The SHORT WAVE Magazine

2/-

EXCLUSIVELY FOR THE RADIO EXPERIMENTER & TRANSMITTING AMATEUR

VOL. VI No. 1 MARCH 1948

WEBB'S RADIO

Important announcement

THE EDDYSTONE '640'
COMMUNICATIONS RECEIVER

CAN NOW BE SUPPLIED FOR **£39 10s.**

Free of Purchase Tax

In addition to the welcome news that H.M. Customs and Excise have now exempted the Eddystone '640' from Purchase Tax, the makers announce a reduction in price due to improved line production.

This efficient general purpose short-wave receiver is designed to meet the exacting requirements of Amateur-Band Communications.

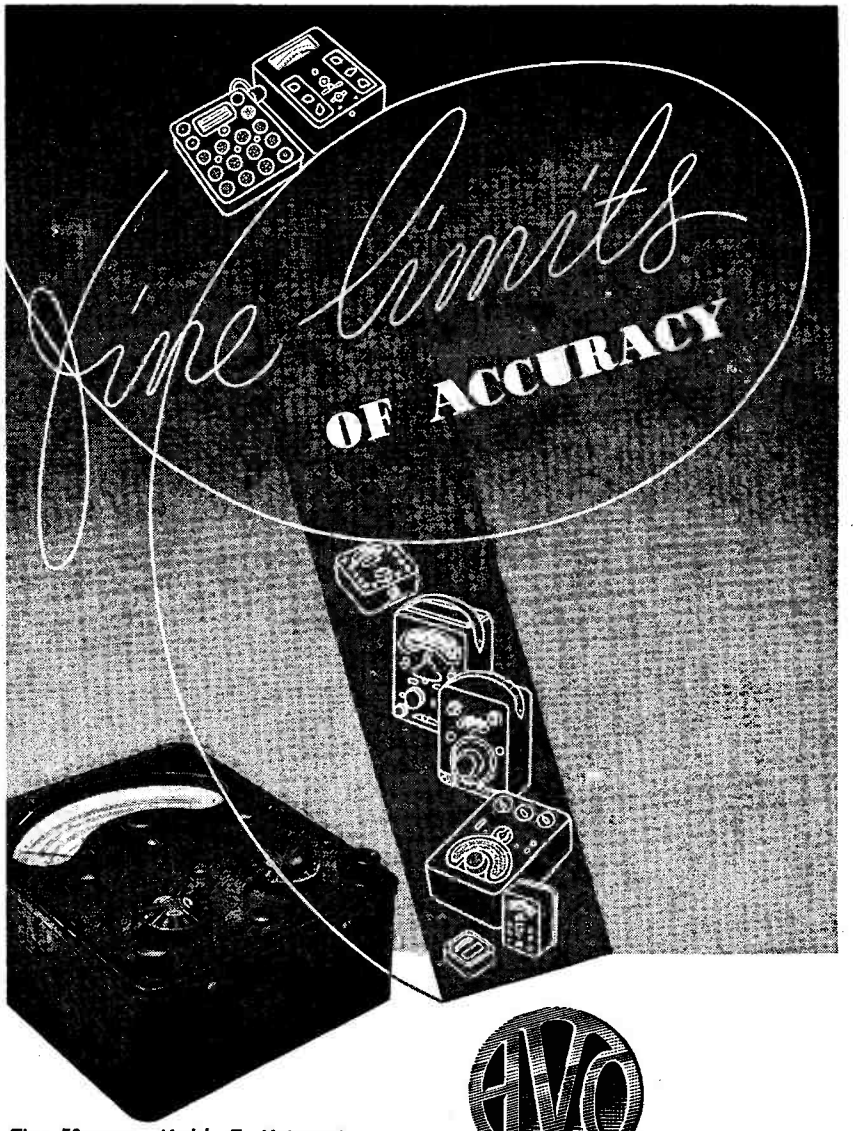
CONTINUOUS COVERAGE from 31 to 1·7 Mc/s with Electrical Band-spread throughout. Eight valves (plus rectifier). One R.F. and two I.F. Stages. Efficient Noise-limiter. 10, 20, 40, 80 and 160 metre Amateur Bands calibrated. Beat Frequency Oscillator. Flywheel Control on Bandspread. Vacuum mounted Crystal filter. Adaptor for Battery Operation.

The '640' has outstanding signal/noise ratio and extremely good image rejection. Plug-in external 'S' meter available. **£5 5s. 0d.** extra.

Available Ex-Stock from WEBB'S RADIO

14 SOHO STREET, OXFORD STREET, LONDON, W.1

Telephone : GERrard 2089. Shop Hours, 9 a.m. to 5.15 p.m., Sats. 9 a.m. to 1 p.m.



The 50-range Model 7 Universal AvoMeter, the pioneer of the comprehensive range of "Avo" precision instruments, is the world's most widely used combination electrical measuring instrument. Fully descriptive pamphlet available on application to the Sole Proprietors and Manufacturers :—

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THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.
WINDER HOUSE · DOUGLAS STREET · LONDON · S.W.1 TELEPHONE VICTORIA 3404/9

A

High Frequency

Satisfactory and efficient reception of signals on the higher frequency bands requires equipment designed for this specific purpose. A compromise must be made in most receivers covering from 500 kc/s to 30 mc/s; the tuning condenser used must be relatively large to give satisfactory coverage of the lower frequency bands, but this usually creates an unsatisfactory L/C ratio for the higher frequencies. For reception of signals on 10 metres and above, we suggest the use of an efficient converter, using the main receiver as the IF/AF Amplifier.

CONVERTER MODEL No. 33

A three-stage H.F. Converter using the following valves—RF: 6AK5; Mixer: 9001; Oscillator: 9002. All circuits ganged providing single knob tuning. Voltage stabiliser (VR105/30) fitted. Mounted in metal cabinet and fitted with S/m dial and calibration scales. Supplied complete with valves and sets of plug-in iron-cored coils for three bands.

Price **£13.10.0**

With incorporated power supply **£15.10.0**

Coil sets (comprising RF, mixer and Oscillator):

A. 5 metres. D. 15 metres.
B. 6 metres. E. 20 metres.
C. 10T11. **12/-** per set

(Any three ranges may be selected with Converter No. 33.)

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Our lists give full details. May we send you a copy? We will provide quotations for the construction of special equipment and maintenance of your existing apparatus if you let us have details.

G3CMS G400 G3PS G2FPP G3AIK

Radiocraft Ltd

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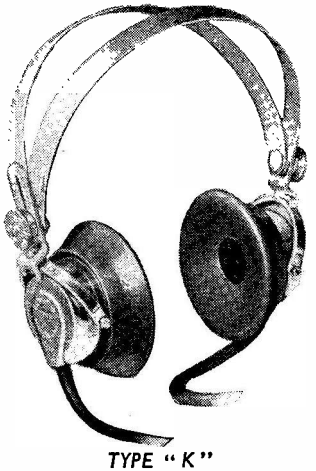

TYPE "K"

For details of other S.G. Brown Headphones (prices from 30/- to 63/-) write for illustrated Brochure "S.W."

The S. G. Brown Type "K" Moving Coil headphones with the following outstanding characteristics, supply that High Fidelity Reproduction demanded for DX work, monitoring and laboratory purposes, etc.

NOTE THESE CHARACTERISTICS

D.C. RESISTANCE, 47 Ohms.
IMPEDANCE, 52 Ohms at 1,000 c.p.s.
SENSITIVITY, $1{\cdot}2\times10^{-13}$ watts at 1 kc. = ·0002 Dyne/cm².

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Price **£5 : 5 : 0** Per Pair

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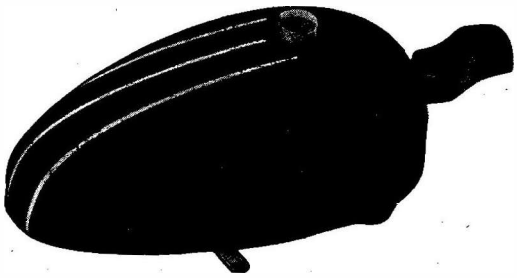

No. 689, **£3/17/6**

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No. 669, "S" Meter, **5 Gns.**
No. 690, Crystal Calibrator, **£12.**
No. 678, Modulation Indicator, **£8/15/-**
No. 683, Beam Aerial Kit, **£19/10/-**
No. 687, Vibrator Power Unit, **£7/17/6**

Please order from your Eddystone Dealer. We do not supply direct.

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will train you for your MORSE CODE TEST

Extracts from unsolicited letters sent us by Candler students, give convincing proof of the excellence of this training which can be taken in your own home.

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Ref. No. 2709. (*After completing only first five lessons, writes*) : "I would like to say how pleased I am with the course; I can send a comfortable 16 w.p.m., and receive 12 to 14 w.p.m., which I think you will agree is fairly good as I was a beginner at the start of the course."

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Ref. No. 2245. (*Glad to announce.*) "I am glad to announce that I recently passed the P.M.G. Special Exam., and as you will see on my report, my speeds are now far ahead of the speeds needed in the examination. I therefore walked through the telegraphy part."

Ref. No. 3795, *says* :—"I recently passed my G.P.O. Amateurs' Morse Examination after your first five lessons."

Ref. No. 2573. (*A really wonderful course.*) "I feel it my duty to express my appreciation for a really wonderful course. Before taking the course my 'solid' receiving speed was about 16 to 18 w.p.m., this I copied letter by letter—'and was I nervous.' To-day I can copy 25 to 26 w.p.m. at one word behind. I can read 30 to 35 w.p.m. as easily as reading a book. Frankly I think that *all* the 'profit' I have gained from the Candler System cannot be represented by—so many words per minute; but, rather as a lifetime's experience gained in a few weeks. It has been said 'you have to pay to learn'—true, but with Candler you pay so little and learn so much."

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G.P.O. Morse Test 12 w.p.m.

Type	Length of Test	Duration of Test	Sending		Receiving
			Max. No. of Erasures	Max. No. of Un-corrected Errors	Max. No. of Errors
Plain Language	36 words	3 minutes	4	Nil	4
Figures	10 groups of 5	1¼ minutes	2	Nil	2

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(1) Two RF Preselector Stages.
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(9) Separate RF and AF Gain Controls.
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Receiver finished in black crackle cabinet, and complete with separate power supply.

SECURE YOUR H.R.O. WHILE STOCKS LAST

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(Carriage 10s.) Case charge £2 (returnable)

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Eddystone 640 Communication Receivers

The model "640" Receiver has been designed primarily for Amateur Communication purposes and covers, without a gap, a tuning range from 32 to 1·7 mc/s.

The following are outstanding features of this Receiver :—

Separate Electrical Bandspread.
High Signal to Noise Ratio.
Large Attenuation of Image Signals.
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Separate AF and RF Gain Controls.

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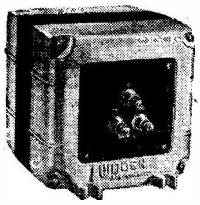

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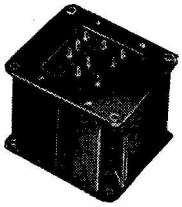

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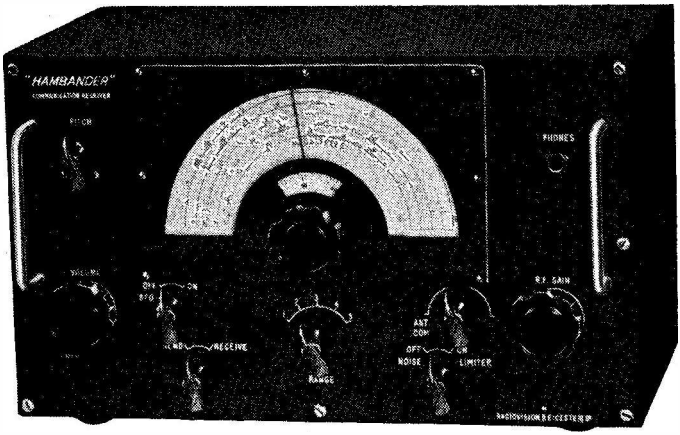

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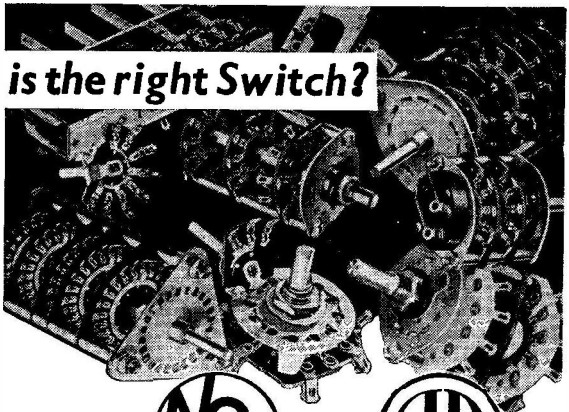

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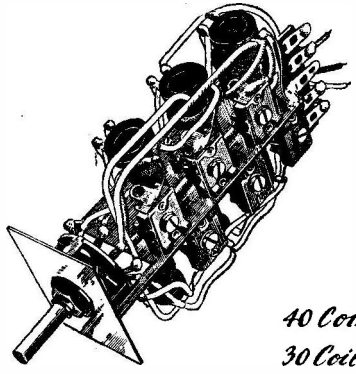

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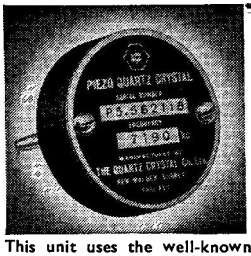

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The P5 unit has a temperature co-efficient of 20 cycles per megacycle per degree Centigrade temperature change. Used with a 6V6 or 6L6 type beam tetrode, it will give up to 5 watts r.f. output on the fundamental frequency and approximately 3 watts on the second harmonic in the Tritet circuit.

Available with fundamental frequencies in the 1·7, 3·5 and 7 Mc. bands for fundamental operation or frequency multiplying to any higher frequency band.

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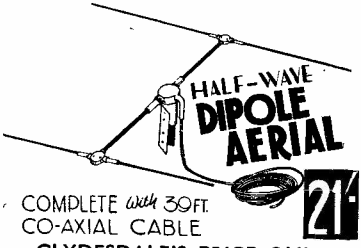

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Here are a few notes which will help users to get the best from this very reliable valve. The use of correct filter circuits and the careful observance of the operating rules are essential if maximum life is to be obtained.

Characteristics

STATIC

Vf	4.0V
If	2.7A
Peak Inverse Voltage	4.7KV
Peak Ia	1.25A
Average Ia	250mA
Valve volts drop	16V
Ambient temp.	0-50° C.

Base—British 4-pin.

DYNAMIC

Circuit	Output	Input	Filters L. in H	Filters C. in μF
Single phase full wave	1500V 500mA	1670V rms per valve	4.5	4
	1000V 150mA	1110V rms per valve	10	4

Filter Circuits

The values of L and C quoted in the table are for the specific output currents stated. For operation under alternative conditions these values must be recalculated. L should vary in direct proportion to the effective load resistance:

$$L = \frac{Reff}{940}$$ (input at 50 cycles)

or, to allow safety factor,

$$L = \frac{Vout}{Iout} \times 1.5$$ (L in henries; Vout = required voltage; Iout = current in mA) provided C remains constant at 4 μF.

e.g.—For 1000V at 100mA, $L = \frac{1000}{100} \times 1.5 = 15$

If the ripple is too great and C has to be increased, then L must increase in direct proportion. Conversely, L may be reduced in direct proportion to any reduction in C.

If a double filter is used the values in the first section must be the same as those for a single filter.

Condenser filter input circuits must not be used or the peak Ia will be exceeded.

Operating Rules

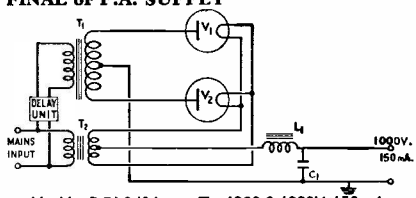
After transportation, all mercury vapour valves must be run-in without H.T. for at least 30 minutes in order to remove mercury from the electrodes. In normal use, the filaments must be run for at least 60 seconds before H.T. is applied, to avoid cathode sputtering.

Recommended Circuits

Final or P.A. Supply (suitable for use with a QY2-100 or 813).

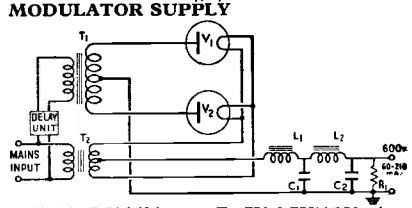
Modulator Supply (approx. 0.25% ripple) (suitable for use with 2 QV05-25's or 807's).

FINAL or P.A. SUPPLY



V_1, V_2, RGI-240A. T_1, 1200-0-1200V/150mA. T_2 2-0-2V/6A. L_1, 5-25H Swinging Choke 250/50mA. C_1, 4μF.

MODULATOR SUPPLY



V_1, V_2, RGI-240A. T_1, 750-0-750V/250mA. T_2, 2-0-2V/6A. R_1, 15000 ohms 25 watt. L_1, 5-25H Swinging Choke 250/50mA. L_2, 20H/250mA. C_1, C_2, 4μF.

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SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR & AMATEUR RADIO

Vol. VI MARCH 1948 No. 56

CONTENTS

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EDITORIAL

Survey

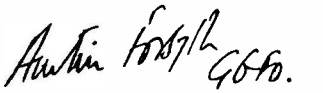
Once again we look back upon a year of modest achievement and forward to twelve months of strenuous endeavour.

The recommencement of activity in March two years ago called for a considerable effort to re-establish the *Short Wave Magazine*, and it was most gratifying to find that the war-time hiatus had not obliterated the great fund of good will so painstakingly built up in pre-war years. We are proud to number to-day many readers who have been with us since March, 1937, and who are kind enough to tell us how much they enjoy it still.

The first principle of our policy is to be useful, up to date and informative ; the second, to be technically reliable ; the third, to mirror the best in modern British amateur technique ; the fourth, to uphold the best traditions and standards of Amateur Radio which, in their finest expression, call for a code of personal conduct which the world, as a whole, could well adopt ; the fifth principle is to maintain our independence, which carries with it the right (and the privilege) of fair comment on all matters which seem to us of moment in the world of Amateur Radio.

As many readers will appreciate, a vast effort must go into the production, regularly by the due date every month, of a periodical of the scope and highly specialised character of this *Magazine*. It would be easy to slap something together and push it out with the pious hope that any defects might pass unnoticed. But in fact each issue is as good as we know how to make it, with neither time, trouble nor expense spared to maintain a standard upon which we are constantly striving to improve.

And so we propose to go on, and this—the commencement of our sixth volume—is the occasion and the opportunity to thank our readers and our advertisers for their support and encouragement during the past twelve months.



High-Stability VFO Driver

Four-Stage Unit with Exceptional Characteristics

By L. ATHERTON, Grad.I.E.E. (G3AND)

(In the quest for better and more efficient variable frequency oscillator equipment, here is yet another constructional design of considerable merit.—Ed.)

UNDER present congested operating conditions it becomes increasingly necessary to employ a VFO if the maximum number of contacts are to be made. Such a unit must be very stable for both 'phone and CW operation and as free from drift as possible. Also, for break-in working it is almost a necessity that the oscillator be keyed. Another very important point is that after a listening period it must start up on a frequency within a few cycles of its nominal frequency if a CW signal on the 20- or 10-metre bands is to remain within the crystal pass-band of a modern communications receiver.

This particular unit has been built with these considerations in mind, and in addition provision has been made for modulation of the output stage if QRP working is desired on 160, 80, or 40 metres. Crystal control is provided for by the use of a single-pole rotary switch, and the circuit will oscillate with "difficult" crystals and also loads them very lightly.

The apparent complication of the circuit is due to the band switching employed, but after inspection it will be seen to be quite simple, and the very great convenience of not having to change any coils adds to ease of operation and reliability, as distortion of the chassis and disturbance of the oscillator are thereby avoided.

Performance

The long and short period stabilities compare well with those quoted for the best commercial equipment, the former being within 1 part in 10,000 (representing less than 200 cycles on the 160-metre fundamental) and the latter is less than 2 parts in 100,000 or better than 40 cycles at the fundamental. The unit will beat against a crystal oscillator on 40 metres for periods of up to an hour without any appreciable change of note.

When checked against a crystal harmonic in the 10-metre band it was found that the oscillator frequency remained constant within about 40 cycles for any variation of the 6L6 tank tuning. This represents a variation of only two or three cycles at the fundamental frequency; no variation whatever could be detected when keying, even on 10 metres.

An output of three watts RF on all bands was obtained with a 300-volt supply, but with 450 volts on the 6L6 8 or 9 watts will be available.

Circuit

The circuit diagram is shown in Fig. 1. The oscillator is a 6AC7 high-slope pentode in an ECO circuit; the cathode tap is obtained by means of condensers C9 and C10, while resistances R3 and R4 provide DC returns for the grid and cathode. The use of R4 instead of a choke ensures that any spurious oscillations due to choke resonance are avoided. This method of obtaining the cathode tap permits employing an untapped coil and also facilitates the use of crystals.

R1 was added to improve the keying characteristic; C11, C12 and R7 act as a key click filter.

The screen voltage was very carefully adjusted for minimum frequency change as the supply HT voltage was varied. With just the right screen voltage the stability of this type of oscillator can be made very good under supply variations. Afterwards, both screen and anode supplies were stabilised by a neon regulator.

The suppressor grid was connected to cathode as it gave better stability when keying than when it was earthed.

The anode circuit has a 3000-ohm resistance in series with the choke to prevent any resonance effects. If desired, a 6SJ7 may be employed in place of the 6AC7 with only a slight reduction in oscillator output.

A 6AC7 is again used in the buffer stage, the grid circuit of which is untuned, and on 160 and 80 metres adequate output was obtained with an RF choke as the

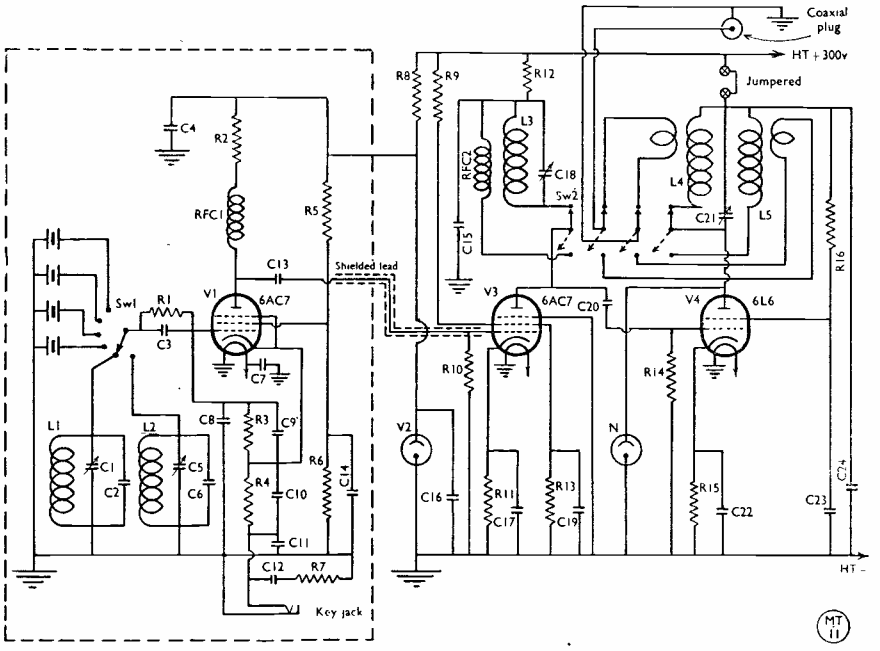


Fig. 1. Circuit of the unit complete. VFO or crystal operation can be obtained at will (SW1) and the output side is also switched (SW2). Stabilised HT supply is provided.

Table of Values

Fig. 1. High-Stability VFO Driver

C1, C5 = 50 $\mu\mu$F, air-spaced variable
C2, C3, C6, C9 = 100 $\mu\mu$F
C4 = ·01 μF
C7, C14, C23, C24 = ·001 μF
C8 = 100 $\mu\mu$F, main tuning
C10, C20 = 500 $\mu\mu$F
C11 = 0·1 μF
C12, C15, C17, C19, C22 = 0·5 μF
C13 = 10 $\mu\mu$F
C16 = 2 μF
C18 = 100 $\mu\mu$F, variable trimmer
C21 = 300 $\mu\mu$F, variable tank tuning
R1 = 68,000 ohms
R2 = 3,000 ohms
R3, R10 = 150,000 ohms
R4, R7 = 2,000 ohms
R5 = 4,700 ohms
R6 = 20,000 ohms
R8 = 6,000 ohms
R9 = 10,000 ohms
R11 = 330 ohms
R12 = 1,500 ohms
R13 = 56,000 ohms
R14 = 0·5 megohm
R15 = 1,000 ohms
R16 = 22,000 ohms
V1 = 6AC7, or 6SJ7
V2 = VR-150
V3 = 6AC7, or 6V6
V4 = 6L6M

L1, 75 turns 20 SWG on 1⅛-in. diameter former 1¼-in. long, wound in three layers.
L2, 45 turns 20 SWG on 1⅛-in. diameter, close wound.
L3, 70 turns 30 SWG on ⅜-in. diameter former.
L4, 14 turns 20 SWG on 1⅛-in. diameter, close wound.
L5, 45 turns 20 SWG on 1⅛-in. diameter, close wound.
Coupling coils on L4 and L5 consist of 4 turns wound over the cold ends.
RFC1 and RFC2, 2·5 mH.
SW1, Six-position rotary.
SW2, Four-pole double-throw rotary.
N, small 250-volt neon lamp.

anode load. For 40-metre operation it was found preferable to bring in a small coil pre-tuned by trimmer condenser C18, which may be set for maximum output in the centre of the 40-metre band. A 6V6 valve will function quite well in this stage.

The two 6L6 PA coils are selected by the four-pole double-throw switch SW2, which also serves to change the buffer anode circuit. One coil covers 160 and 80 metres, the other covers 40 metres. Output is by twisted pair to the switch

and from there to the coaxial socket at the rear.

Construction

The layout adopted is shown in Fig. 3, and Fig. 2 illustrates the general front panel arrangement. Placing the oscillator portion on a separate chassis reduces heating and prevents modulation of the RF by 50-cycle vibration from the power pack. The left-hand chassis carries all the components enclosed in the dotted rectangle in Fig. 1. The chassis is stiffened by a bottom cover, but the ends are left open for ventilation. It measures 7 in. by 5 in. and is 3 in. deep. Care should be taken to avoid possible vibration of the leads between the coils and the switch,

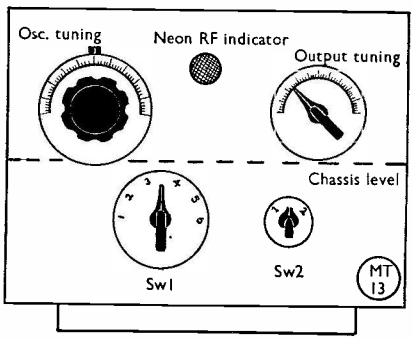


Fig. 2. General layout of panel controls.

if necessary using intermediate anchor points. Condensers C2, C3, C6, C9 and C10 should be of good quality mica or silver mica, and all the resistances of three-watt rating carbon type.

The right-hand chassis measures 9 in. by 7½ in. and is 3 in. deep; it carries the power supply components as well as the remainder of the RF components. Coils L4 and L5 together with C21 are above the chassis to avoid interaction with the grid circuit. The axis of L5 was horizontal and that of L4 vertical to avoid losses due to unwanted coupling. The two chassis are connected by a cable-form for the power supplies and coaxial or shielded cable for the RF.

Condenser C18 was a ceramic type trimmer but an air-spaced midget variable is preferable. The small neon N gives an indication of RF output and saves the cost of a meter.

No tendency for self-oscillation has been observed even when running "straight through" on 160 metres, but a resistance of about 2000 ohms in series with RFC2 would probably cure any such trouble without a noticeable decrease in output.

Operation

When working on 160 metres better stability can be obtained (chiefly in freedom from oscillator pulling with tank tuning), by using the 850/1000 kc coil. For operation on 3·5 and 7 mc, the oscillator is on 1700/2000 kc. C21

Continued on facing page

Defining QSY

Suggestions by

A. M. H. FERGUS, M.Brit.I.R.E. (G2ZC)

AMATEURS have adopted the RST Code as being standard procedure, and indeed, few now on the air would consider any other method. It took someone to suggest our more modern RST before a start was made, and it was quickly accepted and adopted.

Coming to present-day practice, possibly the term that is the least clear of all in the International Code is "QSY"—the more so in view of the almost universal use of VFO's.

In this brief note the suggestion is made that were we to adopt some simple standard akin to RST for the use of QSY, we might all be better off. Stations are frequently asked to "QSY a little." The quantity "little" in the mind of one end may represent a slight adjustment of 2 or 3 kc, but at the other end may be interpreted as 30 kc—showing what can happen without more definition of the *meaning* of QSY.

The writer therefore suggests something more definite which combines brevity with clarity in the request.

Surely, if we adopted "U" to mean "UP" and "D" to represent "DOWN," followed by a figure or figures to indicate the shift required, we hit on a fool-proof method?

Thus, "QSY U 5" would mean "move your frequency up 5 kc", or "QSY D 20" would request "move your frequency down 20 kc."

These figures could even mean an approximation, but they would help steer

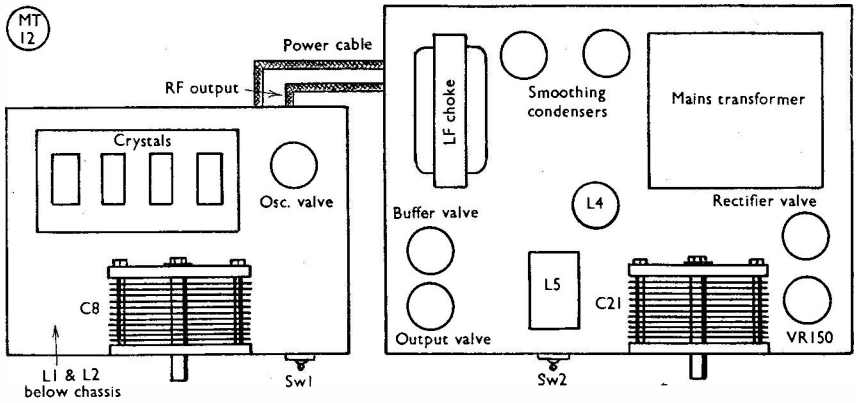


Fig. 3. Block diagram of the general chassis layout. That part of the circuit enclosed within dotted lines in Fig. 1 is in the section on the left in this drawing.

resonates L5 on both 160 and 80, and L4 on 40 metres.

Modulation may be applied *via* the two terminals in the 6L6 HT feed, otherwise they must be jumpered.

Oscillator anode, screen and bleeder only take 6 mA at 150 volts and the valve runs very cool. The 6L6 draws 32 mA at 300 volts ; with the key up it takes 30 mA and so causes only a small variation in the HT load.

Ample ventilation should be provided and the complete unit should be mounted on a sponge rubber pad to prevent shocks and vibration affecting the stability. At least 10 minutes' warm-up should be allowed, 30 minutes if possible. The use of negative temperature coefficient condensers might reduce these times.

The unit has been on the air for over six months, and only once during one (much regretted) QSO has a T8 report been received, all the others having been T9 or T9x. The unit drives a pair of PT15's in a push-pull PA to 150 watts ; on 20 and 10 metres intermediate 6L6 doublers are employed.

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stations clear of long calls and searchings, which with modern standards of calibration, would assist in cutting down interference.

In the old days when "QSLL" was sent, this indicated that on receipt of a QSL card the other side would reciprocate, and we might consider the same idea when using QSY.

If we used "QSYY U 5" it would mean that if the other station moved up 5 kc, once we got him and re-established contact, we would then move up ourselves, on to his frequency.

The use of QSYY would not make for any doubts, as it could be answered by QSY (*I* will move frequency) or QSYY (*both of us* move frequency once contact has been made after the first move).

These suggestions in regard to the meanings to be attached to QSY are put forward for possible adoption generally.

THE RADAR ASSOCIATION

Many readers must have been connected with RAF ground radar during the war, and most of them, but not all, will have heard of the Radar Association. This flourishing fraternity now has 2,500 members and is still growing. Monthly meetings are held at the "Albert," Victoria Street, London, S.W.1, and branches are functioning in Scotland, Birmingham, Liverpool and Manchester.

Accommodation has been reserved for 1,200 members at the Second Annual Reunion—March 12, at the Seymour Hall, W.1—and it is hoped that Lord and Lady Tedder will be the chief guests.

The head office is at 70 High Holborn, W.C.1, and the Hon. Sec., Mr. Charles W. Knight, will be pleased to deal with all enquiries. Annual subscription is 5s., life membership five guineas.

Directed Dipole For Twenty Metres

Simple Two-Element Fixed Beam System

by D. B. KNOCK (VK2NO)

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

The suburbanite centres his attention, naturally, round the smaller systems, of which there are several. But when thinking in terms of half-waves for 14 mc, even the well-tried "Lazy-H" array is inclined to be too cumbersome an affair for many. The choice narrows down to a close-spaced beam of some kind, preferably rotary. But that feature in itself presents major mechanical problems, not the least of which is the design and erection of a solid supporting structure, well braced to withstand high winds.

Fixed Beams

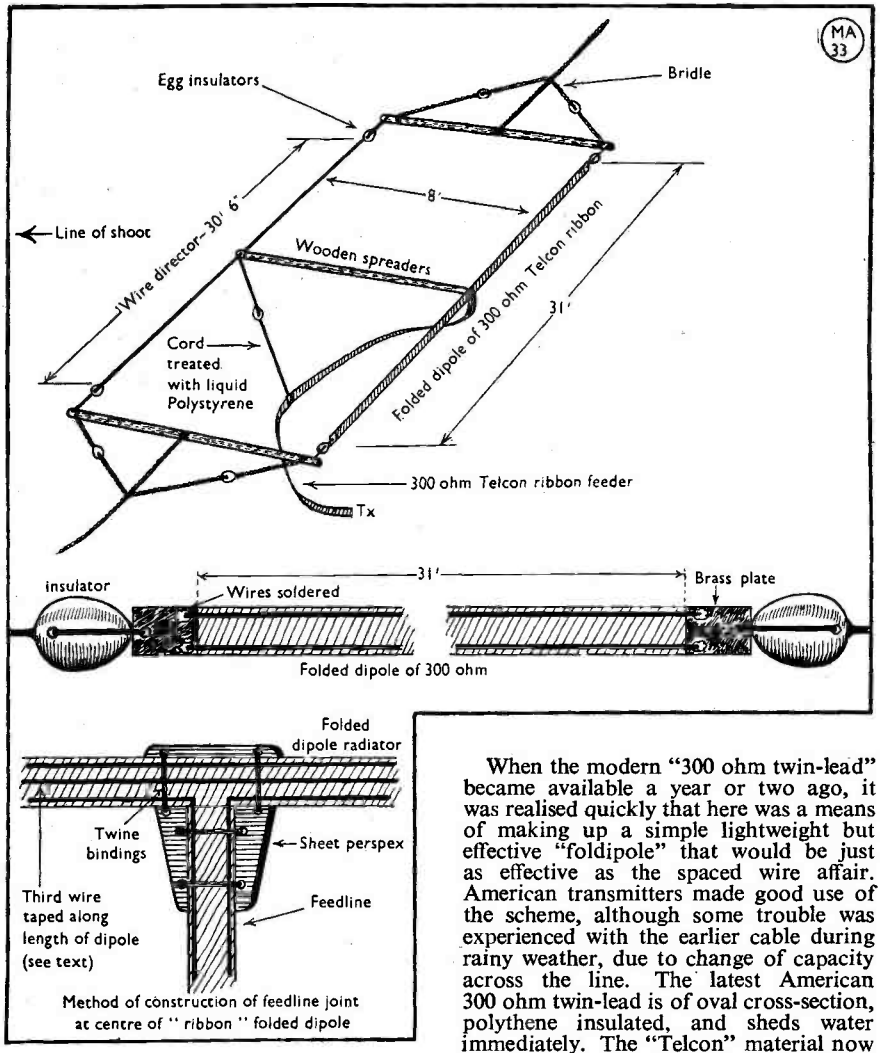
There are many stations (like my own) interested mainly in good communication on 14 mc in a preferred direction, and to that end there is no objection to the use of a *fixed* beam. For the alternative directions and the small amount of time spent in seeking contacts in them—well, a simple half-wave dipole will fill the bill nicely; or the 4-lobe full-wave Windom or Zepp can be used. There is always, too, that "W3EDP" arrangement that seems to perform wonders even in bad locations.

In the October 1947 issue of the *Short Wave Magazine*, the writer described briefly a small beam array of the single section "8JK" kind, in which a form of inductive coupling was applied at the termination of a stub. Irrespective of the feeding method the system is essentially bi-directional. That may or may not be an advantage. Although the array gave excellent results, the bi-directional feature was considered to be rather a nuisance, for the reason that the primary objective at VK2NO is reliable communication with G's over the short route in the early mornings. No discrimination could be expected in the other direction, so that signals from ZL's arrived with unwanted intensity at the same time as the band opened for G's. The ZL, also engaged in working G's, could very well do without the powerful signal from his trans-Tasman neighbour. It was therefore decided that a radiating system with considerable discrimination to the south-east and with plenty of gain to the north-west would be more suitable for the required purpose; and with the arrival in Australia of supplies of the British "Telcon" 300 ohm twin-lead, an idea was put to work.

This design falls mid-way between the ordinary unassisted dipole radiator and the relatively complex rotary beam arrangement; the latter becomes a major undertaking for the average amateur, particularly on 14 mc, due to the mechanical problems involved. The system suggested by VK2NO will give a marked gain in the desired direction, is easy to construct, and in many locations could be erected on supports already available.—Ed.

Folded Dipole Radiator

There is nothing new about the folded dipole scheme introduced in pre-war days by W8JK. The folded dipole is made up of two or more half-wave aerials connected together at the ends, with the feeder taken to the centre of only one of the half-wave sections. The spacing between the sections should be of the order of the spacing used in a transmission line. To make up a folded dipole using wire, the construction calls for a system of spreaders and insulators so that the aerial looks like a length of zepp feedline arranged horizontally, shorted at the ends, and with a similar kind of



feedline teed-in at the centre of one side. The centre impedance of the two-half-wave folded dipole may be considered to be around 300 ohms. This can be raised by adding half-wave sections, but whatever the impedance characteristic, it will be obvious that an aerial made up from 14-gauge copper wire is likely to be rather heavy. If supported between poles with halyards, there may be a large degree of sag in the middle, unless poles and halyards are designed accordingly.

When the modern "300 ohm twin-lead" became available a year or two ago, it was realised quickly that here was a means of making up a simple lightweight but effective "foldipole" that would be just as effective as the spaced wire affair. American transmitters made good use of the scheme, although some trouble was experienced with the earlier cable during rainy weather, due to change of capacity across the line. The latest American 300 ohm twin-lead is of oval cross-section, polythene insulated, and sheds water immediately. The "Telcon" material now available in Australia from Britain is of channel section, but nevertheless no undue change in capacity has been noted here during wet weather. The manufacturers would do well, even so, to mould the material in the oval form.

Folded Dipole with Director

It was decided to make up a simple beam array, using 300 ohm Telcon as the combined radiator and feedline, and reference to the sketches will show how this was done. According to formula, a

folded dipole works out at 31 ft. overall length to hit 14,200 kc ; in practice it was found that a radiator made up of 300 ohm Telcon, and fed with the same material, is widely resonant over the whole band with very little change in transmitter loading. A length is cut to 31 ft., and the wire bared of insulation material at the ends for about ¼ in. Two light brass or copper plates are cut to ½ in. square, and a $\frac{5}{16}$-in. hole is drilled in each near to one side. The bared wires of the twin-lead are soldered to the plates at the side opposite to the drilled hole, which is there merely to bind twine through to an insulator for support at each end. In the exact centre of one side of the now folded-dipole radiator, a cut is made in the wire, and at that point the feedline of similar material is teed-in by twisting the wires and soldering. It will be obvious that such a joint is not by itself strong enough mechanically, and if left thus will result in tearing of the insulation at the centre of the radiator, with eventual breakage of the wire. The method of safeguarding against this is indicated.

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

It will be found that a folded dipole made up as described will load a 14 mc final stage nicely with a two- or three-turn link coil. As the radiator stands it is a good proposition for the amateur wanting a highly effective half-wave system—and it is light. It was decided, after having tested the plain radiator, to make up a simple beam array on the lines shown. Three spreaders of ¾ in. light timber were used, 8 ft. in length, and the radiator was arranged with a director in front, consisting of a wire 30 ft. 6 in. in length. The whole was supported by making bridles for attachment to pole halyards.

With the close-spaced parasitic element there is the usual change of impedance at the centre of the radiator. It is estimated (but not measured) that the impedance in this case dropped to around 150 ohms, which is quite a mismatch. It was found in practice, however, that the standing-wave on the line was not so serious as might have been, and that with 100 watts input to the 813 final, there was plenty of RF in both radiator and director. However, to be on the right side of the RF ledger, the centre impedance of the radiator was brought up to an approximation of the line. An insulated wire was cut, 31 ft. long ; this was bound in position with polystyrene tape at intervals so that it is in the *centre* of the twin-lead radiator throughout its length. The ends of this extra wire were soldered to the brass shorting plates supporting the twin Telcon. The result was an increase in impedance and even more RF up aloft.

MICROWAVE COMMUNICATION

In the Amateur Radio field, the development of our centimetre bands will depend ultimately upon their value as channels for *communication*, as opposed to their pure experimental interest—since the fundamental objective of the great majority of amateurs is communication with their fellows.

It is fascinating to speculate on the very real possibilities that do exist for long-distance communication on the micro-wave channels. It is within the bounds of both present theory and practice that by reflection off the moon, great ranges can be covered. For shorter distances, natural reflecting surfaces can be used, or reflectors actually designed and installed to give communication over particular paths.

One therefore envisages the time when the progressive amateur will be conducting local surveys for the placement of his reflectors for medium-distance micro-wave QSO's, and the *Short Wave Magazine* will be publishing as a regular feature tables showing when the moon is in position for DX communication with different parts of the world. It almost looks as if the moon was cast for this role in the great pattern of Nature.

It is quite a thought—and not at all imaginative or far-fetched. It means that as side-lines, the micro-wave operator will have to study surveying and astronomy in addition to radio—and so a great new field of activity and interest will be opened up and Science will take another stride forward. Yes, the more one thinks of it, the more exciting it sounds !

Miniature Rack-Panel Transmitter

General Description of a Third-Scale Model Design

by K. W. CRANFIELD

(This beautifully built little transmitter—designed for CW operation on the DX bands—was an object of admiration at the Amateur Radio Exhibition last November. It is the kind of thing which could be operated in a small flat, or under similar confined living conditions where space is very much a consideration.—Ed.)

MOST of us have seen or heard about the various miniature receivers which were made for the underground services during the war, where some five or six valves were packed into the space of a pocket torch. However, one does not often see a transmitter of equivalent size which could be used on the amateur bands. There are many operators who, due to accommodation difficulties, are compelled to live in two rooms and therefore by necessity are either QRT, or are waiting for the day when they will have the opportunity of going on the air.

Miniature Rack-Panel Unit

Although not exactly original, it was decided to construct a small transmitter which would be as near as possible to one-third scale size of the standard rack and panel unit and still use parts which were easily obtainable.

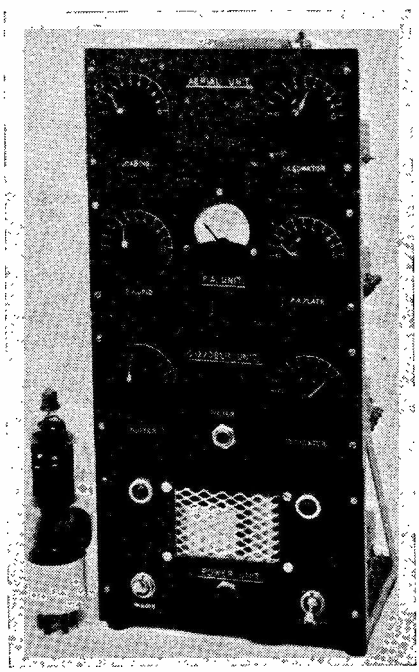
This is not intended to be a constructional article in the usual sense, but will attempt to describe some of the pitfalls encountered in the design and construction of scaled-down apparatus of this kind.

The transmitter consists of four panels and chassis, fitted into a rack constructed of angle brass, 13¼ in. high by 6 in. wide. Starting at the bottom, the first chassis carries the power unit ; above this is the crystal oscillator and doubler, in turn link-coupled to the next chassis above on which is mounted the push-pull PA Stage ; and finally the PA feeding a Collins Coupler on the top panel, so that the transmitter could be matched to any length of wire which could be put up.

It will be seen from the circuit diagram that the valve line consists of a 6X5 rectifier, 6N7 oscillator doubler and 6N7 PA. The latter two valves are metal types on account of their small physical size.

Each chassis measures only 5½ in. by 3½ in. by 1 in. and the power unit is but 4 in. wide.

The latter was started first and little difficulty was encountered to begin with, since some laminations were available to wind the transformer, also there was no trouble in obtaining a small choke which would carry 60 or 70 mA. However, as construction proceeded and the components were fitted to the chassis, together with the various switches and jack, it was clear that there would be little space left into which an 8 + 8 μF condenser would



Front panel view of the transmitter, with an 807 for comparative size. The panels, from the bottom up, are : Power supply ; drive stages ; PA stage ; and aerial coupling unit.

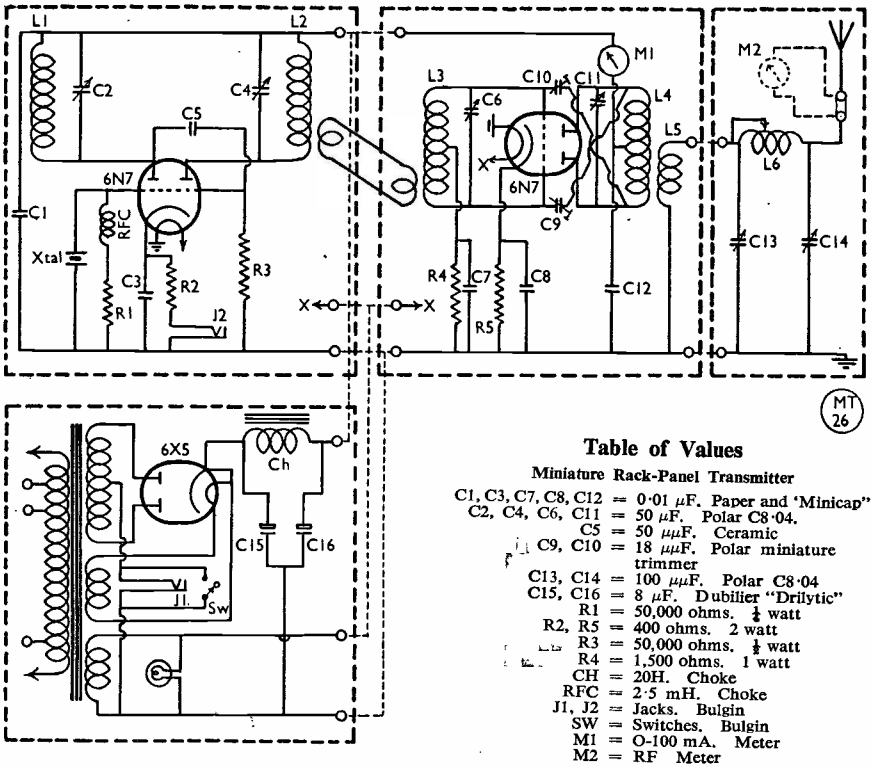


Table of Values

Miniature Rack-Panel Transmitter

C1, C3, C7, C8, C12	=	0·01 μF. Paper and 'Minicap"
C2, C4, C6, C11	=	50 μF. Polar C8·04.
C5	=	50 μμF. Ceramic
C9, C10	=	18 μμF. Polar miniature trimmer
C13, C14	=	100 μμF. Polar C8·04
C15, C16	=	8 μF. Dubilier "Drilytic"
R1	=	50,000 ohms. ½ watt
R2, R5	=	400 ohms. 2 watt
R3	=	50,000 ohms. ½ watt
R4	=	1,500 ohms. 1 watt
CH	=	20H. Choke
RFC	=	2·5 mH. Choke
J1, J2	=	Jacks. Bulgin
SW	=	Switches. Bulgin
M1	=	O-100 mA. Meter
M2	=	RF Meter

Circuit of the transmitter complete. By using twin-triodes, a CO-FD-PA arrangement can be achieved with only two RF valves.

fit. An American type condenser was tried first and found to be too long; a condenser was finally obtained which, although greater in diameter than the depth of the chassis, could be made to fit.

The other components for the remaining chassis were an easier matter, since a fair range of miniaturised types have come on the market; this eased the space problem, otherwise it would have been almost impossible to construct the transmitter with standard-sized components.

Coil Assembly

The plug-in coils were not quite so easy since no commercial coil forms seemed to be available which were smaller than 1¼ in. diameter and greater than ½ in.; the first would not clear the valve, whilst the latter were unsatisfactory due to winding space. So there was nothing for it but to make them.

Some old octal-based valves were obtained and the bases from these were turned down until they just fitted into 1 in. diameter paxolin tubes. The bases were held in place by two 8 BA screws, these being drilled and tapped into the bases in such a manner that they did not make contact with the live pins; finally, some shellac varnish was brushed round the base to give additional strength after the windings had been put on.

It might be mentioned here that ordinary ceramic valve holders were first tried for the coils but that since they were of the spring clip type, once having got the coil in the socket it was almost impossible to withdraw without the use of a lever of some kind. These were then substituted by holders with straight shanks of the "Clix" pattern and the coils could then be inserted and withdrawn with ease.

Coil Data

Coil	7 mc	14 mc	28 mc	Winding
L1	36t	16t	7t	close wound, 30/SWG
L2	18t	8t	4t	close wound, 30/SWG
L3	18t	8t	4t	close wound, 24/SWG
L4	24t	11t	5t	spaced, 24/SWG
L5	One-third number of turns of L4, insulated wire.			
L6	23 turns, 2 in. diameter, 2¼ in. long, 16 SWG.			
Link	Two turns.			

Neutralising Capacities

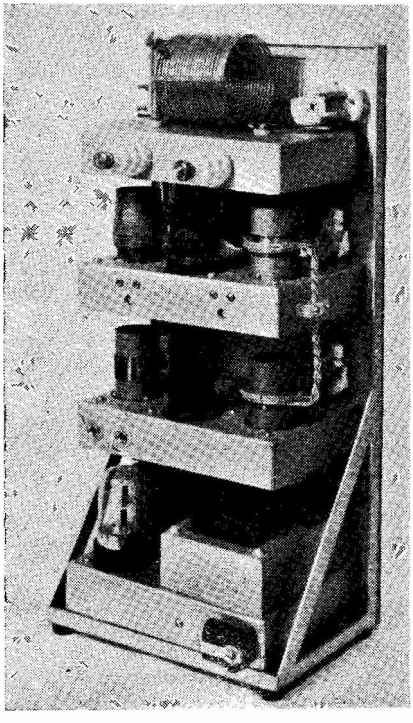
The neutralising condensers in the PA stage were the next headache. After various types of trimmer had been tried, all of which were either too large or too difficult to mount, some very nice miniature air trimmers were found which suited admirably, as it was possible to mount them on the side of the chassis close to the valve holder ; by drilling two clearance holes these condensers could be easily trimmed from the back of the rack. The HT and LT supply runs to each chassis were taken through insulated terminals on the sides.

Actually, the terminals were procured from some old base-board valve holders which had long since been discarded—these in turn were insulated from the metal chassis by means of ceramic washers. The chassis were made of 18 SWG brass with brazed corners and the panels were of 16 SWG aluminium. All the metal work was given a coat of stoving aluminium paint ; the front panels were brushed over with black crackle paint, which gives a very pleasing finish. As regards lettering the panels, the writer was in the fortunate position of having access to an engraving machine on which not only were the panels lettered but the dials were also made, since none was procurable at the time. Since then, however, some small dials have been marketed which would do admirably, and as regards the lettering, labels for the various stages can also be bought.

The importance of making an accurate drawing of the complete equipment before starting on a project of this kind must be stressed. It was by neglecting this point in the first instance that, through a mistake in the rough sketches which had been done, it was found impossible to fit the chassis one above the other in the rack due to the valves being too tall ! This mistake involved almost a complete dismantle, to enable the valve holes to be turned out to a larger diametric so that the complete valve could be sunk down in the chassis, the valve holders then having to be supported on metal pillars. An inspection of the back view photograph will show how the valves are seated, also the arrangement for the plug-in crystal ; on the third chassis the two holes for trimming the neutralising condensers can be seen under the terminals.

Tuning Up

Little need be said about tuning the transmitter as it is simplicity itself, and actually would take longer to describe than to carry out since all stages can be resonated by means of a loop lamp. With an 80-metre crystal and the 40-metre coils in place, the oscillator, buffer and grid



Rear view of the miniature transmitter, showing some constructional details.

coil of the PA were tuned to give maximum brilliancy in the lamp. Then, with the HT removed from the PA the two neutralising trimmers were adjusted so that no RF current was visible in the tank circuit as indicated by the lamp when coupled to the tank coil; both trimmers were set at about equal capacity. With the HT on the PA and the aerial connected, the procedure was repeated, and the Collins Coupler then adjusted to give maximum RF in the coil. In this coupler C14 is used to "draw" and C13 to "resonate," as shown by minimum current in the plate feed. It was possible to draw a current of 40 mA in the PA, which represents an input of 12 watts—and so the little transmitter was on the air, ready to fight its larger brother to make itself heard!

Acknowledgment

The author would like to thank members of the Harrow Radio Society for their encouragement, and especially G4HV for his co-operation, and G4GB, who conducted the actual air tests on the transmitter.

Inexpensive 100-Watt Transmitter

Testing—Adjustment—Low Voltage Performance

By A. B. WRIGHT (G6FW)

PART II

The speech amplifier should first be tested by applying heater and HT voltages and connecting a speaker or headphones *via* a suitable transformer across the secondary of the driver transformer.

Assuming everything proves to be in order, voltage can then be applied to the 807's, a 75-watt lamp being connected across the secondary of the modulator as a load. The lamp load will not of course be a correct match for the modulator but will afford sufficient indication that the 807's are functioning properly.

The plate-to-plate load of a pair of 807's in Class-B is given by the RCA as 6,600 ohms, and if desired a 100-watt resistor with a value of from 4,000 to 10,000 ohms may be connected across the appropriate tappings of the UM3 secondary, to simulate the impedance of the Class-C amplifier which it is proposed to modulate. The lamp is, however, quite a good method of judging the modulator output.

A 0-500 milliammeter should be connected in the HT positive lead to the primary centre tap of the modulation transformer, and the standing current of the two 807's noted. With a plate supply of 700-750 volts the standing current should be in the region of 10 mA.

A sustained whistle into the microphone should now result in an upward kick of the plate current to 450 mA, with the lamp as load, and the 75-watt bulb should light up to full brilliance.

With a resistive load on the modulation transformer secondary, and the matching taps correctly adjusted, the anode current should reach a slightly higher value.

Putting the meter in each 807 anode lead should result in upward plate current kicks of equal magnitude, and if possible a pair of valves should be selected which are balanced, otherwise distortion and loss of output will result.

The first part of this article appeared in our February issue, covering the circuit and general design of the modulator.—Ed.

It will be evident that with such a large current swing, the high voltage supply to the 807's *must have good regulation* if the full output is to be realised. Swinging choke input should be used with a mercury vapour rectifier or rectifiers, and a fairly generous mains transformer. Smoothing chokes should have as low a DC resistance as possible to avoid excessive voltage drop across them on surges of current.

Results

If correct matching between the driver stage and the 807 grids is obtained, and if the 807's are correctly matched to the Class-C stage, no trouble will be experienced in obtaining audio outputs of up to 100 watts using a 6L6 driver. This is of course more than ample for 100 per cent. modulation of a 150-watt carrier.

As a matter of interest the writer has

driven the 807's in Class-B using a 6F6 pentode driver, with 290 volts on the plate, preceded by a 6J7 and 6C5, and a crystal microphone. With this set-up an 80-watt carrier was modulated 100 per cent. with the audio gain one-third advanced. The driver transformer used to match the 6F6 into the 807 grids was a 1:1·4 step-up. The anode voltage on the modulator was 700, the same transformer being used to supply HT to the Class-C RF stage. Conditions of operation in this case were not at all favourable as the regulation of the power supply was none too good, and yet reports received indicated that speech quality was really excellent, there being no trace of distortion.

One or two stations have been heard on the air complaining that they have been unable to obtain the expected output from the Class-B 807's, but in every case it has been evident from the conversation that wrong driving conditions were the cause of failure.

Once the simple principles of matching the driver stage to the modulator grids has been grasped, and the correct *step-up* ratio of driver transformer has been obtained, the audio output is limited only by the 807 anode voltage and the amount of voltage swing obtainable at the grids.

If the modulator has been converted from the usual Class-AB2 807 circuit it should be borne in mind that whilst the required grid driving power for AB2 operation is 0·2 watts, at least 5·3 watts audio will be required to obtain the full audio output from the 807's in Class-B.

A single Class-A 6L6 with sufficient anode voltage to give an output of about 5 or 6 watts will take care of the voltage swing. If greater output is required the 6L6 could be run with battery bias, the correct value of bias being 18 volts, with 350 volts on its anode and 250 on the screen when an output of 10 watts may be obtained. Under these conditions, however, the optimum load for the 6L6 becomes 4,200 ohms, which is near enough to the load impedance of the self-biased 6L6 to enable a similar 1 : 1·8 or 1 : 2 driver transformer to be used.

If a pair of 2A3's or similar triodes, and a correct matching transformer are available, approximately 10 watts of audio should be available to swing the grids of the 807's and this arrangement would form the ideal driver.

The latter circuit has not been tried by the writer owing to the difficulty of obtaining a suitable driver transformer, and so practical working details cannot be given.

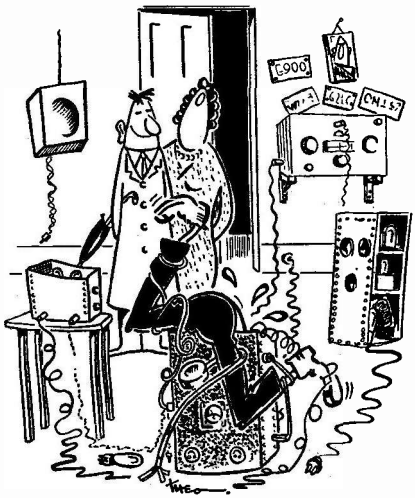
The pentode and tetrode drivers have been so successful, however, and speech quality so good that the writer can see no point in incurring further expense especially as ample audio is obtainable to modulate any power up to the 150 watts maximum.

Operating Conditions with Lower Anode Voltage

Perhaps the constructor has by him a 500- or 600-volt transformer which he would prefer to use with the 807 modulator. A power supply incorporating such a transformer will enable the 807's to deliver an audio output of from 70 to 90 watts, and if, as was originally intended, the modulator is to be used with the 10- and 20-metre 807 transmitter, even the minimum output of 70 watts will plate/screen modulate the Class-C final running at 100 watts, after due allowance has been made for losses.

A set of operating conditions is therefore appended for anode voltages of 500 and 600. As the average plate current in each case works out at about 286 mA the secondaries should be rated for at least 300 mA working current, otherwise, apart from the risk of a burnt-out secondary, the voltage regulation will be inadequate to cope with the large anode current swing.

It should be noted that for each set of operating conditions, grid driver requirements remain the same, in order that



Bert gets quite wrapped up in his short waves, Mr. Glenderhurst.

An Inexpensive 100-Watt Modulator

OPERATING CONDITIONS FOR 807's IN CLASS-B

Plate Supply Voltage	= 750 volts	600 volts	500 volts
Peak Grid-to-Grid Voltage	= 555 volts	555 volts	555 volts
Grid Driving Power	= 5·3 watts	5·3 watts	5·3 watts
Grid Impedance per Valve	= 7,100 ohms	7,100 ohms	7,100 ohms
Grid Bias	= Nil	Nil	Nil
Plate-to-Plate Load	= 6,650 ohms	5,050 ohms	4,000 ohms
Anode Current (2 valves) No signal	= 12mA	10 mA	8 mA
Max. signal	= 450 mA	450 mA	450 mA
Audio Output (Approx).	= 120 watts	90 watts	72 watts

maximum audio output may be obtained for each anode voltage figure.

The optimum anode load for the 807's varies of course in each case, and care should be taken that the correct modulation transformer ratio is chosen.

Adjustment and Operation

Having checked the performance of speech amplifier and modulator we are now in a position to couple the modulator to the Class-C RF amplifier.

For illustration purposes we will assume that the 10/20-metre 807 transmitter is to be plate/screen modulated with an input to the Class-C RF stage of 120 watts.

The first requirement is to ensure that the PA is running in true Class-C, such that the 807's are biased to at least twice the cut-off value. If the values of PA grid leak and negative battery bias are employed as specified, these conditions will have been fulfilled.

Switch on the supply voltages to the exciter stages, the exciter output being tuned preferably to 10 metres, it being the writer's experience that if the Tx puts out good 'phone on the higher frequency band, operation on 20 metres takes care of itself. Tune up all exciter stages, and with the PA stage still switched off note the combined grid current for the two 807's. If all is well it should be in the region of 15 mA, with bias values and supply voltages specified. On switching on the high voltage supply to the final and tuning the tank to resonance (with a 150-watt bulb as load), the grid current will drop to 7 or 8 mA, which is the correct value for Class-C operation. If the grid current is too high, either increase your PA bias or loosen the coupling between two of the exciter stages to bring it to 8 mA.

With the recommended voltages on the exciter stages there should be no trouble with inadequate grid drive, but on no account should the PA bias be lowered to increase the grid current or "downward modulation" will result.

The aerial coupling link must now be adjusted so that the plate/screen input is 120 watts, *i.e.*, 700 volts at approximately 170 mA for the two valves. Touch up the grid circuit tuning to keep the grid current to the proper figure. The 150-watt bulb connected in place of the aerial feeders should be glowing fairly brightly by this time.

We are now in a position to apply modulation, but on no account must the above readings be upset, otherwise the PA load resistance will be altered. The load resistance of the PA is readily calculated by applying Ohm's law, *i.e.*,

$$R_L = \frac{\text{PA plate voltage} \times 1000}{\text{PA plate/screen current (in mA)}}$$

$$= \frac{700 \times 1000}{170} = 4118 \text{ ohms approx.}$$

For matching purposes this figure may be considered as 4,000 ohms.

In order to obtain the maximum power output from the modulator it therefore becomes necessary to match the 4,000 ohms PA load to the 6,600 ohms plate-to-plate modulator load (or whichever plate-to-plate load is applicable). With the multi-match modulation transformer specified this becomes merely a matter of wiring the correct taps according to the maker's instructions.

It now remains only to wire the modulation transformer in series with the PA HT supply lead and we are ready for operation.

A sustained whistle into the microphone should result in an increase in brilliance of the 150-watt lamp connected to the aerial link as an artificial load, the PA anode meter needle remaining stationary if all is well. If the meter needle kicks slightly upwards, overmodulation may be indicated and the audio gain should be backed off until the meter needle remains stationary under modulation. If the lamp decreases in brilliance, "downward modulation" is taking place. In this case it

should be ascertained that the correct PA bias is being applied and that the grid current is up to the required figure.

During experiments with 807's as power amplifiers it was found that a persistent case of "downward modulation" resulted when the 807's were run over 80 watts or so. Incorrect PA-to-modulator matching seemed the obvious cause, but varying the matching taps on the modulation transformer failed to effect a cure. It was eventually found that parasitic oscillation in the PA was the cause, and after the installation of grid suppressor chokes and careful attention to screen by-passing no further trouble was experienced.

An overloaded PA can also cause this effect, and care should be taken that the 807's are not pressed farther than their normal limit. If the Class-B modulator and PA are fed from the same HT supply it is quite likely that the PA meter will kick downwards even though the lamp increases in brilliance—in this case poor regulation of the power supply is the reason.

The aerial feeders should now be substituted for the lamp load, when the PA may require a little retuning, although this should not amount to much if the feeder is correctly matched to the radiating system.

Whilst the modulation percentage may be roughly estimated by noting the upward kick in an aerial current meter (a rise of about 25 per cent. indicating full modulation *on sine wave input*), an oscilloscope or calibrated modulation meter are the only true guides to percentage of modulation. The writer hopes to describe at a later date the construction of a simple modulation meter which will enable the modulation percentage to be read off directly.

With the transmitter on the air the only further snag which may be encountered is RF feedback into the speech amplifier which will result in a loud howl when the audio gain is advanced beyond a certain point. If this fault is encountered, see that the microphone lead is well shielded and earthed, right to the point where it enters the speech amplifier chassis. With a crystal microphone a co-ax screw-on connector is perhaps the ideal coupling arrangement. The speech amplifier should be earthed separately from the RF portion of the Tx.

A resonant length of microphone cable may also cause trouble and lengths of 8 ft. should be avoided. The aerial feeder should (it goes almost without saying) be kept as far from the speech equipment as possible, and earthing the outer metal braid of the co-ax feeder helps to keep the RF in its proper place.

If no feedback troubles were experienced with the dummy load, and yet appear when the aerial is connected, the feeders are obviously the cause of the trouble and the latter precaution should put matters right. The 50 $\mu\mu$F condenser C1 across the microphone input will help to bypass to earth any HF, which reaches the grid of the 6J7.

Conclusion

If all the precautions outlined above, which in any case should be normal practice, are taken, no trouble will be experienced in putting out 100 or 120 watts of good quality 'phone using the P/P807 Transmitter and 807 Modulator.

QSL BUREAU BOX

Our Bureau holds cards for the operators listed below, whose full addresses are not on our files. Please send a stamped addressed envelope, about the size of this page, to BCM/QSL, London, W.C.1, and the cards will then be forwarded on the next clearance. If you would like your call-sign and address to appear under "New QTH's," please mention it at the same time. All such addresses are in due course automatically reprinted in the Radio Amateur Call Book.

2AAX, 2ARJ, 2ATY, 2AXN, 2AYY, 2BDM, 2BJS, 2BMP, 2BPC, 2BVA, 2CCO, 2CTC, 2CUA, 2DAZ, 2DGS, 2DPP, 2FBD, 2FCS, 2FFX, 2FJS, 2FKJ, 2FRL, 2HFD, 2HIL, 2HJQ, 2HN, 2HOW, 2IU, 2JT, 2ND, 2RJ, 2RN, 2TQ, 2TZ, 2UB, 2UX, 2WL, 3AAF, 3AAP, 3ADD, 3ADN, 3AFC, 3AGV, 3AHH, 3AIE, 3AJL, 3AKL, 3AMN, 3APQ, 3AUS, 3AYD, 3AZP, 3BAN, 3BCF, 3BDC, 3BET, 3BFN, 3BGU, 3BHQ, 3BNV, 3BSZ, 3CAW, 3CBG, 3CCD, 3CDS, 3CEH, 3CEW, 3CHP, 3CHW, 3CIK, 3CJM, 3CJP, 3CJX, 3CLT, 3CNR, 3COO, 3CPA, 3CSU, 3CTN, 3CUI, 3CWX, 3DAO, 3DBH, 3DCF, 3DEF, 3DFI, 3DGH, 3DJO, 3PU, 4RW, 5GW, 5JW, 5PZ, 5RD, 5YC, 6JF, 6KO, 6PG, 8DJ, 8PM, 8VD, 8ZZ, GD3AGC, GM2DYP, 3AOR, 3BST, 3BXL, 3BZY, 3CDL, 3CEJ, 3CVJ, 3DBS, 8MA, GW3BYZ, 3CF, 3CZN.

Trans/Receiver 3/II (B.2) In Operation

Notes on Modification and Use

By G. R. HIRST (GW3ZT)

(What is known as the Type B.2 Equipment can be put to good use on the 3·5, 7 and 14 mc amateur bands. Adaptable for telephony working, as a combined transmitter-receiver it can be operated as a completely self-contained 25-watt station.—Ed.)

WHEN the specification of the Trans/Receiver 3/Mark II was first examined, it was realised that a very useful CW/'Phone equipment could quite easily be formed with only a small amount of modification.

This unit is more widely known as the B.2, although how this designation arose is not clear as the official blueprints do not use this title, but call it the Trans/Receiver 3/Mark II. Primarily designed for CW use, the receiver section has stood up well when compared with an 8-valve double-frequency changing superhet, and on many occasions of heavy QRM was even more useful.

Brief Description

The transmitter consists of a 6F6 crystal oscillator and a 6L6 PA. The receiver is a 4-valve superhet consisting of two 7Q7 and two 7R7 valves. Though designed for low impedance headphones, it will work a small speaker. Both transmitter and receiver are contained in a shockproof steel case, 11 in. by 6 in. by 14 in. The 3·5, 7 and 14 mc bands are covered by both units.

The power pack and accessories are in a separate steel case of similar size and can be used on any mains from 90-250 volts AC or a 6-volt battery. Metal rectifiers employing a bridge circuit give two outputs, 250 volts and 500 volts. The PA runs at 60-70 mA, 490 volts, depending on the aerial loading.

A great deal of real DX has been heard on 14 mc. Owing to the lack of a suitable aerial for this band, the transmitter has not yet been severely tested on 20 metres, but in the very near future it will be tried out just as carefully as it has on the 7 mc band.

On 7 mc over a period of one week all parts of the British Isles and the Continent have been worked on 'phone, operating on an average of only one hour a day. Included was a Sunday afternoon 100 per cent. QSO for half an hour with G2BMN (Wellington, Shropshire), using an input of 25 watts.

The average report received has been R5 S7-8 and nothing under S6.

The transmitter was designed to work on any single length of wire and although the most difficult part of adjusting the transmitter is the loading of the aerial, it is surprising how well an odd length of wire can be loaded. As a Windom aerial was available it was used during the testing period and proved quite satisfactory.

Cathode modulation was first tried by inserting a carbon microphone in the key sockets, but although local contacts were made (as was expected), carrier level was high but modulation very low. However, for local work, especially portable use, speech quality by this method is reported as being excellent.

Method of Modulation

The power supply to the transmitter from the incorporated power pack consists of a 250-volt line for the oscillator and PA screen voltage and a main 500-volt line for the anode of the PA.

It was, therefore, decided to break the 500-volt feed to the PA and connect it to the modulation transformer. This means that modulation is applied only to the anode of the PA and not anode-and-screen, as is usual with a tetrode valve. However, results speak for themselves and there is no sign of distortion, every station worked reporting excellent speech quality and depth of modulation. Therefore, in this case, it is not necessary to undertake the added complication of altering the screen supply to the PA.

Fig. 1 indicates where the HT positive line is broken. This is easily done by following the lead from the anode pin of the PA valveholder. It will be found to go to an RF choke. The break is made at the end of this RF choke, remote from

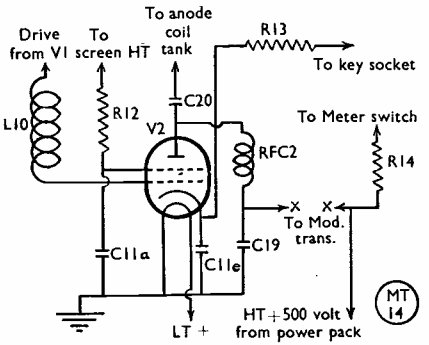


Fig. 1. Circuit of the PA side, showing how modulation can be applied. R12, 500 ohms ; R13, 200 ohms, bias ; R14, 1·2 megohms ; C11a, C11e, C19, C20, all ·002 μF ; V2, 6L6. Key sockets must be shorted on " transmit " and open on " receive."

the anode of the valve. The HT does not pass through the anode inductances as parallel plate feed is used and so the wiring is not at all complicated and can be found in a moment. There are several holes in the case or the panel through which the leads can be passed to the secondary of the modulation transformer. It was decided to do this in the transmitter unit rather than in the power pack because of the simplicity of breaking and making the connection in the transmitter itself.

The Modulator

The modulator is shown in Fig. 2 and consists of two PX4 triodes in paraphase push-pull, driven by one single AC/HL. Modulation is ample when a carbon microphone is used ; a crystal microphone could be employed, but it would be necessary to add another stage. Reports indicate that the carbon microphone is all that is needed for quality. If the PX4 valves have the same mutual conductance and are matched, there is no need for the bias decoupling condenser in the push-pull stage. This modulator combination was built mainly because all the parts and the valves were on hand, while only a power pack with 4-volt filaments was immediately available.

Transmitter Adjustment

Aerial coupling is very critical if correct upward modulation is to be obtained. Many amateurs carry on with " downward " modulation and say that they have never had upward modulation and still work the DX ! However, during several QSO's the aerial coupling was altered to obtain downward modulation and each time the report was : Drop in modulation, harsher quality, and an inferior signal generally. The key sockets must, of course, be short-circuited for telephony operation, but it is essential when going over to the receiver position that the shorting strip in the key sockets be removed or the signal strength is low and on 14 mc it will cause a loss of sensitivity.

The transmitter should be tuned through in the normal manner as far as the PA anode. A low-wattage lamp is wired in series with the aerial lead. The anode tuning control is rotated to obtain the usual dip and it will be found that if the aerial matching control is then rotated, even although the anode current rises, *the aerial may not draw RF current.* If this is the case the aerial matching control should be rotated to another position and a new " dip " in anode current found by means of the PA anode tuning. Once again, the aerial matching control is rotated until the aerial does draw current as indicated by the lamp in series with the aerial.

The modulator is then switched on and a steady note sounded in the microphone should cause an increase in the brilliancy of the lamp. If it causes the brilliancy to go down the aerial matching control and the anode tuning must both be slowly rotated until the correct position to give upward modulation is found. It is a slow process and requires patience, but the tests have proved that it is well worth the trouble. Even although the anode current does not appear to change, it does alter the modulation matching considerably.

In the near future another modulator will be built using 6·3-volt valves and the power supply will be another of the power pack units. They will deliver 500 volts at 80 mA, so that a very small modulator unit could be built up to match the transmitter. Only carrying handles need be fitted and a complete portable 'Phone/CW station is available with an input of 25 to 30 watts even when using batteries for the supply.

Conclusion

This Trans/Receiver Unit has proved during one week that QRP work can still work wonders and that with a little patience 150 watts are not necessary even on a Sunday !

Although complete tests have not been made on 14 mc, the transmitter can be used on this frequency either by using a

14 mc crystal or with a 7 mc crystal doubling in the PA.

When the 21 mc band becomes a reality it will be quite a simple matter to alter the receiver coils, and use one of the spare transmitter coils to enable the unit to be operated on 21 mc.

When running the power supply from the mains, any slight drop will of course cause the anode voltage on the PA to decrease ; but it has never been under 470 volts, and at 65-70 mA represents a very useful input.

Table of Values

Fig. 2. The Modulator Unit

R1 = 250,000 ohms
R2 = 25,000 ohms
R3 = 1,200 ohms
R4 = 25,000 ohms
R5 = 150,000 ohms
R6 = 500 ohms
R7 = 150,000 ohms
R8 = 20,000 ohms
C1 = 0·1μF
C2 = 0·1 μF
C3 = 50 μF, 12-volt
C4 = 50 μF, 50-volt
C5 = 8 μF, decoupling
T1 = Centre-tapped filament transformer
T2 = Multi-ratio modulation transformer
V1 = AC/HL
V2 = PX4
V3 = PX4

Ordinary carbon-button microphone ; or if a crystal microphone is used, add a further stage.

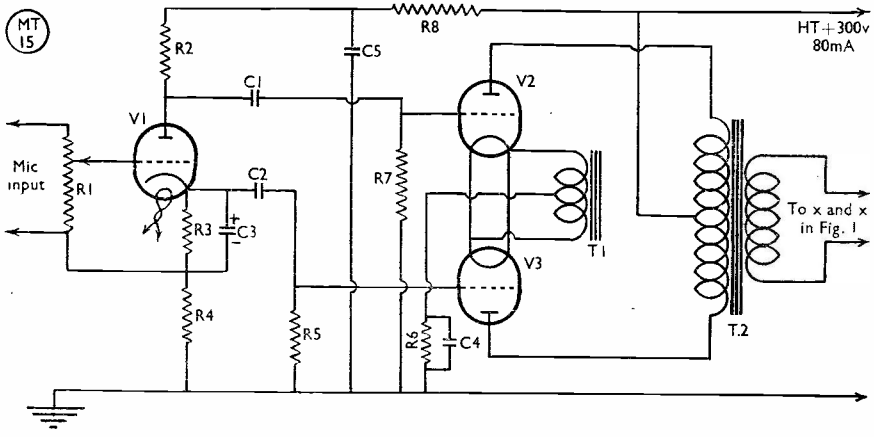


Fig. 2. The modulator arrangement found suitable by GW3ZT, and described in the text.

CALL BOOK STATISTICS

The Winter 1947-48 Edition, the latest issue of the Radio Amateur Call Book, is a massive production of over 300 pages, and is the thickest, heaviest and most comprehensive volume even the Call Book people have ever produced. The whole of the Foreign Section has been re-set in a smaller type-face, and the G listings now show some 3700 QTH'S, in 31 columns. G calls given include those published in our own "New QTH" feature up to and including November last.

For comparison, the VE's run to 33 columns, the Australians to 18 columns and the ZL's to 11 columns. This means that, excluding the U.S.A., there are still roughly twice as many English-speaking amateur transmitters outside the U.K. as there are in it. Put in another way, G's number only about one-third of the total number of amateurs in the British Commonwealth.

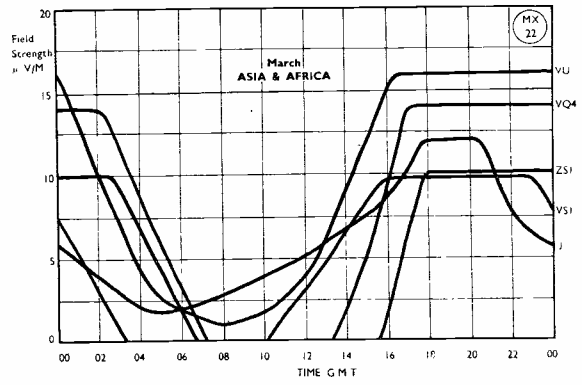
Of the total of 280 pages actually taken up by amateur QTH's, the Americans alone occupy 205 pages, giving a ratio of approximately three times as many W's as the whole of the rest of the world together.

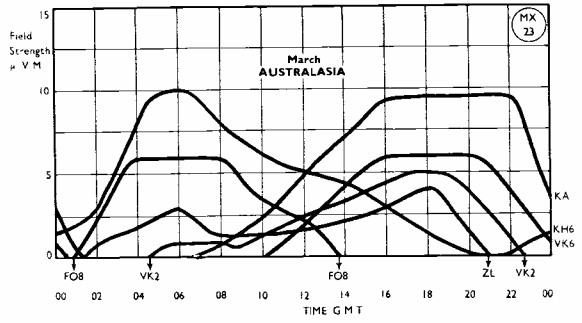
The Winter Edition of the Call Book also includes a map of the world (Mercator projection) showing call areas ; a Q Code table ; and prefix lists arranged alphabetically and by countries.

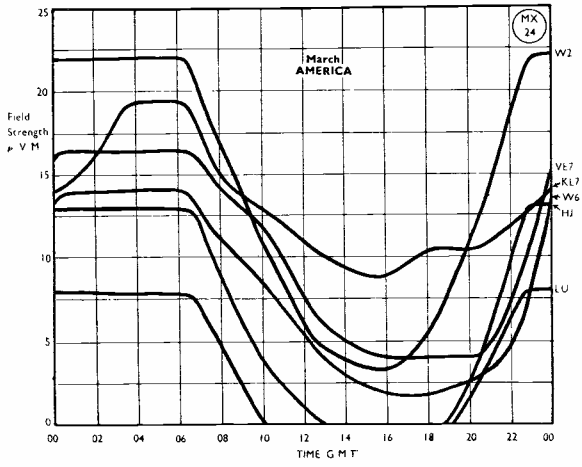
The Short Wave Magazine covers all current Amateur Radio activity

Twenty-Metre DX Forecast

Predictions for March







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

THE slow but steady decline in general signal level is further indicated by the curves for this month. The North American areas, as exemplified by W2, show that the trough of minimum field strength is displaced to the extent of about one hour earlier than the position of the trough in February. KL7 again shows the most drastic decline of all the zones, amounting to about 30 per cent. at 1600 GMT, whereas the South American areas remain almost identical in characteristic, as they have done for many months.

The morning period of activity for VK2 is once more apparent and a considerable expansion of the ZL curve both in the morning, and to a lesser extent in the evening, should result in a greater chance of contact with New Zealand. VK6 is interesting in that it not only indicates a time expansion, but is also the only area which shows a decided increase in signal strength during its period of activity. The remaining Asiatic areas, together with the African areas, show comparatively little change except for the general seasonal decline in signal intensity.

It might be opportune to note that the land areas of maximum local noise level at this time of the year are between latitudes 5° and 20° S in Africa; between 5° N and 25° S in South America; and the area enclosed by 80° E to 170° E longitude, by 15° S to 5° N latitude in the Far East. These noisy areas may be the cause of unavoidable failure to hold DX contacts.

DX COMMENTARY

ON CALLS HEARD, WORKED & QSL'd

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

Another very active month for all the DX types, and again the heaviest load of mail we have yet had. An uncommon and rather interesting characteristic of the said mail is that a large number of erstwhile DX-chasers have written to say, in effect, "Thank goodness we haven't got to strain every nerve to keep our position in that wretched list any longer; we've really been enjoying ourselves this month for a change!"

For this reason, the 1948 Marathon List is not yet exactly overburdened with new entries. In fact, until G3DO's top-scoring claim arrived we (your Commentator and his two 807's) were heading the list. This surprised us more than somewhat, as during the period we have been away from home for a week, off the air rebuilding for ten days, and only on the rest of the time for an average of an hour a day! So some keen types are obviously taking it easy; anyway, we can all work DX *some* of the time—and the DX will still be there next month, *and* next year. So with that pleasant reflection we break into this session's

Hot-Under-Collar Section

This month we propose to argue the plain fact that the general standard of operating is poorer than it was in the pre-war years. We have had so many comments on this point that it seems about time we did something. In the years 1934-39, British stations collectively had a world-wide reputation for good operating and *good notes*. Ninety-five stations out of a hundred had a really beautiful T9x tone—and now what do we hear? If you hear a T9x you stop and listen to it for sheer pleasure, and conclude that the chap is using a crystal. Many of the VFO notes are no better than those of the 1930 fraternity using self-excited oscillators and no form of control at all. We well remember our old TPTG with 50 watts to a DET-1; if we'd ever had a T7 report on *that* we would have been thoroughly ashamed. But now, in this year of scientific achievement and bulging crania we hear T7's all over the place, and bow our heads in shame when a "G" call-sign identifies them.

If you can't get T9 or even T9x reports from your VFO, throw it away. Build a TPTG or Hartley oscillator instead of your final, put it on the air (preferably directly coupled to the aerial) and put out an *honest* T7. Then at least there's a reasonable chance that it will eventually be removed completely and permanently by the GPO.

Apologies to all the beautiful T9 and T9x VFO's that we must have been mistaking for crystals all this time!

But the *operating*! We leave out the well-worn subject of Spivvery, by which we mean sharp practice in any shape or form. No, we refer this time to Stupidity, chief example of which is the enormous time wasted by many stations in calling CQ DX instead of *listening* for the stuff. Time and time again we hear a rare DX station plaintively calling CQ; as soon as he finishes, it seems that a flock of Europeans, including many G's, start up on his frequency calling CQ DX! If all the watts wasted on useless CQ DX calls were bottled and sent to West Hartford they would run an entire ARRL DX Contest. So every time you reach with a sigh for that switch, check your hand in mid-air and *listen* again.

DX of the Month

The 28 mc band has been quite good and interesting throughout the month, but has brought forth little comment. Probably the fact that the best period is between 0830 and midday is responsible for this; and at week-ends it *is* a bit crowded. Most of the mail discusses 14 mc, so we will press on with that. G2AKQ (Ringwood) has been on another flying trip to ZS5, but when at home has been amusing himself raising new countries on 14 mc 'phone, for a change. He sends some useful QTH's in consequence.

New ones from G3BNE (Hampstead) include KH6IJ, ZE2JH, VQ4EHG and VE8OZ. The VQ4 is the Hallicrafters Tropical Expedition in Kenya. 'BNE uses a single 807 and two spot frequencies in the 14 mc band. G2DLJ (Derby) reports

General view of VE2KG, Quebec, with ex-G2CIN at the operating position. The Tx runs 50 watts, using a 6L6-RK39 combination, into a 4-element beam.

for the first time ; he has been on the air for a year and has collected 72 countries. He, too, complains about the eternal CQ DX calls which often cover the band while the DX is still there, underneath it all.

G3SB (Minehead) is one of many who have picked up Zone 19 by working UAØKGA, whose QTH is Cape Schmidt, near Wrangel Island. The UA when last heard was T6 and watery, on about 14050. G3DCC (London, N.8) sends his first report. He was licensed in January and uses a 14 mc dipole "folded into 17 feet." on the roof, as he has no garden space. He has worked VK and W1, 2 and 3 so far. G8PL (London, N.W.3) goes one better and uses an indoor 14 mc aerial, on which he seems to have been very successful. At any rate, he has raised 19Z and 30C this year with it. 'PL concludes his letter with the sage observation that there is rather too much grousing going on nowadays, and pleads for a little more tolerance all round. But he does add that the one thing that makes him see red is 'phone at the LF end !

Concerning this, GM3CSM (Glasgow) says that an extraordinary number of well-known stations, with some OT's among them, operate 'phone between 28000 and 28200. This makes that part of the band pretty insufferable for the chaps with QRP CW. He comments, too, on the T6 and T7 notes, some of which creep out of the band at times. But 'CSM has collected some nice DX, such as KZ5AK, VP4TO, VK6CM, ZL4DP, CE3AB, CX1FY, VS6AE—all on 28 mc.

That UP2 !

Yes, there really *is* such an individual as UA3BD/UP2. G6FU (Surbiton) sends a QSL he has had from UA3BD/UC2, but it appears that the said UA3BD (*a*) found he was in the wrong country or (*b*) moved on. The two possibilities have an equal degree of support ! G2WW (Penzance) worked the UP2 on 7 mc and sends some useful QTH's, including MD3AB and MD7DA. The latter has been giving many of the boys their first Cyprus QSO, but has now returned to Egypt. G2PL (Wallington) also has the QSL from UA3BD/UC2, but worked him in UP2 as well. 'PL has been enjoying 7 and 3·5 mc, and when he returned to the other bands he collected FQ3AT/FE, WØCTV/VR1 and KB6AD for three new ones. He runs

ZONES WORKED LISTING

Station	1948		Post-war	
	Zones	Countries	Zones	Countries
	'Phone and CW			
G3DO ..	31	66	39	145
G6QB ..	31	56	40	152
G4CP ..	24	44	39	126
G6PJ ..	22	35	39	76
G3TK ..	21	38	39	117
G3AAE ..	21	32	38	106
G8IP ..	21	32	38	105
MD1D ..	20	35	39	121
G2AVP ..	20	31	37	98
G8PL ..	19	30	21	68
G2BXP ..	18	38	34	86
G2WW ..	16	45	39	149
G5MR ..	16	18	38	103
G3BDQ ..	14	28	35	81
G3BNE ..	14	27	20	45
G5HH ..	11	30	30	79
G3ACC ..	10	19	30	85
G2DHV ..	1	2	25	49
	'Phone only			
G3DO ..	28	55	37	116
G8QX ..	12	12	34	106

a regular Sunday schedule with W1BB, subject of the photograph last month; this has been going strong for 18 months and each QSO lasts about two hours! 'PL says this is a real example of amateur friendship, extending over nineteen years.

PX1C

Two reports about PX1C are to hand. G3BWM (Broadstairs) had his card returned from Box 66, Andorra, endorsed Unknown. G4IX (Parkstone) received back a large picture postcard from Radio Andorra (704 and 5980 kc), with no comment whatever. So it appears that there just isn't a PX1C—or that he can be classified with the VK1 heard by G4IX round about midday on 7 mc.

And those D and DA stations! They busily give their full QTH's, and some of them send QSL cards, but we repeat—they *are* pirates, and are all operating in defiance of the occupying authority; they are being energetically rounded up. Only the familiar D2's and the three-letter D4's (the BC-610) boys are genuine.

G3AWP (Bournemouth) has piled up 63 countries and says that 7 mc seems to be the DX band these days. He worked a VE3 on a 33-ft. Zepp with 50-ft. feeders and 25 watts! What we used to call an AOG, without a doubt. 'AWP tells us that down Bournemouth way they call a VFO a "Spiv Special".

G3TK (Leigh) has collected UAØKGA, OY3IGO, MI6ZJ, CR7VAL, W3KXO/KG6 and some other nice ones, and duly appears in the Marathon list. G2WD (Stoke-on-Trent) unearthed W6PJN/KG6 (Saipan) on 28 mc, who has been putting in beautiful 'phone in the mornings. G4RX (Barnet), also on 28 mc, worked C7AT (28050, 0920 GMT).

G6ZO (Totteridge) still pulls out the plums, such as FQ3AT/FE, WØCTV/VR1 (Makin Atoll, Gilbert Is.), G2FDF/HZ (Kuwait), and (you've guessed it) UAØKGA. On 3·5 mc he worked ZL4GM, and on 7 mc VQ3HJP and VQ5JTW. 'ZO adds that many "DX" calls on 7 mc are heard in North London with a steady unfading S4 signal and are the work of a ruthless leg-puller. This last is substantiated by G5FA (London, N.11), another 7 mc stalwart. 'FA sends a list of 7 mc DX which just teems with VK's, W6's and other choice pieces. But he finds that he has spoilt his own pleasure by pushing up the final from 40 to 100 watts—it's all too easy now!

G6TC (Wolverhampton) has been busy on 7 mc with 7 districts W, 3 districts VE, PY1 and TI. He has also had a QSL from the well-known Eric Trebilcock in Tasmania, referring to a day when 'TC's

aerial lay on the roof and hung over the garden wall! 'TC has one grouse—the amount of inter-G working on 7 mc in the early mornings when the DX is coming through. (Some of these inter-G chaps only work on S9 signals and so never turn up the RF gain control—they just wouldn't know about DX.)

G5WC (London S.E.19) would like to see a Zone List for 7 mc only. He says anyone who can make a score of 20 is a hero.

QSL Matters

We are urgently asked by SV1RX to state that the sending of QSL cards to the SV QSL Bureau *must cease forthwith.* There is danger of serious trouble out there, so cards for SVØ stations should be sent to their Army addresses only, where known; those for SV1WE and SV1RX (only) should be sent to BCM/QSL, London, W.C.1, where we will hold them until the owners are in England in the summer. *Do not send cards to any other SV1 stations, even if requested.*

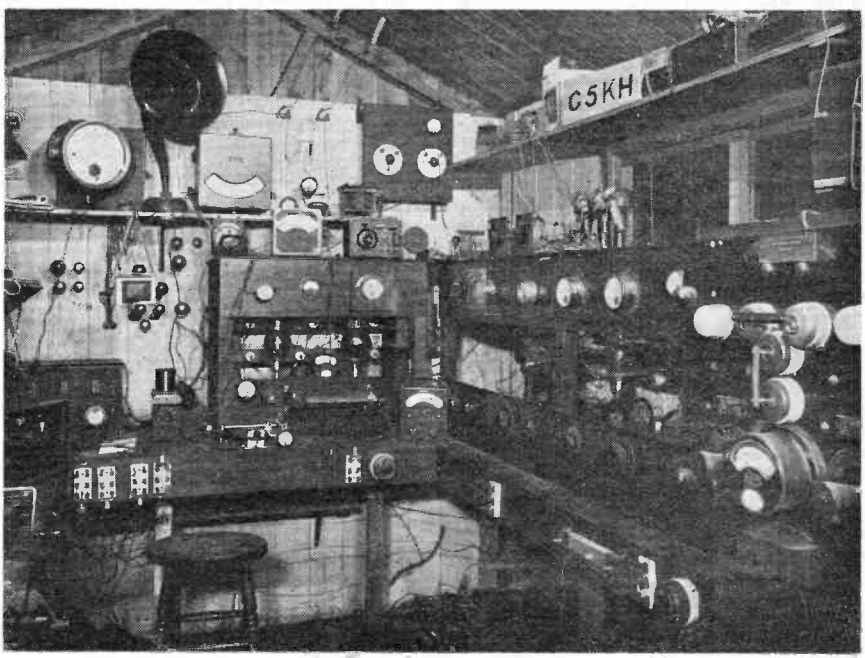
ON4JW (Brussels) comments on our remarks about "The QSL Racket" two months ago. He mentions stations in ZS3 and VQ8 who happily say "Sure QSL Jules" but don't reply to Air Mails, reply coupons or anything else. He also mentions some black sheep in the USA for the benefit of those in search of WAS—particularly a well-known one in Vermont. On the other hand, we have a letter from PY4FI listing no less than 34 G's who owe *him* cards!

The HA QSL Bureau is now A. Sass, Dohany utca 1/c, V. em. Z., Budapest, Hungary, which is the new Bureau for transmitters only.

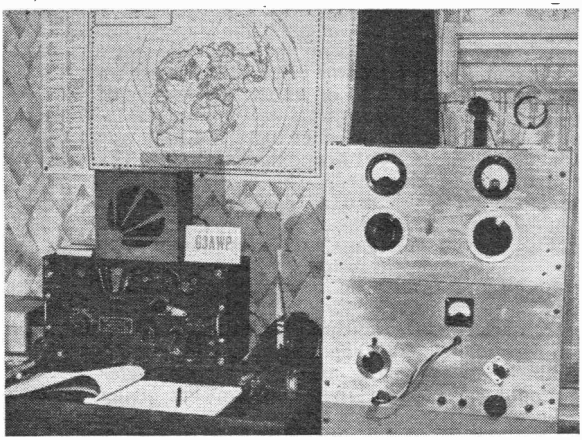
Other news includes plaintive notes from VP6CDI, VP4TT and ZD2KC, saying that they cannot possibly reply to SWL reports. Those they receive are all useless, as they invariably refer to times when they are working strings of G's without the slightest difficulty. D2FP, R.A.F. Wahn, BOAR 19, says that his log for the period June 17-December 3 was accidently destroyed, and if any G's who worked him during that time want cards, he would be glad to hear from them.

3·5 mc

There is still a lot of activity in the early mornings on 3·5. Unfortunately the G's



Old-timer G5KH, of Putney, London, S.W.15, showing the station in the late 1920's.



G3AWP, Winton, Bournemouth, has a BC-342 Rx, with a 6V6-807-P/P 807 transmitter operated at up to 90 watts input, using three switched crystals. Activity is on 14 mc mainly.

all bunch together at the LF end and are mostly S8-9 when the DX is good. G3BFC (Ferndown) passes on the information, *via* G3BM, that VR6AA has been heard on the band. G2BY (Cheltenham), getting tired of 'phone nattering and general spivvery on the other bands, took up 3·5 seriously, and says that he is delighted to have found some of the pre-war spirit once again. He has worked all USA districts except the 7th, with VE1, 2 and 3 and a ZL. 'BY has also been working G's on the band with an input of 0·016 watts ! This was derived from a 6L6 CO with an HT supply of 8 volts from a bias battery—no trickery ! Very good solution to BCI and TVI problems, that.

News from Overseas

MD5LR (full QTH in list) was on the air for one month and worked 19Z and 49C. He is now QRT pending release, and wants to make sure that he has not failed to QSL anyone awaiting one. His "second op." will probably be keeping the station on the air with the call MD5GM.

VE7AFM (Vancouver) is ex-G3NQ, and uses a 500-watt transmitter on the front of which you "dial" any two selected bands. He lives 1,000 ft. up, with the Pacific straight out in front and mountains to the back.

G3ATL (Rochdale) was recently in Hong Kong and met VS6AZ, who will be operating at the LF end of 14 mc and particularly wants G QSO's. G3ATL saw VS1AK later in Singapore, who is also anxious for G contacts around 14300 and 28500 kc. G3CDR (*HMS London*) is another who has been out there for some time, and still hears G's on 7 mc in places like Hong Kong. He describes his gear as a mediocre CR100 with a poor end-fed aerial.

G2LX (Lincoln) asks us to say that he has relinquished his call and will be taking out a new one in Southern Rhodesia, to which he is no stranger, having been one of the first active amateurs in those parts.

W4BPD (Orangeburg, S.C.), owner of the famous rhombic farm, is worked into a frenzy by his lack of success with Zone 23. (Fancy building a rhombic specially for Zone 23 and then never hearing anyone there !) He points out that it is much more difficult for the East Coast than the West on account of the time factor. 'BPD now has an aerial assortment totalling twelve rhombics, an extended vertical double Zepp for 28, another for 14, two doublets for 14, one extended double Zepp for 3·5, one 10-element Sterba on ZL and Southern Europe, and a four-element rotary. (Pause while we go out and look

. . . That's all it ever says. Last time I'll buy surplus equipment. . . .

at our "piece of wire". . . .)

Bob Ford of AC3SS (Gangtok, Sikkim) is at present on leave in England. AC3SS will not start up again, but he says there is a young Indian who will probably be running an AC3 station shortly. Bob, however may *possibly* be operating from AC4 on his return (now, now ! come, come ! hands off that VFO knob!) We hope to meet Bob and agree on his procedure ; perhaps we can bribe him to send QLM and then start listening at the *HF* end !

A very cheery letter from Patrick Lebail (F3HK) tells us that he is not on the air, but *someone* is, using his call. But he says the chap isn't much good, for only four QSL's have come in from the Bureau. 'HK says, "I am boiling hot while reading your column—like a bee viewing a sizable chunk of honey through a window pane !" We hope to hear that he will find time to get the real F3HK back on the air soon.

ZS5YF, Durban, is ex-G3BYF and uses a VFO 6L6-807-809 transmitter, with 50 watts input and a 138-ft. single wire aerial. The receiver is an SX-24 with two-stage preselector. He has worked 66C in 29Z ; though he is always on the look-out for G's, difficulties at ZS5YF are a high local noise-level and BC receivers within a few feet of the transmitter.

DX QTH's

HC1JW	Box 2536, Quito, Ecuador.
HC2HP	Dr. H. Parker, Box 664, Quito.
HH3L	Box 153, Port au Prince, Haiti.
MD3AB	Box 247, Asmara, Eritrea.
MD5LR	S/Sgt. L. Richardson, H Mess, 5 B.O.D., Tel-el-Kebir, MELF.
MD5ZC	L/Cpl. P. L. Bennett, Royal Signals, 8 Inf. Bde., MELF.
ST2CH	RAF Station, Khartoum, Anglo-Egyptian Sudan.
TG9BA	Al Broll, c/o PAA, Guatemala City.
VE8OG	Cambridge Bay, Victoria Island, N.W.T.
VP6CDI	F. J. North, Little Kent, Christchurch, Barbados.
VQ4EHG	Gatte, Hallicrafters Expedition, Private Bag, Nairobi.
VQ4HGB	Baker, c/o Barclays Bank, Nairobi.
XE2C	Box 317, Monterey, Mexico.
XE3AC	c/o Airport Manager, CMA, Campeche, Mexico.
YS1AC	Arcadio Chavez, Villa del Guardo, El Salvador.
YV5AB	Box 1542, Caracas, Venezuela.
ZC6WF	Don King, c/o 6 Airborne Divn., Postal Unit, Haifa.
ZS1GR	P.O. Box 380, Cape Town.

ZD4AM (Tafo) didn't think much of January for DX, but on February 1 he raised WØOZW/KS6 for a brand new one. Harold says that ZD4AT is ex-G2FYG. ZD4AM has a peculiar worry ; he is enjoying a QSO with a G and would like to go on, but the other chap nearly always says "Mustn't keep you now." Very considerate, as he says, but a bit boring for *him* ! He has been the first ZD4 for more people than he can count, in spite of ZD4AB's considerable activity in the earlier days out there.

G2FDF/YI (Baghdad) has also found things poor and suffers acutely from QRM emanating from various USSR districts He still receives direct QSL's in spite of our published request for it to stop. The political situation is hot, he says, so please *don't*—or you won't see him back in G again. He sends a list of G calls—unfortunately much too long for publication.

The WAZ Marathon, 1948

This has started up slowly, partly because many readers obviously *didn't* read what we said last month about the list being published in order of merit of 1948 scores. Those who have just sent their post-war scores can't appear on the list at all. We think some of the disappearances are due to timidity, which will suddenly be overcome when they find that their totals are better than many now

in the list. Let us repeat : Please send a *post-card* with just the four figures on it, like this : 25, 50 ; 39, 129. That's all we need. The *first* time, give a list of Zones and Countries worked ; after that, just the additional ones each time. But these can be in your letter and need not be on the post-card.

Some of the W6 DX fraternity scored 31 and 30 Zones in the first fourteen days of January ! W6DI had got 28Z and 59C on 'phone only by January 15. But whatever your score, if you feel competitive, let's have it. If you don't, that's all right too.

Shorts and Stop Press

G6BB (Streatham) has unearthed UA, UB, UC, UP and UR on 7 mc, in addition to most W districts. G6PJ (Sheffield) is still very cut up about the poor QSL returns from USSR. As he says, "Why count all these countries if you can never get a card out of them ?" Some of them are an awful bother to work, too.

G2AVP (Stradishall) had a trip to MD5, where he spent a convivial evening with MD5PC (they also worked some VK's on 'phone !) He finds KL7's very good at the home QTH, and also collected a new country with VS9ET (Oman).

G4CP (Dudley) replies to one of last month's points by saying that he *does* work between 14350 and 14400—gets results, too, when W and VE are coming through.

Via G3DO/J8AAZ (also confirmed *via* G6QB/J8AAZ !) : All stations in Korea will shortly be using the prefix HL, instead of J8 or AK. So when you hear an HL—don't be fright !

G2AO (Malvern) has been working ZS's on 7 mc by raising them on 14 and asking for a QSY. One of them got straight through on 40 metres and gave him a list of the G's all round his frequency. 'AO also worked VQ4HGB and sends his QTH.

And now it's about time to QRT ; next month's deadline is first post March 17. WAZ and Marathon claims with four figures on a *post-card*, please, and all your news in a separate letter, to "DX Commentary," *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. So Good Hunting—and tell us all about it. BCNU and 73.

FIRST CLASS OPERATORS' CLUB

PRESIDENT : GERALD MARCUSE, G2NM
HON. SECRETARY : CAPT. A. M. H. FERGUS, G2ZC

The winner of the F.O.C. 1947/8 Marathon Contest was C. T. Wakeman, G4FN (Westcliff-on-Sea), who thus becomes holder of the silver cup donated to the Club for this Contest. G4FN succeeded in being the first to work 66 F.O.C. members. G8VG and G3ARM were winner and runner-up, respectively, in the Open Contest.

The F.O.C. claims the distinction of having as a member the oldest Old-Timer still active—J. E. Catt, G5PS, who has never let up on Amateur Radio since 1904 !

Year's Survey

The Club has closed its first year of post-war activity with a large and increasing membership, a spirit of the utmost harmony among the members, and a credit balance. All those who have helped in any way to achieve this very satisfactory state of affairs—far exceeding the hopes and expectations of the Club's original sponsors—are thanked for the part they have played.

Members should have received ere this an individual up-to-date printed list giving QTH's of the membership, with a copy of the By-Rules of the Club. One of the most important of the latter is that F.O.C. members are pledged to observe the principle of keeping 'phone off the LF end of all amateur bands.

Election Notice

In accordance with the Rules, the following have been elected to active membership of the F.O.C. :

F. A. Robb, GI6TK (Belfast) ; G. Howarth, G5XC (Barrowfield, Lancs) ; J. Powell, VQ3HPJ (Dar-es-salaam) ; E. F. Fowler, GM5UT (Aboyne) ; N. G. Roberts, VK5NR (Darwin, Australia) ; B. Petersen, OZ2NU (Aalborg, Denmark) ; J. Rasmussen, OZ7BR (Lyngby, Denmark) ; A. Bosten, G3BIN (Loughborough) ; C. G. Wilkinson, G2LI (Hampton) ; R. F. C. Brake, G8QR (Norwich) ; D. C. Derry, G8PQ (Middleton, Lancs.) ; W. D. Jones, G3BBF (Newton Abbot) ; T. G. Mitchell, G3BPZ (Rochdale) ; N. T. J. Bevan, G8IH (London) ; W. H. Dyson, G8TD (Burnley) ; E. Kaleveld, PAØXE (Haarlem).

All correspondence regarding the F.O.C. should be addressed to the Honorary Secretary, Capt. A. M. H. Fergus, G2ZC, 89 West Street, Farnham, Surrey. (*Tel. : Farnham Surrey* 6067.)

Minimising TVI

Discussing Precautions at the Transmitter End

by K. E. V. Willis, A.R.C.S., B.Sc. (G8VR)

We have no apologies to make for bringing this matter up again, since the further one examines it, the more menacing it appears. It now seems probable that our promised 21 mc band will be virtually useless in the TV service area, since second harmonic radiation from PA's running more than QRP inputs will be very difficult to eliminate.—Ed.

THE problem of television interference by amateurs, especially on the vision channel, is probably the most serious that has ever confronted the amateur fraternity. At the moment, such troubles are confined mainly to operators who live in and around London, but as time goes on the whole country will be served by television (and for longer programme periods) and nearly all amateurs will become involved.

Of the importance of the problem there can be no doubt. It is *not* sufficient simply to refrain from transmitting during television hours, since these hours will be extended eventually. In any case, channels utilised by television may be employed by other essential services outside TV hours, and interference with these services might also be encountered. One can foresee the time when an amateur who fails to clear up television interference caused by his transmitter will suffer the withdrawal of his licence, and so it is up to all concerned to get to grips with the problem without delay.

The essential difference between the TV receiver and that designed for ordinary broadcast reception is that television requires a very wide band of frequencies on which to transmit the vision signals. Thus, the television set admits a wide band, and is not specially selective. In addition, the channels allotted to television are badly placed in the spectrum from the amateur point of view, and harmonics from our bands often fall within the pass-band of the television receiver.

The problem *can* be solved, however, as witness the results of those amateurs who have so arranged things that they can operate both television receiver and a transmitter on the amateur bands *under one and the same roof.* Each interference suppression problem is more or less individual, taking into account the conditions which obtain at the particular site. But some of the suggestions made here are general in their application, and can be tried with reasonable hope of success Some cases have, unfortunately, refused to yield to any form of treatment, but it is to be hoped that further work will solve even these difficult ones.

Mains-Borne Interference

Considerable interference can be caused by RF entering the mains wiring, thereby "piping" energy which should be in the aerial to every house in the district !

If TVI is being caused purely by mains pick-up, then with the co-operation of the owner of the affected receiver it can be cleared up fairly easily. First, remove the aerial from the television receiver, and if the interference is entering only by the mains, it will be unchanged by this test. If it is simply reduced, then the interference is only partly due to this cause. In either case, the remedy is an efficient mains-filter to keep the RF out of the mains wiring. It can be constructed in the following way.

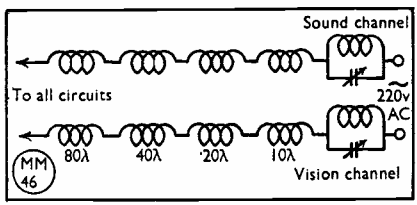


Fig. 1. Multi-band mains choke arrangement for blocking-off piped interference through the domestic supply lines.

In each mains lead, a choke is inserted which offers a high impedance to each of the frequency bands on which it is intended to operate the transmitter. For example, a station working exclusively on 10 metres would require a pair of 28 mc RF chokes in the mains lead feeding *all* apparatus in the station, including the receiver. On the other hand, those who wish to operate all bands must insert a string of chokes in series, one for each band. In addition, it is often helpful to include two chokes, one in each mains lead, tuned respectively to the vision and sound channels of the television broadcast. These may be tuned by air-dielectric

concentric type trimmers of maximum capacity 30 $\mu\mu$F, and the coils should have as high a Q-value as possible. Such a filter for a typical 4-band installation is shown in Fig. 1. The chokes may be wound from approximately a quarter-wavelength of wire for the frequency band concerned. The gauge should be sufficient to carry the mains load, and generally speaking should be about 12- or 14-gauge for the higher frequency chokes, and 18-gauge for the lower frequencies. The diameter of the chokes can be reduced as the frequency goes up, say from 1 to 2 in. at 1·7 mc down to $\frac{1}{2}$ in. at 28 and 58 mc.

It may be wondered why no by-pass condensers to earth have been included between the chokes (Fig. 1), but though in certain cases it may be an advantage to use them, in many installations they will not only prove useless but also ruin the action of the whole filter. This is due to the fact that earth return paths are often of very high resistance, and the RF component prefers to take the path of least resistance *via* the condensers, by-passing the choke. This is clear from a study of Fig. 2.

Tuning of the two TV frequency chokes can either be carried out beforehand, if a Q-meter is available, or failing this, they can be tuned up by actual tests, the optimum position being that which produces least interference.

If the problem is one of mains interference, these steps should clear it up completely—and will probably be a considerable help in ordinary BCL interference as well.

Radiated Interference

The worst type of interference to be dealt with (and unfortunately the most prevalent) is that which is caused by actual radiation from the transmitting aerial. In bad cases, even with the transmitting aerial removed, sufficient radiation takes place from the inter-stage and power wiring of the transmitter, or from the receiving aerial. Judicious earthing and construction of all apparatus in screened metal boxes is a definite aid, while co-axial coupling leads between stages is to be recommended.

The television aerial is vertical because television signals are vertically polarised. This gives a clue to a method of minimising interference. The amateur should avoid all traces of vertically polarised radiation from his apparatus. That vertical dipole is fine for omni-directivity, but a menace to television. This implies that a *flat-top* aerial should be used. Open-wire feeders, too, are definitely to be avoided. There seems to be only one answer—a really good dipole, co-axial fed, as high up as possible, and with a very flat top. Standing waves must be absent from the feeder, or vertically polarised radiation will result. Most television aerials are of the "beam" variety, utilising

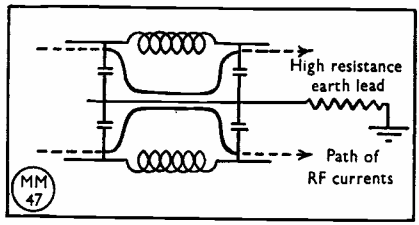


Fig. 2. Conventional mains RF choke circuit, not always effective for reasons discussed in the text.

a reflector behind the receiving dipole. This fact can be used to advantage if the transmitting aerial can be arranged *behind* the reflector, which then tends to shield the television dipole from direct radiation. If your location is surrounded by television aerials, then this remedy is impossible !

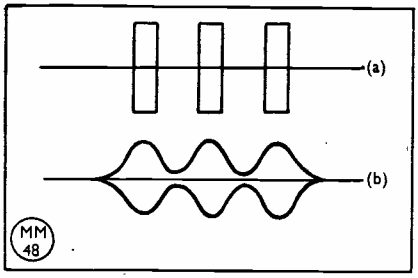


Fig. 3. Degrees of key-thump filter adjustment.

Another useful tip is to operate the transmitting dipole end-on to the television aerial. In a serious case, although this limits the area covered by the transmitter, it is better to work just some of the world than not be able to work at all.

Influence of Transmitter Design

With a really well-designed transmitter, television interference would be hardly noticeable. This illustrates the importance

of design. For CW work, the keying must be adjusted so that the carrier goes on and off gradually instead of starting and stopping with an abruptness which shock-excites neighbouring equipment. As an illustration of this, see Fig. 3, in which the Morse letter S is shown sent under two extreme cases of keying adjustment. The wrong way (*a*) is more like pulse transmission, while (*b*) is good from the television interference point of view but may be too gradual to give good Morse formation. Somewhere between these two lies the optimum condition, and by adjustment of both keying circuits and keying filter, it can be determined.

The final stage of the transmitter must be 100 per cent. stable, or spurious radiation will result. Switch off the drive to the final stage, and with the anode voltage applied, reduce the bias until the valve just takes current. If the stage is inherently unstable, this will show it up, for the grid meter will kick up and down and it may be possible to strike a neon against the tank coil. Anti-parasitic chokes consisting of about 50 turns of 24 DSC wire wound on a 100-ohm resistor, and inserted in both anode and grid leads to the final valve (indeed in all valves throughout the transmitter if necessary) will clean up the radiated signal, and make sure that the stage is correctly neutralised.

For 'phone operators, if the anode current meter of the modulated stage kicks up and down on modulation peaks, then it is certain that attention is required. On 5 and 10 metres, the use of narrow-band FM is not only economical, but also much less likely to cause television interference.

Finally, always avoid the use of a frequency-multiplier as a final stage; also, avoid driving the final by a frequency-multiplier stage, otherwise the harmonic content of the radiated signal will tend to be high, and interference greater.

These brief notes may have served to convince some of the lucky amateurs who live in areas not yet served by television that they have trouble ahead. Now is the time to clean up the rig in order that when the interference problem arrives, it can be tackled in the knowledge that the radiated signal is as clean as possible, for that is half the battle.

REVIEW ACKNOWLEDGMENT

We have received for review *The Radio Handbook*, Eleventh Edition (American); *Very High Frequency Techniques*, two volumes (American); *Electronic Circuits and Tubes* (American); *Radiocraft Reference Annual* (American); *Introduction to Wireless* (British); *The Practical Radio Reference Book* (British); *Home-Built Televisor* (British) and *Books for the Technician* (British). Notes on these volumes will be appearing in future issues of the *Magazine*.

FOREIGN PERIODICALS

Readers will perhaps be interested to know that we have for long been in exchange relations with radio and Amateur Radio publications throughout the world, in many languages, and that the *Short Wave Magazine* is freely quoted in a large number of them. These periodicals naturally contain a great deal of interesting material, and it has always been our hope to find space to print summarised extracts from them as a regular feature. For the present, however, all we can do is to present a few snippets of immediate interest from the more important publications.

XTAL XCHANGE

Here are this month's offers. Please set out your own request for publication on a *separate slip* in the form given below; head it "Xtal Xchange —Free Insertion"; negotiate direct. Buy-or-sell notices cannot be accepted for this space.

G2BPS, 24 Northbourne Avenue, Morpeth, Northumberland.
Has 3584, 3625, 3725, 3755 kc crystals, mounted. Wants frequencies 1845, 1900, 7110 or 7130 kc, or near.

G3AAE, 24a Watcombe Road, Bournemouth, Hants.
Has 1812·5 kc QCC P5, holdered. Wants similar 7000-7150 kc crystal.

G3ASK, Grove House, Fenstanton, Hunts.
Has 1000 kc crystal in octal mounting. Wants crystal around 7090 kc.

G3DAA, Brindle Croft, Clay Mills, Burton-on-Trent, Staffs.
Has 7178 kc QCC P5 crystal. Wants similar holdered crystal 7010-7050 kc.

G3LB, 7 Skellbank, Ripon, Yorks.
Has 356, 465, 1607, 3333, 3590, 3595, 5610 kc crystals, holdered. Wants 7015-7050, 7060-7080 and 7100-7165 kc crystals.

G6TG, Wandsworth, Burniston, Scarborough, Yorks.
Has American-type 7400 kc crystal. Wants similar 4167-4225 or 6250-6350 kc crystal.

THE VHF BANDS

Magazine Contest Report—

Tabulated Results—

Summary of Activity

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

It is hoped that readers will recognise the column under its new heading. With so much attention now being devoted to the 50 and 144 mc bands, additionally to 58 mc, the old title which has served for so many years had clearly become a misnomer. While to drop it is like parting with an old friend, the time has clearly come for a change—and the beginning of a new volume with this issue provides the opportunity.—Ed.

IN spite of the extremely poor propagation conditions, the January *Short Wave Magazine* Five-Metre Contest attracted a very large entry, and activity reached probably the highest levels ever recorded on the band. Unfortunately, the North and South of the country were almost completely cut off from one another, and while we southerners were wondering whether anyone north of Kirkby and Oswestry was active, the northerners thought all the southerly G stations had migrated to six metres to work some real DX !

An analysis of the logs has shown that some 150 G stations were active during the Contest period ; we imagine there was also activity in GM and GI, but that the poor conditions resulted in no contacts worth entering. As there are so many new calls in the lists, we are printing a complete record of stations active during the Contest ; the G2 and G3 calls appear this month and the remainder will be in next time.

Very large scores were obtained by some stations, particularly in the South. While congratulating the leaders on what is by any reckoning a splendid effort, we know they will agree when we say that the activity in the Home Counties area made large scores much more easily obtained in the South than the North. It is interesting to see that the 1st and 2nd places this year are occupied by the same operators, G6VX and G5MA, who were in those positions in the 1946 Contest. (*See* March, 1947, issue for comparative tables, pp. 38-40.)

The Midland counties were, in general, poorly represented, and this further served to keep the Northern scores down. We must offer our congratulations to the little band up in Newcastle who worked themselves and nobody else. Actually, they got no counties outside their own, but kept going in the hope that something might break through. Theirs was a very noble effort in putting forward entries. G3YH in Bristol was another hero, who in spite of much time on the band, worked just one Zone B station three times, fortunately outside his own county. Those of us who grumble about low activity in south-east England seem to have little to grouse about compared with this.

The results are set out in tabular form herewith, and a study of these tables will yield much interesting information.

For instance, the lead scorers for each Zone are : Zone A, G2AJ, Hendon, and G2YL, Walton-on-Hill, Surrey (79 points) ; Zone B, G2KG, Chelmsford (174 points) ; Zone C, G8WV, Hanslope, N. Bucks (225 points) ; Zone D, G3AAK/A, Crowborough, Sussex (75 points) ; Zone E, G3APY, Kirkby, Notts (184 points) ; and Zone F, G2ADZ, Oswestry, Salop (192 points). These are all outstanding scores for the conditions that prevailed and the more northerly stations, in particular, are to be congratulated on fine performances.

M.A.W.E No. 1

First *Magazine* Activity Week-end is March 13-14. CU on Five ?

Comments

Everyone seemed to have enjoyed the Contest, although some suggestions and criticisms were made by many entrants. In most cases, these ideas are at such variance with each other that it is obviously impossible to satisfy everyone ! The county multiplier came in for some comment, but here we have one competitor saying, "The county multiplier is most unfair," while another says, "The multiplier was a real brainwave ! " Although many thought it gave an unfair advantage to certain stations, a perusal of the results will show that with one or two exceptions it made little difference. The whole object of the county multiplier was to add zest to the competition between

stations closely placed geographically, and we feel that for this reason alone the results justified it—apart from its obvious value in keeping up the level of activity. Had bonus points been allotted instead, the positions would, in fact, have been much the same. G2KG and G2ADZ were, perhaps, hardest hit, for they would have been 3rd and 4th respectively without the multiplier, instead of 10th and 12th. But with bonus points their positions would have been only slightly higher than with the multiplier.

The length of the Contest also came under fire, although there was by no means full agreement on this point either (except we imagine among the XYL's). To those whose domestic harmony may have been a little upset, we offer apologies !

Grouses

Other comments referred to Contest etiquette. We are more than sorry that the operating behaviour of certain stations caused annoyance to quite a number of entrants. It is not proposed to pillory the offenders on this occasion, but we feel it is in the interest of all operators on the band that publicity should be given to procedures which annoy and irritate others.

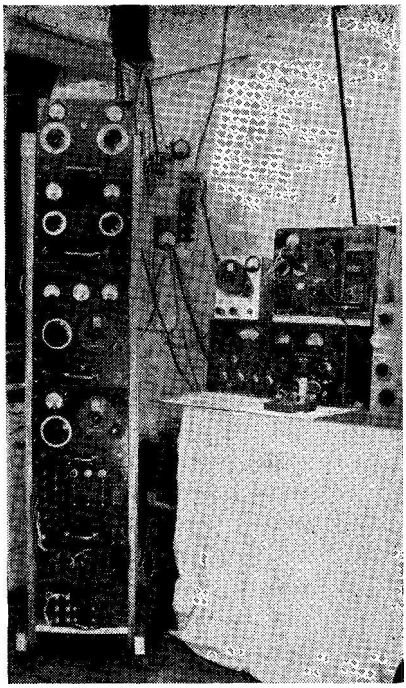
The first complaint is the misuse of VFO's. The employment of VFO's, as on the DX bands, by swooping on to a station already in contact and parking on him is strongly deplored by a large number of London area operators—and we agree without reservations.

The second complaint also refers to VFO's. Most notes on the band were T9, but there were a notable few whose notes were not what they should have been, mainly because they were using VFO's. We don't want to insist on crystal control for the next Contest, but we shall certainly introduce rules regarding quality of notes and operating procedure. There can be no objection to the use of a VFO operated in the proper way, with due consideration for others, and capable of giving a T9 signal on any frequency to which it is set. What is objected to are spiv-tactics and dirty notes. If you use VFO what sort of reports did you get? Also let us have candid reports. Not T9 when it's really T6 !

Complaint No. 3 refers to the pre-arranging of Contest QSO's by post. One station is alleged to have solicited contacts with rare counties by sending cards to suitable stations beforehand ! No, this is not in the best Contest spirit !

A fourth complaint bemoans the practice of passing on a rare DX station from one operator to another, so that stations outside the ring do not get a look-in. This is annoying at any time, but in a Contest can be very unfair to other competitors. Perhaps we should also include the usual moan by the HF-end operators that stations do not search their area of the band. Many missed G6NA and G8RS through this.

However, as we have already said, while voicing their complaints almost every entrant expressed enjoyment of the Contest and most of them asked for another one !



General view of G3BTC, Welling, Kent, who is active on 58 mc.

DX Contacts

Examining the logs in more detail we find G2ADZ made the greatest number of contacts in Zone F, by working G2NH, G2XC, G3BLP(2), G5MA(2), G5US, G6VX(4), G6XM(3), and G8SM—figures in brackets being times worked. A non-entrant, G2BMZ, also did some outstanding Zone F work by giving points to G2AJ, G2MR, G2NH, G2YL, G3BLP,

THE SHORT WAVE MAGAZINE

5-METRE CONTEST

JANUARY 17 TO JANUARY 25, 1948

Place	Call	Location	Scores by Zones						Total Pts.	Counties	Final Score
			A	B	C	D	E	F			
1	G6VX	Hayes, Kent.	67	76	148	55	120	72	538	19	10,222
2	G5MA	Ashtead, Surrey	76	98	81	10	24	96	385	17	6,545
3	G8WV	Hanslope, Bucks.	2	50	225	35	16	—	328	18	5,904
4	G3BLP	Selsdon, Surrey	54	62	99	25	32	48	320	18	5,760
5	G2NH	New Malden, Surrey	75	96	99	10	—	36	316	16	5,056
6	G3APY	Kirkby, Notts.	11	36	78	25	184	—	334	15	5,010
7	G6XM	Farnborough, Hants.	31	134	54	30	24	48	322	15	4,815
8	G2MR	Surbiton, Surrey	73	88	102	5	8	12	288	15	4,320
9	G2AJ	Hendon, Middlesex	79	140	57	—	8	24	308	14	4,312
10	G2KG	Chelmsford, Essex	13	174	75	45	32	—	339	12	4,068
11	G2XC	Portsmouth, Hants.	7	52	168	60	16	12	315	12	3,780
12	G2ADZ	Oswestry, Shrops.	1	6	42	55	40	192	336	11	3,696
13	G5US	Camberley, Surrey	43	140	39	—	16	24	262	14	3,668
14	G8SM	Molesey, Surrey	67	66	51	—	8	24	216	15	3,240
15	G2YL	Tadworth, Surrey	79	84	66	—	—	12	241	13	3,133
16	G3AAK/A	Crowborough, Sussex	13	138	27	75	—	—	253	11	2,783
17	G5RP	Abingdon, Berks.	15	110	93	25	—	—	243	11	2,673
18	G2CIW	Brentwood, Essex	23	98	54	25	—	—	200	11	2,200
19	G5PY	Clapham Park, London	59	56	81	—	—	—	196	11	2,156
20	G4IG	Beckenham, Kent	57	56	75	—	8	—	196	11	2,156
21	G8RS	Reading, Berks.	18	106	27	5	8	—	164	13	2,132
22	G5LQ	Chiswick, London	59	66	51	—	—	—	176	12	2,112
23	G8PX	Oxford, Oxon	6	64	123	5	—	—	198	10	1,980
24	G3CWW	Hendon, Middlesex	70	84	9	—	—	—	163	11	1,793
25	G6UH	Hayes, Middlesex	65	76	21	—	—	—	162	11	1,782
26	G4AP	Swindon, Wiltshire	2	36	105	32	—	—	175	9	1575
27	G8TS	Farnham, Surrey	21	108	9	—	—	—	138	9	1,242
28	G2WS	Beckenham, Kent	59	42	33	—	—	—	134	9	1,206
29	G3BK	March, Cambs.	3	30	39	40	—	—	112	10	1,120
30	G3CUA	Cambridge	13	24	96	—	—	—	133	8	1,064
31	G5GX	Hull, Yorkshire	4	16	30	45	24	12	131	8	1,048
32	G6OS	Hull, Yorkshire	4	16	36	45	16	12	129	8	1,032
33	G2CWL	Haslemere, Surrey	13	82	9	—	8	—	112	9	1,008

Place	Call	Location	Scores by Zones						Total Pts.	Counties	Final Score
			A	B	C	D	E	F			
34	G5MR	Felpham, Sussex	6	68	66	—	—	—	140	7	980
35	G5IG	Cambridge	8	18	69	10	—	—	105	9	945
36	G5AS	Kingston, Surrey	47	34	24	—	—	—	105	9	945
37	G5HN	Reading, Berkshire	13	84	6	—	—	—	103	9	927
38	G6FO	Maids Moreton, Bucks.	4	18	66	10	—	—	98	9	882
39	G2NM	Bosham, Sussex	6	48	45	—	8	—	107	8	856
40	G2KF	Edenbridge, Kent	37	58	9	—	—	—	104	8	832
41	G2FZR	Snodland, Kent	12	64	21	—	—	—	97	8	776
42	G2UJ	Tonbridge W., Kent	25	70	9	—	—	—	104	7	728
43	G2HDY	Roehampton, London	42	34	—	—	—	—	76	7	532
44	G6MN/A	Worksop, Notts.	12	40	9	5	8	—	74	7	518
45	G4NT/A	Downley, Bucks.	12	33	3	—	—	—	48	10	480
46	G3HT	Edgware, Middlesex	40	24	—	—	—	—	64	7	448
47	G4MR	Slough, Bucks.	35	18	—	—	—	—	53	8	424
48	G2OI	Eccles, Lancs.	15	6	30	45	—	—	96	4	384
49	G2FFY	Westerham, Kent	37	26	—	—	—	—	63	6	378
50	G2BRR	Woodford, London	21	32	—	—	—	—	53	6	318
51	G3DA	Handforth, Cheshire	12	32	6	25	—	—	75	4	300
52	G3BTC	Welling, Kent	45	10	—	—	—	—	55	5	275
53	G6LC	Warrington, Lancashire	6	10	6	15	—	—	37	3	111
54	G2BMC	Linthwaite, Yorkshire	17	12	24	—	—	—	53	2	106
55	G8IC	Doncaster, Yorkshire	4	8	15	—	—	—	27	3	81
56	G2CPT	Goole, Yorkshire	12	24	—	—	—	—	36	2	72
57	G3WW	Wimblington, Cambs.	9	8	3	—	—	—	20	2	40
58	G6NA	Guildford, Surrey	10	2	—	—	—	—	12	3	36
59	G3YH	Bristol, Glos.	—	6	—	—	—	—	6	1	6
	G3CYY	Newcastle	6	—	—	—	—	—	6	1	6
60	G4LX	Newcastle	6	—	—	—	—	—	6	1	6
	G4QA	Newcastle	6	—	—	—	—	—	6	1	6

5-METRE RECEIVING CONTEST

Place	Name	Location	Pts.	Counties	Score
1	L. C. Blanchard	Coulsdon, Sy.	261	12	3132
2	F. J. Harris	Sutton, Sy.	103½	11	1138½
3	W. H. Pierce	Reigate Hill, Sy.	86	12	1032
4	P. J. Towgood	Bournemouth, Hts.	85½	7	598½

COUNTY CHAMPIONS

Following are the leading stations in Counties from which three or more entries were received.

Berkshire	G5RP
Buckinghamshire	G8WV
Cambridgeshire	G3BK
Kent	G6VX
London County	G5PY
Middlesex	G2AJ
Surrey	G5MA
Sussex	G3AAK/A
Yorkshire	G5GX

G5MA and G8SM. Other Zone F contacts were made between G4JO and G6VX, G6OS and G6VX, G4LU and G6XM, G3AUS and G5MA, G3BLP and G5GX.

G2ADZ's Tx uses a KT8C as a power doubler in the final stage, while the 3-element close-spaced beam is made from brass curtain rail and is 33 ft. high. The Rx is a battery 0-V-1, using HL2K as detector. It must be the curtain rail that does it !

Amongst the more interesting items of equipment used by contestants must be mentioned the receiver at G8RS (Reading). This employs a 6AK5 RF stage, feeding into a 6AK5 mixer triode connected. The oscillator is CC from a 5 mc crystal in a 6SK7 tritet to a 6SK7 multiplier, final frequency fed to mixer being 50 mc. Output from the mixer is therefore 8·5 to 10 mc ; and is fed to an AR88 as an IF tuner. This is a receiving system with very interesting possibilities for VHF, since it calls only for a stable oscillator, which can be crystal-controlled.

G8WV used a 2-stage wide-band amplifier consisting of two 6AC7 RF valves, feeding into a converter using 6AC7 RF, and ECH35 mixer/osc, output on 3·5 mc to a superhet Rx, with push-pull detector to allow noiseless BFO injection and working with AVC on CW.

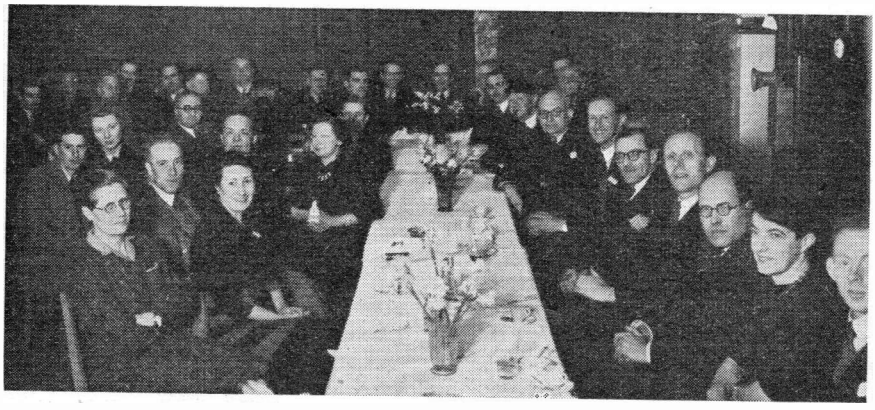
G3HT (Edgware) had his co-axial pipe-oscillator Tx, using a DET2O, in operation. The anode circuit is tuned by the internal capacity of the valve. The power input was only 4·5 watts at 260 v. stabilised. Frequency was varied by a small capacity across free end of pipes which are about 2 ft. long. Reports were mainly T8.

Unusual Callsigns

Amongst the entries it was a pleasant surprise to find so many callsigns hitherto unknown to us. Space will nòt permit mention of all these, but we have picked out a few which we think may be of special interest.

Several entries were received from Yorkshire. Among them G2CPT (Goole) who used 20/23 watts to an RK34 in his PA. The Rx was an EF54-EF50-EC52 convertor into an 1155, while several aerials indoors and out were tried including a 200 ft. long wire, 50 ft. high. His best DX was G3APY at 45 miles with an S8 report, and G5JU was heard. Another Yorkshire station was G81C (Stainforth), using a DET19 power doubler and a beam of the type described by G5LJ in the *Magazine* for March last year. His best contacts were with G6LC (Warrington, Lancs.). G2BMC (Linthwaite, nr. Huddersfield) also put in an entry. Using 14 watts to an RK34 and a 3-wire single section 8JK fixed beam (NW and SE), at a QTH 750 ft. a.s.l. (but badly screened by still higher hills to west and south), he worked G5GX and G6OS for Zone C contacts.

G6LC (Warrington) emphasises the size of Yorkshire and suggests we make it several multipliers in future Contests ! His best DX was also with Hull stations, in Zone D. On behalf of all the Southern



Gathering of the Fiveband Clan. Some 30 VHF operators from the south met in London on February 21 for what was an historic occasion in the annals of VHF activity. This is a shot of the party, organised by G4KD, assisted by G2AJ. Among those in the picture are G2NH, G2NM, G2UJ, G2YL, G5MA, G6FO, G6KB and G6VX. Various suggestions were made about a Fiveband Club, a VHF Century Club and a National VHF Convention—proposals regarding which will be unfolded in due course.

5-metre stations we would like to tell the Northerners who were active during the Contest that we are looking forward to some contacts with them as soon as the weather improves sufficiently to enable GDX to be worked. So please keep at it.

Cambridgeshire produced a number of entries. In addition to those regularly mentioned in this column, we were also glad to find G3WW (Wimblington), who used a 4-element c.s. beam to the dimensions of G5BY's, recently described in the *Short Wave Magazine*. G2KG was his best DX, although he called a number of London stations, including G6VX.

To all these and also to those whom we have not had space enough to mention in detail this month, we can only say that we hope that you will write again. The more reports we get the more interesting can we make this column.

Receiving Entries

Four entries came in for the receiving contest. Congratulations to L. C. B. Blanchard for a very fine effort ; G2BMZ heard three times was his best DX. His Rx is a modified HRO using one RF stage—an EF50 fed from a 4-element rotary beam 27 ft. high. F. J. Harris (Sutton) used a converted Admiralty Responsor Unit (W479OB) fed from a dipole. He heard G2ADZ and G2BMZ.5 Thanks are also due to all those listeners who sent check logs.

Personal Comment

Although cross-checking the logs, measuring distances, and going over the mathematics has entailed many hours of work, it has been most interesting and very enjoyable, especially in view of the grand support that was given to the event. The logs were extremely well set out and gave the information exactly in the form intended by Rule 9. Some entrants, however, found the calculations a little difficult and one competitor wrote $3 \times 2 = 4$ in working out the score for two Zone C contacts, while another counted three counties and made it two !

Elastic rulers also seem to have been in use at some QTH's—and believe it or not, one entry came in without name, callsign or QTH ! Luckily, we had worked him and traced him from our own log. By the way, our own entry in the Contest is there just for the sake of completeness and since nobody has checked it, delete it if you so wish ! We *have* checked G6FO's and can't make it any less !

Thanks to those who kindly sent in check logs. Some of these would have made worthy entries, but most of the operators concerned felt they had not been on long enough to make it worth entering as contestants, which was a pity. G3BXE (West Wratting, Cambs.), who scored 1,680 in the first five days, had to QRT due to petrol shortage. He worked 10 counties in this short period. Other

EQUIPMENT USED AT THE LEADING STATIONS

Callsign	Transmitter	Receiver	Aerial
G6VX	CO : 5 mc QVO4-7 Multiplier : QVO4-7 PA : LS 50	Convertor (6J6 triodes with xtal. osc.) into HQ120X.	4 ele. wide-spaced beam 47 ft. high.
G5MA	CO : 7 mc 6V6 Quadrupler : 6L6 Doubler : 807 PA : 35T	Mod. HRO (954 and EF54 RF's to mixer of HRO, osc. on 28 mc).	3 ele. close-spaced beam 45 ft. high.
G8WV	CO : 7 mc 6J5 Doublers : 6J5, 6V6 and 807 PA : 815	2-stage wide-band RF amp. (6AC7) ; convertor (6AC7 and ECH35 to main Rx on 3·5 mc). *See text.*	3 ele. beam 24 ft. high.
G3BLP	Mod. Type 37 Osc., with 807 power doubler ; 829 PA added last few days.	Ex-German naval E-536 with CV139 GGT pre-amp.	2 ele. c.s. beam, T-matched from 80-ohm twin feeder. 30 ft. high.
G2NH	CO : 3·5 mc 6L6 Doublers : 6L6 PA : 35T	Mod. HRO (6AK5 RF into mixer of HRO. Osc. on 14 mc).	3 ele. close-spaced beam, 42 ft. high.
G3APY	5 stage CC unit, driving 832 PA.	EF54 RF and mixer ; 955 osc ; 2 IF's at 1·6 mc ; 1 IF at 150 kc. Series noise-limiter.	Not stated.

FIVE-METRE ACTIVITY LIST

G2/G3 Calls

List of stations known to have been active during the *Short Wave Magazine* Contest period. Stations with G4, G5, G6 and G8 calls will be given next month.

G2ACZ	Goole, Yorks.	G2HDY	Roehampton, London.	G3AYA	Kilburn, Middlesex.
G2ADZ	Oswestry, Shrops.	G2HLF	Heathfield, Sussex.	G3BFP	Croydon, Surrey.
G2AHC	Northwood, Mddx.	G2JU	Harrow, Mddx.	G3BGW	Cheveley, Cambs.
G2AJ	Hendon, Mddx.	G2KF	Edenbridge, Kent.	G3BK	March, Cambs.
G2ATK	Birmingham, Warks.	G2KG	Chelmsford, Essex.	G3BKI	Southend, Essex.
G2AUA	Wellingborough, Northants.	G2KI	Walton-on-Thames, Sy.	G3BLP	Selsdon, Surrey.
G2AUF	Denton, Lancs.	G2MR	Surbiton, Surrey.	G3BMT/A	Sheffield, Yorks.
G2BB	Yateley, Berks.	G2MV	Kenley, Surrey.	G3BTC	Welling, Kent.
G2BDQ	Stocksfield, N'land.	G2NH	New Malden, Surrey.	G3BTL	Southend, Essex.
G2BDX	Hackney, Mddx.	G2NM	Bosham, Sussex.	G3BWS	Gillingham, Kent.
G2BH	Barnsley, Yorks.	G2OI	Eccles, Lancs.	G3BXE	West Wratting, Cambs.
G2BMC	Linthwaite, Yorks.	G2QT	Ashford, Kent.	G3BY	Ashton-u-Lyne, Lancs.
G2BMZ	Torquay, Devon.	G2RI	Leicester, Leics.	G3BYY	Hackney, Middlesex.
G2BOI	Newcastle, N'land.	G2UJ	Tunbridge Wells, Kt.	G3CU	Dulwich, London.
G2BRJ	Clourne, Derbys.	G2WS	Beckenham, Kent.	G3CUA	Cambridge.
G2BRR	Woodford, Essex.	G2XC	Portsmouth, Hants.	G3CWW	Hendon, Middlesex
G2CIW	Brentwood, Essex.	G2XS	Kings Lynn, Norfolk.	G3CYY	Newcastle, N'land.
G2CPT	Goole, Yorks.	G2XV	Cambridge.	G3DA	Handforth, Cheshire.
G2CWL	Haslemere, Surrey.	G2YL	Walton-on-Hill, Sy.	G3HC	Witney, Oxon.
G2DBF	Bournemouth, Hants.	G2ZV	Kensington, London.	G3HT	Edgware, Middlesex.
G2FBU	Worplesdon, Surrey.	G2ZK	Acton, Middlesex.	G3NR	Kings Langley, Herts.
G2FFY	Westerham, Kent.	G3AAK/A	Crowborough, Sussex.	G3VB	Haslemere, Surrey.
G2FI	Wallington, Surrey.	G2ABA	Coventry, Warks.	G3WW	Wimblington, Cambs.
G2FPP	Sidcup, Kent.	G3APY	Kirkby, Notts.	G3YH	Bristol, Glos.
G2FUU	Hoddesdon, Herts.	G3ATM	Huddersfield, Yorks.		
G2FZR	Snodland, Kent.	G3AUS	Torquay, Devon.		76 *Stations.*

check entries were received from G2AUA, G2BDQ, G2DBF, G2FUU, G2HLF, G2KI, G4OF, G5BD, G6NK, G6UW, G8KZ, G8LY, and R. J. G. Kemp.

Frequency Checks

In his very detailed log, the winner, G6VX (Hayes, Kent), has included the measured frequency of every station worked. It is intended to give a selection of these in the next few issues, as we think they will be of interest to the operators concerned as well as a guide to others searching for them. Thanks, G6VX, and the congratulations of us all on the very fine performance ! G6VX's score is largely a tribute to his very careful watch-keeping.

Magazine Activity Week-ends

Arising from the Contest, readers have asked for more such affairs, even as monthly events, to keep activity up. So we are launching a monthly Magazine Activity Week-end. (M.A.W.E. in future!) The idea is that everyone (yes, *everyone* !) should make a special effort to be on five metres for as long as possible between 1500 on a Saturday and midnight on the Sunday for one week-end each month,

sending in to us as soon as possible afterwards lists of calls worked and heard, together with any other relevant information. We do not want to make this a contest (at least, not every month) but we shall certainly discuss all the outstanding results obtained. If we all keep at it, then some of the outlying districts will be brought into the picture. The Newcastle, Bristol, GI and GM groups are hungry for DX. Let's make an effort to get through to them. Also, the Lancashire and Yorkshire stations want to work the South Coast, and Londoners want Cornwall, so what about a really good effort on this once-a-month occasion, with everybody there for as much time as can be spared over the week-end.

Here are the dates for the next four months: March 13-14; April 10-11; May 8-9; June 12-13. Period to be 1500 on the Saturday to Sunday midnight in each case.

As we shall want to write up the story in the following month's issue, please send in the results and Calls Heard lists in good time, and in any case by the due date given each month at the end of this article.

General Report

Naturally, this month's news has been mainly concerned with the Contest, but one or two items of more general interest include some spor-E openings on both sides of the Atlantic. G5BY worked 1ISS at 1655 on January 6. The opening lasted from 1600-1715 GMT, and various harmonics were heard from Europe. Over in U.S.A., spor-E showed up several times between December 27 and January 4. On the former date some double-hop contacts were made. This is a *most* unusual occurrence in mid-winter.

Tropospheric conditions have been generally poor or very poor, but some good GDX was workable in the evening of February 15, G2ADZ and G2BMZ being remarkable signals in Portsmouth, while G5ZT was heard in Essex as well as in the London and Surrey areas. The London area signals G2AJ, G4KD and G8KZ were all S9 *plus* in Portsmouth and we were glad to contact G8AL (North Chingford) for the first time. These conditions coincided with the southerly movement of an anti-cyclone from Norway and preceded an influx of cold easterly air from the Continent on the following day, when conditions deteriorated somewhat.

Six Metres

No 6-metre DX has been reported and G6DH says the MUF is well down on twelve months ago. To quote him, "Unless the sun bursts into some new activity during the next four weeks we've 'had' 50 mc."

ZL3HC (Timaru) sends news of the 6-metre spor-E openings in the Antipodes, confirming VK2NO's report of last month. We were very interested to note that ZL3AR, an old-timer, is feeding his convertor into an Eddystone 504.

Conclusion

And there we must leave you until next month, but please don't forget the M.A.W.E. on March 13-14 ! Except for TV hours, we will be on most of the period so hope to QSO as many stations as possible. Let us have your calls heard and general comments by March 16 at latest. The address is, as usual, E. J. Williams, (G2XC), *Short Wave Magazine*, 49 Victoria Street, London, S.W.1.

FIVE-METRE CALLS HEARD

G4LU, Avalon Pant, Oswestry, Shrops.

Heard: G2YL, 3BLP, 3BUR/A, 5BD, 5MQ, 6CW, 6OS, 6TL, 6VX, 8IC, 8JV, 8QS, 8UZ, 8WV.

Worked: G2AK, 2ATK, 3APY, 3IS, 3LN, 4AP, 5JU, 5LJ, 6MN/A, 6XM, 6YU, 8KL. (*January* 12-*February* 11.)

G6UW, Downing College, Cambridge.

Worked: G2CIW, 2KG, 2MR, 2MV, 2XV, 2YL, 3APY, 2BGW, 3BK, 3BLP, 3BXE, 3CUA, 3WW, 4IG, 4JV, 5IG, 6VX.

Heard: G2AJ, 2WS, 5AS, 5BD, 5GX, 5MA, 6LX, 6OS, 8SM. (*During Contest.*)

G2HLF, 9 Theobalds Green, Heathfield, Sussex.

Heard: G2AJ, 2BB, 2CWL, 2FFY, 2KF, 2MR, 2MV, 2NH, 2NM, 2QT, 2UJ, 2XC, 2YL, 2WS, 3AAK/A, 3BLP, 3BYY, 3BNR, 3BTC, 3CWW, 3VB, 4NT/A, 5AS, 5MA, 5MR, 5US, 6CJ, 6OH, 6VX, 8NS, 8RS, 8TS, 8SM. (*During Contest, on* R-1132A.)

G4OF, Radiohm, Morton, Gainsborough, Lincs.

Heard: G2AJ, 2BOI, 2CPT, 2MV, 2OI, 3ALD, 3BLP, 3BUR/A, 3BK, 3DA, 3WB, 5BD, 6LC, 6OS, 6UH, 6VX, 8IC, 8JV, 8SX, 8UZ, 8WV. (*January* 18-27.)

G3BK, 28 Regent Avenue, March, Cambs.

Heard: G2CIW, 2MR, 2NH, 2WS, 2YL, 3BLP, 5MA, 5PY, 6FO, 8SM. (*During Contest.*)

G2BRR, 10 Hillcrest Road, South Woodford, E.18.

Heard: G2ADZ, 2FFY, 2KG, 5US, 6OH, 8KZ. (*During Contest.*)

G8LY, Restawhile, Clanwilliam Road, Lee-on-Solent, Hants.

Heard: G2AJ, 2HLF, 2NH, 2XC, 3AAK/A, 5MR, 5OJ, 5US, 6VX. (*January* 25 *on mod. HRO and* 3 *ele. c.s. beam* 18 *ft. a.s.l.*)

NEW QTH's

This space is available for the publication of the addresses of all holders of new callsigns, 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.

EI6T T. Power, 66 Johnstown. Waterford, Eire.

G2AQC G. Carew, 8 Hill Park Road, Torquay, Devon.

G2ASR T. E. Scholes, 3 St. Helens Road, Bolton, Lancs.

G2ATT J. Tourtel, 35 Morpeth Avenue, Totton, Southampton.

G2BP J. W. H. Alexander (*ex-G8DK*), 73 Skinner Street, Chatham, Kent.

G2BPS R. Crozier, 24 Northbourne Avenue, Morpeth, Northumberland.

G2BYA/A R. G. Lane, Mervyn Works, Boundary Road, Woking, Surrey.

GM2BUD D. Tannock, 45 Sunnyside Crescent, Mauchline, Scotland.

G2CGQ P. B. Archer, 16 Summersgill Road, Lancaster.

G2CSJ J. W. Peel, 5 Brookefield Avenue, Balme Road, Cleckheaton, Yorks.

GW2DLK G. O. Jones, Radio House, Llangefni, Anglesey, N. Wales.

G2FWP V. E. C. Orchard, 3 Police Cottages, Lyndhurst, Hants.

G3AIV I. B. Pym, 15 Beaulieu Avenue, Fareham, Hants.

G3AOQ A. W. N. Evans, 7 Macaulay Road, Wyken, Coventry.

G3ASK F/O E. Laraway, Grove House, Fenstanton, Hunts.

G3AZJ S. Mapplethorpe, 55 Browning Way, Heston, Middlesex.

G3BGW T. W. J. Homewood, 35 High Street, Cheveley, Cambs.

G3BHR A. W. Munden (*ex-PK1AM*), 181 Coombe Lane, West Wimbledon, London, S.W.20.

G3BMC D. Gray, 11 Radcliffe Road, East Croydon, Surrey.

G3BMT W. R. Watson, Wyndhurst, Worksop Road, Mastin Moor, Chesterfield.

GM3BNX J. J. Shaw, 19 Square, Kelso, Roxburghshire.

G3BWL W. Lavery, 16 Woldham Road, Bromley, Kent.

GM3BXW C. M. Mendelsohn, 601 Kilmarnock Road, Merrylee, Glasgow, S.3.

G3BYQ W. G. Dunlop, 2 The Crescent, P.O. Radio Station, Leafield, Oxford.

GD3BZE R. Clay, 8 Arbory Street, Castletown, Isle of Man.

G3CDR G. H. Scholey, 8 Rectory Lane, Preston, nr. Hull, Yorks.

G3CDY F. J. Rouse, 99 Gloucester Road, Cheltenham, Glos.

G3CKL J. E. Bell, 180 Domonic Drive, London, S.E.9.

G3CKV P. Bolton, 28 Perdeswell Street, Barbourne, Worcester.

G3CMZ W. A. Rowley, 6 Sandbeck Avenue, Skegness, Lincs.

G3COA M. McKavney, 107 Buller Street, Bury, Lancs.

G3CPG L. Damon, 36 Teme Road, Tolladine, Worcester.

G3CPN M. J. Stevens, 96 Green Lane, Hersham, Walton-on-Thames, Surrey.

G3CPZ S. Cousens, The Anchorage, 17 Applesham Way, Portslade, Sussex.

G3CQR P. R. Burridge, St. Mary's Cottage, Bovey Tracey, Devon.

GM3CSM I. Hamilton, 66 Greystone Avenue, Burnside, Rutherglen, Glasgow.

G3CUN J. Leonard, 148 Duncroft Road, South Yardley, Birmingham, 26.

G3CUN/A LAC J. Leonard, RAF Station, Farnborough, Hants.

GD3CVO/A M. W. S. Barlow, Walters House, King William's College, Castletown, Isle of Man.

GI3CWY E. S. Wilson, Altahammond, Whitehead, Co. Antrim, N.I.

G3CXD R. Bowers, 9 Kingsway East, Newcastle, Staffs.

G3CXM E. F. Dilnot, 17 Montpelier Road, London, S.E.15.

G3CXQ E. Britton, M.Sc., 97a Hare Lane, Claygate, Surrey.

GW3CYP R. Thomas, Goleufryn, Cwm-y-Glo, Caernarvon, N. Wales.

G3CYT F/L F. Wright, 12 Alwyne Mansions, Alwyne Road, Wimbledon, London, S.W.19.

G3CYW F. S. Owen, Strathnaver, High Lane, Ormskirk, Lancs.

G3CZL R. N. Buckman, 17 St. Thomas Gardens, Ilford, Essex.

G3CZV B. H. Singleton, 13 Tithby Drive, Sherwood, Nottingham.

CHANGE OF ADDRESS

G2BYA R. G. Lane, 41 Addison Road, Guildford, Surrey.

G2BZQ R. Q. Marris, 99 Glebe Road, Cambridge.

G3ARU H. J. Smith, 150 Wanstead Park Avenue, London, E.12.

G3CCZ E. L. Devereux, Parkwood Lodge, Brockhill Road, West Malvern, Worcs.

G4PS P. R. Burkitt, Hamden, Prospect Avenue, Farnborough, Hants.

G4PS/A P. R. Burkitt, The Willows, Pavenham, Bedford.

G4RS Maj. W. E. Corbett (*ex-FE1ES, ex-G5WG*) 17 Tudor Avenue, Bebington, Wirral, Cheshire.

G5DP J. R. Williamson, 3 Borrowdale Road, Bebington, Wirral, Cheshire.

G5ZQ C. Aldridge, 25 Old Barn Way, Southwick, Sussex.

G6UB S. W. J. Butters, 50 Hillside, Banstead, Surrey.

G6UR Lt. Hedley Punch, R.N.V.(W).R., 12 The Croft, Monkton Combe, Bath, Som.

Here and There

RCMF Exhibition

The British Radio Component Manufacturers Federation is holding its Fifth Annual Exhibition just now, at Grosvenor House. The President of the RCMF is Sir Robert Renwick, Bt., K.B.E., who did outstanding work during the War at the Air Ministry and M.A.P. in connection with the provision of radar and communications equipment and the progressing of the many highly specialised projects called for in that very wide field.

Some 102 exhibitors are showing at the Exhibition, with products classified under nearly 200 main headings.

The O.V.S.V.

From OE3WB, Secretary, comes news that the Austrian amateur organisation O.V.S.V., with 450 members, has been recognised by the occupation authorities. Transmitting licences are not yet being issued to Austrian nationals, but members are busy on the Rx side in anticipation. O.V.S.V. notices appear in *Radio-Technik* and the QSL Bureau is functioning at Kierlungerstrasse 10, Klosterneuberg, under OE3WB.

"Victory DX'ers Club"

G2AHL, ex-VU2AD, 3 Betchworth Avenue, Earley, Reading, Berks., with some other ex-VU's, is anxious to get in touch with all operators now at home who, while serving in the Forces outside Europe, at any time during their service ran an amateur station. The idea is to form a Club the membership of which will be confined to transmitters who qualify as "Victory DX'ers"; please write him direct to the address given.

Eddystone 640

We are pleased to be able to pass on the glad news that the "640" has been freed of purchase tax, and that Stratton & Co., Ltd. have also found it possible to reduce the basic cost of the receiver, which is selling well. For £39/10s. net you can now obtain a first-class communications receiver which is also a quality British product successfully marketed in the States against the local competition . . .S'fact !

"Twenty Metre DX Forecast"

This feature has been appearing for some six months, and it would be most helpful to us to have further information from readers generally as to whether they have found the forecasts useful and reliable.

B.O.T.C. and F.O.C.

Announcements relating to the First-Class Operators' Club and the British Old Timers' Club, both supported through the *Short Wave Magazine* exclusively, will in future appear in alternate issues, space being the factor. B.O.T.C. will be in next time.

Index Vol. V

This issue contains, as a loose supplement, the Index to Volume V, March 1947 to February 1948. Giving some 250 subject headings, it also discloses the interesting fact that nearly 50 contributors have had feature articles published in the *Magazine* during the year, between them covering practically every aspect of Amateur Radio.

Postal Tubes

Readers who have bought Zone Maps from us will have received them wrapped round a cardboard tube, to prevent damage in transit. Fresh supplies of these tubes are proving exceedingly difficult to obtain —if you still have yours, its return to us at 49 Victoria Street, S.W.1. would be greatly appreciated, as it can be used again—and again !

Errors Crep' In

In our review of the Radiovision "Hambander"—pp. 750-751, February—it was inadvertently stated that the frequency coverage was continuous ; in fact, there are five switched bands : 1.7-2.6, 3.2-4.6, 7-10.5, 14-21, and 20-32 mc.

In the ARRL DX Contest note on p.728, same issue, we struck another bad patch when working the dates back—they should have been February 14-15, February 21-22, March 13-14 and March 20-21, between 0001 and 2359 GMT for each period ; that is, midnight on the Friday to midnight on the Sunday.

Sorry about these two failures—there is no reasonable excuse for either of them.

The other man's station G2HKU

Herewith a view of G2HKU—E. H. Trowell, 27 Unity Street, Sheerness, Kent—who runs the outfit from 230-volt DC mains.

The transmitter is powered by a motor-generator, with heaters also supplied from the DC line, through suitable dropping resistors. The sequence on the Tx side is 6L6-6L6-P/P 807, with a modulator using 6J7-6N7-P/P 6L6 in Class-AB1, with a carbon microphone coupled into the cathode of the 6J7. There is also a separate small 6L6 CO transmitter for 1·7 mc operation.

The transmitter rack is home-built and carries the units as follows: Top, aerial tuner; second down, main transmitter complete; third, 1·7 mc transmitter; fourth, modulator unit; fifth, smoothing unit and mains voltage droppers; sixth, spare panel.

On the receiving side, G2HKU has a modified CR100 run off the 230-volt supply for HT, with car-battery LT; an HRO, on a vibrator pack; a home-cooked 1-V-2; and a Pye BC superhet.

The aerial is a 67-ft. doublet, arranged to have a 47-ft. top with 20-ft. feeders. As the house is below sea level, the 25 ft. above ground is reduced to something less than 19 ft. a.s.l. Operation at G2HKU is mainly on 14 mc and DX worked so far is 50C in 15Z, with inputs varying from 17 to 25 watts.

G2HKU is to be congratulated on a station which combines good practice with the best use of the available facilities.

THE ZONE MAP

Have you ordered your copy of the new full-colour version of the Zone Map, as described on p. 753 of the February issue? This is a fine job, in a limited edition on heavy linen-backed paper, and will probably be unrepeatable at any price. It costs 6s. post free; we still have the original two-colour version at 3s. 9d.

THE MONTH WITH THE CLUBS

FROM REPORTS

The Club Movement is apparently in full stride for the spring season, 32 Clubs having reported this month, one of the largest totals we have yet had. We note the normal number of newcomers, balanced to some extent by corresponding "fade-outs." It may be our imagination, but there seems to be a dearth of new ideas for meetings, which have settled down into the familiar routine of Talks, Discussions, Quizzes, Junk Sales and the occasional Social Evening.

If you try out a new idea, please publicise it to the full for the benefit of other Clubs, whose secretaries all read these notes in the hope of finding something fresh !

Next month reports are wanted by first post on March 17. Address them to Club Secretary, *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. Good photographs are always of interest for this feature, and those used are paid for by way of a small donation to the funds of the Club concerned. So if you have any that may be suitable, please send them along.

And now for the reports. . . . .

North Kent Radio Society.—This Club has now secured three-room premises at the Freemantle Hall, Bexley, Kent, every Monday night from 7 till 11 p.m. The Club transmitting licence is expected very shortly, and the new Secretary (QTH in panel) is hoping for a very successful season. He gives thanks to G4CW for his stout work during 1946/7.

Stourbridge & District Amateur Radio Society.—At a meeting in February, Mr. Hunt, of Hi-Fi Ltd., gave the second part of his talk on High-Fidelity Amplification, and demonstrated his points with a test amplifier. Meetings are held, as usual, at King Edward VI School, Stourbridge.

Wanstead & Woodford Radio Society.—A large and regular gathering of members attends the Tuesday meetings, and a monthly news letter is published under the editorship of G2BRR. An unusual forthcoming event is a May-Day *fete* and garden party, arranged by the local Community Association; the club will have a stand from which its transmitter G3BRX will be on the air on the top band.

Basingstoke District Amateur Radio Society.—At a recent meeting, the President, G6OU, opened a discussion on The Future of Amateur Radio, outlining his own experiences from 1912 up to the present day. A Radio and Morse course is now running every Tuesday at 7.45 p.m. under G2UM—meetings take place at the Assembly Rooms, Potters Lane.

East Surrey Radio Club.—The A.G.M. was held at Toc H Rooms, Redhill, last month, and it was decided to cover all branches of Electronics in future, with special attention to high-fidelity reproduction. Secretary's QTH in panel—new members welcomed.

Thames Valley Amateur Radio Transmitters' Society.—At the February meeting G6MB gave a lecture with the comprehensive title of "Odd Thoughts." On March 3 there is to be a lecture and film by courtesy of the Mullard Valve Co. Members keep a weekly sked on the top band at 2230 ; this has been so successful that transmitting time has had to be restricted to two minutes per operator !

Retford & District Amateu Radio Club.—This club inaugurated itself in January and, now it is duly organised, is meeting at 7.30 p.m. on Mondays at The Community Centre, St. Swithuns Place, Chapelgate, Retford. The membership already includes three transmitting amateurs ; the Hon. Sec. will be delighted to see new members.

Spen Valley Radio & Television Society.—They recently visited the BBC station at Moorside Edge, and future arrangements include a Film Show presented by the Central Office of Information, Leeds. Membership totals 25, including five owners of call-signs. Room for more, and the Hon. Sec. will be glad to hear from them.

Oswestry & District Radio Society.—This club recently held a successful Hamfest, consisting of a Dinner, Dance and a free-for-all (OM's and XYL's) on the PA system ! Special arrangements are being made for beginners and juniors during the coming season—meetings at the Oswestry Technical Institute.

York & District Short Wave Club.—All the officers were re-elected at the recent A.G.M.; the club has grown to a membership of 30 in its first year. Wednesday meetings are so much occupied that separate "Morse nights" have been instituted. Other activities include lectures, Junk Sales and work on the club transmitter.

Reading & District Amateur Radio Society.—At the last meeting a talk and discussion on National Field Day was followed by a lecture on modifications, additions and general methods of increasing circuit efficiency of the R.1155 and the BC.348 receivers.

Worthing Radio Group.—At the February meeting,

members were informed that the club has been given permission to use a local site for portable working. A film show followed. At the next meeting—March 4, 7.30 p.m., at Olivers Cafe, there will be a lecture on "Oscilloscopes."

Coventry Amateur Radio Society.—A portable transmitter-receiver for "the man in digs" was recently described by G3BZA. The Annual Dinner is organised for March 20—the principal guest will be Mr. V. Desmond, G5VM. This club is also giving slow Morse practice over the air—a practice which seems to be steadily growing in popularity.

Birmingham & District Short Wave Society.—A talk on Radar was given in two parts during February. At the March meeting there will be a lecture on the principles of oscilloscopes followed by a demonstration and description of suitable circuitry.

Kingston & District Amateur Radio Society.—Recent lectures on "BCI and TVI," "Power Line Carriers" and "Television Receiver Design" were followed by interesting discussions. A one-day Listening Contest was staged in February for the benefit of non-transmitting members. Slow Morse classes are now held before every meeting—alternate Thursdays, 7.30 p.m., at the Kingston Hotel; the next is on March 11, when visitors will be welcomed.

Hi-Q Club, Giffnock.—The activities here cover a variety of interests, from receivers for 144 mc, to DX on 3·5, 14 and 28 mc. A certain member, who has worked much DX on "ten," has just discovered that his doublet was only getting juice up one leg . . . oh, well, it proves something or other! Questions of current interest among Club members are "What does S9 mean?"; "What is DX?"; and the feasibility of band-planning. We wish we knew the answers to these, too!

Solihull Amateur Radio Society.—Good luck to a new organisation; they met for the first time on January 29, with 23 founder members attending. The second meeting was held on February 11, with a demonstration of the R.1224A. A full programme of activity is being mapped out and all interested in the district are invited to look in at meetings: these are on the 2nd and 4th Wednesday of each month, at the Old Manor House, High Street, Solihull.

Cheltenham Amateur Radio Society.—At the A.G.M. held recently, G8LB was elected President and G5BK Chairman. A visit to the receiving station of the Ministry of Civil Aviation at Birdlip and the transmitting station at Winstone proved to be interesting events and late in

Following are the names and addresses of the Secretaries of the Clubs whose reports appear in this issue. They will be pleased to welcome new members and to offer every assistance.

BARNET. R. Walker, G6QI, 7 Potters Lane, New Barnet, Herts.
BASINGSTOKE. L. S. Adams, 16 Bramblys Drive, Basingstoke.
BIRMINGHAM. N. Shirley, 14 Manor Road, Stechford, Birmingham 9.
BRADFORD. W. S. Sykes, G2DJS, 287 Poplar Grove, Great Horton, Bradford.
BURY (G3BRS). R. H. McVey, 46 Holcombe Avenue, Elton, Bury, Lancs.
CHELTENHAM. H. Brislin, 52 Cleevemount Road, Cheltenham.
COVENTRY. J. W. Swinnerton, G2YS, 118 Moor Street, Coventry.
EAST SURREY. L. Knight, G5LK, Radiohme, Maderia Walk, Reigate.
EDGWARE. R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middlesex.
EXETER. E. G. Wheatcroft, 34 Lethbridge Road, St. Loyes, Exeter.
GIFFNOCK. J. D. Gillies, GM2FZT, 3 Beridale Avenue, Glasgow, S.4.
HOUNSLOW. A. H. Pottle, 11 Abinger Gardens, Isleworth, Middlesex.
KINGSTON. A. W. Knight, G2LP, 132 Elgar Avenue, Tolworth, Surrey.
NORTH-EAST. J. W. Hogarth, G3ACK, 4 Fenwick Avenue, Blyth, Northumberland.
NORTH KENT. J. L. Bowes, G4MB, 20 Broomfield Road, Bexleyheath, Kent.
OSWESTRY. G. H. Banner, G3AHX, 6 Coppice Drive, Oswestry, Salop.
READING. L. A. Hensford, B.E.M., G2BHS, 30 Boston Avenue, Reading.
RETFORD. H. White, G3BTU, 39 Trent Street, Retford.
SOLIHULL. T. O. G. Talboys, G2ATK, 6 Bramley Croft, Shirley, Birmingham.
SOUTHEND (G5QK). J. H. Barrance, M.B.E., G3BUJ, 49 Swanage Road, Southend-on-Sea.
SPEN VALLEY. R. Ellis, G3BKM, 2 Tennyson Place, Cleckheaton, Yorks.
STOURBRIDGE. W. A. Higgins, G8GF, 35 John Street, Brierley Hill, Staffs.
SURREY. L. C. Blanchard, 122 St. Andrews Road, Coulsdon, Surrey.
THAMES VALLEY. D. R. Spearing, G3JG, 99 High Street, Esher, Surrey.
WANSTEAD (G3BRX). R. J. C. Broadbent, G3AAJ, 24 St. Margarets Road, Wanstead Park, London, E.12.
WEST BROMWICH (G3BWW). R. G. Cousens, G3BCS, 38 Collins Road, Wednesbury, Staffs.
WIRRAL. B. O'Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Ches.
WOLVERHAMPTON. H. Porter, G2YM, 221 Park Road, Fallings Park, Wolverhampton.
WORTHING. G. W. Morton, 42 Southfarm Road, Worthing, Sussex.
YORK. G. W. Kelley, G5KC, 123 Kingsway West, Acomb, York.

Photograph taken at the first meeting, in their new premises, of the Coventry Amateur Radio Society. G5GR (Chairman) is in the centre, with G5ML on his left and G2LU (Treasurer), on his right, and G2YS (Secretary) next on the right) Coventry is one of the most successful and best supported local Club organisations in the country.

January the first social evening was attended by about sixty members and friends. Slow Morse classes are held on the air—on the 7 mc band from 1900-1930 and 2200-2230.

Bradford Short Wave Club.—The latest report states that on account of the difficulty of obtaining suitable accommodation, and the effects of staggered hours and Evening Classes, the club is ceasing its activities. The club's assets—it is hoped about £20—are being given to the Wireless for the Blind Fund.

Exeter & District Radio Society.—They have been very active during January and February, with lectures, discussions, Quiz programmes and a demonstration and film show. A full programme has been arranged up till the A.G.M. on April 29; meetings are held every Thursday at the YWCA, 41 St. Davids Hill, Exeter. The club transmitter licence is on the way.

Wirral Amateur Radio Society.—This club flourishes with a paid-up membership of 68, including 25 licensed amateurs. Recent events included a talk by G2AMV on his home-built amateur-band superhet, and another on "Carrier Telephony," by Mr. H. Crofts, dealing with the development of GPO line systems.

Bury & District Radio Society.—A Hamfest has been arranged for April 17 at the Masons' Arms, Whitefield; meanwhile meetings are held every Thursday in the permanent club rooms at Hodson's Mill, Tottington (except on the second Thursday in the month, when they are at the Athenæum, Bury). A new 'phone and CW transmitter is now under construction for the Club Station, G3BRS.

Edgware & District Radio Society.—Members and friends thoroughly enjoyed the annual social evening on January 17; the menu was printed on the back of the Club's G3ASR/A QSL card, which shows the oldest member (G3HT) and the youngest (G3CWW) in attitudes of rapt attention round a distinctly hay-wire rig! Interesting talks have been a feature of recent meetings—March 17 is the date for a Film Show, to which all interested are invited.

Barnet Radio Group.—Next meeting is at Bunny's, New Barnet, at 7.30 p.m. on March 13; they will also be running some lectures on the R.A.E., the next being at Victoria Road School, New Barnet, at 8.0 p.m. on March 15.

Niedersachsen British Radio Club.—This club exists solely for the benefit of British radio amateurs in Germany, and was inaugurated in January, at Wesley House (Forces Study Centre), Hanover. Meetings are to be held monthly, during the third week-end of every month. All amateurs in the British Zone are invited to get in touch with

the Secretary, D2GU, E. G. Styles, P & T Branch, (TZA), 120 HQ, CCG, BAOR 11.

Southend & District Radio Society.—Meets fortnightly in Room G, Art Section, Municipal College, Victoria Avenue, Southend. The March meetings are on the 12th and 26th. There is also a "Round Robin" on the top band on alternate Fridays, 2130. As there are about 100 licensed amateurs in the district the club is seeking to extend its membership and the Hon. Sec. will be delighted to hear from interested people.

Bradford Amateur Radio Society.—The proposed merger with the Bradford Short Wave Club has, of course, been dropped owing to the dissolution of the latter. A welcome is now extended, however to all former members of the Short Wave Club. The next meeting after publication is on March 16, 7.30 p.m., at 66 Little Horton Lane, Bradford.

West Bromwich & District Radio Society.—On March 8 a Radio Quiz is being held between two teams, one at the club room with a small portable transmitter, and the other in the "shack" of one of the members. On March 22 a Junk Sale will be held. Meetings take place on alternate Mondays, 7.30 p.m., at Charlemont Schools, West Bromwich.

W WEST SOMERSET
:ll anyone. in this district interested in the formation of a Club please communicate with T. C. Bryant (G3SB), 29 Lower Park, Minehead, Somerset?

North-East Amateur Transmitting Society.—The rota of towns for NEATS meetings has been cancelled and all are now held in Newcastle-on-Tyne. The permanent QTH is:—British Legion Rooms, 1 Jesmond Road; meetings are on the last Monday in each month at 8 p.m. Six members have stations operating on five metres and several others are expected to start up shortly.

Wolverhampton Amateur Radio Society.—Membership is still on the increase, and a Radio Exhibition is being held from April 5 to 10, of which further details will be given later. Recent lectures have covered "Fidelity Reproduction" and "Transformers," and the club now has its own bulletin, which is a regular and popular feature. (We should like to see a copy occasionally.)

Surrey Radio Contact Club.—The February meeting took the form of a talk on Power Supplies—stabilised and otherwise. Meetings continue to be well attended; the next is on March 9, when there will be a Junk Sale—Blacksmiths Arms, South End, Croydon, at 7.30 p.m.

Hounslow & District Radio Society.—The A.G.M. showed this club to be in a strong position with steadily increasing membership. March meetings are on the 3rd and 17th, and a full programme for the next quarter has been arranged, including some "practical evenings."

WHEN WRITING TO US

May we again remind readers how helpful it is if they address separate letters or slips to each of our various sections, dealing only with matters affecting that department, rather than covering a number of dissociated subjects in the one letter? There is of course no objection to the different slips being sent in one envelope!

Magazine sections or departments are now: Advertising Manager (advertising matters only, including Small Advertisements); Circulation Manager (all orders, payment of and enquiries regarding subscriptions, obtaining copies, back numbers, and *changes of address* if you are a direct subscriber); DX Commentary, and Calls Heard (General); The VHF Bands, and Calls Heard (VHF); Club Secretary, for "The Month with the Clubs"; "Pse QSL," for the *Short Wave Listener*; New QTH's, where the call sign and address are for publication; Crystal Exchange; and the QSL Bureau (*cards only* to BCM/QSL, London, W.C.1).

General correspondence not covered by the foregoing should be directed to the Editor. And when writing in on any matter, please be sure to print your name and address and sign your call, if you have one.

EDDYSTONE SPEED KEY

Many readers who visited Stratton's Stand at the Amateur Radio Exhibition in November last will have seen (and if they thought they could swing a fast key, perhaps have tried) the new Eddystone speed key. It is fitted with an automatic dot-sender, after the fashion of what is known as a "bug" key. The Eddystone product, a model of which has just come in for test, is beautifully made, on a heavy base with rubber stick-pads, and is fully adjustable as regards dot speed, dot gap and dash gap. Some further notes on this new speed key will appear in the next issue.

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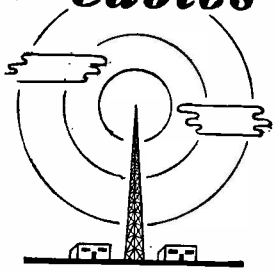
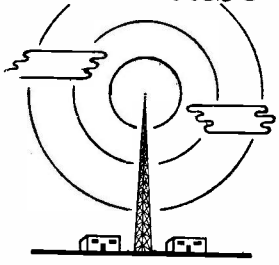
MODERN RADIO TECHNIQUE

★ *Cables*



A complete range of co-axial and balanced twin screened and unscreened TELCON Cables is available for the reception and transmission of radio frequencies up to the centimetre range. In all of these "TELCOTHENE" is employed as the dielectric with "TELCOVIN" as a protective sheathing. "TELCOTHENE" insulated "hook-up" wire and sleeving in all sizes are also produced. Full technical data is contained in the Telcon R.F. brochure.

★ *Metals*



TELCON METALS are widely used in modern designs of radio components. The advantages of high permeability and low loss are utilised by the employment of MUMETAL, RADIOMETAL and RHOMETAL for transformers, chokes and magnetic shields. TELCUMAN, with its low temperature coefficient, is suitable for precision resistors and PYROMIC and CALOMIC can be employed where rise of temperature is likely. The age hardening high tensile 'Cu.Be.250' BERYLLIUM COPPER alloy, with its high fatigue resistance, is particularly suitable for springs and electrical contacts. TELCOSEAL glass sealing alloys are available for practically all types of glass employed in radio and television, and TELCON BIMETALS are ideal for delay switches and components involving thermostatic action.

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ALL-WAVE SUPERHET KIT. A Kit of Parts to build a 6-valve (plus rectifier) receiver, covering 16-50 metres. Medium and Long-wave bands. Valve line-up 6K5, 6K7, 6Q7, 6J7, two 25A6 in pushpull. Metal rectifiers are incorporated for H.T. supply. Output impedance is for 3 and 15 ohms. The latest Wearite Coil Pack incorporating Iron Dust Coils is used, making construction and alignment extremely simple. A pick-up position on the wavechange switch and pickup terminals is provided. A complete kit including valves but without speaker or cabinet. Chassis size 14 × 6 in. Overall height, 9 in. Price £11/16/3.

Suitable loudspeakers are the GOODMANS 10 in 6-watt. P.M. at 47/6 or for superlative reproduction, the Goodmans 12 in. P.M. at £6/45/-.

SPECIAL OFFERS. 807 (Ceramic base Tubes. 15/- each.

CATHODE RAY TUBES by famous maker, 3½ in. dia. electrostatic 4 v. 1·3 A Heater. 800 v. Anode. Short persistence. Green screen. Complete with base, 17/6 each.

TEST UNIT AP53874 consists of a Test Unit for a U.H.FTx., incorporates a 230 v. 50 c/s Power Pack, with a smoothed output of 240 v. up to 50 m/a and 6·3 v. 2 a., 2 EF50, 1 EC52, 1 EA50, 1 5Z4G, 1 Y63 Magic Eye, and a large quantity of condensers, resistors and tuning gear. Contained in an attractive steel case. Size 10½×9× 8½ in. Price 45/-. Carriage and packing, 5/-.

TEST UNIT TYPE 73, consists of a special purpose Oscilloscope that requires only rewiring and the addition of a few condensers and resistors to convert into a standard oscilloscope, input 230 v. 50 c/s. A 3½ in. C.R. tube and 1 SU22OA, 1 EB34, 1 5Z4, 3 SP41, 2 EA50, are included. Controls are "Brightness", 'Velocity", "X Shift," "Y Shift", Focus Amplifier "in/out", "Calibrate", "on/off Tx". Price £8/8s. Carriage and packing 20/-.

ROTARY TRANSFORMERS, input 12 v., output 180 v., 30 m/a., 4 v., 2-3 a., with 19 volts input, output is 50 per cent. higher. May be used on D.C. mains as L.T. charger. With small conversion could operate as D.C. Motor. Original cost over £5. Employ powerful ring magnet. Price 10/- each.

H.T. ELIMINATOR AND TRICKLE CHARGER KIT. Consists of a complete kit of parts to construct an H.T. Eliminator with an output of 120 v. at 20 m/a and provision for Trickle Charging a 2 v. Accumulator. Two Metal Rectifiers are employed. With circuit, 35/-.

RELAY UNIT TYPE 9, consists of a 24 v. operated relay unit incorporating 3 KT33C valves, a telephone line (Uniselector) switch with 6 poles, 26 contacts, 5 P.O. type relays, 2 high-speed relays, and a quantity of other material. Contained in an attractive relay rack type metal case 19 × 9 × 9½ in. deep. Price £4/5s. or without valves, 30/-. Carriage and packing 5/-.

SIGNAL GENERATOR TYPE 33 consists of a battery driven generator, with two separate units for approx. 1 metre and 5 metre operation. Includes two CV6 (VR135) "horned" triodes and one diode. A large quantity of U.H.F. Tuning Gear. Contained in a teak case size 18 × 8 × 8 in. Price 30/-.

OUTPUT TESTER TYPE 9 consists of a unit incorporating three separate diode detectors and a 3-valve Amplifier, each diode with its separate U.H.F. Tuning System. A retractable 18-in. aerial is fitted and three VR130 (HL23) valves, 3 D.I. Diodes and a large quantity of U.H.F. Tuning Gear is included. Contained in a teak case size 18×8×8 in. Price 30/-, or minus three HL23 valves, 15/-.

PREMIER COIL PACK consists of a wired and aligned Coil Pack of the most Modern Type incorporating such features as Permeability Tuned I.F. Transformers with Litz windings on Polystyrene formers (7KC Bandwidth) Air Dielectric Trimmers, Litz wound medium wave coils, Tuned R/F stage, covers 13-40, 40-120, 200-557 metres. Dimensions of Pack, 6 in.× 4½ in. × 2½ in. Pair I.F. Transformers, 3-Gang Condenser, Slow-motion Drive and Dial are supplied loose. Complete Circuit is supplied Price complete £3/17/6.

OSCILLOGRAPH POWER UNITS. Input 230 v. 50 c. include transformer, metal rectifiers, voltage doubling and smoothing condensers. Type 409, output 900 v. 25/-. Type 410, output 1,800 v. 35/-.

SPECIAL HEADPHONE OFFER. High-grade Double Headphones, using balanced armature units. D.C. Res. 60 ohms. 3/6 per pair. Matching Transformer if required, 2/6 each.

OSCILLOGRAPH FOUNDATION KIT. Comprises a transformer giving an output of 800 v., condensers, metal rectifiers, 3½-in. Cathode Ray Tube and base, and L.T. Transformer. Price 55/-

MAINS TRANSFORMERS. Military surplus. All 230 v. 50 cycles input.

Type No.	*Output*
3	500-0-500 v. 150 m/a, 4 v. 2½ a., 4 v. 1 a., 4 v. 5 a. 35/-
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5	450-0-450 v. 150 m/a. Tapped 300 v., 4 v. 3-3 a., 4 v. 3-5 a. 30/-
35	300-0-300 v. 250 m/a, 4 v. 3-5 a., 6·3 v. 5-7 a., 6·3 v. 1-2 a. 35/-
30	Output 30 v. 4 a. 20/-
31	Output 40 v. 3 a. and 104 v. 1½ a. (auto wound) 21/-
32	Output 700-700 v. 150 m/a, 1,000 v. 30 m/a, 4 v. 1 a., 4 v. 4 a. 40/-
33	Output 38 v. at 2 a., tapped at 32, 34, 36 v. 15/-

C.R. TUBES. We have available a large quantity of E.M.I.4/1 Cathode Ray Tubes. 3½ in. diameter, Green Screen, short persistence, 4 v. 1·3 a. Heater. 800 v. H.T. Complete with socket 17/6 each

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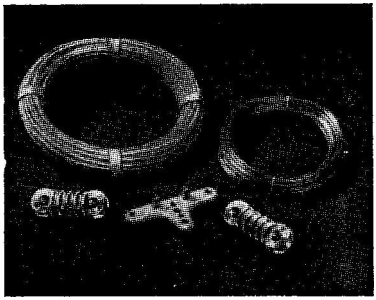
To ensure speedy service. Please put "A" in the top left-hand corner of your letter or order



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
		9·0	27
14·0	16·5	12·0	20
28·0	8·0	15·0	16
		18·0	13
58·5	4·0	21·0	11

Length given is per half-section

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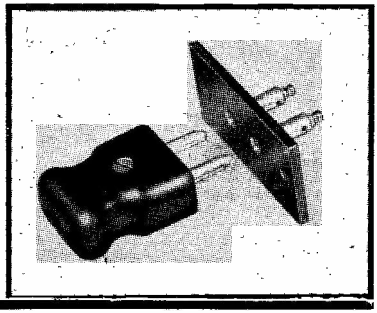

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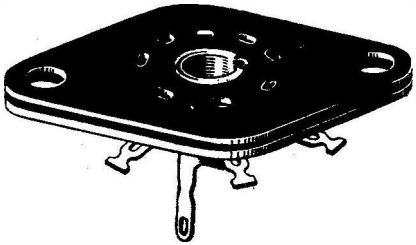
FOR LOCK-IN TYPE VALVES

EBL21, ECH21, 7A7E, 7B8, etc.



TYPE VH 540/8

A double-plate laminated valveholder designed with 8 special sockets and centre spigot socket meeting the requirements of the B8G and B8B range of Loctal Valves.

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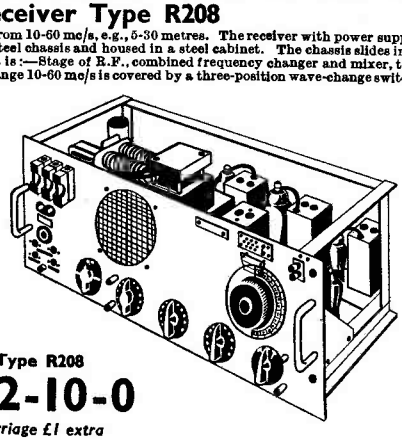
Communications Receiver Type R208

This is a very fine set built with precision; the frequency coverage is from 10-60 mc/s, e.g., 5-30 metres. The receiver with power supply for working off mains or 6v battery and 6" loud-speaker is built on a steel chassis and housed in a steel cabinet. The chassis slides into the front of the cabinet and has handles for withdrawal. The circuit is:—Stage of R.F., combined frequency changer and mixer, two stages of I.F. detector, A.V.C. and first A.F. and 6V6 output. The range 10-60 mc/s is covered by a three-position wave-change switch. Other controls include Muting, Phone jacks, Battery mains on/off switch, A.F. gain, R.F. gain and B.F.O. The set will work with open aerial or dipole. The sets, which are in tip-top condition, weigh 80 lbs. and measure 23" × 12½" × 17½".



Type R208

£12-10-0

Carriage £1 extra

Also £1/0/0 should be sent for packing case, this will be refunded just as soon as the packing case is received back.

BC.348. This much coveted receiver has a frequency range of 200-500 Kc. and 1.5-18 Mc/s. Six position switch brings separate frequency calibrated dial into position and superfine Vernier tuning unit gives 90 turns of tuning for each band—two stages R.F.—three stages I.F.—crystal filter—voltage stabiliser—automatic noise compensation—constant sensitivity on all bands—phone and speaker output—all standard 6.3 volt valves—complete with plug-in Dynamotor for 28 volts. Note this can be removed and standard A.C. mains equipment can easily be fitted in its place. (We will supply details, or do the job if required.) Brand new and complete. **PRICE £28 10s.**, plus 10/- carriage, plus 10/- packing (case returnable).

INTERCOM. A1134 complete with valves 15/-. Or if you want to build a loudspeaking intercom. we can supply a complete kit comprising two loudspeakers in veneered cabinets, the amplifier 1134 and diagram with full instructions. PRICE £4, post paid.

R1155. We can supply this famous receiver which is doing good service the World over complete with ten valves and in tip-top condition, tested before despatch. PRICE £12 10s. plus £1 carriage, 10/- of which we will refund if you return the transit case.

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Moving Coil Milliammeters:
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Special line:
0-1mA 2" square flush mounting, **7/-.**
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0-750mA 2½" Plug-in, calibrated 0-100 for use with thermo couple, **7/6.** 0-3A 2" square RF ammeters **6/6.**

Mansbridge Condensers. 1mF 1000v 1/-, 2mF 300v 10d., 4mF 600v 4/-, 4mF 1000v 4/6, 10mF 500v 5/6, ·1mF 5000v (size 2½" × 3½" × 6½") 5/6. All working voltages.

Smoothing Chokes, 5-10H 200mA, **8/-.**

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Vis. Indicators, Type 3 with 2300mA movements, **4/-.** Cross-over needle type as used with R.1155 with 2 60mA movements **5/11.**

Selenium Rectifiers. 250v 40mA HW, **4/-.** 250v 60mA HW, 4/6. 350v 60mA HW, 5/-. 400v 40mA HW, 5/-. 12v 1A bridge, 4/-.

Speakers P.M. 5", less trans. 16/11. 5" with trans., 19/11. 10" with trans **37/6.** All new and boxed.

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Tuning Conds., ·0005 2-Gang with epicyclic drive, **10/6.**

Carbon Volume Controls with SW. 5K, 10K, 25K, 50K, 100K, 250K, 500K, 1M, 2M, 2½" spindles, **5/6.**

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Wire Wound Vol. Control, 3W Type, 200Ω, 500Ω, 2K, 10K, 20K, 50K, **2/6.** 15W, 50Ω, 500Ω, **4/-.**

8-way Jones Plug & Sockets. 1/6 pair. Co-ax. Plug and Sockets, 1/3 pair. 5-way Bakelite Plug and Sockets, 1/6 pair.

Electrolytics. 25-25, 2/-, 4mF 350v, 2/3. 8mF 450v, 3/3. 8mF 170v, 2/-. 8+8 450v, 5/-, 16-8 450v, 5/6. 16-16 350v, 5/6. 16-24 350v, 5/6. 16-32 350v, 5/6.

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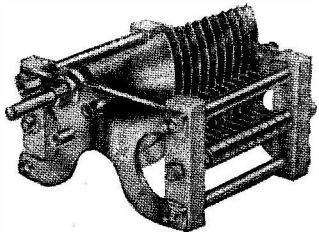

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CYLDON TRANSMITTING 200 PFD

Ceramic insulation. Double spaced

Bargain **12/6**

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SPECIAL OFFER! A.C. mains

20 watt CW on 3·5 m/cs and 7 m/cs may be used on any other bands. **6L6** Osc, **6L6** PA, **S130**, **5U4G**. Complete with 3·5 m/cs crystal.

£12-12-0 (Carriage 5/6)

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A limited number of these successful Receivers are again available. Circuit comprises Acorn Pentode Mixer, Acorn oscillator, two Pentode IF stages at 12 m/cs, double diode triode. Special **Eddystone** two-pin low loss miniature coils cover the range 2-10 metres, while results have been obtained up to 350 m/cs using ¼" strip coils. First-class reception is obtained on 5 and 10, also Television and Police Bands. **IF Gain Control.** Slow motion bandspread dial. 6 sets of coils are required to cover 2-LOM.

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POWER PACKS. Imhof Type Cabinet. 300V 100 m/a 6·3v **5U4G** rectifier

£6-6-0

COMMUNICATIONS RECEIVER BC.348.R

The famous American Air Force's 8-valve superhet receiver, covering 500-200 kcs and 1·5-18·0 mcs. in six bands, as previously advertised. ALL BRAND NEW IN SEALED CARTONS. A fresh purchase of these enables us to offer them complete with power pack for A.C. operation without additional cost. Our saving is passed on to you. Price only **£32/10/-** complete. (Carriage, etc., 10/-). Or in their original form with built-in dynamotor **£28/10/-**. (Plus carriage). Full conversion details for A.C. supplied.

COMMUNICATIONS RECEIVER R.1224.A.

The ex-R.A.F. 5-valve superhet battery receiver covering 1·0-10·0 mcs in 3 switchable bands. Power supply 2v L.T. 9v G.B., 120v H.T. Has Muirhead precision slow motion dial, aerial trimmer, sensitivity control, etc., etc. Circuit employs RF stage. Supplied with valves as follows: 2 type VP23, and 1 each FC2A, HL2, P.M.22A. Cabinet size 15"×9¾"×8½". A battery superhet of the highest order. ALL BRAND NEW IN ORIGINAL PACKING. ONLY **99/6** (carriage, etc., 7/6).

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We have now only a few of these very fine wavemeters left. Covers 1·9-8·0 mcs with check frequencies up to 25 mcs. Employs dual crystal 100/1,000 kcs, giving 2 kcs accuracy. Operates from 6v DC, but AC conversion details supplied. Complete with spare valve and spare vibrator and instruction manual, in padded teak case. ALL BRAND NEW AND UNUSED. ONLY **£6/15/-**.

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Open until 1 p.m. Saturdays, we are 2 mins. from High Holborn, 5 mins. from King's X

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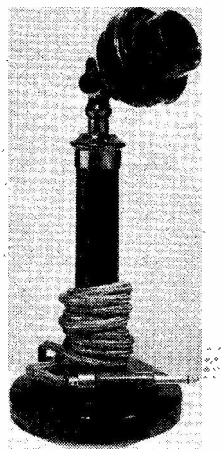

Desk Microphone. A Genuine Bargain. Brand New in carton.

Complete with screened lead and Jack plug. Single button—conical diaphragm. Extremely sensitive and high quality. As used by R.A.F. Ground Stations.

ONLY **10/-** *plus 1/- postage*

AR88 **£50.** HRO Rack outfit, complete. Brand new, **£80.** Polystyrene solution. Pint tins, **7/6**, postage, 9d.

Photo electric exposure meters. Very sensitive. Made by Metro-Vick, **17/6**, postage 6d.

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S.A.E. FOR LISTS SWM OF OTHER BARGAINS

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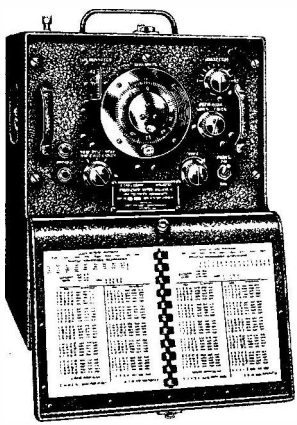
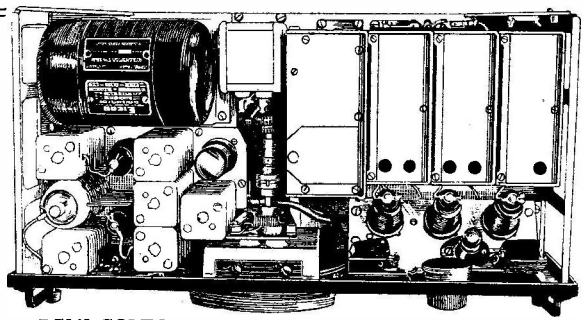
BC348 COMMUNICATION RECEIVER





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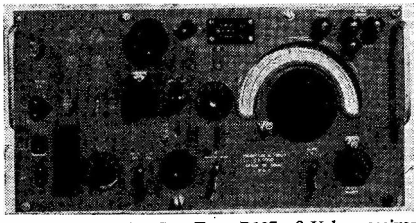

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VR136 (EF54), VR137 (EC54), Sylvania VR91 (EF50), VT52 (EL32), KTW61, 5Z4G, 6D6, 6G6, 6FY, 6J5G, 6H6, 5/- each. RCA 816, VR105/30, VR150/30, 10/6 each. 0-350 mc or 0-1 amp. Thermo-couple RF meters, 6/-.—G2OO, A. Hoile, Well Street, Loose, Maidstone. Phone 83579.

WIRE Recorder, RCA. Perfect condition.—Offers to Box No. 235.

11-VALVE 50-60 mc Superhet (R1481), built-in AC Power Pack, as new, circuit, £11.—GM6MS, 390 Kingspark Avenue, Rutherglen.

SPEECH equipment, comprising 6J7-6J7-pr.6C5s, transformer driver for 807s UM3 output transformer, complete with 600 and 300v packs and separate heater transformer, £15. 1132A, not meter or valves, £3. 1147A, complete with instruction book, offers. —G3WW, Wimblington, Cambs.

SCR.211 (BC221) Frequency Meter. 125 to 20,000 kc. Perfect, as new, £14.—254 Grove Green Road, Leytonstone, E.11. Phone Ley 4986 (eve.).

348R as new, RF stage modified, complete with external power unit, £32. Carriage paid. —G2IN, 114 Cambridge Road, Southport.

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R.C.A. AR 88D, perfect, just re-aligned. £55 or near offer. Consider exchange for modern HRO Senior.—G5ND, 133a Penrose Avenue, Blackpool.

SALE. RCA-AR77E, 10-valve Receiver, S-meter, Xtal, BFO, 540 kc-30 mc, excellent condition, £30. Also a number of triode and pentode acorn valves, 10/- each.—Write Bass, 153 Domonic Drive, New Eltham, London.

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BC312 modified for mains, excellent condition, £16. NC100X, complete, good condition, £28.—G4CF, 132 Liverpool Road South, Burscough Town, Lancs.

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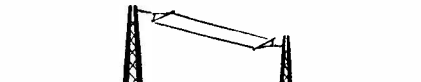

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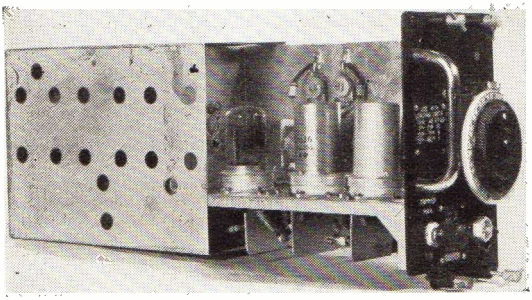

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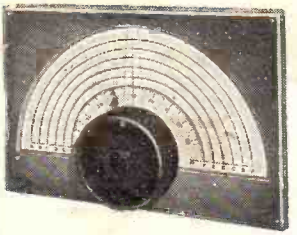

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