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The
SHORTWAVE
Magazine

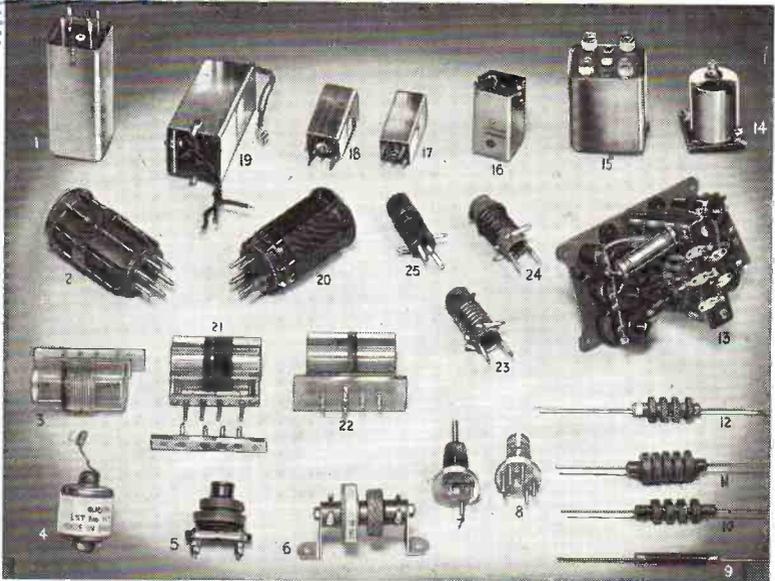


**EXCLUSIVELY FOR THE
RADIO EXPERIMENTER &
TRANSMITTING AMATEUR**

VOL. V No. 9

NOVEMBER 1947

Webb's FOR DIVERSITY OF STOCK INDUCTANCES

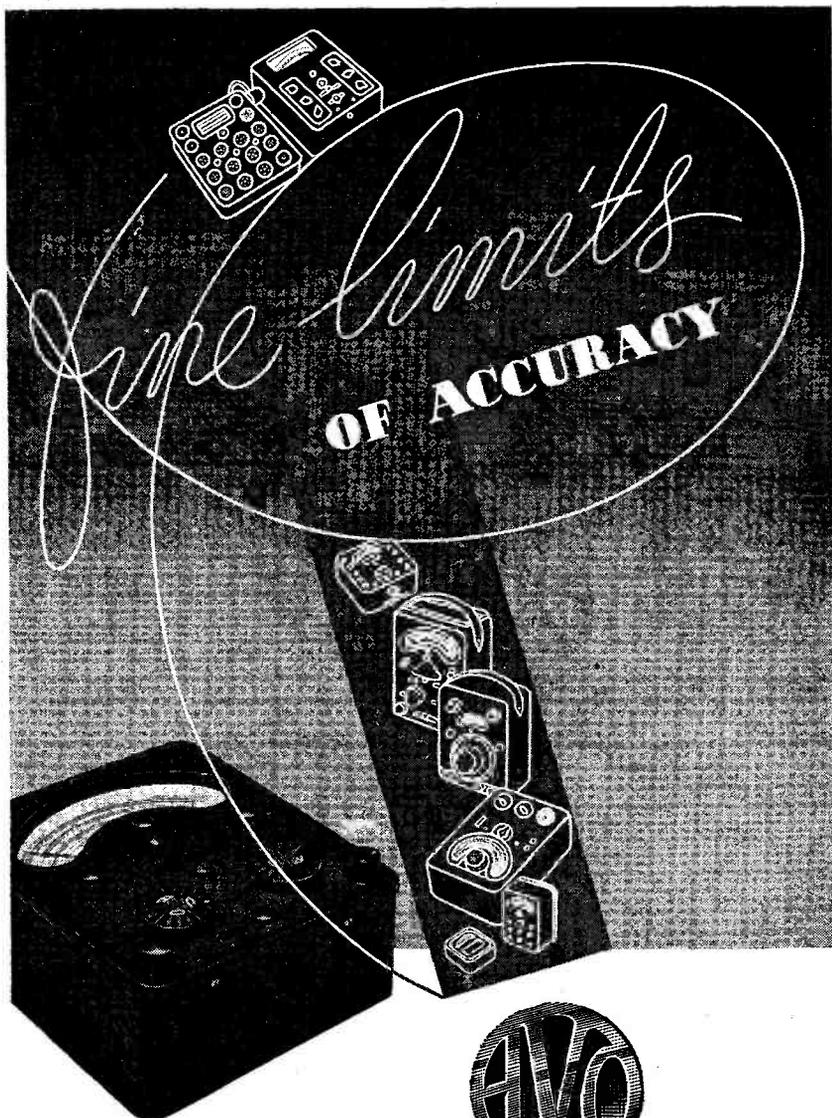


- 1. Wearite I.F. Transformer Nos. 501/2. Size 1 3/8 in. sq. by 3 1/2 in. high, 450-470 Kc/s. No. 501 has critical coupling with flying lead. No. 502 has close coupling for diode input—no flying lead. Both types . . . 10 0
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 - 6 W 3.95 to 1.8 Mc/s 5 3
 - 6 LB 25 to 11.5 Mc/s 5 0
 - 6 P 2000 to 924 Kc/s 5 9
 - 6 Y 13.6 to 6.4 Mc/s 5 0
 - 6 G 1153 to 590 Kc/s 5 9
 - 6 R 7.3 to 3.2 Mc/s 5 3
 - 6 BR 612 to 300 Kc/s 6 6
 - 6 GY 300 to 150 Kc/s 6 6
- 3, 21 & 22. Denco interchangeable coils on low-loss ribbed polystyrene formers 2 in. x 1 1/8 in. dia.
 - Range 1. 1 to 2 Mc/s (tuned 100 pf)
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 - 7. 50 to 90 Mc/s (tuned 50 pf)
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- 4. Bulgin "Skeleton" general purpose H.F. Choke, All-wave type 6 6
- 5. Eddystone No. 1066 All-wave Choke. One hole fixing. Inductance 17.9 millihenries 4 0
- 6. Bulgin Quench coil. Two winding unit for super-regeneration 5 6
- 7 & 8. Denco "Maxi-Q" Plug-in coils (Octal based). In eight ranges covering from 850 Kc/s to 130 Mc/s. Each range available in four types for all purposes—"Blue", 4/2; "Yellow", 4/2; "Red", 4/2;

- "Green", 5/0. (Coding as for Denco interchangeable coils also shown in this advertisement)
- "Maxi Q" unwound formers with cores 2 3
- 9. Eddystone No. 1011 U.H.F. Choke 120/25 Mc/s. Inductance 5.6 microhenries 1 9
- 10. Eddystone No. 1010 S.W. Choke. 60/1.5 Mc/s. Inductance 1.25 millihenries 2 6
- 11. Eddystone No. 1022. Transmitting S.W. Choke. 60/1.5 Mc/s. Inductance 1.5 millihenries carries 250 milliamps. 3 0
- 12. Denco 2.6 millihenry general purpose S.W. Choke on polystyrene former 2 3
- 13. Wearite Coil pack series 600. Three ranges, Superhet coil assembly. In two types:—
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- 15. Eddystone No. 645 I.F. Transformers. 450/465 Kc/s. Litz wound and permeability tuned, plated brass case gives efficient screening. Band-width for a pair of transformers is 5 Kc/s at 20 dB down. Two stages (three transformers) gives band-width of 5 Kc/s at 30 dB down 19 6
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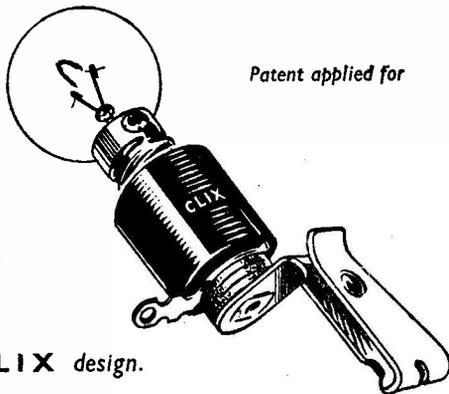


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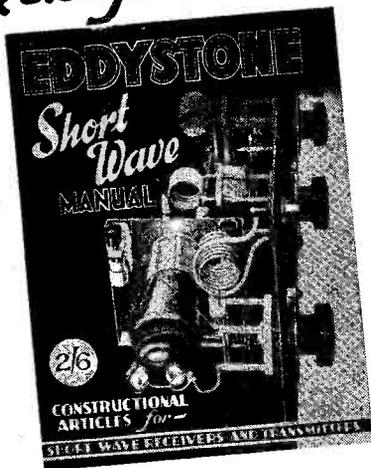
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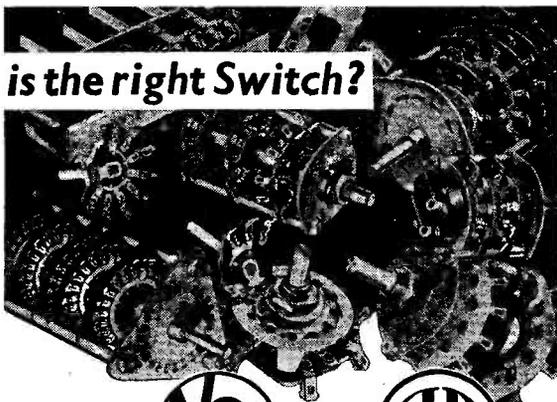
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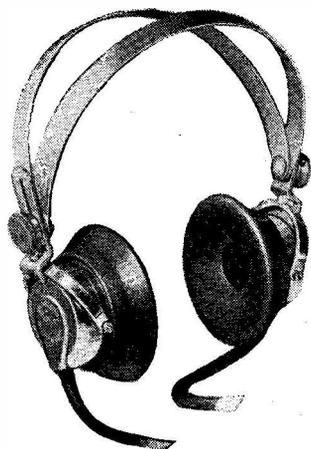
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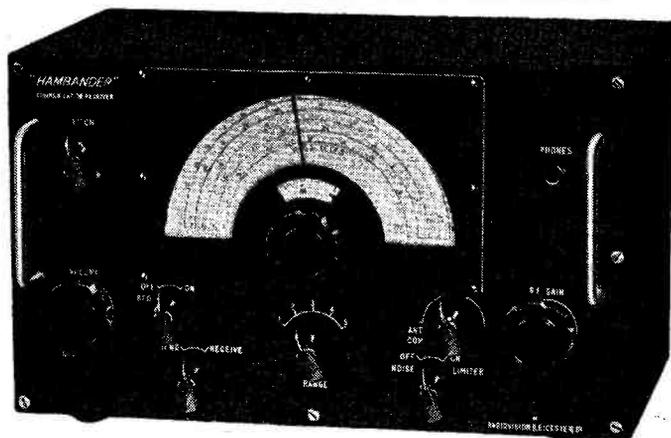
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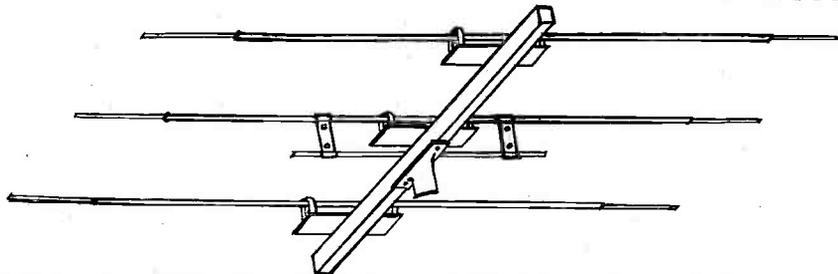
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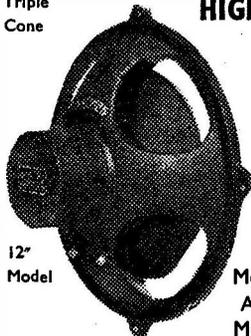
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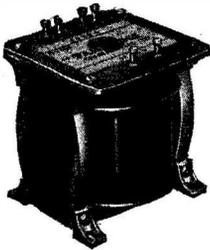
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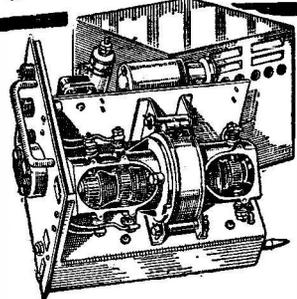
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25 a.	3½ in.	—	Prof.	M.C. D.C.	7/6
25 a.	3½ in.	—	Flush	M.I.D.C.	7/6

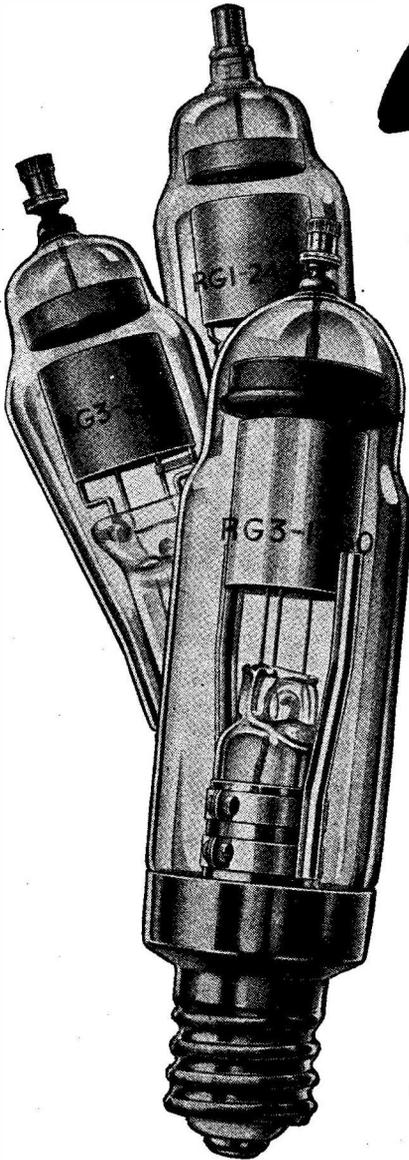
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Filament Current	- - -	5.0 A
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SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR AND AMATEUR RADIO

Vol. V.

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EDITORIAL

Band-Planning

Now that our frequencies are determined for the future, urgent consideration must be given to the question of how they are to be used. The present condition of our main communication bands is such that unless band-planning action is taken, the position will drift into utter chaos, to the grave detriment of Amateur Radio.

We are in entire agreement with the view that band-planning, to be fully effective, must be organised on an international basis—indeed, that is obvious. In this country, it may mean enlisting the active support of the Post Office to carry out the policy.

Having arrived at the plan itself (which on the DX bands will be conditioned largely by what the Americans want, they outnumbering the rest of the world by about 20-to-1) the next point will be enforcement. So far as G's are concerned, it might be better to obtain compliance by means of regional committees of qualified amateurs appointed, with proper safeguards, to act as monitor stations and with local authority to issue warnings to offenders. Any further or more drastic action would be a matter for the Post Office, taken only on the advice of the committee and after due investigation.

This is a far-reaching proposal and means in effect the policing of our bands. There will be diverse opinions as to whether it is either wise or practicable. Though at first sight the idea may seem repugnant, there can be little doubt that unless rapid and hard-hitting action is possible, band-planning is foredoomed to failure by reason of the anti-social attitude some operators choose to adopt.

There are thus two aspects of the problem—the band plan itself, and enforcement of its provisions. Convinced, as we are, that unified decisions on the matter are essential for the future well-being of Amateur Radio, we shall be glad to support any scheme holding out a reasonable prospect of success.

Austin Ford 7/12 60-60.

Converters For Five And Ten

Units to Operate with a 3 mc IF/AF Amplifier

By W. J. CRAWLEY (G2IQ)

(In the August issue, the author discussed amateur-band receiver design and suggested that the logical approach to the problem at HF and VHF is a standard IF/AF amplifier unit operated with converters designed for the required frequency ranges. Here are his ideas for 28 and 58 mc.—Ed.)

THE most important item to consider in the design of converters for 28 and 58 mc is noise. Thermal agitation, which is most apparent in the first stage of the receiver, is unavoidable but may be reduced by making the first stage as efficient as possible. Valve noise can be cut down to a minimum by careful choice of valves and component values. Among valve noises, that of the mixer is likely to be most troublesome.

Mixer Noise

Generally speaking, the equivalent noise resistance of a pentode when working as a mixer is greater by at least two, and perhaps even four times the resistance representing the noise produced in the same valve when working as an RF amplifier. For this reason it is necessary to ensure that the equivalent noise resistance of the mixer valve is exceeded by the internal impedance of the signal voltage applied to its grid. This may be achieved by employing sufficient gain ahead of the mixer to ensure that the signal amplitude applied to the grid of the mixer is large compared to the mixer noise. The signal/noise ratio is thereby improved to the point where mixer noise becomes negligible.

Once this point has been reached there is no point in striving after higher pre-mixer gain because it will not improve the signal/noise ratio. Indeed, it may impair the signal/noise ratio by introducing regeneration. This may not show itself in actual instability, but the writer has often encountered high gain RF stages working near the

threshold of instability and apparently giving extremely high overall amplification, but whose actual signal/noise ratio was quite poor.

There is an optimum, then, that the amateur constructor can obtain in his RF amplification.

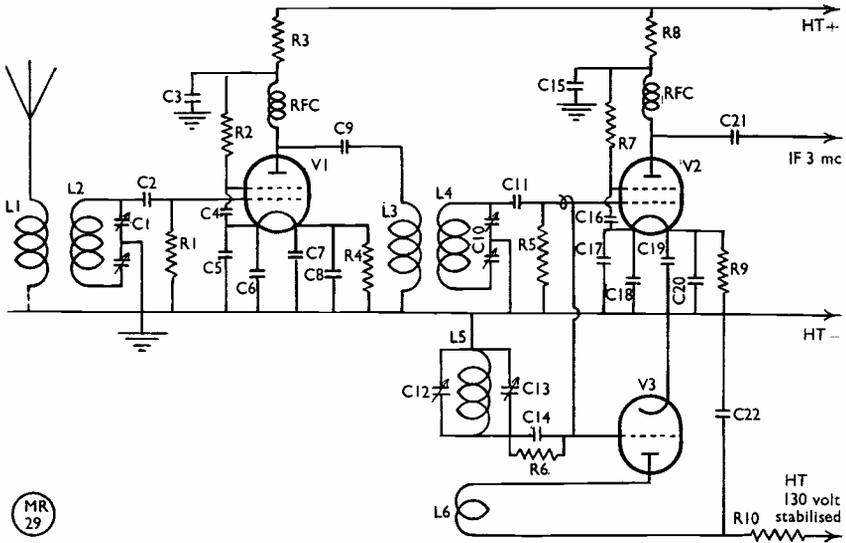
Perfect stability with enough amplification to overcome mixer noise represents the ideal for our converters. Experiments over many months have led the writer to the conclusion that at 28 and 58 mc one carefully designed RF stage is sufficient.

The EF54 versus the E.G.T.

The two converters to be described are similar in many respects. Split-stator tuning is used in both units. An EF54 RF stage was found to do all that was asked of it at both frequencies. The writer cannot agree with those who claim enormous advantages from their earthed-grid triode RF stages at 58 mc, and respectfully suggests that they try the EF54! The advantage of improved noise in the earthed-grid triode does not begin to make itself felt until 100 mc or so is reached. The E.G.T. shows less than 1 dB improvement in noise over the EF54 at 58 mc, and in bad localities the wide pass-band of the E.G.T. is a positive nuisance and it there becomes distinctly inferior to the valve using the more selective input circuit.

Construction

Both converters are built on small Eddystone cast chassis and fit neatly into the corresponding Eddystone black crackle case.



MR
29

Fig. 1. Circuit of the 28 mc unit, as described in the text by G2IQ.

For the 28 mc unit, the chassis is divided into three compartments, two pieces of 18 gauge aluminium $5\frac{1}{2}$ -ins. \times $3\frac{1}{2}$ -ins. being bolted to the chassis. The RF and mixer compartments are $2\frac{1}{2}$ -ins. wide, leaving about $3\frac{1}{2}$ -ins. for the oscillator. These dimensions are not critical but $2\frac{1}{2}$ -ins. is the minimum for any section. Corresponding strips of aluminium are placed under the chassis so that each stage is a separate screened unit. The screening between mixer and oscillator could be omitted, but it is better to know how much injection capacity is being used rather than to rely on stray capacity.

To simplify this converter separate tuning has been used for all three circuits and any ganging troubles are thus obviated. The RF and mixer coils are standard 4 or 6 pin $1\frac{1}{2}$ -in. diameter plug-in types designed to cover the 14 mc band with normal tuning. With split-stator tuning they cover the 28/30 mc band quite easily. The size of these coils clearly indicates the advantage of increased coil inductance which split-stator tuning affords! The grid winding consists of

Table of Values

Fig. 1. The 28-30 mc Unit

- C1, C10 = $25 \times 25 \mu\mu\text{F}$, split stator
- C2, C9, C11, C14 = $50 \mu\mu\text{F}$ mica or ceramic
- C3, C15, C22 = $.01 \mu\text{F}$ mica
- C4, C5, C6, C7, C8, C16, C17, C18, C19, C20 } = $500 \mu\mu\text{F}$ mica
- C12 = $50 \mu\mu\text{F}$ air-spaced trimmer
- C13 = $10 \mu\mu\text{F}$ variable
- C21 = $100 \mu\mu\text{F}$ mica
- R1, R5 = $330,000$ ohms, $\frac{1}{2}$ -watt
- R2 = $5,600$ ohms, $\frac{1}{2}$ -watt
- R3 = $2,000$ ohms, $\frac{1}{2}$ -watt
- R4 = 150 ohms, $\frac{1}{2}$ -watt
- R6 = $33,000$ ohms, $\frac{1}{2}$ -watt
- R7 = $250,000$ ohms, $\frac{1}{2}$ -watt
- R8 = $1,000$ ohms, $\frac{1}{2}$ -watt
- R9 = $4,700$ ohms, $\frac{1}{2}$ -watt
- R10 = $1,000$ ohms, $\frac{1}{2}$ -watt
- V1, V2 = EF54
- V3 = See text
- L1 = See text
- L2 = 7 turns on $1\frac{1}{4}$ -in. former
- L3 = 2 or 3 turns on $1\frac{1}{2}$ -in. former
- L4 = 7 turns on $1\frac{1}{4}$ -in. former
- L5 = 3 turns on $1\frac{1}{2}$ -in. former
- L6 = 1 turn close to L5

7 turns of 24 or 26 SWG enamelled copper wire, but the aerial winding is a matter for experiment. The writer uses a balanced input with 300-ohm Amphenol line, and three turns have been found optimum for this condition. A 70-ohm line requires 2 turns.

The split-stator condensers may be of any design provided that the physical dimensions allow for mounting in the restricted space available. The writer uses an Eddystone $25 \times 25 \mu\mu\text{F}$ for the RF and a Polar 2-gang $25 \mu\mu\text{F}$ condenser for the mixer. The oscillator coil is tuned roughly by a $50 \mu\mu\text{F}$ midget air-dielectric type, whilst an-

other $50 \mu\mu\text{F}$, with all rotor plates but one removed, serves for bandspread. This capacity (about $10 \mu\mu\text{F}$) is sufficient to spread 28/30 mc over most of the 0/100 dial.

Points to Watch

Special points to note in wiring the converter are as follows: Keep all grid and plate leads as short and as rigid as possible. Where grid leads have to go through the chassis to the variable condensers use either ceramic feed-through bushes or sheath the wire in polythene tube or similar low-loss insulant. Avoid all loops by having one common earth point for each stage. The best position for this is at the screw holding the valve-holder in position, and may be made by bolting three soldering tags to this screw and fanning them out for easy access. There are four cathode outlets to the EF54; by-pass each tag separately to earth with a $500 \mu\mu\text{F}$ mica condenser. If possible arrange one of these condensers to lie right across the valve holder so that it acts as further screening between grid and plate.

Table of Values

Fig. 2. The 58 mc Unit

- C1, C9 = $25 \times 25 \mu\mu\text{F}$ split stator
 - C2, C12, C13 = $50 \mu\mu\text{F}$ mica
 - C3, C4, C5, C6, C7, C8, C15, C16, C17 } = $500 \mu\mu\text{F}$ mica
 - C14, C19 = $0.1 \mu\text{F}$ mica
 - C10 = $30 \mu\mu\text{F}$ trimmer
 - C11 = $4 \mu\mu\text{F}$ variable
 - C18 = $100 \mu\mu\text{F}$ mica
 - C20 = $30 \mu\mu\text{F}$ ceramic trimmer
 - R1, R5 = $330,000$ ohms, $\frac{1}{2}$ -watt
 - R2 = $5,000$ ohms, $\frac{1}{2}$ -watt
 - R3 = 150 ohms, $\frac{1}{2}$ -watt
 - R4, R8 = $2,000$ ohms, $\frac{1}{2}$ -watt
 - R6 = $33,000$ ohms, $\frac{1}{2}$ -watt
 - R7 = 1 megohm, $\frac{1}{2}$ -watt
 - R9 = $5,600$ ohms, $\frac{1}{2}$ -watt
 - R10 = $5,600$ ohms, $\frac{1}{2}$ -watt
 - L1 = 1 turn
 - L2 = 6 turns, 1-in. diam.
 - L3 = 6 turns, $\frac{3}{4}$ -in. diam. centre-tapped
 - L4 = 3 turns, $\frac{3}{4}$ -in. diam.
 - L5 = 1 turn, close to L4
- V1, EF54; V2, 6AK5; V3, 6J6.

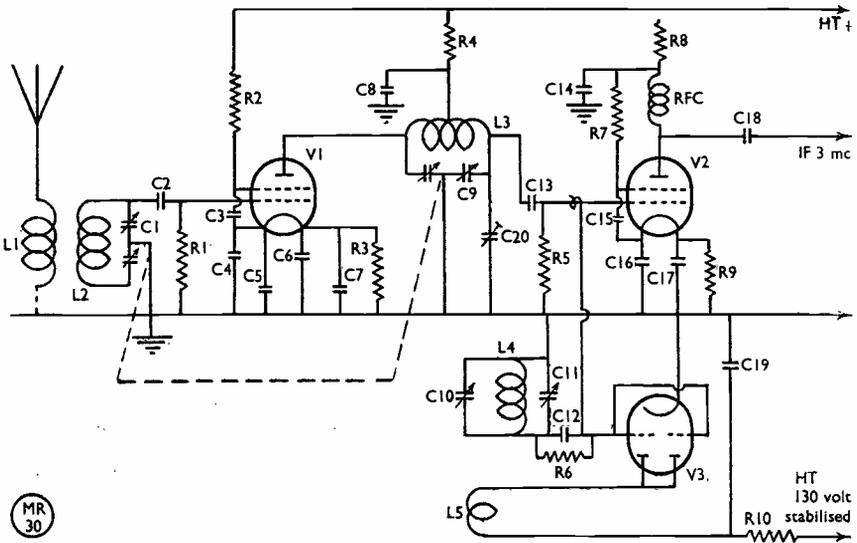


Fig. 2. The 58 mc converter circuit.



Mixer noise is reduced by the use of high-value cathode and screen resistors. In the interests of high conversion gain, high signal/noise ratio and low signal-grid current, single grid input is used in the mixer. This results in some pulling, but its advantages outweigh this one disadvantage. The use of a very small capacity reduces pulling to a minimum, and this capacity is obtained by wrapping a piece of insulated wire once around the mixer grid pin and connecting the other end to the oscillator grid. The choice of oscillator valve is not critical and the following types have been used with good results: 6C4, 9001, 9002, 9003, 6AG5, 6AK5, 6J6, all triode-connected. The photograph shows a 6AG5, triode-connected, in this position.

Operation

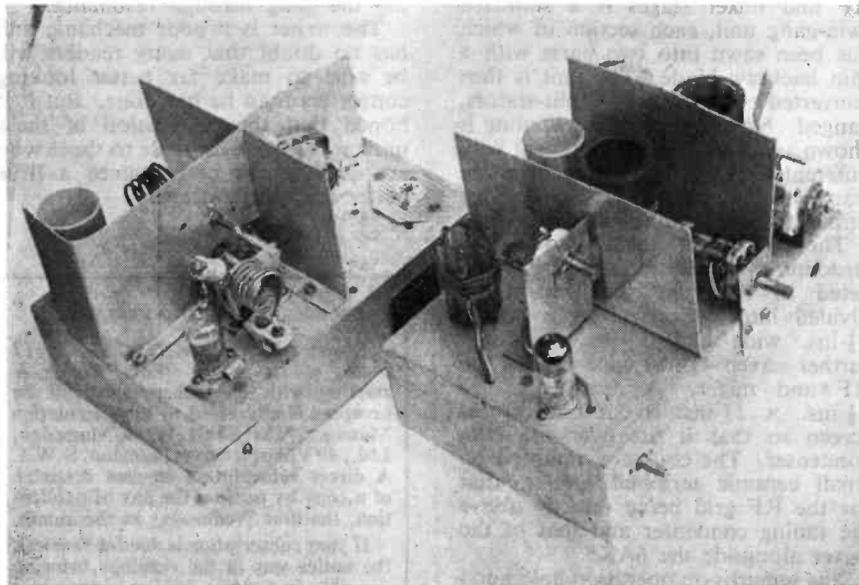
The writer uses an output frequency of 3 mc which means tuning the oscillator through 31/33 mc or 25/27

mc. With the oscillator coil specified, which has three turns for the grid winding and one turn tightly coupled for the reaction winding on a Denco standard former, the setting of the 50 μF oscillator condenser is about half-way in. If no wavemeter is available, finding the band is a matter of trial and error. The writer prefers to tune the oscillator through 31/33 mc and resonance in C1 and C10 is indicated by a sharp increase in background hiss.

The 58 mc Converter

The circuit of this unit is similar in most respects to the 28 mc set. The 6AK5 has been found an excellent mixer for this frequency and a 6J6 strapped as one triode, in which condition its mutual conductance is 10 mA/volt, is a strong and stable oscillator.

The coils, which in the case of the RF and mixer stages are mounted as near to the tuning condenser as pos-



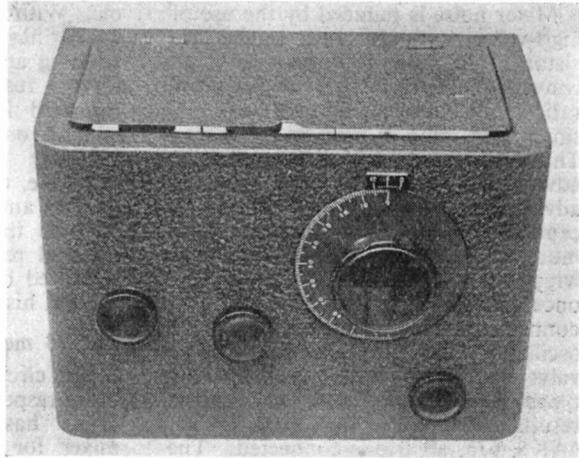
The 58 mc converter on the left, with the 6AK5 mixer compartment visible. The 28 mc unit is to the right, with the oscillator section nearest camera.

sible, are self-supporting, wound with 16 SWG enamelled or silvered wire. The RF coil has six turns 1-in diameter whilst the mixer is made slightly smaller, namely 6 turns $\frac{7}{8}$ -in. diameter. The reason for this is to dispense with the trimmer across the RF coil, and one trimmer only, that in the mixer circuit, is used. For the oscillator, where stability is the main consideration, three turns on a circular piece of distrene, $\frac{3}{4}$ -in. diameter, with one turn for reaction, are used. This coil is tuned by a Philips 30 $\mu\mu\text{F}$ ceramic trimmer and a 4 $\mu\mu\text{F}$ parallel condenser spreads the band about 70° on the $0/100^\circ$ dial.

The ganged condenser used in the RF and mixer stages is a standard twin-gang unit, each section of which has been sawn into two parts with a thin hacksaw blade. The unit is thus converted into two split-stators, ganged. No aerial coupling winding is shown, as here again experiment with different sizes will pay dividends in the transfer of energy. As a guide, one turn is the optimum for a 70-ohm line.

The precautions taken in the construction of the 28 mc unit are duplicated in this set. The chassis is divided into two parts by a screen $5\frac{1}{2}$ -ins. wide and $3\frac{1}{2}$ -ins. deep. A further screen $4\frac{1}{2}$ -ins. wide divides the RF and mixer. A small aperture $1\frac{1}{2}$ -ins. \times $1\frac{1}{8}$ -ins. is cut out of this screen so that it fits over the twin condenser. The coils are mounted on small ceramic terminal blocks, that for the RF grid being directly above the tuning condenser and that of the mixer alongside the 6AK5.

The remarks on operation hold good for both units. For an output frequency of 3 mc, the oscillator trimmer should be two-thirds out. Resonance



The 28 mc unit ready for work. Small-knob controls are for RF, mixer and band-set, with the large dial for band-spreading.

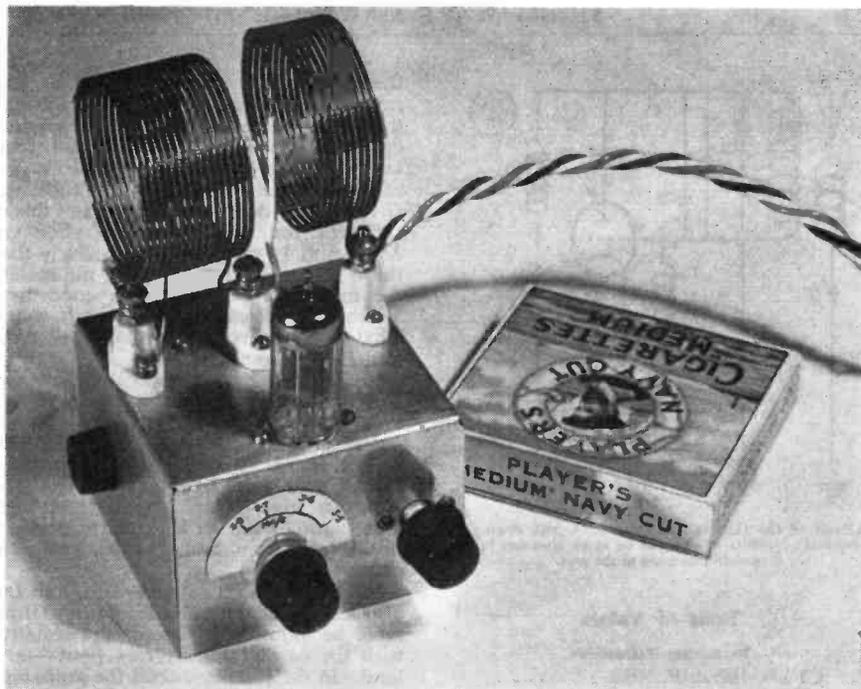
of RF and mixer is again indicated by an increase in hiss, but the mixer trimmer must be adjusted whilst swinging the gang through resonance.

The writer is a poor mechanic and has no doubt that many readers will be able to make far better looking converters than he has done. But it is hoped that the description of these units will serve as a guide to those who are striving for performance a little better than the average.

SUBSCRIPTIONS AND RENEWALS

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QRP on Eighty Metres

A Compact T9 Hartley Transmitter

By A. H. B. CROSS, Ph.D. (G3FN)

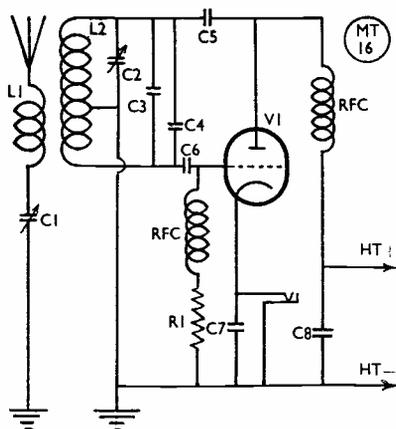
(A "one-lung" QRP job always has a fascination of its own. This little transmitter has been carefully designed round the Hartley self-excited oscillator circuit to produce a good quality low-power CW signal, with the advantages of frequency flexibility. To ensure calibration accuracy and to comply with licence conditions, it should be set up with a crystal-checked frequency meter as reference.—Ed.)

AMATEUR Radio is one of those hobbies which include amongst their devotees a variety of specialised interests. There always has been, and probably always will be, a section of the amateur populace whose particular interest is low-power communication, or construction of compact transmitters or receivers—to mention only two of the hundred and one varied interests which, collectively, constitute Amateur Radio. QRP and compact gear suggest "miniaturisation," to use a recent addition to our vocabulary. By reducing a transmitter to its bare essentials and employing modern small components, quite effective com-

munication can be maintained without radiating an anti-social signal and with very little space required on the operating table.

Nowadays, variable frequency is practically essential if a transmitter is to be used to maximum advantage on any band. Probably few would deny that variable frequency within a band is preferable to considerable power increase at a fixed frequency. The "netting" of stations on the frequency of one of them does much to reduce QRM on our crowded frequencies to-day.

A miniature transmitter capable of operating anywhere within a given band



Circuit of the Hartley transmitter. A high degree of frequency stability is obtained by close attention to the details discussed in the text.

Table of Values

T9 Hartley Transmitter

C1	=	100 μF .
C2	=	60 μF .
C3, C4	=	68 μF , silvered mica.
C5	=	330 μF , " "
C6	=	68 μF , " "
C7, C8	=	.002 μF paper.
R1	=	10,000 ohms, $\frac{1}{2}$ -watt.
L1	=	11 turns, $2\frac{1}{2}$ ins. dia., 14 t.p.i.
L2	=	16 turns, $2\frac{1}{2}$ ins. dia., 14 t.p.i., cathode tap 5 turns from grid end.
V1	=	6C4.

and radiating a thoroughly acceptable signal, which all but the most discriminating describe as "T9," is easily constructed. Before embarking on construction it is necessary, however, to give some thought to the factors which largely determine the stability of a self-excited oscillator delivering power to an aerial.

Frequency Stability

The rules for obtaining a stable note from a self-excited transmitter were written many years ago. Judging by some of the signals heard to-day, they have either been mislaid or forgotten. The more important ones are listed below for reference.

(a) In order to ensure dynamic stability a high-C tank circuit is necessary. Dynamic stability implies immunity from

the effects of changing plate voltage. The same high-C circuit also reduces frequency drift by making the valve inter-electrode capacities smaller fractions of the total tank capacity. About 200 μF is the capacity required actually to tune the circuit at the desired frequency and this is sufficient for satisfactory operation on 3.5, 7 and 14 mc. Note particularly that this is the actual capacity used, not merely the maximum of the tuning condenser. When the valve capacities are small, somewhat lower values of capacity are sufficient, e.g., about 150 μF .

(b) If the valve is to operate efficiently, high bias is necessary (at least twice cut-off voltage for class-C operation). This requires a fairly high value of grid leak (about 10,000 to 20,000 ohms for many triodes) and high excitation. If, after providing a high-C tank circuit and high valve grid leak, a key chirp persists, insufficient excitation is the probable cause.

(c) Adequate excitation. This, and the grid leak value, are interdependent. Both must be adjusted for maximum stability with the oscillator delivering power to a load. In the Hartley circuit the excitation is increased by moving the cathode tap towards the plate end of the tank coil.

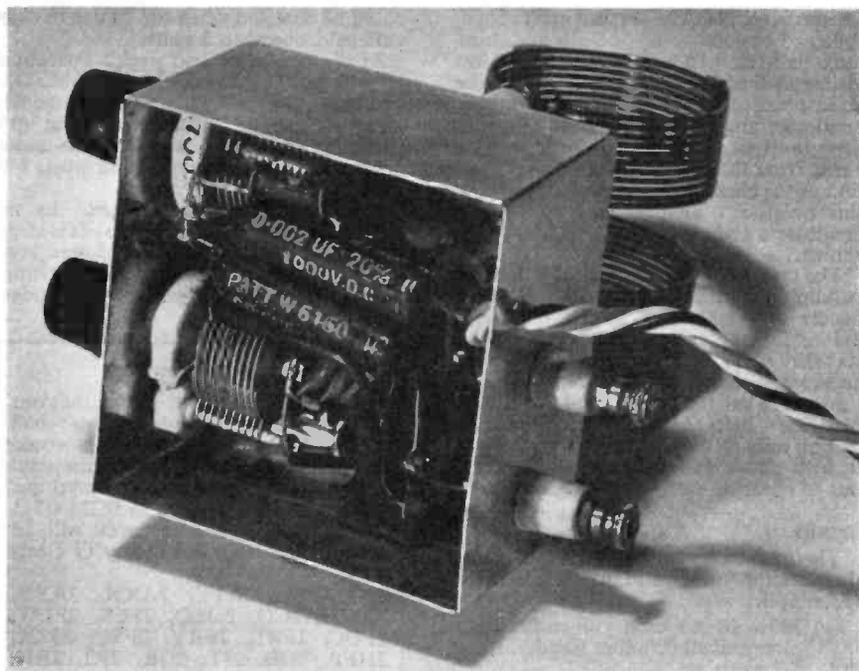
(d) Low ripple in the HT supply. This is more important than with a self-excited oscillator than with crystal control, but does not, for single stage transmitters, generally require special voltage stabilisation. Normal filters, preferably using choke input and a bleeder, are sufficient in most cases.

(e) Protection of the whole transmitter from vibration. Self-excited oscillators should not be built on the same chassis as the power supply and may require additional protection by placing on resilient supports or on a separate table. With reasonably solid construction, vibration from keying should not be troublesome, though heavy coils and connections are necessary when large valves are being operated with considerable input power.

Using miniature components, 18 SWG wire is ample for coils and connections if joints are good both mechanically and electrically.

(f) Aerial coupling to the "cooler" end of the tank circuit. This minimises capacity coupling but aerial feeders should be light and kept taut to prevent swinging. Coupling should be sufficient only to draw rated plate current.

A triode oscillator embodying the above rules in its design and construction will exhibit high valve efficiency, although



Underside view of the chassis, showing how economically space can be used.

circuit efficiency will be slightly lower due to the large circulating tank current. Unloaded plate current will run about half the loaded value and the working conditions will be true class-C. The stability of the note will be entirely satisfactory and greatly superior to that of many of the multi-stage transmitters of the type VFO-?-PA on the air to-day. The economy is in both equipment and worry.

Circuit

These rules have been applied to the design and construction of a QRP transmitter operating in the 3.5 mc band. They were found to be quite reliable.

The circuit is shown in Fig. 1 and comprises a parallel-fed Hartley oscillator with series-tuned inductive coupling to the aerial. The complete RF section is only 3-ins. square and has been used for some time with both mains pack and battery HT supplies. The values of components are given in the table.

A 6C4 is used as the oscillator valve, principally on account of its small size and relatively large RF output. The small

inter-electrode capacities are also an advantage in minimising drift due to heating. Parallel feed was chosen as it helped the mechanical construction by enabling the cathode tap to be connected directly to chassis.

The rigidity of the aerial coupling coil could be increased by using an additional stand-off insulator, but no instability due to vibration has been detected with the lightweight coils employed.

Construction

Almost every amateur has his own favourite ways of translating a circuit diagram into a piece of equipment, even when the circuit is as simple as a Hartley oscillator. It will be sufficient, therefore, to say that the chassis is bent from a 7-in. square of thin aluminium sheet, and the photographs are views of the upper and lower sides. Owing to the restricted space below chassis it is not possible to show the placing of all components in the photograph. The heater wiring was installed first and tucked well into the corner of the chassis. Grid and plate blocking con-

condensers and RF chokes are next fitted, followed by the two 68 μF silvered mica tank padding condensers which are just visible in the view of the underside. The bandspread condenser and aerial tuning condenser are both mounted on the front drop without insulation of their moving vanes from the chassis. Note the connection of the bandspread condenser to make this possible. Finally, the two by-pass condensers and grid leak were mounted as shown.

The values given in the table for the padding condensers, bandspread condenser and tank coil spread the range 3.5 to 3.8 mc conveniently on the dial. As the silvered mica condensers were accurate within ± 2 per cent., the coil turns were calculated for the known tank capacities beforehand and required correction only to the extent of removing one turn to obtain full coverage of the band, due to ignoring stray wiring capacities.

Results

The transmitter has been operated from three sources of HT and two of LT. The HT supplies were :—

- (a) 300 v. 60 mA each with choke input filter and 30,000-ohm bleeder. Input 5.7 watts.
- (b) Mains eliminator giving 150 v. at 25 mA. Input 1.2-1.5 watts.
- (c) 120 v. standard capacity dry battery. Input 0.5-0.7 watts.

The inputs quoted are for the same degree of aerial coupling in each case. LT supplies used include 6 v. AC and 6 v. DC (4 dry cells). With all sources of HT and LT tone reports have been consistently T9 with two exceptions. The exceptions are two occasions when the transmitter was operated (actually, in each case, wholly from battery supplies) *without a DC earth connection*. The "T8" then received appears to be due to the effect of unshielded mains wiring in the shack. The choice of a suitable earth connection will vary with different locations and on different bands. Twelve feet of wire connected to a buried copper plate have been satisfactory on 3.5 mc at this station. It is a simple matter to try various schemes and select the best, as must also be done with regard to aerial coupling arrangements.

The coupling coil and series condenser shown feed an 84 ft. length of wire conveniently on 3.5 mc.

The 6C4 seems to be very tolerant of low heater voltages. No perceptible fall of signal strength reports or of plate input

could be detected when the heater battery voltage dropped to 5 volts.

In the course of one week's operation on 3.5 mc, G, GM, GD, ON, SM, OK and LA (Spitzbergen) were contacted, using 0.5 to 0.7 watt input from dry batteries. These contacts were made under normal conditions on the band when 150 watt stations were operating.

This transmitter is, of course, by no means the limit of compactness. It is large enough to be easily built and was constructed and operated in the same evening. The performance still fascinates its builder.

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PHILIPS TECHNICAL REVIEW

For those wishing to keep informed on the more advanced aspects of radio and electronics and in physics generally, *Philips Technical Review* will be of particular interest. It deals mainly with the theory and application of new developments, and technical investigations undertaken by the great Philips concern.

Single copies are obtainable at 2s. each from the Publications Department, Philips Lamps, Ltd., Century House, Shaftesbury Avenue, London, W.C.2. The subscription for 12 issues is one guinea.

Local Oscillator Design

Improving Stability on the Higher Frequencies

By R. KNOWLES, B.A. (G3AAT)
Instr. Lieut., R.N.

(Obtaining absolutely stable operation of the local oscillator in a superheterodyne receiver on the HF bands is not easy. This article discusses the problem in general and suggests a practical solution which will give very good results.—Ed.)

THE main requirements for a receiver local oscillator are that it should provide the desired output voltage over the whole frequency range of the receiver and that it should be as free from frequency drift as is possible. At present, very little work has been done on the design of a constant voltage local oscillator, because mixer valves are not very critical in this respect, although the makers do give an optimum value for the oscillator voltage.

The frequency stability of the local oscillator is of the utmost importance, as the bandwidth of the receiver is limited by the IF amplifier and thus the tuning of the set is determined by the frequencies of the local oscillator and the IF. On the broadcast bands, a drift of 1 kc might be tolerable, this being 0.1 per cent. at 1 mc. At 10 mc this represents 0.01 per cent., and the permissible drift for amateur reception would be reduced to a matter of some 200 c/s, making a stability of 0.002 per cent. desirable, which is no mean requirement.

Obtaining Frequency Stability

Worst of all factors is the effect of temperature changes on the values of coil and condenser forming the frequency determining resonant circuit. All forms of varnished paper and other high loss dielectrics must be avoided, as such substances have large temperature coefficients, generally positive. Polystyrene or ceramic formers would seem to be the best available, unless a formerless construction for the coil is possible. For these, silver-plated Invar or ceramics are used. Invar is a steel with negligible temperature coefficient of expansion, but it has rather poor HF conductivity, owing to its high specific resistance and to the skin effect, so it is silvered.

This method of construction is suitable for HF coils, but not for multilayer MF coils, where the usual former and wave-winding methods must be used. A small positive temperature coefficient is usually

unavoidable and its effect can be minimised by the use of negative temperature coefficient trimmer condensers. However, at the frequencies at which such coils are used, the percentage stability required is less, as explained before.

At VHF, Invar or ceramic tuning elements are used. The word element is employed as it is hard to say exactly where the coil leaves off and the condenser begins. One thing is certain! The fact that the valve will comprise quite a bit of the capacity across the circuit. For centimetric wavelengths, the oscillatory circuit is built into the valve and takes the form of a cavity resonator, whose electrical size must not be allowed to change as the valve warms up.

In all cases, the essential thing is to build the tuning unit so that it will have as low a temperature coefficient as possible and then to prevent it from getting hot. This means that no valves or resistors dissipating appreciable power should be allowed anywhere near the tuning elements—a difficult job at VHF, where all leads must be kept short. This difficulty is usually avoided in practice by placing the coil and condenser under the chassis and the valve above.

Effects of the Valve

When the tuned circuit has been made stable, the designer's attention must then be turned to the necessity of introducing a valve to make the circuit function at all! Not only does the valve contain a source of heat, but some of its capacities depend on the potentials applied to its various electrodes. All the care taken in designing the tuned circuit will be wasted if the valve is not coupled correctly to it.

The thermal effects on the valve are complete within the first ten minutes and need not worry us unduly, though it would be better if drift during the first ten minutes could be eliminated. If the valve is able to heat up the tuned circuit, the temperature may not settle down for an hour or so and this would be much worse. Also troublesome is the variation of capacity with

condenser. In order to raise the internal impedance of the valve, an un-bypassed cathode resistor of 560 ohms was wired in. Across this resistor the necessary 10 volts peak is developed and passed to the mixer grid through a .002 μ F coupling condenser.

From the output point of view, the valve behaves as a cathode follower and has a low internal impedance (effect of negative voltage feedback). From the oscillator coil's point of view the effect of the cathode resistor is to provide negative current feedback, giving a high input and output impedance. The effect of the resistive components is lost in the grid leak, but the raised input reactance is turned to good account. A 5-50 μ F air trimmer has had to be connected across the oscillator section of the gang condenser to make up for the lowered Miller capacity of this circuit, and required to be set at about 20 μ F. This capacity is fixed once and for all and it is not likely to vary with temperature or supply voltage; it is large enough to swamp valve-to-valve variations in capacity.

The variation in output over the range is of the same order as before the changes, AOC not being applied for economy reasons. The drift is much reduced, and above all, the signal frequency trimmer

does not affect the oscillator at all. It is even possible to touch the mixer injector with a screwdriver and only cause about 100 c/s change in beat note on the highest frequency range of the receiver (11-30 mc). Varying the RF gain control (and hence the HT voltage) makes no audible difference to the pitch of the oscillator when heard on another receiver.

While all these desirable effects can be obtained by careful design of an orthodox triode oscillator, the circuit as given gets the results easily. A few more components were needed, but the pentode was there already. An EF50 or similar type would have been more suitable, but a minimum of different valve types was wanted for the modified receiver. In return for the very much increased stability of the set it is not considered to be a waste of a pentode, especially as the difference in price between a triode and pentode is so small. This circuit can not be recommended for VHF, as the heater to cathode capacity will bypass the output unless heater chokes are used, and in any case pentodes are not desirable at VHF, owing to transit time effects. A triode could be used, the feedback making the impedance appear higher than it really is, and also making oscillation harder to obtain.

TRANSMITTER BAND-CHANGING TURRET

An ingenious and what should be an extremely efficient band-changing turret for the output stage of a transmitter is now being offered the W's by an American manufacturer. The essential feature of this design is that not only are the coils for the 3.5, 7, 14 and 28 mc bands carried on the rotating turret, but *one* set of condenser vanes as well. These vanes (which can be regarded as the stator of the usual tuning condenser) mesh with the other set in such a way as to give the correct capacity for best L/C ratio and Q value for each band. This latter set of plates, the "rotor" half of the condenser, can be varied over a short capacity range for trimming purposes.

In this design, the mechanical layout is such that the RF circulating path can be made short, direct and positive, thus overcoming the weakest feature of all ordinary coil-switching arrangements.

Since only the HT and valve plate connections have to be brought into the turret, quite simple spring contacts suffice for even a high-power RF stage.



I have a friend in the shack who wants to say a few words . . .

The BC-348 Modified

Notes on Adapting a Useful Receiver for Amateur Operation

By J. HUM (G5UM)

THE compact American-made communication receiver known as the BC348, which was mass-produced during the war for the U.S. Army Air Force, is now coming on to the British disposals market in some quantities. Amateurs acquiring it may be glad to have advice upon modifying the set for their particular requirements.

The BC348 was manufactured by numerous different American companies, and each version of it is distinguished by a different suffix letter. Most of the models offered for sale in this country appear to be of the 348L, Q or R series. They differ only in minor details, and therefore the notes given below can be taken as applying to all variants.

A concise specification of the BC348 is contained in the appendix to this article. As will be seen, the receiver does not employ the most up-to-date types of valve. Nor does it cover the 28 mc or projected 21 mc amateur bands. The medium-wave broadcast range is also omitted, but the set tunes to the medium low-frequency band, and will just take in the Light Programme transmitter at Droitwich on 1,500 metres. Its band spreading is fairly good, but nothing like "full vision," mainly due to the fact that as used in aircraft applications it was required to have a wide frequency coverage as opposed to a band spread coverage. In spite of these disadvantages, however, it represents quite good value for money at the prices at which it is offered by disposals dealers.

Power Supply

As generally delivered, the BC348 will have a 28-volt dynamotor incorporated inside it at the back left-hand edge of the chassis. Unless the user wishes to operate the set from a 28-volt DC supply (most unlikely, one imagines) this dynamotor should be removed, in accordance with the following sequence of operations:

(1) Slacken off five screws holding spade terminals on a panel at the left-hand edge of the chassis, and withdraw the spades from under the screws.

(2) A long retaining bolt runs from the front panel, left-hand side, right through to

the back. This must be removed before the dynamotor can be freed. A small metal catch on the inside of the left-hand chassis support prevents the retaining bolt from being withdrawn. This must be pressed inwards. Then pull out the retaining bolt.

(3) Slacken four captive screws holding down the dynamotor. The motor unit can then be lifted bodily from the chassis.

(4) Replace retaining bolt. It will click back into position.

(5) Of the five spade connections now hanging free at the left-hand side of the chassis, cut off numbers 1, 2 and 3 and tape up the ends. Take No. 4 to an external HT negative and No. 5 to HT positive, remembering that HT negative is *not* chassis. (See Fig. 1.) A small power pack can be mounted in the space vacated by the dynamotor, if desired. Alternatively, leads may be soldered to the "HV+" and "HV-" tag ends and taken to an external power pack.

Rewiring the Heaters

The heaters in the BC348 are in series for operation from a 28-volt DC source. While they will work satisfactorily from 28 volts AC (if the user happens to have that odd value of voltage-winding available), the hum level will probably be unduly high, due to the fact that several of the heaters will be so far removed from earth from an RF point of view. For this reason and for general convenience it is

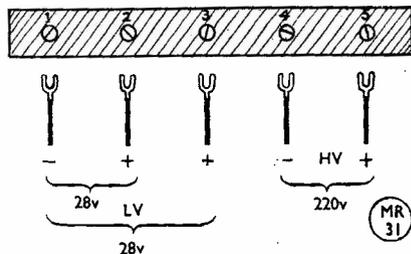
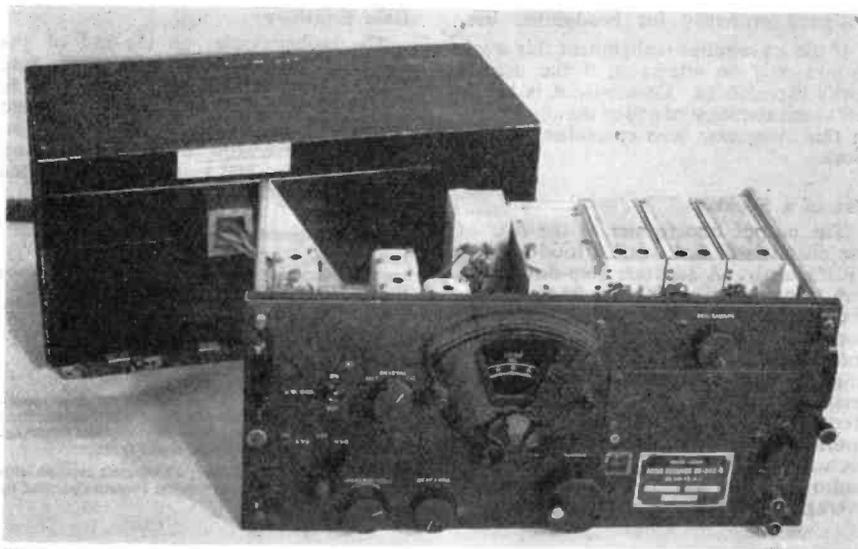


Fig. 1. The power supply tag-board as fitted to the BC-348 chassis. All spade ends should be disconnected before removing the dynamotor. The HV leads can then be taken to an external power pack. LV is obtained as shown in Fig. 2.



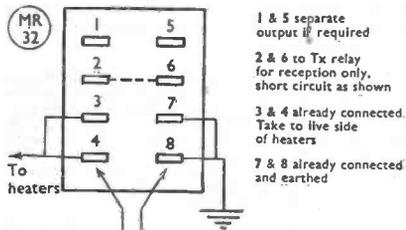
The BC-348 withdrawn from its cabinet. The space at the left rear on the chassis originally accommodates the dynamotor, leaving room for a mains power pack if desired. The inspection cover on the front panel exposes the underside of the valves in RF and FC positions.

strongly recommended that the heaters be wired for use with the more orthodox 6.3-volt AC supply. The simplest method of rewiring the heaters is to unsolder every heater connection from every valve and then rewire the lot to parallel heaters rather than attempt to utilise existing wiring. A point for use as LT outlet will be found on the 8-way plug board at the rear centre of the chassis—See Fig. 2.

The two dial lights are in series and should also be rewired across the 6.3-volt AC line. The 60-ohm dropping resistor

between them and their illumination control rheostat should be removed.

Most of the heaters are accessible from underneath the chassis. The heaters of the two RF valves and the frequency changer can only be got at by removing the plate from the front panel, right-hand side. The underside of the local oscillator cannot be reached, but fortunately one side of its heater is earthed inside its compartment. The other comes out to the top of the two tags appearing at the front on the oscillator box. Take this to the unearthed side of the 6.3-volt supply. It is marked "Black Tracer." The lower of these two tags, marked "Yellow Tracer," should not be disturbed. It feeds HT to the local oscillator.



- 1 & 5 separate output if required
- 2 & 6 to Tx relay for reception only, short circuit as shown
- 3 & 4 already connected. Take to live side of heaters
- 7 & 8 already connected and earthed

Fig. 2. Connections to the 8-way plug board at the rear of the BC-348 chassis. A 6.3 volt AC supply should be brought in as shown. Though the receiver can be muted by throwing the AVC switch to "off," HT is not cut; for this purpose a send-receive switch or relay should be wired across tags 2 and 6 above.

Other Points

It is recommended that a 200-volt power supply be used with the BC348, but that great care be exercised not to exceed this voltage to any great extent, in view of the fact that many of the components are unlikely to withstand higher voltages. The writer has successfully used a BC348 with a 150-volt pack, its consumption being 35 mA. At this voltage it will operate an external speaker comfortably, but not at any great volume; its output stage is

designed primarily for headphone use.

If the set requires realignment this work should only be attempted if the user is really experienced. Otherwise it is better left to the attention of one of the advertisers in this *Magazine* who specialise in such work.

Use of a Speaker

The output transformer at the rear of the chassis will not work a loud-speaker satisfactorily. A separate step-down output transformer of 30- or 50-to-1 ratio should therefore be installed, its input connected to the spare lug on the existing transformer and to earth; its output might usefully be taken to one of the two telephone sockets on the front panel. Remove existing wiring from it first, of course! The 6K6 output valve will, with such an output transformer, deliver more audio than is normally needed in the average radio room.

Gain Equaliser

The potentiometer on the end of the variable condenser spindle, by furnishing additional cathode biasing, is intended to maintain equal gain over the entire band covered by the condenser. This is an unnecessary provision in amateur use and valuable additional gain will be obtained if this component is shorted out.

APPENDIX

Specification of the BC-348

Valve line-up: 6K7 first RF, 6K7 second RF, 6J7 converter, 6C5 local oscillator, 6K7 first IF, 6F7 second IF and BFO, 6B8 third IF, second detector and AVC, 6K6 output, neon stabiliser RCA 991, two dial lamps.

Frequency coverage: six switchable bands—

13.5-18 mc	3.5-6.0 mc
9.5-13.5 mc	1.5-3.5 mc
6.0-9.5 mc	200-500 kc

Intermediate Frequency: 915 kc. On the four lower-frequency bands the oscillator frequency is higher than signal frequency. On the two higher frequency ranges the oscillator is below signal frequency.

Other details: Crystal filter; all controls marked with function; AVC or manual volume control operated by switch.

FIRST CLASS OPERATORS' CLUB

PRESIDENT: GERALD MARCUSE, G2NM

HON. SECRETARY: CAPT. A. M. H. FERGUS, G2ZC

With a month still to run to complete the first full year of the Club's revival, the membership now exceeds 80 on the current active list.

Marathon Contest

Members are reminded that this Contest embraces all bands, but before sending in logs they should check that no contacts claimed come within the normal Club periods, since such contacts do not count for points.

Standing Committee

A small standing committee is being elected to deal with matters of urgent importance, but in regard to general administration voting will be by the entire Club through the monthly Circular Letters, as hitherto.

Operating Standards

The question of notes in the sense of signal purity and operating procedure generally is under discussion; as confirmed by the voting, members are expected always to have a clean note, and the Club also looks with disfavour on the misuse of VFO's, bad manners on the air, and

similar crimes in the amateur calendar. Within its own membership, the F.O.C. is determined to maintain the highest standards in these matters.

The *Short Wave Magazine* Band Planning suggestions have been adopted by the Club as a purely domestic rule, as the F.O.C. feels that these proposals are at least a start in the right direction.

Election Notice

In accordance with the Rules of the First Class Operators' Club, the following have been elected to active membership of the F.O.C.:

G. A. Kingsbury, G6SS (Southsea); C. T. Bryant, G3SB (Minehead); D. H. Borden, W1BUX (Swansea, Mass., U.S.A.); J. H. Brazzill, G3WP (Brightlingsea); B. Mattsson, SM7XV (Halsingborg, Sweden); A. C. A. Newman, G2FIX (Wilton, Wilts.); H. de Laistre Banting, G3BQ (Staines); J. Turnbull, G8UK (Monkseaton); J. P. Evans, GW8WJ (Prestatyn); E. J. Lake, VK4EL (Brisbane, Australia), and J. A. Carr, GM3AXR (Stonehaven).

Applications for membership and 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.)

Twenty-Metre DX Forecast

Predictions for November

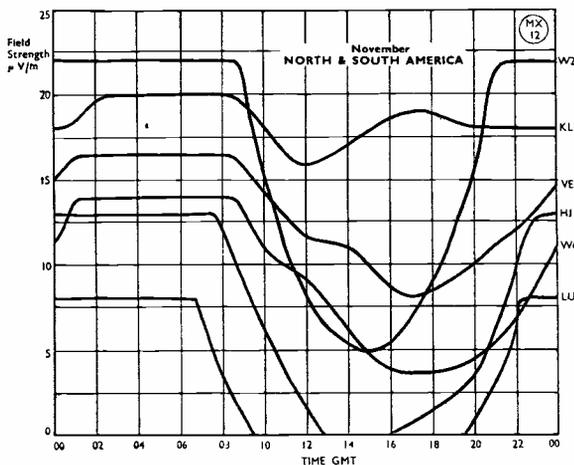
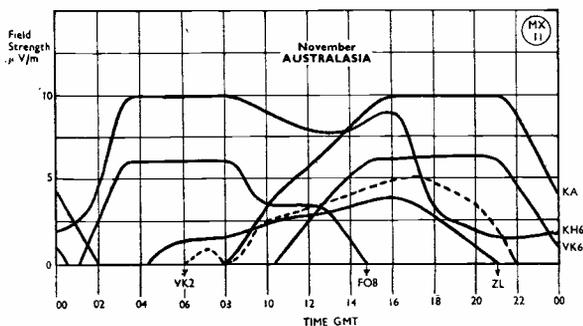
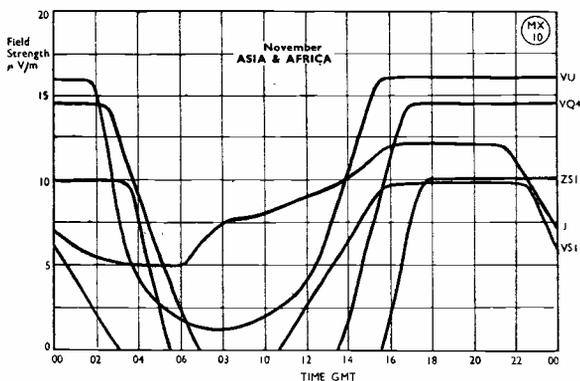
By I. D. McDERMID,
A.R.T.C. (G3ANV)

AS the winter conditions advance, so do the general conditions on the 14 mc band improve, as will be observed by an examination of the current curves.

With regard to the American graphs, some peculiarities are to be observed on the W6, KL7 and VE7 curves, but the practical significance of these changes of slope will be slight, and they are really only of academic interest. Also it will be seen that the time in the morning at which the theoretical maximum field strengths of the various American areas start to decline is about two hours later than during October. It is of interest to note that the further north the signal originates, the later does it start to decline.

Turning now to the African and Asian curves, notice that the J signal has increased in general condition such that it now gives a five-hour period of maximum theoretical field strength, as shown by the flat top to its afternoon period. Between 1200 and 1400 hours should be a good time of the day for contact with this area, since although it has not reached its peak strength, it is not overcrowded by stronger signals from other areas. VU and VS1 are also shown to be coming in a bit earlier in the afternoon. A further change in the J curve is now becoming evident in the form of an alteration of slope around 0800 hours.

The Australasian group of curves show that the morning periods for VK2 and ZL have nearly joined up with the afternoon times.



DX COMMENTARY

ON CALLS HEARD, WORKED & QSL'd

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

This month we propose to plunge straight into the "Grouse and Grievance Department" without even a preamble. We don't usually get worked up about things, but there have been times lately when we should dearly have loved to kick someone in the teeth—and the object of our affections would have been, in every case, one of those anti-social 'phone stations who *will* stay at the LF end of the band.

Yes, we know there's no law against it; neither is there any law about being rude to your mother, or eating peas with a knife, or going to bed with your shoes on. But if we are to live together on the all-too-narrow bands that we have, there must be some co-operation, just as there has to be in all other aspects of daily life.

How's this for a black record? First, 28 mc in the evening, with a KH6, a KG6 and a J9 all coming through weakly on CW; after calling one of them, no further hope because of *two* G 'phones on about 28030 kc. Next, 14 mc during the VK Contest. Lots of VK's on CW hugging the LF edge, *plus* three Italian 'phones and one G (the latter working duplex with someone on 7 mc!). Next try, 7 mc at 0700, and ZLAGA on about 7005 kc with a nice signal; but not nearly as nice as the G 'phone on 7002 working a Frenchman, or even the Frenchman working an Italian; or even the latter spluttering over about 30 kc. Finally, 3.5 mc, for a chat with the FOC boys one Wednesday evening; the whole of the LF half full of 'phones, mostly G's again, although there were a few PA's about.

One would think that there was enough room between about 28150 and 28500; or between 14100 and 14400; or between 7050 and 7300 kc for the 'phone boys. But no! there is always some Spiv-like character who says "Let's get down where it's clear; never mind these CW merchants—we don't know what they're doing anyway".

The answer to this is, of course, some sort of compulsory band-planning, but apparently no one has the nerve to try it out. The other answer would be for all the CW users to go on 'phone and mix it all over the band; perhaps then the 'phone-

merchants would realise that the popularity of CW has hitherto been making things much easier for *them*. That would be a bit hard on the newcomers who *have* to use CW; and, in any case, it would never happen. But we can foresee a shift by CW users to the HF ends of the bands, which everybody seems to be leaving alone for some uncanny reason.

Well, that's off the old chest; and maybe someone can tell us why habitual users of 'phone (*some* of them, anyway) are not content with having just 75 per cent. of the band to play with and insist on making it up to the full hundred. We wouldn't know—but then we've only been in the game for 25 years and we've still a lot to learn. (Yes, we do work CW and 'phone, but *not* on the same frequency.)

WAZ

Two points to note about the WAZ List this month: First, we have adopted the same point of view as CQ, and "let bygones be bygones." All-time figures have been dropped, because in many cases the post-war figure is the same or nearly so. So in future we require your post-war scores only. Secondly, those who have not reported for the last three months have been taken out of the list; if they wish to reappear with a new score (or even with the old one) they should drop us a post-card at the appropriate time.

It is a significant fact that the 40's, 39's and 38's alone occupy just about half of the list; it looks as though those with scores in the lower 30's are a bit ashamed of them and don't bother to send them in. Come, come! It's quite creditable to appear in the list at all—let us hear from you.

The Month's DX

All the most exciting work has still been on 14 mc—nothing will ever stop that band, it seems. 28 mc has been patchier than it was this time last year—very good on occasions, though. But, at the time of writing, the W6 and W7 parties haven't



G2VV, Hampton-on-Thames, in 1934. The Tx was TPTG, with a 68-ft. end-fed aerial, and 25 watts into a Mullard TZO5-20. The Rx was 0-V-1.

started, and are overdue; the whole of October was marvellous last year.

7 mc has attracted more customers in search of DX, and we propose to cover the doings on that band first of all.

7 mc

G5GK (Burnley), a faithful 40-metre man, has been working PY's, ZL's and "the usual W's", including a nice three-way with W2MUM and W6GAL; he's out for a 7 mc WAS! G6ZO (Totteridge) has been up there and worked PY1LQ, PY2AFS, ZL's in some quantity, W7AJS, G8XY/VO, KP4EX and SM8BD (Swedish aircraft over Jerusalem).

G5DQ (Cambridge) has worked, among the more usual stuff, VE7VC, VE8NX, SU1CN and OY7NL. G8KS (Manchester) has had a report from Eric Trebilcock in Tasmania (579 sigs while working Norway!); GM5YW (Edinburgh) has collected nearly all the Russian districts plus CN8, ZD4, OH and some W's, using a T.1154/R.1155 combination on 7048 kc, crystal-controlled. GC3GS (Jersey) has been very active on the band

again, and tells an amusing story about G2FX, who, more or less unwittingly, found himself working *four* GC stations all in one QSO! For all the other G's who would be glad of just *one* GC contact, GC3GS will be on the look-out during the coming season.

14 Mc

New ones have been cropping up all over the place, to the immense joy of the country-chasing fraternity (we got an HE ourselves this morning!) G2PL (Wallington) has unearthed UA1KEC (Franz Josef Land), VU2RW (Pakistan), and what he calls "bread and butter stuff" such as HS, TA, VP8, CR4, C9 and all that. He says a well-known W6 told him that the competition over there is such that our little bit of friendly rivalry over here is a Sunday-school treat! We won't tell you what some of those W6 Spiv-types get up to—might give someone ideas.

G3TK (Leigh), whose name is Ron Wood, worked ZS6DZ and found he can't be Ron Wood; he suggests that this can't happen very often! TK collected VP8AI, VP8AD, FM8AD, KZ5BA,

ZONES WORKED LISTING

Station	Zones	Countries
'Phone and CW		
G6ZO	40	180
G2PL	40	177
G5DQ	40	157
G6QB	40	147
G2WW	40	144
G2AJ	40	142
G5VU	40	124
G3DO	39	139
G3FJ	39	136
D2KW	39	131
G2VD	39	130
G5RV	39	126
G3AAK	39	122
G5WM	39	120
G8RL	39	120
G3AAM	39	115
G3QD	39	114
G3TK	39	114
G8IL	38	131
G6LX	38	126
G5CI	38	115
ON4JW	38	115
G6PJ	38	72
G4AR	37	108
G4CP	37	103
G2CNN	36	114
G2AKQ	36	104
G2AO	36	100
G8IP	36	97
G3AAE	36	90
G5LP	35	96
G5MR	35	92
G2AVP	35	89
G8RC	35	78
G3BDQ	35	74
GW4CX	34	84
J4AAK	34	66
G8KU	33	91
G8VR	33	90
G2LC	33	85
GM2AAT	33	71
G6XX	31	83
G5OQ	31	78
G6BB	31	71
G2HFC	30	81
G2VV	30	74
G5HH	30	67
G3AGN	30	63
'Phone only		
G6LX	37	124
G3DO	37	111
G2PL	36	122
G6BW	36	115
G6WX	36	105
G3FJ	35	112
GM2UU	35	102
G8QX	33	100

XZ2HP and plenty more, but is still gunning for Zone 23. G5WC (London, S.E.19) has also collected a lot of new ones, but modestly goes off to talk about some other stations he has visited. He says that there are many DX workers up and down the country whose calls never appear in any honour rolls, but who knock the stuff off like nobody's business. He visited one shack and worked a KG6, a KH6 and VR6AA in quick succession.

G6ZO's 14 mc bag for the month includes W3LYK/Antarctica (Ronne Expedition at Stonnington Island), UA1KEC (Franz Josef Land), VS9SO (Ship at Socotra) and an imposing list of C's, J's and other Asiatic and Oceanic DX. From 7 mc he added UF6 to his grand total.

G3CNM (Cheadle Hulme) apostrophise for not having worked 30 Zones yet, but adds that he has only been licensed for a week! He is already running a daily schedule with VE1BV, however, and has also collected EPIAL and other DX. He would appreciate SWL reports from anywhere over 8,000 miles.

G6XX (Goole) says that VS6BA wants contacts in the Chatham or Rochester area. 'XX has been working VS1CE, VS1BA, CIDK and other good stuff, in spite of Italian 'phones on his crystal frequency. G3AAK/A (Crowborough) has raised AR8AB, TA3SO, CR7AD, LU1ZA and I1AHC (all new ones for him) from his temporary QTH, but doesn't find it works like his permanent home at Broad Hinton.

G8QX (Malvern) has reached his century on 'phone, mostly, however, on 28 mc. But on 14 he has been enjoying himself with W6's in the evenings, the long way round. Owing to the Malvern Mills he can't get there the proper way! And TI2OA, long way round, one afternoon, seems to us like a good bit of DX. Until TI2OA swung his beam over the Pacific he was inaudible at G8QX.

G2WW (Penzance) has not had a really exciting month, although he raised VS4VR LU1ZA, ZK1AB, ZP6AP and sundry KL7's and KH6's. He also added to his WAS total with Arkansas, New Mexico and West Virginia.

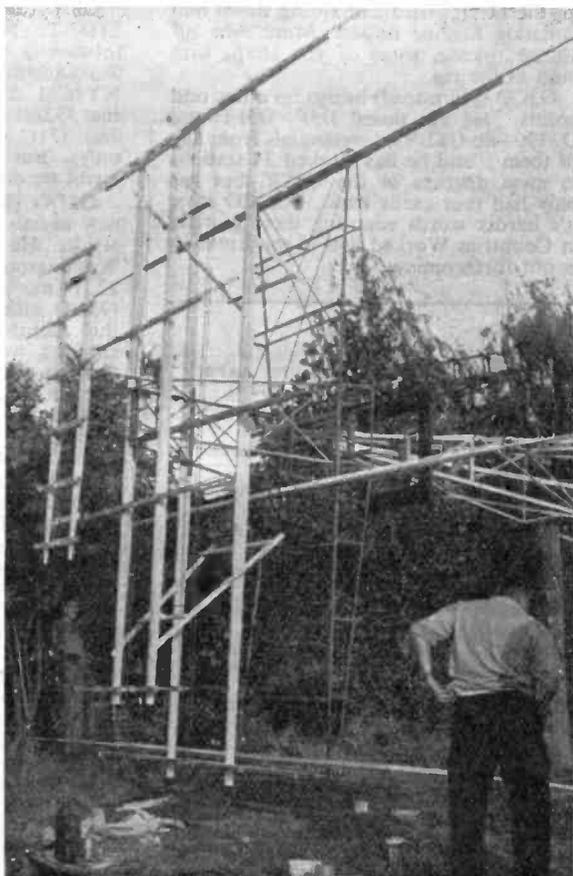
G2AKQ (Ringwood), reporting for the first time, has just completed twelve months on the air, and with his 25 watts has collected 36Z, 104C and 46 States, which sounds pretty good to us. He recommends a half-wave vertical, Zepp-fed, with the base at ground level, for those whose surroundings are sufficiently open. G2AVP (Stradishall) was pleasantly surprised to find his score was 35Z

and 89C, although he imagined the Zone score to be in the lower twenties. He does a bit of listening while airborne in Lancasters at 15,000 or 20,000 feet; he says the DX under these conditions is much stronger than any locals, and gives him itchy fingers.

G3FJ (Slough) now has his "century" confirmed, and also WAS—both post-war with an 807 and 25 watts! An excellent performance. Recent additions are J8ACS, W2WMV/C9, VS6AC and VP5FR, all on 28 mc. G2AJ (Hendon) send a nice list of DX, including C8KY (Zone 23) worked on 28 mc 'phone. First offering from G3AAM (Birmingham) also includes some good stuff, and he jumps right into the 39 class. 'AAM uses key only, with 150 watts but his first 89 countries were achieved on the DX stations' tactics and the way "spivving" is encouraged; bearing in mind the note from G8XY/VO last month (no calls within 5 kc of his frequency) 'AAM was surprised to hear the said station go back to a W who was dead on him. Ah, well, it only goes to show...

Safety-Valve Department

One of the nicest "rude" letters received for a long time comes from GM2AAT (Edinburgh), who has several things to get off his chest. High spot—"... some of the yooeping, clucking quasi-DC heard even from CC stations; yes, there are just as many clots hiding their incapacibilities behind a crystal..." But 'AAT's real theme is that stations with home-built receivers should still have an honourable mention, because a really good one which "scoops into the noise" is an infinitely knottier problem than the production of a few watts of RF. He loses patience with



Not a disaster, nor yet a radar aerial array, but the top of VK3KU's composite rotary beam for 14, 28, 50 and 166 mc, lowered for inspection.

the reverent hush that descends upon an assembly when the mystic symbols "HRO" or "AR88" are mentioned, and says "Give me a small acreage of aluminium and a handful of EF50's—but, of course, it would cut into my operating time. Sick and tired of hearing that lame-brained excuse, that hackneyed pænan to mediocrity, 'I haven't time.'" He doesn't actually say "Pah!" at the end of it, but you can feel it there.

We know what 'AAT is getting at, all right. Some of the ropey transmissions we have heard could be cured if the owners would spend one hour an evening clearing

up the mess, instead of sitting down and radiating horrific noises. More time *off the air*, please, some of you chaps with bugs in the rig.

G3CO (Plumstead) brings up a few odd points. He has raised D5F, D5FF and D3TX—no QSL's or credentials from any of them; and he has worked 34 stations in most districts of the USSR, but has only had four cards back. *As 'CO says, it's hardly worth counting these prefixes in Countries Worked lists if confirmation is not forthcoming.

DX QTH'S

HZ1AB	161 AACs Sqn., 791 AAFBU, APO 616, c/o PM, N.Y.C.
I6ZJ	G. R. Chiffey, Government Press, BMA, Eritrea, MELF 5.
J8AAM	AP0 235, c/o PM, San Francisco, Calif.
J8ACS	AACS, APO 712, c/o PM, San Francisco.
J9AAW	125 Signal Service Coy., APO 331, c/o PM, San Francisco.
J9ABX	W. C. Baxter, APO 331-3, c/o PM, San Francisco.
MD1B	HQ Royal Signals, Benghazi, MELF 6.
SHF1X	Prof. Hans Pettersen, Research Laboratory of Electronics Gothenburg, Sweden.
TF3EA	Box 108W, Reykjavik, Iceland.
VP4TAD	AP0 857, c/o PM, Miami, Fla.
VP6LN	Box 133, Barbados, B.W.I.
VO4REW	R. E. Woolfall, Box 581, Nairobi, Kenya.
VR3A	R. Garrett, Washington Island, via Fanning Island, Central Pacific.
VS1CE	G. R. A. Wright, PO Box 434, Singapore.
VS1CH	Petty Officers' Mess, R. N. Wireless Station, Krangi, Singapore.
VS6AC	367 Signals Unit, RAF, Hong Kong.
VS7GM } VS7IT }	Royal Naval Air Station, Trincomalee, Ceylon.
VU2EC	Northern Command Signals, Rawalpindi, Pakistan.
VU7AB	Box 370, Oil Coy., Bahrein Island, Persian Gulf.
XAMC	Signal Service Coy., APO 209, US Army, Trieste.
YV3AL	Box 18, Barquisimeto, Venezuela.
ZC6DZ	Capt. P. G. Keller, "B" Mess, HQ No. 1 Inf. Div., British Forces in Palestine.
ZD4AL	West Africa Signal Regt., Accra, Gold Coast.
ZS2AT	Rev. A. B. Trewin, Standard Bank of S.A., East London, Cape, South Africa.

G8IL (Salisbury) adds to his list with FQ3AT, AR10M, TA1AO, VP6CDI (obviously our old friend the Wizard of Stokenchurch is on the air!), FL1AB, NY4CM and VP5FR. He tells us, too, that G2ZB of Boscombe has worked 37Z and 131C on 'phone (125C on 28 mc only). But as we haven't heard from 'ZB direct we don't put him on the list yet.

G3DO (Sutton Coldfield) has got his new aerials going and is delighted with results. He claims the first G contact with Washington Island (VR3A), on September 27, 14 mc 'phone. VR3A's QTH, sent by G3DO with many other useful ones, is in this month's list. GM2UU (Stranraer) suggests we might print a list of DX stations that do *not* QSL—the rats! He has put up a new rhombic, but the wires pass over some houses with a clearance of only two feet; reports have been good so far and his totals are mounting nicely.

G3BI (Seer Green, Bucks) reports for the first time with a good DX log and some useful QTH's; but he quotes ZD3B as Christmas Island, and we feel we ought to mention that ZD3B's card (on our wall here) comes from Bathurst, Gambia!

G3AJV (Bradford) has worked M1A in San Marino, and says he seems to be genuine—HF end of 14 mc on 'phone. G3ANY (Chingford) is off to Toronto, and hopes to be on the air as a VE before very long. He sends 73 to all his G friends.

G6TC (Wolverhampton) is in a new QTH, running 50 watts and crystal control, and has managed to raise some nice pieces such as CR4BQ, KV4AA, UI8AB, and all the routine DX. He wants reports from outside Europe on his 7 mc transmissions.

G2NH (New Malden) explains that he gave ex-G2YD's call incorrectly last month—Bob Wright is now VS1CE, *not* VS1AC as stated and listed last month. 'NH works a sked with him on 14 mc.

28 mc 'Phone News

G6BW (Churchill, Som.), always a 28 mc 'phone stalwart, has given himself a new thrill by working WIHKK while the latter was driving round the streets of Boston, Mass. And 'BW collected an R5, S9 report from him! WIHKK was using 60 watts, with only a whip aerial on the car, and put up a fine performance. Other DX at G6BW includes AR8AB, VU7AB, ZD4AB, KH6FD, KH6GQ, plus loads of less rare stations—all 28 mc 'phone.

G6LX (Croydon) has put himself at the head of the 'phone WAZ list with the tidy

score of 37Z, 124C, all on 28 mc. He quotes a recent night when he heard KP6, J9 (Pago-Pago), J9 (Kerguelen), J9 (Marshalls), KM6, VR2, KH6, KL7, all coming in from the north and apparently unconscious that they were reaching Europe, as they were all working W6 and W7.

We hear a curious story about Pitcairn, to the effect that Andrew Young, the former VR6AY, cannot now get himself a licence and is not allowed to talk over VR6AA, which is "a Government rig." We don't quite know all the details, but it would seem that unhappily there is some discord over it; we'd like to hear VR6AY on the air again. VR6AA is on 28 mc 'phone regularly nowadays.

Shorts

G3YY (Sheffield) is back at his old QTH, after being in various hospitals for three years; he has knocked off some good DX with an indoor aerial, but expects to "get outside" soon. G3IS (Rugby) has worked PX1C (Andorra) on 7 mc, and hopes he's genuine. G2HKU (Sheerness) has been ill but is back on, and has gone "QRO" with 30 watts to a pair of 807's. G2AO (Malvern) has scored his century, and has cards from EPIAL and UAØKQA (wish we had!) G4QK (Croydon) has worked VE's on 3.5 mc and heard plenty of W's, without being able to call them as yet. And he heard G6ZO calling VK2ADE, which made him stop and think

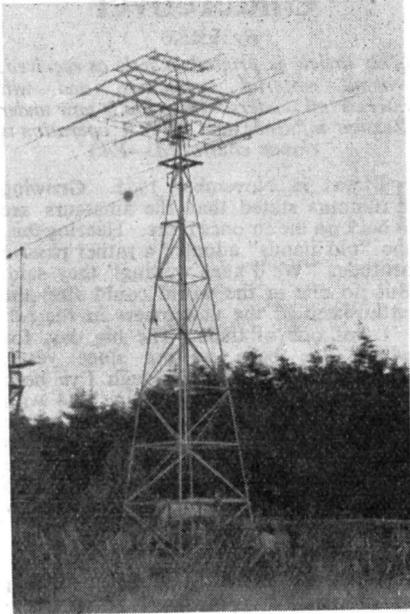
News from Overseas

R. W. A. McKichan of Hong-Kong asks us to modify our statement that only those calls beginning with VS6A are genuine; they have now got into the VS6B series. Several pirates have been rounded up, though. They were mostly not interested in Amateur Radio, but concerned in the exchange racket with China!

ZS2AT (East London) is ex-G2AT, and, earlier still, ex-VQ5NTB. He hopes to be working G's before long. MD2C (Castel Benito) has only been on the air three weeks, but had 150 QSO's during that time, all on 'phone with 22 watts.

J9ABX (Okinawa) tells us that they now have a club called the "J9-ers". He is President, J9AGT Vice, and J9AAO Secretary. There are some 35 members, and all have agreed "not to use more power than necessary," and to work *above* 28500 kc in the evenings. They will all be glad of reports from G.

G3AXU (ex-XADZ) is abroad again,



VK3KU's beam system in position. It weighs four tons and the mast itself is insulated from ground, enabling the whole assembly to be operated as a capacity loaded quarter-wave vertical aerial for 7 mc!

this time with the call ZC6DZ. (He was also MD5DZ for a while!) They are trying to organise a Divisional Amateur Radio Club in Palestine, and any reader interested, either Army or RAF, should get in touch with ZC6DZ at the QTH in the list. He finds things difficult compared with Italy, where he had a well-equipped workshop; his present billet is a tent!

ON4JW (Brussels) sends in a new WAZ claim, which upholds the honour of the ON's; he hasn't yet collected the promised figures from ON4AU, which are expected to be startling when they do arrive.

And that concludes the oration for this month. Next month's mail is wanted by November 15, first post; please put your WAZ claims on a post-card—just the final figures and the additions since the last claim, as this saves much clerical work this end. Remember the 1948 Marathon, although you can't do anything about that yet! And keep that 'phone off the LF end, if it's yours. 73 and BCNU on December 3.

Undercover

By YR5X

(This article is printed exactly as received, without editorial correction, and will interest all readers. Rumania is now under Russian influence and all YR operation is closely controlled.—Ed.)

IT was in November 1945. Growing rumours stated that the amateurs are back on the air once more. Hearing this, the "old hands" adopted a rather passive attitude. "We'll keep waiting" they said. But no one in the world could stop the enthusiasm of the newcomers in the art.

I was one of them. The big day, for which I've been waiting since years, seemed to approach. Though I've been having a small transmitter in 1944 with which I transmitted . . . recorded music on . . . 27 meters crystal controlled (it was the only crystal I had), I never had a chance to work with fellow amateurs before so that my excitement was increasing and my curiosity had no limits.

First Steps

On the 15th of the same month I built up a little ECO-controlled 6L6-807 fifty-wattter sincerely hoping it will work. It did. A small neon bulb touched to the output terminals was glowing gaily. I became impatient. But then a second problem occurred. I had no receiver. It was done in one hour by constructing a useful 0-V-0. That was on the 19th. I memorised the code during the same night, practiced it the next day and on the 21 of November X Q 4 B B, the first post-war Rumanian station was pounding out his first timid CQ call. A prompt answer came from SU6ZY in Cairo. Apologising for my poor code knowledge I gave him his report, got mine and signed off in a hurry to avoid further complications. I will never forget that day.

I kept on working on 14 mc, but soon I discovered that most of the stations using that band were phoneys (so was I). I decided to QSY on 28 mc a few days before Christmas. Managed to work EI2M, about my first G station, and a couple of locals which, by that time, came on too. But I found conditions to be rather bad, so I closed down till the end of February 1946. I came back with a brand new gear including a good American bug. The transmitter was composed of a 6SK7 ECO, 6V6 doubler, 6L6 doubler, 807 final, 2A3 keying tube and a 6C5 audio oscillator. Still low-powered but a good quality signal that time. My code proficiency also

improved rapidly and finally I was able to send and receive about 35 w.p.m. A 9-tube superhet replaced the 0-V-0, PR1AA replaced XQ4BB. A new era began.

Not having any troubles with the authorities gave me more courage, so I thought I might take a chance and work 'phone also. As I didn't have a microphone I tried to use a dynamic loudspeaker instead of it. It worked. My first contact was HB9DO in Lucerne. We started the QSO on CW. Then I went over on 'phone, but soon I signed off with the words: "Sorry OM, this is my first voice contact and I don't know what . . . to tell you. QRX for CW . . ." The next 'phone QSO found me prepared and today I am one of the most phanatic rag chewers.

That "PR1AA" Call!

During March and April, "Peter Roger One Able American in the Balkans" was so much called by the South Americans on 20 meters, that I made up my mind and decided to use the regular YR call. YR5X was chosen and YR5USA was used occasionally when working "portable" from the Signal Corps of the U.S. Army where I was employed.

HB9AG in Zurich, Switzerland, was my kind QSL Manager during this first period. I was receiving hundreds and hundreds of cards from every corner of the globe. I never thought however to send . . . replies. The result was that I never had the courage to contact a station twice, as I knew he'll ask me: "Where is your promised card, OM?" So it became a "must" for me to print confirmation cards and that is what I did. As soon as I had them ready, I sent along—in my enthusiasm—more than 700 QSLs during the first week.

A little while after I jumped over to 40- and 80-meters working both 'phone and CW. Generally speaking, I had no troubles at all contacting DX stations due to the fact that YR's were extremely scarce. And that—only that—explains why today I am proudly holding cards from 94 countries, 39 zones and 45 American States. I never worked with more than 40 to 50 watts input power to the 807 which proved to be an excellent tube, and I never used another sky-wire than the popular single wire fed Hertz.

Arrest QRM!

Following the arresting of YR5V (prewar YR5VV) I had to bring my transmissions to an end on April 6, 1947. I had to do it. So that YR5X is now closed down "for the duration" but he is still hoping for better days. . .

Here and There

"Pulsed MCW Transmission"

This article, appearing in our October issue, has aroused a good deal of interest in the VHF world, as it suggests what is a new principle of transmission in the field of Amateur Radio. Following discussions with the Engineer-in-Chief's Department, it must be pointed out that in fact such a system is not at present permissible in this country, as pulse transmission in any form is still forbidden under the terms of the licence. At the request of the G.P.O., we are glad to make this quite clear.

The D.A.R.C.

Further to the note in this space last month, we are now informed that the Deutscher Amateur Radio Club is only permitted in the British Zone of Germany, under the title D.A.R.C./BZ. The Americans have allowed the formation of three local groups in their Zone, and it is hoped eventually to unite them all under the leadership of the D.A.R.C. No Club activity has so far been possible in the French and Russian Zones, and no German nationals are yet licensed to transmit. The only activity open to them is as SWL's and, therefore, they particularly value QSL's for their reports.

Back Number Note

A few copies of the February, March, April, May, August, September and October (all 1947 only) issues of the *Short Wave Magazine* have now come to hand and are available at 1s. 8d. each. Copies of the December, January and onwards from March 1947 issues of the *Short Wave Listener* can also be obtained from us at 1s. 4d. The "Principles of Short Wave Reception," a 32-page booklet, is still available at 1s. 8d., as is the Great Circle Zone Map, price 3s. 9d.

All prices are post free. Write the Circulation Manager, Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1.

MCC—Club Contest

At the moment of writing, a total of 22 Clubs have entered stations for the *Short Wave Magazine* second annual 1.7 mc Club Transmitting Contest, and it is probable that a few more will roll in before the closing date, November 14.

Those entries already received are given in "Month with the Clubs" in this issue. The Contest runs for the period November 15 to 23, and the co-operation of all 1.7 mc operators will be welcomed in helping to make it the success it was last year.

Crystal Exchange

This is a free service to all readers wishing only to *exchange* crystals. Buy-or-sell notices cannot be accepted for this space, and all negotiations should be conducted direct. Notices should be set out in the form given below, headed "Crystal Exchange—Free Insertion."

G3CCJ, 3 St. Matthews Avenue, Surbiton, Surrey.
Has 3550, 3570 and 7172 kc crystals. Wants frequencies between 7005 and 7065 kc.

G3CIM, 35 Melford Avenue, Barking, Essex.
Has 7185 kc crystal, mounted. Wants frequency just below 1900 kc.

The Call Book

The publishers of the Radio Amateur Call Book, 608 South Dearborn Street, Chicago, 5, Illinois, U.S.A., ask us to request that G's whose callsigns were in pre-war issues but have not appeared since should notify the Call Book *direct* of their present address. The existing G lists are still some 2,000 entries behind, mainly on pre-war calls. For the reason of space, our own "New QTH" feature can only cover post-war licence issues or current changes of address. All QTH's we publish are passed on to the Call Book.

Amateur Radio Exhibition

An exhibition of strictly Amateur Radio interest, under the auspices of the Radio Society of Great Britain, is to be held at the Royal Hotel, Woburn Place, London, W.C.1, during the period November 19-22 inclusive. Some 20 firms directly concerned with Amateur Radio have taken stands, and an interesting show is assured.

Admission will be by catalogue only, price 1s., at the door, or 1s. 3d. post free of the Secretary, RSGB, New Ruskin House, Little Russell Street, London, W.C.1.

Address, Please!

Will D. J. Perrett please let us have his address, so that we can deal with his enquiry dated October 15.

NEW QTH's

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

G2AHC	R. W. Bishop, 9 Cranbourne Road, Northwood, Middx.	G3BCM	c/o H. Flintham, 50 Burton Avenue, Balby, Doncaster, Yorks.
G2AOA	J. Melling, 158 Ribbleson Avenue, Preston, Lancs.	G3BHS	F. A. Russell, 11 Chestnut Avenue, Eastleigh, Hants.
G2AQN	28 Woodbine Street, Ossett, Yorks.	G3BI	G. H. Williams, Burtley Cottage, Seer Green, Bucks.
G2BHM	H. M. Blaber, 9 Stanton Road, West Wimbledon, London, S.W.20.	G3BKV	25 East Street, Weymouth, Dorset.
G2BRR	R. G. Rugg, 10 Hillcrest Road, South Woodford, London, E.18.	G3BLP	G. W. J. Haydon, 52 Littleheath Road, Selsdon, Surrey.
G2CHI	W. G. Bailey, 80 Cavendish Avenue, Harrow, Middx.	G3BND	c/o N. H. Brown, 63 Corporation Road, Audenshaw, Manchester.
G2CKN	R. J. Jackson, Ringfield Hse, Hurworth-on-Tees, near Darlington, Co. Durham.	G3BQF	J. S. Froude, 8 Burkes Parade, Beaconsfield, Bucks.
G2CMK	C. W. Kemp, Byways, Heigham Grove, Norwich.	G3BSC	B. G. Dodd, 5 Smitham Bottom Lane, Purley, Surrey. (Tel.: Uplands 7565.)
G2CMK/A	C. W. Kemp, 67 Greenbay Road, Charlton, London, S.E.7.	G3BSR	M. W. Pearce, ERA's Mess, HMS <i>Mull of Kintyre</i> , GPO Rothesay, Bute.
G2COU	C. Page, 50 Blenheim Crescent, Luton, Beds.	G3BUU	W. D. Chester, 43 Southbourne Road, Fordhouses, Wolverhampton.
G2DHV/A	G. V. Haylock, 63 Lewisham Hill, London, S.E.13. (Station at Evesham.)	G3BVD	60 Henshall Road, West Bollington, Macclesfield.
G2DLJ	W. R. Chaffe, 147 Peartree Road, Derby.	G3BVI	Kilsby, Rugby, Warks.
G2DYM	R. B. Holman, 118 Fore Street, Kingsbridge, South Devon.	G3BVL	W. R. Bradford, Mudford Sock, Yeovil, Somerset.
GW2FGJ	S. Lloyd, 71 Pant-y-celyn Road, Town Hill, Swansea.	G3BXC	J. V. Ashworth (ex-XABK), 4 Shayfield Drive, Benchill, Manchester. (Tel.: Wythenshawe 3009.)
G2FIS	F. Jowett, 21 Eldon Street, Heckmondwike, Yorks.	G3BXX	L. E. W. Johnson, 55 King Harold Road, Colchester, Essex. (Tel.: Colchester 3043.)
G2HBJ	D. Stott, 2 Percy Street, Rochdale, Lancs.	G3CAV	D. R. Watton, 452 Redditch Road, Kings Norton, Birmingham 30.
G2SO	M. Geddes, The Chalet, Woodside, Leigh-on-Sea, Essex.	G3CBI	K. Watts, 17 Grosvenor Road, Shaftesbury, Dorset.
G3ADK	S. W. Holland, Southview, Kingsdown Avenue, Luton, Beds.	G3CBJ	Palace Electrical Co. Ltd., 32 Chiltern Street, London, W.1. (Tel.: WELbeck 4667 and 6084.)
G3ADS	R. Sawkins, Barr Cottage, Runfold, Farnham, Surrey.	G3CDA	M. R. Everett, 138 Braunstone Lane, Leicester.
G3ADZ	D. W. J. Haylock, 230 Devonshire Ave., Southsea, Hants. (Tel.: Portsmouth 33288.)	G3CED	G. A. Partridge, 17 Ethel Road, Broadstairs, Kent.
GW3AGB	W. Evans, Gurnos Stores, Lower Cwmtwrch, Swansea.	G3CEL	G. Stafford, 29 Sandringham Road, Hyde, Cheshire.
G3AGG	J. Ailmore, 9 Ormond Street, Aldecar, Langley Mill, Notts.	GW3CGN	R. R. Williams, 28 Farrar Road, Bangor, North Wales.
G3AHB	L. G. Coote, 19 Burlington Avenue, Slough, Bucks.	G3CJI	R. B. Miller, 84 Mayfair Avenue, Bexleyheath, Kent.
G3ALF	R. J. S. Scotto, Ombersley, Barming Woods, Maidstone, Kent.	G3CJQ	Capt. W. J. P. Hayes, 129 Altmore Avenue, London, E.6. (Correction.)
G3AST	J. A. Plowman, 140 Wardown Crescent, Luton, Beds.	G3CKX	S/L S. F. Sharpe, 64 Windsor Avenue, Hillingdon, Middx.
G3AUR	W/O Bradbury, Sgts' Mess, RAF Benson, near Oxford.	GM3CMB	A. D. Stears, 106 Saughtonhall Drive, Edinburgh 12. (Tel.: Edinburgh 62427.)
G3AXX	F. Dawkins, 295 Margate Road, Ramsgate, Kent.	G3CMĀ	J. F. E. Lynes, 8 Curzon Road, Weybridge, Surrey.
GM3AXR	J. A. Carr, URAS, Stonehaven, Scotland.	G3CMN	J. C. Sargent, 3 St. Helens Down, Hastings, Sussex.
G3AZ	J. Hunter, 67 Victoria Avenue, Collier Row, Romford.	G3CMY	R. W. Rowsell, 62 Clifton Road, Weston-super-Mare, Som.
G3BBK	J. N. Orrin, 4 Silvertown Road, Aigburth, Liverpool 17.		
G3BBZ	S. P. Turner, 26 Wordsworth Walk, Golders Green, London, N.W.11.		

G3CNM	F. Armstrong, 13 Wyngate Road, Cheadle Hulme, Stockport, Ches.	G4DP	W/O Dickinson, Sgts' Mess, RAF Scampton, Lincs.
G3CNU	E. B. Davis, 66 High Street, Broadstairs, Kent.	G4DY	L. Berryman, 35 Hampton Road, Falsgrave, Scarborough, Yorks.
G3COJ	A. H. B. Bower, 18 Alderidge Avenue, Hull. (Tel.: Central 10555.)	G4LU	S. F. Brown, Avalon, Pant, Oswestry, Salop.
G3CPH	F. Hatt, 13 Trammere Road, Edmonton, London, E.9.	G4QG	A. R. Street, High View, Upperton, Petworth, Sussex.
G3CPI	G. P. Marley, Newlyn, 6 Kirkstone Gardens, High Heaton, Newcastle-on-Tyne 7.	G5PS	J. E. Catt, Balgownie, Hempstead Road, Kings Langley, Herts.
G3CPK	I. G. Gibbs, Denefield, Heather Way, Woodcock Hill, Felbridge, East Grinstead, Sussex.	G5QK	Southend Radio Society: Hon. Sec. K. Crispin, 27 Thurstone Avenue, Southend-on-Sea, Essex. (Correction.)
G3CPV	E. P. H. Woodroffe, 296 Cooden Drive, Bexhill-on-Sea, Sussex.	G6PZ	R. Weston, 72 Flowerdown Avenue, RAF Camp, Cranwell, Lincs.
G3CWW	A. W. W. Timme (ex-VU2CW), 11 Cheyne Walk, Hendon Central, London, N.W.4. (Tel.: HENDon 1497.)	G6SB	L. W. Robbins, 12 Leighton Avenue, Pinner, Middx.
G3DM	E. C. McLoughlin, 36 Springwell Road, Liverpool 20.	G6SI	J. E. Simmonds, 12 Royal Albert Bldgs., Cartwright Street, London, E.1.
G3NR	A. W. Birt, 6 Hempstead Road, Kings Langley, Herts.	G8LT	R. W. Addle, Heatherland, Maybury, Woking, Surrey.
G3QF	Rev. E. Geddes, Rackheath Rectory, Norwich, Norfolk.	G8PF	H. E. Bennett (ex-VU2PF, VS1BP, VS7PF), 10 Martin Grove, Morden, Surrey.
G3QI	R. Bean, 6 Victoria Street, Wetherby, Yorks.	G8PF/A	H. E. Bennett, RAF Medmenham, near Marlow, Bucks.
G4BI	L. J. Philpott, Chapman Street, Loughborough, Leics.	G8WO	W. C. Pond, 458 Green Lane, New Eltham, London, S.E.9.

NOTE ON SOLDERING

The manufacturers of Ersin Multicore have recently issued a brochure containing technical details, which will be of particular interest to the service-man, of the melting points and recommended bit temperatures for the more popular alloys; a table showing the length in feet per lb. for each gauge of soldering alloy, and metric and inch tables for SWG sizes. With this brochure, which also describes soldering processes in various trades, goes a sample card with test lengths of Ersin Multicore solder.

The brochure and card are available on application to Messrs. Multicore Solders, Ltd., Mellier House, 23 Albemarle Street, London, W.1.

AMATEUR NARROW-BAND FREQUENCY MODULATION

The two great advantages of NBFM are the reduction or elimination of interference to BCL's—the curse of many amateurs in crowded areas—and very simple modulating equipment; a secondary advantage is that the process of receiving FM considerably reduces receiver noise.

The main disadvantages are that an FM transmission takes up more room than an AM signal (undesirable on our already overcrowded bands), requires special (but quite simple) receiver arrangements for proper reception of the signal, and if extensively adopted by amateurs will introduce a serious selectivity problem where transmitter frequencies are used at random, as on our bands.

There are at least 15 amateurs in this country known to us to be working with FM, mainly on 58 mc. Their transmissions, while being extremely pleasant to listen to, illustrate the selectivity and interference problems touched upon above.

NEW HEADPHONE DESIGN

The American Telex Co. has produced a new type of headset which looks like a doctor's stethoscope and is worn in exactly the same way—under the chin instead of over the head. Weighing just over 1 oz. only and incorporating its own volume control, the Telex Monoset is claimed to be a great advance in headphone design.

FIVE METRES

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

BEFORE proceeding with all the exciting news which has come in this month, your new commentator would like to express his personal thanks to his predecessor, A. J. Devon, who, both pre-war and post-war, has conducted this department of the *Short Wave Magazine* with such success, and who has been largely responsible for the interest and resultant activity which has made the many post-war VHF records and achievements possible.

The policy of "Five Metres" will remain unchanged, and as ever its primary objective will be the development of interest in VHF operation and technique, with as wide and as an impartial a survey as possible of VHF activity and opinions.

Early this month we wondered whether there would be anything to write about. With the disappearance of spor-E DX, and the opening of the season on 28 mc, activity on five metres dropped abruptly. But since then events have occurred on 50 mc exceeding anything for which the most optimistic of us could have dared to hope. Even though the MUF was expected to exceed 50 mc in some directions, its consistency, day by day, has been quite remarkable.

The First Break

By early October, reports were coming in that ZS1P and others in South Africa were receiving the afternoon transmissions from Alexandra Palace with fair regularity. Then, on October 4, came the first of a series of exciting contacts, when, from 1405 to 1434 GMT G5BY and ZS1P worked CW and 'phone on a crossband contact, G5BY on 28 mc and the ZS on 50 mc. CW signals from ZS1P were RST 579 and 'phone S4. Earlier in the day conditions had not been so good, for both G6DH and G6XM (who had listened earlier) switched off under the impression that nothing would happen that day.

The first Europe-South African two-way on 50 mc was made a week later by PAØUN and ZS1T at about 1200 GMT. A contact with ZS1P followed.

On October 14, VQ2PL and ZS1P heard

MUF Goes High—

*G5BY/ZS1P Make First
50 mc Cross-Band—*

*Many 50/28 mc DX
Contacts—*

Further DX Expected

MD5KW on 50 mc, and on the 15th VQ2PL and MD5KW had a 28/50 mc crossband contact.

The following day G5BY and ZS1P repeated their first crossband QSO, and VQ2PL and ZS1P worked MD5KW (the latter contact 2-way on 50 mc). G6DH heard nothing of MD5KW, who was beaming on G most of morning.

On the 17th, PAØUN and ZSIT had their second two-way. ZS1T was S7/8 at G6DH from 1200 to 1225 (all times GMT), while G5BY had cross-band QSO's with ZS1AX and ZS1P from 1209 to 1249. VQ2PL and MD5KW made it again at 1530, and MD5KW's signals were still audible at VQ2PL with the former's beam pointing north. The MUF to the States went as high as 46 mc at 1355, with S9 plus signals at G6DH from an FM station.

G5BY had three separate cross-band contacts with ZS1P and ZS1T on October 18, between 1200 and 1500, but there was no sign of these stations at G6DH. MD5KW and ZS6BJ had a two-way on 50 mc at 1300. Both G6DH and G5BD (Mablethorpe) heard an American FM station on 48 mc.

On Sunday, 19th, MD5KW reached G for the first time and was heard by G5BY from 0800 to 0835 and from 0948 to 0952, cross-band contact being made at 0820. G6LK heard MD5KW at intervals from 0945 to 1100, signals peaking to S9. G5BY reported MD5KW at RST558 peaking 20 dB over S9! Later, ZB2A got a cross-band with ZS1T. This same day J9AAO worked CE1AH on 50 mc two-way for a new world record of 11,300 miles—if our trigonometry is right!

Other distances we make as follows :

G5BY/ZS	— 5,970 miles
G6DH/ZS	— 6,015 "
PAØUN/ZS	— 5,940 "
MD5KW/ZS	— 4,500 "

In addition to all this there have been many new paths opened up in the Americas, notably between LU and W5, while XE1KE has had over 50 contacts with LU and OA4; also, TG9JW, CE1AH and PY2QK have been worked

by the LU's. MD5KW has been hearing harmonics of All-India Radio up to 49 mc, and W7ACS/KH6 has worked W5, 6 and 7.

MUF Up To 63 mc

Still more interesting is the news that on October 14, ZSIP heard G pulse signals (harmonics from 31.5 mc) on 63 mc, for a short period and on October 16 at 1414 he received a station calling him on 58.5 mc, and made out the figure "5" in the caller's sign. Further, MD5KW is reported to have heard a G6 'phone on 58.5. This all indicates the possibility of real DX contacts being made in our 58.5 band.

On many of the dates when 50 mc DX has been achieved there have been indications of spor-E and also of good tropospheric propagation conditions; G6DH suggests that these may well be playing their part with the F2-layer, which is the main agent.

We ourselves, like many other VHF operators, have found the times at which conditions peak very inconvenient and, hence, have been able to take little active part. But it is good to know that the coterie of enthusiasts who are able to be on the job at the right hour are doing so well and taking full advantage of the excellent conditions. Their achievements will, without doubt, be of considerable interest to propagation research workers throughout the world, as well as their fellow amateurs. Amongst those known to be making regular observations on the band are G5BY, G5WP, G6DH, G6LK



When G3MY is /P on Burbage Moors, this is the station; it is completely mobile.

and G6XM. G5BY, G6DH and G6LK have 6-metre beams in use, and for efficient operation in these tests it appears necessary to have beams and receivers for 5, 6 and 10 metres and transmitters for 5 and 10—preferably as separate items to save time in change-over, since conditions alter rapidly, and a few minutes lost changing frequency might well lose a contact.

While we are writing, the news comes from G6XM (Farnborough) that he is transmitting on 5 metre schedule and listening for replies on 10 and 6 metres. His times are Monday to Friday 0600, 1200 and 1700; Saturday and Sunday, hourly from 0700 to 1200. He calls CQ on

Flash—50 mc Open 26 October

An excellent East-West 6-metre opening developed 1400-1630 BST on Sunday, October 26. G5BY cross-banded 50/28 mc with W1LL, W1CLS, W1HDQ, W2RGV, W2BYM, W2AMJ, W8RLT, hearing also W1CGY and W3CIR/1—all operating between 50 and 50.2 mc. Peak strengths were very high and several contacts were on 'phone. G6LK heard W1HDQ, W1CLS, W3CIR/1 and W2AMJ. G2BMZ worked W1CLS and W3CIR/1, also receiving W1HDQ and W2BYM. British operators have now cross-banded with ZS1, MD5, W1, W2, W3 and W8 50 mc stations. Congratulations to all concerned.

CW for 5 minutes and then listens for replies on the other two bands, after a quick look round 5 metres.

The 144 mc Band

A few extracts from the November *CQ* regarding 144 mc operation in the States may interest those who are preparing for the release of that band over here. The latest DX record is 650 miles between W3GV and W0WGW, achieved at 0130 EST on September 18. Several other stations have worked to distances of 500 or 600 miles. Comparing 144 and 50 mc, W0NFN says some nights 144 is not nearly as good as 50; then along comes an evening when signals are a lot better. He has worked places on 144 mc that he never makes on 50 mc.

If we may make a suggestion of our own here, it is that tropospheric propagation may be caused by two mechanisms: (1) Ducting, or super-refraction; (2) Reflection at a temperature, inversion or layer of low humidity. (*Tropospheric Propagation and Radio Meteorology*, published by N.B.S. in America, supports this.) Both are caused by the same weather phenomena, but if the condition is not extreme or widespread then no extensive duct is formed, and only partial reflection occurs at grazing incidence. This will favour a longer wavelength (*i.e.* 50 mc), while, if things are good enough for an extensive duct to form, then shorter wavelengths will perform better (*i.e.* 144 mc). Hence, if this surmise is correct we may expect 5 metres to be more consistent up to, say, 200 miles, but 2 metres to excel when conditions really peak and to extend to longer ranges. This agrees with W0NFN's observations above.

In our opinion most of the fairly consistent 5-metre GDX is one hop reflection from layers of comparatively low humidity (temperature inversions being of minor importance), but the reception of G5BY in Germany at 600 miles or so on June 1 last, at 2125 GMT, while making his record GDX QSO with G5GX points to a wide and extensive duct existing at the time, there being no evidence of spor-E.

The highest MUF's for spor-E in America this summer have been of the order of 75 mc, so that it looks as if we can definitely rule it out on 144 mc.

G5MQ puts forward a very useful suggestion; the transmitter section of the American VHF aircraft set SCR522, employing an 832 in the final stage, makes

an ideal low-power transmitter for 144 mc, since it is designed to cover 100 to 156 mc, from crystals around 8 mc. The receiver can also be adapted, and G5MQ has had good results with it on our five-metre band. Its selectivity will not be high due to the wide-band IF stages, but suitable modification may be possible. This set was also used in this country as the TR5043.

The R.A.F. ground station receiver R1132A should also prove useful. Designed for 100 to 125 mc operation, it ought to be possible to extend the range to cover the 144 mc band, but here again selectivity is not good, although sensitivity is high. The IF stages (of which there are four) might well be modified, possibly to a lower frequency than their present 12 mc, or perhaps to a double superhet circuit,

FIVE METRES COUNTRIES WORKED LIST Starting Figure, 3

Worked	Station
12	G5BY (F, FA, G, GW, HB, I, OK, OZ, PA, SM, ZB1, ZB2)
11	G2XC (F, FA, G, HB, I, ON, OK, PA, SM, ZB1, ZB2) G6LK (F, FA, G, GW, HB, I, OK, ON, PA, SM, ZB1) (G6XM F, FA, G, GW, HB, I, OK, ON, PA, SM, ZB2)
10	G5BD (F, FA, G, GW, I, OK, ON, PA, SM, ZB2)
9	G2NH (F, FA, G, GW, HB, OK, ON, PA, ZB1) G5MA (F, FA, G, GW, HB, I, OK, ON, PA)
8	G2MR (F, FA, G, GW, I, ON, PA, SM) G3YH (F, G, GW, HB, I, OK, OZ, ZB2) G5MQ (F, FA, G, GM, GW, HB, I, OK) G6DH (F, FA, G, I, OK, ON, PA, SM)
7	G3BW (F, G, GM, GW, HB, I, PA)
6	G3DA (F, G, GM, GW, HB, I, D)
5	G2KF (F, FA, G, ON, PA) G3IS (F, G, I, ON, PA) G3BXE (F, G, GW, I, SM) G5BM (FA, G, GW, I, SM) G5IG (F, FA, G, ON, PA) G6MN/A (F, G, GW, HB, I, D)
4	G4IG (F, G, ON, PA) G4LU (F, G, HB, OK) G5PY (F, G, GW, I) G8UZ (G, HB, I, ZB2)
3	G3MY (G, GW, ON)

the second stage becoming a frequency changer to say, 1.5 mc.

We shall be glad to have suggestions regarding 144 mc equipment. G5MQ, G6LK and G6UH are understood to be ready for the word "go," but in answer to numerous enquiries, there is no present indication of the release of the band prior to January 1, 1949!

Sporadic E

The subject of the variation of spor-E ionisation with sunspot cycle must be pursued still further, as another authority on propagation, Ferrell of CQ, has written us disagreeing with the views expressed on p. 488 of the last issue. The divergence of opinion does not appear to be very great, however, for Ferrell says "That the occurrence of sporadic-E does vary inversely with the sunspot number has been known for a number of years," and goes on, "There is some question whether this effect applies to 5 and 6 metres. Although there is reason to believe that there will be more spor-E openings during the sunspot minimum it has been suggested that they may not be as intense, *i.e.*, the skip distance may not be as short."

Next month we hope to bring you the reply of our first expert—these columns look like becoming a forum for an exchange of views between the propagation authorities!

While on this subject, G6DH, who kept observations on harmonics and VHF signals generally up to 1942, is of the opinion that spor-E openings on 5 metres are less frequent at sunspot minimum, although they may be possibly more prevalent on lower frequencies. It is a great pity the war years interrupted the present cycle of observations, but we should know the answer by 1952 or so, if we manage to keep a band around 60 mc.

Tropospheric Conditions

With the continued spell of dry and fairly settled weather, at least over the southern half of the country, GDX conditions have been generally good, and it has been disappointing that activity has been so low. Although fading has been present on some occasions, many solid contacts have been made by those who were active. Several stations, G2CIW (Brentwood), G3COJ (Hull) and G4LU (Oswestry) and G5PY (London) give September 26 as the outstanding evening of the period, while other dates quoted as very good include September 27 and

A.J.D. AND E.J.W.

With this issue, A. J. Devon relinquishes "Five Metres," which he has contributed for so long. With many claims on his time and large responsibilities in regard to other sections of the *Short Wave Magazine*, he will now be able to devote himself to fresh activities in new directions.

A. J. D.'s successor, E. J. Williams, B.Sc., G2XC, is one of the best-known operators on the 58 mc band, and has gained a considerable reputation as an authority on VHF working. We are sure that readers will not only welcome G2XC as a regular contributor to the *Magazine*, but will also give him that close support his predecessor always enjoyed and gratefully acknowledges as the real source of such inspiration as he was able to bring to "Five Metres."

EDITOR

October 1, 5 and 12. The circuits between G2XC and G2ADZ (165 miles) and G6DH (116 miles) have been remarkably good and the consistency of 6DH's signals (usually at S7) has surpassed anything previously recorded from him.

In spite of the low activity a goodly number of reports have come in and since these reports must normally be the mainstay of this feature we are very grateful for them.

The North

G5MQ (Liverpool), who at 190 miles can usually be relied upon to put in a readable signal on the south coast even when all other northern GDX is absent, has been relatively inactive whilst preparing for 144 mc (see above), but on the few occasions he was on produced the usual reliable signal. From the opposite coast there are two reports. G3COJ (Hull) started activities on September 26 and succeeding in hearing quite a bit of GDX and working G2ADZ, G3BXE and G3APY, which personally we think is good going, but G3COJ himself seems to think otherwise. He is using 20 watts to an 832, and a rotary beam remotely controlled by a couple of strings with weights on the end. (That's more or less our scheme, too!) He finds a peculiar effect in that his RF stage oscillates when he turns the beam S or S.E. He will be inactive until early December.

Further down the coast at Mablethorpe G5BD continues his regular work, which includes a frequent check on MUF. He

has heard FM signals from the States on 48 mc at good strength. He bemoans the low activity, but reports that the schedule with G8JV (65 miles) has passed the 400 mark; this is fine going. (We shall have to count up our own with G6KB although the distance is, of course, not so great.) He has worked G2XC and G5BY several times recently when no other signals were audible, and has contacted G5MA/P (on the South Downs) when the latter was using only 6 watts of 'phone.

G3MY (Sheffield) found the colder weather a little discouraging for his portable work on the moors at night but promises further /P activity up to November 30 if the weather holds up, particularly on Sunday mornings from 1000 to 1300. At the home QTH conditions are difficult due to the surrounding barrier of hills, but one or two weak signals have been heard. While out /P on August 24, he was logged by DE7153 in Neunberg.

Midland Reports

G8UZ (Sutton-in-Ashfield) now uses an 8-valve super-het, built exclusively for 5 metres. It has CV66 GG RF, and EF50 mixer. This replaces his old 0-V-1 with which he heard so much DX. Not far away, G3APY has started operations from his new QTH (Kirkby) and has been heard putting out a good signal. G6MN (Worksop) has been experimenting with an indoor beam against the outdoor long wire 30 ft. high, with the former winning every time, but has raised and worked Denbigh on the long wire. He, also, has worked G5BY when no other signals were audible.

Almost in Wales, but unfortunately not quite, G2ADZ and G4LU (Oswestry) have provided the most consistent GDX of the month for the southern stations. Strange that Shropshire, once the most difficult of North Midland counties for us, should now be the easiest. G2ADZ also complains of the lack of activity at reasonable hours (up to 2300 BST), and describes the lassitude before 2200 as deplorable. With the exception of four evenings, however, he has had QSO's of 160 miles or over between September 14 and October 19, but we think most of those have been with G2XC! He appeals for SWL reports. G4LU has been listening on the G5BD/G8JV nightly schedule and receiving both ends well, the latter off the back of his beam. Highlights of the month at G4LU have been reception of G6VX and G5MA on September 12 at strength exceeding that of G5MQ. On

October 1 G2XC peaked S9 plus, while on the 4th a two-way S9 plus 'phone QSO was made with G5BD.

G2ATK (Shirley) reports some good contacts with G2AOK/A (Stow-in-the-Wold) who now has a 3-element beam in use. G2ATK has been testing narrow-band frequency modulation by adding a reactance modulator to his crystal stage, preceded with a 6J5 amplifier. He is constructing an adaptor for his receiver, which will plug into the 6Q7 stage. G3SS (Birmingham) is also using NBFM, and finds it cures BCI. Finally, G2ATK appeals for more activity and is on most nights from 2000 to 2200 BST, and calls any station he hears.

G3ABA (Rugby) asks for more activity (Don't we all?) on week-end mornings, and requests the London stations to turn their beams north on Sunday mornings. He agrees with us that the two recent field-days proved that daytime GDX conditions can be good. He hopes to move to Coventry soon, which prompts us to ask where is G6YU these days?

We are glad to hear G5BM (Cheltenham) back on the band, and to know that he is well on the way to recovery from his recent operation. He has logged F8ZF and wonders whether the Frenchman has been heard at greater distances on ducting. F8ZF (Boulogne), who uses a 4-element 0.2λ spaced beam and a 17-valve superhet, has recently visited a number of 5-metre G stations, including G2KF, G3NR, G5MA and G6DH. He is very interested in tropospheric propagation.

Down South

News of activity in a new county has come in from G8NV, who has moved down to Cornwall. His own QTH being unsuitable he has installed his 5-metre gear at G2BJS (Redruth), who is on a high spot. They are badly screened by Dartmoor from most of the nearer stations so are hoping for good tropospheric bending when they get going so that some GDX may be worked. A 3-element beam is under construction. The frequency will be 58.65, or VFO. The receiver is EF50 RF, EF50 mixer, 954 oscillator—9.8 IF and 6V6 output.

In and around London, G5LQ (Chiswick) has, after 11 months of trying, reached his 14th county, but says it has been well worth while. G2CIW (Brentwood) also has been having a successful time, his best contacts including G5BD and G5MQ. He is using an 832 in the final.

G5PY (Clapham Park), after struggling for months to work Notts, raised G6MNA G8UZ and G3APY one after the other in less than an hour on September 26, and they all came back to CQ's. He has since added G8JV. G5PY has been having a major rebuild but hopes to be on again by the time this is in print.

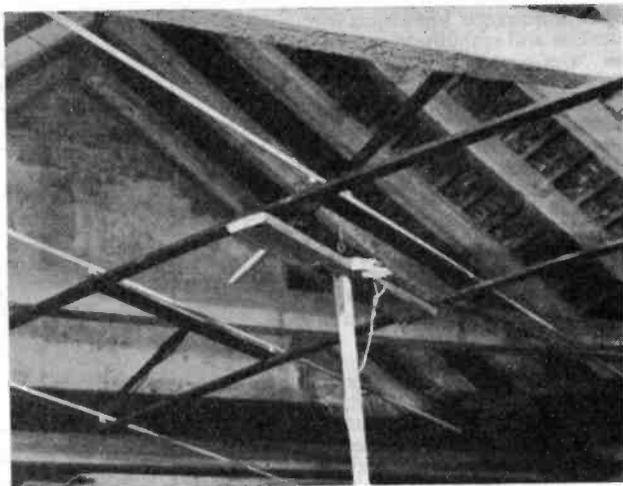
G8SM (East Molesey), as if in reply to the many complaints of low activity, says he has been active, but at the work-bench rather than on the air. He has been constructing a new broad-band RF stage using a GG circuit and is hoping for good results.

G6XM (Farnborough) now has his 5-metre beam 5 feet above the 10-metre one, and notices no ill effects from their close proximity; if anything, reports are due to the extra height. He is very active, hoping for DX contacts during daylight hours, and has heard much of the 50 mc DX.

G4AJ (Kensington), back from the East on a short visit, puts in his claim for 15C from the old QTH, and gives us the welcome news that he will be on 5 and 6 metres with 100 watts when he returns to Calcutta—activity is not, however, expected before the spring. Good luck, OM.

Oxfordshire

For a long time, G6KB (Checkenden) has been the sole but consistent Oxford representative on five metres. Unfortunately, due to interference from a large transformer just north of him he has been unable to effect many contacts in that direction. Now he is joined by G5XB (Sonning Common) and G8PX (Oxford) so those up north still requiring Oxfordshire will find their chance much enhanced. The former using 23 watts to an LS50 and a 4-element rotary beam has been active since mid-September and has been getting out well to the south and Midlands. G8PX has a convertor working into an HRO and sends a useful list of calls heard on an indoor dipole. He has a beam under



G2FWA, Croydon, has his 5-metre beam in the roof space.

way and hopes to have a transmitter on the band by the time this is in print. Another Oxford station we have recently worked is G5LO.

New QTH's

G4NT/A, 650 feet up at Downley, Bucks, with 45-ft. lattice masts and his field-day rig, made a notable appearance on September 30 with a tremendous signal, working F8ZF his first night. There's no doubt it is a better 5-metre site than the former one at High Wycombe.

A card from G8LY reports progress at her new QTH (Lee-on-Solent, Hants.) where she is at sea-level. So far reception has been on long-wire only, and G8KZ best DX heard at R1S2! She hopes to have the beam up one day and to renew acquaintance with "the gang."

G6FO, now at Maids Moreton, Bucks, has been listening and hearing most of the regulars. He will be on the band with the Tx as well in the near future.

Quick Ones

S. W. L. Towgood (Bournemouth) is busy building a new TRF receiver and so has done little listening. He has heard G4LU for the first time on October 6, but little else exciting . . . G2BMZ (Torquay) with a new convertor using a 6J6 has been hearing some new calls including G2ADZ . . . G3CCD (Kensington) has made wel-

come appearance, but suffers from a noisy location and inability to put up a beam at his "digs" . . . G3FP (Croydon) tunes the director of his indoor beam with .0001 μ F condenser at the centre; claims it is very effective on reception . . . G2NM/G6KB schedule daily at 1230 and G2NM/G2XC/G6KB have daily three-way at 1730 . . . G2NM says VK3BQ is beaming on G on 50 mc . . . G6XS reports ZS6BT, 6JB, 6DO and 6GV active on 50 mc . . . G5IG (Cambridge), now at a new QTH with his beam only 12 feet high, made a first QSO with G2XC . . . G8QM promises to go portable in Suffolk again soon.

Some Valve Data

Referring to G4IG's query on page 492 last month regarding the performance of valves, G8JV (Nottingham) sends some data on the noise factors of some of the more popular RF amplifiers of to-day. The figures are for 60 mc, and show the order of merit.

Type	Noise factor (dB)
CV53	3
6AK5	4.5
RL7	5
954	6
9001	6
EF50	7
SP41	9

As G8JV says, "All the valves mentioned will give sufficient amplification for the noise added by the following valve to be negligible. It will be seen that there is not a great deal to choose between them, and even the improvement to be gained by using a CV53 will be masked by Milky Way noise radiation. It is worth noting

FIVE METRES COUNTIES WORKED LIST Starting Figure, 14	
Worked	Station
30	G3BXE (100)
29	G5BY
28	G2MR, G5MQ
27	G2XC (205), G5BD, G6XM (138)
26	G2NH (170), G4LU, G5BM, G5MA, G5PY (136), G6LK (208), G5VX, G8UZ
25	G2ADZ, G8SM
24	G2RI, G6MN/A
23	G3BLP, G3MY, G3PZ, G60H (129)
22	G2ATK, G6YU
21	G2CIW, G3IS, G4IG (154)
20	G2YL, G3DA, G5JU, G6KB
19	G5IG
18	G2NM, G4AP
17	G2KF, G6CW, G8QM/A
16	G3AAK, G8KZ
15	G3ABA, G4AJ, G8KL
14	G5LQ

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

that at 144 mc the CV53 will give an improvement of 4/5 dB over its nearest rival and will be essential for the sensitive receiver."

FIVE-METRE CALLS HEARD

G8PX, 1 Lovelace Road, Oxford.
FRZF, G2AOK, 2CIW, 2FH, 2FKZ, 2GG, 2MV, 2NH, 2PI, 2XC, 3BLP, 3BXE, 5LO, 5MA, 5PY, 5RP, 5XB, 6KB, 6LK, 6NW, 6VX, 6XM, 8OX, 8RS. (Reception only, period September 21-October 11, HRO with convertor.)

G8UZ, 29 Columbia Avenue, Sutton-in-Ashfield, Notts.

Worked: G2ATK, 2ADZ, 2BJY, 2NH, 2XC, 3AAT, 3ABA, 3BXE, 3DG, 3MY/P, 3NR, 3PZ, 3WD, 3WW, 3IS, 4BI, 4IG, 4LU, 5AS, 5BY, 5JU, 5MA, 5MA/P, 5YY, 6DH, 6HY, 6KB, 6MN/A, 6OH, 6VD, 6YO, 8GX, 8IC, 8IV, 8KZ, 8QM/A, 8SH, 8SM, 8WL.

Heard: G3MA, 5PY, 6LX/P. (August 19-September 13.)

G4LU, Avalon, Pant, Oswestry, Shropshire.

Worked: G2AOK/A, 2BJY, 2NV, 2OI, 2XC, 3AAT, 3ABA, 3BLP, 3DG, 3IS, 3MA, 3PZ, 3PZ/A, 3WW, 5BD, 5LJ, 5MA, 5MA/P, 5MQ, 6KB, 6LK, 6OS, 6YD, 6XM, 8KL, 8QM/A, 8QS, 8SM.

Heard: G2ATK, 2BKZ, 2CUA, 2MV, 2NH, 2RI, 3APY, 3BK, 3BXE, 3BY, 3COJ, 3DA, 3SS, 3WD, 4IG, 5BY, 5JU, 5PY, 5WP, 6MN/A, 8IV, 8UZ.

G3COJ, 18 Allderidge Avenue, Hull.

Worked: G2ADZ, 3APY, 3BXE, 3TZ, 5BD, 6BX, 8QM/A.

Heard: G2CIW, 2FKZ, 2MV, 2NH, 3BLP, 5MA, 5PY, 6DH, 6LK. (Period September 26-October 2.)

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

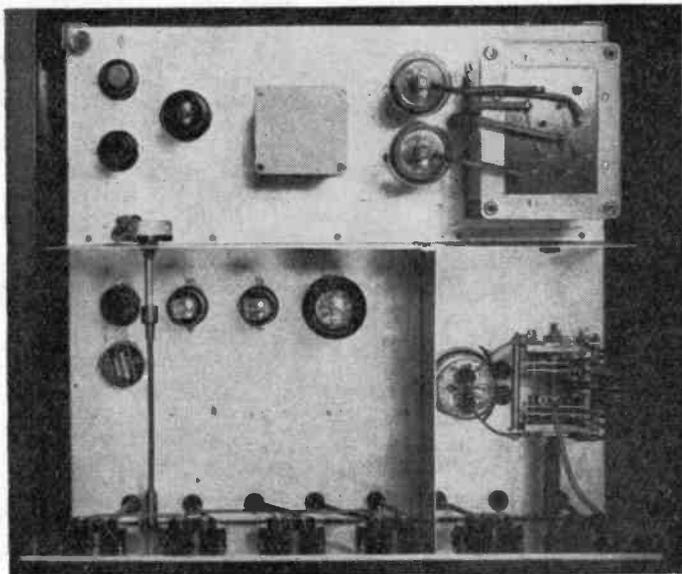
Worked: G2ADZ, 2BMZ, 2CIW, 2KF, 2XC, 3CCD, 4AP, 5PY, 5XB, 6JJ, 6LL, 6OH, 6OT, 6UH, 8CK, 8RC, 8RS, 8WV.

Heard: G2ATK, 3AAT, 3APY, 3BXE, 4LU, 5BM, 5BY, 5MA/P 8OX. (Receiver, 3-stage convertor, EF50, EF50, 6J5, into 8-valve super at 5 mc.)

G5PY, 18 Parkthorne Road, Clapham Park, S.W.12

Worked: F8ZF, G2AAK/A, 2ADZ, 2ATK, 2BMZ, 2IQ, 2RI, 2XC, 3AAT, 3ABA, 3APY, 3WW, 4AP, 5MA/P, 5BD, 5BM, 6DH, 6MN/A, 8JV, 8QX, 8UZ.

Heard: 2HA, 3BK, 3BXE, 3SS, PA0JW. (All over 50 miles, September 25-October 11.)



A top view of the G4NT rig. RF driver stage on lower left, with the 829 PA on the right. The modulator assembly is to the rear behind the vertical screen and uses 6SJ7-6J5-6L6-P/P 807's in Class-AB1.

Countries, Counties and Stations

The panels have again undergone a big change, and progress seems to have been made by everyone except your conductor, who is stuck at 27 countries and 11 countries after having missed GW4LU/P last month. No rude remarks about our receiver, please!

The biggest changes are in the Counties table—where G3BXE (West Wrating, Cambs), as a result of a contact with G2BMZ, has jumped into the lead with 30 worked. Congratulations, OM, and a fine performance. Further down, there have been some big jumps; G2ATK goes up 8 places, G5BM 7, and G6KB and G6MN 6 each, while G2CIW makes an entry into the table at the 21 level. He only claimed 20 but we heard him make a contact with G2NM (Sussex) after he had sent in his claim.

We imagine some operators are not up to date with their claims as several

have been heard quoting over the air figures in excess of those shown in the table—so please check, and if you are behind with your claim let us have it in time for the December issue.

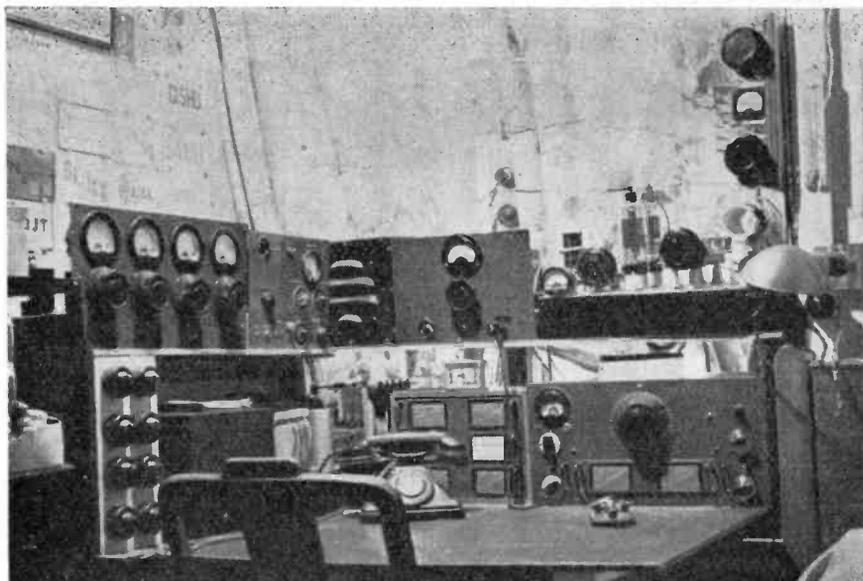
And now for that Cornish contact!

Reports—December Issue

Of course, we continue to rely for the ultimate success of this feature on the views and reports as expressed in readers' letters, so your new conductor hopes to hear from you regularly. In addition to routine reports on results and conditions, we should like to have details of equipment, including rigs proposed to the 144 mc and other VHF bands.

Reports for next month's issue should be with us by November 17 latest. Please write E. J. Williams, G2XC, c/o *Short Wave Magazine*, 49 Victoria Street, London, S.W.1. (ABBey 2384). 73, CU 3/12/47.

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Helps Them and Helps Us*



The other man's station G3AAE

The station of G3AAE, J. D. Kay, 24a Watcombe Road, Southbourne, Bournemouth, was one of the first "G3-plus-3's" to be licensed (July 10, 1946) and the very first British callsign to be issued with an E—a break with a tradition that had held in this country since the earliest days of Amateur Radio.

G3AAE spent much of his time on 7 mc after starting up and ever since he came on the air on December 27 last, has been a 100 per cent. CW operator—and he QSL's 100 per cent., too. By the end of May, 1947, over 1,200 stations had been worked in 55 countries. Since then, G3AAE has given some attention to 14 mc, and in the three months to the beginning of October had brought in 90 countries

in 36 Zones, all on CW with an input of 75 watts to the PA.

The receiver is an HRO and the transmitters are a 6V6-PT15 job for QRO and a low-powered 6L6-807 assembly which was used when first on the air on 7 mc. Another transmitter is now under construction for 28 mc, using 6L6 tritet-6L6-P/P 807's, and is probably perking by now.

The aerial system is a half-wave (cut for 7 mc), Zepp fed, slung between two forty-foot poles. The station is thus well equipped for general operation on all bands 7, 14 and 28 mc, and altogether G3AAE is giving a very good account of himself.

He asks us to mention that visitors are always welcome—but ring him on Southbourne 1775 beforehand.

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

THE MONTH WITH THE CLUBS

FROM REPORTS

There is no doubt about the opening of the new season as far as the Clubs are concerned. This month we publish 33 reports, many of our old friends having reappeared, and a fair number of new ones also having arrived. Winter programmes are well in hand, and the whole Club movement would seem to be in a very healthy state.

The Contest Entry

The following Clubs have so far entered for the 1.7 mc Transmitting Contest, opening on November 15: Aberdeen (GM3BSQ), Ashton-under-Lyne (G3BND), Beaumanor (G3BMR), Burton (G2DAN), Bury (G3BRS), Carlisle (G3ART), Coventry (G2YS), Edgware (G3ASR/A), Grafton (G3AFT), Grays (G2YH), Hi-Q (GM3AR), Medway (G2FJA), North Angus (GM6RI), Nottingham (G3CKV), Romford (G4KF), Stroud (G2FRG), Wanstead (G3BRX), Warrington (G3CKR/A), West Cornwall (G2JL), Wirral (G8BM), Worcester (G3BDS), and Slade (G2AK)—a total of 22 to date.

Further entries can be accepted up to November 14; any other Club now wish-

ing to take part must lodge an entry form by that date for their participation to be valid.

There have been two requests for clarification of Rules 4 (a) and 4 (b). The following amendment has therefore been sent to all Clubs entered:

A "period of working" is defined as any spell of watch-keeping maintained for the purpose of scoring in the Contest—whether calling CQ, listening round for a station to call, or actually working a station. For the purpose of the Contest, a watch-keeping period of one hour, calculated from the time of opening the watch, will be the minimum operating spell allowed in reckoning the periods to make up the total of 30 hours' operating time permitted.

We look forward to a useful and interesting event and last year's leaders—Coventry and Grafton—are all set to gain the laurels again this time. For our part, we wish everyone the best of luck! Whoever may be the winner, it should be a good Contest. One small point: Will those responsible for forwarding results please re-read carefully Rules 7-9; it is most important that we have all the results in by December 5.

Reports for December

The dead-line for the coming month is first post on November 13; as usual, reports arriving after this will be "unavoidably held over" until the January issue, which seems a long way off at present! Address them all to "Club Secretary," *Short Wave Magazine*, 49 Victoria Street, London, S.W.1—and, as always, photographs will be welcomed.

Aberdeen Amateur Radio Society.—Another entry for the "Top-Band" Contest has come from Aberdeen, where they have got away to a good start for the new season. Members were recently shown round the local BBC Station by two of their number who are on the staff; two further parties are also being taken round.

Slade Radio.—The club meets on alternate Fridays at the Parochial Hall, Broomfield Road, Slade Road, Erdington, at 8 p.m. Future meetings include a talk by Mr. H. W. Yeates (GPO) on November 14 and the Annual General Meeting on the 28th. Visitors are assured of a warm welcome.

Coventry Amateur Radio Society.—The recent A.G.M. closed a very successful year's activity, and plans are afoot for a move into larger premises. The winter programme includes operating contests, lectures, auctions and visits. Major Brown's recent lecture on Remote Position Indication for Beam Antennas attracted a record attendance.

Birmingham & District Short Wave Society.—This club has now obtained a room at 220 Moseley Road, Birmingham 12, at which meetings will be held on alternate Thursdays (starting October 16) in addition to the monthly meetings

held at the Hope and Anchor Hotel, Edmund Street, Birmingham. The new premises will be used for practical work and it is hoped to have the club transmitter working there in due course.

St. Pancras Radio Society.—They have now settled down after a rather long summer break, and welcomed several new members on the re-opening night. Quite a lot of equipment has been collected, and the club transmitting licence is looked forward to with enthusiasm. Meetings are on Monday and Thursday evenings at 7 p.m. at the L.C.C. Evening Institute, Holmes Road, Kentish Town.

Hi-Q Club, Giffnock.—Activities have been reduced by—of all things—an epidemic of 'flu! Individual members have been very active, however. The Club was recently visited by W2BFS, whose home

is New York, but who is at present signing AR10M in Damascus. When he is away his wife operates the station as AR1YL. GM3AR is the station nominated for the Club Contest this month and many members are now working 1.7 mc to get themselves acclimated.

York & District Short Wave Club.—A big winter programme is coming along, with Morse classes continuing, and a start is being made on the club transmitter. All SWL's in York are invited to 29 Victor Street, any Wednesday at 8 p.m.

Darlington & District Amateur Radio Society.—This club, formed in September, already has 26 keen members, and meets on alternate Thursday evenings. They have a fully equipped workshop in Buckton's Yard, Darlington—loaned to them by a kindly radio dealer, who also happens

to be the President of the Club! Lectures for the winter season have been arranged, and the next meeting after publication is November 13 at 7.30 p.m.

West Bromwich & District Radio Society.—A series of talks for the next three months has been arranged, and the club is also visiting Droitwich during November. Visitors and prospective members will be welcomed at the Gough Arms Hotel, Jowetts Lane, at 7.30 p.m. on alternate Mondays.

Guildford & District Group.—The next meeting of this Group is on November 23 at 3 p.m. in the Cinema Cafe, Woodbridge Road, Guildford. A post-card to the secretary (name and address in panel) will reserve tea for intending visitors. The Group joined forces with the Model Engineering fraternity recently, and manned a station at the local exhibition. It was a great success, and is strongly recommended to other clubs.

Worthing & District Group.—This Club has been holding its own Receiving Contest during the week-ends of the Australian DX Contest in October, and intends to run further domestic events from time to time. Meetings now take place at Oliver's Cafe, Southfarm Road, Worthing; the next is on November 6 at 7.30 p.m. and will be a "Junk Sale." The previous meeting took the form of a lecture on Principles and Applications of Radar, including a working description of magnetrons, rhumbatrons and waveguides.

Romford & District Amateur Radio Society.—The November programme includes a General Discussion on the 10th, a lecture on Micro-waves on the 17th, and a further talk on Maths. applied to Receiver Design on the 24th. On December 1 there will be a Junk Sale. All meetings are at Mawney's Road School, Romford, at 8 p.m.

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

- ABERDEEN (GM3BSQ).** A. D. J. Westland GM3BQU, 17 Beaconsfield Place, Aberdeen.
BARNET. R. Walker, G6QL, 7 Potters Lane, New Barnet, Herts.
BIRMINGHAM. N. Shirley, 14 Manor Road, Stechford, Birmingham 9.
BRADFORD (Short Wave Club, G3NN). V. W. Soven, G2BYC, Rushwood, Grange Park Drive, Cottingley, Bingley, Yorks.
BRADFORD (Amateur Radio Society). W. S. Sykes, G2DJS, 287 Poplar Grove, Great Horton, Bradford.
BLACKPOOL. H. D. Ashworth, G4PY, 5 Albion Avenue, Blackpool.
COVENTRY. J. W. Swinnerton, G2YS, 118 Moor Street, Coventry.
DARLINGTON. G. Walker, G2AWR, 6 Geneva Crescent, Darlington.
EASTBOURNE. R. F. Nugent, G2FTS, 12 St. Anthony's Avenue, Eastbourne, Sussex.
EDGWARE (G3ASR). R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware, Middx.
GIFFNOCK (Hi-Q). J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4.
GRAFTON (G3AFT). W. H. C. Jennings, G2AHB, Grafton LCC School, Eburne Road, Holloway, London, N.7.
GRIMSBY (G3CNX). R. F. Borrill, G3TZ, 115 Garden Street, Grimsby.
GUILDFORD. H. C. Spencer, G6NA, 1 Shepherds Hill, Stoughton, Guildford, Surrey.
HARROGATE. K. B. Moore, Spinney Cottage, 2a Waiside Crescent, Harrogate, Yorks.
LONDON, S.W. R. Lisney, 4 Ongar Road, London, S.W. 6.
NORTH-WEST KENT. B. A. M. Herbert, 18 Leamington Close, Bromley, Kent.
OSWESTRY. G. H. Banner, G3AHX, 6 Coppice Drive, Oswestry, Salop.
READING. L. A. Hensford, B.E.M., G2BHS, 30 Boston Avenue, Reading.
ROMFORD (G4KF). R. C. E. Beardow, G3FT, 3 Geneva Gardens, Whalebone Lane North, Chadwell Heath, Essex.
ST. PANCRAS. H. Brown, 84 Blenheim Gardens, London, N.W.2.
SLADE. C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.
SPEN VALLEY. R. Ellis, G3BKM, 34 Booth Street, Cleckheaton, Yorks.
STOURBRIDGE. W. A. Higgins, G8GF, 35 John Street, Brierley Hill, Staffs.
SURREY. L. C. Blanchard, 122 St. Andrews Road, Coudsdon, Surrey.
THAMES VALLEY. D. R. Spearing, G3JG, Thurston, Orchard Way, Esher.
TORBAY. K. J. Grimes, G3AVF, 3 Clarendon Park, Tor Vale, Torquay.
WANSTEAD (G3BRX). R. J. C. Broadbent, G3AAJ, 24 St. Margarets Road, Wanstead Park, London, E.12.
WEST BROMWICH (G3BWW). R. G. Cousins, G3BCS, 38 Collins Road, Wednesbury, Staffs.
WEST CORNWALL. R. V. Allbright, G2JL, Greenacre, Lidden, Penzance.
WIRRAL. B. O'Brien, G2AMV, 26 Coombe Road, Irby, Heswall, Cheshire.
WORTHING. G. W. Morton, 42 Southfarm Road, Worthing, Sussex.
YORK. G. W. Kelley, G5KC, 123 Kingsway West, Acomb, York.

Eastbourne & District Group.

—The first meeting of this Group brought an attendance of 30 together; a committee was elected and future events were discussed. Morse classes are being arranged, and the next meeting is on November 7 at 7.30 p.m. at the Friends Meeting House, Wish Road; prospective members will be welcomed.

Stourbridge & District Amateur Radio Society.

—This club met once more during October at King Edward School, Stourbridge, 28 members and two visitors being present. In view of petrol restrictions it was decided that future meetings should begin at 7.45 p.m. and finish earlier than hitherto. Sub-committees were formed to deal with the matters of a club station and field days.

Edgware & District Radio Society.

—The 1.7 mc D/F Contest held during September was a great success and thoroughly enjoyed by all those who took part. The receiver used by the winner was built inside a cigar box! Weekly meetings are now under way again, with attendances on the increase; at a recent meeting a local firm demonstrated examples of electronic equipment, including an electronic key, which the members naturally tried out.

Surrey Radio Contact Club.

—The October meeting included three short talks, on Remote Control, VFO's, and "The Little Black Box." What was in the latter we are not told. The Chairman spoke very strongly about certain members using high-power 'phone in the CW sections of the bands (see DX Commentary). A Club Social has been arranged for December 16, and the next regular meeting will be on November 11, 7.30 p.m. at the Blacksmith's Arms, South End, Croydon.

Bradford Short Wave Club.

—Activities have continued during the summer months, and the winter season opens with a visit to the Bradford branch of Cable and Wireless Ltd. The transmitter, G3NN, is on the air again, on both 'phone and CW; all reports will be welcomed and QSL'd.



Some of the Edgware crowd on the June field day. Among those in the front row are G4KD (seated, right) G8KZ just behind, and G3LT, G2AI, G2IM, G2AJ, G5FG, G2QY and G2CNM.

Grafton Radio Society.—The second A.G.M. has been held, and the officials for the new season elected. GW3ALE is President and G2AHB continues as Secretary. Meetings are held every Monday, Wednesday and Friday at 7.30 p.m., with Morse classes at each one. Every member is taking part in some way in the forthcoming Club Contest, and all are looking forward to it immensely. Those without Morse knowledge will keep logs and brew tea!

West Cornwall Radio Club.

—With 45 members, things are going well; the Club is re-organising into groups in order to combat the threatened loss of petrol, since the membership is scattered and transport essential for full meetings. The centres are to be Camborne, Redruth, Penzance and Penryn. The annual dinner takes place on the 6th and G2JL is to sustain the honour of the Club in the contest.

Reading & District Amateur Radio Society.

—At the recent A.G.M. the officers for the coming season were elected, after which a general "rag-chew" developed. A committee of two transmitting and two SWL members was also elected to aid the officers in the arrangement of the winter programme and the formulation of constitution and rules. During October a visit was paid to the VHF section of the REME workshops at Arborfield. The Annual Hamfest takes place on November 9 at

the People's Pantry, Cross Street; two of the annual competitions will be decided on that occasion. Regular meetings are held at the Palmer Hall, West Street, on the second Wednesday and last Saturday of each month.

Torbay Amateur Radio Society.

—A recent meeting enjoyed a record attendance and a warm welcome was given to G6OT, who paid a surprise visit. There was also a report and discussion on the September five-metre Field Day operations. Meetings take place on the third Saturday of the month, YMCA Torquay at 7 p.m.

Harrogate & District Short Wave Radio Society.

—Members recently visited the BBC station at Moorside Edge, and were duly impressed, after seeing the location, with the way in which the station kept on the air all through last winter's difficulties. Regular meetings will be resumed shortly at 31 Park Parade, Harrogate.

Thames Valley Amateur Radio Transmitters' Society.

—This club recently held an exhibition of short-wave equipment, including four working stations, in aid of the local Boy Scouts' Jamboree. G6MB/P worked 7 mc telephony, G8SM/P was on five metres, and G3AIU/P and G5LC/P operated 7 mc "walkie talkies." Other equipment on view included "spy" and "underground" transmitters, QSL cards, receivers and five-

metre equipment. A recent meeting heard Mr. Michel Kasia on the subject of transmitters for frequencies between 30 and 150 mc, and the next (unfortunately before publication) will include a lecture on aeriols. The annual dinner is planned for early December, at the club headquarters.

Spenn Valley Radio & Television Society.—Another newcomer, recently formed, and welcome. The coming season's programme has been prepared, classes in Basic Radio are being started, and Morse classes are also organised. Three transmitting licences are held by the membership at present, and a club licence will be applied for when premises are available. Meanwhile, the secretary will welcome enquiries.

Barnet & District Radio Group.—Welcome to another newcomer to these columns. The next meeting will be held on November 15 at 7.30 p.m., at the Millicent Café, Lytton Road, New Barnet, and will include a sale of members' and visitors' surplus gear. Non-members are always welcome and the Secretary (QTH in panel) will be pleased to help prospective members.

Bradford Amateur Radio Society.—The winter syllabus had been arranged, and on November 4 G6BX will lecture on "Five Metres." On the 11th there will be a discussion—"Crystal Control versus VFO." (This meeting might well be a lively one!) The Club room is at Cambridge House, Little Horton Lane; note new Secretary's QTH in panel.

North West Kent Amateur Radio Society.—Officers for the forthcoming season were elected at a recent meeting; the President is G2MI, the Vice-President G5LB, and the Secretary G2WI. The coming season's programme was also discussed at length. The next meeting is at Aylesbury Road Schools, Bromley, on November 7 at 7.30 p.m.

Wirral Amateur Radio Society.—At the recent A.G.M. G8BM was elected Chairman and G2AMV Secretary, and the past successful season was reviewed. The Friday night net on the top band is now well established and usually includes G3AVI, G6VS, G3AKW, G6IL and G2AMV. November meetings are on the 5th and 19th—YMCA, Whetstone Lane, Birkenhead, at 7.30 p.m.

Grimsby Amateur Radio Society.—This club's transmitting licence has arrived, with the call G3CNX (150 watts 'phone and CW), and a T.1131 is already on the air. Membership grows steadily, and Club nights are Thursdays, 7.45 p.m. at 115 Garden Street, Grimsby.

Oswestry & District Radio Society.—Recent talks at the meetings (held alternate Tuesdays in the Oswestry Technical School) have included subjects such as Negative Feedback, Power Supplies and Time-bases. The Powys Eisteddfod is to be held in Oswestry and includes radio among its Arts and Crafts sections; several club members will be submitting entries.

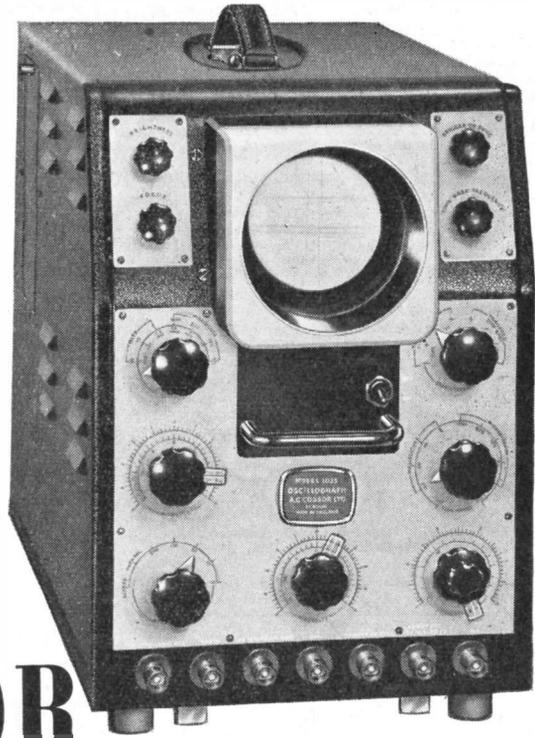
Wanstead & Woodford Radio Society.—The officers and committee for the forthcoming season have been elected, and a good winter programme is under way. A talk was given recently by Mr. A. Baldwin, an SWL member, on "Short Wave Listening." Membership is now 68, with attendances on the increase, and during the season it is hoped to include in the programme half-a-dozen film shows on radio subjects.

Blackpool & Fylde Amateur Radio Society.—An old club starts in a new home on the first Tuesday in November. They have suffered for some time from lack of accommodation, but have now acquired premises at the Shaw Road Garage, South Shore, where many tools are available and members' constructional problems may be solved. It is hoped to begin work on the club's transmitter and to organise Morse classes. A welcome is extended to anyone interested in short-wave radio, and you will find the secretary's QTH in the panel.

London Short Wave Club.—This club is just starting a drive for new members, and meets every Friday, at 8 p.m. at "The Crown," Battersea Park Road, Battersea. Meetings hitherto have been somewhat informal, but members have now been asked to bring some of their gear along to meetings. A low-power club transmitter is under construction, and other schemes are under way. Secretary's QTH in panel.

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- (1) Use of the Bureau both ways is open only to readers who obtain either the *Short Wave Listener* or the *Short Wave Magazine* from us on direct subscription. Cards from overseas are, however, accepted without restriction for free delivery to any British amateur.
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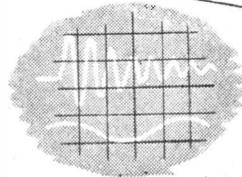


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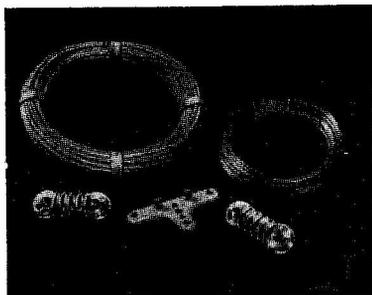
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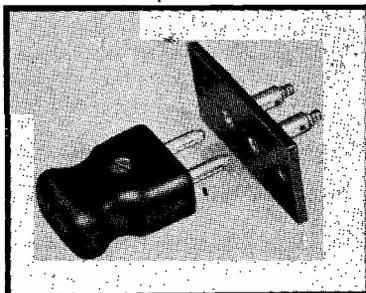
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14.0	16.5	9.0	27
28.0	8.0	12.0	20
56.0	4.25	15.0	16
		18.0	13
		21.0	11

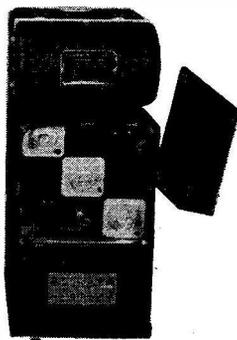
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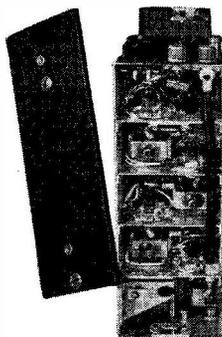
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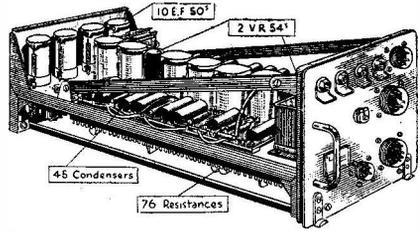
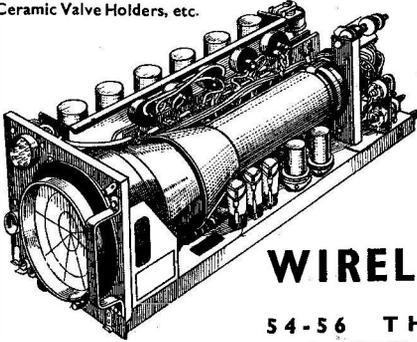
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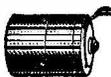
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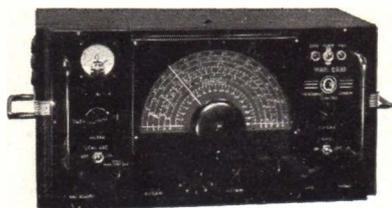


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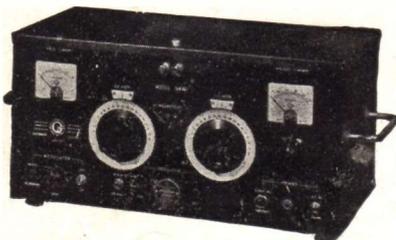
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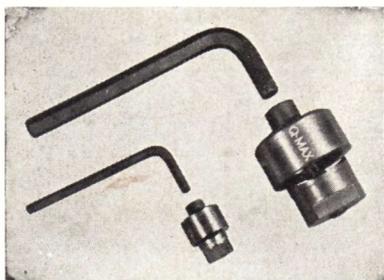
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