The SHORT WAVE Magazine

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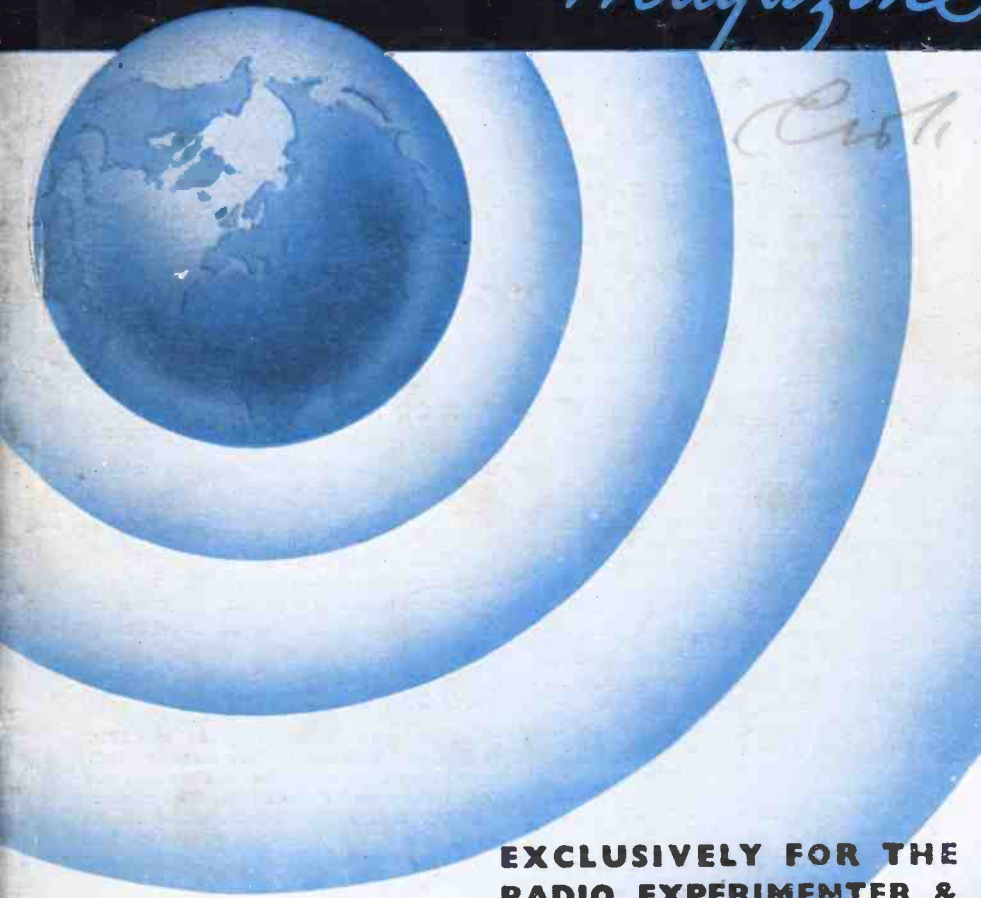

EXCLUSIVELY FOR THE RADIO EXPERIMENTER & TRANSMITTING AMATEUR

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SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR AND AMATEUR RADIO

Vol. V. MAY 1947 No. 46

CONTENTS

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AUTHORS' MSS.

Articles submitted for editorial consideration must be typed double-spaced with wide margins, on one side only of quarto sheets, with diagrams shown separately. Photographs should be clearly identified on the back. Payment is made for all material used, and a figure quoted in the letter of acceptance. A large stamped addressed envelope should be enclosed for the return of MSS. not found suitable for publication.

EDITORIAL

Conference

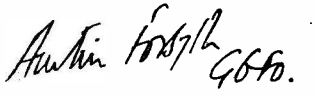
We are on the eve of Atlantic City. Broadly speaking, the British amateur proposals are not unsatisfactory when considered in relation to the extreme pressure on ether space by a variety of new interests, all of them influential. We gave a clear warning to this effect here last January. As we see it, the suggested allocations in the communication bands are about the most we could reasonably have expected.

Though we are seriously curtailed at 3·5, 7 and 58 mc, the situation could have been far worse had we not been strongly backed by the Services—a fact which will be news to many people and should not be forgotten.

To 5-metre operators, the lack of any suggestion between 29·7 and 168 mc is disastrous. A band, however narrow (250 kc would do), in the 50 or 60 mc region, allocated on an international basis, would be sufficient for our needs.

Much tussling, squabbling and lobbying will enliven the proceedings at Atlantic City before firm decisions of any kind emerge. It can be said that the British and American Governments will do all they can for amateurs up to the limit of their respective proposals. The American amateur delegation is in the happy position of being able to sit back and watch its Government fight for an allotment considered satisfactory by the ARRL. The British party is not quite so well placed. The representatives of the International Amateur Radio Union, as a delegation, are seriously handicapped by reason of the fact that they have no seat at the table but must operate as best they can round the fringe of the Conference proper.

We wish the RSGB delegates good fortune in what will be an arduous and expensive undertaking. Though there is now little they can do to broaden the scope of the British proposals, they can do much to enlist foreign support for those proposals.



Modifying the Type 21 Receiver

Easy Conversion to a Good General Purpose Unit

By **J. STEBBINGS, B.Sc. (Eng.)**

AMONGST the vast amount of Government surplus apparatus now finding its way into the Amateur Radio market is an interesting equipment designated the Type 21. After examining one of these, the author decided that a very cheap and efficient communications receiver for amateur use could be produced by a little conversion work on this set. The result is the neat self-contained receiver shown in the photographs.

Unlike most Service equipment the Type 21 is built into an ordinary fibre case 14-in. × 10-in. × 7-in. In its original form the suitcase contained the four-valve receiver unit, a single-valve crystal controlled transmitter, and an AC power pack for 100-250 volts, 40-100 cycles, together wtih aerial and earth wire, key, headphones and crystals. Packed separately were a spare set of valves, and a battery-operated power supply. As purchased the suitcase contained the receiver unit, the AC power pack, a pair of headphones, and oddments in the form of fuses, wire and so on.

The Circuit

The circuit of the receiver in its original form is shown in Fig. 1. It will be seen that the RF stage (EF 39) is tuned-anode coupled to a triode-hexode frequency changer (ECH 35) which is followed by a single IF amplifier (EF 39) tuned to 470 kc. Detection, AVC and LF amplification are performed by a double-diode-triode (EBC 33) the triode section of which feeds a pair of 120 ohm headphones. The maximum output is 120 milliwatts. The triode section also performs the function of BFO. Oscillation is produced by the iron-cored BFO coil and its associated condensers C16, C17 and C18. Switch S1 brings the BFO into circuit. There is no separate control of audio output. but R13 is the combined RF and IF gain control.

Table of Values

Type 21 Receiver

C1	= 4 $\mu\mu$F
C2, C4, C7, C21	= 0·1 μF
C5, C10, C11, C20	= 0·4 μF
C6	= 200 $\mu\mu$F
C8	= 50 $\mu\mu$F
C9	= ·00305 μF
C12, C25	= 100 $\mu\mu$F
C13	= 500 $\mu\mu$F
C14	= ·025 μF
C15	= 20 $\mu\mu$F
C16	= 3 $\mu\mu$F
C17	= 110 $\mu\mu$F
C18	= ·003 μF
C19	= 15 $\mu\mu$F
C22	= 500 $\mu\mu$F
C23, C24	= 8 $\mu\mu$F
S1	= BFO switch
S2	= Send/Receive switch
S3	= On/Off switch
T1	= Output Transformer
T2	= Mains Transformer
R1, R12	= 390 ohms
R2, R3	= 25,000 ohms
R4, R10, R19	= 1,000 ohms
R5	= 22,000 ohms
R6, R11	= 39,000 ohms
R7	= 46,000 ohms
R8	= 220 ohms
R9	= 53,000 ohms
R13	= 10,000 ohms
R14	= 20,000 ohms
R15	= 100,000 ohms
R16	= 470,000 ohms
R17	= 50,000 ohms
R22	= 7,500 ohms, 6 watts
L1	= Aerial coil
L2	= RF coil
L3	= Osc. coil
V1	= ARP34(EF39)
V2	= ARTH2(ECH35)
V3	= ARP34(EF39)
V4	= AR21(EBC33)
V5	= AZ31(rectifier)

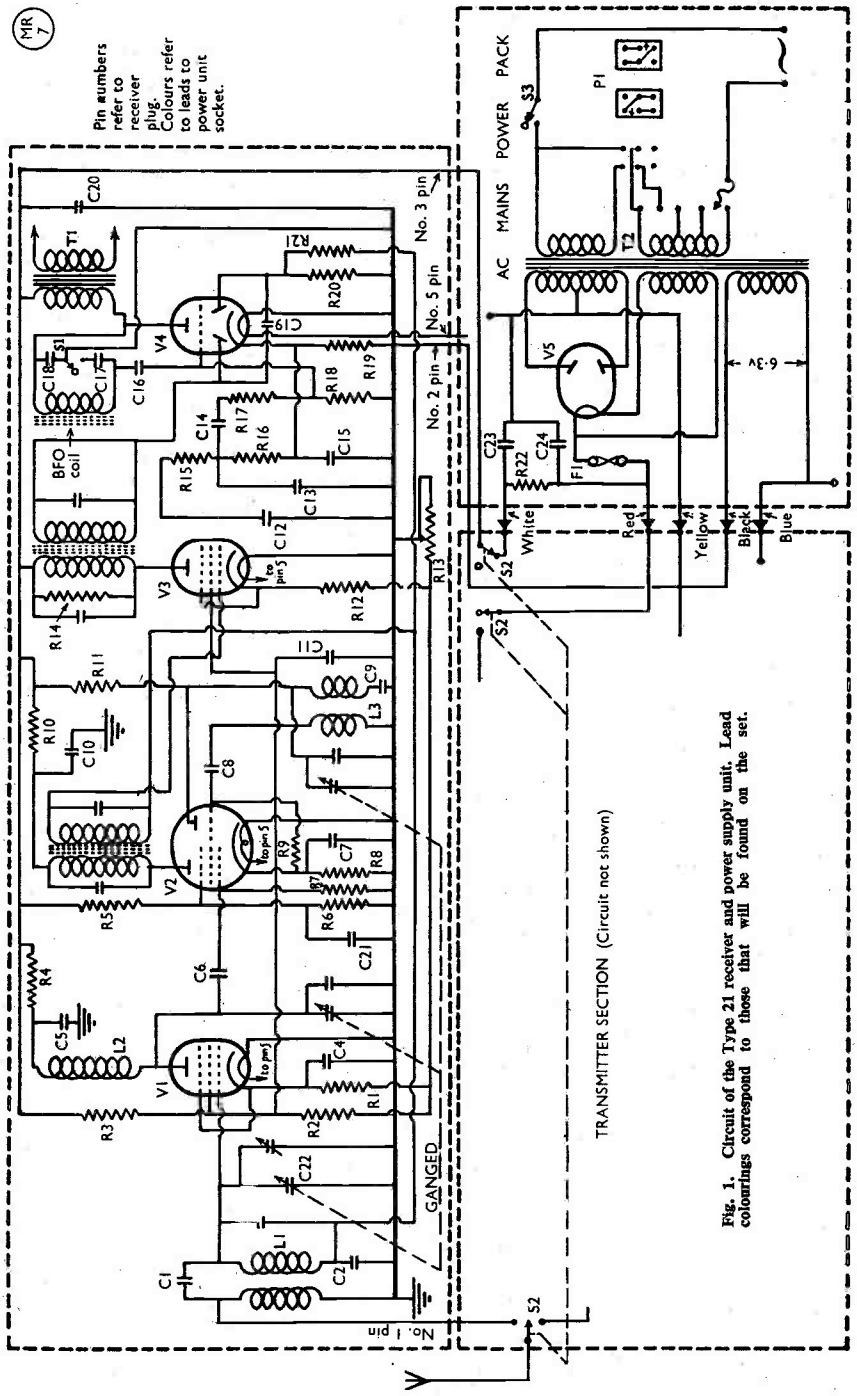


Fig. 1. Circuit of the Type 21 receiver and power supply unit. Lead colourings correspond to those that will be found on the set.

The three coils L1, L2 and L3 are built into the set and tuning is carried out by the three-gang condenser C29. The range covered is 3-8 mc and a small 30-1 reduction drive operates on the frequency calibrated dial. The receiver is very compact as there is no coil switching; it measures 10-in. × 6-in. × 5 -in. Sensitivity is given as 1 microvolt for intelligible CW.

The AC power unit measures 5-in. × 7-in. × 4-in. and is contained in its own metal case with an on/off switch, voltage adjustment panel, and panel-type fuse holder. It will give more power than is required for the receiver alone and so an output stage may be added to feed a speaker, of which more will be said later. In its original form the receiver requires 25 mA at 250 volts and 1·2 amps. at 6·3 volts. The full-wave rectifier is an AZ31 and smoothing is carried out by the resistance R31 and condensers C26 and C27.

Conversion

So much for the apparatus as it is purchased. Now let us turn to the work of conversion. The author decided to extend the frequency range by making provision for plug-in coils in place of the existing fixed set. The coils L1, L2 and L3 were accordingly removed, notes made of the connections, and the loose wires carefully labelled. L1 was originally mounted horizontally on the panel end of the three-gang condenser, L2 was situated between V1 and V2, and L3, the oscillator coil, was mounted on the underside of the chassis below the three-gang. The associated trimming condensers were also removed, the aerial trimmer being on the top of the gang condenser whilst the oscillator and RF trimmers were below the chassis. The fixed padding condenser C9, having a value of ·00305 μF, was easily identified and removed. The coupling condenser C6 and the grid resistance R7 were mounted on the former of coil L2 and consequently were taken off with it. There is not sufficient room in the set for the standard type of 4-pin plug-in coils and it was consequently decided to use Wearite P-type coils mounted on 4-pin bases removed from old valves. Sets of these coils were bolted to 4-pin valve bases and 1¼-in. diam. paxolin coil formers were fitted inside the bases to serve as a protection to the coils and to accommodate the trimming and padding condensers. It was not difficult to find sufficient valve bases of such a size that the 1¼-in. diam. formers would fit tightly inside after a little scraping with a sharp knife. The use of an adhesive was found to be unnecessary. The completed coils are shown in the photograph.

The use of octal bases would have been preferable had they been obtainable as the spigot would facilitate coil changing. Nevertheless it would have been necessary to drill the spigot for the coil fixing screw.

Coils

The original coils were of course used again for the 3-8 mc range and the P-type coils obtained for the 8-25 mc and medium wave ranges. Other ranges can naturally be used, and Table 1 shows the frequencies covered by the full range of coils and the actual trim-

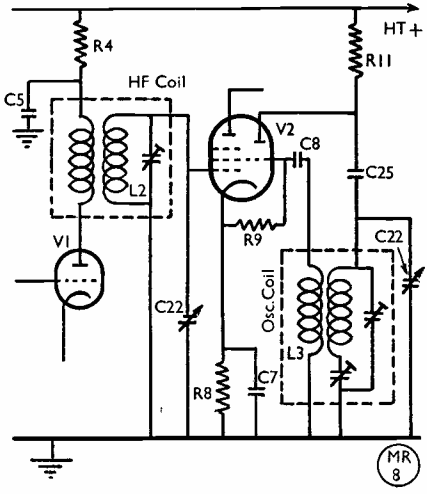
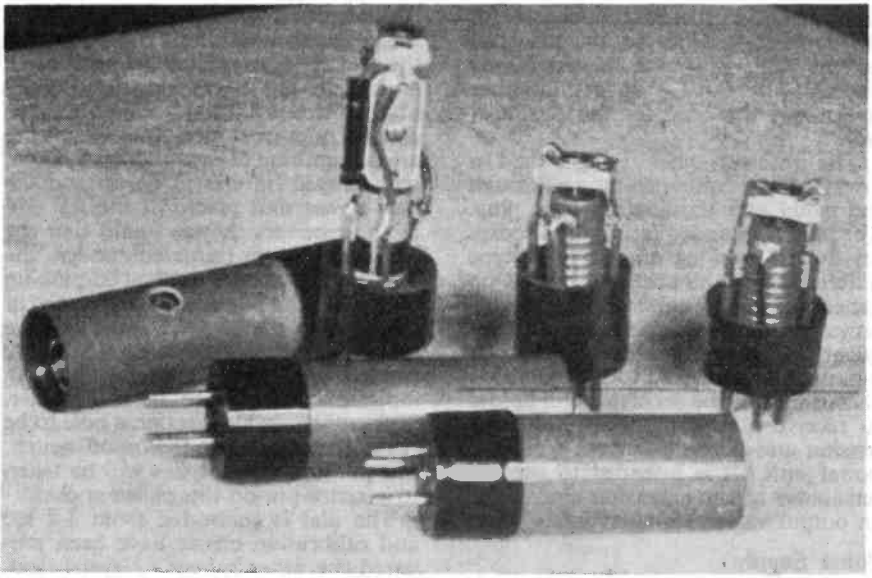


Fig. 2. Alterations to the circuitry around V1 and V2. Note the 100 $\mu\mu$F condenser C25, inserted in the oscillator plate lead as a precaution against trimmer or padder condenser shorting on L3.



Showing the method of mounting the coils. Valve bases are used, with a paxolin tube to protect the coil. Note the hole in the tube for adjusting the padder.

ming and padding capacities required. It will be found that the existing coil L2 has only a single winding, and so to bring it into line with the P-type coils a primary winding was added of half the number of existing turns. It was put on between alternate turns of the existing winding with DCC wire. The circuit alteration is shown in Fig. 2.

Trimmers for the aerial and RF coils were soldered to the tags of the secondary windings and they sit firmly on top of the coils. In the case of the oscillator coils provision had to be made for the fixing and adjustment of a padding condenser. The photograph of the coils shows how the adjustable padding condenser and its fixed parallel condensers were soldered to one tag of the coil with the trimmer mounted on top of the whole assembly. The trimmer can thus be adjusted from above and the padder through a hole drilled in the surrounding paxolin tube. The connections were made with 16-gauge wire and the assembly is quite rigid and remains in position during ganging operations.

Chassis type paxolin valve holders were mounted above the chassis on spacers for the aerial and RF coils, and can be seen in the interior view of the receiver. As provision was made for a dipole aerial condenser, C1 was omitted when reassembling the existing coils, with no noticeable difference in performance. The underside of the chassis is fitted with a removable cover plate, and to avoid interaction with the wiring, the leads to the aerial sockets were taken outside this plate and through the chassis to the aerial coil holder. The cover plate can still be removed by sliding it out from underneath the aerial leads.

Oscillator Coil

The existing oscillator coil was mounted below the chassis, and so it was necessary to arrange for the new coils to plug into a holder on top of the chassis. There was no room for this, so the chassis had to be extended 1½-in. to provide for the new coil holder. An extension chassis 1½-in. wide by the full length of the set was added and

holes drilled in the existing chassis for the connecting wires to the new coil holder. This is shown in two of the photographs. An L-shaped aluminium screen was provided for the oscillator coil.

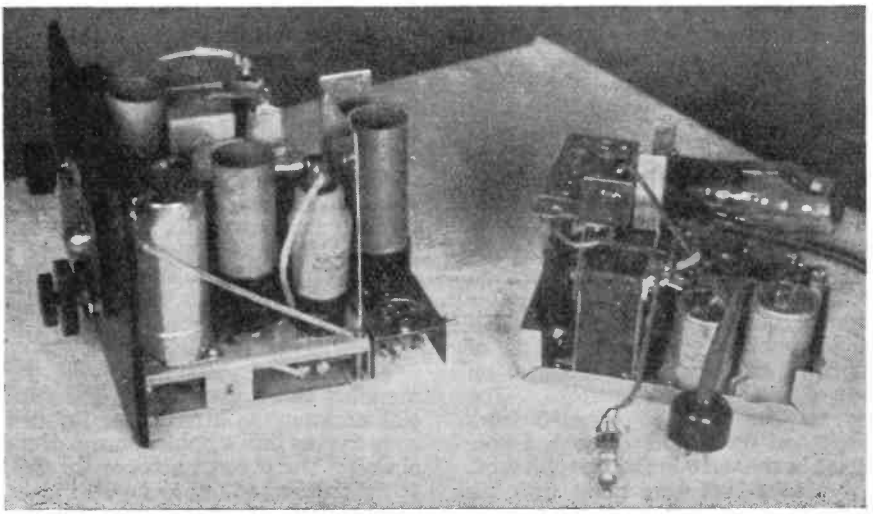
The receiver when bought had a 5-way rubber cable projecting through the panel and terminating in a plug. The plug is intended to fit into a socket on the transmitter and is of a type different from the socket provided on the end of a short cable attached to the power unit. These plugs were consequently removed and discarded. A 4-pin socket was fixed to the extension chassis next to the oscillator coil holder to receive a new plug carrying high tension and filament current from the power unit. It is intended to use the remainder of the extension chassis for an output valve at a later date.

Power Supply

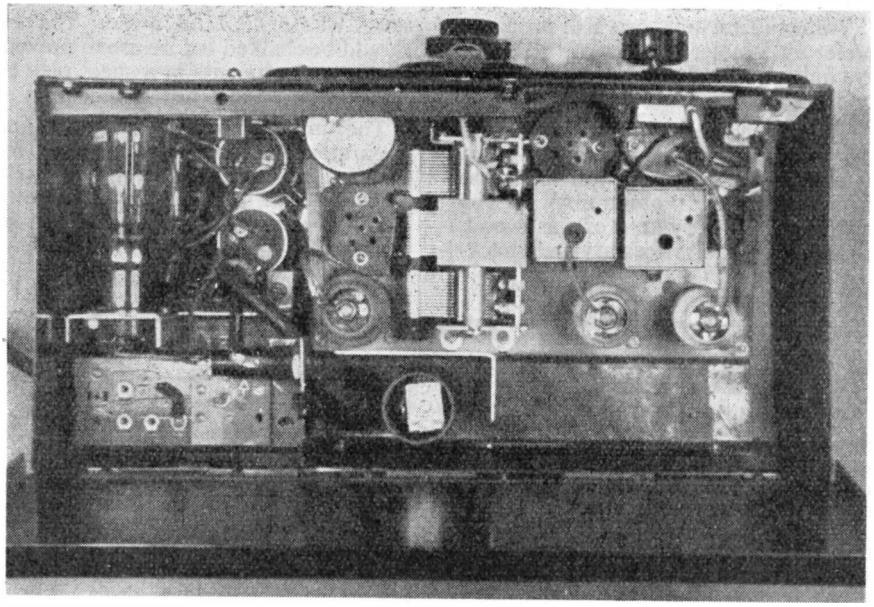
The power unit can be used without alteration except for the new plug, but the author wished to house the whole assembly in a single case. The unit was therefore dismantled and reassembled to a more convenient layout with the addition of a smoothing choke and a further electrolytic condenser. With the original power unit the output to the headphones was reasonably free from hum, but it was considered desirable to add additional smoothing to ensure hum-free reception when the aluminium case 13½-in. × 7-in. × 6½-in. with hinged lid was made up and the new power unit placed at the RF end of the receiver. It was found that the LF transformer situated under the RF/IF gain control was apt to pick up hum when the power unit was placed at that end of the set. The space above the power unit next to the rectifier valve can be used for a magic eye tuning indicator which is to be fitted later. This will be visible through a hole to be cut in the case above the on/off switch. The control wire for this will be taken to a spare pin on the power socket.

The dial is calibrated from 3-8 mc and calibration charts have been prepared for other ranges. Nevertheless, the author suggests that a pointer should be fitted to the back of the dial and a scale fixed to the panel on which all ranges may be marked in megacycles.

A logging dial marked from 0 to 100 was attached to the larger of the slow motion knobs, and this provides a



The receiver chassis and, on right, the power unit. The small extension to the chassis, as described in the text, can be seen with the meta screening for the oscillator.



Looking into the receiver as modified. Rectifier valve on left, V1 in the first can at top with V2 in line below and the RF coil socket between them, aerial coil socket to the top right, and oscillator coil behind the screen along the lower edge. The space to the right of this screen could be used for an additional output stage.

useful degree of band spreading. This, however, is not shown in the photographs.

Suggestions

The following suggestions may be of interest to amateurs thinking of undertaking similar work.

For loud speaker reception with the output stage added the AVC system might be improved by feeding the screen of the IF amplifier through a 100,000 resistor instead of from the fixed potentiometer as at present. An additional 0·1 μF fixed condenser for decoupling would be required. The gain control could then be made fully automatic by the removal of R13. This could be replaced by a 1·0 megohm LF control in place of R18.

TABLE 1.

Coil	Range (metres)	Ac and RF Trimmers	Oscillator Padders	Oscillator Trimmers
P.A.1	700–2000	72	150	95
P.A.2	200–557	65	450	76
P.A.3	16–47	55	5000	50
P.A.4	12–34	60	5000	60
P.A.5	34–100	60	2400	60
P.A.6	91–261	60	900	65
P.A.7	250–750	60	350	73

Note.—Values are in $\mu\mu$F. Coils used are Wearite P-Type with original coils for 3-8 mc (34-100 metres) range for which set is designed.

Transmitting amateurs will probably prefer an S-meter in place of the magic eye indicator, and room for this should be found in the same position.

Those who have not tried metal work should not be deterred from attempting the construction of a case from 18-gauge aluminium. The material is as easy to work as wood, and the only tools necessary are a hack-saw, twist drills, and a file. The file should be chalked before use to prevent clogging. Long cuts in a sheet may be made with a fine tenon saw.

The total cost of the original apparatus and the parts required for conversion amounted to approximately £6 and it will be agreed that the completed receiver is good value for so small an outlay.

R.C.M.F. BULLETIN No. 1

Issued by the Radio Component Manufacturers' Federation, this one contains some interesting correspondence between two member-firms on the relative merits of co-axial and balanced twin-line for connecting television aerials. The contentions are that while co-ax gives better signal strength, balanced twin-line improves the signal/noise ratio.

Other contents in this issue cover the discussions of various Panels responsible for arriving at standardised component specifications; when one sees that such factors as the minimum withdrawal force required to extract a valve from its holder, the pin contact resistance at VHF, and the insulation test conditions for valve-holders are carefully argued, one appreciates the enormous amount of patient and valuable work these Trade organisations undertake in the general interest.

And in the course of a short article on "Metallic Resistive Materials," the author makes the point that there is no such thing as a "non-conductor," which is an impossible absolute—it is simply that some materials are less conducting than others. A point worth remembering in our own work.

AUSTRALIAN NOTE

Don Knock, VK2NO, who does the "Calling CQ" column in the *Australasian Radio World*, has joined us on the Keep it Clean theme. It seems that the VK's are just as much afflicted with bad behaviour and poor operating technique as we are—VK2NO says that things are worse now than in 1938, and that a few irresponsibles are doing Amateur Radio much harm in Australia.

CRYSTAL EXCHANGE

With reference to the notice in the April issue ("Here & There," p. 116) below are the latest offerings. Insertions made are free, but must be confined to exchange only. Please set out requests in the manner shown. All negotiations should be conducted direct.

G2DDM, 34 Birch Avenue, Romiley, Cheshire.
Has 1850 kc unmounted P5 unit. Wants 7010 kc, or within 5 kc either way.

G3AEM, 118 Pilton Street, Barnstaple, N. Devon.
Has 7234 and 465 kc (in holder). Wants 3550 kc or near.

G3AQB, 17 Belgrave Crescent, Blyth, Northumberland.
Has 1850 kc. Wants 7020 kc or near

G3ASJ, 36 Volta Street, Selby, Yorks.
Has 7243 kc. Wants 3.5 mc crystal.

G5DU, 77 Blackwell Avenue, Walker, Newcastle-on-Tyne.
Has 3590 kc. Wants 7010 kc, or near.

G6BB, 35 Criffel Avenue, London, S.W.2.
Has 7070 kc. Wants 7050 kc, or near.

SWL, 4 Gothic Street, Rock Ferry, Cheshire.
Has Hallicrafters CX1 2300 kc. Wants 100 or 1,000 kc.

OLD-TIMER YL

Miss May Smith, W1BDN, who started on the air in 1920 and is still active on 3·5, 14 and 28 mc with 225 watts CW and 'phone, is believed to be not only the longest-licensed YL operator but also the oldest in point of years. She will be 80 next birthday and as far back as 1880 was a line-telegraphist in New York. We offer our respectful congratulations, and acknowledge W1NVP's column in March *CQ* as the source of this item.

Simple Modulator for CO/PA Transmitter

Speech with the 'Two-Valve Job'

By E. R. WESTLAKE (G6KR)

(In August last, our contributor described an effective CO/PA arrangement under the title "Two-Valve Job for 160 Metres." This design has proved very popular and some further notes on it, discussing CW operation on other bands, appeared in the October issue. The article below describes a suitable modulator for this same transmitter.—Ed.)

THE modulator discussed here is complementary to the CO/PA transmitter described in the *Short Wave Magazine* for August last, and primarily, was designed for anode modulation. As the PA in this particular case is a tetrode, care must be observed to ensure that the anode and the screen of the valve are modulated simultaneously. This can be effected by a jack in the common lead of the anode and screen of the PA, and, to make this clear, part of the circuit of the CO/PA has been redrawn. In the event of the PA screen current being derived from a potentiometer, one end of which is earthed, it will be necessary to replace this by a series dropping resistor of the correct value in the HT line, as shown in Fig. 1, otherwise trouble may be anticipated.

Modulator Circuit

As to the modulator itself, the input valve is a high-gain triode, with an indirectly-heated cathode, and this valve is resistance-coupled to a medium power tetrode. The amplification factor of the H63 triode is 100, the impedance being 6,600 ohms and the mutual conductance 1·5 mA/V. These figures ensure a high initial drive to the succeeding KT66 in the final stage. These two valves are standard GEC products, their American equivalents being the 6F5G and 6L6 respectively.

From the circuit of the amplifier it will be seen that the microphone input is well screened and special attention should be paid to this during construction ; if possible, the microphone transformer, battery and input RFC should all be enclosed in a small metal box, and this in turn must be properly earthed. Screened leads between the microphone itself and the amplifier help to prevent feedback, and it is recommended that the connections to the modulating transformer should also be screened and the braid or other metallic cover bonded to the common earth line. Provided that attention is given to the foregoing details, the lay-out of the valves and other components do not call for any comment. A carbon microphone is quite suitable for ordinary speech, and quality can be very good.

Matching

As is usual with any form of amplifier, the output transformer should be a fairly close match to the output valve, otherwise audio wattage will fall off considerably. The ratio of primary to secondary in the modulating transformer should be such as to give a 1-to-1 ratio, but this figure needs adjusting if the HT voltage is much higher or lower than that indicated on the diagram. If a multi-ratio matching transformer is available so much the better, with the proviso that the windings should be capable of carrying the respective anode currents of the audio equipment and of the transmitter PA. The power supply to the modulator should give an output of 350v. HT, with 6·3v. amp. for heater current. Total HT consumption is in the region of 80 mA, and of this the H.63 will only take 2 mA maximum.

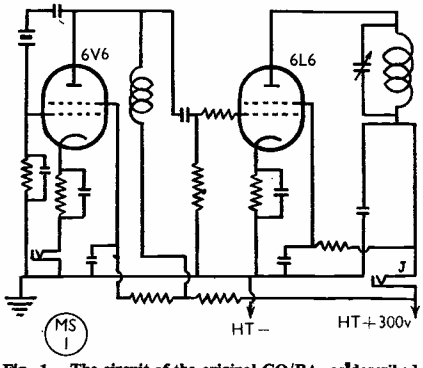


Fig. 1. The circuit of the original CO/PA, as described in the August issue. For anode-and-screen modulation of the 6L6, it is essential that jack J be wired as shown. The modulator circuit is given in Fig. 2. Cathode control can be applied by breaking the cathode of the 6L6 and connecting the modulator output across the break.

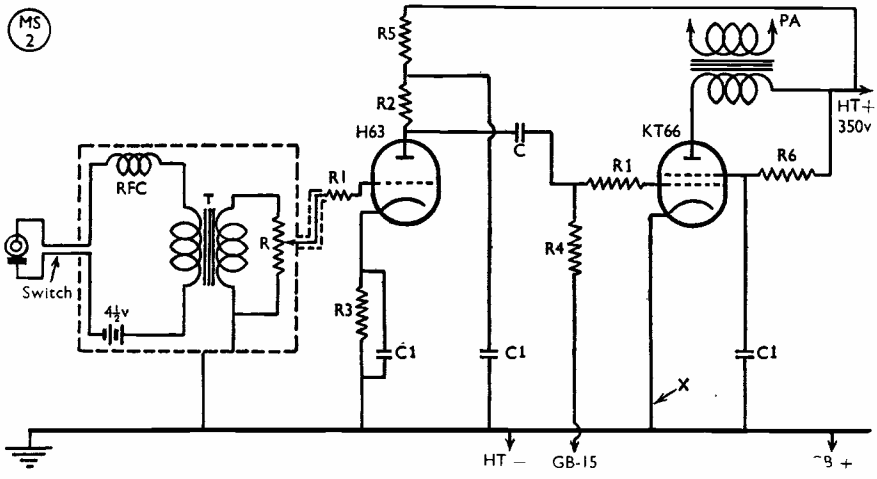


Fig. 2. Circuit of the modulator. A carbon microphone is shown, for which one stage of speech amplification (H63) is sufficient. This would not give enough gain with a crystal microphone, for which an additional stage (and some re-design) would be necessary. If self-bias is desired, a 3-watt resistor of 170 ohms, by-passed with 25 μF, can be inserted at the point " X " in the cathode lead of the KT66.

Bias

Grid bias is derived from a battery and this is quite as cheap as a combination of resistor and by-pass condenser, particularly as the bias resistor would have to carry a comparatively high current. If however it is decided to utilise the voltage drop across a resistor its value should be 170 ohms, and whilst a 2-watt rating would suffice, a 3-watt would give cooler working.

Although good results have been obtained by anode modulation, it is suggested to the experimentally inclined reader, that cathode modulation be given a trial; this can be achieved by breaking the line to the cathode of the PA below the 6L6 bias resistor in the diagram of the CO/PA (Fig. 1). The two terminals of the output transformer are then taken to the two ends of this broken lead and the microphone and the remainder of the equipment used in the normal manner. When trying this form of modulation it will be found that the amplifier gain must be cut down considerably, otherwise the PA will be overloaded.

Table of Values

Two-Stage Modulator

C	=	0·1 μF.
C1	=	2 μF.
R	=	250,000 ohms.
R1	=	5,000 ohms, 1 watt.
R2	=	50,000 ohms, 1 watt.
R3	=	2,000 ohms, 1 watt.
R4	=	500,000 ohms.
R5	=	150,000 ohms, 1 watt.
R6	=	7,000 ohms, 2 watt.
T	=	High-ratio (60 or 90 : 1) microphone transformer.

STANDARD FREQUENCY TRANSMISSIONS FROM WWV

Station WWV, of the American National Bureau of Standards, makes continuous transmissions on 10, 15, 20, 25, 30 and 35 mc, modulated with a 440-cycle tone. The 10-25 mc transmissions are also modulated with 4,000 cycles audio. The station announces itself on telephony every hour and half-hour, and at 20 and 50 minutes past the hour, either 6 W's or 8 N's may be heard in Morse. The former indicates that an ionospheric disturbance is in progress or anticipated, and the 8 N's that everything is normal.

All the frequencies used are to an accuracy better than 1 in 50 million. The 35 mc signal, radiated at an output power of 100 watts, is a useful check on general VHF conditions across the Atlantic.

Transmitter HT Feed

Discussing Three Methods

By **J. H. HUM (G5UM)**

The vast majority of short-wave transmitter designs appear to favour the use of series feed in preference to parallel feed in the anode tank circuit. Generally, the circuit diagram will be as shown in Fig. 1. As a possible refinement an RF choke may be inserted at X. It is desired to show that series feed is not necessarily the best method to adopt, and that alternatives exist which are well worth considering.

Now series feed would seem to be favoured for a number of reasons. First of all, it puts the tuned anode inductance "near" to the anode itself from an RF point of view. In fact, being connected directly to the anode it could hardly be much "nearer"!

A second reason for the preference for series feed dates back many years to the time when good quality blocking condensers and radio frequency chokes—which are essential in the alternative system of parallel feed—were not readily available. The result was that parallel feed gave a poorer performance than series feed.

Comparisons

In this respect the writer well remembers his first experiments with crystal oscillators twenty years ago. He was anxious to compare outputs obtainable from a 160-metre CO, using alternative systems of series and parallel feed. With series feed no difficulties whatever were encountered. With parallel feed the oscillator would not start at all until a really efficient RF choke had been substituted for the existing one and a good quality mica blocking condenser obtained—not so easy then as it is nowadays. In spite of this, performance was still below that given by a series feed oscillator.

No doubt other experimenters have had a similar experience, and this—coupled with the point mentioned regarding the coil being "nearer" the anode—has undoubtedly influenced them in favour of series feed.

But in these days of metal chassis, the use of series feed has one great disadvantage. It demands the very careful insulation of the variable condenser spindle from the metal panel. Constructionally, that is often a nuisance. Electrically, it introduces the danger of a breakdown particularly if, at a later date, higher power is employed than that for

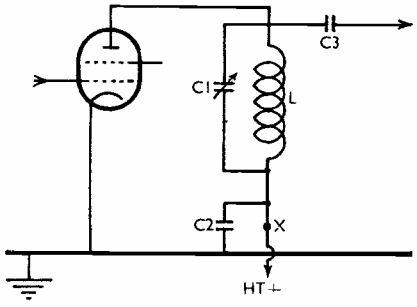


Fig. 1. Standard series-feed circuit. An RF choke is sometimes inserted at X, but is not essential. In this circuit, both sides of C1 must be well insulated.

which the transmitter's safety tolerances originally allowed. Under peaks of modulation, especially, are poorly-insulated condenser bushes likely to fail.

In these days, then, an almost unshakeable argument can be made out for parallel feed, where the variable condenser is at earth potential for DC. Fig. 2 shows a typical circuit of a parallel-fed tank circuit.

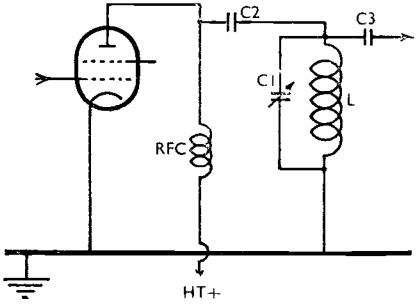


Fig. 2. The normal parallel-feed arrangement. The RF choke becomes a vital factor and C2 must withstand the HT. But one side of C1 is earthed, easing the constructional problem where a metal chassis is used.

Unshakeable argument, did we say? Right, let's try and shake it !

We can put our finger on the weaknesses of this circuit without any difficulty at all. *The weaknesses are precisely the same in this year* 1947 *as they were when such circuits were first evolved*, namely, in the use of a blocking condenser and an anode feed choke. This blocking condenser is in the " hottest " lead of the circuit, and must pass the whole of the generated RF without loss.

In addition, it must withstand the full HT voltage. In the series feed arrangement the condenser in the anode circuit is at the " cold " end of the coil and merely acts as a by-pass decoupler.

Similarly, the RF choke must be good enough to prevent the generated RF from straying into the HT line in the parallel feed arrangement. In the series feed circuit the choke, if used at all, is " cold " for RF. Indeed, as we have seen, it is almost superfluous.

Constructors will naturally weigh these disadvantages of parallel feed against the disadvantage of having to insulate the condenser when series feed is used, and against the fact that in series feed the condenser spindle, carrying the full HT voltage, is a source of danger.

Compromise Method

Now, it is possible to employ a system which combines the best of both methods. It is illustrated in Fig. 3. For want of a better term the writer suggests that it be known as " series-parallel " feed, which electrically is precisely what it is. In Fig. 1 coil and condenser are in series with the valve and its HT supply. In Fig. 2 they are paralleled across the valve. In Fig. 3 the coil is in series and the condenser in parallel with the valve.

If at a first glance the reader concludes that the coil and condenser are in series then he would be advised to look again ! For the " cold " end of the coil is at earth potential (*via* the decoupling condenser C1). So is the rotor of the tuning condenser C2. Therefore, the coil and condenser, so far as RF is concerned, are in parallel. Coil and condenser tables will hold for this arrangement just as they do for the more conventional circuits. To prove this point the writer's 10-metre PA stage was rewired to " series-parallel " feed. The coil and condenser settings remained exactly as they were under the former parallel feed system.

The charm of this circuit is that the tuning condenser spindle is at earth potential yet the inductance is still as " near "

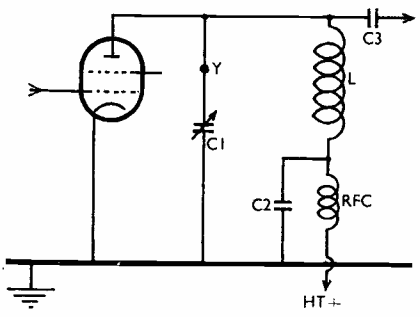


Fig. 3. Series-parallel feed, the modification suggested by G5UM. C1/L are effectively in parallel via C2, and the circuit tunes quite normally. One side of C1 can be earthed and the DC voltage across it removed by inserting an additional series condenser at Y. It is necessary to provide a good RF path from C1 through C2 to L, since the RF circulating current flows in this part of the circuit.

to the anode as it could possibly be. The fixed plates of the condenser, being connected to anode, remain at a high potential. This high voltage can, however, be removed from them by the simple expedient of inserting a good quality fixed condenser at point Y in Fig. 3. Another advantage springs from this arrangement ; if all DC voltage is removed from C1, the rating of this condenser may be reduced considerably, and a receiving type component should be adequate for inputs of 50 watts or so.

When connecting this safety condenser at Y the constructor will be well advised to select one equal in value to that of the tuning condenser. If both are, say, 100 $\mu\mu$ F, the two in series will total 50 $\mu\mu$F. This results in conveniently round figures, which, in turn, facilitate calculation of L and C values in the tuned circuit.

It will be observed that a choke is included in the anode circuit of Fig. 3—in spite of our statement earlier that it was superfluous when used in the almost similar series-feed arrangement. Practical experience dictated the need for this choke. Tests were performed without it, and on 28 mc a distinct drop in efficiency resulted. In actual practice two RF chokes can be used in series in this position. The one nearest to the inductance is a good quality section-wound transmitting type.

Although the diagrams depict various forms of anode feed as applied to an early stage in a transmitter (say a CO), the methods shown are obviously applicable to a final amplifier. In that position, of course, condenser C3 is omitted.

The Quartz Plate

Selection and Manufacture

By F. BURNS

Most of us who are interested purely in Amateur Radio have not very much time for delving into the whys and wherefores of the theory which applies to a small piece of the glass-like substance called quartz. It is here intended to touch upon the more useful and interesting part of it, which might be helpful to the newcomer to the amateur world.

In order to obviate confusion as much as possible, the word "crystal" will be applied to the raw quartz as illustrated in Fig. 1. "Blank" will be applied to the finished resonator shown in Fig. 2, and it is this which we purchase for use in controlling our oscillators.

It has been found that of all piezo-electric materials, quartz produces the best results for use as a frequency control due to its being physically stable and having a very low temperature coefficient; quartz maintains its frequency far better than almost any electrical component.

Types of Crystals

The crystals themselves are divided into two distinct types: They can be either "right-handed" or "left-handed" stones, but both types can be used for the same purpose, as it is only the manner in which they are cut that decides the frequency and the temperature coefficient of the finished article.

A right-handed crystal can easily be distinguished from the left-handed one by the position of the major faces with respect to the minor faces. The prism faces are called "m" faces; major faces (or terminations), "r" faces; and the minor faces are "z" faces. If the minor faces are on the right-hand side of a major face then the crystal is right-handed. Similarly, if the minor faces are on the left-hand side of the major faces, the crystal will be left-handed. There are other minor faces called "s" faces, but these are not very often seen. Both types of crystal are identical except that one is formed with its faces in a plane 180 deg. to the other. The crystal illustrated in Fig. 1 is a left-handed crystal. As will be seen in this figure, all the faces are given a name, this being the commercial method of referring to the faces.

Piezo-Electric Action

If a slab of quartz is taken and subjected to a stress, it will be found that due to the mechanical deformation, a separation of the centres of gravity of the positive and negative charges in each molecule takes place and thus is generated a dipole moment in the molecule. The effect of this is to produce a positive and negative charge on opposite faces of the slab. Conversely, if an electric field is applied to the slab, the quartz will be deformed and if this field is oscillatory the slab will oscillate mechanically. The frequency of oscillation of a blank is dependent upon several things: The thickness of the finished blank, the ratio of its length to width, and the angle at which it is cut to the X-, Y- and Z-axis of the crystal.

Before a blank or a series of blanks can be cut from the crystal it is necessary to carry out certain tests in order to discover whether the crystal has any of the flaws mentioned below:—

Twinning: there are two types, optical and electrical twinning. The former can be detected by the naked eye but the latter has to be checked by electrical methods or by etching. Optical twinning is caused when both a right-handed and a left-handed quartz have grown in the same crystal. Electrical twinning is due to a reversal of polarity in some parts of the crystal.

"Rain" denotes planes of small bubbles distributed through the crystal. "Ghosts" are caused by a cessation of growth and re-growth.

There are several other flaws which occur in quartz, but those mentioned are the main ones which are encountered. When cutting the blanks, all these flaws have to be avoided, so it will be seen how quite a large portion of a crystal can be turned to waste.

The Axes

To simplify matters, crystals are given three main axes, the principal one being called the Z-axis, which passes vertically through the crystal; the X-axis passes through the corner of a prism and the Y-axis perpendicular to an "m" face.

A "Z" cut slab, therefore, will be a slab cut in relation to the Z-axis; similarly, for the X and Y cuts, except that they will be cut in relation to their own axes. The three cuts mentioned are shown in Fig. 3, but other types of cut are used such as the "AT" and "BT," which produce plates with exceptional temperature coefficient characteristics.

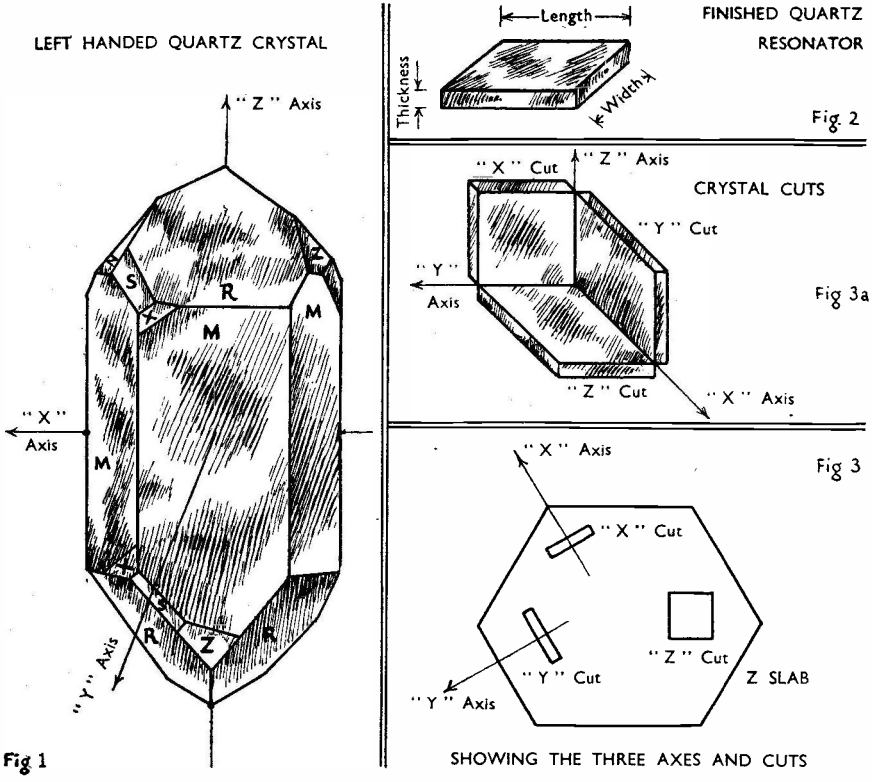


Fig 1 SHOWING THE THREE AXES AND CUTS

As has already been mentioned, one of the most important factors in deciding the natural frequency of a quartz resonator is the thickness of the slab or blank. The higher the frequency the thinner must be the blank or plate. Eventually, a stage will be reached when the blank will be too thin for practical use as it will be mechanically weak. In a case like this, instead of, say, using a pure X cut, the blank will be cut at some calculated angle from the X-axis, and the final result will produce a blank with the same natural frequency but a greater thickness than the one in the X plane. It will be seen here that the angle of cut can make quite an appreciable difference to the frequency of a resonator.

Manufacture of Crystals

To cut the blank from the raw quartz at the required angles calls for a considerable amount of skill, and will only be described very briefly here. The crystal is fixed on to the bed-plate of a diamond sawing machine after it has been set up to the required orientation and a "z" slab cut. From the "z" slab can now be cut the necessary blanks in the same manner. For other than X or Y cuts the "z" slab will have to be tilted to the necessary angles calculated for them.

When the blank has been finally sliced to approximately the correct frequency it is ground down to a finer limit by a process sometimes known as "lapping." The blank is revolved between two heavy steel plates fed with a mixture of some type of abrasive material for a period calculated to have ground away enough quartz to bring the frequency as near as possible to the required standard. The blank is then "etched" until spot-on frequency is reached. Etching is carried out by immersing the blank in an acid solution electrically heated. When the crystal has been brought to the correct frequency it is cleaned and fitted into its holder. There are many types which could be discussed but the subject of crystal-holders, air-gaps and mounting methods is one for a separate article.

The Synchrodyne Receiver

New Method of Reception

By **D. G. TUCKER, Ph.D., A.M.I.E.E.**

We are indebted to the Editor of "Electronic Engineering" for permission to reproduce the article below. The principle put forward by its author, who is on the staff of the GPO Research Station, offers great scope for experiment on the short wave bands and thus will be of interest to many readers.—Ed.

A RADIO receiver is generally of either superheterodyne or "straight" type, and in any case effects demodulation of the incoming modulated carrier-wave signal by a process of rectification. Selectivity, or discrimination against unwanted signals, is obtained by means of tuned circuits or band-pass filters inserted in either the radio-frequency or intermediate-frequency sections of the receiver. It is essential to effect the discrimination before demodulation, since otherwise all signals are equally demodulated, and the modulation-frequency output signals become entirely unseparable. It is generally quite difficult to design the selective circuits to give a good discrimination against unwanted signals, while at the same time producing negligible distortion of the wanted signal. Thus selectivity and quality are mutually incompatible requirements of design.

Synchrodyne Principle

This difficulty can be overcome, and a considerable simplification of circuit detail effected, by a process of demodulation whereby the incoming signal is, without any filtration, demodulated, not by rectification, but by modulation with a frequency equal to its own carrier frequency. The modulation-frequency output of the wanted signal is then obtained correctly, but all other signals become high frequencies relative to the modulation frequency, and can be separated as far as desired by a low-pass filter in the output circuit. A low-pass filter is easily designed to give a very much better pass-band response than a band-pass filter for a given bandwidth and discrimination. Quality reception is now, therefore, quite consistent with high discrimination.

To obtain the frequency for demodulation, which must be the same as the carrier frequency to the wanted signal, it is not possible to use a free oscillator. Any difference between the two frequencies shows up as a beat in the output signal, which is generally intolerable.

The method of obtaining the correct frequency is to synchronise the demodulating oscillator to the incoming carrier by injecting some or all of the received signal voltage into the oscillator circuit. Providing the voltage relationships in the circuit are correct in relation to the circuit parameters, the output of the oscillator will be a relatively pure tone of frequency equal to that of the carrier, with the sideband and other frequencies substantially suppressed.

This property of the synchronised oscillator may be described as amplitude discrimination in the non-linear regenerative circuit, since all frequency components of lower level than the wanted carrier are automatically suppressed by a considerable amount, 30 dB suppression being readily achieved.

In addition to the amplitude discrimination due to non-linearity, which is independent of the frequency of the various signal components, there is also, of course, the frequency discrimination due to the tuned regeneration in the oscillator, and this is very effective in regard to unwanted signals other than the sidebands of the wanted carrier. It is important that this frequency discrimination should be suf-

ficient to reduce all unwanted signals to a level below that of the wanted carrier, since otherwise the powerful amplitude discrimination effect cannot be utilised. If the unwanted signals are too strong for this, then additional filtration can be provided in the synchronising path before the injection into the oscillator circuit is effected. No restriction of frequency band in this path has any effect on the quality of the output signal.

Circuits

A block schematic of a typical arrangement is shown in Fig.1. This is mainly self-explanatory, and is in accordance with the account given above. Two additional features are shown, however, viz. :

(1) Very broad-band tuning may be applied to the input, if required, and ganged to the oscillator tuning control This will have negligible effect on the quality of the demodulated signal, but will prevent strong stations elsewhere in the frequency spectrum from overloading the receiver and thus becoming demodulated by rectification.

(2) AVC may be applied, if desired, by the utilisation of the DC component in the output of the demodulator; this component has an amplitude proportional to that of the carrier of the input signal.

Test Results

The principle has been adequately tested in practice A typical test which demonstrates the effectiveness of the method was as follows:

The BBC transmitter on 877 kc was received at a level of about 0·07 V at the input. A signal generator was set at 867 kc with a 30 per cent. modulation at 400 c.p.s. adjusted to roughly the same level, and also applied to the input of the receiver. When the oscillator was tuned approximately to 877 kc, with sufficient injected signal to give a synchronised frequency range of about 0·2 per cent. (i.e., about 1 to 2 kc), the broadcast programme was heard with the 400 c.p.s. tone from the signal generator about 50 or 60 dB below the programme level—i.e., almost imperceptible. When the oscillator was tuned to about 867 kc, the 400 c.p.s. tone was heard with the programme just about imperceptible; when the modulation was removed from the signal generator, so that silence should be obtained in the receiver output, the broadcast programme was just perceptible. The circuit used in this test was as shown in Fig. 2 ; it was more or less the simplest possible.

Operation

The operation of the circuit by the user is very simple. The oscillator

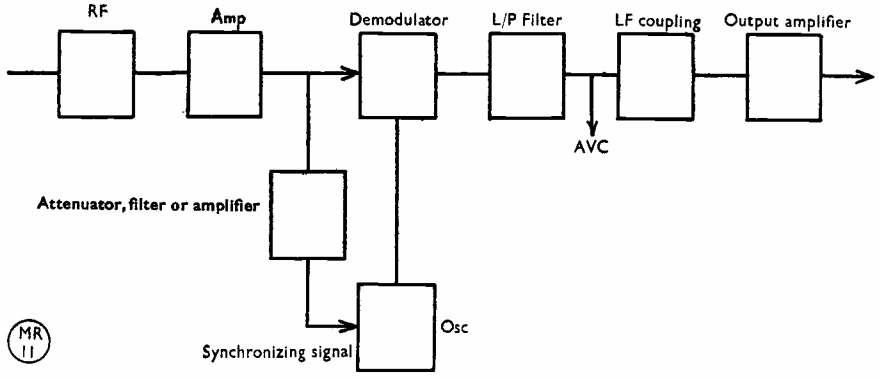


Fig. 1. Block schematic of the circuit arrangement. The attenuator-filter-amplifier element in the synchronising circuit may not be required in certain cases.

tuning control is adjusted until the programme is obtained at a suitable volume. The volume of the output depends on the actual working point in the synchronising frequency range, being a maximum when the tuning is set in the middle of this range. When the oscillator is mistuned, a powerful beat note is heard, which makes listening completely impossible; when the oscillator is tuned to *any* point in the synchronising range, the programme *quality* is equal to the best obtainable, only the *volume* being affected. *The receiver is thus either correctly tuned or not tuned at all; distorted output is impossible.* This is an immense advantage over ordinary receivers, where mistuning for control of volume is commonly met, with its associated frequency response distortion.

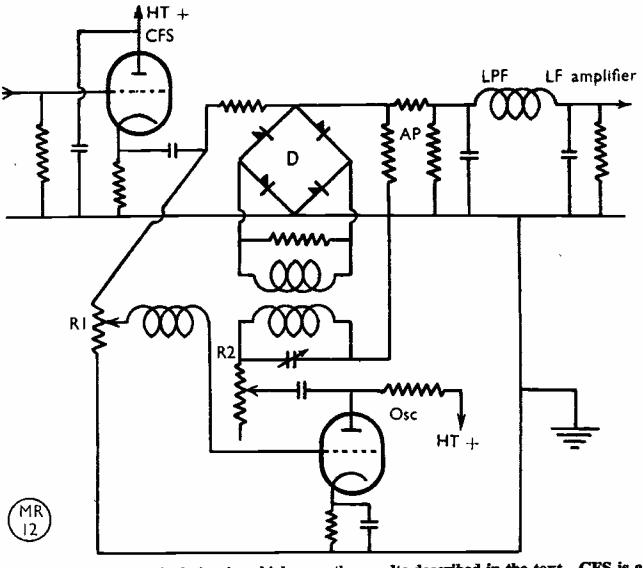


Fig. 2. A practical circuit, which gave the results described in the text. CFS is a cathode-follower stage, D the demodulator, AP a small attenuator pad, LPF the low-pass filter, and Osc the oscillator. R1/R2 are pre-set and adjustment for volume is on the oscillator tuning condenser.

The author wishes to acknowledge the useful suggestions made by Messrs. W. H. B. Cooper, E. R. Hoare, J. F. Ridgeway and F. Scowen in connection with the development of the new method; most of these suggestions have been incorporated in the above account.

BEAM AERIAL DESIGN

An interesting article in April *QST* discusses from the practical point of view the length and spacing of the elements of beam aerials for maximum gain. From a series of experiments with an *indoor* beam in what appeared to be unfavourable conditions for obtaining reliable data, the element spacing for a maximum gain of 9·6 dB was found to be 0·2 wavelength between each element. For a frequency of 140 mc, the preferred lengths are given as reflector 43 in., 1st director 39·5 in., and 2nd director 38·5 in.

DX COMMENTARY

ON CALLS HEARD, WORKED & QSL'd

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

We were recently at an orchestral concert (yes, we do take time off occasionally !) and distinctly remember wondering "What does a trombonist think about when he's not playing ? " A trombonist's working life consists of short periods of intense, concentrated activity interspersed with rather longer periods during which the can do nothing but wait, try to look intelligent, and prepare for his next triumphal entry. For so long did we muse over this difficult musical problem that we finally got quite worried about it and started applying it to other people. And, of course, we eventually got round to " What does a DX man do when there's no DX ? "

That is a question that is liable to affect many of us, if the prevailing spell of bad conditions at the time of writing continues for long. Certainly the DX bands have seldom been so tricky since the war as during these middle weeks of April. Some of us DX-chasers are probably content to stay on our usual bands and to be very pleased with a contact with VK now and then, thinking how good we are to get over there at all with conditions so bad. Others, however, like to get away from it all and use some of the other bands. GDX on 5 metres, for instance, is a thrill that eventually captures many ; but what of DX on 1·7, or even 3·5 mc ?

Employment of all bands is a Good Thing. The more bands the average amateur uses, the less the congestion on any one of them, because he can't generally be on two at once. As we now possess an aerial system which works all the way from 1·7 mc down to 28, we feel rather virtuous and operate regularly on five bands.

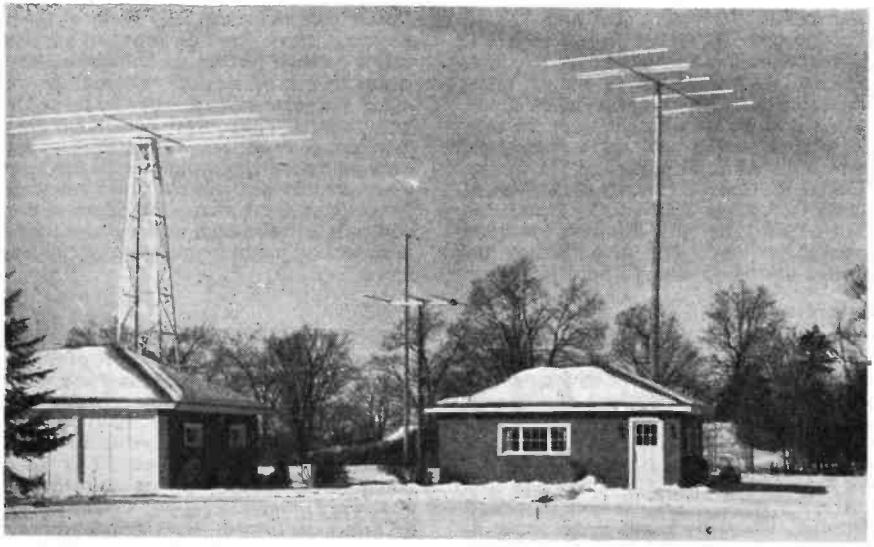
So, talking of 1·7 mc DX (DX being a relative term) we may as well begin by saying that at least three British stations—G3MT, G4TA and G8MU—have been heard by ZB2A in Gibraltar. ZB2A sent this news *via* G8WS (Sanderstead) but was also going to QSL direct. Who will be first to QSO ZB2A on 1·7 mc ? It will be good DX.

Our 3·5 mc band can also be quite interesting, even in the summer. There is little or no chance of W or VE QSO's until October or later, but we know of one or two G stations using very low powers who have worked 30 countries or more on the band. Those who prefer ragchews to rubber-stamp QSO's and exchanges of QSL's will find it a good band for working SM, LA, PA and the other medium-distance countries—and 25 watts seems to be as good for the purpose as 150.

VFO's

On matters of general DX interest, we feel that "this column" can express an opinion which may or may not be the personal one of he who writes it. Having established this, we wish to state that This Column no longer approves of VFO's as long as they are used in the prevailing manner. The recent BERU Contest showed up the VFO at its worst. Not only is the practice of calling a station on his own frequency rather stupid, but when carried to extremes it can be absolutely devastating. And now comes the habit of starting to call a station on his own frequency before he has finished his CQ, so as to make sure of being the first one he hears on going over ! For sheer bad manners, aggressiveness and general selfishness this takes some beating.

Now we can't blame this on the VFO *per se*, as useful a piece of gear as was ever devised. It's the clot behind it that is to blame, and we *can* do something about him. This Column thinks (and its opinion is coming to be shared by *QST* and *CQ* as well) that it is time we refused to answer a station that calls dead on our own frequency. If we could just establish the new custom that the man with a VFO calls a DX station on some frequency within, say, 15 kc in either direction, picking his spot at random, we should have solved the problem, Similarly, after calling CQ, listen over the 30 kc band of which your own frequency is the centre, and don't always pick someone in the same place. This would surely maintain all the advantages of VFO procedure and eliminate all the worries ? After all, you only call a man on his own frequency to save him from searching the whole band ; but why not



General view of the aerial arrays at VE3HC, Guelph, Ontario. The gear is housed in the building on the right.

assume that you have a reasonable chance of success if he has to search a 30 kc area ? And however popular he is, a flock of stations calling him and spread over 30 kc are not likely to jam him right out because he comes back to a short call and catches all the others still sending his own call-sign without having got round to signing. (Do you see what we mean ?) Someone has got to clean this one up, sooner or later. This is only an idea, but even if you don't like it, you must admit that we did try ! And if you have a better one. . . .

All the letters received this month skip about the bands so much that it is impossible to segregate them completely. Sufficient to say that 28, barring freak periods, has peen poorish most of the month except for Africa and South America ; that 14 has been very lively but rather weak most of the time ; and that 7 is still a mess, most of the DX having now faded out or left the band.

14 mc

The early part of April saw wonderful conditions for the Pacific areas in the early mornings. G6QB was lucky enough to bag the first European contact with KC6, in the form of K6ETF/KC6, on 'phone and CW. This was followed by KP6, ZK1 and a load of KH6's, who became quite commonplace for a few days.

G8KP (Horbury) found he had 38 Zones, switched on the receiver, and without touching it heard his 39th—in Zone 39, too—and worked him, adding VQ8AE to his collection. Other nice ones were VQ4KTH, ZD1KR, W7LEE (Arizona), HH2BL, FT4AN, XE1A, CM6AH and heaps of others. G2WW (Penzance), also high on the roll of honour, collected HE2UD (Liechtenstein), LC1AH (Norwegian Polar Expedition), CZ7O (claiming to be in Turkey), HZ2BY, PK6AX (Celebes), HP4Q, VP8AD (South Georgia), HV1AC (Vatican City ?), VR1AD (claiming to be in Lhilo), ZA2D and ZA1CC, and ZZ2B, said to be in Oman.

G6BB (Streatham) worked XE1KE one early morning and discovered that he was old X1AY, once a very famous 28 mc station ; 'BB also worked W6TIP at the *HF* end of 14 mc, following our advice of last month. G5CW (London, S.W.7) also tried this, and raised two W5's both appearing out of a dead band at 2200 GMT. Others at G5CW include VP8AD, FF8WN (Dakar), VU2PB (Andaman Islands) and UAØKAA.

G2HPF (Chelmsford) comes up with CZ7O (see above), this time claiming to be a Czech student at Adrianopol University, Turkey, so he may well be genuine. Others from 'HPF include CR6KW (Angola), OE9AA, I1AHC/I6 and LI2BO. G5BM

(Chelmsford) claims ZC6AA, ZC7A (Transjordan ?), UO5AC and KH6FD (28 mc' phone).

GM6RV (Ardrossan) is one of many who report ZC1AL, in Transjordania, who wishes it to be known that he is the only ZC station, and is now active every night from 1600 to 2200 GMT. QTH in list. G3DO (Sutton Coldfield) has worked KP6AA, Palmyra (QTH in list), and also CR4AA, but his QSL has been returned from Cape Verde Is., strengthening the general suspicion about the latter !

From Overseas

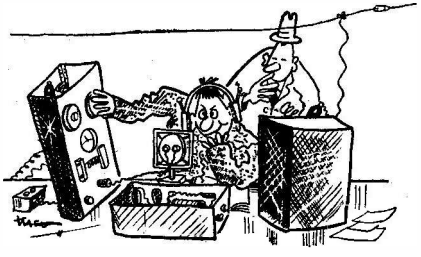
Harold Owen (Tafo, Gold Coast) sends his usual list of Calls Heard, but finds static terrible now. He reports seeing, in a South African paper, pictures of a minute walkie-talkie outfit said to be on sale in Great Britain, and also said to have "a special frequency-band allocated for it." We live and learn !

SU1WP (Cairo) has just been moved to Palestine, where he hopes to be active as ZC6WP (QTH in list). He adds that the projected scheme of Service calls with the prefix JX for Palestine is likely to be started up very soon, and also that outstanding QSL's from SU1WP will be cleared up as soon as possible.

VP9Q (Bermuda) reports that he is now on the air on 14 and 28 mc for about three hours a day, and wants QSO's with G stations. His problem, of course, is to shake off the swarms of W stations that come back every time he calls "CQ G" ; he is local to them, but still comparatively rare as a country. So he says "Call *off* my frequency." (What did we say, now ?)

Windoms

Several readers have taken up the Windom controversy, but none of them agree as to how it works. We think the answer is this : That with a perfectly matched feeder (top and bottom) the Windom is just another dipole, and one that is very efficiently fed. Most of them, however, carry standing waves of varying ratios on their feeders, and therefore have characteristics quite different from the top alone. In some cases this can be turned to good effect. Those who swear that their Windom gives better coverage than a Zepp or a centre-fed aerial hanging in the same place are obviously in the latter category. Makes one think that a Windom with a controllable mismatch and the right kind of downlead might be quite a nice thing to have.



Now for Zone 23.

WAZ

The first WAZ Listing appears herewith, triumphantly headed by a couple of thirty-niners. (Oh, AC4YN, when *are* you going to emerge ? We have our rhombic all ready for you !) We should like to see more names on the Roll ; no need to be shy of it, because anything above 30 is good going. This month we are showing (*a*) Post-war Zones, (*b*) Post-war Countries and (*c*) Zones confirmed. Next month we want to come into line with *CQ*, the sponsors of the scheme, by showing the following :— (*a*) Post-war Zones, (*b*) Post-war Countries, (*c*) "All-time" Zones, (*d*) "All-Time" Countries. The main list will be for CW and 'phone, but a separate list for 'phone only will be published if there are sufficient applicants. But it should be clearly understood that the placing is purely on the strength of *Post-war* Zones Worked. Don't omit to send the total of countries worked, however, as it simplifies the placing of those who have worked the same number of Zones.

WORKED ALL ZONES LISTING

Maximum Possible 40 Zones

Station	Post-war Zones Worked	Post-war Countries Worked	Zones Confirmed
G2PL ..	39	142	38
G8KP ..	39	126	?
G6BS	38	104	35
G3AAK ..	38	?	31
G2WW ..	37	126	32
G2AJ	37	120	32
GW3AX ..	37	?	35
G5VU ..	37	113	35
G5YV ..	37	?	30
G3DO ..	36	112	?
G8RL ..	36	101	32
G4AR ..	36	94	26
G2CDI ..	36	?	32
G5IV	33	?	28
G2CNN ..	33	87	24
G3HS ..	33	?	26
G8UR ..	32	?	23
G6PJ	30	60	15
G4LX ..	30	?	21
GW4CX ..	30	?	19

For our own information (not for publication) we should like, with your first list, a table showing (1) Call of station worked, (2) Country and Zone, (3) date and (4) time. This is a complete check ; after the first list simply send additions and new totals from time to time as you progress. The WAZ List will be kept up-to-date and reprinted periodically so that all interested can see how they stand.

Miscellany

Most of the following comes from letters from those who describe their DX on several bands, and who therefore were not included in the 14 mc category earlier on. G3AUB (Stockport) has been very active on 7 mc with ZC6AA, PY2AJJ, W1JCE (all on 25 watts), and has worked VO1S on 3·5 mc. He recommends the clear spot round about 7200 kc (now, now, hold back those VFO's). G2HKU (Sheerness) had a nice 7 mc QSO with W4CT, but would like some of the high-powered G's to move up to 3·5 mc for their chats with the next-door neighbours. G3SD (Newcastle) didn't like the line of fire of his outdoor aerial, so arranged a dipole in the roof space, with the ends hanging down vertically. On this he has worked VSMB, VU2BF, ZB2B, UA6LB, UB5FE, ZL4GA, VE7PR and (oh, why go on !) He quotes this "to encourage the bloke who simply can't manage an outdoor wire." And very useful, too.

G8GD (Sutton, Surrey) worked LN1AV on 7 mc 'phone. The LN station was operating from a Norwegian flying boat over Northern Ireland (QSL *via* GI6TK). He also had an excellent 'phone chat on 14 mc with Zoya, the YL operator of UA1KBA in Leningrad. G2FSR (Chingford) who is ex-VS4JH, remarks that 15 watts on 7 mc seems to work practically anything on the band, and wonders why all this high-powered stuff is bandied about. Is it, he asks, that people build a 150-watt rig and then do not find it easy to reduce power ? He has also become a 1·7 mc enthusiast, and says that, given an efficient aerial, it is possible to work the whole of the country in the evenings with little or no QRM.

GM2AAT (Edinburgh) sends a list of DX as long as your arm for 14 mc, including a nice slinky one—F9ABC in Corsica ! 'AAT uses 25 watts and is also anti-QRO. He says "Give me a maximum of 50 watts, and if results are bad, then it's time a little experimental work was done to find out why." Trouble is, it's so much easier to double or treble the power if you feel that way inclined. His own location is very poor, with terraces of houses above him and the local "Alp" rising to 650 feet, not to mention a 132,000-volt line a quarter of a mile away. But his list of DX for a few days makes you think.

The 28 mc rotary at SV1EC, Athens. Left to right : SV1RX, SV1EC (now G2EC) and SV1KE. The photograph was taken last summer, before G2EC returned home.

G5WC (London, S.E.19) comes up with a tirade against "the senseless poppycock you hear on 7 mc, mainly from the 'circle clubs' who nightly clutter the band with what seems to be an excuse to keep the Tx running and stay up until everyone else has

turned in." He has also experienced the usual cross-town talkers who complain about bad conditions while simultaneously blotting out VR2AB ! But he sends in a good list of 14 mc DX.

A long letter from G6CB (Winbledon) takes up several points we have mentioned in the past, chiefly about the peculiar way in which certain areas will arrive in the middle of a dead band, and adds that individual *stations* do similar things. And he asks whether different sets of stations are audible in different parts of this country at the same time, particularly on 28 mc. We think there is no doubt of that ; we hear others working DX that is not coming our way at all, and then raise a 589 from some DX station who has been trying to work another G and given it up on account of weak signals both ways.

G6MC (Bingley), mentioning that he scored 18,224 points in the ARRL DX Contest, adds that he rigged up a TP-TG with a 203A so as to work on 7 mc in a hurry. All his reports were T9, and he had all the advantages of VFO with one valve ! (The general adoption of this is *not* recommended ; G6MC obviously knew how to make it work !) But he wonders what some of the present-day amateurs with 100% commercial equipment would do if they had to make everything themselves as we all did in the old days (including variable condensers and mains transformers).

Shorts

A. L. Thorley (Wednesbury, Staffs.) hopes to be on the air by now with the call VQ3ALT at Dar-es-Salaam. QTH is in the list. He will welcome reports and QSO's on 14116 and 28232 kc. G2CUR hopes to have an ME5 call-sign in the Suez Canal Zone. G6HU (Barkingside) sends the details of "KUFRA," whom he worked recently—see list. G6LK (Cranleigh) came off 5 metres for a while and was amazed at conditions on 14 and 28 mc, with W6's, VK's and ZL's coming in "the long way round." His score in the ARRL 'Phone Contest was 39,616. G2AXG/A, in hospital for an operation, had his portable with him in the ward, and managed to raise a bottle of ginger ale, by radio, for a patient who needed it but couldn't get it ! Delivery time, 18 minutes from going on the air. G3AWG (London, S.E.16) finds that many stations call CQ but seem only to work "a few friends," and wonders whether the three-plus-three calls frighten them ?

D2GQ (Lubeck) was the victim of a particularly dirty piece of business during the gap between the two halves of the ARRL Contest. He found his shack burgled, all the small gear removed, the HRO stripped of valves and all the electrical fittings torn down. However, with the help of D2DR he got back on the air in time for the second half. He is also a Windom enthusiast, and adjusted his own with "two meters in the top, three in the feeder and a pair of binoculars." (Wot, no feeler gauge ?)

DX MAP

A wall-mounting version of the Great Circle DX Zone Map on p. 166-7 in this issue is available. See page 173 for details.

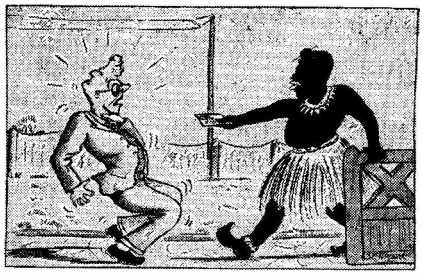
DX QTH'S

CE5AW	Ernesto Liebrecht, Box 560 Concepcion, Chile.
CR4HT	Praia, Cape Verde Islands.
CR6KW	Box 831, Darrania, Angola.
CT2XA	53rd Recco., c/o APO 406, P'master, N.Y.C.
CZ70	Adrianopol, Turkey (QSL *via* I1PQ)
EK1AS	c/o RCA Communications, Tangier
I1AHC/I6	Eritrea—QSL *via* A.R.I.
K6ETF/KC6	C.A.A., Canton Island, Phoenix Group, Pacific.
KG6AM	J.C.A. Navy 926, c/o Fleet PO, San Francisco.
KP6AB	Palmyra Island, c/o P'master, Honolulu, Hawaii.
KUFRA	Cpl. J. Oliver, c/o No. 1 RAF Met. Unit, RAF, Cairo.
LI2BO, LI2JC	RAF, El Adem, M.E.F. 7.
OA4AI	P.O. Box 538, Lima, Peru.
PK1XW	c/o Intel., Batavia, Java
TI2OA	Otto Andre, Coronado, Costa Rica.
VK4NK	Port Moresby, British New Guinea.
VP9Q	B.S. Atkinson, Kenrose, 3rd Ave., Cavendish Heights, Bermuda.
VQ8AK	Le Reduit, Mauritius.
VU2CT	E. H. S. Lewis, Digboi P.O., Assam, India.
VU2CV	Sgm. J. Gerard, Royal Signals, 1st Armoured Divn. Sigs., Secunderabad, Hyderabad, Deccan.
VU2PB	RAF, Port Blair, Andaman Islands.
ZC1AL	Post Office, Mafraq, Transjordan.
ZC6WP	RAF, Aqir, Palestine, M.E.L.F.
ZD1KR	Norman Wadsworth, Kortright, c/o P.O. Freetown, Sierra Leone.
ZD2K	S. G. Kitchen, P.O. Box 570, Lagos, Nigeria

G2VV (Hampton), whose new QSL bears a beautiful picture of Hampton Court Palace, recommends more people to listen to the W1AW broadcasts. Unfortunately they are at 0100 GMT, but they have been asking amateurs throughout the world to listen to the V2 Rocket Tests, giving frequencies and full data. The V2's are equipped with automatic transmitters operating during flight. G2VV has been very active on 14 mc, with all the usual DX plus HV1AC—we shall soon know whether he is genuine. 'VV raises the question of whether ships and aircraft in the various Zones count for WAZ. The answer, unfortunately, is No! Land stations only, please.

SV1RX (Athens) has rolled in 87 countries on 14 and 28 mc since Christmas, running 75 watts and a pair of half-wave dipoles with coaxial feeders. He remarks "My biggest problem in working new countries is the hundreds of G's and W's who want *me* for a new country. It's very trying at times!"

G3AOY (Manchester) says that he is sailing for South Africa at once, where his address will be D. C. Hilton, 123 Clark Road, Durban. After a few weeks in Durban, however, he hopes to be travelling around Northern Rhodesia, Nyasaland and Angola, possibly with a rig of some sort. How he will identify himself we don't know yet—but please look for him. G4LV, signing J4AAK, tells us *via* G3MD that he is on the look-out for G's and would like to work many more. A Calls Heard list appears in the appropriate space.



G9BF's DX contacts always QSL the sure way.

G6BY (Weston-Super-Mare) has just completed his 500th QSO with W1DQ on 14 mc. This is a post-war achievement, and contacts have been maintained at least once during each 24-hour period, despite conditions. Both stations used low power and (or should we say *but*?) rhombics. Excellent work, whatever the power or the aerial systems.

G2CDI (Stokenchurch), putting in his WAZ claim, asks "What about 28 mc as a DX band with South Americans coming

DX FORECAST FOR MAY 1947 (ALL TIMES GMT)

	7 mc	14 mc	28 mc
NORTH AMERICA :			
East and Central	2300-0500	1300-0700	1600-2000
West Coast	?	0400-0700	?
CENTRAL AND SOUTH AMERICA	2200-0300	2100-0500	0900-2300
AFRICA :			
North of Cancer	All day	All day	0900-1800
South of Cancer	?	1600-2200	1100-1800
ASIA :			
West of 75° E.	1500-2000	1500-2100	0900-1500
East of 75° E.	?	1400-2100	1200-1600
OCEANIA :			
VK, ZL, VR, ZK	?	0600-1500	1000-1200
PK, KA, KG6 etc.	?	1300-1700	1000-1500

NOTE.—*The times given above are the most likely periods during which signals may be expected from the parts of the world indicated. Under unusual conditions, signals may be heard outside these times.*

CALLS HEARD

This month's Calls Heard section records G activities on all bands 1·7 to 58 mc. Information of this kind is always of interest, especially to those new to the bands, so we should greatly appreciate it if overseas readers would let us have lists of G calls heard at DX.

in at 0230, and VK and ZL coming in up to 0100 from the South-West?" 'CDI has been making the most of these strange conditions while they last, and has worked many VK's and ZL's the long way round. G3AAK (Broad Hinton), another high scorer in WAZ, puts in a terrific list of DX worked; really and literally "too numerous to mention." G2PL (Wallington), who tops the WAZ Roll so far, remarks on the spell of good conditions on 7 mc during March, when he worked ZL, VK, VQ4, PZ1, NY4, CM, KP4, KL7, KH6, VE7, all W districts, HH5, XE, VU, YI, and ZC6. Yes we *did* say 7 mc. G5FA (New Southgate) sends his log for the first half of the ARRL Contest, during which he worked on 7 mc only and raised 37 W's. G6QX (Hornchurch) is back on the air after a long absence, and hopes to be knocking off all the DX. He contributes to the discussion on the Windom aerial: his is 139 feet of 14 gauge with a feeder of 20 gauge, and he gets it to work on all bands from 28 to 1·7 mc.

So that's about it for this month. Deadline for next month is first post on May 13; many thanks and acknowledgments to all those who have contributed this time. Let us have those WAZ claims—and hold off that VFO!

WORKED ALL ZONES LISTING

If you have worked 30 or more Zones, send in a claim for listing in "DX Commentary." Claims printed here will be re-published in their "WAZ Honour Roll" by our American contemporary *CQ*. Documentary proof is not required unless 40 Zones are claimed. See this issue for details on how to make your claim.

CALLS HEARD

Please arrange all logs strictly in the form given here, numerical and alphabetical order and on separate sheets under appropriate headings, with callsign and address on each sheet.

OVERSEAS

1.7 mc

G3AWR. On board s.s. *Cheltenham* in positions stated.

Antwerp, March 23, 1900-2045 GMT.

G2AJU (56), 2AQH (56), 2ATU (55), 2BIP (56), 2 BMP (56), 2CM (45), 2CPT (46), 2CZH (44), 2DAN (44), 2DGW (45), 2DPQ (33), 2FIX (45), 2FLU (44), 2FMO (46), 2FPU (43), 2HAS (34), 2HCO (57), 2HFW (33), 2HNU (55), 2HW (55), 2TZ (56), 3 AHE (45), 3AJD (44), 3AUH (57), 3AZD (44), 3FN (33), 2IP (56), 3NT (44), 3UY (33), 4AL (55), 4AY (44), 4FD (56), 5BK (57), 5BS (55), 8LZ (33), 8ML (46), 8QJ (33), D2CH (58).

50 miles West of Lands End, March 28, 1900-1930 GMT.

G2BMP (44), 2FIX (55), 2 NJ (56), 3AJD (44), 3AUH (56), 3PU (57), 4KZ (56), 4MH (44), 5ZX (44), 8LX (33), GW3ALE (44).

20 miles South-West of The Skerries, March 29, 1930-2000 GMT.

G2JF (44), 3ABB (57). 4AG (45), 4KZ (45), GW8CT (45).

25 miles West of Liverpool, March 30, 1000-1045 GMT

G2BVU (59), 2FCC (55), 2FPU (59), 2FTU (57), 2LD (59), 3ARS (58), 3NT (57), 5AU (59), 5KG (58), 5UA (57), 5XN (59), 6PY (56), 6QT (57), 8QS (57).

('Phone and CW. RS in brackets.)

3.5 mc

GW3ALX, aboard s.s. *Pencarrow*, Melilla, Spanish Morocco.

G3ADQ (45), 3ALD (45), 3MD (45), 4GJ (45), 5SV (45), 8HI (45), 8MU (46), 8RQ (57), 8UL (46), GM5BA (56).

(April 2-6; RS values in brackets, all T9. Receiver, Marconi CR300.)

7 mc

G3AWR. On board s.s. *Cheltenham* between Madeira and U.K., March 3-9.

G2AYZ (58), 2CKK (57), 2FCC (57), 2FDF (56), 2FWL (55), 2HKW (56), 3AAU (57), 3AWQ (55), 3AZA (55), 3AZL (59), 3BCI (57), 3BDS (58), 3FXB (56), 3VB (45), 3WJ (56), 5GK (57), 5LP (57), 6TN (56), 6WR (56), 8FM (58), 8IG (55), 8RL (57), GM2FXN (44), 3GBI (57), GI3ZX (58), EI5B (57).

(RS in brackets.)

G3BEG. On board s.s. *Esneh* in Sitia, Crete, March 2, 2030-2115 GMT.

CW: G2HKW (569), 3ABY (579), 3AWQ (449), 3AZE (569), 3GX (579), 3KF (569), 5LP (459), 8PQ (569), 8PT (459), 8VG (589).

'Phone: 5GK (56).

GW3ALX, on board s.s. *Pencarrow* Melilla, Spanish Morocco.

EI9Q (56), G2BUJ (56), 2FZO (58), 3AAE (56), 3ABY (57), 3AOV (45), 3ASX (57), 3BCI (56), 3BDQ (57), 3BIN (55), 3DZ (57), 3IV (55), 3LM (567), 3RY (57), 6TN (58), 6WP (56), 8HG (55), GC2FMV (44), GI3AMY (55), GM3ATN (56), 3BQO (55), 4JQ (56).

(April 2-6; RS values in brackets, T9 unless otherwise stated. Receiver, Marconi CR300.)

14 mc

Harold Owen, B.Sc., West African Cacao Research Institute, Tafo, Gold Coast Colony.

CW: D2KW (56). G2AUF (33), 2BJW (55), 2CLL (56), 2COP (56), 2DFH (44), 2DM (448), 2FMM (55), 2GK (33), 2HNO (22), 2KU (56), 2NM (568), 2QO (56), 2QY (448), 2WQ (44), 2ZA (56), 3ABC (34), 3AH (44), 3ARO (34), 3BLG (568), 3CT (567), 3HK (45), 3SB (558), 3SR (44), 3YC (338), 4CP (568), 4GF (44), 5BJ (56), 5JR (33), 5MR (44), 5MU (45), 5NL (45), 5RV (56), 5VQ (456), 5VU (56), 5WI (45), 5YV (43), 6BB (44), 6CL (578), 6JF (55), 6QB (45), 6RS (568), 6UG (55), 6UT (56), 6XT (45), 6ZO (578), 8GP (56), 8HH (578), 8JR (44), 8MZ (44), 8NL (55), 8QY (56), 8UD (55), 8UT (458), GM2FHH (458), 3AVO (44), 3AXR (33).
(*March 24-March 31 : RS values in brackets. T9 unless otherwise stated. Receiver :* 0-*V*-1.)

G3BEG. On board s.s. *Esneh* in Sitia, Crete, March 2, 1900-1945 GMT.

CW : G2FGX (589), 2KU (559), 4KI (549), 5GK (589), 5OO (578), 5PJ (579), 5TU (579), 8VH (579), 8VV (559).

'Phone : G2IG (58), 2XV (57), 3LZ (56).

28 mc

R. Legge, 20 Beethoven Street, Binghamton, N.Y., U.S.A.

'Phone : G2BHW, 2FKO, 2FPP, 2HDV, 2HIW, 2XK, 3AAK, 3ACT, 3ADD, 3AME, 3FX, 3PW, 3WH, 4GN, 5JW, 4LP, 4PF, 4QL, 5JZ, 6WB, 6WR, 8QM, GI3VQ, GM2LQ 3ZX, 4AN, 5FT, 6JH, 8AH, GW3XY.

BAND NOT STATED

Heard or Worked by G4LV/J4AAK, Japan.

G2HX (56), 2BSQ (44) 2BXF (56), 2BYA (45), 2HFO (57), 3ABR (44), 3AXW (55), 3BLG (55), 4IN (57), 5IZ (55), 5VB (57), 5YU (54), 6RS (45), 8GP (44), 8IH (56), 8 NF (45), 8ON (44), 8RF (54), GI5UR (55), 6YM (45), GM3RL (44).

FIVE METRES

G5TH, 198 Clifton Drive South, St. Anne's-on-Sea, Lancs.

Worked : G2APY, 3BY, 4OS, 5BD, 6CW, 6OS, 6YQ, 6YU, 8JV, GW6OK.

Heard : G2AOA, 2BXL, 2FJD, 2IN, 2OI, 3DA 3TN, 4JJ, 5MQ, 5TD.
(*All April* 7-13.)

G4IG, 49 Woodbastwick Road, Beckenham, Kent.

Worked : G2IQ (155), 2VH (68), 2XC (68), 2XS (100), 3BK (80), 3IS (85), 5BD (135), 5IG (60), 5BY (185), 6DH (60).

Heard : G2BMZ 168), 3AAK (80), 5MQ (190), 6CW (120), 6YQ (190), 6YU (95), GW4FW (140).
(*All April* 10-20. *Distances in brackets.*)

G6YU, 14 Bourne Road, Copsewood, Coventry, Warks.

Worked : G2AK, 2BJY, 2COP, 2MR, 2MV, 2NH, 2XC, 2YL, 3ABA, 3FD, 3IS, 3LN, 4DN, 4LU, 5BD, 5LJ, 5MA, 5PY, 5TH, 5US, 6FO, 6MN/A, 6VX, 6XJ, 8QX, 8TO, 8WL, 8WV. (*All month ending April* 19.)

Heard : G2BMZ ('phone 56), 5BY (569). (*April* 15, 2230-2300 *DST.*)

G5GX, 39 Corby Park, North Ferriby, E. Yorks.

G2FJD, 2FZX, 2TK, 3ABA, 3APY, 3BK, 3BY, 3IS, 4GZ, 4JJ, 4LU, 5JU, 5MA, 5MQ, 5TH, 6BX, 6CW, 6DH, 6MN, 6VX, 6YO, 6YQ, 6YU, 8JV, 8SJ, 8UZ. (*Heard or worked, April* 9-21.)

G3BK, 28 Regent Avenue, March, Cambs.

Worked : G2MV, 2XS, 3WW, 4IG, 5BD, 5IG, 5MA, 8JV.

Heard : G2MR, 2NH, 2XC, 3IS, 5MQ, 6YQ, 6YU. (*All April* 10-18 ; *Rx EF50 Converter into superhet ; Aerial, 4-element indoor beam.*)

SWL, Locks Green, Field Place, Weybridge, Surrey.

Heard : G2AJ, 2CUA, 2MR, 2MV, 2NH, 2YL, 3PW, 4AJ, 4CI, 5AS, 5CD, 5MA, 5RD, 5UM, 6DH, 6LK, 6NA, 6OH, 6VA, 6VX, 8SM, 8TF, 8VB. (*Rx*, 0-*V*-1.)

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

G2BMZ, 2CUA, 2IQ, 2MR, 2MV, 2NH, 2WS, 2VH, 2XC, 2XS, 2YL, 2ZV, 3ABA, 3AYA, 3FP, 3GM, 3IS, 3PW, 3WS, 3BK, 4AJ, 4DN, 4GB, 4IG, 4OO, 5AS, 5BD, 5BY, 5IG, 5MA, 5MR, 5LQ, 5RD, 5UM, 5US, 6AG, 6CW, 6DH, 6FO, 6OH, 6YU, 6VX, 8GX, 8KZ, 8LY, 8SK, 8SM. (*All heard or worked April* 2-17.)

SWL, 6 Guildhall Road, Southbourne, Bournemouth, Hants.

Heard 'Phone : G2BMZ, 2MR, 2NH, 2NM, 2XC, 3AAK, 5AS, 5MA, 8QX.

Heard CW : G2BK, 2BM, 2NH, 2NM, 2VH, 2VS, 2XC, 4DN, 5BY, 5MA, 5QG, 6FO, 6YU, 8TS. (*All March* 14-18 ; *Rx*, 1-*V*-1.)

G2BK, 2BMZ, 2NH, 2VH, 2XC, 3AAK, 4DN, 6FO, 8QX, 8TS. (*All April* 18, 1850-2324 *DST.*)

G6OH, Farthings, Earleydene, Sunninghill, Nr. Ascot, Berks.

Heard CW: G2DN (549), 2IQ (559), 3IS (549) 4LU (539), 5BD (549). 5BY (558), 5GX (539), 5MQ (539), 6DH (539).

Heard 'Phone : G2BMZ (Q5S5), G5BY (Q5S5), 8QX (Q5S3/6).

(*All April* 11-22.)

SWL, Canon Gate, Reigate Hill, Surrey.

G2BMZ, 2XC, 2NM, 2VH, 3IS, 3PW, 5BD, 5BY, 5CM, 5MR, 5UM, 6DH, 6KB, 6YU, 8QX, 8UZ. (*All over 40 miles distant, 'Phone and CW, 2200-2245 DST, April 6-19, EF50 Converter, Rotary dipole.*)

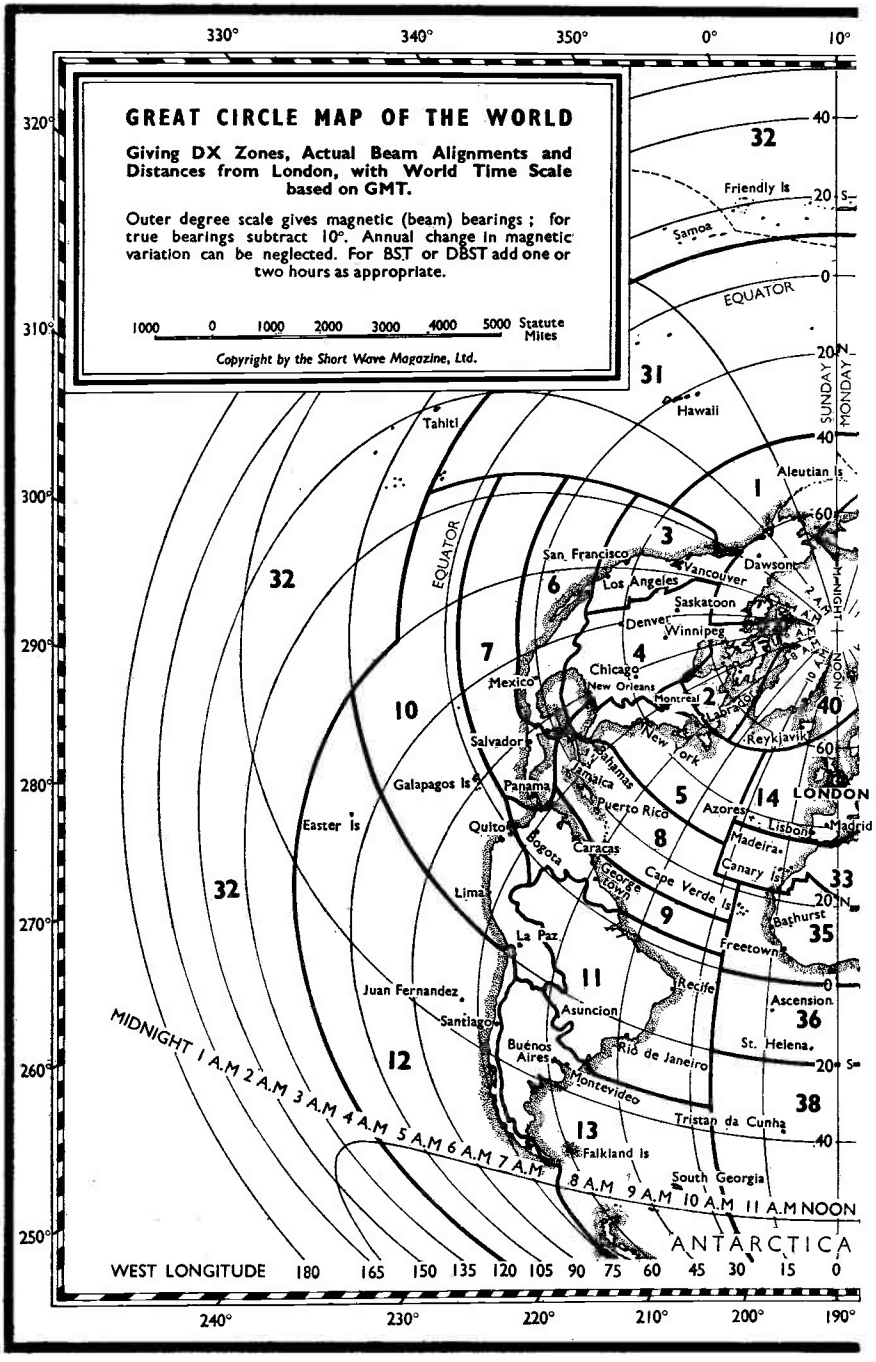
G4JJ, 44 Northgate, Barnsley, Yorks.

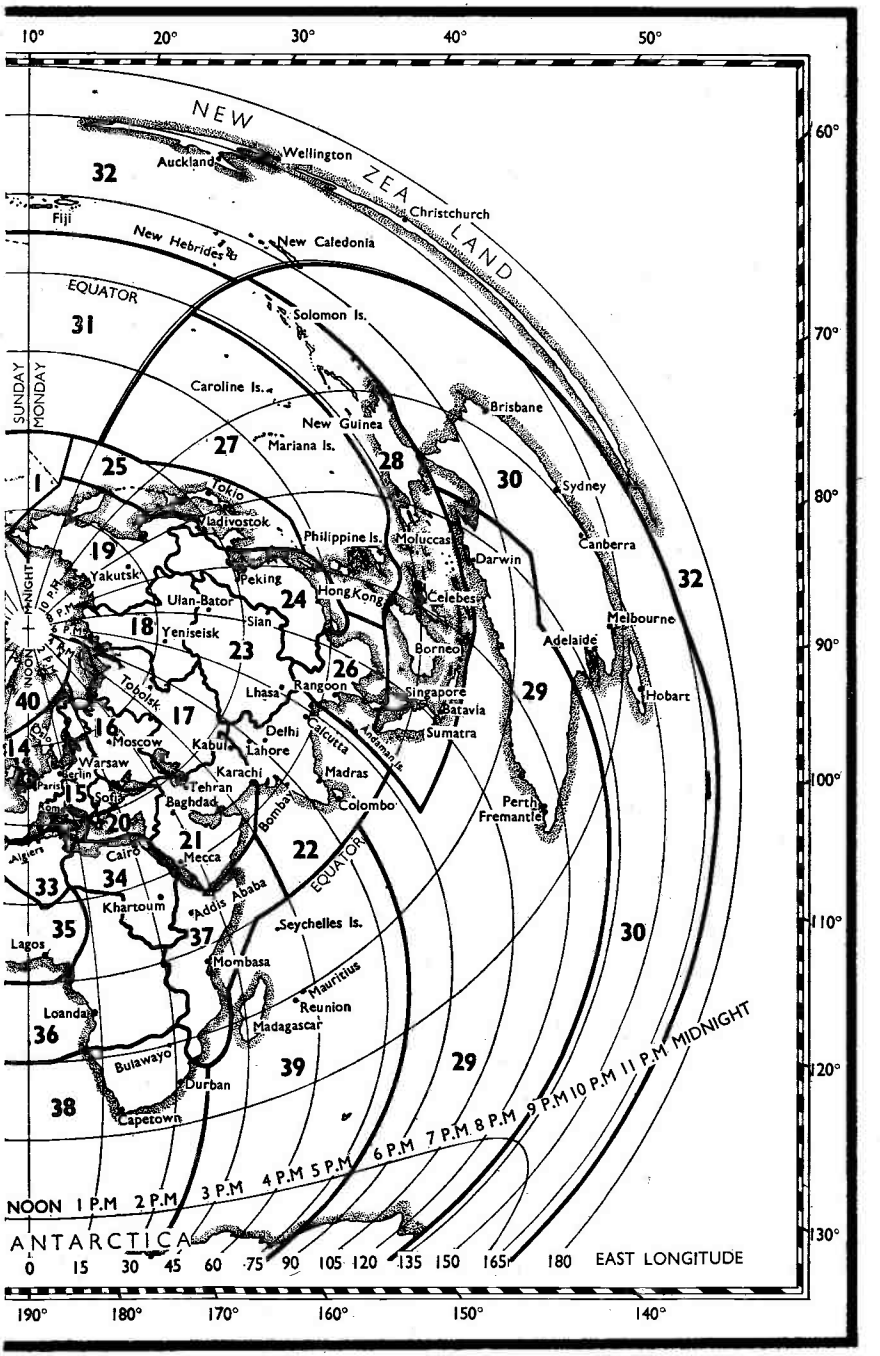
Worked : 2BOO, 2FJD, 2IQ, 2MA, 2TK, 3APY, 3ZK, 5GX, 6BX, 6OS, 6YO, 8NM, 8OK.

Heard : G5MQ (54), 5PW (58) 6MN/A (55).

SWISS CONTEST

During the period 1800 June 7 to 1800 June 8, the HB's are running their Field Day event. Bands used will be 3500-3635, 7000-7200 and 14000-14400 kc. Individual station entries will be confined to two operators with a total of not more than 22 lb. of gear between them ; group entries are not limited by weight or number of operators, but the whole outfit must be transportable in a 4-seater car and the maximum input not more than 50 watts. Contacts with G, GC and GW portables count 4 points and with GI and GM 5 points. Anyone grinding out a worse-than-T8 note will be disqualified. All Swiss stations participating will use CW and the prefix HB1.


GREAT CIRCLE MAP OF THE WORLD
Giving DX Zones, Actual Beam Alignments and Distances from London, with World Time Scale based on GMT.
Outer degree scale gives magnetic (beam) bearings ; for true bearings subtract 10°. Annual change in magnetic variation can be neglected. For BST or DBST add one or two hours as appropriate.
1000 0 1000 2000 3000 4000 5000 Statute Miles
Copyright by the Short Wave Magazine, Ltd.
330° 340° 350° 0° 10°
320° 310° 300° 290° 280° 270° 260° 250°
240° 230° 220° 210° 200° 190°
WEST LONGITUDE 180 165 150 135 120 105 90 75 60 45 30 15 0
EQUATOR
Friendly Is
Samoa
Tahiti
Hawaii
Aleutian Is
San Francisco
Vancouver
Dawson
Los Angeles
Saskatoon
Denver
Winnipeg
Chicago
Mexico
New Orleans
Montreal
Reykjavik
New York
Salvador
Bahamas
Jamaica
Galapagos Is
Panama
Puerto Rico
Azores
LONDON
Lisbon
Madrid
Easter Is
Quito
Bogota
Caracas
Madeira
Canary Is
Cape Verde Is
George Town
Lima
Bathurst
Freetown
La Paz
Recife
Juan Fernandez
Asuncion
Ascension
Santiago
St. Helena
Buenos Aires
Rio de Janeiro
Montevideo
Tristan da Cunha
Falkland Is
South Georgia
ANTARCTICA
MIDNIGHT 1 A.M 2 A.M 3 A.M 4 A.M 5 A.M 6 A.M 7 A.M 8 A.M 9 A.M 10 A.M 11 A.M NOON
SUNDAY
MONDAY
1 2 3 4 5 6 7 8 9 10 11 12 13 14
31 32 33 35 36 38 40


10° 20° 30° 40° 50°
60° 70° 80° 90° 100° 110° 120° 130°
NEW ZEALAND
Auckland
Wellington
Christchurch
Fiji
New Hebrides
New Caledonia
EQUATOR
Solomon Is.
Caroline Is.
New Guinea
Mariana Is.
Brisbane
Sydney
Canberra
Melbourne
Adelaide
Hobart
Darwin
Philippine Is.
Moluccas
Celebes
Borneo
Singapore
Batavia
Sumatra
Tokio
Vladivostok
Yakutsk
Peking
Hong Kong
Ulan-Bator
Sian
Yeniseisk
Tobolsk
Lhasa
Rangoon
Calcutta
Andaman Is.
Delhi
Kabul
Lahore
Karachi
Madras
Colombo
Perth
Fremantle
Moscow
Warsaw
Berlin
Paris
Rome
Sofia
Tehran
Baghdad
Bombay
Cairo
Algiers
Mecca
Khartoum
Addis Ababa
Seychelles Is.
Mombasa
Mauritius
Reunion
Madagascar
Lagos
Loanda
Bulawayo
Durban
Capetown
ANTARCTICA
SUNDAY
MONDAY
MIDNIGHT
NOON
1 2 3 4 5 6 7 8 9 10 11 P.M MIDNIGHT
NOON 1 P.M 2 P.M 3 P.M 4 P.M 5 P.M 6 P.M 7 P.M 8 P.M 9 P.M 10 P.M 11 P.M MIDNIGHT
0 15 30 45 60 75 90 105 120 135 150 165 180 EAST LONGITUDE
190° 180° 170° 160° 150° 140°
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

FIVE METRES

By **A. J. DEVON**

GM3BDA Hears G5MA, 352 miles— Improved Conditions April 9-22— Individual Reports— Counties Worked Listing

THE change in the weather certainly brought about the expected and very welcome improvement in conditions. The band began to show itself more forthcoming on the evening of April 9, conditions getting gradually better, becoming very good on the 11th and 12th, and holding with a few poor patches till about April 22. There was an Aurora manifestation on the evening of the 17th, though occurring rather too late for it to be generally noticed.

During this period, many interesting things happened, the big news being the reception of G5MA of Ashtead, Surrey, by GM3BDA of Airdrie, Lanark, at RST536—note the tone—at midnight DST on April 17. The great circle distance is 352 miles and this is the best GDX reception so far achieved. G5MA followed this by working GW4FW (Cardiff, 127 miles) on two-way 'phone on the evening of April 19, for his 21st county. GW4FW has been heard or worked by several other stations, including G2MV, G2NH, G5BY and G6VX, so he is getting out well and brings Glamorgan into the picture as another workable county.

The Aurora display on April 17, coming after most people had pulled switches, was probably another opportunity missed for making a new GDX record. But with the increasing activity in the North, it should come along any time now. There seems to be little doubt that one can think of the Aurora Borealis as producing a vertical, intensely ionised curtain capable of returning signals in the horizontal plane and diffused over a wide area. What is known as the North Auroral Zone normally extends well to the south of Greenland, to about Lat. 65 deg. N, which is less than 600 miles to the north of Edinburgh. It is certain that the characteristics of Aurora reflection are a roughened note and northerly directivity on all signals outside the local area.

Under the conditions that have prevailed during the recent good period, the band has been at its best from about 2200 DST onwards, peaking at 2300. Not lack of activity earlier, but DST, is the main reason for this.

Up North

From Edinburgh, GM2HDH reports reception of GM2DI, GM2LQ, GM5VG (all Glasgow), GM3ANO (Cowdenbeath, Fife), GM3BBW, GM3BDA (Airdrie), GM6JH (Linlithgow) and GM6SR. The distances are not great, being of the order of 45 miles maxmium, but these are the active stations and what they have done so far. GM2FZT says that there is a good deal of purely local 'phone working, and as has so often happened in other "development areas" in the 5-metre sense, it is probable that there is not enough careful listening for DX.

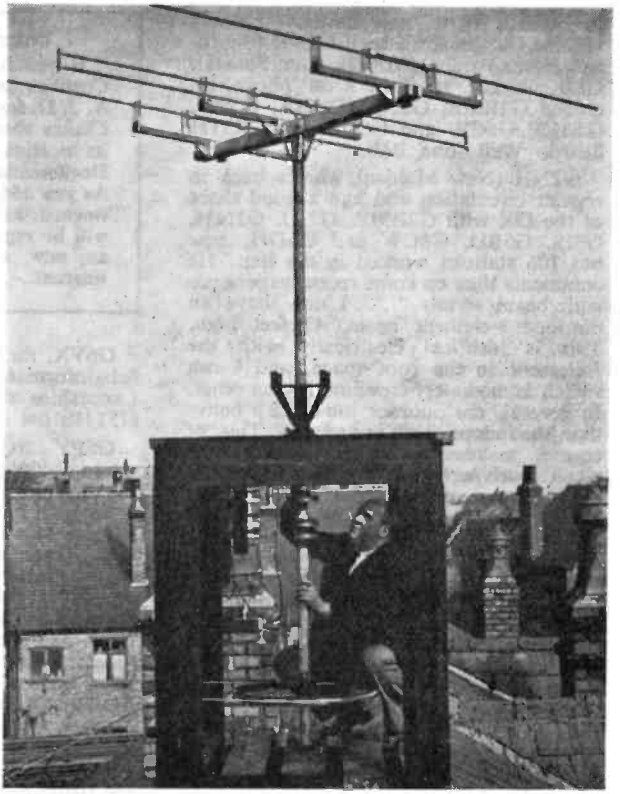
G2IN (Southport, Lancs) with G5ZI coming on, is now in action and looking for contacts. He has taken a great deal of trouble to get himself properly equipped, with an EF54 RF-EF50 Mixer-EC52 Osc converter feeding into an SX-16, the transmitter having a QVO4-20 in the final, the whole topped off with a 3-element outdoor rotary. So we hope to hear something of G2IN down south before very long.

G4JJ (Barnsley), who says he feels like Mr. Micawber with his new 3-element, has got well under way with G2TK (Scarborough, 73 miles) as his best DX. G4JJ, screened to the south, feels confident that with a little more activity up to the Border he could find them and get in on this over-100-mile GDX business. Well, 'JJ, we are trying to whip 'em up for you ! Anent the "Worked All Counties" note last month, he is one of the several thousand (it seemed) readers who poke fun at your earnest conductor about the Ridings of Yorkshire ; yet we do have enough rough geography to know there are three—it just slipped through on the proof when we were excited about the PA/ZS affair. Sorry, Yorkshire, and thanks for the laughs we got out of some of the cards.

G2TK/G8SI report good progress from Scarborough, with G4JJ, G5BD, G5GX, G6OS and G8VJ(JV?) worked, and G2FZX, G3APY, G5IG, G6BX and G6DH heard. Some of these are good DX in the over-100-mile category. G2TK finds his beam gives him better results on reception than on transmission, while G8SI, by opening the reflector to ·15

wavelength spacing, is now hearing G6OS, G6BX and G5BD (75 miles) consistently. G6DH was received three times during the good spell.

G5BD (Mablethorpe), whose 15 counties worked from a very unfavourable location geographically is a most creditable performance, has now completed a run of 250 contacts with G8JV (Nottingham, 70 miles) and has worked G2TK on 14 consecutive evenings for another marathon. One of the latest raised of the new stations on the band is G2XS (King's Lynn), who is another beginning to get out. G5BD also received G5BY RST556, on April 17, with his beam N.E. ! This distance is again in excess of the standing two-way GDX record by some 35 miles.



The 3-element rotary at G2IN, Southport, Lancs. The genera lconstruction of the beam and the method of rotating it can be followed from the photograph.

Midlands

G5JU reports increasing activity in the Birmingham area, with G3LN putting out a very good signal and G2BJY (West Bromwich) doing well with simple gear ; he has been heard several times in the south-east. G6YU (Coventry) had no less than 80 contacts in the month ending April 19, new stations worked being G2COP (Lichfield), G3LN (King's Norton, Birmingham), G5PY (London), G5TH (St. Anne's, Lancs.), G6MN/A (Worksop), G8TO (Ilmington) and G5US (Camberley). On the evenings of April 11, 12 and 15 G6YU heard both G2BMZ (Torquay) and G5BY on 'phone, this being the first occasion the Devon stations had appeared in Coventry.

A first report from G3BK (March, Cambs), whose experiences, and those of his locals G3WW and G2XS, have been the same as so many others new to the band—nil returns for months past until they were about to give it all up, thinking GDX was a myth. Then, on April 11 and 12, G2MV, G4IG, G5BD and G8JV were worked, with G2MR, G2NH, G2XC, G3IS, G5IG, G5MQ, G6YQ and G6YU heard. Just eight counties in that little lot, all in a couple of evenings and some of it excellent GDX.

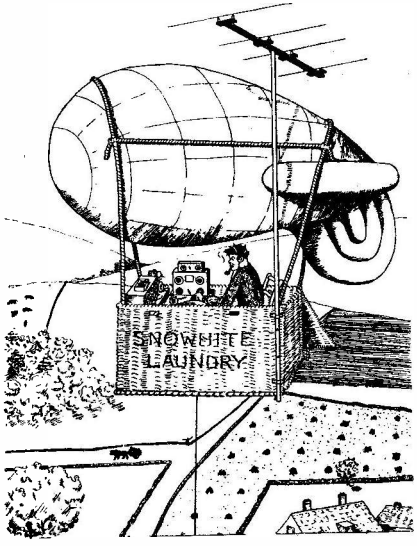
Down South

G2MR (Surbiton) now has a total of 132 stations worked for his 19 counties and has heard several more, including G3DA (Handforth, Cheshire), for new ones yet to be worked. Due to gale damage he is running temporarily with a fixed beam looking N.W., which is the right direction for the GDX.

G5MA, now one of the leading 5-metre men in the country and a most consistent operator with an excellent signal on both CW and 'phone, made many fine QSO's during "the spell" as well as bringing

in quite a lot of new stations—notably G2NM (Bosham, Sussex), G2VH (Southsea, Hants.) and G5MR (Bognor, Sussex). GDX worked, much of it on 'phone, included G2BMZ, G2IQ, G3ABA, G5BD, G5MQ, G6CW and G8UZ, with G5TH heard. Well done, Bob.

G2NH (New Malden), who is back in regular circulation and had a good share of the DX with G2BMZ, G2IQ, G2NM, G3IS, G5BD, G6CW and G6DH, now has 106 stations worked in the log. He comments thus on some recent experience with beam aerials " . . . I now have an outdoor 3-element beam, 43 feet high. This is identical electrically with the 3-element in the roof space, and I can switch immediately from one to the other. In general, the outdoor job is 2S's better than the indoor, both in and out. This, of course, makes a tremendous difference when receiving weak signals, which are often 100 per cent. readable on the outdoor beam when inaudible on the other ; also, when signals are QSB, a station dropping right out on the indoor array can still be read in the troughs with the outdoor . . . ." As one of the first successfully to use an indoor beam (details of its construction were given on p. 143 of our March, 1946, issue), an idea which has since been widely adopted, G2NH thinks that other operators may be interested in the greatly improved results he is now getting with a similar aerial outdoors.



One way of getting GDX on 58 mc—not recommended

COUNTIES WORKED LIST

If you have worked 14 or more Counties on 58 mc, send a claim to A. J. D. for listing in "Five Metres." Claims should give one station and its location for each County worked. Documentary proof is not required. As you add to your total of Counties worked, keep us informed ; the List will be reprinted from time to time as new entries and adjustments warrant.

G6VX, *via* G5TH, passes us much useful information as to activity in the Lancashire area, which is summarised in G5TH's list in Calls Heard.

G5PY (Clapham Park, London), gradually extending his coverage after a lot of hard work, feels that at 59·36 mc he is too high in the band for many operators who seem only to search round the LF end. There is something in this ; several others above the middle make the same complaint. G5PY proves his point by saying that his beam brings in a lot of GDX he should be able to work and on a recent occasion, after calling GDX for an hour or more, he got RST569 from a Midlands station asked to listen for him through a third party at the LF end. It undoubtedly is difficult to search the whole band with care when conditions are good ; the remedy is to remember the HF boys and use QLM, QMH more.

Further South

G2XC reports plenty of activity locally, with G2NM and G2VH reaching out from sea-level locations. With 19 counties in the bag, G2XC is another doing good work from a poor position on the map.

G5BY, in a report full of interest, says that the MUF has gone right back, so that the ZS schedule has not been kept recently. But there was a good sporadic-E opening on April 2, 1850-2015, though with nobody on to cash in. The North African BC harmonic on 57·7 mc, an infallible guide on these occasions, was pounding in at S9, with other foreign BC harmonics audible up to 59·2 mc, and all beaming south. G5BY, who also keeps a careful check on weather data, finds that fog locally is a sign of good GDX conditions for him. And he remarks that judging by the reception reports he is getting now, there is plenty of new activity in the offing. GW4FW (80 miles) has been

worked twice, and on April 17 at 2200 DST, G6OH received G5BY *via* Aurora with his beam N.E.

To the west, stations active or coming on are G2ZG (who used to give your conductor a nice 'phone signal on 440 metres about 25 years ago), G5TN also of Weston-super-Mare, and G2AAW (Burnham-on-Sea). These are all Somerset stations. G8QX (Malvern, Worcs.) is getting out very well to the east and has been heard or worked by several Midlands and South London stations.

Counties Worked List

The first appears herewith—we hope it will encourage more entries, especially from the North, where there are several operators who would make a good showing. And even if you have only the basic fourteen, get into the list and start building up your total.

With activity now reported from Glamorgan and Somerset (thanks, G2JM) and five counties named in Scotland, the workable maximum in G, GW and GM becomes 40 counties out of a total of 83 in the three countries. No news from GI, but EI8L is known to be on in Dublin.

And for the information of all who have claimed G2AK (Great Barr) for Warwickshire, he is just in Staffordshire though the postal address is Birmingham ! This will mean an additional county for several ; please adjust claims when next writing, as in order to avoid confusion, we have not altered lists. There will probably be further border-line cases of this nature.

FIVE-METRE
COUNTIES WORKED LIST
***Starting Figure*, 14**

Worked	Station
22	G5MA, G6VX
21	G2NH
19	G2MR, G2XC, G6LK, G6YU
18	G4IG
17	G5BY, G6CW
15	G2YL, G5BD, G6FO
14	G5IG, G8UZ

Calls Heard

This month, we show a bigger volume of 5-metre Calls Heard (see p. 165) than have ever appeared before. These lists are most interesting, not only for what they record, but also for the information they give of new stations. We are always glad to see such lists and will print every one of any merit received up to the limit of the space allowed in the *Magazine* for the 5-metre Calls Heard feature.

RELAY CONTEST

The *Short Wave Magazine* Five-Metre Relay Contest is scheduled for the eight-day period 1800 July 19 to 2359 July 27. Rules will appear in the next issue. Take your holiday some other time !

SWL Reports

It is as unusual as it is pleasing to have four SWL letters this month, covering reception experiences on five metres. K. D. Harris (Weybridge) is a 15-year-old with an 0-V-I, and has been on the band since the end of January. P. J. Towgood (Bournemouth) turns in a useful Calls Heard list, as does W. H. Pierce (Reigate Hill). The latter, as we know, has for long been a keen listener on five ; he runs an EF5O-EF5O-EF5O converter into a home-built 7-stage receiver, using a rotatable copper-tube dipole fed through co-ax. W. H. P. has a beam in prospect and a new converter using acorns in hand.

G. Elliott (Gosport) remarks that the "theories put forward by various people to explain 5-metre propagation seem to work very well for those located on hill-tops and other favourable locations, but do not explain the very rare occurrence of DX in unfavourable locations such as mine. It is nothing to do with the receiver, as the converter working into the R.1155 gives results identical with those obtained on the battery 1-V-1-".

Points

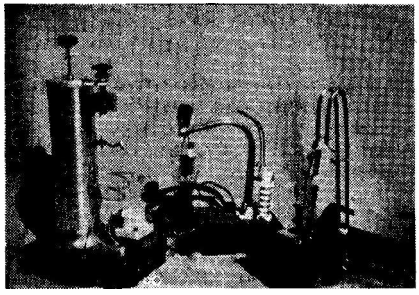
When you want GDX, call "CQ GDX" and add the beam direction, using Nth, Sth, Est, Wst for directivity . . . . Always add your county when giving QTH or calling CQ on 'phone . . . . It's not a bad idea to mention the frequency as well . . . . When conditions are good, and you are working 'phone, sign each transmission on CW . . . . When working DX under QSB conditions, send fast doubles, *not* slow ; QRQ will nearly always beat fading unless it is to inaudibility for periods of more than a few seconds. . . . Use the search procedure signals and give the HF enders a chance ; there are a lot of good stations above 59 mc. . . . . When you raise DX, always try to give the other end of the contact a quick list of local calls active

at the time; this helps others to make QSO's. . . . Do not spend too much time just QRX; push out a CQ even if things do seem quiet . . . . Is anyone working on the 2300-2450 mc band? If so, please let us know.

Reports for June

The paragraphs above are a bare summary of some 30 individual reports. Your conductor would like once again to thank all those who take so much trouble in sending us their news, of which we cannot have too much; this feature lives by readers' reports, and it is our earnest endeavour to make the best possible use of them for all interested in the band.

Next month's dead-line is May 19, latest, and as usual the address is A. J. Devon, c/o *Short Wave Magazine*, 49 Victoria Street, London, S.W.1.



VK2NO is very interested in the 166-170 mc band. These are some pre-war experimental oscillators.

THE GDO

An article in March *CQ* describes the grid-dip oscillator, the principle of which can be applied to frequency meters for the checking of tuned circuits and for aerial or transmission line measurements. In effect, a meter in the grid of the GDO gives an indication when its tuned circuit is resonated with the circuit under test, *which need not be alive with RF.*

THE SHORT WAVE LISTENER

Our companion *Short Wave Listener*, entirely devoted to the interests of the SWL, is the only periodical of its kind in the world and is essentially practical in character.

Its main news features—"Have You Heard?" covering amateur band reception and "DX Broadcast" dealing with broadcast station listening—discuss their subjects in great detail and provide the latest and most reliable information available to the SWL. There is also a large Calls Heard section and a regular Broadcast Station List. WAZ is featured as "Heard All Zones."

Other articles in the last two issues were Improving Receiver Performance, What *is* DX? A Simple Autodyne Converter, Travel of a DX Wave, A Multi-Purpose Heater Transformer, More About Band-Spread, Practical Application of Ionospheric Theory, and Cathode Balancing Resistors.

The next issue of the *Short Wave Listener*, dated June, is due on May 15 and will be No. 7 of Vol. I. A few back numbers are now available, at 1s. 4d. post free.

NEW COMMUNICATIONS UNDERTAKING

A new company, to be known as Electronic Transmission Equipment, Ltd., has been formed by the Mullard Wireless Service Co., Ltd.

It will develop and manufacture a comprehensive range of communications apparatus, including that for line and supersonic work, and so meet the increasing demand for this type of equipment. It will take over the present communications activities of Radio Transmission Equipment, Ltd., in the new laboratories and works situated at Wandsworth, London, S.W.18.

The products developed and manufactured will be marketed through the Communications Division of the Mullard Wireless Service Company, Ltd., Century House, Shaftesbury Avenue, London, W.C.2.

★ ★ ★

PROCEDURE SIGNALS

In the current issue of *QST*, the ARRL recommends the adoption of the following end-of-transmission signals: AR, after a call to specific station; K, go ahead any station; KN, go ahead station called only; SK, end of contact; CL, closing down and not searching band.

Here and There

The Zone Map

Readers will be interested to know that a large two-colour version of the Zone Map, suitable for wall-mounting, can be obtained from us and certain Amateur Radio supply houses.

Though as printed on pp. 166-7 in this issue the Map appears to be in two sections, this is only because for reproduction in the *Magazine* it has been divided down the meridian of Greenwich. The wall-mounting Map does not of course show this division.

Our Zone Map gives time, distance and actual beam alignments for all parts of the world relative to London, and it is sufficiently accurate for the whole British Isles. Its accuracy is in fact well within that obtainable with any beam system. Since the annual change in magnetic variation is only about 9 minutes of angle, the outer degree scale has been adjusted to give *magnetic* bearings so as to eliminate the need to apply any correction for beam alignment. The Map as it stands is good for six years before it is even one degree out—and few beams need be aligned better than plus or minus three degrees.

The Zones are delineated in red, and the complete Zone List is printed on the sides of the Map. The large version also has many additional place names. It is sent out rolled in a cardboard tube to prevent creasing.

The Short Wave Magazine **Great Circle Zone Map :** In two colours, size 21-in. by 35-in. on heavy paper, price 3s. 9d. post free, from the Circulation Manager, The Short Wave Magazine, Ltd., 49 Victoria Street, London, S.W.1. The initial print is limited, so order now for immediate delivery. Trade enquiries are invited.

The Physical Society

During the period April 9-12, the Physical Society held its 31st Exhibition of Scientific Instruments and Apparatus. In the Research Section there were some extremely interesting demonstrations, including the behaviour of centimetric radar waves, multi-channel transmission and reception with a single aerial, noise suppression and a working unit of an automatic telephone exchange. Many famous firms were represented amongst the Trade exhibitors, covering a wide field in scientific equipment—ranging from a particularly impressive display of meters of every kind to ultra-sensitive balances for the determination of minute quantities.

Eddystone 640 Receiver

In the next (June) issue of the *Short Wave Magazine* we shall be publishing the first Test Report on the new Eddystone 640 Amateur Band Communications Receiver, which is now being put through it on our test bench.

QSL Bureau

Cards are held for the G's listed below. Full address, please, with stamped envelopes of a suitable size, to BCM/QSL, London, W.C.1.

G2CJY, G2YC, G3ABB, G3AJF, G3AZS, G3BBJ, G3BBS, G3BCF, GI3BKG, G3OD, GM4GK, G5QC, G8QR, G8SW.

Greek Licences

From N. Joly, SV1RX, we hear that the Greek authorities have now agreed to calls in the series SVØAA-SVØAZ being issued to holders of XA licences granted by C.M.F. In future, therefore, all military personnel operating from Greece will be distinguishable by these callsigns, some of which are already on the air. Greek nationals will also be licensed shortly, after 15 years' under-cover operation. As at March 26, the following were active and genuine SV's : SV1AH, SV1AZ, SV1BC, SV1GY, SV1MS, SV1RX, SV1SM and SV1TA.

F.O.C.

First Class Operators' Club Notes are being held over till our next. If you are interested in the F.O.C. look up the rules on p. 623 of the December issue and write Capt. A. M. H. Fergus, G2ZC, 89 West Street, Farnham, Surrey (Tel. : Farnham 6067.)

Corner Comment

With effect from March 31, the Gee chain (pulse navigational system) operating on 29·7 mc moved to 31·5 mc, thus clearing the HF end of 28 mc and the noise interference round 59-60 mc, which has been so bad in many parts of the country.

READERS' *half-guinea* IDEAS

Folded Aerial—Variable Coupling Device—Neutralising Condenser—Selective Absorption Wavemeter—Stowing Small Parts—A Relay Trip

More ideas from readers. What about yours? You supply the idea, we do the work, you get the 10*s.* 6*d.*

Folded Aerial

G3SN started with a 33-ft. Windom for 14 mc, with two-thirds of the top and the feeder as a "sort of" end-on quarter-wave aerial on 7 mc. With only 40-ft. between his masts, he then tried a 65-ft. wire folded about the ends as shown in Fig. 1. This can be resonated in the usual way and reports with it are most satisfactory; there appears to be a reduction in end-fire effect but an increase in broadside radiation. The tapping point is "VS1AA" and G3SN suggests that by adjusting the aerial as a whole for 14 mc, it will be found right for 7 and 28 mc also. As he points out, the idea is applicable to doublets and to other bands in similarly restricted locations, provided the radiating (straight wire) portion can be made not less than 60 per cent. of the required total length for resonance.—*From A. P. Ellis, G3SN, 7 Sidwell Terrace, Longbrook Street, Exeter, Devon.*

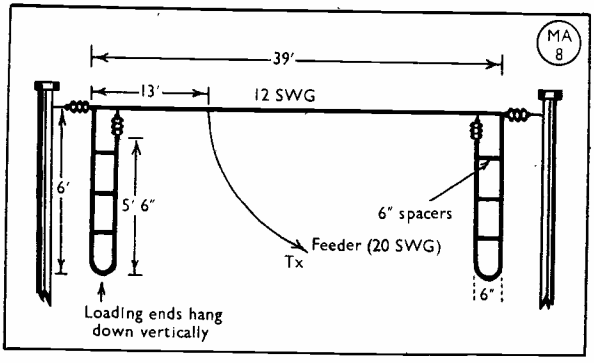


Fig. 1. Due to space considerations, G3SN uses a folded ½-wave aerial for 7 mc. The system loads up well and can be made to resonate correctly; there is no radiation off the folded end sections.

Neutralising Condenser

G8TT has made himself a pair of neutralising condensers for a push-pull RF stage by the method shown in Fig.2. The 1-in. brass discs are actually blanks used for dog-collars, and obtainable from a pet shop. These discs are tapped, screwed and soldered to the brass rod, and the edges ground and polished. The cost of a home-made component of this kind need only be a few pence, as odd parts can easily be adapted for a similar design. —*From G. A. Woods, G8TT, 37 Tewitt Well Road, Harrogate, Yorks.*

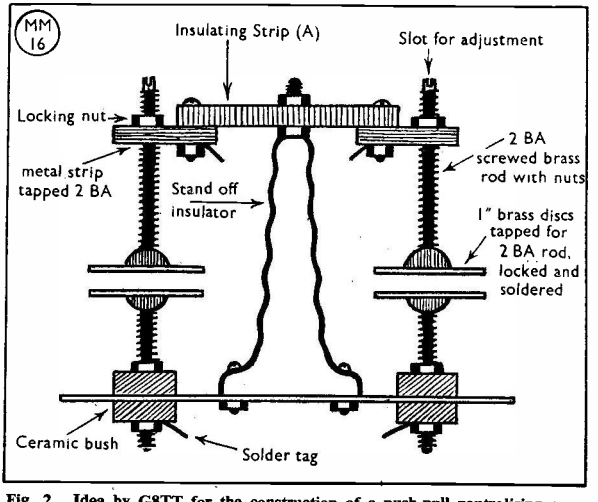


Fig. 2. Idea by G8TT for the construction of a push-pull neutralising condenser. The sketch is self-explanatory, the parts are mainly junk-box, and the important point to watch is the use of good insulating material for the bridging strip (A).

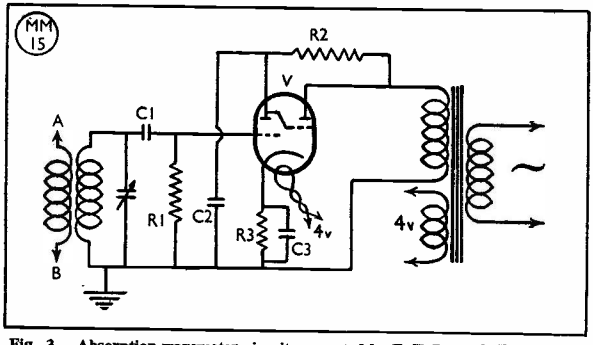


Fig. 3. Absorption wavemeter circuit suggested by P. E. Leventhall. A magic eye (Mullard TV4 or similar) is used to indicate resonance. Greatly improved accuracy is claimed for this arrangement.

Absorption Wavemeter

Shown at Fig. 3 is the circuit of an absorption wavemeter claimed to be much more sharply resonant (or, more strictly, selective as an indicator) than the usual coil-condenser combination with a loose-coupled lamp circuit introducing heavy damping. P. E. Leventhall says that by using a magic-eye tuning indicator much greater accuracy and sensitivity can be obtained. Standard 4-pin coils may be employed for the tuned circuit, or alternatively a switched coil unit to cover the required ranges.

Calibration can be carried out in the usual way against signals of known frequency and curves prepared. In making transmitter adjustments, a short length of wire from the vicinity of the RF tank taken to A, with B and E earthed, is all the pick-up necessary. As far as may be possible, the meter should be calibrated under the conditions of its use.

Values for Fig. 3 are : C1, 10 $\mu\mu$F ; C2, 250 $\mu\mu$F ; C3, 25 $\mu\mu$F ; R1, 1 megohm ; R2, 2 megohms ; R3, 100,000 ohms. T is a mains transformer giving 250 volts for HT and LT for the magic eye used (a 4-volt Mullard TV4 in this case).—*From P. E. Leventhall, 6 Rookwood Road, Osmondthorpe, Leeds, 9.*

Stowing Small Parts

G5WC's ingenious idea (Fig. 4.) is self-explanatory, and was inspired by watching the assistants in a large store working the cash-desk by remote control with containers catapaulted along wires. In his modification, the tops of screw-on glass jars are fixed on the underside of a shelf ; in the jars can be kept all those assorted small parts which usually live in a series of odd tin boxes kept in odd places. The wanted item, not being visible, is always found in the last box opened.—*From N. Vaus, G5WC, 101 Central Hill, Upper Norwood, London, S.E.19.*

Fig. 4. G5WC has a series of screw-top jars for holding small parts. The lids are fixed by screws to the underside of a shelf and the jars screwed into the lids.

Variable Coupling Device

This idea (Fig. 5.) is for variable inductive coupling and is clear from the sketch. The coil to be varied is rotated about an axis which is at 45 degrees to the axis of the fixed coil. Thus, a 90-degree rotation allows for all degrees of coupling between maximum and minimum, with considerable economy in space.—*From R. A. Bernard, 18 Mortimer Crescent, London, N.W.6.*

Relay Trip

The current which will hold a relay closed is invariably too small to actuate it ; in a particular case, 3 mA held the relay on but the actuating current had to be increased to 10 mA. A dropping resistor (see Fig. 6) was used to limit the current to about 5 mA, and an 0·2 μF condenser connected in parallel. This, when charged, supplies the extra current momentarily required to snap the relay closed.—*From R. H. Alderson. 16 Longfield Grove, Pudsey, Leeds.*

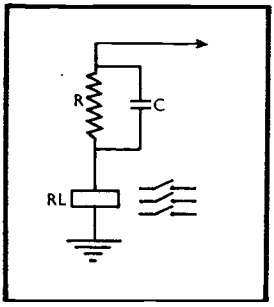


Fig. 6. Idea by P. H. Alderson. The 150,000-ohm resistor R limits the operating current for the relay RL.

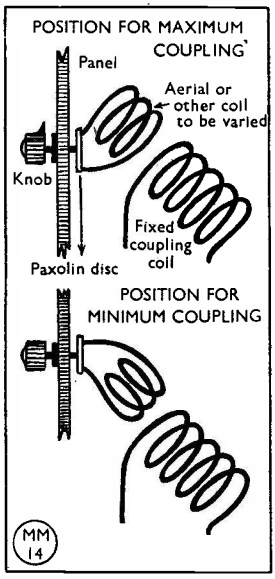


Fig. 5. R. A. Bernard's method of obtaining panel-controlled variable coupling. With extension rods, it could be applied to transmitter links.

NEW QTH's

Only those which have changed since the appearance of the September, 1939, issue of the Call Book or were not included in it for fully licensed operation, or are now licensed for the first time, can be published here. All that do appear in this column will automatically be included in the next Call Book, now in preparation. The number of QTH's we can print each month depends upon space available. QTH's are inserted as they are received, up to the limit of the space allowance. Please **write clearly** *and address to QTH Section.*

G2ACV G. W. Satchwell, 187 Damson Lane, Elmdon Heath, Solihull, Warks.

G2AJU E. J. R. Cowles, Stutton, Near Ipswich, Suffolk.

G2AKK W. Lishman, 10 Pine Street, Darwen, Lancs.

G2ALN E. W. Taylor, 188 Victoria Avenue, Higher Blackley, Manchester, 9.

G2ART F. H. P. Cawson, 113 Waterloo Road, Birkdale, Southport, Lancs.

G2AVR A. V. Spray, Ninfield Road, Bexhill-on-Sea, Sussex.

G2AZL W. Paylor, 3 White Point Avenue, Whitby Yorks.

G2BAG A. G. Boon, Gordon Villa, Ash Lane, Rushington, Littlehampton, Sussex.

G2BID J. Warwick, 9 Hebers, Middleton, Lancs.

G2BTX G. T. S. Lloyd, 14 Bramley Avenue, Fleetwood, Lancs.

G2CLO J. C. Gill, 23 Seamer Street, Seamer Road, Scarborough, Yorks.

GM2DBX J. Taylor, Post Office, Methilhill, Leven, Fife.

G2DDM W. F. Morris, 34 Birch Avenue, Romiley Cheshire.

G2DUP L. G. Bacon, 46 Loftus Road, London W.12.

GI2DVH J. Stewart, 57 Bridge Street, Lisburn, Co. Antrim.

G2FBG A. E. Dempsey, 10 Sylvan Avenue, Mill Hill, London, N.W.7.

G2FDT F. G. Donnison, 81b Bolebridge Street, Tamworth, Staffs.

G2FJN 18 Eton Street, Walton, Liverpool, 4.

G2FTK F. A. Noakes, 4 Barons Field Road, Cheylesmore, Coventry.

G2FYY M. B. Rowles, 90a Rockingham Road, Corby, Near Kettering, Northants.

G2FYY/A M. B. Rowles, Malvern House, Nassington, near Peterborough.

G2FZU S. Eyre, 48 Lower Stanton Road, Ilkeston, Derbyshire.

GW2HBK N. B. Yates, Grasbil, Waenfawr, Caernarvon, North Wales.

G2HDY J. Ballard, 169 Huntingfield Road, Roehampton, London, S.W.15.

GM2HFV W. G. Duncan, 23 Noran Avenue, Dundee, Angus.

G2HKT L. R. Hawkesford, 19 Merstowe Close, Acocks Green, Birmingham, 27. (*Tel.: Acocks Green* 1355).

G2HNY 22 Beech Grove, Netherton, Liverpool, 10.

G2SF L. Owen, 44 Highfield Road, Chelmsford. Essex.

G3AAV G. N. Glover, 1 Welburn Avenue, Leeds, 6.

G3AHA G. Elms, 23 Bearton Green, Hitchin, Herts.

G3ACJ A. Johnson, 22 Richmond Road, Nuneaton, Warks. (*Correction*).

G3AFJ E. D. Watterson, 3 Hatherley Court Road, Cheltenham, Glos.

G3ARZ C. L. Waywell, 10 The Slade, Clophill, Beds.

G3BDX H. L. Booth, 7 Hampstead Square, Grindon, Sunderland, Co. Durham.

G3BKK A. C. Appleby, 68a, Sutton Street, Newcastle-on-Tyne, 6.

G3BKZ T. S. Wragg, M.B.E., Bakewell, Derbyshire.

G3BOC H. M. Synge, Dundoran, Vyner Road South, Birkenhead, Cheshire.

G3DJ R. C. Fishlock, 122 Hillmorton Road, Rugby, Warks. (*Tel.: Rugby* 4030.)

G3II S. J. Mayhead, 6 Buckingham Road, Kingston, Surrey.

GM3ND A. T. Wood, 181 Dunniker Road, Kirkcaldy, Fife.

G3QP J. Brindle, Marlow Cottage, Lostock Hall, Preston, Lancs.

G3RX J. A. Reading, 29 Herrick Road, Highbury, London, N.5.

G3VB P. W. Gammon, 20 West Street, Haslemere, Surrey.

G3WN 106 College Road, Norwich, Norfolk.

G3YY C. T. Fairchild, 75 Halland Road, Brighton 7, Sussex.

GW4CZ W. James, 12 Greenfield Street, Penygraig, Rhondda Valley, S. Wales.

G4GW G. A. Parris, The Hollies, Harley Lane, Heathfield, Sussex.

G4PM H. Axon, 11 Kendal Road, Lytham St. Annes, Lancs.

G4QU/A F. C. Mason, Owls Barn, Burnham, Bucks.

G5HM J. Fitton, 18 West Street, Rochdale, Lancs.

G5WA Capt. A. Barber, A.M.I.E.E., D.L.C.(Hons.), Nanpantan, Windmill Road, Minchinhampton, Stroud, Glos. (*Tel.: Brimscombe* 2199.)

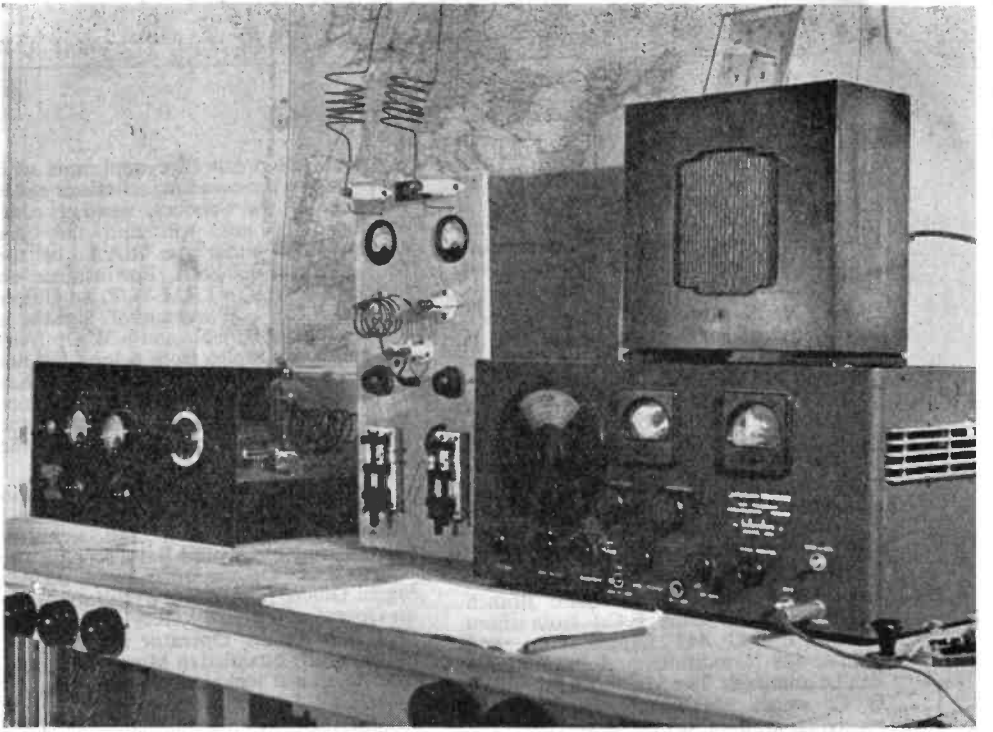
G6BP H. G. G. Chandler, 35 Highfield Gardens, Aldershot, Hants. (*Tel.: Aldershot* 1119.)

G8GT W. O. Lyons, 123 Malpas Road, Newport, Mon.

G8NY L. H. Luscombe, 98 Denton Road, Hornsey, London, N.

GM8OJ 66 Princes Street, Ardrossan, Ayr.

G8VJ D. J. Evans, 220 Station Road, Lower Stondon, Beds.



The other man's station

G2SA

Above is a view of the station of H. A. Savage, Burnham-on-Crouch, Essex, G2SA. First on the air in February 1929, with a single DE5 in a Colpitts circuit and 6 watts from dry batteries, some noteworthy DX was worked, the best contact being VE5AW in White Horse, Yukon. Those were the days !

Later came crystal control, then a rack-and-panel job, and finally the lay-out depicted in the photograph, although it is not possible to include the 1·7 and 3·5 mc transmitter located at the other end of the room. Transmitters and receiver are mounted on a wooden bench, the lower shelf of which carries the power supplies. There is a conventional 100-watt CO-FD-PA rig for 14 and 28 mc, and a low power Pierce oscillator-PA for the lower frequencies. The aerial system consists of a 68-ft. Zepp, used against a 70-ft. counterpoise for 1·7 and 3·5 mc working.

Between the Hallicrafter SX24 and the 100-watt transmitter will be seen the aerial control panel, ingeniously designed to enable a quick change-over to the band selected. The efficient, modern design of station and control gear is due to the close co-operation of G5RV, who for many years has been "guide, philosopher and friend."

G2SA frankly admits that his chief interest lies in working DX—he was WAC in 1938—but at week-ends, when the scramble is on, he betakes himself to the quieter bands for chats or a QSO party. Incidentally, he has strong views about telephony on the DX bands—therefore he does not use it !

GETTING A LICENCE

We frequently receive enquiries from readers which amount to "How Can I Become an Amateur Transmitter?" If you do **not** hold exempting qualifications, you have to pass a technical examination and a Morse Test. Here is an outline, in brief, of the procedure involved.

The Radio Amateurs' Examination is conducted under the *ægis* of the City & Guilds of London Institute, at examination centres all over the country. Particulars regarding the R.A.E. can be obtained either from your local Technical College, or the Superintendent, City & Guilds of London Institute, Dept. of Technology, 31 Brechin Place, South Kensington, London, S.W.7. Specimen question papers have appeared in the *Short Wave Magazine*.

The authority for the issue of licences is the Engineer-in-Chief, Radio Branch W5/5, G.P.O., London, E.C.1, from whom Forms E-in-C 447 (Application) and E-in-C 428 (Conditions and Exemptions) can be obtained. The Morse Test standard is 12 words per minute, sending and receiving, and is arranged through the nearest head post office on instructions from London.

Almost all prospective applicants who have been in the communications or radar branches of the Services, whether commissioned or not, will find they are exempt from either the R.A.E. or the Morse Test, if not both. For instance, an Officer R.N. (C), a LRM W/T, an Officer R.A. (I.F.C.), a Foreman of Signals, a Signals Officer R.A.F., and a W/Op (Air) are merely examples from a long list not having to take either examination. They would thus be granted an "A" Licence as amateur transmitters merely on the acceptance of their applications by the G.P.O.

Grades such as LRM A.R., Radio Mech., R.Sigs., and Wireless Mech. I would be exempt from the technical examination but would have to pass the Morse Test. On the other hand, an Air Signal Officer (F.A.A.), a Telegraphist S., an Operator Wireless & Keyboard, and a W/T Slip Reader Operator are accepted as being fully qualified in Morse but would have to sit the technical examination.

There are also a number of civilian exemptions in the same sense as the foregoing. All are covered in Form E-in-C 428, obtainable from the G.P.O.

WITH THE THAW CAME THE FLOOD. HE WAS IN THAT TOO.

THE MONTH WITH THE CLUBS

FROM REPORTS

All the Clubs seem to have survived the crisis and most of them have planned ambitious summer programmes in which 5-metre work and portable tests figure prominently. This month we have reports from 36 of them, but we should still like to receive more photographs of interest for publication in the body of this feature. If any Club Meetings produce successful and interesting photographs, the Club Secretary would be very pleased to see them for possible inclusion.

Although the monthly number of reports seem to average about 35, we have more than 80 Clubs on *Short Wave Magazine* Club Register. Does this mean that some of them are no longer active? It is easy to see which of them are really flourishing, by the regularity of their reports, but every now and then an old friend returns and a few new ones arrive.

Reports for the next issue, please, by May 13, addressed to the Club Secretary, *The Short Wave Magazine*, 49 Victoria Street, London, S.W.1.

Exeter & District Amateur Short Wave Radio Society.—This club is now organised, an Inaugural Meeting having followed the preliminary announcements in these columns. Membership is now 20, including six licensed transmitters. Several meetings have already been held (Thursdays at 7 p.m., Mount Pleasant Chapel Schoolroom) and a welcome is extended to new members. The present membership comes from as far as Exmouth, Sidmouth and Honiton.

Bradford Amateur Radio Society.—Lectures have been given by G2BOO on "Multivibrators, with special reference to Receiver Calibration," and by Mr. E. M. Price, M.Sc., on "Modern Precision Methods of Frequency Measurement." A film show was also arranged for April.

Brighton & Hove Group.—Recent meetings have included talks and demonstrations on lining up superhets, stabilising power supplies, and a Radio Quiz. Future activities, it is hoped, will include demonstrations by manufacturers and talks by well-known people on subjects of interest.

Southport Amateur Transmitters' Association.—We have received two issues of "QSO," the mimeographed publication circulated to Southport members. This shows that a very live crowd are at work up there, and brings home to us that very few clubs do publish their own journals. Preliminary announcements of meetings, technical articles and a "Wanted and for Sale" section all figure in the Southport effort, together with a few "digs" at local members and some pointed hints on operating. Congratulations, Southport, and a long life to you.

Stourbridge & District Radio Society.—An interesting use of the 5-metre band was made by this club at its April meeting. A lecture and demonstration was given by G2AK, who erected his own portable gear. During the description of the equipment he contacted the club's Vice-President, G2NV, who spoke to those present at the meeting from his home. Another club turning to VHF! This seems to be a popular trend nowadays, and will doubtless increase during the summer months.

Aberdeen Amateur Radio Society.—Power has now been installed in the Club Room, and the various constructional groups are under way. Lectures for the R.A.E. are still being given, and the Club would welcome anyone in the neighbourhood who would assist Mr. L. Hardie (2FHH) in giving them.

Bradford Short Wave Club.—This club suffered a misfortune in having its former headquarters requisitioned for conversion into a dwelling place! Meetings are now held at the Temperance Rooms, Harewood Street, Bradford. Easter holidays caused a quiet month but the Annual General Meeting will have been held by the time this appears.

North East Amateur Transmitting Society.—The suspension of Club Notes last month, due to the crisis, held out the announcement of this club's "Hamfest," organised for April 28 at Newcastle-on-Tyne. We hope, however, that this function passed off successfully. It was proposed to broadcast particulars extensively on the 1·7 and 3·5 mc bands from G3ACK, the Secretary's station.

North Kent Radio Society.—This newcomer to our columns has recently been formed, and holds its meetings on alternate Wednesdays (1930 in the Lecture Room at Crayford Library). Morse classes are held, and a full programme of lectures has been arranged. The next meeting after publication is on May 14.

North West Kent Amateur Radio Society.—The former Chairman, G8DN, has resigned owing to pressure of business. G2MI is now President, with G2WS as Vice-President. Forty amateurs attended a recent meeting, and the club is flourishing. Meetings will continue throughout the summer on the last Friday of each month at Aylesbury Road School, Bromley, at 8.0 p.m.

Oswestry & District Radio Society.—This club recently visited RAF Shawbury and saw the Radar Training Sec-

tion in action. Members were given demonstrations of Gee and H2S displays. Newcomers and would-be holders of licences will be interested to hear that a Summer Class has been suggested, and supported by the Principal of the Oswestry Training College. The syllabus will be that covering the Radio Amateurs' Examination, and the first class will be held on May 5.

Reading & District Amateur Radio Society.—Recent meetings included a talk on the club's transmitter by G2YI, who is building it, a talk and demonstration on "Amplifiers" by G6CU, and two lectures, one on "Modulation Measurements" and the other on "Plastics," by the President, Dr. Lemon (G2GL). Meetings are held at Palmer Hall, West Street, on the second Wednesdays and last Saturdays of each month at 6.30 p.m.

St. Pancras Radio Society.—An active programme has been maintained, despite "cuts" and other inconveniences, and it is hoped, during June, to demonstrate a working amateur station to the public at an Exhibition at Kentish Town Men's Institute, where work carried out by members will also be displayed.

Slade Radio. — Particular items of interest include a Brains Trust (April 18), a talk on The Electron Microscope (May 2) and a meeting held over the air, using the 5-metre band, on May 16. This will be a three-way affair, with the members split up between the various locations. A G.P.O. lecture on "Interference" follows, on May 30.

Kingston & District Amateur Radio Society.—An April event, spread over two meetings, was a visit to the Warner Bros. Studios at Teddington, where G3QR demonstrated recording and reproducing apparatus. Mr. Hughes has had to resign owing to ill health, and the new Secretary is Mr. A. W. Knight (G2LP). On May 8 there is to be a talk on Aerials by G8IP, and on May 22 a general meeting and junk sale will be held.

North Angus Amateur Radio Society.—Another newcomer, to whom we wish every success. This club is recruited from the Brechin, Montrose and Forfar areas, and proposes to meet in Brechin on the last Wednesday of each month, Montrose on the first Wednesday and Forfar on the third Thursday. A programme of instruction on transmitters is to be drawn up, and a start will be made by describing and demonstrating a 25-watt rig which has already worked all continents. Secretary's name in usual panel.

Wanstead & Woodford Radio Society.—The scheme of inter-club visiting has been tried out here, and members of the club visited the Ilford society to hear a talk on "Bridges" by Mr. Newman of the GEC. The club transmitter, G3BRX, is now on the air, and has had some useful publicity in the local papers as "The Voice of Wanstead" and "Wanstead on the Air." Morse classes are held every Tuesday in the Club Room at 7 p.m.; meetings begin at 8 p.m., and new members will be heartily welcomed.

Wigan & District Amateur Radio Club.—This club now has its own transmitter and the call G3BPK. Aerial masts are under construction, and the station will operate in the 7, 14 and 28 mc bands to start with. Members are looking forward with great enthusiasm to future contests.

Malvern & District Radio Society.—This club was formed during March, and holds its meetings on the first Wednesday of each month at the Forester's Arms, Great Malvern. All those in the district who are interested in any aspect of radio will be welcomed as members and are invited to get into touch with the Secretary.

Hi-Q Club, Giffnock.—The Hi-Q members have been discussing the possibility of using the 3·5 mc band for low-power local QSO's, and it is proposed to adopt 10-watt 'phone transmitters for this purpose. Several members are active on the DX bands, and the Scribe, GM2FZT, hopes to be trying out his portable transmitter shortly. These tests will include some on 5 metres from the top of the local high spot, which commands a view of the whole Clyde Valley and the coast around Largs and Ayr.

Hamburg Amateur Radio Society.—The first Overseas Club to join us in these pages is now active with D2KW (G8KW) as President, and D2VB (G2VB) as Secretary. Meetings are held every Monday at 1930 in the lounge of the YMCA, Hamburg. Visitors would be very much welcomed, and may 'phone D2KW in office hours at Hamburg 34 27 63. Lectures and visits are being arranged, including a tour round the

Some of the GI's at a recent meeting in Northern Ireland.

Leeds members with G3BEW. They operate a T.1154 on 3·5 mc, and licensed transmitters in the photograph are G5MK, G3ATI, G3BPR and G3YP.

two 100 kW transmitters at Radio Hamburg. G's in Germany, please note !

Bury District Group.—This Club has now met in its permanent headquarters (The Municipal Technical College, Bury), and future Club Nights will be Thursdays at 7 p.m. The club transmitter is under way, and excellent aerial facilities are available. All radio enthusiasts in the neighbourhood are specially invited to call in.

Will those interested in the possibility of forming an Amateur Radio Society in Billericay and district please get in touch with S. C. Fisher, Hillside Road, Billericay, Essex.

Cannock Chase Radio Society.—Slow Morse instruction has now been organised, and takes place each Thursday at 2030. A new club room is also a distinct hope for the future, at which lectures can be held without transporting blackboards, easels and so on at every meeting. Several members will be active on the air in the near future, and the new programme of lectures will be arranged shortly.

Sunderland Radio Society.—Another newcomer, whose inaugural meeting was held recently at 16 North Bridge Street, Sunderland, where it meets on the second and fourth Wednesdays of each month. Membership numbers 21, including 11 holders of licences. Secretary's name and QTH in panel.

Surrey Radio Contact Club.—The Annual General Meeting marked the end of the first post-war year with a record attendance of 59, and it was also announced during the meeting that the hundredth member had just joined. The Chairman (G2DN) reviewed the year's activities, and the new committee was elected. The next meeting is on May 13 at 7.30 p.m.

Swindon Radio Society.—This club, with a membership of 37, plans to visit the Radar School at RAF Yatesbury in the near future. Recent events have included a series of talks on "Fundamentals" and on "Meters," and a discussion on "Modulation Equipment" has also been held. All returning Swindon servicemen are welcomed.

Thames Valley Amateur Radio Transmitters' Society.—On April 22 G6WN gave a talk entitled "An Old Timer Looks Back;" the May meeting is to include a lecture on "Five Metres" by G8SM, and in June it is hoped that a well-known Polish transmitter will talk on Amateur Radio in Poland. Meetings are still held at 8 p.m. on the first Wednesday of the month.

Cheadle & District Amateur Radio Society.—This club has taken good strides during its first three months, and classes have already been started in several subjects. All the tutors are qualified wireless officers, and the Club holds thirteen full licences. As this constitutes one per 680 of the local population, Cheadle is claiming a record !

Edgware & District Radio Society.—Attendances have returned to normal since the passing of the Ice Age, and between thirty and forty turn up every Wednesday at the Orchard Cafe, Mill Hill Broadway. Subjects discussed have included "Band Planning," of which the club is not in favour until it is

organised on an international basis. Eight members of Grafton recently visited Edgware, and a return visit has been arranged. Here is an excellent idea for other clubs not too widely separated; Edgware has already approached neighbouring clubs with this object in view.

Midland Amateur Radio Society.—"MARS" still flourishes, and 68 members and visitors attended a recent gathering, which took the form of a Brains Trust. Meetings are held at the Imperial Hotel, Birmingham.

Coventry Amateur Radio Society.—A recent auction was very successful, and the £24 turnover added £2 to the club's funds. A visit to the local Decca Navigator station has been arranged for May 4, and there is shortly to be a lecture on "Backroom Business" by a member who was prominent in helping Resistance Movements during the war.

West Bromwich & District Radio Society.—This club is now meeting fortnightly at the premises of the Udall Electrical Engineering Co., Mill Street, Great Bridge. A workshop has been placed at their disposal for practical work. On the other Tuesdays the club will meet as usual at the Gough Arms Hotel. An interesting series of talks has been arranged, and the club transmitter is nearly ready.

Hounslow & District Radio Society.—This Club is running smoothly now, with an increasing membership. Meetings are held on alternate Wednesdays at the Grove Road Schools. Practical nights have proved a great success; various pieces of gear are under construction, and several members hope shortly to obtain their licences, after which a Club Transmitter will be put on the air.

Worcester.—This club, the inaugural meeting of which has just been held, has not yet given itself a title. Unfortunately, the crisis prevented our publishing their preliminary announcement last month, but we hope to report that the initial meeting was successful and that we can welcome another newcomer to the ranks of the clubs.

York & District Short Wave Club.—A full programme of lectures has been started, and a portable transmitter is being built for the summer. Morse classes are held every Wednesday and are divided into three categories—Beginners, 6 to 12 w.p.m., and "speed work." Many local transmitters are active, and new members will be welcomed.

Radio Society of Harrow.—Membership still increases; Morse classes, lectures and competitions flourish. Mr. J. H. Reyner recently lectured on "Electronics in Industry," and a 5-metre Field Day has been arranged in collaboration with other Clubs in the vicinity. The May meetings will take place on the 6th and 20th.

Following are the names and addresses of the secretaries of the clubs mentioned this month. They will be pleased to give every assistance to prospective members.

ABERDEEN. A. D. J. Westland, 17 Beaconsfield Place, Aberdeen.
BRADFORD (Amateur Radio Society): J. H. Macdonald, G4GJ, Mayfield, Wagon Lane, Bingley, Yorks. (*Tel.: Bingley* 965.)
(Short Wave Club): V. W. Sowen, G2BYC, Rushwood, Grange Park Drive, Cottingley, Bingley, Yorks.
BRIGHTON. Lt./Cdr. J. R. D. Sainsbury, G8HV, 80 Lansdowne Road, Hove.
BURY (G3BRS). C. Turner, G8NL, 4 Moreton Avenue, Whitefield, Manchester.
CANNOCK CHASE. K. R. Boot, G2FZG, 75 Beech Tree Lane, Cannock. Staffs.
CHEADLE. V. E. Hughes, G3AVG, Abbots-Haye, Cheadle, Stoke-on-Trent.
COVENTRY. J. W. Swinnerton, G2YS, 118 Moor Street, Coventry. (*Tel.: Coventry* 4578.)
EDGWARE (G3ASR). R. H. Newland, G3VW, 3 Albany Court, Montrose Avenue, Edgware.
EXETER. E. G. Wheatcroft, 7 Mount Pleasant Road, Exeter.
GIFFNOCK. (Hi-Q Club): J. D. Gillies, GM2FZT, 3 Berridale Avenue, Glasgow, S.4. (*Tel.*: **HARROW.** J. F. A. Lavender, G2KA, 29 Crofts Road, Harrow. [*Merrylee* 4060.)
HOUNSLOW. A. H. Pottle, 11 Abinger Gardens, Isleworth, Middx.
KINGSTON. A. W. Knight, G2LP, 132 Elgar Avenue, Tolworth, Surrey.
MALVERN. R. G. Brunskill, G3BAM, 10 Newtown Road, Malvern Link, Worcs.
MIDLAND. W. J. Vincent, G4OI, 342 Warwick Road, Solihull, Birmingham. (*Tel.: Solihull* 0413.)
NORTH ANGUS. W. Robertson, GM6RI, Schoolhouse, Logie Pert, Near Montrose, Angus.
NORTH-EAST. J. W. Hogarth, G3ACK, 4 Fenwick Avenue, Blyth, Northumberland.
NORTH KENT. H. L. Overton, G4CW, 6 Lower Station Road, Crayford, Kent.
NORTH-WEST KENT. L. Gregory, G2AVI, 18 Upper Park Road, Bromley, Kent. (*Tel.: Ravensbourne*
OSWESTRY. G. H. Banner, G3AHX, 6 Coppice Drive, Oswestry, Salop. [2071.)
READING. L. A. Hensford, B.E.M., G2BHS, 30 Boston Avenue, Reading. (*Tel.: Reading* 60744.)
ST. PANCRAS. H. Brown, 84 Blenheim Gardens, London, N.W.2. (*Tel.: GLAdstone* 3212.)
SLADE. L. A. Griffiths, 34 Florence Road, Sutton Coldfield, Warks.
SOUTHPORT. R. Moffitt, G5KX, 1 Balmoral Drive, Southport.
STOURBRIDGE. D. Rock, G8PR, Flat 1, Block 1, Worcester Road, Summerfield, Near Kidderminster.
SUNDERLAND. S. Herbert, G3ATU, Roker House, Roker, Sunderland.
SURREY. L. C. Blanchard, 122 St. Andrews Road, Coulsdon, Surrey. (*Tel.: Uplands* 3765).
SWINDON. P. Greenwood, G2BUJ, 49 Western Street, Swindon, Wilts.
THAMES VALLEY. D. R. Spearing, G3JG, Thurston, Orchard Way, Esher, Surrey. (*Tel.: Esher* 3369.)
WANSTEAD (G3BRX). R. J. C. Broadbent, G3AAJ, St. Margarets Grove, Wanstead Park, London, E.12.
WEST BROMWICH. R. G. Cousens, G3BCS, 38 Collins Road, Wednesbury, Staffs.
WIGAN (G3BPK). H. King, 2 Derby Street, Spring View, Wigan.
WORCESTER. J. Morris Casey, G8JC, c/o Brookhill Farm, Ladywood, Droitwich, Worcs.
YORK. G. W. Kelley, G5KC, 46 Melrosegate, York.

THE AMATEUR BANDS

Following are the bands now open for British amateur operation:

1715-2000 kc	10 watts (A) and (B)
3500-3635 kc 3685-3800 kc	25 watts (A) 150 watts (B)
7000-7300 kc	25 watts (A), 150 watts (B)
14000-14400 kc	25 watts (A), 150 watts (B)
*28000-30000 kc	25 watts (A), 150 watts (B)
*58500-60000 kc	25 watts (A) and (B)
460·5 mc	5 watts (for radio control of models and only by special application)
*2300-2450 mc	25 watts (A) and (B).

*FM permitted.

"A" licences are all three-letter calls issued post-war, and are for CW operation only; licensees in this category are not normally allowed the use of telephony and full power till they have had twelve months' experience. Class "B" licensees are holders of reissued pre-war two letter call signs, and are allowed the unrestricted use of CW, MCW and 'phone with power as given above.

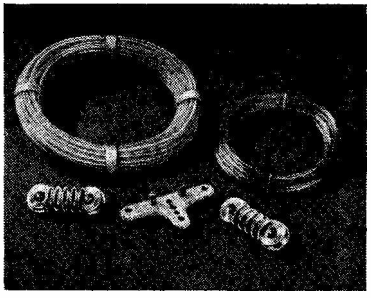
NEW QTH

Messrs. Wright & Weaire, Ltd., have now concentrated the whole of their production at their new works at South Shields, Co. Durham. The London offices are at 2 Lord North Street, S.W.1. (ABBey 2126.)

RADIO VALVE VADE-MECUM SUPPLEMENTS

Many readers who have a copy of the latest issue of the Brans *Radio Valve Vade-Mecum*, reviewed on p. 679 of the January issue, are taking advantage of the free supplement service.

They should note, however, that the postage to Belgium is 3d. per oz., and not 2½d., with the result that many coupons are being returned as insufficiently stamped. Messrs Ritchie Vincent and Telford, Ltd., 136a Kenton Road, Harrow, Middlesex, who are agents for this and other Continental publications, inform us that they will be glad to accept, for onward transmission, readers' coupon-orders for the supplements. The first of these is now being issued.



THE IDEAL TRANSMITTING AND RECEIVING AERIAL FOR THE AMATEUR

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

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

$$\text{Length of half-section in feet} = \frac{234}{\text{Frequency in Mc/s}}$$

Cadmium copper is supplied as this will not stretch—a most important matter if the aerial is being used for transmission. Suitable for 200 watts RF up to 28 mc/s.

The complete kit with instructions in carton, L609.

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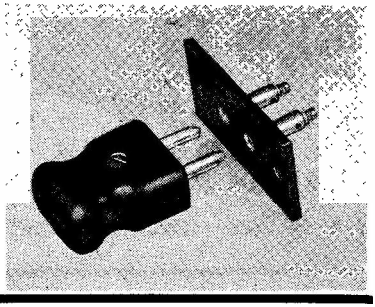
Frequency in Mc/s	Length in feet	Frequency in Mc/s	Length in feet
7·0	32·75	6·0	40
		9·0	27
14·0	16·5	12·0	20
28·0	8·0	15·0	16
		18·0	13
56·0	4·25	21·0	11

Length given is per half-section.



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Rotating ceramic coils wound with special alloys are employed. These count up to 43 complete rotations, giving remarkable setting accuracy.
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The unit is housed in a metal instrument box, size 12½" × 9" × 17" deep.
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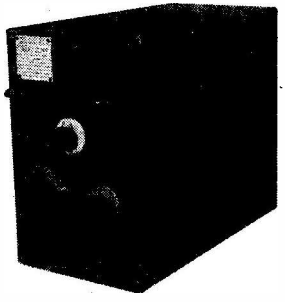

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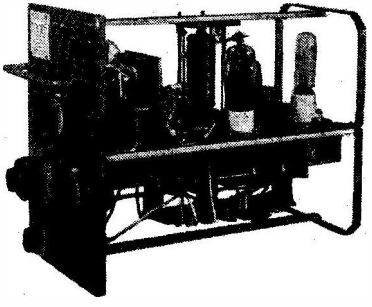

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