wanted. G6PJ (Sheffield) is one of the lucky few who raised VP7NG and he has found things very good for VK/ZL contacts in the mornings, too. G2HPF (Great Baddow) has discovered to his sorrow that CR6KW, worked a year ago, was a phoney. He has just worked CT1OR, who denied ever having operated the said station.

G3BI (Seer Green), who has become one of the high scorers this year, sends some useful QTH's which indicate that he has been getting around: YV1, C7, PZ1, FQ3AT/FE, CR9, OA, C9, VK9, HL1—not too bad? G3TK (Leigh) says that when he comes on the band is either just folding up or else it's full of howling ECO's, lids, T3 notes and the gentry who screw their keys down and squirt parastics in all directions. (Life is like that, 'TK, unless you sleep by day and get on the air at 4 a.m.) Nevertheless 'TK has added VP5MU, YV1AZ, C7OO, CR6AN and 6AU, among many others.

Down Bournemouth way, G3AAE has been working some nice steady 14 mc



A DX group outside Radiolympia, 1947. Left to right: VU2JD/G3CPL, VU2AD/G2AHL, VU2AT, VU2AR and VU2AB.

DX, including VS9ET and PK4VD, both of whom we should appreciate very much. He comments on the new AP prefix for Pakistan, which will, of course, be stale news by the time you read this. G8KP (Wakefield) has collected practically everything going—and that includes YA3B, VR5PL and 5IP, CT3AB, VS9ET, all on 14 mc CW. He has broken out with some 28 mc 'phone as well.

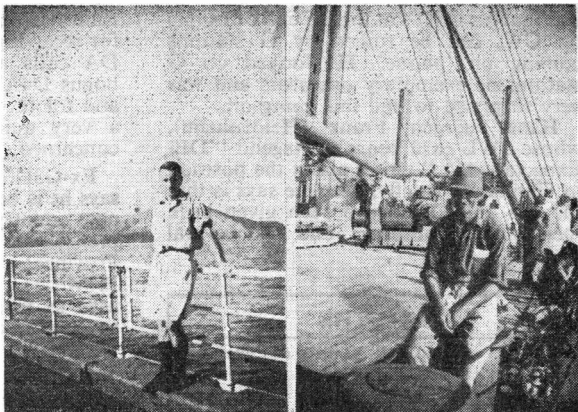
#### News from Overseas

Before we pass from 14 mc to 28 mc we had better let the overseas types break through, because we welcome a lot of them this month, all with very newsy letters. Ex-MD5LR writes from Bath to say that there will no longer be an MD5GM connected with the old 5LR station, as the second op. is also awaiting release.

Ex-G3BFV is now on the air as ZS1GV; he has been hearing G's on 7 mc, but calls to them produce no effect. (QTH in list.) Gossip from Athens includes a nice high score from SVIRX; he says he had decided not to continue the Great Country-Chasing-Racket, in fact it was one of his New Year Resolutions not to do so. But when he found that he had worked 24 Zones in January, including 10 of them on the first day, he thought he'd better go on. (Funny how it gets you—just look at us!) MD1D is no more—Dan Lockyer pulled the switch and is going on to Transjordan, where he intends to come on the air in spite of all difficulties. He says he has QSL'd 100 per cent., but if anyone has *not* had his card from LI2CL or MD1D, drop a line. We shall be keeping in touch.

ST2FU (Wadi Halfa) wants more precise information in these columns about whether the choice bits have been worked on 'phone or CW. When correspondents tell us clearly, we pass on the information, but they often leave it vague themselves. We'll try to make it even clearer in future. ST2FU is ex-MD2C, runs 10 watts of 'phone with occasional excursions into CW, and works mostly on 28mc. He says that MD2B, MD2D and MD2G (ex-T1NS) are still active in Tripoli.

Maurice Selby of J4AAK is home



A personality photograph of more than ordinary interest, VR6AA on left, with Pitcairn Island in the background, and Andrew Young, VR6AY, on right. These shots were taken by G3CNM when his ship *s.s. Athenic* called at Pitcairn recently.

again, and hopes to be back on the air as G4LV when his next location is settled—possibly from GM. Ham Whyte (VE3BWY), who was, of course, G6WY, tells us that he has bought a "beautiful 500-watt Tx" with which to rend the ether; we'll all be looking for you, Ham.

Two very interesting letters from G3CNM (*s.s. Athenic*). He left England way back in December, and found his first real treat was listening to the 7 mc band in mid-Atlantic! No QRM whatever at mid-day—in fact no signals at all! Lovely! A bit later you find HI, HH, TI and so on blowing your cans off with S9 'phone. And so through the Panama Canal and away to Pitcairn, of all places. On arrival, 'CNM had an hour's chat with VR6AA and also met VR6AY, who is still trying to find out why the New Zealand authorities will not renew his old licence. He says they don't even answer his letters. His second letter comes from "G3CNM at Wellington, N.Z.," and includes the photographs from Pitcairn, shown here. He hoped to do some intensive listening while in port, but they took the ship's aerial down to leave room to swing derricks for unloading, and that was that.

G3ATL (home QTH Rochdale) is now licensed as ZL2AFP (Portable), for use on board the ship in which he is Senior Signals Officer. He asks for reports and QSO's, and all cards should go to his home address.

HA8S (Budapest) wants to know why

it is that his QSO's at the LF end of 14 mc, on CW, can be ruined by G stations coming on 'phone. H<sub>3</sub> looked on G stations as exemplary operators and was very surprised to find this going on.

Hans Juergen Franz (H<sub>3</sub>idenheim), whose SWL card bears the legend "DE-Expectant-1-A," writes about the position in Germany. Briefly, what he says is that the D's and DE's have been given back their old DE numbers, and that several

Radio Clubs are officially licensed—but for receiving only. All the strange D and DA calls are worked under cover; a bogus D4AVL was recently rounded up, and for the next six months he will be in a very quiet place, as far as radio is concerned.

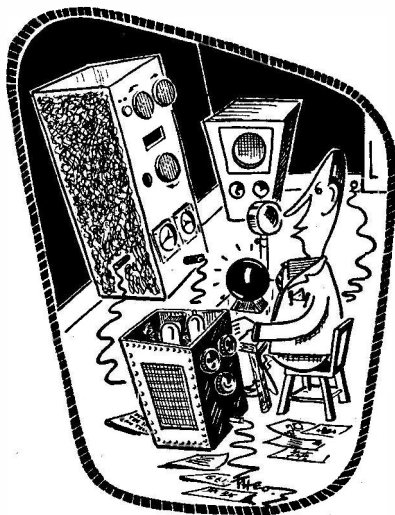
Ex-G3HS is now AP5B (Lahore) and says he is being worked to death giving a new country to the DX boys! Pakistan prefixes are expected to be: AP2, Sind Province; AP3, North West Frontier Province; AP5, West Punjab. AP5B asks us to give this note some space to save long explanations in QSO!

### DX QTH's

CE5CU	Box 3971, Santiago de Chile.
CR9AM	Box 504, Macao.
EK1GW	c/o Mackay Radio, Tangier.
ET3AE	Box 145, Addis Ababa.
ET3AF	Box 858, Addis Ababa.
HI2S	Box 103, Port-au-Prince, Dominican Republic.
HL1AR	APO 901, c/o Postmaster, San Francisco, California.
J4AAK/G4LV	Cpl. B. M. Selby, c/o Well Hill, Hemingford Road, North Cheam, Surrey.
KP4EZ	APO 851, c/o Postmaster, Miami, Fla.
MI3BC	QSL via A.R.I. ( <i>Station in Ertrea</i> ).
OA4Q	Box 538, Lima, Peru.
OQ5AS	Box 9, Usumbura, Urundi, Belgian Congo.
OX3GF	APO 858, c/o Postmaster, New York.
VE9GW	c/o O.V.C., Port Moresby, New Guinea.
VF4TT	Waller Field, Trinidad, B.W.I.
VP5AL	Government Airport, Kingston, Jamaica.
VP7NG	Box 2003, Arlington, Virginia, U.S.A., ( <i>Station in Bahamas</i> ).
VQ4NSH	Box 571, Nairobi, Kenya.
VQ5ELD	L. H. Durham, Post Office Kampala, Uganda.
VS7AC	P/O Clee, Naval HQ, Trincomalee, Ceylon.
VS7LA	c/o RAF, Koggala, Ceylon.
VS7WN	A. J. Benn, Admiralty W/T Station, Narahenpitiya, Colombo, Ceylon.
W1DTS/CT2	Bill Gibbs, 24 Fletcher Avenue, Lexington, Mass.
ZB1AO	Capt. Gatehouse, HQ Royal Artillery, Tigne, Malta.
ZC6NO	c/o X Branch HQ, Palestine.
ZD8B	A. Boa, Cables and Wireless Ltd., Ascension Island.
ZS1GV	A. J. Marsh ( <i>ex-G3BFV</i> ), Port Radio Office, HM Dockyard, Simonstown, South Africa.
ZS3F	Box 297, Windhoek, S.W. Africa.

### 28 mc DX

And now back home again to some of the DX types. G5XS, an OT at Ashton-under-Lyne, referring to 28 mc, asks whether some of the DX kings *have* to call a rare station like FQ3AT/FE every time they hear him, even if they have worked him before? They might remember the queue! But then to continue with a 25-minute ragchew in fifth-form French is a little *too* much. 'XS also records a case of a G station calling an XZ2 for about twenty minutes, with occasional five-second pauses; during the whole of this time the XZ was in QSO with someone else. Of course, anyone doing that



Trying out a new crystal tonight, OM.

sort of thing just wants dumping on a lonely island somewhere *without* a transmitter.

GM3CSM (Glasgow) also has some complaints about the 28 mc CW band, including the accusation of bad notes. He has placed himself nicely on the list this month, though.

### Piracy Department

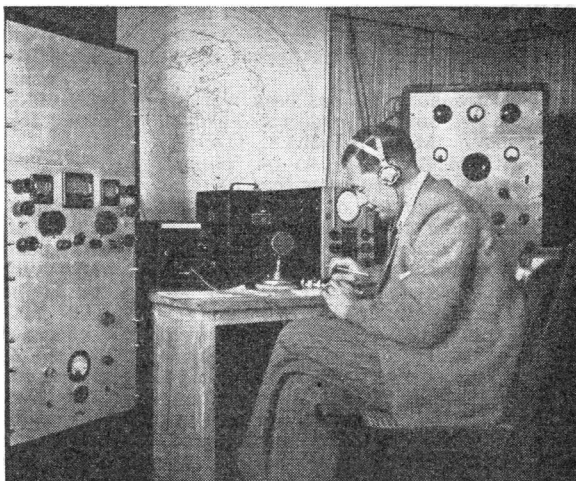
G5QI (Henley) puts out a CQ and hears lots of stations coming back, but not to the right G5QI! His own outfit usually runs 1 watt to a CO, and the pirate has an FCO, which gives him an unfair advantage. G2FXA (Stockton-on-Tees) says that anyone working a "G2FXA" on 3.5 mc 'phone will be in QSO with a pirate—he keeps getting cards for non-existent contacts.

VK1AA, however, is *not* a pirate! There are no normal VK1 calls, but G6YQ (Liverpool) tells us that VK1AA is a Royal Australian Navy Ship, *H.M.A.S. Wyatt Earp*, on an Antarctic Expedition. This news came to 'YQ via VK3YP.

### Shorts

Our first contribution from the Outer Hibrides comes from GM3BST on Benbecula, whence he works plenty of DX on 7 mc. He gets Aurora conditions up there and finds the band going silent after dark, and generally playing tricks. His main trouble is aerial supports—it would be on a treeless island where the gales howl frequently. Flimsy things just blow down. 'BST has worked on 7 mc (and had a card from) VS9ET.

G2COT (Sheffield) worked M1MB (San Marino) on 'phone recently and wonders whether it counts as a country. We say it does—but so far as we know M1A was the only genuine amateur there. Anyone who worked W1DTS/CT2, or CN8EE, and did not get a card for the QSO, should get in touch with W1DTS at his home QTH—in list. (This from G2ZC.). G3CO (London, S.E.18) and several others continue the UC2/UP2 story; thanks, chaps, but this correspondence is now closed—it wasn't getting anywhere. 'CO very much wants to see



VK4GDF, Nairobi, runs 75 watts on 28 mc to a 6L6-807-P/P TZ40 job, the Rx being an SX28A, with a dipole aerial for transmission.

some band-planning, especially on 3.5 mc—don't we all?

G3BIK, aboard the *M.V. British Character*, sends a list of Calls Heard from the Eastern Med., but unfortunately doesn't mention the band. We hope to hear from him again, though. G3CHN is an operator in the Merchant Navy and will be *en route* to the States via Suez Canal and Far East. He remarks that several ten-metre "beams" at home here must be rather indifferent performers, because when the proud owners shine them on the USA, they still put S9 signals into Portuguese East Africa! Anyone who would like G3CHN to listen for them on his next trip should drop a line to him at Broadley Farm, Sway, Hants.

G2AO (Malvern) still works 7 and 14 mc; he recently put the rig on 14 mc 'phone for the first time, called CQ and back came KW6AI. . . 'AO says it was like working his first VK all over again! G8QX (also Malvern) remarks on the "GDX" possibilities of 30 mc late in the evenings. He recently had some 100-mile contacts at S9 *plus*.

G3DEU (Hove) runs DC mains and a 6-volt car battery for heaters, and is also restricted to an indoor folded dipole. This sounds like a really tough situation for DX! Keep plugging, 'DEU—you'll get there eventually. G8PL (London,

N.W.3) also uses an indoor aerial, but is better placed for power. He sends some very useful QTH's which appear in the list.

G8OJ (Manchester) has been working 7 mc only, but has collected ZC6NN, 6NR, 6WF, MD2G, EK1AA, OX3ME and PK3JM (the last two on 'phone). G8JC (Droitwich) suggests that PX1C is one of the engineers of Radio Andorra working under cover—hence the picture postcards of that station which sometimes come back. But as long as his cards contain no details of a QSO they are useless as confirmations.

G3CDR (*H.M.S. London*) writes from Singapore with a short list of Calls Heard on 7 mc. Best time for it there, he says, is about 2130 GMT—early in the morning at the other end. He hears VK's working ZS's on 'phone on 7 mc; the ZS's fade out when the G's come in.

Incidentally, those readers who get around the world are particularly asked to send us comprehensive lists of G Calls Heard—which are always appreciated.

There is, of course, no point in covering the 14 and 28 mc bands, but 7 mc Calls Heard from long distances, and 3.5 and 1.7 mc lists for medium distances will be very welcome and are sure of appearance in the appropriate space.

#### Last-minute Note

At the time of writing (late March) conditions are definitely changing for the better; after one or two almost complete black-outs, the 28 mc band is once again very lively from early in the morning; and 14 mc is yielding signals like KH6, KG6, VR2 and VR5, instead of the more usual crowd of VK's and ZL's. It looks as though April might be a really fine month, as it usually is.

So write and tell us all about it—and the deadline is April 15, first post. Marathon and WAZ claims on post-cards, please, and send them, together with all news, to "DX Commentary," *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. Good luck, Good DX—and BCNU.

## British Old-Timers' Club

### Membership Hits the Century !

This, the third Membership List, contains 32 names and brings the total membership to 100 exactly. Here, in order of "radio seniority," are this month's additions :

H W. Pope (G3HT), PZX in 1911; D. F. Owen. (G2BC), OEX in 1912; J. Partridge (G2KF), MXR in 1912; R. F. J. Maidment (G5MM), VXE in 1913; A. G. Davies (G2PC), 1920; F. S. Adams (G2YN), 1921; R. W. Bailey (G2QB), 1922; K. Graham Styles (G2SK), 1922; A. N. J. Ley (G5DM), 1922; A. T. Wallace (G5KP), 1922; L. H. Lee (G5FH), 1923; A. D. Gay (G6NF), 1923; F. Cropper (G6XS), 6XY in 1923; J. M. Drudge-Coates (G2DC) Y-DCR in 1924; W. Stockburn (G2TG), 1924; G. McLean Wilford (G2WD), 1924; E. J. Reid (G5QB), 1924; T. A. St. Johnston (G6UT), 1924; J. Banner, M.B.E. (GW3ZV), 1925; H. E. James (G5JM), 6KA in 1925; R. Carlisle (G16WG), 1925; C. H. Young (G2AK), 1926; A. A. Barrett (G5UF), 1926; D. B. Fry (G5UY), 1926; J. I. G. Taylor (G6XD), 1926; F. W. Garnett (G6XL), 1926; C. J. Reid (G2IP), 1927; J. W. Wroth (G2WT), 1927; R. S. Holden (G15HU), 1927; H. A. Bartlett (G5QA), 1927; H. A. M. Whyte (VE3BWY), G6WY in 1927; A. G. Chambers (G5NO/ZB1AB), VE5BP in 1928.

It has been decided to hold the Old Timers' Dinner in London in the early autumn, probably about September next, depending upon when and where accommodation will be available for what we expect to be a party of about 150—and what a night it will be !

Eligibility for attending the Dinner will be either (a) inclusion in the B.O.T.C. membership lists as published from time to time in the *Short Wave Magazine*, or (b) the holding of a radiating licence issued by any British authority at a date *not later* than June 30, 1928, with possession of a transmitting permit (but not necessarily issued by the same authority) current on June 30, 1948.

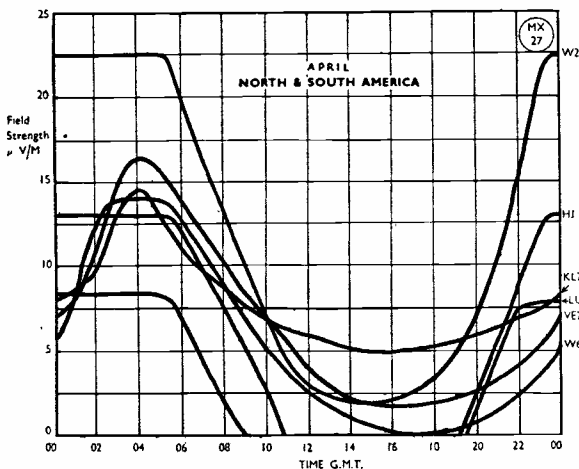
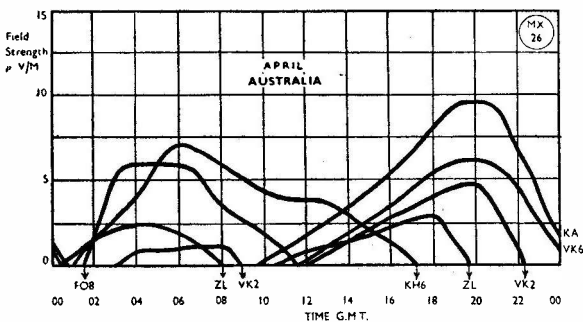
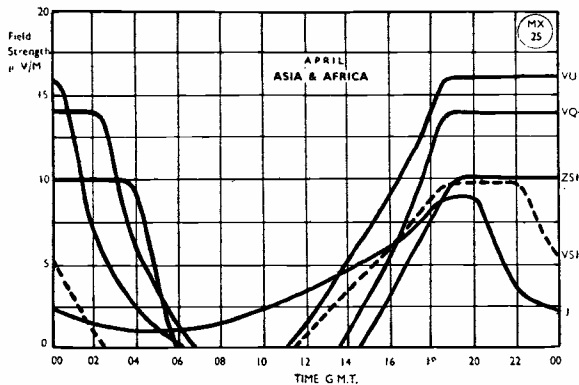
At the request of the RSGB, and in deference to the fact that the first Old Timers' function was organised by the Society some years before the war, this year's event will be a joint affair. Hence, it has been agreed that either membership of the B.O.T.C. or eligibility under clause (b) above will qualify for attendance at the gathering next September.

The cost will not be more than one guinea per head (exclusive of wines) and since nothing can be done till we have some idea of numbers, all who are eligible and would like to attend are asked to notify either the RSGB or the *Short Wave Magazine* by June 30 next; it would be a convenience if B.O.T.C. members would write us, and that others not yet (or not intending to become) B.O.T.C. members would inform the RSGB.



# Twenty-Metre DX Forecast

Predictions for April



by I. D. McDERMID,  
A.R.T.C. (GM3ANV)

**M**OST areas show neither a decrease in maximum and minimum field strength or a decrease in period of activity. Thus, VK does not now reach its peak field intensity until about two hours later than last month, the same applying to VS1, and the more northerly areas of Asia, as exemplified by J, show a maximum field strength only 75 per cent. that of last month. The more northerly of the American areas also indicate drastic reductions in field strength, with a pronounced maximum at 0400 GMT. Hence, it may be anticipated that the chances of evening contacts with KL7, VE7 and W6 areas are now almost *nil*, and will remain negligible until next autumn. With reference to the Australasian curves, VK2 and ZL now show two well-defined periods of activity on the east and west vortex of signals from these areas. The maximum strength of signals from these zones, as well as from VK6, remains at the same level, but in the case of VK6, for a shorter period of time. The same applies to the Oceanic signal from FO8. Although it will be seen that the geographic area enclosed by VK2, VK6, VS1, J and KA, all show a pronounced peak between 1900 and 2100 GMT, the local time factor must be considered, since all good amateurs are asleep during the night—or are they ?

# Round Europe on QRP!

## Five-Watt Week-End Tour

By W. OLIVER (G3XT)

(Our contributor's last article—"One Watt Can Still Work Wonders", April 1947—aroused considerable interest on the subject of QRP. The notes below will be a further encouragement to low-power operators on our busiest band. Ed.)

"YOU seem to have been all round Europe on QRP!" That was the comment of a certain G3 operator when I told him about my 5-watt adventures during a recent week-end. Between Friday and Tuesday I contacted 39 different stations in 15 European countries.

Apart from England itself (which accounted for 13 of the contacts), the countries worked were: Scotland, Wales, Northern Ireland, Eire, Holland, Belgium, France, Germany, Switzerland, Czechoslovakia, Italy, Denmark, Norway and Sweden. A "QRZ?" reply was also received from Finland, but no QSO established; evidently the QRM made it impossible to read my call-sign.

The best DX contacts included Czesky-Brod and Miava in Czechoslovakia; Lake Como in Italy; and Halden near Oslo Fiord in Norway. British Isles contacts ranged from Cupar in the north to Bromley in the south, and from Great Yarmouth in the east to Waterford in the west.

The transmitter I used was a tritet CO, with a 25A6 pentode as the oscillator, working off AC mains. The aerial was a Windom, with a 66-ft. top running NW/SE, a 33-ft. feeder tapped on to the top at a point 22 ft. from the end nearer the house, and a simple aerial tuning

circuit with link coupling from the oscillator tank coil.

### Solid QSO's Obtained

The outstanding features of this week-end test were the high readability of the contacts; nearly all of them were 100 per cent. "solid" both ways, despite the week-end pandemonium of QRM from stations using a hundred watts or more against my five: The uniform signal-strength in all directions with the same aerial; most of the stations concerned reported my signals RST-569, 579 or 589. Only a very few found the readability below R5, and fewer still gave me reports of S5 or less.

Three frequencies were available; 7022, 3520 and (doubled in the tritet circuit) 7040, but nearly all the best work was done on the 7 mc frequencies. Only one DX contact—Denmark—took place on the 3.5 mc band. Searching for replies was entirely on a QLM basis, so all the contacts were made in the overcrowded lower half of the bands.

These facts seem to deny the notion that successful QRP work can only be done at picked times on specially selected frequencies, and should be an encouragement to anyone who is contemplating trying out a low-power transmitter.

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## Indoor Aerials

### 14 mc Transmitting System for DX Operation

by L. A. KIPPIN (G8PL)

THOUGH much useful information appears from time to time in the *Short Wave Magazine* on the subject of aerials generally, mention has not yet been made of the operator who has to work with a bit of wire strung up indoors.

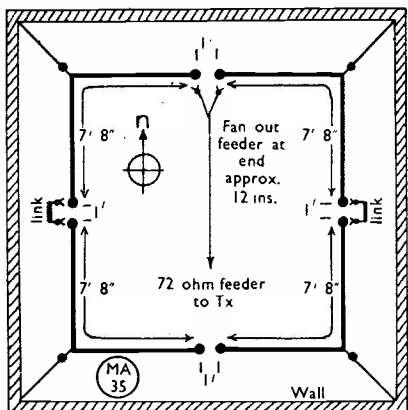
All sorts of expedients are open to those

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These notes will be of great interest to many readers—even those who have plenty of space for outside arrays. G8PL shows that there is no need to be off the air because facilities are lacking for the usual outdoor system. We should very much like to see any other solutions of this particular problem.—Ed.

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who have just a little space out-of-doors, however small it may be. But when the transmitting aerial has to be inside the house one is pretty much up against realities. At G8PL, the entire aerial system has to be in a first-floor room, hence these comments.



————— 14 SWG copper wire      ———— Cord  
 Small insulators                      ← Crocodile clips

Fig. 1. General arrangement, in plan view, of G8PL's indoor system for 14 mc.

The details of the arrangement will be clear from the sketch. It is basically a small end-fire array, and is also bi-directional. Being cut into four sections, the system can be made to give maximum radiation either east-west or north-south by adjustment of the wire links and feeders. The aerial is hung from the picture-rail and, being completely indoors, is impervious to weather conditions. Adjustments are easy, too; one can get

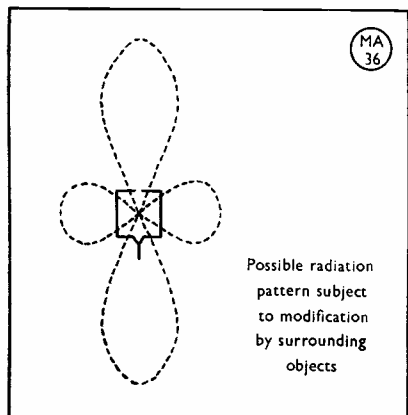


Fig. 2. Theoretical radiation pattern of the 14 mc indoor system.

round the whole system by standing on a chair!

**Results**

Running 100-140 watts, 68 countries in 20 zones have been worked, and on 14 mc reports of S6/7 have been received from VK and ZL. Recent DX includes CR6, MD3, PY, VK4, VK5, VQ4, VS9, and ZL—so the system really does work.

It is not suggested that an indoor transmitting aerial of any type is ideal (in fact, anyone who can borrow a wire clothes-line in a back garden is probably better off), but it is a practical solution to the problem of getting on the air when no outside space is available.

**CARDS IN THE BOX**

If your callsign is in the list below, it is because we are holding cards for you, but have not got your address on file. Please send a stamped addressed envelope, about the size of this page, with your name and callsign, to BCM/ QSL, London, W.C.1. The cards will be forwarded on the next G clearance. Should you wish your callsign and address to appear in "New QTH's," please mention it at the same time.

- G2ADL, 2ALB, 2AMA, 2AOF,
- 2BFB, 2BIP, 2BMW, 2BTU, 2BWL,
- 2CKF, 2CJ, 2CQ, 2CVA, 2DGF,
- 2DKV, 2DTG, 2FCV, 2FIG, 2FSO,
- 2HAI, 2HAV, 2HZF, 2ZL, 3ACP,
- 3ADB, 3AGU, 3AIO, 3AKJ, 3AM,
- 3AMW, 3ANF, 3ANX, 3APD, 3ARG,
- 3ART, 3ASX, 3ATZ, 3AUP, 3AVV,
- 3AXT, 3AXV, 3AXW, 3AYS, 3BCH,
- 3BCQ, 3BDI, 3BGN, 3BHW, 3BIK,
- 3BJ, 3BJU, 3BKH, 3BLR, 3BMV,
- 3BMY, 3BMZ, 3BOF, 3BOS, 3BPJ,
- 3BRE, 3BRK, 3BUD, 3BVA, 3CAI,
- 3CBA, 3CCI, 3CCS, 3CDQ, 3CEV,
- 3CIW, 3CLB, 3CLD, 3CNI, 3CNO,
- 3COI, 3CPB, 3CPR, 3CSW, 3CT,
- 3CUM, 3CVB, 3CVW, 3CXN, 3DCD,
- 3DCN, 3DDM, 3DEQ, 3DFL, 3DLN,
- 3FW, 3JG, 3MM, 3OD, 3TP, 3ZC,
- 4DH, 4KM, 4NQ, 4PV, 4RJ, 4YN,
- 5BC, 5BW, 5CH, 5DZ, 5WL, 6GA,
- 6KL, 6OY, 6PW, 6SP, 6VY, 8AU,
- 8AV, 8DG, 8FC, 8FR, 8HG, 8KX,
- 8KY, 8PT, 8TB, GM2FTN, 3BDA,
- 3BTX, 3BUX, 3CXE, 4AA, GW3AUJ,
- 3BRI, 3CA.

Use the QSL Bureau

# THE VHF BANDS

By E. J. Williams, B.Sc. (G2XC)

*Good GDX on Five—*

*Individual Reports—*

*Fiveband and VHF*

*Century Clubs—*

*144-420 mc Notes*

THE past month has seen periods of outstanding GDX conditions on five metres. So far as is known no new inter-G record has been set up, but there is a fairly widely expressed opinion that the evening of March 8 produced the best post-war tropospheric conditions experienced on the band. From quite early in the evening until well after midnight, contacts over distances between 100 and 200 miles were being made with little or no fading and very high signal strength. The explanation seems to lie in the existence of a large temperature inversion and steep humidity gradient. At 2100 GMT the inversion was 8 deg. F. between 1,000 and 2,000 ft. a.s.l. It is not known if anyone was active the following morning, but it is worth recording that the inversion between ground and 1,000 ft. was as great as 19 deg. F. at 0900 on March 9, while the humidity dropped from 83 per cent. to 43 per cent. just above the inversion.

Other good dates were February 28 and 29, March 9 and March 13, but some GDX was audible on most evenings, the Devonshire stations being received very consistently in south-east England.

## Activity Week-End

The first M.A.W.E. resulted in a fairly high level of activity—not up to contest pitch, but decidedly above average. The fine weather was a counter-attraction outdoors, but with the exception of the afternoon period there was always someone on the band during the week-end. The peak of conditions appeared to be during Saturday afternoon and evening, particularly the period 1500-1700, when we made some good solid GDX contacts north and south-west. On the Sunday conditions deteriorated appreciably, although the London signals were good in Portsmouth all day.

One of the most notable features of this first M.A.W.E. was the large amount of activity above 59 mc! On Sunday morning there was QRM between 59 and 59.3 mc, while 58.5 to 58.6 was void of

signals! Lists of calls heard and worked are given elsewhere in this article.

The next M.A.W.E. will be April 10-11, beginning at 1500 BST on the Saturday; we hope to have a QSO with *you*—and don't forget to let us have a short report on what you hear and work, however little it may be.

## Six Metres

This month the 50 mc first-contact position is brought up to date. The table has been compiled from information supplied by G5BD, G5BM, G5BY and G6DH. If there are any prior claims, please let us have them in time for next month, when a revised final list will appear, to stand as a monument to the skill and perseverance of the operators concerned.

So far as we know there has been no 6-metre DX worked from G since December 18,\* when G5BY was across to the States. G6XM was hearing harmonics up to 46 mc on March 10 and 11. G6DH says "the sun seems to have been shining on everything except the ionosphere lately!" On the other hand, we understand that the South Americans have had

M.A.W.E. No. 2

**Second Magazine Activity Week-end  
is April 10-11. BCNU on Five!**

a good patch on 50 mc; on March 6, CE1AH, PY2QK, LU9AM and CX1AQ had a 4-way on 6 metres, surely a remarkable achievement.

Though we have had the assurance of more than one eminent British scientist that amateur VHF work is of considerable value, several readers have suggested that it is being somewhat exaggerated. It was with great interest, therefore, that we saw the opinion of the Central Radio Propagation Laboratory of the American National Bureau of Standards, in a letter to G5BY commenting on his 50 mc observations. To quote from this letter: "Heretofore,

\* (But see late news note.—Ed.)



The outfit at G5PY, Clapham Park, London, an active 5-metre station. The Rx side comprises an S27 for general VHF listening, with an EF54-EF50-EC52 converter into an SX28 at 8.5 mc for 50 and 58 mc reception. The transmitter, power supply and modulator complete are carried in the rack assembly, the 58 mc PA being an 807 FD ; this is shortly to be replaced by a pair of RK34's to "reach 144 and 420 mc." G5PY's aerial is a 3-element rotary beam, controllable from the operating position.

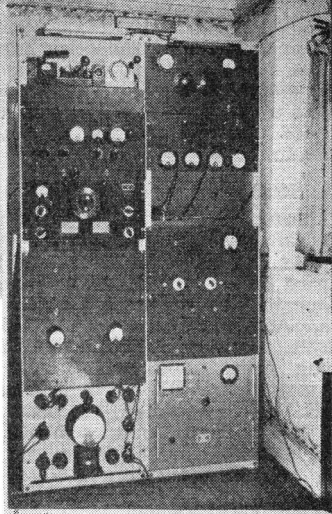
reliable checks on frequencies above about 30 mc have been extremely scarce. It was with great pleasure, therefore, that Mr. Ferrell's comprehensive report, including your own observations, was received. I sincerely hope this important work will be continued."

While on the subject of "firsts", GI6YW points out that apropos the note on p. 745 of the February issue, the first two-way 'phone working record in GI was on June 29, 1932, when GI6YW worked GI5HV—sorry, but at the time we were thinking of post-war results; however, we are glad to put the record straight.

#### Individual Reports

G5GX (Hull), whom we worked on February 29 for the first over 200-mile GDX from G2XC, is using 20 watts to an 832 and a 4-element w.s. beam. He remarks that in spite of the stations listed last month, Yorkshire activity remains very low.

G8JV having moved to Matlock, the long-maintained schedule with G5BD (Mablethorpe) has at last been broken after a continuous run of no less than 530 contacts! G8JV's new QTH is badly screened to the south. G5BD heard F8NW and worked G3AAT/A (Fareham) recently. A welcome newcomer is G5BJ (Birmingham), using NBFM 'phone, with a 6SL7 as CO on 1.8 mc, and phase modulation. The final is an 829B and deviation 15 kc.



G2RI (Leicester), in common with several others, comments on the increasing number of operators who seem unable to use or read CW on five metres. He asks us to correct the impression that CW is used only by stations unable to operate telephony! This is not so. Many of us enjoy CW operation and it has undoubted advantages in GDX work. Both 'phone and CW have their place in Amateur Radio, whether on 58 mc or any other band.

G2ADZ (with whom we have a schedule at 1900 BST daily) continues to keep Shropshire on the map, assisted by G4LU.

#### FLASH - 50 mc OPENS

On March 27, 1400-1527 BST, the MUF went high enough to open 50 mc for a good CW and 'phone contact G5BY/ZS1T. ZB2A and ZS1T also heard one another, but no QSO resulted.

During the good spell on March 8, G2ADZ beamed north for two hours, but his best was G2AOA (Preston). G4LU missed the March 8 opening as he had his 5-metre power pack hooked up to a new 420 mc superhet on test.

G6MN/A (Worksop) has been hearing GW5UO, but no QSO as yet. G8KL (Wolverhampton) worked G2XC for his third QSO with a new 3-element beam.



G8UR will shortly be active from the same town.

G3ABA (Coventry) draws attention to the numerous BBC and other harmonics in the Midlands, some GDX often being lost under them. He wonders what is going to happen when the Midland TV service starts up amongst all these odd radiations.

### The South

During the past month a number of new callsigns from south-G have appeared in our log. G6NK (Weybridge), who started on the last day of the *Short Wave Magazine* Contest, has a rotary dipole in use. Across the street from G6VX in Hayes, Kent, is G3BOB, who has been doing some good work, including a contact with G5BD up in Mablethorpe. G2HDY (Roehampton) has nearly made the first rung of Counties Worked with the 13C, using a fixed folded dipole in the attic, while G4RO (Welwyn Garden City) is pushing out a useful signal for Herts; he now has a 3-element rotary going.

In the Portsmouth area G8LO has made one or two appearances on the band, but suffers from an extremely noisy QTH.

### G2AJ/P on Dunstable Downs

Special mention must be made of G2AJ's gallant effort in going portable in Bedfordshire on February 28 and 29. He has, of course, given us a lot to do as the whole Counties Worked panel has had to be revised as a result! However, as G2XC was one of the lucky 75, we have done the job cheerfully. G2AJ wants to acknowledge his indebtedness to G2AHC and G6SB for their valuable co-operation. They provided the transport and were able to co-ordinate some tests of their own during the expedition. G5GX (Hull) was the most outstanding GDX signal heard on the Dunstable Downs, while G3APY was one of the most consistent. G2IN (Southport) and G5BD were audible all day on February 29, and G2AJ/P achieved contacts with four Lancashire stations, though G3DA in Cheshire could not be found. In all, the very satisfactory total of 23 counties was worked; but G2AJ, never satisfied, grumbles that he did not QSO Denbigh, Caernarvon, Northumberland or Durham! And, says he, there was activity up there! *QSL's have been sent to all 75 stations worked.* So far nine have replied. What will the final number be? Anyone who has not got his card from G2AJ/P can have another by sending his own to G2AJ with the necessary request!

### SIX METRES

#### LIST OF FIRST CONTACTS

##### Canada

G5BD/VE1QZ 1620 Nov. 5, 1947  
G5BY/VE2KH 1323 Nov. 20, 1947  
G5BY/VE3ANY 1544 Nov. 20, 1947

##### Canal Zone

G6DH/MD5KW 0855 Nov. 10, 1947

##### Egypt

G5BM/SU1HF 0900 Nov. 16, 1947

##### France

G6DH/F8ZF 2035 Dec. 10, 1947

##### Netherlands

G6DH/PAØUN 0750 Mar. 10, 1948

##### South Africa

G5BY/ZS1P 1230 Nov., 1947

##### U.S.A.

G6DH/W1HDQ 1302 Nov. 5, 1947  
G6DH/W2AMJ 1345 Nov. 5, 1947  
G5BY/W3OR 1325 Nov. 22, 1947  
G5BY/W5JLY 1530 Nov. 16, 1947  
G5BY/W9ZHL 1555 Nov. 22, 1947  
G5BY/WØIFB 1632 Nov. 22, 1947

**Note:** No claim received for first G/W4 contact two claims for first G/W8 under investigation.

### More Reports

G5RP (Abingdon) has been getting excellent results with a new 4-element wide-spaced beam, working 20 counties during the February 28/29 week-end.

G6XM (Farnborough) who worked G3ZK (Halifax) on March 8, makes an interesting point, with which we think most south-east G's will agree, namely, the great consistency of the Devonshire stations in the London and south-east area, compared with that of stations at similar distances to the north. G2BMZ and G3AUS have been putting over remarkable signals day after day at distances up to 200 miles when little or nothing has come through from the north. We can only offer two suggestions. First, these Devonshire boys take their beams seriously and have built really good arrays, and secondly, the intervening stretch of sea may set up much better humidity gradients than on the path to the north. Any other suggestions?

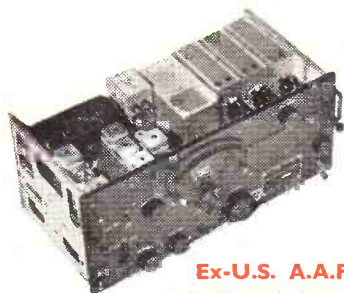
G3BLP (Selsdon) was another who worked G3ZK on that night of nights,

# CLYDESDALE

Staff Hams:  
GM3ASM, GM3BL

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BC348 RECEIVER**

For A.C. mains 200/250v. operation with internal power pack.

A communications receiver, covering 1.5-18.0 mcs. and 200-500 kcs. with 9 valves, built-in A.C. power pack, high imp. phone, and 2-3 ohm L.S. Outputs, Vernier tuning control, crystal filter, noise limiter, A.V.C., M.V.C. and B.F.O. controls, in black crackle case, 18" x 10" x 8", complete with circuit.

CLYDESDALE'S **£27.10** Carriage and  
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Circuit available at 1/3d. Post free.

Price of unmodified BC348 on application.

BRAND NEW



COMPLETE with 39ft  
CO-AXIAL CABLE

### DIPOLE AERIAL

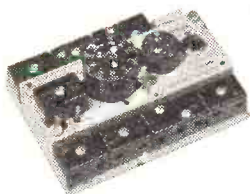
Half-wave dipole aerial 9' 3", with reflector 9' 7", and crossarm 4' 11½" plus 39' co-axial cable and co-axial plug for approx. 6 metres, either vertical or horizontal mounting to existing mast or wall bracket. Robust construction.

CLYDESDALE'S **21/-** each Carriage  
PRICE ONLY paid  
or packed in a stout wood case, non-returnable,  
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### CO-AXIAL CABLE

Coil (12 yds.) first-class co-axial cable, approx. 80 ohms. At special price

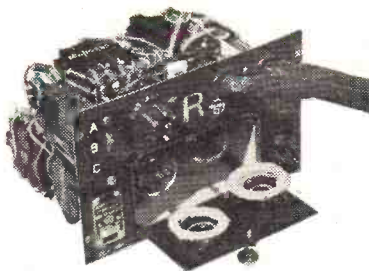
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REPEAT OFFER—FURTHER SUPPLY

### AI134 BATTERY AMPLIFIER WITH JUNCTION PANEL

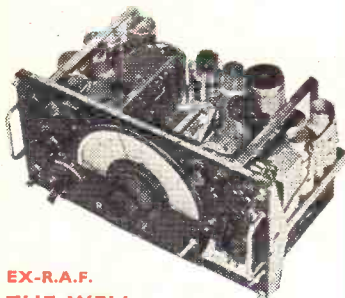
2-Valve, 2-stage pre-amp. intercom. unit, with QP21 and 21OLF trans., condensers, switches, 10- and 4-pin plugs, etc., in metal cabinet 7" x 5" x 4½", with circuit plus junction panel, containing 10 and 4-way sockets. Six 2-way and



two 3-way terminal blocks, switches, etc., on board. 6" x 4½".

CLYDESDALE'S **19/6** each Post paid  
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EX-R.A.F.

## THE WELL

### KNOWN RIISZ RECEIVER

A communications receiver for 18-0-7.5 mcs., 7.5-3.0 mcs., 1,500-600 kcs., 500-200 kcs., 200-75 kcs., 5 wavebands with 10 valves, S.M. tuning, calibrated dial, etc., complete receiver unit in metal case 16½" x 9" x 9". Power supply required 210v. 60 ma. Smoothed D.C. 6.3v. 3.5a. A.C. Tested in operation before despatch.

CLYDESDALE'S PRICE ONLY **£12.12** Carriage and packing paid

Circuit available at 1/3 post free. Circuit for an A.C. mains and output unit at 6d. post free.

### BRAND NEW EX-R.A.F.

#### TI154 TRANSMITTER

Complete Tx with "Ham" band coverage, for "Fone" C.W. and M.C.W. with valves ML6 (VT105) Hartley M.O. 2/PT15's (VT104), parallel P.A. ML6, mod. and side tone, suppressor grid modulation, simplified tuning, etc., etc., with circuit less power pack, in metal cabinet, with cooling louvers.

CLYDESDALE'S PRICE ONLY **£10.10** Carriage and packing paid

Voltages required L.T. 6.3v. 4a. H.T. 1,200v. 200 ma. Circuit and data available at 2/3 post free.

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#### SLOW MOTION DRIVE

Muirhead 48-1 ratio, 3" dia. for standard on main drive, four drilled holes allow for fitting an escutcheon. A metal tongue is provided to lock the drive to the panel.



Clydesdale's price only **7/6** each Post paid  
2 for 13/6

## CONDENSERS

All tested before despatch



Cap.	V.D.C. Wkg.	Size	Mtg.	Price ea.	Dozen
<b>ELECTROLYTIC, ALI CAN</b>					
8 mfd.	750	1½" dia. 4" high,	Clip	6/-	59/6
8 mfd.	500	1" dia. 4½" high,	Single hole	6/-	59/6
8 mfd.	350	1" dia. 2½" long,	Tubular	2/-	20/-
4 mfd.	350	1" dia. 2½" high,	Single hole	2/3	21/6

### MAINSBRIDGE, METAL CASED

8 mfd.	750	4½" x 4" x 2"	Upright	6/-	55/-
8 mfd.	500	4½" x 3" x 1½"	Upright	5/-	45/-
4 mfd.	250	2½" x 1½" x 1½"	Upright	1/9	15/-
2 mfd.	600	2½" x 2" x 1½"	Upright	1/9	15/-
2 mfd.	400	2½" x 2" x 1"	Upright	1/3	9/-
1 mfd.	2,000	4½" x 2½" x 1½"	Upright	3/6	30/-
1 mfd.	750	2½" x 2" x 1"	Upright	1/6	13/6
0.3 mfd.	1,500	2" x 2½" x 2"	Upright	2/-	17/6
0.25 mfd.	2,000	2½" x 2" x 1½"	Upright	2/6	20/-

### U.S.A. METAL CASED, OIL FILLED

Ceramic S.O. Insulators

4 mfd.	350	3½" x 2½" x 1½"	Upright	3/-	22/6
1 mfd.	600	2" x 2½" x ¾"	Upright	1/6	13/6

### CERAMIC HIGH VOLTAGE TRANSMITTING

750 pf.	15 KV	3½" long 1½" dia.	Hanged pot	3/11	36/-
750 pf.	15 KV	3½" long 1½" dia.	Hanged pot	3/11	36/-
500 pf.	15 KV	3½" long 1½" dia.	Hanged pot	3/11	36/-
500 pf.	15 KV	3½" long 1½" dia.	Hanged pot	3/11	36/-
25 pf.	4 KV	2½" long 1½" dia.	Upright	3/11	36/-

### VARIABLE AIR SPACED CONDENSER (STRATTON 339)

Lab. built, on DL9 insulation, brass vanes, caps. 3/50 pf. or 2/100 pf. or 4/200 pf. as connected. Size 2½" x 2½" x 1½".

CLYDESDALE'S PRICE ONLY **4/11** EACH Post paid

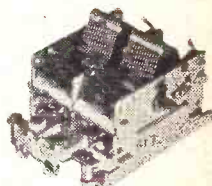


### 2-GANG TUNING CONDENSER

with trimmers, ceramic insulator, size 2½" x 3" x 2", max. cap. 500 pf. per section.

CLYDESDALE'S PRICE ONLY **7/6** EACH

Post paid

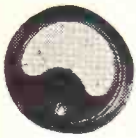


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Brand new in  
Maker's Boxes



Range	Resistance Ohms	White scale	Flush	Mounting	Price each Post paid
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0/500	75	2½" round	...	...	25/-
0/500	500	2" round, piece cut off top flange	...	...	8/6
500-0-500	500	2½" round, plug-in	...	...	12/6
<b>Milliammeters</b>					
5-0-5	6	2½" round	...	...	10/-
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0/10	5	2" square, internal shunt to 100 ma, marked "MagFeed" 0/300 ma.	...	...	5/6
0/40	0-75	2" square, two readings	...	...	12/6
0/120	0-42	2" square, two readings	...	...	12/6
0/500	2	2" round...	...	...	9/-
<b>Thermo-coupled Ammeter</b>					
0/0-5	0-7	2" square...	...	...	7/6
<b>Volt Meters</b>					
0/30	6000	2" square	...	...	5/6
0/40	8000	2" square	...	...	5/6
0/40	8000	2" square, black face	...	...	5/6

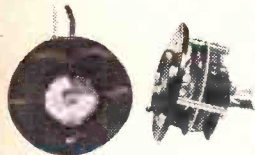
### DST 100 MK III

13+1 valve, 7-waveband communications Rx., 30 mc/s-50 kc/s continuous coverage, current consumption and signal meter. Controls include R.F. gain, B.F.O., I.F. gain, noise limiter, independent R.F. and I.F. chassis, enclosed in a metal cabinet. For A.C. mains 200-250v. operation. Reconditioned, tested in operation before despatch.

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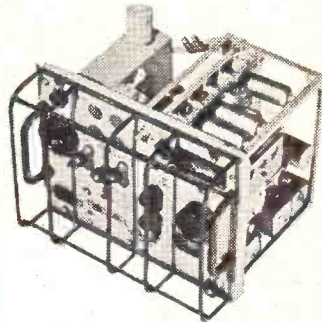
### BRAND NEW

### REMOTE CONTACTOR No. 4



Relay switching unit, comprising 24-volt relay, drive mechanism, on/off switch, resistance, etc., in round 4" dia. metal case with plastic top, perspex window.

Clydesdale's Price only **3/11** Post paid



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### RECEPTION SET, R109

For H.T. and C.W.

A receiver, covering 1.9-8.5 mcs. in 2 switched bands, with 9 valves. S.M. tuning, crash limiter, for phone and speaker operation. L.S. fitted. In metal case 15" x 11" x 10". Input 6 V.D.C.

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### MICROPHONE AND HEADPHONE ASSEMBLY

Consisting of a carbon hand power microphone (Tannoy) in diecast case with press switch.

Moving coil headphones, 40 ohms coil, sealed and moisture proof, fitted with rubber earpieces. Connecting cable terminating in a 5-point plug.

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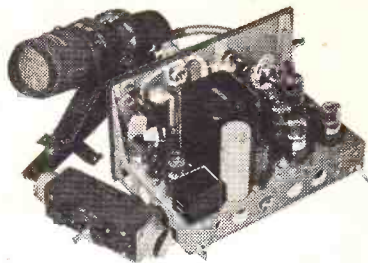


**BRAND NEW**  
**WHEATSTONE BRIDGE**

Resistance and continuity test set. 20-0-20. M.C. galvanometer, range  $\cdot 1/210$  ohms, can be extended, circuits supplied, with decade switches, precision resistors, in hard wood carrying case,  $16'' \times 7\frac{1}{2}'' \times 6\frac{1}{2}''$ .

CLYDESDALE'S  
PRICE ONLY **50/-**

Carriage paid. Packed in wood box



**BRAND NEW**  
**EX-U.S.N. AIRCRAFT**  
**RADAR EQUIPMENT**

AN/APA-1, comprising Cathode Ray Indicator, 3 BPI C.R.T., in adjustable case. Repeater Amplifier, with 11 valves 7/6Sn-7G's, 6H6, 6G6G. 2X2/379. 6X5GT plus other VHF gear. Control Unit and Instruction Book for 110/115v. 400/2,400 c/s.

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**Brand New. Set of Plugs for AN/APA-1**

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**RI481 RECEIVER**

A V.H.F. receiver unit for 65-86 mcs. with 10 valves plus stabilizer, screened R.F. unit, S.M. tuning dial calibrated 0-180, "S" meter, B.F.O. Attenuator, etc., rack mtg. enclosed chassis, dark grey.  $19'' \times 10\frac{1}{2}'' \times 11''$ , with circuit, tested in operation before despatch. Power supply required 210v. ma., smoothed D.C. 6-3v. 3-5a. A.C.

CLYDESDALE'S  
PRICE ONLY **£7.19.6**

Carriage and packing paid

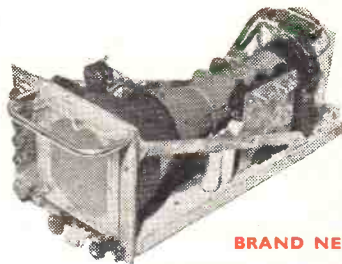
**EX-U.S. NAVY**

**I.F.F. RECEIVER/TRANSMITTER**

Types ABK (43AAX) 12v. and ABKI (43AAY) 24v. for 158-186 mcs., with 10 valves, Pioneer dynamotor, etc., in metal case  $12'' \times 12'' \times 8''$ , used, good condition.

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Circuit available at 1/9 post free



**BRAND NEW**  
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**INDICATOR UNIT**

A self-contained cathode ray indicator, less power unit with V.C.R.97 C.R.T. in mu-metal screen. 7 Valves, 4/EF50's, 3/EB34's, volume controls, switches, condensers, etc., in metal case,  $18'' \times 8\frac{3}{4}'' \times 7\frac{1}{2}''$ .

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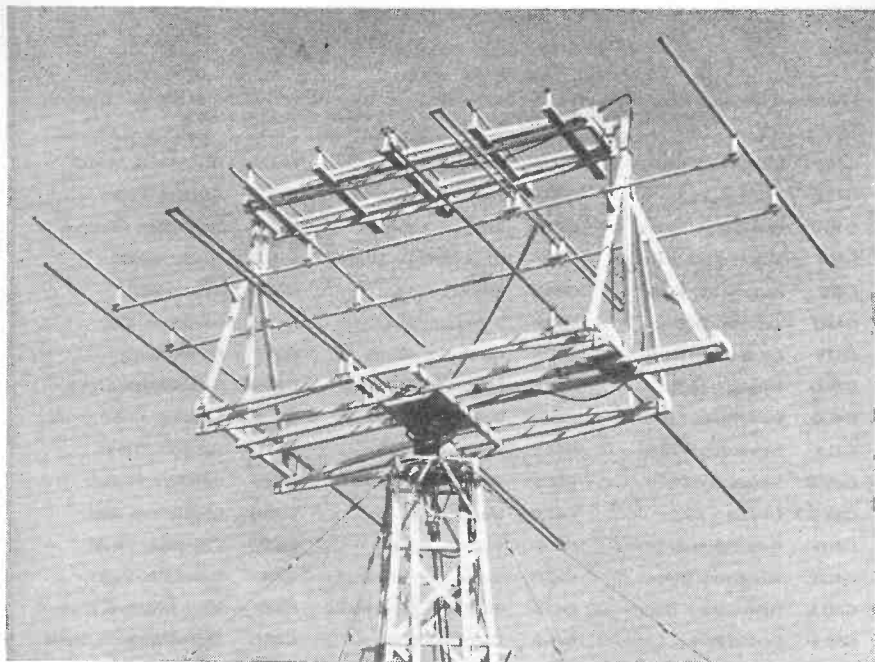
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VISIT OUR BRANCHES IN SCOTLAND, ENGLAND AND NORTHERN IRELAND





W3OR, Essington, Penna., was well heard over here on 6 metres during the November 50 mc break. He has a very fine composite beam array for 28, 50 and 144 mc; the polarisation of the 2-metre beam is adjustable to either plane. The 6-metre Tx runs 600 watts input, (Acknowledgment "CQ")

March 8. He has also worked much other GDX, including G5MQ and G5BD at S9 'phone. G5MR (Bognor Regis) has raised his beam from 15 to 21 ft. and says it seems to have made a great improvement.

Activity continues in and around Cambridge. G6UW (with G3COJ as operator) enters the Counties Worked list by rolling in 14C in 16 days. They went portable as G2FJD/P on one occasion, working G2XV, G3BK and G5BD from the Gog Magog Hills. One visitor wanted to know what they used for an induction coil. During vacation, G3COJ (Hull) will be active, *i.e.*, for four weeks from March 20. G5IG heard F8GH at 1900 on March 11, but could not raise him.

Others who have reported active include G2CIW (Brentwood), G2HLF (Heathfield), G2JU (Harrow), G3YH (Bristol), G5LO (Chiswick), G5MP (Hythe), G5PY (Clapham Park), G5FO (N. Bucks), G6UH (Hayes, Middx.), G6VX (Hayes, Kent), G8SM (Molesey) and G8KZ

(Kensington). Many thanks to all of them.

In addition, a large mail has come in from VHF listeners; it is much to be regretted that *Magazine* space is too tight for them to be covered in detail here, although all have been read with interest. However, these very useful reports are being handed over to A. A. Mawse, who conducts the VHF column in our *Short Wave Listener* for the special interest of SWL's; material from these letters will be appearing in his column in the May issue.

#### Contest Point

Our thanks also to those who were kind enough to comment on the rapid appearance of the results of the recent Contest. Well, the dates were chosen so as to make it possible and everybody responded by producing their entries by the time they were wanted.

Others have pointed out some errors regarding the counties in which certain

## FIVE-METRE ACTIVITY LIST

G4, G5, G6, and G8 Calls

List of stations known to have been active during the *Short Wave Magazine* Contest period. A supplementary list of stations since reported active will be given next month.

G4AC	Chelmsford, Essex.	G5LQ	Chiswick, London.	G6SB	Northwood, Mddx.
G4AP	Swindon, Wilts.	G5MA	Ashted, Surrey.	G6TF	Sheffield, Yorks.
G4GG	Wimbledon, Surrey.	G5MR	Felpham, Sussex.	G6TL	Stalybridge, Cheshire.
G4CI	New Malden, Surrey.	G5PY	Clapham Park, London.	G6UH	Hayes, Mddx.
G4IG	Beckenham, Kent.	G5RD	Sunbury, Surrey	G6UW	Cambridge.
G4JO	Torquay, Devon.	G5RP	Abingdon, Berks.	G6VC	Northfleet, Kent.
G4JV	Letchworth, Herts.	G5US	Camberley, Surrey.	G6VX	Hayes, Kent.
G4KD	Edgware, Mddx.	G5XK	Huddersfield, Yorks.	G6XM	Farnborough, Hants.
G4LU	Pant, Salop.	G6BH	Accrington, Lancs.	G6XX	Howden, Yorks.
G4LX	Newcastle, N'land.	G6BX	Bradford, Yorks.	G6YO	Bradford, Yorks.
G4MR	Slough, Bucks.	G6CJ	Stoke Poges, Bucks.	G6YU	Coventry, Warks.
G4NT/A	Downley, Bucks.	G6CW	Nottingham.	G6ZQ	Cheltenham, Glos.
G4OF	Gainsborough, Lincs.	G6DH	Clacton, Essex.	G8BV	Chingford, Essex.
G4OT	Woodham, Essex.	G6FO	Maids Moreton, Bucks.	G8IC	Stainforth, Yorks.
G4QA	Newcastle, N'land.	G6JK	High Wycombe, Bucks.	G8JV	West Bridgford, Notts.*
G5AA	Crystal Palace, London.	G6KB	Checkendon, Oxon.	G8KL	Wolverhampton, Staffs.
G5AS	Kingston, Surrey.	G6LC	Warrington, Lancs.	G8KZ	Kensington, London.
G5BD	Mablethorpe, Lincs.	G6LX	Croydon, Surrey	G8NF	Slaithwaite, Yorks.
G5BM	Cheltenham, Glos.	G6MN/A	Worksop, Notts.	G8PX	Oxford.
G5CD	Hendon, Mddx.	G6NA	Guildford, Surrey.	G8QS	Prestwich, Lancs.
G5CP	Sale, Cheshire.	G6NF	Shirley, Surrey.	G8RS	Reading, Berks.
G5GX	Hull, Yorks.	G6NK	Weybridge, Surrey	G8SJ	Halifax, Yorks.
G5HN	Reading, Berks.	G6NW	Abingdon, Berks.	G8SM	Molesey, Surrey.
G5IG	Cambridge.	G6OH	Ascot, Berks.	G8TS	Farnham, Surrey.
G5JU	Birmingham, Warks.	G6OS	Hull, Yorks.	G8UZ	Kirkby-in-Ashfield, Notts.
G5KL	Newcastle.	G6PG	Dartford, Kent.	G8WV	Hanslope, Bucks.
G5LO	Oxford.	G6QT	Bolton, Lancs.		*Now moved to Matlock, Derbys

80 stations.

Total 156.

London stations are located. Here, we relied upon entrants knowing if they were in the L.C.C. area! G8KZ has kindly sent in a complete list of districts in the County of London—a total of 81! So if you *are* in doubt, let us know and we will check against the list for you.

Our attention is also drawn to the fact that an elastic ruler would make distances shorter and not longer! In self-defence, let it be said straightaway that we did have to *increase* quite a number of

mileages, and several scores given in the Table of Results are actually higher than those originally claimed! So we are *not* apologetic!

## Fiveband Club

It was a great disappointment to your conductor not to be able to get to the Fiveband Dinner in London on February 21—but it was the weather that intervened. Those who faced the blizzard had a very enjoyable time, even if they did

have to trudge home through the snow.

Among the interesting suggestions made at the dinner was one for a Fiveband Club, and the *Short Wave Magazine* is very happy to be able to support the idea. Club membership will be open to all genuinely interested in 5-metre work and who are regularly active. The object of the Club will be to encourage activity on 58 mc, and with this in view members will be expected to support events organised for that purpose (e.g., the M.A.W.E.). A special membership certificate will be provided by the *Magazine*.

Members of the Fiveband Club will be eligible for membership of the more exclusive VHF Century Club on production of 100 post-war QSL's confirming two-way contacts on 50 and 60 mc bands. The main intention of this verification is to encourage the practice of QSL'ing. The *Magazine* will also provide a certificate for the VHF Century Club.

It is hoped to organise social gatherings, similar to the recent meeting in London, at various places from time to time. Applications for membership of the Fiveband and VHF Century Clubs should be sent to us at *Magazine* Headquarters as soon as possible, and in the case of the Fiveband Club should contain a statement that the applicant is regularly active on five metres and will support events designed to encourage five-metre activity to the best of his or her ability.

No subscriptions, entrance fees or other dues are called for, since it is the intention that both these ventures shall be supported by the *Short Wave Magazine*, through this feature, in which the membership lists will appear.

#### Whither 144 mc ?

We note that it is being suggested in some quarters that at least part of the 144 mc band be used for "cross town" communication, employing self-excited oscillators and super-regenerative receivers. Readers will no doubt react violently to any such suggestion and in the general interest we feel we must comment on one or two factors in the argument.

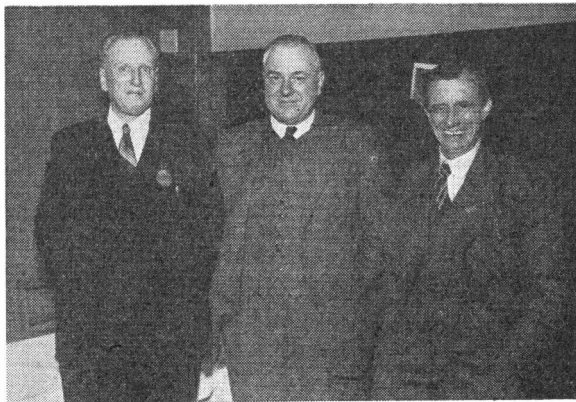
It is alleged that it is the expense and complexity of 60 mc gear which has kept

#### FIVE METRES COUNTIES WORKED LIST Starting Figure, 14

Worked	Stations
30	G3BXE (121), G5BY
29	G5BD, G6XM (197)
28	G2MR, G2XC (238), G5MA, G5MQ, G6LK (225)
27	G2ADZ, G3BLP (144), G5BM, G5PY (199)
26	G2AJ (179), G2NH (170), G4LU, G5RP, G6MN/A, G6VX, G8UZ
25	G2CIW (118), G2RI, G8SM
23	G3ABA, G3MY, G3PZ, G4IG (163), G6OH (129)
22	G2ATK, G5IG, G6YU
21	G3IS, G4AP, G6KB, GK8Z
20	G2YL, G5JU
19	G2NM
18	G3BK, G5GX
17	G2KF, G6CW, G6LX, G8QM/A
16	G3AAK, G5LQ, G8KL
15	G4AJ
14	G5BJ, G6UW

*Note: Figures in brackets after call are total of different stations worked : starting figure 100.*

so many G's off the band. What nonsense ! If expense is a serious consideration one can get to five metres in two stages—a quadrupling tritet and a power



The QCC team at the Fiveband Dinner. L. to R. ; Bill Thompson, G2MR; Bob Munday, G5MA ; and (yes, you've guessed it), Ernest Dedman, G2NH.

doubler. This will give ample RF for 'cross-town working, and an O-V-1 was used by G2ADZ for his 16 Zone F contacts in the *Magazine* Contest. No, it is the striking absence of consistent DX which keeps most people off five metres! And the same will apply to 144 mc, *however simple we make the gear!*

Apart from this, adequate frequency checking apparatus will be a necessity with self-excited squish boxes! In this same controversy (if one can call such a subject a matter for discussion at all) we are referred to two articles in our respected contemporary, the *Wireless World*. These are said to make a case for

the super-regen. But on reading these articles we find, "It is obvious that the circuit will radiate furiously . . . a preliminary RF stage with proper screening is the remedy" and "The receiver can be connected to a fixed aerial on the roof. But it is only fair to point out that such an arrangement is likely to radiate perceptibly over a sufficient radius for it to be deemed by the GPO (and perhaps by neighbouring VHF explorers) to be a transmitter." Quite! That is why we do not want them and while building the preliminary RF stage, with its proper screening, why not use the two valves, with their bits and pieces, to make a first-

### FIVE-METRE CALLS HEARD

G3CWW, 11 Cheyne Walk, Hendon Central, London, N.W.4.

**Worked:** G2AJ, 2FKZ, 2FPP, 2FZR, 2FWA, 2KF, 2XC, 4CG, 4KD, 5PY, 6HD, 6NA, 6NK, 8KZ.

**Heard:** G2BB, 2CIW, 2HDY, 2HLF, 3BOB, 3BLP, 3BXE, 5CD, 5LQ, 5RD, 5US, 6NF, 6OH, 6UH, 6VX. (All during March M.A.W.E.)

G2AJ, 22 Beaufort Gardens, Hendon, N.W.4.

**Heard:** G2ADZ, 3ABA, 3APY, 4LU, 2COP, 5GX. (March 13, 1900-2300; all over 100 miles.)

G6UW, Cambridge University Wireless Society, Downing College, Cambridge.

**Worked:** G2AJ/P, 2BB, 2CIW, 2FKZ, 2HLF, 2MR, 2OI, 2XC, 2XV, 3APY, 3BGW, 3BK, 3BLP, 3NR, 3BOB, 3BTL, 3ZK, 4IG, 5BD, 5GX, 5IG, 5MA, 5PY, 6OH, 6XM, 8SM, 8UZ.

**Heard:** G2ADZ, 2AJ, 2DU, 2FZR, 2IN, 2MV, 2NH, 3AAT/A, 3AUA, 3BXE, 4LU, 5DF, 5RP, 6GR, 6MN/A, 6NB, 6OS, 6UH, 8NR, 8RS, 8WV.

G5MR, South Lawn, Admiralty Road, Felpham, Bognor Regis, Sussex.

**Worked:** G2HLF, 2XC, 3BLP, 4IG, 5CM, 5LQ, 5RP, 5ZT, 6NA, 6UH, 8KZ.

**Heard:** G2BB, 2KF, 2NH, 3AUS, 3CWW, 3VB, 4KD, 5US, 6FO, 6GH, 6VX, 6XM. (During M.A.W.E.)

G2ADZ, Lloft Wen, Ardmillan Lane, Oswestry, Shrops.

**Worked:** G2BB, 2NH, 2OI, 2XC, 5US, 6VX, 6XM, 8SM.

**Heard:** G2AJ, 2COP, 2HLF, 2MV, 3BLP, 5PP, 6FO, 6ZQ. (During M.A.W.E.)

G5BM, Berriville, Anle Drive, Cheltenham, Glos.

**Worked:** G2ADZ, 2AJ/P, 2AOK/A, 2ATK, 2NH, 2OI, 2RI, 3APY, 3BY, 3DA, 3PZ, 4LU, 5GX, 5JU, 5LJ, 5MA, 5RP, 6OS, 6RB, 6XM, 6ZQ.

**Heard:** G5BJ. (February 28-29, using 6m. beam.)

G5LQ, 12 Cambridge Road, Chiswick, W.4.

**Heard:** G2ADZ, 2BMZ, 4AP, 6FO.

**Worked:** G2XC, 3BXE, 3CQ, 5MR. (During M.A.W.E.)

G3YH, 24 Hall Street, Bristol, 3.

**Heard:** G2BB, 2BMZ, 2MR, 2NH, 3PZ, 5BM, 5DF, 5MA, 8RS, 8UZ.

**Worked:** G2AJ/P, 2XC, 3BLP, 4AP, 5RP, 5US, 6XM. (February 14 to March 14.)

G2AJ/P, Dunstable Downs, Bedfordshire.

**Heard or Worked:** G2ADZ, 2AOK/A, 2AUA, 2BMZ, 2CIW, 2DU, 2FFY, 2FKZ, 2HDJ, 2HDY, 2IN, 2IO, 2KF, 2MR, 2NH, 2OI, 2RI, 2XC, 2XV, 2YC, 2YL, 2ZV, 3ABA, 3AEZ, 3APY, 3AUS, 3BGW, 3BK, 3BLP, 3BOB, 3BUR, 3BTC, 3BY, 3CUA, 3CWW, 3HT, 3IS, 3NR, 3PZ, 3YH, 3ZK, 4AP, 4IG, 4KD, 4LU, 4MR, 4RO, 5BD, 5BJ, 5BM, 5BY, 5DF, 5GX, 5IG, 5JU, 5LO, 5LQ, 5MA, 5PY, 5RP, 5US, 6FO, 6GR, 6JJ, 6KB, 6LC, 6MN/A, 6NB, 6NK, 6OH, 6OS, 6UH, 6UW, 6VX, 6XM, 6ZQ, 8JV, 8KZ, 8PB, 8PX, 8RS, 8SM, 8UZ, 8WV. (February 28-29.)

G2HLF, 9 Theobalds Green, Heathfield, Sussex.

**Worked:** G2AJ, 2BB, 2BMZ, 2CWL, 2FFY, 2FKZ, 2FPP, 2FTS, 2KF, 2KI, 2MR, 2NH, 2NM, 2QV, 2UJ, 2XC, 2YL, 3AAT/A, 3AUS, 3BLP, 3BOB,

3BYY, 3HT, 3VB, 4IG, 4MR, 4RO, 5BY, 5IG, 5LQ, 5MA, 5MR, 5PY, 5RP, 5US, 6OH, 6UW, 6VX, 6XM, 8RS, 8SM, 8TS.

**Heard:** F8AA, 8NW, 8ZF, G2ADZ, 2FZR, 3BK, 3CU, 3CWW, 3NR, 5DF, 5HN, 5MQ, 6PG, 6UH, 8PX. (February 1-March 15, on R.1132A.)

G5BJ, 94 Sunnymead Road, Birmingham, 26.

**Worked:** G2AK, 2ATK, 2COP, 2RI, 2XC, 3ABA, 3APY, 3BLP, 3FD, 3IS, 3ZK, 5BD, 5GX, 5LJ, 5RP, 6GR, 6VX, 6XM, 8AL, 8KZ, 8UZ.

**Heard:** G5MQ. (March 2-9, on RF 26 converter into HRO.)

G2CIW, 23 Tower Hill, Brentwood, Essex.

**Heard:** G2ATK, 2COP, 2NM, 3PZ, 5BY, 5GX, 5PP, 6OS, 8UZ.

**Worked:** G2ADZ, 2AUA, 2BMZ, 2RI, 2XC, 3ABA, 5BD, 5MR, 5RP, 8PX, 8TS, 8WV.

G4LU, Avalon, Pant, Shropshire.

**Heard:** G2AJ/P, 2BB, 2MR, 2XC, 2XV, 5MA, 6FO, 6MN/A, 8UZ.

**Worked:** G2AK, 2AOK/A, 2ATK, 2COP, 2OI, 3ABA, 3BLP, 3BUR/A, 3BY, 3IS, 5BD, 5BJ, 5BM, 5GX, 5JU, 5LJ, 5PP, 5US, 6LC, 6OS, 6YU, 6ZQ, 8KL, 8JV, 8PX.

G6MN/A, 70 Bridge Street, Worksop, Notts.

**Heard:** G2MR, 2NH, 2RI, 2XC, 3ABA, 3BLP, 3PZ, 5BJ, 5MA, 5MQ, GWSUO.

G8KL, 3 Broome Road, Wolverhampton, Staffs.

**Heard:** G2ADZ, 2AK, 2AOK/A, 2ATK, 2BB, 2XC, 3ABA, 4LU, 5BJ, 5LJ, 5JU, 5MA, 5PP, 6FO, 6VX, 6XM, 8SM.

rate superhet convertor? It's not so much more complicated!

Several items of 144 mc interest are to hand and will be covered in next month's story.

#### 420 mc

Two readers, I. M. Gaye (Haslemere) and A. A. Brown (Epsom) have written to draw attention to a piece of ex-U.S. Navy radar equipment which is easily converted for use as a receiver on 420 mc. This is the receiver Type ASB-7, designed to operate on 515 mc, and is a double superhet, the first IF being 55 mc and the second 16 mc; there is a "lighthouse" RF stage and the output of the Rx is designed to feed into a CRT indicator unit. A conversion of the receiver for amateur operation on 420 mc was given in the *American Radio News* for July, 1947. This includes the introduction of a noise silencer, S-meter and a 6V6 output stage.

The Type ASB-7 equipment has been available quite cheaply in this country, and if readers are interested we shall be

glad to give further details of the circuit on request.

At a recent meeting of the South London UHF Group, the 420 and 2300 mc bands were discussed. This group suggest that, for a start, vertical polarisation be used, and that operation be in the band 430-440, to avoid tuning of too large a frequency area. Selective IF stages are contemplated in the receivers, and so stable transmissions are advised. A valve list for both bands is being produced, while information on frequency measurement on 2300 mc is being sought. We shall be pleased to have readers' comments on these points, and in particular notes from anyone operating on 2300 mc.

#### In Conclusion

Having again exceeded our allowance of words we must now conclude—but please don't forget to send in your reports for next month by April 17 *latest*. And just a final reminder: M.A.W.E. No. 2 is April 10-11. Write E. J. Williams (G2XC), *Short Wave Magazine*, 49 Victoria Street, London, S.W.1.

## Approach to 144 mc

### Some Suggestions for Rx and Tx

By W. J. CRAWLEY (G2IQ)

*(Always full of ideas, our contributor has turned his attention—as have many other VHF operators—to the intensely interesting problems which are presented by the projected 144 mc band. Here are some sound practical suggestions which will be found helpful in getting ready for it. There is as yet no definite news as to when we can expect this band which, nominally at least, is still in full occupation by other interests.—Ed.)*

**T**HE proposed allocation of the 144-146 mc band for future amateur use is a prospect that makes the VHF man's mouth water. Here is a new field for experiment and exploration. New problems both in reception and transmission confront us and the scope for exercising that ingenuity for which the amateur is justly famous (and can justly be proud) is greatly extended.

If you are the type that buys a beautiful shining transmitter thing ready to go on the air at the flick of a switch, plugs in a microphone and just talks about handles and QSL cards, don't read any farther: this article will not interest you! The

other day a friend, a licensed amateur, said to the writer "These experiments of yours are all very well, but you're only finding out things that electronic engineers have known for years." We agree, but we do enjoy our hobby and, furthermore, we try to apply our experiments to the specialised field of Amateur Radio, in which there are particular problems of no interest to the professional.

#### Receiver for 144 mc

The writer has, in the past, eulogised the EF54 as the RF amplifier *par excellence* for 50-60 mc, mainly because of its low equivalent noise resistance and high input

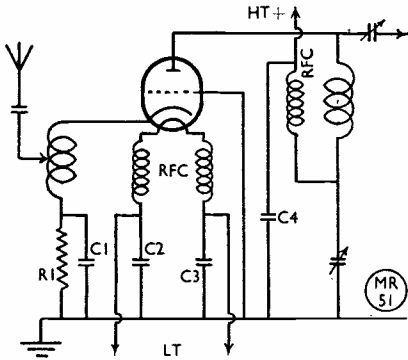


Fig. 1. Conventional GGT circuit, suitable for 144 mc operation.

**Table of Values**

Fig. 1. Conventional GGT Circuit

- C1, C2, C3, C4 = .001  $\mu$ F, mica
- R1 = 150 ohms

impedance. At 144 mc, however, the use of a pentode in the first stage of a receiver is not recommended. At this frequency the EF54 shows a noise factor of 9 dB, which compares unfavourably with the earthed-grid triode with a noise factor of about 4 dB. In addition, the input impedance of the EF54 enters the region where it will have appreciable effect upon

the first tuned circuit ; at this frequency it is little more than 1,000 ohms, which is about one-tenth of the value at 60 mc.

Triode RF amplifiers are indicated, then, in our 144 mc receivers. Two methods are available and in each the obstacle of positive feedback through the grid-anode capacity is successfully overcome—in one by earthing the control grid and in the other by neutralisation.

Circuits for both types are in Figs. 1 and 2, and from the amateur point of view there appears to be little to choose between them on the scores of gain and noise. Fig. 3 is an interesting arrangement popular in America, using a 6J6 double-triode, and known as a cathode-coupled amplifier. The input is fed into the grid of the first triode and the output from the first anode is coupled to the second triode, which is connected as an earthed-grid amplifier, through the common inductance in the cathode. The gain with this combination is said to be equal to a high-gain pentode, but the signal-noise ratio is superior owing to the triode's lower noise-factor and higher input impedance.

**The Mixer**

Here again, screen noise is responsible for more than 50 per cent. of mixer noise and the use of a triode for this stage is again advocated. Very good results have been obtained by the writer with the American double-triode type 6J6 (Fig. 4). The use of grid-leak bias on the mixer makes the arrangement particularly tolerant as to oscillator voltage, and the two valves in one envelope conveniently combine the functions of mixer/oscillator. Sufficient injection is obtained through the capacity between the valve pins for satisfactory operation and no external coupling is required.

**The IF Amplifier**

The choice of intermediate frequency is not likely to present much difficulty. It must be sufficiently high to prevent interaction between mixer and oscillator, but it should be remembered that the higher the frequency the poorer the selectivity. Whilst for some time, at least, 144 mc is not expected to rival 7 mc on a Sunday morning, the overall noise of the receiver will increase as the selectivity is decreased. Therefore, an IF of between 7 and 10 mc is suggested. Three stages of IF amplification using high-gain valves such as the EF50 or SP61 will be sufficient for amateur needs.

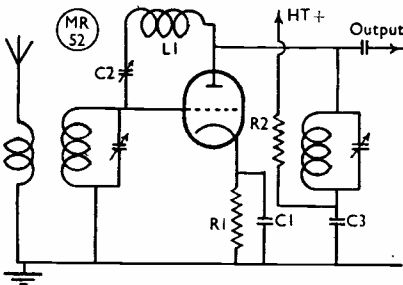


Fig. 2. Circuit for a neutralised RF amplifier for the 144 mc receiver.

**Table of Values**

Fig. 2. Neutralised RF Amplifier

- C1, C3 = .001  $\mu$ F
- C2 = Neutralising capacity
- R1 = 200 ohms
- R2 = 3,300 ohms
- L1 = Neutralising coil
- V = 6AK5, triode connected

**Ignition Noise**

Contrary to the opinion expressed by some hopefuls ignition noise is still a factor to be considered at 144 mc ; indeed, it seems almost as bad as at 60 mc. The inclusion of one's own pet limiter circuit is therefore strongly recommended.

**The Transmitter**

On 60 mc many amateurs obtained quite good results by pressing into service valves on hand, such as the 807, designed for lower frequency work. They cannot hope to repeat their experience at 144 mc and the choice of valve types must be confined to the few specially designed for VHF service. Types 832 or 829 seem to be the obvious choice for the final amplifier. Tests with each of these types indicate that with careful layout and sufficient excitation, efficiencies of the order of at least 60 per cent. may be achieved.

Although the manufacturers state that neutralisation is not normally required at 144 mc, it has been found preferable to employ home-made neutralising condensers consisting of small lengths of 18 SWG wire from each grid, which are laid parallel to the opposite plate in the push-pull stage. These valves will work satisfactorily with full input up to 250 mc and with excellent efficiency at 144 mc, require very little drive and may be used with either coils or resonant lines.

The choice of valves for the frequency multiplying stages, of which there must be quite a few, is rather limited. The Osram TT11 (VT51) used by the writer in this application is quite suitable. Rated at 300 volts anode and about 7.5 watts dissipation at 70 mc, the efficiency is about 50 per cent. at that frequency. The writer's experimental rig for 144 mc has a conventional triode employing a 6 mc crystal and 12 mc output, an EF50 doubling to 24 mc, a TT11 tripling to 72 mc and a Hytron 2E30 doubling to 144 mc. There is just sufficient output from this line-up to drive the 829B to full grid current. The EF50 doubler could be dispensed with and an 8 mc crystal used, taking the 24 mc harmonic from the triode, but even short experience with this higher frequency work has taught that one cannot be niggardly with valves ; as conventional types may be used in the first two or three stages there is no point in trying to economise.

There appears to be no limit to the variety of compact multi-element arrays that may be tried on 144 mc, but the writer, who does not know much about aerials anyway, is going to leave this to the experts.

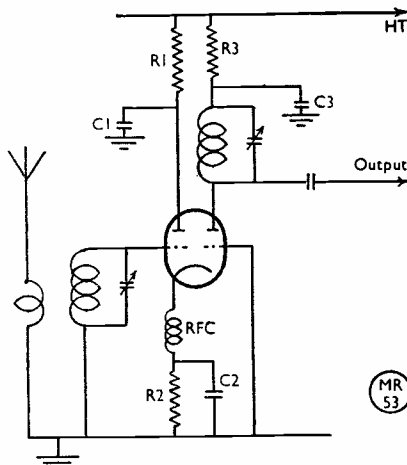


Fig. 3. Cathode-coupled 6J6 RF stage.

**Table of Values**

Fig. 3. Cathode-coupled 6J6 RF Stage

- C1, C2, C3 = .001  $\mu$ F, mica
- R1, R3 = 3,300 ohms
- R2 = 50 ohms

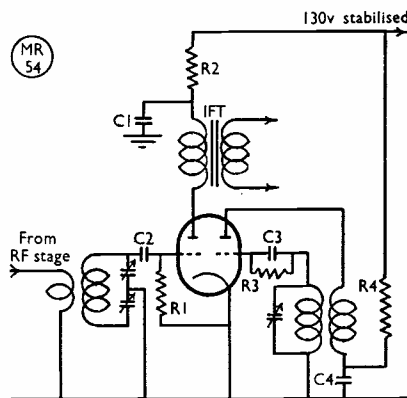


Fig. 4. Using the 6J6 as a combined mixer-oscillator.

**Table of Values**

Fig. 4. 6J6 Mixer-Oscillator

- C1 = .01  $\mu$ F, mica
- C2, C3 = 50  $\mu$ F, ceramic
- C4 = .001  $\mu$ F, mica
- R1 = 4.7 megohm
- R2 = 3,200 ohms
- R3 = 27,000 ohms
- R4 = 5,600 ohms
- V = 6J6



# Valve Delay Circuit

## Arrangement derived from the Miller Time Base

By D. B. APPLEBY

THIS circuit, by means of a valve, provides an adjustable delay from milliseconds to seconds, depending upon the time constants used.

Basically, the circuit consists of a standard Miller time base with the addition of a relay in the anode circuit, and hand-switched bias on the suppressor taking the place of the synchronising pulse and DC restorer. The grid is returned to earth instead of HT, as we do not require a very linear fall of anode voltage.

### Operation

With S1 open, the suppressor is very heavily biased negative and results in the anode current being at zero and the anode voltage at maximum. The screen takes heavy current and the voltage is therefore low; cathode and grid are at earth potential. The relay is de-energised and the contacts are open.

When S1 is closed, the suppressor is earthed, removing the bias and anode current starts to flow. The anode voltage falls and transfers the drop *via* C1 to the grid. This slides the grid back along the grid base and so reduces the anode and screen currents. The charge on C1 starts to leak away and allows the anode current to start increasing again. The anode voltage drops once more; the action is cumulative until the anode voltage falls to a low level and the valve takes full current. This is the normal Miller action. During this time the relay is steadily energised until it closes at a current depending upon the type of relay used. The time that the valve takes to assume full anode current depends upon the time constant of C1R1 and altering these values will alter the delay time.

### Practical Circuit

The values shown were found to be suitable for the EF50 and result in a delay of about 40 seconds. Other valves may be employed providing the anode current is sufficient to close the relay used. The anode load and bias will have to be altered to obtain correct operation. The bias value need not always be as high as shown,

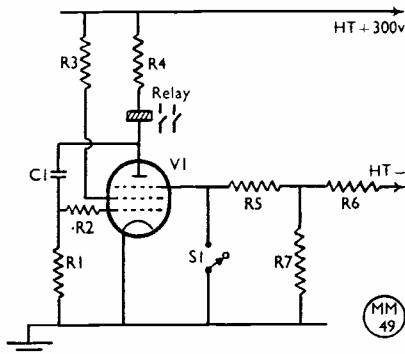
A delay circuit is useful in a variety of applications. The design suggested here is straightforward, and the delay can be adjusted over a wide range.—Ed.

but it must be sufficient to cut the anode current off. The relay in the writer's circuit is an ex-GPO Type 3000 with a pair of heavy duty contacts added. The DC resistance is 1,650 ohms and it closes at just over 6.0 mA, with a hold-on current of 1.5 mA.

### Application

This circuit is employed by the writer in a power pack feeding a universal supply panel. Its use is to delay the HT supply until heaters are warmed up. Overload contacts could be inserted in series with S1 to cut HT if a fault developed and so safeguard the power supply. If S1 is tripped either accidentally or on purpose, the full delay time is effected and so the HT would flick on and off if the overload persisted.

No originality is claimed for this circuit, which is an adaptation not generally known of a standard arrangement.



Circuitry for valve delay system. With the values given, a 40-second delay can be obtained.

### Table of Values

#### Valve Delay Circuit

R1	=	500,000 ohms
R2	=	1,000 ohms
R3	=	27,000 ohms
R4	=	6,800 ohms
R5	=	470,000 ohms
R6	=	100,000 ohms
R7	=	100,000 ohms
S1	=	S.P.S.T. Toggle switch
C1	=	1.0 $\mu$ F
Relay	=	Ex-GPO Type 3000, resistance 1,650 ohms
V1	=	Mullard EF50

# Here and There

## The AT Code

Opinion on the practicability of the proposed new amateur procedure code—see *Short Wave Magazine*, February, pp. 730-731—is about equally divided between those who favour its use and those who consider the existing Q Code fulfils all normal needs.

The interesting thing is that, almost without exception, those who are “for” the AT Code are operators licensed since the war. Those against its adoption are mainly holders of pre-war call signs, who regard it as an unnecessary complication.

Though several hundred opinions have been received, we do not consider that there is yet sufficient backing for the AT Code to justify further action for its general adoption. It would be helpful if many more readers would state their views—have another look at the original article and send in a card saying “Yea” or “Nay.”

## Photographs, Please

We are always glad to see photographs of Amateur Radio interest—whether of stations or equipment, home or overseas. If you have good, clear prints (any size) please send them in. All those used will be paid for, and if required they can be returned; the block-making process involves no damage or marking of the original.

## Band Planning

We have received from the RSGB their band-planning proposals, which have been circulated to all amateur organisations and a number of radio periodicals. We are reluctant, in the RSGB's own interests, to criticise what are obviously compromise suggestions of no great merit, put forward without full and proper consultation with other interested parties.

But in broad terms it seems to us that the CW bands are too narrow; that the proposed allocation of frequency areas to CW and 'phone stations together is unworkable, in that these areas will become virtually 'phone bands; and that the plan as a whole is unrealistic since it does not take the American allocations fully into account.

However, that a proposal has emerged at all is obviously a step in the right

direction, particularly as the observance of any finally agreed plan is to be made compulsory.

It is understood that the whole question of Band Planning is to be referred to an IARU conference—which may well be the first and last test of the IARU organisation. Though sound enough in its general conception, as a working body the IARU is vague and nebulous in the extreme; activities are directed from ARRL headquarters at West Hartford, and it is inescapable that American opinion will be the deciding factor on such an issue as Band Planning—unless the European societies are strong enough to assert themselves.

## Mail Order Supply Co.

They have opened a new mail order (only) office at 3 Robert Street, Hampstead Road, London, N.W.1, to which *post orders* should be sent. All other enquiries should go to 24 New Road, London, E., as before. An M.O.S. innovation is a monthly general-interest news sheet, the first issue of which is expected shortly.

## “50 Watts With DC Mains”

Further to this article which appeared in our February issue, ZBIAB informs us that the general performance of the transmitter can be improved by using battery instead of auto bias, which reduces the standing PA plate current and increases output. Resistors R7 and R8 in the original diagram should be removed or shorted, and —50 volts battery bias applied in series with R12.

## Net Working

The establishment of regular nets on the LF bands is a very good way of maintaining contact among local stations. Though we know that several Club nets are in operation on 1.7 and 3.5 mc, there is room for many more. The successful operation of a net calls for single-channel working with a control operator (who does *not* talk the whole time!) to bring stations in, and snappy transmissions by all others in the net—which can give itself a name, like “The Lincolnshire Poachers” or “The Lancashire Late-Nighters.”

## NEW QTH's

This space is available for the publication of the addresses of all holders of new call signs, or changes of address of transmitters already licensed. All addresses published here are automatically included in the quarterly issue of the Call Book in preparation. QTH's are inserted as they are received, up to the limit of the space allowance. Please write clearly and address on a separate slip to QTH Section.

E17T	W. T. MacMahon, 92 Homefarm Road, Drumcondra, Dublin.	G3DBW	H. J. Pitt, Flat No. 1, Tower Hill Works, Witney, Oxon.
G2ASY	B. T. Chapman, 8 Grange Gardens, South Norwood Hill, London, S.E.25.	G3DCC	E. J. King, 632 Green Lanes, London, N.8.
G2BOC	D. H. H. Clarke, 15 Corporation Street, Lincoln.	G3DCF	G. E. Cox, 263 Goswell Road, London, E.C.1.
G2BTY	L. J. T. Lewis, Kandersteg, Pond Head Lane, Earley, Reading, Berks.	G3DCJ	J. E. Wootton, Junior Grammar School, Compton Road, Wolverhampton, Staffs.
G2CMR	A. M. Boyce, 34 Carr Avenue, Prestwich, Manchester.	G3DCQ	A. V. Greenwood, 22 Kingsley Gardens, Chingford, London, E.4.
G2FMR	F. W. Broomfield, 44 Derwent Avenue, Headington, Oxford.	G3DCU	W. Schreuer, 13 Park Avenue, London, N.W.11.
G2FUP	S. Bransby, 96 Woodmere Avenue, Shirley, Croydon, Surrey.	G3DCV	A. R. Watson, 75 Elwyn Road, March, Cambs.
G3AMH	H. Green, Barugh Coke Ovens, Gawber, Barnsley, Yorks.	GM3DDE	L. F. Benzies, M.A., Hutton Park Hotel, North Bay, Largs, Ayrshire.
GM3BBW	G. F. Tuck, 36 Redhall Avenue, Longstone, Edinburgh 11.	G3DDF	P. W. L. Adey, 18 Mount Park Crescent, Ealing, London, W.5.
G3BIS	P. V. Edwards, 62 Thompson Street West, Darlington, Durham.	G3DDR	F. E. Bennett, 26 Swanage Way, Hayes, Middx.
G3BQS	K. Chorley, 19 Fairbridge Road, Upper Holloway, London, N.19.	G3DDV	D. B. E. Duke, 26 The Warren, Hardingstone, Northampton.
G3BUY	J. T. Dent, 25 Kingston Drive, Flixton, Staffs.	G3DEF	B. J. Gealer, 6 Ferndale Road, Swindon, Wilts.
G3BZL	E. Blore, 27 Fountain Street, Leek, Staffs.	G3DEK	J. E. James, 4 Victoria Street, Cinderford, Glos.
G3CAA	J. R. Simpson, 22 Hollow Road, Anstey, Leics.	G3DEL	H. L. Jakeman, Ingerthorpe, Great North Road, Highgate, London, N.2.
G3CAG	R. H. Pearson, 14 The Grove, Bletchley, Bucks.	G3DEX	F. N. Howard, The Nook, Drayton, Norwich.
G3CBG	W. A. S. Murray, Redknocker, South Petherton, Som.	G3DFC	R. A. F. Amateur Radio Society, Danesfield Court, Medmenham, Marlow, Bucks.
G3CBG/A	W. A. S. Murray, 114 Cecll Road, Hale, Cheshire.	G3DFD	M. C. Farley, 55 Westway, Caterham, Surrey.
G3CHO	H. Pharaoh, Colwyn, Hard Lane, St. Helens, Lancs.	G3DFE	O. S. Couldwell, 114 Gloucester Place, London, W.1.
G3CHP	I. J. Wood, Reydon, Coldharbour Lane, Bushey, Watford, Herts.	G3DFE/A	O. S. Couldwell, 80 Alexandra Road, Newland, Hull.
G3CKX/A	S/L S. F. Sharpe, R.A.F., Danesfield Court, Medmenham, Marlow, Bucks.	G3DFF	R. J. Barrett, 69 Shrewsbury Road, Carshalton, Surrey.
GM3COE	J. N. Piper, Freeland, Gateside, Fife.	GM3DFM	R. N. Redfern Smith, 36 Murrayfield Gardens, Edinburgh 12.
G3CRL	W. Newsham, 12 Roberts Road, Boscombe East, Bournemouth.	G3DGH	D. G. Hardcastle, 3 Shrubbery Street, Kidderminster, Worcs.
G3CRV	L. F. Cole, 100 Birch Tree Avenue, West Wickham, Kent.	G3DIV	P. J. Pollard, 6 Annington Road, Eastbourne, Sussex.
G3CUL	F. R. Ellory, 153 Windsor Avenue, Hillingdon, Middx.	GW3DIX	G. Moorfield, Slabod, Capel Curig, Caernarvonshire.
G3CVY	Lt.-Col. J. J. Davis, T.D., A.M.I.E.E., 6 Queens Gate Terrace, London, S.W.7.	G3DJD	R. J. Donald, 2 Canfield Road, Brighton 7, Sussex.
G3CXW	R. F. Hall, 71 Micheldever Road, Lee, London, S.E.12.	G3DJG	C. Oakes-Jones, 78 Turreff Avenue, Donnington, Wellington, Salop.
G3DAA	E. Cockayne, Brindle Croft, Clay Mills, Burton-on-Trent, Staffs.	G3DUF	W. F. Poole, 11 Bisham Gardens, Highgate, London, N.6.
GM3DAP	A. W. Adam, 30 Oronsay Crescent, Kessington, Bearsden, Dumbartonshire.	G4RV	A. N. Porter, 11 Audrey Walk, Wellington Hill West, Bristol 9.
G3DBT	R. A. Whitehead, Medford House, Bentham Road, Alverstoke, Gosport, Hants.	G5KG/A	F/L G. W. Slack, Officers' Mess, RAF, Danesfield Court, Medmenham, Marlow, Bucks.
G3DBU	Cpl. W. Bevan, Royal Signals, 1 "F" Block, Old Ward Barracks, Bulford Camp, Wilts.		

G5WW/A	P. Carment, Officers' Mess, RAF Danesfield Court, Medmenham, Marlow, Bucks.	G2QB	R. W. Bailey, 32 Cassiobury Drive, Watford, Herts.
G6BD	R. A. Farmer (ex-D2AV), 12 Carisbrooke Road, St. Leonards-on-Sea, Sussex.	G3ASE	H. S. King, 24 Chandos Avenue, Whetstone, London, N.20
G6QF	W. K. Miller, 94 Hilton Lane, Little Hulton, Bolton, Lancs.	G3BDQ	J. D. Heys, 14 Eastern Street, St. Leonards-on-Sea, Sussex.
G6WF	B. Whitehouse, The Bratch, Wombourn, Wolverhampton, Staffs.	G3BWQ	S. H. Iles, 13 North Street, Downend, Bristol.
G8OZ	R. A. French, 24 Sudbury Crescent, Bromley, Kent.	G4JS	1 Marsh Terrace, Darwen, Lancs.
G8WI/A	C. R. Thompson, Officers' Mess, RAF, Danesfield Court, Medmenham, Marlow, Bucks.	G4OG	D. C. Gordon, The Garden Cottage, Folkestone, Kent.
<b>CHANGE OF ADDRESS</b>			
EI4G	G. H. O'Donnell, 61 Stiles Road, Clontarf, Dublin.	G4QD	R. A. Delahunt, 18 Bridge Road, Bold, Widnes, Lancs.
G2CNO	L. G. Blunden, The Grotto, Campsea Ashc, Woodbridge, Suffolk.	G5VS	V. A. Sims, Redlands Lodge, Maidenhead Court, Maidenhead, Berks.
G2COU	C. Page, 18 Highfield Road, Luton, Beds.	G5WG	G. F. Wakefield, 32 Quebec Road, Ilford, Essex.
G2DHV/A	G. V. Haylock, c/o 28 Longlands Road, Sidcup, Kent.	G5YN	Major E. Y. Nepean, Greystones, Teffont, Salisbury, Wilts.
		G6BZ	S/L M. C. Bunting, 22 Woodcote Road, Leamington Spa, Warks.
		G6BZ/A	S/L M. C. Bunting, 122 Huntingdon Road, Cambridge.

**CONTRIBUTORS NOTE**

We are always glad to see articles dealing with any aspect of Amateur Radio, and we give quick appearance to important material of immediate value and interest. Besides which, in the Amateur Radio field we still pay the highest rates in the world.

If you have ideas for an article, let us see your suggestions, with a short outline of the proposed range it is to cover.

**NEW QTH'S**

The loading has once again run ahead of the available space, so that it is taking up to two months for call signs to appear. We are sorry about this, and as soon as we see a chance will take some more space to get up to date again. All concerned will probably agree that one page is a fair average allocation for this feature, though for our part we should like to be able to print the lot every month.



Sir Robert Watson-Watt (speaking) was one of the chief guests at the Belling-Lee Jubilee Celebration Dinner; Mr. Edgar Lee was in the chair and Capt. Mullard is on the right of the photograph. The progressive success of the firm of Belling-Lee, well known in radio for over twenty years, is an outstanding example of the initiative and resource which have built up the British radio industry.



## The other man's station G2AMJ

A photograph of the beam aerial system at G2AMJ—G. Raahague, A.M.I.E.E., 87 Wolfreton Lane, Willerby, East Yorks. —appeared on p. 609 of our December issue. Here is a view, and some details, of the station itself.

G2AMJ uses two HRO's, one for the signal on tune, and the other as a monitor for comparative strengths—and also to find a frequency clear of QRM should the station being worked get buried. These receivers are carefully calibrated by means of the BC-221 on the right of the receiver position, and dial readings are indicated on both receivers. Also available is an S27 for NBFM or FM reception.

The transmitter is a Collins 30J, using a pair of HF100's in the final, modified for 150-watt operation. Crystal control is employed on three frequencies in the 28 mc band, and the Tx can also be VFO-

controlled by the Type 145 Oscillator, visible to the left of the HRO's; again, frequency is checked by the BC-221 frequency meter.

Modulation check is by means of a Mullard 4-in oscilloscope. The monitor above the 145 is used for aural check on 'phone quality, and is also adapted for field strength measurement work. The station is relay-operated and arranged for "push-to-talk" control; pilot lights are incorporated to indicate when circuits are "live."

G2AMJ is a "10-metre only" station, and on this band good and consistent reports are received from VK and W6.

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### CORRESPONDENCE

We are anxious to make space (some-how!) for two regular pages of reader correspondence, of which we receive a large bundle every month, full of useful and interesting points. It is neither neglect, indolence nor lack of material which prevents it happening—but until we can see a way of getting a couple of pages, it is considered better in the interests of all concerned to use the available space for practical general-interest articles.

# THE MONTH WITH THE CLUBS

## FROM REPORTS

Activity continues to be at a high level, and we publish this month the reports from 36 Clubs, including some very welcome newcomers. For this reason, we keep the preamble short, merely stating that the deadline for next month's reports is *first post* on April 15. Please address them to the Club Secretary, *Short Wave Magazine*, 49 Victoria Street, London, S.W.1.

**Wanstead and Woodford Radio Society.**—An Extraordinary General Meeting was held during March at which members agreed to annul the office of President, after the resignation of Mr. E. D. Ostermeyer, G5AR. Rules were also polished up and will be circulated in due course. A news-sheet is now published, in which details of forthcoming meetings are given.

**South-West Essex Radio and Scientific Society.**—Newcomers, they formed in January, and now meet every Wednesday, 7 p.m., at Valence House, Becontree Avenue, Dagenham (Room 9, 1st Floor). Talks have been arranged on Superhet Theory, Basic Radio for the Beginner, Television Receivers, and regular Morse classes, junk sales and raffles are also held. Secretary's name in panel.

**Burnham and Highbridge Amateur Radio Society.**—This Club was inaugurated in February, and is now in full swing. Future meetings are to be held at the Ring-o'-Bells Hotel, Burnham-on-Sea, on the first and third Mondays of each month; they will include Morse classes, and lectures covering the RAE syllabus. Slow Morse transmissions on 3.5 mc are also being started shortly.

**Stourbridge & District Amateur Radio Society.**—The A.G.M. was held at King Edward VI School, and a good attendance recorded. The new committee and officers were elected, and the President (G6OI) referred to the happy atmosphere prevailing in the Society and hoped that further activities would be undertaken

soon. During the coming year, it was decided, a Social Evening will be held.

**Basingstoke & District Amateur Radio Society.**—At the March meeting D. R. Willis demonstrated Marconi instruments, including a transmitter Output Meter, Audio Frequency Meter, Modulation Meters and so on. This Club has been given some useful publicity in one of the local papers, and membership now stands at 32.

**South Shields Amateur Radio Club.**—They have now acquired a new call (G3DDI) and a new address (Trinity House, Laygate, South Shields). The Club transmitter will soon be on the air, and a course of lectures and demonstrations has been arranged for the forthcoming months.

**Cannock Chase Radio Society.**—Cannock Chase meets on the second and fourth Tuesdays, 7.30 p.m., at the Unicorn Inn, Church Street, Cannock, and new members will be heartily welcomed if they will just turn up. The future programme includes a course in Radio Fundamentals, visits to places of radio interest, and participation in NFD.

**Weston-super-Mare Radio Society.**—The first report received from this Club informs us that meetings are being held on the first Friday in every month, 7.30 p.m., at the Y.M.C.A., Weston. Secretary's QTH in panel.

**Wirral Amateur Radio Society.**—A demonstration on VHF aerials was recently given by Mr. Arthur Bell, of the

Merseyside Radio Society; signal generator, transmitting and receiving aerials were set up on the club room table and many effects were demonstrated. A proposal on compulsory band-planning was carried by 24 votes to 3. April meetings are booked for the 7th and 21st—both 7.30 p.m. at the Y.M.C.A.

**Smethwick & District Wireless Society.**—Recent meetings have included demonstrations of the AR88, the Eddystone 640, and three sound-films on Radar. The club transmitter, G2GX/A, is operated from the club-room on 7 and 14 mc 'phone.

**Bradford Amateur Radio Society.**—Membership is increasing and meetings are well supported. A forthcoming lecture is on "Radio Signals from Outer Space," by G2FJD. Members of the "Worked All Planets" Club are expected to turn up in numbers!

**Doncaster & District Amateur Radio Society.**—The A.G.M. was held on March 3, at which the Officers and Committee were duly elected. Meetings are held every Wednesday, 7.30 p.m., at 73 Hexthorpe Road, with Morse classes, and a series of lectures. From April onwards, however, the Club will meet on Tuesdays as well.

**Rae & Farnborough District Amateur Radio Society.**—This Club, now in its second year, holds very successful meetings every other Monday at 7.15 p.m. The Secretary will be pleased to hear from any potential members and also, in particular, from anyone prepared to lecture on Radio and Electronics subjects. On April 12 there is a Brains Trust, and on April 26 a Mazda lecture on "Valve Technique."

**Midland Amateur Radio Society.**—A recent lecture on "Design of UHF Generators" (with a demonstration on



450 mc) was attended by 89 members and visitors. The lecturer was G2RQ and the demonstrator G5BJ. All meetings are on the third Tuesday, 6.30 p.m., in the Imperial Hotel, Birmingham.

**Bovingdon Airport Club.**—This Club's licence has come through with the call G3DGS, several members are licensed to operate, and the first QSO has already been made with a 6-watt transmitter. Skeds are being arranged with stations in surrounding districts. Members recently visited Bovingdon Airport Control and were shown over all the equipment used in a modern civil airport. The Hon. Sec. requests that correspondence should be addressed to him at the QTH given, and not at the Airport.

**Reading & District Amateur Radio Society.**—Another new idea for Clubs, as tried out by this Club in February—a "Mystery Parcel Exchange," in which all participants (if

they were lucky!) may well have obtained that very piece of gear they have been looking for! A rather unusual lecture was also given by the President, Dr. Lemon, the title being "Very Low Frequency Oscillations." Effects of AC were demonstrated by mechanical methods at frequencies between 0.5 and 2 cycles per second. Meetings are at Palmer Hall, 6.30 p.m., on the second and last Saturdays of the month.

**Southend & District Radio Society.**—During March the Club was given a talk on Gramophone Recording by Mr. R. V. Ripley, A.M.I.E.E., of E. K. Cole, Ltd. At the April meeting, on the 9th, there will be a Murphy lecture on Television. April 23 is set aside for informal "rag-chewing." All meetings are now preceded by a Morse class at 7.15 p.m.

**Grafton Radio Society.**—All North London amateurs and enthusiasts will be welcomed

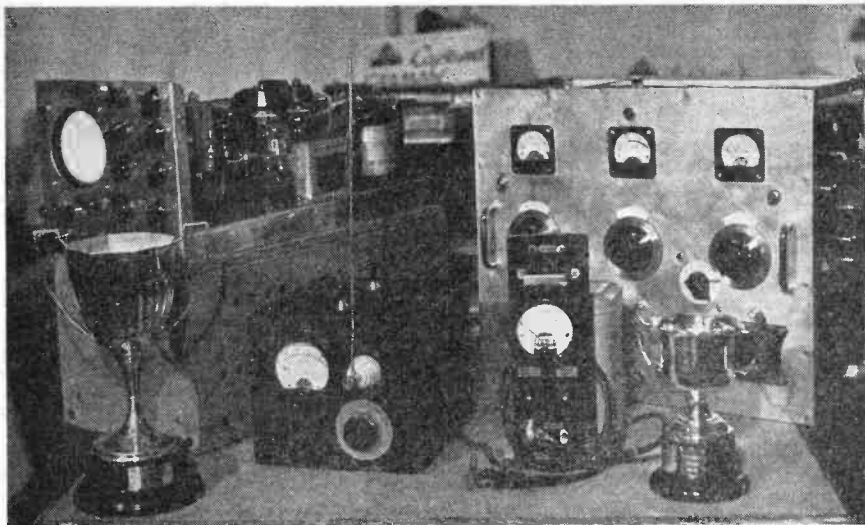
at this Club, which must be one of the very few in the country which meet three times a week! Mondays, Wednesdays and Fridays, 7.30 p.m., will find Grafton in session at the Grafton School, Eburne Road, Holloway, London, N.7 (one minute's walk from the "Nag's Head.")

**Medway Amateur Receiving & Transmitting Society.**—Still expanding, they now have a membership near the 70 mark. Recent lectures have covered such subjects as "The Electronic Test Meter," "Antenna Coupling Arrangements" and "Transmitting Procedure and Intelligent Reporting." Work on the Club station is going ahead, alternate nights being devoted to constructional work.

**Tees-Side Amateur Radio Society.**—First report from this Club, which has been running for over a year. There are now 40 names on the register, including 13 "ticket-holders." A Club transmitter

Following are the names and addresses of the Secretaries of Clubs whose reports appear in this issue. They will be pleased to give full details and every assistance to prospective members.

**BASINGSTOKE.** L. S. Adams, 16 Brambls Drive, Basingstoke, Hants.  
**BOVINGDON AIRPORT (G3DGS).** T. D. Lord, Police Station, Bovingdon, Hemel Hempstead, Herts.  
**BRADFORD.** W. S. Sykes, G2DS, 287 Poplar Grove, Great Horton, Bradford  
**BURNHAM AND HIGHBRIDGE.** T. N. Carter, G3BFV, P.O. Radio Station, Highbridge, Som.  
**CANNOCK CHASE.** D. M. Whitehouse, 69 Church Street, Cannock, Staffs.  
**CHIPPENHAM.** W. A. Henson, G3DGG, 12 Filton Way, Chippenham, Wilts.  
**COVENTRY (G2ASF).** J. W. Swinnerton, G2YS, 118 Moor Street, Coventry.  
**DONCASTER (G3CBM).** H. Flintham, 73 Hexthorpe Road, Doncaster.  
**EAST SURREY.** L. Knight, G5LK, Radiohse, Madeira Walk, Reigate.  
**EDGWARE (G3ASR).** R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middx.  
**FARNBOROUGH.** R. J. Corps, B.Sc., Armament Dept., R.A.E., Farnborough.  
**GIFFNOCK (HI-Q).** J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4.  
**GRAFTON (G3AFT).** W. H. C. Jennings, G2AHB, Grafton LCC School, Eburne Road, London, N.7.  
**HARROW.** N. J. Hanscomb, G3APK, 80 Manor Road, Kenton, Harrow.  
**KINGSTON.** A. W. Knight, G2LP, 132 Elgar Avenue, Tolworth, Surrey.  
**MEDWAY.** S. A. Howell, G5FN, 39 Broadway, Gillingham, Kent.  
**MERSEYSIDE.** C. M. Johnstone, 6 Flawn Road, West Derby, Liverpool.  
**MIDLAND.** W. J. Vincent, G4OL, 342 Warwick Road, Solihull, Birmingham.  
**READING.** L. A. Hensford, B.E.M., G2BHS, 30 Boston Avenue, Reading.  
**RETFORD.** H. White, G3BTU, 39 Trent Street, Retford.  
**SLADE.** C. N. Smart, 110 Woolmore Road, Erdington, Birmingham, 23.  
**SMETHWICK (G2GX/A).** Mai, G. A. Swinnerton, G6AS, 23 Hawthorn Croft, Quinton, Birmingham, 32.  
**SOUTHEND (G5OK).** J. H. Barrance, M.B.E., G3BUJ, 49 Swanage Road, Southend-on-Sea.  
**SOUTH-WEST ESSEX.** P. F. T. Redman, 108 St. Andrew's Avenue, Elm Park, Romford, Essex.  
**SOUTH SHIELDS.** W. Dennell, G3ATA, 12 South Frederick Street, South Shields.  
**STOKE-ON-TRENT.** D. Poole, G3AQW, 13 Oldfield Avenue, Norton-le-Moors, Stoke-on-Trent.  
**STOURBRIDGE.** W. A. Higgins, G8GF, 35 John Street, Brierley Hill, Staffs.  
**SURREY.** L. C. Blanchard, 122 St. Andrew's Road, Coulsdon, Surrey.  
**TEES-SIDE.** H. Walker, G3CBW, 9 Chester Street, Middlesbrough.  
**THAMES VALLEY.** D. R. Spearing, G3JG, 99 High Street, Esher, Surrey.  
**WANSTEAD (G3BRX).** R. J. C. Broadbent, G3AAJ, 24 St. Margaret's Road, Wanstead Park, London, E.12.  
**WESTON-SUPER-MARE.** W. C. Holley, G5TN, 252 Locking Road, Weston-super-Mare.  
**WIRRAL.** B. O'Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Cheshire.  
**WOLVERHAMPTON.** H. Porter, G2YM, 221 Park Lane, Wolverhampton.  
**WORCESTER.** J. Morris Casey, G8JC, Brookhill Farm, Ladywood, Droitwich, Worcs.  
**WORTHING.** G. W. Morton, 42 Southfarm Road, Worthing, Sussex.



Impressive array of equipment built by Reading members for their Constructors' Competition.

is under construction, permanent premises have been obtained, and everyone is very busy with Morse classes and all the other activities. Next meeting is on April 12 at 7.30 p.m. Secretary's QTH in panel.

**Radio Society of Harrow.**—The last meeting included a discussion on equipment, site and personnel for the forthcoming NFD event. Equipment will be made by Club members. Future events include a talk, by G2AI, on Aerial Systems. This will be on April 20.

**Merseyside Radio Society.**—At the March meeting there was a talk on Single-Side-Band working by G3BNO, and a new Hon. Sec. was elected (QTH in panel). At the April meeting (before publication) there is to be a talk on aerials. The Club publishes a very interesting bulletin called "Merseyside Amateur Radio Review," giving a very full account of the Club's activities, social, technical, constructional and projected! It also covers the work of the Liverpool and District Short Wave Club.

**Slade Radio Society.**—The next two meetings after publication are on the 16th (Ceramics) and the 30th (High-Fidelity Reproduction). All meetings are held at the Parochial Hall, Broomfield Road, Slade Road, Erdington, at 8 p.m.

**Worcester & District Amateur Radio Club.**—At the last meeting another "pre-exam" lecture was given, and the President gave a brief description of his 50-cm oscillator, which was passed round for inspection. In future an informal meeting will be held on the third Tuesday of each month, the regular monthly meetings continuing on the first Thursday.

**Coventry Amateur Radio Society.**—The Club's transmitter, G2ASF, has now made its debut on 3.5 mc, and will be heard on most Mondays. The last meeting comprised a demonstration of various types of oscillator; on April 26 Mr. T. R. Theakston, well known for his Maths. lectures, will talk. The Club carried off the Desmond Trophy by winning the MARS/CARS Team Contest—good show for Coventry!

**Chippenham & District Short Wave Club.**—Another newcomer, and meetings are held every Tuesday, 7.30 p.m., at the Community Centre, Chippenham. Morse classes and technical instruction form the backbone of the present programme. Secretary's QTH in panel.

**Edgware & District Radio Society.**—During March members heard Dr. Bloomfield (G2NR) on the subject of the newer low-loss insulating materials, and on March 21 the first of the year's outdoor events (a 1.7 mc DF Contest) was held. Motive power was, of course, limited to bicycles! Membership increases weekly, and a sixpenny raffle is held each week to pay the rent.

**Stoke-on-Trent Amateur Radio Society.**—This Club held a very successful Exhibition in Hanley at the beginning of March. The idea was to show the public the amateur's contribution to the art of radio, and the exhibits took the form of a pageant of "Radio Through the Ages." On the modern side, the Police and Territorials co-operated with some of their equipment—the

former demonstrated the ease and quickness with which a police car can be contacted. G3ALP and G3UD were on the air from the Exhibition. Normal meetings are held every Thursday at 7.30 p.m., and comprise lectures, demonstrations, junk sales or just "someone's idea."

**Thames Valley Amateur Radio Transmitters' Society.**—A lecture on "An Introduction to the Electronic Valve" was recently given, illustrated by a Mullard film. This was the first of a series of six similar lectures. A panoramic short-wave receiver built by a member was also described. At the April meeting there will be a talk on VHF work.

**Retford & District Amateur Radio Club.**—After only six weeks' existence this Club has a membership of 17, including two YL's! Permanent premises have been obtained; Morse and radio classes are held every Monday pending the "move-in." Secretary's QTH, as usual, in panel.

**Kingston & District Amateur Radio Society.**—Lectures during March were on "Crystals" and "RAF Communications Equipment and its Modification for Amateur Use." Forthcoming events were also discussed, and these include a Field Day in May, and a display of technical films. April meetings, on the 8th and 22nd, are both lectures—"Underwater Communication" and "The Decca Navigator."

**Surrey Radio Contact Club.**—The March junk sale was very successful, and was visited by G8IG and G6VX, the latter contributing some valves and components. Next meeting is at the Blacksmith's Arms, 7.30 p.m. on April 13, and will be the A.G.M.

**East Surrey Radio Club.**—A lecture on "Frequency Measurement," as required at amateur stations, was recently given by G2MV, deputising for G5OH. Meetings are held on the last Thursday, at Toc H Rooms, Redhill.

**HI-Q Club, Giffnock.**—This Club records a 100 per cent. attendance nearly every time—a healthy sign, if ever there was one. Two main subjects of discussion are Rotary Beams and F-M Equipment. There is also a "VHF" group working on 2,300 mc; several contacts have been made and the experts are preparing to go mobile for some longer-distance work.

**Worthing Radio Group.**—The March meeting was well attended, and Mr. Crowley gave a talk on the design and applications of the CRO. At the April meeting (before publication) the first of the Mullard valve films is to be shown.

**Wolverhampton Amateur Radio Society.**—Great activity is taking place in connection with the Borough's Centenary Celebrations. Recent activities have included a lecture on transformers, a junk sale, and a demonstration of the CRO by Mr. F. T. Smith, the Club's Chairman.

#### EDDYSTONE RELEASES

In addition to their Speed Key, mentioned in our last issue, Stratton & Co. offer two other very useful and interesting new items—the Eddystone Signal Strength Meter, and the Eddystone Modulation Level Indicator.

The S-meter has been designed primarily for use with the 640 Receiver, into which it plugs without any alteration or fiddling; the meter is 0-200 microamp at full-scale deflection and is calibrated in S units and dB above S9; the standard is a 4 dB change in carrier-level for each S point.

In the Modulation Level Indicator, two crystal rectifiers are employed, with a meter calibrated to give direct percentage-modulation readings when the RF pick-up is correctly adjusted. The various bands are covered by plug-in coils, and the calibration holds good on all frequencies up to 28 mc. This particular instrument can also be used as a 'phone monitor and field strength meter, and thus combines a number of useful applications.

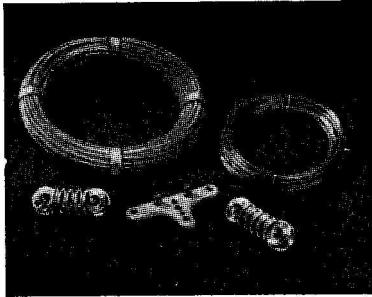
Other new releases include the Eddy-

stone Beam Aerial Kit—a complete assembly as far as the supporting tube for a 3-element array adjustable to any frequency between 50 and 100 mc—and the Crystal Calibrator. The latter is a self-contained unit providing high harmonic output from 100/1,000 kc bars on frequencies up to 60 mc.

★ ★ ★

#### SMALL POINT

If you are busy on frequencies from 28 mc up, and the layout of the gear will allow it, try inductive in preference to link coupling. There is nothing new about this—except the large increase in transfer efficiency by the use of inductive coupling as the frequency goes up. In a particular piece of equipment, link coupling gave a maximum of 18 mA of drive at 50 mc; the link was four inches long, of the best material, and carefully adjusted at each end. By arranging for variable inductive coupling this became 30 mA at the optimum settings.



### THE IDEAL TRANSMITTING AND RECEIVING AERIAL FOR THE AMATEUR

This very practical kit consists of a "T" strain insulator, 80 ft. of cadmium copper wire and 80 ft. of L336 balanced twin feeder with plug and socket to suit (see illustration below) and two glass end insulators. The "T" insulator in the illustration on which sensible terminals and "cable grips" are provided, has been designed to take the feed from the centre of a half-wave di-pole.

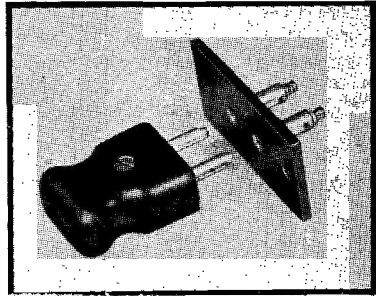
For receiving purposes, the length per half-section is not critical to within a few inches, but for transmission the lengths given are approximate only and must be slightly re-adjusted to the correct length from the formula:—

$$\text{Length of half-section in feet} = \frac{224}{\text{Frequency in Mc/s}}$$

Cadmium copper is supplied as this will not stretch—a most important matter if the aerial is being used for transmission. Suitable for 200 watts RF up to 28 mc/s. The complete kit L609. PRICE 35/9. The "T" strain insulator L333 supplied separately. Price each 3/3, also L336 Balanced twin feeder at 7½d. per yard.

Short Wave Amateur Band		Short Wave Broadcast Band	
Frequency in Mc/s	Length in feet	Frequency in Mc/s	Length in feet
7-0	32-75	6-0	40
14-0	16-5	9-0	27
28-0	8-0	12-0	20
		15-0	16
58-5	4-0	18-0	13
		21-0	11

Length given is per half-section



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Our department dealing with the above is always ready to discuss, and, we hope, solve the various problems the average constructor meets when building that new equipment.

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**Primary** 200 to 250 volts

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**£4.3.6**

5 volts, 3 amps ; 6.3 volts, 4 amps.

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1A3	13/11
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1A7	19/6
1C5	12/-
1G4	12/6
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1H5	13/5
1LC6	13/11
1LN5	12/-
1N5	14/-
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3Q5	12/-

**5 Volt Range**

5R4GY	19/5
5T4	13/11
5U4	19/11
5V4	12/-
5W4	12/-
5Y3	12/-
5Z3	19/11
5Z4	12/-

**6.3 Volt Range**

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6AB7	19/11
6A8	15/3
6AC7	19/11
6AG7	13/11

6B8	16/7
6C5	10/-
6C6	20/7
6C8	19/11
6D6	20/7
6F5	13/3
6F6	13/11
6F8	19/11
6H6	10/-
6J5	10/-
6J7	13/11
6K6	13/11
6K7	13/11
6K8	15/3
6L6	19/11
6L7	13/11
6N7	19/5
6Q7	12/7
6R7	12/7
6SA7	15/3
6SF5	12/7
6SG7	13/11
6SH7	13/11
6SJ7	13/11
6SK7	13/11
6SL7	19/11
6SN7	19/11
6SC7	19/11
6SQ7	12/7
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7C6	12/7
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7Q7	15/3
7R7	15/3
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25Y5	12/-
25Z4	12/-
25Z6	12/-
35Z4	12/-
35Z5	12/-
35L6	13/11
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43	17/3
76	13/3
80	12/-
83	19/11
117Z6	16/7
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866A	20/-
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**MATCHED Valves in Pns. Tungram**

P27/500/Px25	each valve
NO P.T.	22/6 ea.
6L6	38/10 pr.
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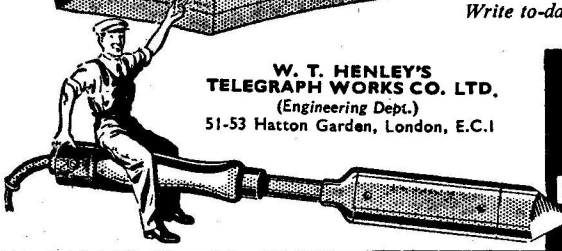


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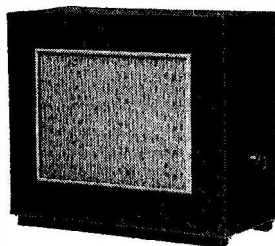
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## STANDARD 8 CABINET MODEL

Mahogany finish

Size: Height 10"  
Width 12" Depth 5½" **PRICE £3:18:0**

Price with Universal Transformer £4:4:0

**Technical Details of Chassis Model for use with your own cabinet.** Dia. 8". Baffle opening 7½". Voice coil impedance at 400 cps., 2.3 ohms. Pole dia. 1". Flux density gauss, 8,000. Total gap flux, 31,000. Peak power capacity 4 watts

Price less transformer **£1:17:6**  
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DO NOT MISS THIS BARGAIN.**

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**SPECIAL VALVE BARGAINS, Brand New ex-Government.** Miniature 1.4 volt button base, 1S5 at 9/6, 1T4 at 9/6, 1R5 at 11/6, 1.4 volt local transmitting tetrode 1299A at 7/6 each. 807 at 12/6, 5Z3 at 12/6, ECC31 at 12/6, 6SJ7, glass or metal, at 7/6, 6K7, glass or metal, at 8/-, 6KBGT at 10/6, CV6 and E1138 at 5/-, 955 acorn at 12/6, EF50 at 7/6, CV66 at 10/6, 6H6 or EB34 at 5/-, EA50 at 7/6, 6A7 at 18/-.

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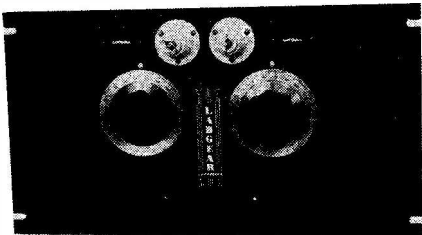
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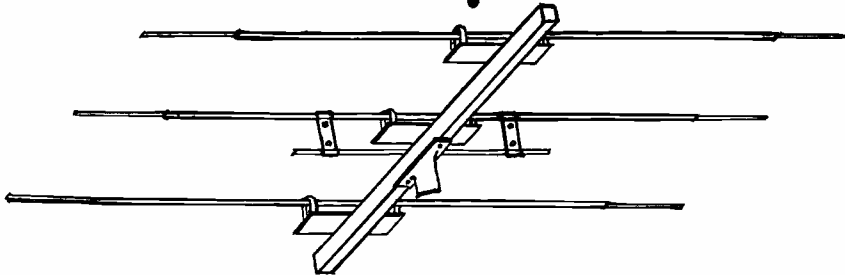
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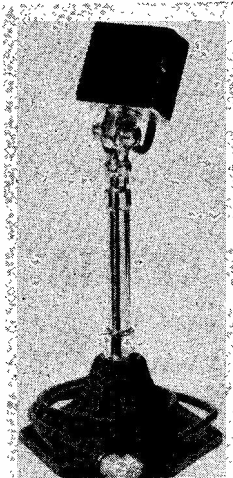
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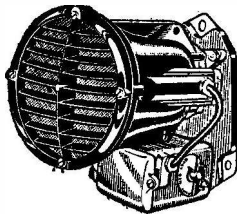
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**A**MATEUR selling out. 80 valves, including 807's, 6L6's, T20, lot £10. Type 37 oscillator/transmitter, 20 mc to 80 mc, £12. Emdo converter, with 2, 5, 6 and 10-metre coils, £8. Sig. Gen., 17 mc to 95 kc, 100/250 AC, £9. Crystal calibrator, 100/1000 kc, with 10 kc multivibrator and internal mod., £4. 'Phone: Wallington 3528.

**S**TUCK'S Radio, G3AMR, North Street, Sudbury, Suffolk.—Eddystone 640's, £39/10/-. Bugs, 77/6. Full range Eddystone and other amateur components, ex stock. Lists.

**A**LUMINIUM chassis and panels, any size, plain or punched to your requirements, from 3/9.—E.A.D., 13 Bence Lane, Darton, Barnsley.

**B**RAND, spanking, new National HRO Senior Receivers. Signal-meter, X-tal, nine coils, AC power pack. It's worth a few extra pounds to have a receiver which has no "friggid about." £62/10/-.—Power's Radio (G3ASC), Oswestry.

**EF54**'s, 5/-; 807's, 12/6. R3002 radar receivers, complete with 4 SP41, 2 RK34, 1 EF50, 3 D1, rotary transformer, 12v input, 480v 40 mA output, 22-85 mc, 45/- carriage paid. Brown's Type "F" headphones, 4,000 ohms, 10/- pair. List 1d.—Norris, G8FJ, 8 Kingshill Crescent, St. Albans.

**B2**Mk. III Power Packs, 230v AC and 6v, 70/-. B2 Transmitters, complete with coils, 45/-. Type 37 Oscillators, complete with AC power packs, £8. Type 145 power packs, 750v and fls, 80/-. R22 Transceiver, complete, £6. Sleeving, all colours, 7/- per 100 yds. Valves: 7R7, 7Q7, 807, etc. Send for list.—Radio Repairs Unlimited, 381a Dunstable Road, Luton, Beds.

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**HALLICRAFTERS** SX16 Communications Receiver, fine condition, complete with Hallicrafters speaker to match. Forty-seven Pounds. G2IN, 116 Cambridge Road, Southport.

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TRADE—continued.

**F**OR the High Stability VFO Driver *Short Wave Magazine*, March. 6AC7 RCA, new, boxed 7/6. 50 PF Var. Air Spaced Cer. 1/9. 100 PF Trim Dubilier Cer. 1/3. 7 mc Xtals yr. choice of freq. 12/6. .5 mF Sprague 1/-. Resistors 6/- Doz. For Miniature Tx: RCA, 6N7, 10/-, 6X5 7/6, new, boxed. .01 Sprague 8d. Twin Cer. Trimmers, 2-40, Dubilier, 1/6. See also displayed Ad. G3SJ, 10 Yorkshire Street, Burnley.

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**BRAND** new B2 Transmitter/Receiver, power supply, all coils, unused, £12 complete, or exchange first-class camera. General Radio (U.S.A.) amateur-band precision absorption frequency-meter, Model 558, in case with charts, 3.5 to 60 mc, £4 10/-. General Radio (U.S.A.) general-coverage absorption frequency-meter, Model 358, in case with charts, 1.5 to 22 mc. Visible RF indication, £4. Large Cydon transmitting condenser, 250  $\mu$ F max., 0-1 in. spacing, polished vanes, ceramic insulation, beautiful job, list £3 16/-, sell £2 5/-. Brand new E.D.C. Rotary Converter, input 12v DC, output 90v 250 mA, £2. Bound volumes *RSGB Bulletin*, 1933/34, 1934/35, 1935/36, 1936/37, 1937/38, 8/6 each. Loose issues, 1938/45, 7/6 per doz.—GW6AA, G.P.O. Box 4, Colwyn Bay, N. Wales.

**WANTED.** Hallicrafters SX24, if possible with spare valves.—Offers to Hyde, 106 Brampton Road, St. Albans, Herts.

**R.F.** Thermocouple meter, 0-350 mA and 0-1 amp. All guaranteed, 6/- each, including packing and postage.—Brown, 101 Wilson Avenue, Rochester, Kent.

**NATIONAL HRO**, complete, all coils (9 sets) and power pack—best offer £38. Hallicrafters SX24, best offer £24. Both receivers in full working order.—105 Greenhill Road, Blackheath, Birmingham.

**20-WAT** Telefunken amplifier, perfect, £20. Offers.—R.A.F. Type 2B DF Beam Array. New. Offers. Must sell.—Perkins, 12 Airdale Avenue, Giffnock, Glasgow.

**SHORT WAVE MAGAZINE** back numbers for disposal. June, 1946, to March, 1948. Offers to Curtis, Kent House, High Street, Footscray, Sidcup, Kent.

**NEW** American Aerial Equipment. 35-ft. 1 1/2 in. dia. sectional steel mast in divided bag, £4/10/-; 20-ft. lightweight sectional colour-coded whip aerial, with heavy-duty insulated spring base, £2; 10-ft. polished steel tapered whip, 15/-.—Harris, Strouds, Pangbourne, Berks.

**TROPHY** Six, 550 kc to 44 mc, with EF50 pre-selector, £10. 1100-0-1100 250 mA transformer, £3. Both carriage extra, but prefer buyer collect. Inspection invited.—G2HDT, 25 Alexandra Road, Burton-on-Trent, Staffs.

**HALLICRAFTERS** Super Defiant SX125, 12-valve, 42 RF, PP output, S-meter, 6-stage selectivity, crystal, new condition, 38 gns. AVO Oscillator, battery model, £8. Stamp reply.—2 Cliff Road Gardens, Leeds, 6.

**BC342** Re-aligned, overhauled, notched speaker, power transformer, £24 or offers.—GRDT, Redcroft, Eldin Avenue, Cheltenham, Glos. **EDDYSTONE** 2-valve pre-selector and 3-valve 5/10 converter, also power supply for same. Offers to 10 Moor Park Road, Northwood, Middlesex.

SHORT WAVE (HULL) RADIO  
G5GX10/15 WATT PHONE/CW TRANSMITTER  
TYPE SW 15/F

Power Input: 10-20 watts.

Freq. Range: Plug in coils for 160, 80 and 40-metre bands.

Circuit: Pierce oscillator using SP61 valve driving 6L6 PA. Modulator consists of 6J5, 6J5 and 6V6.

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The modulator is intended for use with a crystal microphone.

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Power Supply: Any power supply with 6-3volt heaters and 250-350 volt HT.

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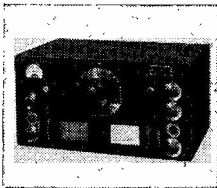
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## SMALL ADVERTISEMENTS

READERS'—continued.

**FIRST** letter secures AR88-LF. Fair condition, cabinet scratched. Without tools, speaker, £40. Buyer collects.—G2NS, 7 Foxholes Road, Southbourne, Bournemouth.

**MIDGET** DC Test Meter, 12 ranges, new, £3. Two Ferranti Multi-Meters, 30/- each. 832, 30/- Valves, Books, cheap. S.A.E. List.—22 Highfield Drive, W. Wickham, Kent.

**WANTED.** R1155 tuning gang condenser. Good condition. Would consider damaged R1155 receiver if gang intact.—34 Pound Avenue, Stevenage, Herts.

**SALE.** DC-to-AC Converter, 230v in, 250v 400 watts out, £6. New unused transformer, 115 v in, 230 v 2 amps single-phase out, £8; or nearest offer. Required: Any type Transceiver for 12v DC power supply. Minimum coverage two amateur bands. Transmitter CW. Offers please.—Box 242.

**HAMMARLUND** Comet-Pro, Xtal model, coils —all Ham bands, £20 or near, plus carriage, or exchange for 50/60 watt Modulator.—40 Dale Lane, Heckmondwike, Yorks.

**NATIONAL** HRO communications receiver, crystal, S-meter. 10/550 metres, complete with speaker. Offers. Would exchange wire recorder.—Box 244.

**RACAR** 88D communications receiver, crystal gate, 10/550 metres, noise limiter, 14 valves, service manual. Offers Box 245.

**HRO** 15-watt amplifier, Rx and Tx valves, and much other gear for sale. 813's, AR88, etc., wanted. Stamp for list.—Box 243.

**FOR** sale. B.P.L. Model R.X.600 Signal Generator, nearly new. Cost £21. £18 or offer.—Box 247.

**H** 550 metres, for sale, £15; or exchange plus cash for BC-342 or 348, or similar.—H.T.B., 3 Hingston Street, Birmingham, 18.

**HRO** SENIOR, special grey enamel, fitted into enclosed professional rack, sloping front, with loudspeaker above and unused Tx control panel below, 230v pack, 4 spare valves, 2 spare coils, spare S-meter. Any test. £55.—GSFH, 17 Knottsall Lane, Lanley, Birmingham.

**160-**METRE Tx, BC-221 as drive unit, all coils and valves, no power supply, £12. BC-221, complete with valves and Xtal, works well, but front panel rough, £5. Cossor double-beam scope, perfect. Offers invited.—Box 246.

**BC348** COMMUNICATION receiver by R.C.A., unused, in mint condition and not interfered with, sacrifice £18.—Davis, Highview, Romeyn Road, S.W.16.

**WANTED** HRO Bandsread Coils, also any condition Senior HRO, or components for same.—375 Harrogate Road, Moortown, Leeds.

**100-156** MC Tx, BC950-1625-1625-832-832, £12. 28/80 mc Tx/Rx, TBY, 7 valves, £8. 30-40 m Rx, R1124, 7 valves, £1/15/- Offers; exchange.—Fox 24.

**VFO** TYPE 145, with power pack, excellent condition, working order, owner going abroad. What offers?—G2FMM, Gorwell Esplanade, Penmaenmawr, North Wales.

**R1132** £4. American Transceiver, 420 mc, £2, Rectifier set, 24v 8 amp DC output. 200-250 input, £6. Generator, 12v input, 600v output, 15/-, 12v vibrator pack, 250v output, 25/-, Transformers: input 200-240, output 250-250 60 mA, 5v 2a 6.3v 2a, 10/-, Ditto, 4v LT (Varley), 12/6. 350-350 60 mA, 6.3v 3a, 5v sa, 12/6, Ditto, 4v LT, 12/6. HR 'phones, 3/6.—G6SC, 7 Rutherford Close, Ewell, Surrey. Ewell 4182. Callers preferred.

**SALE** 1155, modified 6F6 output; 160, 80, 40, 20 Sham bands, 'phone jack, 8-in. energised speaker, separate power pack, £25 or offer. Tx: 6L6 Tritet, meters in screen and anode, coils 20, 10, 10, Xtal, valve, 5s. Taylor AC Bridge, £9. Carbon mikes, 5/6.—G3VX, Sunny Cottage, Donnington Wood, Wellington, Shropshire.

**S-METERS.** 2-in. bakelite, flush mounting, 0-250 Microamp Weston movement. Scale marked "S" Meter, graduated 0-9 and backward reading, 17/6 each.—G3BK, 28 Regent Avenue, March, Cambs.

## SMALL ADVERTISEMENTS

READERS'—continued.

**G3ATU** GUARANTEES the following: Finest oil-filled condensers, 4 mfd, 2000v wkg. 10/3; 4 mfd, 1000v wkg., 5/-; 2 mfd 500v wkg., 2/-; 810's (4), £2/15/-; 872a's, 30/-; Precision Meters by Simpson, Chicago, 3 in. square, DC 0-1000 mA, 39/-; 0-250 mA, 30/-; AC 0-150v, 25/-; RF 0-10 amps, 40/-; Transmitting Variables, 500 mmfd 3000v wkg., 10/-; 200 mmfd 4000v, 15/-; 350 mmfd 6000v, 25/-; Roker House, Roker, Sunderland.

**G5CPOFFERS** unused R. C.A. 5R4GY full-wave rectifiers, 950v 175mA, 12/6 each. American multi-ratio modulation transformers, 200 watt, 25/-; ratio of windings supplied. Mansbridge Paper Condensers, 1000v wkg., 4 mfd, 3/-; 1500v wkg., 1 mfd, 2/6; 35k 60-watt vitreous resistances, 1/6; Black crackle totally enclosed and ventilated slide-in chassis, 20 in. x 5 in. x 8 in., 7/6.—G5CP, 33 Manley Road, Sale, Manchester.

**AR.77E** 10v communication Rx, 31-0-55 mc, calibrated bandspread on 10, 20, 40 and 80 metres, var. selectivity, Xtal filter, noise limiter, S-meter. In FB condition, £37. Demonstration, and buyer to collect.—*Bextleyheath 754.*

**HALLICRAFTERS** HT11, with 12v rotary power unit and handset, ready for operation, what offers? BC348-0, brand new, converted 230v AC, offers over £30. R.1155 with power pack and speaker, offers? 3 in. oscilloscope, Puckle time-base, two amplifiers, offers? 1000v power pack, £12. Ham-built receiver, 2RF, 2IF, BFO, Eddystone parts, £10.—G3LZ, 3 Derwent, Damhead Hall, Warrington, Lancs.

**GERMAN** 7-valve Rx, 2.5 mc-26 mc, continuous bandspread, as new, £10. New B.P.L. Signal Generator, £10. Heavy Rice-Kellog B.T.H. speaker, 1250-ohm field coil, £1/10/-. 30 volumes *Wireless World*, £5.—Box 254.

**FOR** sale. 12 6N7's, 6/- each; 8 6SN7GT's, 6/- each; 4 PX4's, 5/- each. All in perfect condition, almost new.—Box 250.

**RADIONE**, German Comm. Rx, 110-220 AC, 24v DC, 2.5-25.5 mc. Cont. 3 wavebands, BFO, built-in speaker; offers £25. New, pair 4069A's, 3 Eimac 15E's, 6 RCA 1625's, sell or swap. Wanted VHF Converter.—GW8MQ, 53 Little Water Street, Carmarthen.

**REASONABLE** offers for HRO Senior, 4 coils.—Taylor, 2 Southfields Avenue, Gt. Sankey, Warrington, Lancs.

**COMPLETE** B2 Tx/Rx, with power pack, all coils, accessories, two crystals, perfect, £14. S.A.E. list gen.—G8UA, 406 Higher Brunshaw, Burnley.

**FOR** sale, R1155, fully modified, power pack, 6F6 output, 8-in. speaker, £20. BR515, 357.—5 Manor Road, Preston, Paignton, Devon.

**WANTED**—*Radio News* for October and November, 1946. Also *CQ* for May, 1946. Purchase or loan.—Box 249.

**BC221** Frequency Meter for sale, brand new; includes three spare valves and American lightweight headset, £15. Wanted: Hallicrafter Skyriter Marine, good condition, or would exchange.—Stephenson, 16 The Ridgeway, St. Albans, Herts.

**WANTED**—£1 offered Bandspread Dial for Hallicrafter SX24. Urgently needed for replacement.—Box 252.

**BC312N** Receiver, perfect, as new, £14. If less dynamotor, ready for power pack, £13.—G5BM, Berrville, Arle Drive, Cheltenham, Glos.

**SALE**. Complete Tx, including 1,500v power supply, SSA and MOD, TZ40's and UM4, LV power supplies for SA, EXC and Bias; exciter 6L6-807, Buffer TZ40, PA PP35T's, Aerial Tuning Unit, 8 Sangamo Weston mA meters, 2 ditto voltmeters, 0-2,000v m/c and 0-500v m/c. Nearest offer to £120.—Further details, G8RY, 315 Stafford Road, Wolverhampton, Staffs.

**THE** following valves for sale, new and unused: 4 TZ40's at £1 each, 4 829's at £1 each, 4 826's at £1 each, 2 35T's at £1 each, 2 805's at £1/5/-, 1 7, 3 5, 7 mc Xtals, mounted, 12/6 each. D104 Xtal mike, new, £3. IN27 R.C.A. Xtal diode rectifiers, 3/- each. Wee Messer, new, £4. 6 807 R.C.A.'s, new, at 15/- each.—Box 261.

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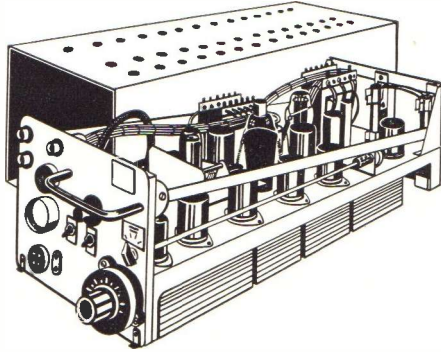
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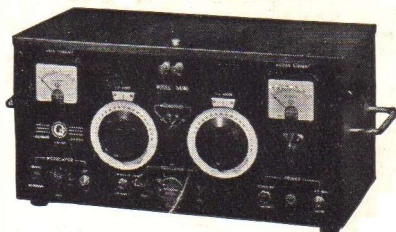
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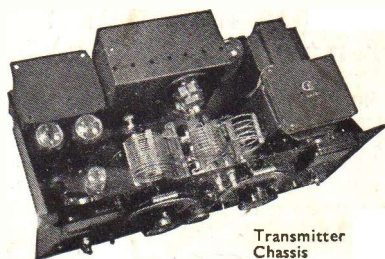
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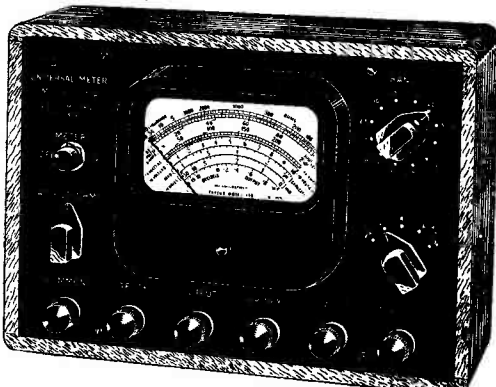
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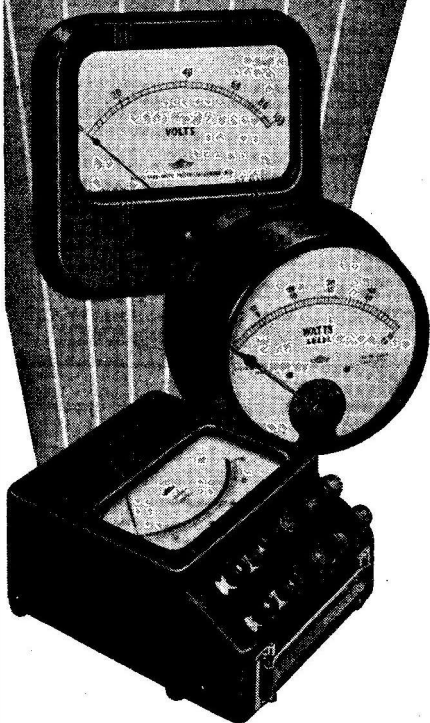
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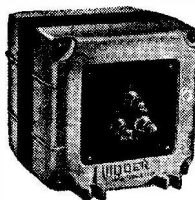
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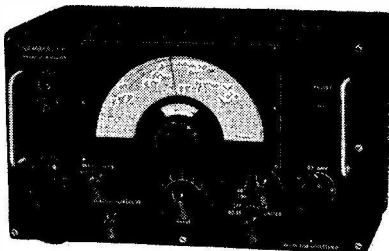
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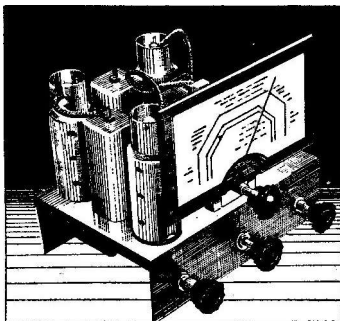
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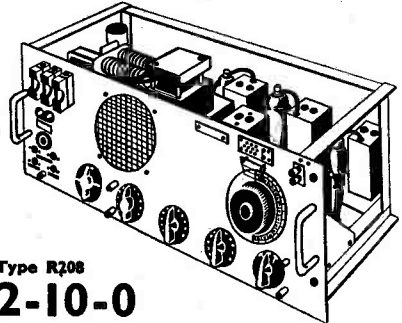
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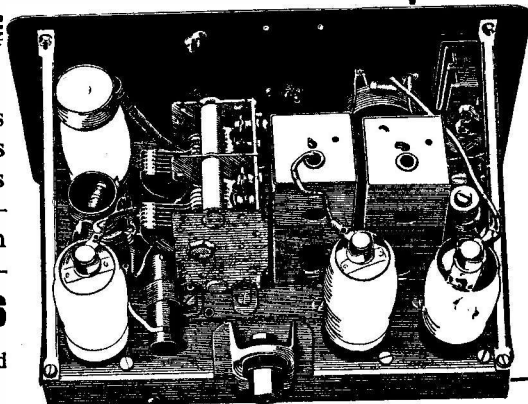
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# SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR & AMATEUR RADIO

Vol. VI

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No. 57

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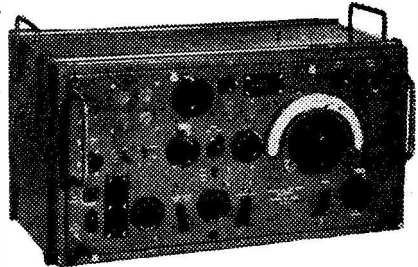
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	450-0-450 v. 150 m/a. Tapped 300 v., 4 v. 3-3 a., 4 v. 3-5 a.	30/-
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32	Output 700-700 v. 150 m/a, 1,000 v. 30 m/a. 4 v. 1 a., 4 v. 4 a.	40/-
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5 ma.	2½ in. . . . .	5/5
150 ma.	2½ in. . . . .	6/-
1 ma.	3½ in. . . . .	15/11
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## EDITORIAL

## Portable

With the prospect of long summer days, many operators will have ideas about the possibility of a little practical work under outdoor conditions—not only organised field days and VHF outings, but more regular activity with portable equipment.

Under present conditions, transport is of course the biggest problem; certainly, the gear, including accessories, can all be accommodated in a couple of small carrying cases, but the prospect of pursuing one's researches by the use of "public transport" alone is enough to daunt all but the most enthusiastic and determined of operators.

However, there seems to be a prospect of some slight amelioration of the situation in regard to "basic," and apart from that, amateurs have always found some way of overcoming difficulties which at first glance appear almost insuperable.

The GPO will issue on request, at a nominal fee, a /P amendment to the normal station licence, which will allow operation under portable conditions anywhere within ten miles radius of a point designated by the licensee. This is a very valuable concession and a facility of which much good use can be made.

The design and construction of compact and efficient portable apparatus calls for a high degree of technical skill, and the achievement of good results with inputs of a few watts to such apparatus can be a very satisfying reward. For those hemmed in by bricks and mortar, there is also a lot of interesting and instructive work to be done with different types of aerial, which can usually be prepared beforehand and slung up quickly at the site.

We would suggest that amateurs generally give much more attention to the practical problems of operation under portable conditions—there is much valuable experience to be gained and huge enjoyment to be derived from a day spent at a /P location.

*Austin Frost 1/2 6660.*

# Wide-Band RF Pre-Amplifier

British Version of the "R9'er"

By G. A. HUME (G5UX)

*(It is widely known that a good RF pre-selector will improve almost any communications receiver, especially at the upper end of the tuning range. The "R9'er" has been well spoken of in the States for the past year. It is a broad-band fix-tuned RF amplifier and is claimed to give high gain on 28 mc. Here are the details of a unit on the principle of the "R9'er" and designed for 10 metres.—Ed.)*

AS a result of numerous contacts with American stations, the writer became interested in an RF amplifier known in the States as the "R9'er." Every station using this amplifier was very impressed with the gain, performance and particularly with the fact that the unit was small, could be built into existing receivers and required little or no tuning. A few enquiries round the local stations revealed a growing interest in this amplifier although information regarding mechanical layout and design was extremely sketchy and components were apparently difficult to come by.

With the assistance of several W's, particularly W6LRU, mechanical details and photographs of the original design were obtained and it was decided to build the unit using components which could be bought fairly easily in this country.

This article has been written at the request of numerous stations operating on the 10-metre band who had obtained some information and circuit arrangements from the States but who had had little success with the completed job. No originality is claimed for the amplifier, which was devised and built by the G.E. Co. of America and originally published by them in December 1946—but a great deal of spadework has been done in getting the unit working with British components.

The writer's prime interest was to obtain maximum performance on 28 mc, particularly as the majority of modern communication receivers tend to fall off when approaching this frequency; hence, the unit has been built for that band only, although in the original design a system of plug-in coils enabled it to be used on 14, 28 and 56 mc. After several months of experimenting a design was evolved which gives considerable gain and has an excellent signal-to-noise ratio.

## Performance Characteristics

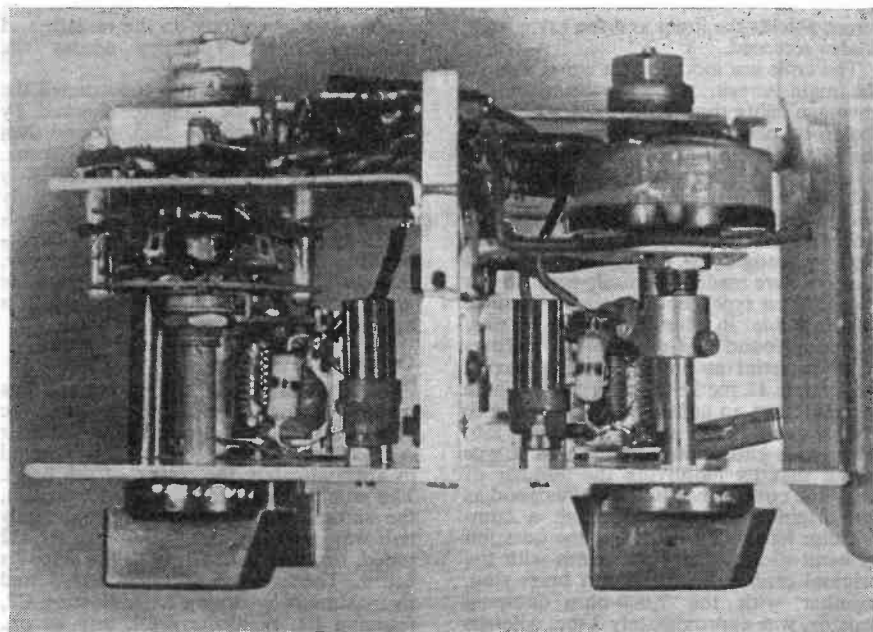
The unit to be described is an electronic impedance matching device and a broad-band amplifier giving maximum performance on 28 mc. The gain achieved depends to a certain extent on how well the receiver is matched to the receiving aerial, but the *minimum* gain which may be expected is from 25 to 30dB. This is actual measured gain and was checked and rechecked using several communication receivers, including the National HRO and NC100XA.

The gain is obtained in two ways—first by careful input and output matching. In the normal amateur station the aerial-to-receiver matching is given very little consideration, although considerable time is usually spent in matching the radiating system to the transmitter. In these days of multi-element aerials on the higher frequencies, increased power and generally higher efficiency, it is the writer's belief that the limiting factor in any amateur station is the receiver. In broad terms, almost irrespective of power it is possible to work practically anything that can be received.

The majority of communication receivers have, according to the manufacturers, a nominal input impedance of 250 to 500 ohms. This may be perfectly true for the lower frequencies, but tests have revealed that the input is nearer 2,000 ohms at 28 mc. This discrepancy is bad enough, but usually a 72-ohm line links the receiver to the aerial, and so the loss in gain due to the mismatch is considerable.

A series of tests was carried out using several aerials with different receivers and it was found that by careful attention to this matter of matching the aerial into the receiver gains varying between 5 and 20 dB could be obtained.

Apart from the increase possible by careful input and output matching, the



General layout in G5UX's version of the "R9'er."

American 6AK5 miniature valve acting as a broad-band amplifier will give an additional gain of up to 25dB. At the writer's station 'phone carriers which could only be detected by using the BFO were resolved into quite intelligible and workable speech by use of the unit to be described.

### Circuit

Referring to Fig. 1, the circuit arrangement consists of a broad-tuned grid, a broad-tuned plate, a standard cathode circuit and an adjustable screen supply. The by-pass condenser C5 is used in order that the variable C7 may be operated with the stator grounded. Co-ax cable or twin transmission line may be used for both the input and output sides, and in the case of single-wire feed it should be connected to the junction of C1 and C2.

Condensers C1, C2, C6 and C7 form the impedance matching input and output circuits, and with the constants shown the unit will match any input or output impedance from 40 to 2,700 ohms.

It is very important that the other circuit values should be strictly adhered to—even in the case of by-pass condensers—otherwise the band-width is upset. The measured

band-width of the unit is approximately 1 mc at 28 mc, and over this range the unit will give reasonably uniform gain. The general construction and layout is important, the 6AK5 being mounted horizontally with the grid-pin projecting on one side of the screen. The actual positioning of components is not too critical and providing reasonable care is taken no trouble should be experienced. Inadequate shielding may lead to instability and will prevent the unit from functioning properly.

### Constructional Details

The unit is built in a 3 in. × 4 in. × 5 in. aluminium box and all components are mounted on the front panel. The dividing screen between grid and plate circuits is made of 3 in. × 4 in. ×  $\frac{1}{8}$  in. aluminium and it is essential that this be a good fit and securely bolted to the front panel.

Three plugs are provided as follows: at the top for the output, the middle for power supply and the lower plug is the input. Two further screens are mounted on the main screen, the upper one carrying the change-over switch and the lower one the screen potentiometer. A further small

screen shields the input and the valve itself is also screened.

The coils are mounted on either side of the main screen, the adjustment of the coverage being through clearance holes in the front panel, and the screen carrying the switch is built across the valve holder so that the grid is entirely screened.

Little difficulty should be experienced with the actual construction as in the writer's case the unit was built entirely from photographs. The original coil formers were made of ceramic with a brass slug (Millen type), but these are of course unobtainable in this country. It was, however, found that amongst the surplus RAF material at present on the market were some 12 mc IF transformers. These formers have an adjustable dust-iron core and seemed to be suitable for the job. Numerous checks were made and it was found that by modifying the number of turns the coils proved to be just as good as the original ceramics, although a compromise had to be struck on the question of band-width. The band-width with the original ceramic formers with brass slug, together with the 7,000-ohm damping resistor, was approximately 2 mc, whereas with the dust-iron core no better than 1 mc could be obtained. The 1 mc band-width at 28 mc was considered satisfactory, especially as the normal operating band for G stations appears to be about 1 mc, *i.e.* mostly between 28 and 29 mc.

The gain of the unit is almost entirely dependent on the construction of coils, and it is stressed that the wire gauge must be right and the coils wound in one layer so as to obtain maximum Q. Enamelled wire may be used providing there is no sign of the enamel being cracked or chipped. The matter of stressing maximum Q may at first seem a little strange when the coils are heavily damped with the 7,000-ohm resistor; but a little consideration will show that unless maximum Q is obtained in the undamped state the band-width will be materially altered when the damping resistor is added. The band-width

should depend entirely on the resistor and the distributed capacities across the circuit.

With the unit as finally constructed the band-width can be roughly checked by setting the frequency to 28.5 mc and then carefully tuning over the band 28-29 mc. The background noise should be fairly constant over this range, falling off slightly at the ends. If it is found that the band-width is greater than 1 mc and it is impossible to obtain greater coil efficiency, the 7,000-ohm damping resistor should be gradually increased until the band-width is approximately correct.

### Operation

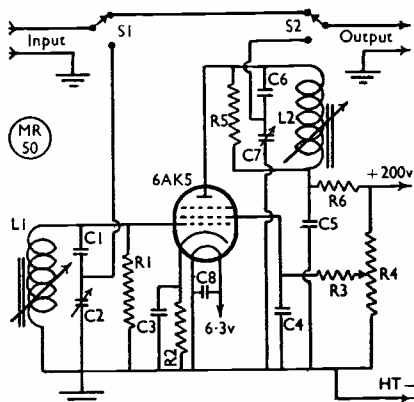
With the input and output connections made to the aerial and to the receiver, the switch S should be set so that the amplifier is cut out and the receiver tuned to a signal in approximately the centre of the band. The amplifier should then be switched in, the screen control set to approximately half-way position and the condenser C2 tuned, together with L1, until the signal is heard. The signal should then be adjusted to maximum by tuning L1, adjusting C2, retuning L1, readjusting C2, and so on. This process should then be repeated with the plate circuit C7 and L2. If C1 is found to be at maximum capacity the length of the aerial must be altered. Conversely, the length of the line between the receiver and the amplifier must be altered if C7 does not tune near its middle capacity setting. To correct this, add a quarter wave and prune, until the condenser peaks the signal at approximately centre scale.

With the unit finally peaked, the screen

### Table of Values

#### Wide-Band RF Pre-Amplifier

C1, C6	= 5 $\mu$ F, ceramic
C2, C7	= 100 $\mu$ F
C3, C4, C5, C8	= .0005 $\mu$ F, mica
R1, R5	= 7,000 ohms, $\frac{1}{2}$ -watt
R2	= 200 ohms, $\frac{1}{2}$ -watt
R3	= 15,000 ohms, $\frac{1}{2}$ -watt
R4	= 25,000 ohms, heavy-duty potentiometer
R6	= 10,000 ohms, 1-watt
L1, L2	= 13 turns 28 SWG on slug-tuned former
S1, S2	= DPDT wafer switch, ganged



Circuit of GSUX's version of the American "R9'er."



potentiometer should be adjusted for maximum output consistent with minimum screen volts. Once these adjustments have been made the unit may be forgotten as far as the operator is concerned, for it will give maximum output over the entire band without any additional tuning.

The unit as described will give excellent pre-amplification gain over the 10-metre band, and stations have been worked that

were inaudible on the original receiver. When the receiver is required to operate on other bands the amplifier is switched out by means of switch S1/S2.

It is hoped that in a further article it will be possible to give details of a system of plug-in coils for use on 5, 10 and 20 metres. The writer is indebted to the G.E. Co. for the original data on what they have called the "R9'er."

---

## Crystal-Checked VFO Drive

### Economical Method of Calibration

By R. J. DONALD (G3DJJ)

EVERYONE agrees that a good VFO has certain definite advantages over the crystal oscillator in the exciter stage of an amateur transmitter—but it also has certain definite disadvantages, not least of which is the necessity for some form of frequency measuring gear. The GPO rightly insist on equipment of very high accuracy in this respect, and the regulations lay down that it must be used whenever the frequency of the transmitter is changed.

Crystal wavemeters as such have two disadvantages; first, they can be expensive even when bought on the surplus market, and secondly, they require a good deal of attention on the part of the operator when in use. The writer recently found himself faced with the preliminaries to getting on the air for the first time and therefore set to work to produce something which would (a) satisfy the GPO, (b) not involve too much expense, and (c) allow foolproof one-hand operation without sacrificing accuracy.

The notes below explain how this was achieved.

#### The Principle

The usual method of frequency measurement is to compare the VFO fundamental with the harmonics of a crystal standard such as a 100 kc bar, but equally accurate frequency measurement can be carried out by comparing the *harmonics* of the VFO with the harmonic of a suitable standard such as a 1 mc crystal oscillator. In the latter case, of course, the beats will not be equally spaced, nor will they be of equal strength, but that does not matter.

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This article describes how a 1 mc crystal oscillator can be employed to provide calibration check points for a VFO. Though applied to a Type 145 driver unit, the system is adaptable to any VFO, using crystals of different frequencies and known calibration.—Ed.

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In practice a triode valve such as the triode section of a 6K8 frequency changer can be operated as a reference standard with a 1 mc crystal in its grid circuit and its tank tuned to give steady oscillation. With about 100 volts of stabilised HT, it will generate a long line of harmonics extending into the very high frequencies. If a signal from the VFO (which of course also contains a harmonic content) is fed into the mixer grid of the 6K8, beat notes will appear in the anode circuit of the valve. Whenever the sum or difference between a harmonic of the VFO and a harmonic of the crystal falls within the tuning range, a beat note will appear. A stage of resistance-coupled AF amplification will increase the strength of these beats, with headphones as an indicating device in the anode circuit. Fig. 1 shows the circuit.

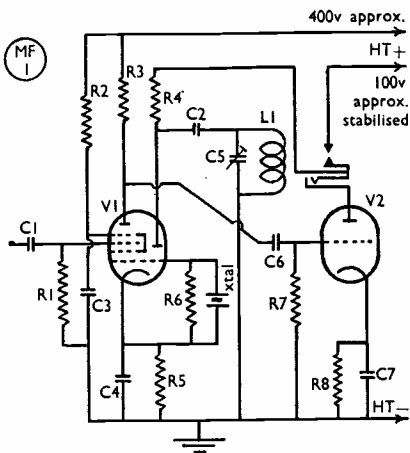
#### Construction

It is not proposed to go into great detail regarding the construction of the unit, since anyone who decides to use the system will have their own ideas on the subject. Harmonics from the crystal up to the 46th at least are required, and therefore suitable care must be taken with the choice of components. The valveholder for the 6K8 should be ceramic and the

Table of Values

Fig. 1. Crystal Checker for the VFO

- C1 = .00001  $\mu$ F  
 C2 = .002  $\mu$ F  
 C3, C4 = 0.5  $\mu$ F  
 C6 = .05  $\mu$ F  
 C7 = 25  $\mu$ F, 25<sup>v</sup> volt DC  
 V1 = 6K8  
 V2 = 6J5 or similar  
 R1, R6 = 1 megohm  
 R2 = 68,000 ohms, 2 watt  
 R3 = 100,000 ohms, 1 watt  
 R4 = 30,000 ohms  
 R5 = 300 ohms  
 R7 = 500,000 ohms  
 R8 = 1,000 ohms  
 L1/C5 = 1 mc  
 (Broadcast aerial coil with coupling winding removed and compression type .001  $\mu$ F trimmer.)  
 Xtal = 1 mc



G3DJJ's circuit for applying a 1 mc crystal calibrator, with AF amplifier, to the Type 145 Oscillator. The method of taking out check points is described in the text.

condensers C1 and C2 should be silvered mica type. If the unit is to be built into a low-power VFO unit, care must be taken to keep the VFO oscillator and the crystal oscillator well apart to prevent RF from the crystal side getting into the drive circuit. Coupling to the mixer valve should be from the last buffer, and the unit must be carefully shielded.

The writer was fortunate enough to obtain an Oscillator Type 145. This is an excellent unit containing an 807 as drive oscillator, and covers from 1.8 to 8.0 mc in two bands, with a dial that can be read to very high accuracy. In its Service use it is operated with about 500 volts HT, and it contains four neon regulators to stabilise this voltage. First, one of these was removed so as to use it on just under 400 volts, and the screen voltage reduced somewhat so that the anode current fell to about 15mA. Some other unwanted parts were also removed and room was thus made for the 6K8, crystal and oscillator tank coil contained in a small can, on the top deck of the 145 chassis and to the rear, with their associated parts grouped around the valve holder below the chassis. A 6C5 audio stage was fitted in the mounting previously accommodating the stabiliser, and a 'phone jack was mounted on the front panel. This jack was arranged so that removing the plug disconnected the HT from the crystal oscillator anode as well as from the AF amplifier, so as to prevent stray pick up of 1 mc harmonics in the receiver.

### Calibration

It will be clear that a very large number of beat notes will be audible and the first job is to sort them out—but this is not nearly as difficult as might be expected. By a little simple arithmetic the points on the VFO range which will result in beat notes can be worked out beforehand! To do this first write down a list of crystal harmonics and divide each by whole numbers thus:—

6000 ÷ 2 = 3000	9000 ÷ 3 = 3000	13000 ÷ 4 = 3250
7000 ÷ 2 = 3500	10000 ÷ 3 = 3333.3	15000 ÷ 4 = 3750
8000 ÷ 2 = 4000	11000 ÷ 3 = 3666.6	18000 ÷ 5 = 3600
8000 ÷ 3 = 2666.6	11000 ÷ 4 = 2750	19000 ÷ 5 = 3800

When the quotient expressed in kc falls within the normal tuning range of the VFO a beat will be heard in the 'phones when it is tuned through that frequency. For example, when the VFO is tuned to exactly 3666.6 kc its third harmonic will be on 11 mc and will be at zero beat with the 11th harmonic of the crystal oscillator.

For the benefit of anyone who might care to use the system with a VFO covering 3.5-3.8 mc, a list of check points used at G3DJJ is given in a separate table.

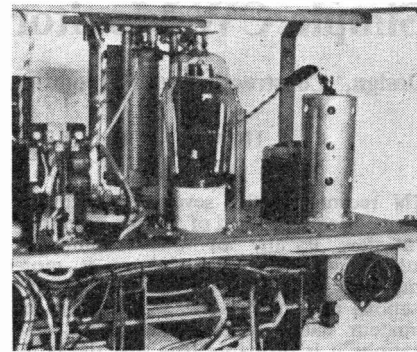
When worked out and identified on a calibrated receiver the check points should be plotted on a large-scale graph.

### Operation

If the audio output is wired into the headphone circuit of the receiver, operation becomes simple, quick and completely legal. One cannot shift frequency more than a few kc without passing a beat note,

Beat-notes and Harmonic Relationship in the 3.5-4.0 mc Range with a 1 mc Crystal

VFO Freq. (fundamental) to nearest kc	Order of Harmonic	-1 mc Xtal Harmonic
3,500	2	47
3,538	13	46
3,545	11	39
3,555	9	32
3,571	7	25
3,583	12	43
3,600	5	18
3,625	8	29
3,636	11	40
3,666	3	11
3,700	10	37
3,714	7	26
3,727	11	41
3,750	4	15
3,778	9	34
3,800	5	19
3,900	9	36
4,000	1	4



The 1 mc crystal oscillator stage, with its AF amplifier, can be mounted in the space left by removal of the barretter in the Type 145 Oscillator.

and a rapid glance at the graph will satisfy the operator as to his frequency.

Before making the final calibration chart, it is desirable to make sure that the crystal really is what it purports to be. In the case of 1 mc crystals this can be done easily by checking the second harmonic against the standard frequency transmission from GMT on 2 mc (this is radiated daily from 10.00 to 10.15 hrs on weekdays)—or on the various frequencies of WWV.

Correct operation of the following stages of the transmitter should be carried out by means of an absorption type wavemeter, as in the case of crystal control.

**Conclusion**

Of course, there is no special reason for using a 1 mc crystal; any crystal of known and checked calibration accuracy could be employed. One ground for 500 kc, or for a frequency in the 1.7 band would be quite suitable, except that there is the added complication in the initial working out of where the beats should appear.

When applying for his licence the writer explained the apparatus described here and also said that he was not in possession of a crystal wavemeter as such. The licence was duly granted, so that it may safely be assumed that the system meets with official approval.

**UNLICENSED GERMAN STATIONS**

Once again—all calls other than those prefixed D2, D4 and D5 are pirates operating in defiance of their respective Zone authorities. It does not make the task of our own people in Germany any easier if the DA's are encouraged in their unlawful activities by finding that G's are prepared to work them. We know that the DA's now have what amounts to an "underground" organisation, which has divided the country into "call areas" for the purpose of "issuing" licences. We know that they operate a QSL Bureau, and are ready to exchange cards for all contacts made. But we also know that such activities can only delay in the long run the issue of licences to those German nationals who are not breaking the law, and that the DA's caught are not just getting off with a fine and a reprimand—

they are "going inside" for six months.

We agree that all this is very hard on the keen German amateur who just wants to be on the air like the rest of us, with no fell intent or evil purpose. But the thing to remember is that if the outcome of the war had been the other way, the penalty for defying the occupying authority in this manner would have been the bullet, with no time wasted. The Nazis would not for a moment have tolerated anything in the nature of amateur operation, which even in their own country was very tightly controlled before the war—on much the same lines, incidentally, as it is in Russia to-day.

Our suggestion is that all G's should reflect on these facts before calling or working a known pirate in the Occupied Zones of Germany.

# Simple CW Monitor

## Design, Construction and Operation

By J. HUM (G5UM)

IN recent months several descriptions have been published of 'phone monitors, but few if any of CW monitors—suggesting almost that 'phone is more important than CW! Though telephony stations may make their presence on the amateur bands more obvious than CW stations it is probably true that the latter outnumber them several fold; it is felt that the design of a good and reliable—but ultra-simple—CW monitor will have a considerable appeal. Particularly for the new "G3-plus-three's" coming on in large numbers at the present time, such a piece of equipment will be found most useful, because in the early, *ab initio* days of halting Morse sending (ex-Service operators excluded!) some means of checking the character of the transmitted telegraphy is practically indispensable.

In the writer's description of the "No Cost Five" in the September *Short Wave Magazine* the suggestion was made that monitoring of the transmitter in question could easily be effected by means of a simple 1-valve reacting detector housed in a screened box. It is now proposed to describe this useful piece of equipment in more detail.

### Battery or Mains?

Tradition has it that a CW monitor should be a completely self-contained battery-driven device capable of being carried round the room if desired, completely independent of the main transmitter. While designs of that type have their attractions they suffer, in the writer's estimation, from a quite unnecessary "messiness." The batteries must be contained within the case, in which position all too frequently they set up corrosion—yes, even when they are of the "all-dry" type. Moreover, in battery-operated monitors it is necessary to employ types of valves which are probably not used in any other equipment in the station, thus complicating the spares problem; on the other hand, those ancient 2-volt battery valves can often be used up in such equipment, if one is prepared to accept their associated batteries, and the fact that they have poor performance at the higher frequencies.

Discarding the traditional form of battery-driven CW monitor, the writer sought to design a more up-to-date mains operated type which would meet all the requirements demanded by present-day conditions. Its specification was set down as follows:

(1). It should be compact, and take up the minimum possible space on the operating desk.

(2). It should employ only one reacting detector valve.

(3). It should tune to all amateur bands from 160 metres to 10 metres, using switchable coils for quick band-changing.

(4). It should have one-knob control, and no fiddling adjustment of regeneration should be necessary.

The circuit of the monitor is shown in Fig. 1. It meets the requirements mentioned in the following respects:

(1). It is compact, and is housed in an aluminium case measuring 8 ins. tall by 5½ in. wide by 6 in. deep. Any metal case would do, of course, provided it were equally economical of bench space. Small biscuit tins, or even those cylindrical jobs beloved of manufacturers of milk foods would do—do very well, in fact.

(2). Its single valve is the ubiquitous—one might almost say inevitable—EF50, triode-connected for maximum docility as in the original "All EF50 TRF Receiver."

(3). Three sets of coils are provided which cover the five major amateur bands. Since switchable coils are used no attempt has been made to add the 5-metre band to this monitor, though the more ambitious constructor should not find this a very difficult proposition.

As is customary at G5UM, the monitor was made up from parts which happened to be lying unused in the junk box. Among those parts was a Polar "Ideal" condenser, which is—literally—ideal for a job of this nature. It employs a built-in slow-motion movement which is absolutely silent in operation even at 10 metres, and it has two concentric knobs giving direct or slow-motion drive. These are marked in degrees, which is perfectly adequate for use in a monitor, where precise scale calibration is unnecessary. Its capacity of 250  $\mu\mu\text{F}$  enables it to tune to two amateur bands with any one coil. If this type is not available any well-built variable condenser of the same capacity will serve.

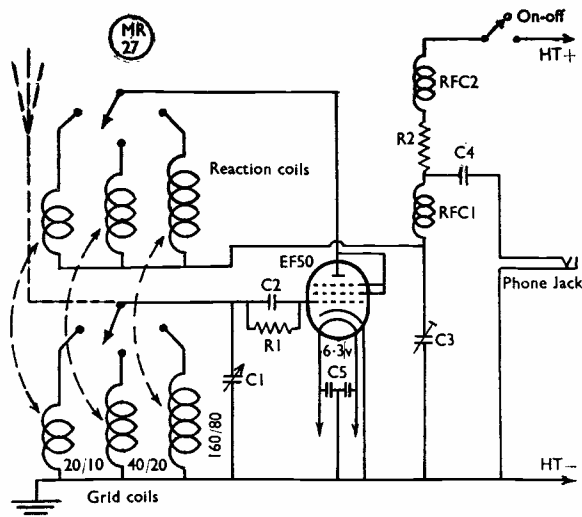


Fig. 1. Circuit diagram of the band-switched monitor.

### Table of Values

Fig. 1. Simple CW Monitor

C1 = 250  $\mu$ F, with slow-motion drive

C2 grid condenser = 100  $\mu$ F

C3 pre-set reaction = 100  $\mu$ F

C4 audio coupling = .01  $\mu$ F

C5 hum-bucking = .001  $\mu$ F

R1 grid leak = 2 megohm

R2 anode load = 30,000 ohms

#### Coils :

160/80 : 60 turns grid, 15 turns reaction, 36 SWG

40/20 : 15 turns grid, 8 turns reaction, 24 SWG

20/10 : 4 turns grid, 2 turns reaction, 24 SWG

All on  $\frac{1}{2}$ -inch diameter bakelite formers, close-wound. Slight variations in number of turns may be needed to take up variations in individual circuit layouts.

RFC1, RFC2 = Ordinary broadcast type chokes.

### Adjusting the Coils

As the diagram shows, a multi-contact wavechange switch is employed. Three of its contacts bring in the grid coils. Three others bring in the reaction coils. In point of fact, there is no need to switch the reaction coils, because they do no work when their respective grid coils are out of operation, but for maximum circuit isolation the constructor may prefer the slight additional complication of the extra switching. Incidentally, a single-wafer Yaxley with two sets of three contacts each is all that is needed for the wavechange switch.

Because a monitor of this type should for preference employ one knob control, no variable reaction condenser is provided on the control panel. Indeed, a slot-adjusted variable air condenser is mounted on the chassis deck, pre-set once and for all. This necessitates a certain amount of juggling with the position of each reaction coil in relation to its grid coil to ensure that steady oscillation is obtained on each band, but the exercise of a little patience in this respect is well repaid. Of course it is possible to take the easy way out and mount the reaction condenser on the front panel so that it can be adjusted for oscillation on each band, but that rather

defeats the object of making the monitor one-knob control.

Unless the constructor is very lucky it is unlikely that he will obtain oscillation on all bands at exactly the same point on C3. This does not matter at all, because no attempt need be made to have the EF50 just on the verge of oscillation—its most sensitive state—since it will not be required to pick up weak signals. All it is called upon to do, in fact, is to pick up a strong signal from the station transmitter, and “verge of oscillation” working is not needed for that. If oscillation cannot be obtained the reaction windings should be reversed. If still “no joy” add more reaction turns—but cut them down later to the minimum needed to sustain oscillation.

When steady oscillation has been obtained on each band, the reaction coils should be fixed permanently in position with Chatterton's Compound. The “20/10” coil will probably be the most difficult to adjust to ensure that the monitor oscillates smoothly and steadily on 20 metres with the tuning condenser almost full in but does not go into violent squeeging on 10 metres when the tuning condenser is almost full out.

### Other Features

Some simplification of the output circuit may be achieved by eliminating R2 and inserting the headphones in its place (eliminating C4 as well, of course).

If then the headphone jack were not made self-closing the monitor HT would be switched off when the headphones were withdrawn. Personally, the writer prefers the arrangement as shown, with a separate on-off switch to remove the monitor signal from the receiver. The choke RFC1 may not be necessary. If the monitor works satisfactorily without it then eliminate it! The choke RFC2 is intended to isolate the HT input lead to prevent too much RF being picked up from outside.

### Power Supply

The monitor requires the usual 6.3 volts for its heater, and a low value of HT for its anode, both of which may be obtained from any external power pack feeding other equipment and capable of sparing another 5 or 6 mA.

An HT voltage of 50 should be quite adequate. It may even be found too high. The compromise at which to aim is steady oscillation on all bands without paralysis of the detector on any of them. The detector will almost certainly be paralysed by a strong local signal if too high an HT voltage is applied to it.

### Operation

Before putting the monitor into operation it should be roughly calibrated by beating it against a transmitted signal and noting the scale reading at which each band appears. The coils have been proportioned so that they cover one

amateur band at the top end of the condenser travel and another at the bottom end. Minor adjustments should be made to the coils to achieve this coverage.

While the monitor is being calibrated the constructor should observe whether it is receiving a clean, pure note from the transmitter or whether it is "killed" by the transmitted signal. As has been said, too much HT voltage may cause this effect. On the other hand, more adequate screening of the monitor might cure it. If the signal picked up should be too weak a short "aerial" consisting of six inches of covered wire can be soldered at point X in Fig. 1 and carried through a hole in the side of the cabinet. Unless the monitor produces a pure, clean beat-note from a local signal it is worse than useless.

The monitor, will, of course, pick up harmonics from the transmitter. These should never be used; they do not give an accurate picture of the transmitted signal. Only by listening on the fundamental can an operator determine exactly the quality of his telegraphy. Whether for instance, it is emitting "whiskers" on either side of the fundamental, or whether his VFO is as chirpy as some of those we hear.

To employ the headphones at will with either the monitor or the receiver a switching arrangement should be employed. A double-pole change-over toggle switch mounted on a small panel is connected so that the headphones may be thrown over to either piece of equipment.

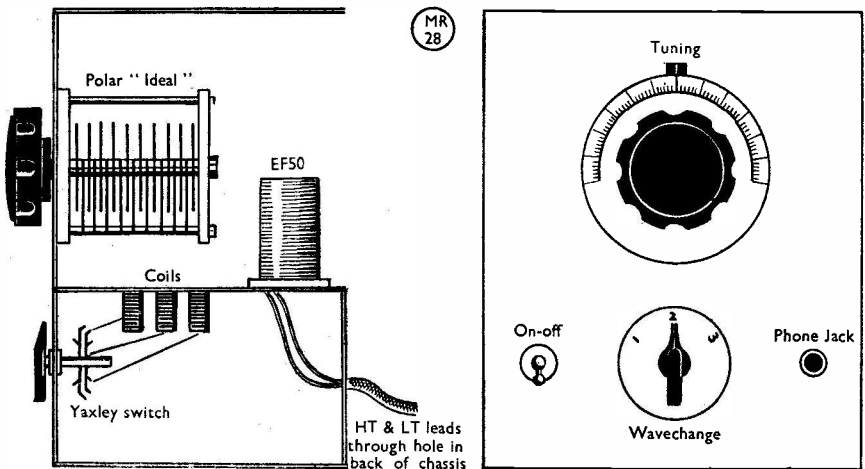


Fig. 2. Suggested mechanical layout for construction of the monitor.

# The Type 145 Oscillator

Design Details—Circuit Arrangement—Operation as VFO

by N. P. SPOONER (G2NS)

WHILE more and more Government surplus equipment becomes available, the flow of authentic information concerning much of it appears to be meagre in comparison. The Type 145 oscillator is no exception, and although a considerable number are now in amateur use, there are many interesting points about the equipment still not generally realised.

An Air Ministry publication records the coverage of the war-time ground station transmitters of American make (officially labelled as the ET4332 and the ET4336) as being from 2 to 20 mc, with the CO operating on its fundamental frequency. Apparatus Kit Type 74/74A was then designed to provide for these transmitters additional MO control by means of the Type 145 oscillator and the Type 392 power pack, both of which would bolt to the side of the main transmitter cabinet. These two units were common to both kits, but the 74 included a Type 38 aerial coupler that would fit into the top of a transmitter. Since their post-war release for sale it is to the Type 145 oscillator that amateurs have been attracted.

## Power Pack

Commencing with the 392 power pack, this consists below chassis of three  $4 \mu\text{F}$  1,000-volt working condensers and one 10H 70 mA LF choke. Above chassis is an AC mains transformer tapped for 200 to 245 volts input and giving outputs of 700-0-700 volts at 70 mA, 4 volts at 2.5 amps for two CV54 or VU133 rectifiers, and 12.5 volts at 1 amp for the heater of the 807 valve (CV124 or VT60A). This 12.5-volt supply was to be barrettered down to 6.3 volts to maintain a steady heater current under mobile operating conditions. The top-deck components are the two rectifiers and a 20,000-ohm, 45-watt voltage-dropping series resistor. While it is generally accepted that a "nominal 600 volts" should be supplied to the unit it will be found that the four CV45 neon stabilisers will fail to strike with too low a voltage, while with too high a one they will over-work themselves

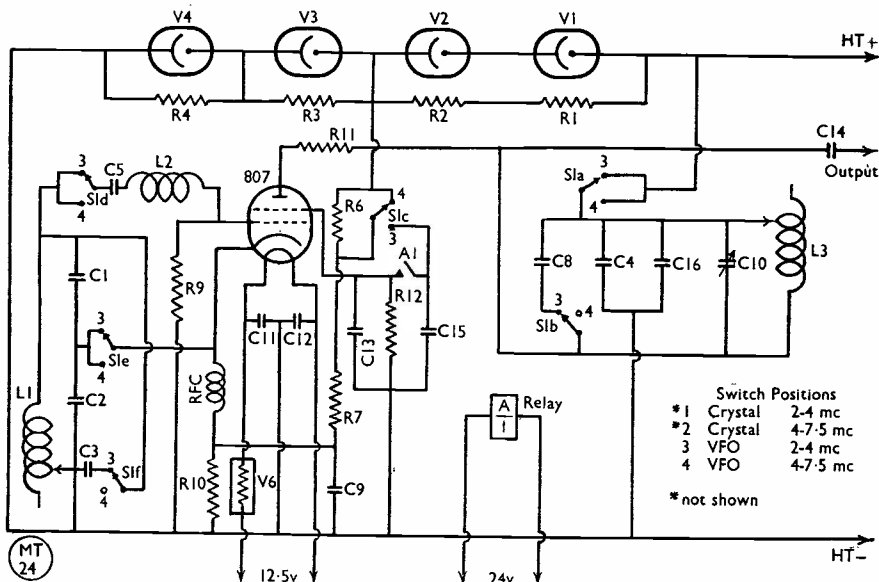
(Many Type 145 Oscillators—an ex-Service drive unit—are in use, and provided certain precautions are taken, are found to have excellent characteristics as VFO drivers on the amateur bands. The Type 145 has many interesting mechanical and electrical features of which some owners may not be fully aware. This article is an authoritative and detailed discussion on the design and operation of the unit.—Ed.)

without properly stabilising the supply. About 120 volts are dropped across each of the neons, rated as having a "maximum striking voltage of 180 and a normal stabilised voltage of 130." It therefore amply repays one to experiment with the HT voltage until the happy medium is found where a meter in the HT supply line to the unit shows practically the same steady reading of round about 50 mA or so whether the key is open or closed.

Under Service conditions the 807 was rated as having a plate dissipation of 25 watts with 300 volts on the screen and 600 volts on the plate. Keying is in the



General view of the Type 145 Oscillator. Controls are : Bottom left, vernier shift ; middle left, main dial ; upper middle, tank trim ; upper right, wave-change. Lower right is the crystal holder.



Circuit of the 145, less crystal switching. The unit is neon-stabilised and will give an excellent drive output on 3-5 and 7 mc.

### Table of Values

#### Type 145 Oscillator

C1, C2	= 560 $\mu\text{F}$
C3	= 240 $\mu\text{F}$
C4, C11, C12, C15, C16	= .01 $\mu\text{F}$
C5	= 47 $\mu\text{F}$
C8	= 200 $\mu\text{F}$
C9	= 0.1 $\mu\text{F}$
C10	= 50 $\mu\text{F}$
C13	= 100 $\mu\text{F}$
C14	= 40 $\mu\text{F}$
R1, R2, R3, R4	= 1,000-ohm, $\frac{1}{2}$ -watt
R6	= 4,700-ohm, 1 watt
R7	= 33,000-ohm, 1 watt
R9	= 20,000-ohm, $\frac{1}{2}$ -watt
R10	= 1,000-ohm, 1 watt
R11	= 150-ohm, $\frac{1}{2}$ -watt
R12	= 100,000-ohm, $\frac{1}{2}$ -watt
V1, V2, V3, V4	= CV45 neon stabilisers
V5	= 807 (CV124 or VT60A)
V6	= Barretter
L1	= Grid Coil
L2	= Feed back
L3	= Plate Coil
RFC	= 1.5 mH RF choke
A1	= Keying relay

screen by means of relay contacts, the relay itself being a 1000-plus-1000 or an 850-plus-850 ohm magnetic 24-volt type known more generally as a Siemens high-speed keying relay. It will operate on about 16 volts, or can be replaced by one less ambitious.

### Type 145 Oscillator

Each component is numbered for

identification and reference, some having also a stores reference number. A condenser and resistor mounting-board below chassis reading from front panel towards rear of unit holds R1 to R4, R6, R7, C7, C6, R10, C9, RFC, R14, R13. Viewed from underneath, the valve-holder panel holds R12 and C13 above L2, C15 with C11 and C12 below L2 and to the right of L2 is R9 and C5. A 100,000-ohm resistor R12 and a .01  $\mu\text{F}$  condenser C15 form an effective key-click filter. The 807 plate lead includes a 150-ohm parasitic suppressor R11 and the cathode is given a small positive bias by voltage drop across 1000-ohm R10.

The front-panel main tuning dial by means of gear-drive simultaneously adjusts the grid coil L1 and the plate coil L3, and the number of whole turns in circuit in both coils appears in the calibration window, while the fractions of a turn can be taken from the dial circumference, readable to one tenth of a degree. This is accurate and extremely useful when re-setting to a desired frequency. As the main tuning dial is operated a contact wheel travels along the windings of each coil and it pays to keep condenser spindles, coil spring leaves, coil windings and contact wheels free from dirt and dust by occasional brushing with "Thawpitt,"



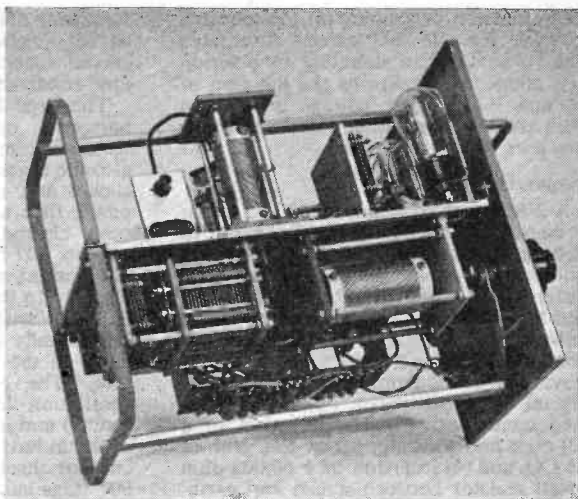
commercial alcohol or carbon tetrachloride in order to avoid a poor wheel-contact, producing an annoying row of "whiskers" on the signal. These will be heard and quickly found in a monitor or when beating against a received signal. Likewise, if the locking knob of the main tuning dial is screwed home too tightly these whiskers may again reappear.

The front-panel fine tuning dial is used to rotate a cam and rock a bar that will move the coil driving shaft through one division for slight QSY after the locking knob on the main tuning dial has been screwed home. With the locking knob unscrewed the fine tuning dial becomes inoperative.

Condensers C1 and C2 have a fixed plate mounted on zero temperature-coefficient metal and a moving plate mounted on brass rods. Expansion and contraction of these rods varies the compensating plate-gap and stabilises the oscillator frequency with changes of temperature. Three sockets on the front panel accommodate any one crystal-holder having either British or American pin-spacing. The front panel dial marked "Anode Trimmer" adjusts the 50  $\mu$ F condenser C10 for maximum output. Greater output as indicated by bulb or neon strike from the plate or top end of the plate coil L3 can also be had if the number of turns in the plate circuit is altered by lifting the contact wheel from its normal position on the winding and replacing it elsewhere.

### Switching

Front-panel switch S1 has four wafers operated by shaft-drive below chassis and two wafers above chassis operated by gear-drive. In position 1 the switch gives crystal operation over 2 to 4 mc and in position 2 from 4 to 7.5 mc. In position 3 master oscillator (or VFO) operation is obtained for 2-4 mc and 4-7.5 mc in position 4. For VFO operation, therefore, only positions 3 and 4 are of interest and in these circumstances the 807 cathode, grid and screen form a



The inductances and tuning condensers in the 145 assembly. The chassis is very solidly constructed and can be withdrawn bodily from the case by the removal of four fixing screws on the front panel.

Colpitts type of oscillator. The tuned circuit L1/C1/C2 is between grid and earth, but the screen (oscillator plate) is held at earth potential by condenser C13 and the cathode is returned to the mid point of condensers C1 and C2. Electron coupling takes place and the plate circuit is at twice the grid frequency in switch position 3 (2-4 mc). In position 4 (4-7.5 mc) the plate circuit is set at three times the fundamental frequency. The figures stamped on the switch dial therefore refer to the *output* frequency and not to the fundamental of grid circuit L1/C1/C2, which is always one half or one third the frequency of the plate circuit when operating as a master oscillator.

Above 7.5 mc further frequency multiplication must take place in the transmitter itself. In position 3 (2-4 mc) condenser C8 reduces the frequency by means of switch section S1b, and likewise condenser C3 across the grid coil by means of section S1f. A higher plate voltage is required for MO (VFO) operation than for crystal; to maintain an equal output under all conditions switch section S1a connects the plate direct to HT in positions 3 and 4, and thus eliminates the extra drop of about 120 volts across neon V1, which remains in circuit in positions 1 and 2.

Resistances R6, R7 and R10 form a