

RSGB

Bulletin

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Vol. 30 No. 11

MAY, 1955

Price 2/6 Monthly

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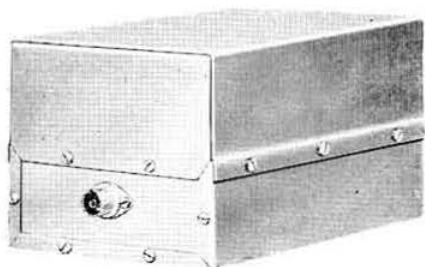
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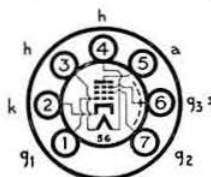
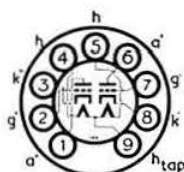
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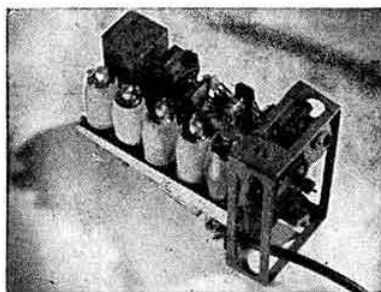
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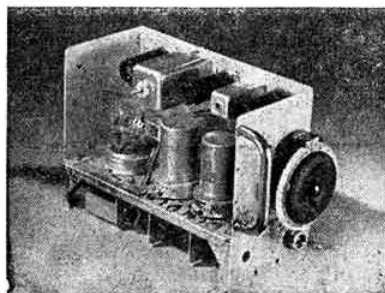
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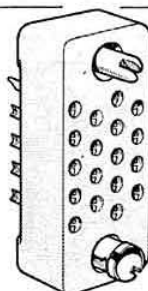
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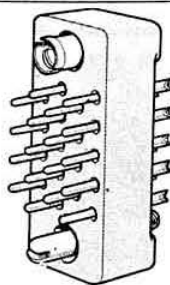
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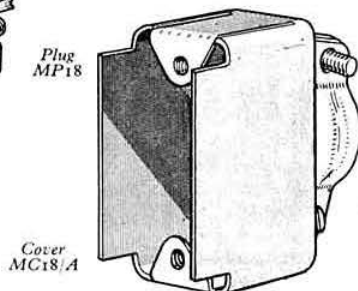


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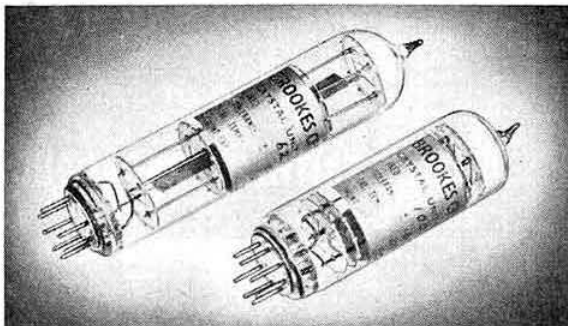
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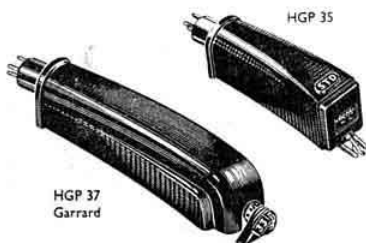
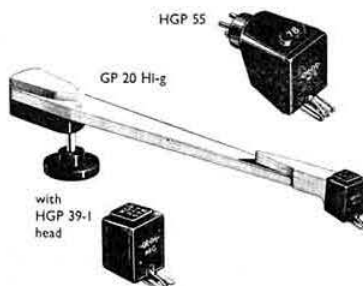
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DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

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V.C.4.



Reflections on the Nottingham Case

REACTIONS were immediate to the court case at Nottingham, where an individual who was not licensed as a radio amateur was convicted after a prosecution by the Post Office.

There is no need to detail further the train of events: the immediate reaction of the Council in complaining to the G.P.O. and to the Press and the subsequent asking of a Question in the House by that former radio amateur, Mr. Charles Ian Orr-Ewing, M.P., whose constant interest in the Amateur Radio movement, incidentally, might well earn him the colloquial eponym of "The radio amateur's M.P."!

Yes, the reaction was swift, and the incident may perhaps now be regarded as closed except for one thing, and that is the lesson which it holds for all of us on the subject of "piracy" in general. However misguided some of the statements in court by the G.P.O. solicitor may have been, he was perfectly right in suggesting that the locations of all transmitting stations in this country should be known to the authorities. During these intensely insecure years of the mid-20th century no one in his senses would deny the importance of this ruling. For this reason alone every radio amateur who suspects the existence of an illicit transmitter should report it at once.

National security, though, is by no means the only consideration; the reputation of the British Amateur Radio movement can be easily brought into disrepute by operators of illegal transmitting stations passing themselves off as genuine radio amateurs. One of the abuses which can result from such illicit operating was shown in the Nottingham case, in which a feature was "gramophone grinding"—a practice long since discarded by reputable licence holders and, in fact, now banned by the current Amateur (Sound) Licence.

Some of us at one time or another have encountered at local meetings the over-keen individual who cannot wait to receive the official licence before "putting that new rig on the air . . . just trying it out, you know." Sometimes the admission is tinged with bravado; alternatively it may be whispered to another in confidence. Whatever form the communication may take there should be but one reply which, to quote a famous Eekersleyism, is: "Please don't do it." The would-be offender should be left in no doubt as to what the consequences will be if he fails to heed the warning.—J.H.

A Good Show

ABOUT a month ago the G.P.O. issued a detailed analysis of its work during the year ending January 20, 1955, in dealing with radio and television

interference complaints. It issued a table showing the number of complaints received about each source of interference, with separate columns for radio and television. The figures for "Radio transmitters—amateur" disclosed that during the year there were 125 cases of interference to sound radio and 303 of interference to television.

When these figures are related to the other 29 types of interference that can be caused to broadcast reception the result may be regarded as extremely satisfactory. For instance, "Other transmitters sited in the U.K.," not amateur, caused 142 and 476 complaints to BC and TV respectively. In other words, "official transmitters," which lie far less thickly on the ground than do amateur transmitters—and then seldom in built-up areas—show up a good deal worse (though to be fair, of course, it should be assumed that the "professionals" were using much more in the way of power).

The analysis of the G.P.O. figures shows that, apart from 21,877 cases of TVI bracketed under the all-embracing word "Unknown", the worst offenders were 8,956 sewing machines, 7,056 commutator type motors and 6,954 hair dryers.

Where sound radio was concerned the highest figure, 12,206, was, as with television, recorded against "Unknown". Ironically enough, the next worst cause of BCI was 6,805 instances of radiation from television time base circuits. (Did someone whisper "TVI in reverse"?)

If a "clean picture" is the wish of radio amateurs in respect of their local viewers then it certainly looks as if they have achieved it—judging from the very small number of cases reported by the G.P.O.

That is by no means the end of the story; if the majority of British Amateur Radio transmitters are closed down during television hours then, of course, TVI will be negligible. There are grounds for suspecting this is happening to a fairly widespread degree, either because the lure of the screen is stronger than that of the shack, or because there is a fear, possibly quite baseless, that TVI will be caused and therefore the risk is not worth taking.

It is reasonable to suppose that a significant increase in operating during television hours could occur without undue aggravation of the TVI problem. On 1.8 Mc/s and 145 Mc/s, in any event, it should, in fact, be quite difficult to create TVI except with the most outrageously constructed equipment. On the other five h.f. bands which fall between 1.8 and 145 Mc/s, operation on medium power should be the order of the day—or, rather, evening—once the commonsense TVI-proofing advice so often given in this journal has been followed.—J.H.

The Antennamatch†

Part I—General Considerations of a New Aid to Maximum Efficiency in Aerial Matching

By F. HICKS-ARNOLD (G6MB)*

It is never very easy to be quite sure that a transmitter is delivering maximum power to its radiating system but the instrument to be described in this and the succeeding article enables the necessary measurements to be made quickly and simply. The Antennamatch is one of those devices which, once installed, is likely to leave the user wondering how he ever managed without it. Its construction should be an urgent project amongst all those wishing to employ their transmitting equipment to best advantage.

It is a fundamental truism that "any given aerial is only as good as the matching between it and the transmitter permit it to be." Unfortunately, this is all too often overlooked and much useful power is wasted on its way to the radiator.

Power transfer from the transmitter to the aerial system is nearly always carried out by the use of some form of transmission line between the output of the transmitter and some convenient feed point along the aerial itself. When the transmission line is correctly terminated to the load presented at either end, and the line itself has the correct characteristic impedance, then, and then only, are the voltage and current uniform throughout its length and r.f. power flows along the line in the form of a travelling wave.

The ratio of voltage (V) to current (I) is the characteristic impedance (Z_0) of the line and is determined by its type of construction. Correct matching and uniform travelling wave occur when the aerial load is equal to Z_0 and the load offered to the transmitter is also Z_0 . If the load at the aerial or end of line remote from the transmitter is of a pure resistive nature and of Z_0 impedance then it will accept all the power which the line offers. Should this not be so, a second travelling wave will be reflected back from the load to the source of power.

The interaction between the forward travelling or power wave and the reflected backward travelling or loss of power wave results in periodic variations of V and I along the line, referred to as standing waves. The impedance V/I offered to the transmitter now depends on the degree of mismatch and the length of the transmission line, since for every volt offered to the line by the transmitter there is a reflected voltage fed back along the line. The phase angle between the forward and reflected voltages may be of any relative angle depending on the length of the line and may either aid or oppose the transmitter. If the mismatch is severe it may be difficult to load the transmitter correctly, and as the average current in the line is increased, so is power lost by line resistance also increased. If the load presented to the transmission line is of Z_0 impedance and purely resistive, then the phase angle of voltage and current flowing along the line will be zero, and the



The front panel appearance of The Antennamatch showing the various meters and controls.

total power presented to the line will be accepted by the load. Should the load be not purely resistive, but reflect back either capacitive or inductive reactance, then the phase angle will change from zero to a figure depending on the magnitude of the reactance and of a sign determined by whether the reactance is capacitive or inductive.

Loading the Transmitter

Thus it can be clearly seen that for maximum transference of power from the transmitter to the aerial two conditions are required: correct impedance and zero phase angle. The ratio between forward and reflected current in a transmission line is called the Reflection Coefficient K and is related to the standing wave ratio by the equation:

$$S.W.R. = \frac{1 + K}{1 - K}$$

K is always less than unity, since the load cannot reflect more current than it receives, so that for a perfect match K is zero.

If these two conditions are not present, difficulty will be found in loading the transmitter with the correct coupling. How many of us have been guilty of adding another couple of turns to the link coupling to the p.a. tank when it appears that the final will not load to the correct value? Such expediency is unforgivable and quite useless as a method of getting more power into the aerial—it serves only to increase the standing wave ratio on the line and to increase the circulating current, thus further increasing losses by heat and reactance thrown back along the line.

With the ever increasing popularity of the pi-network and its advantages for harmonic reduction, correct matching between the final stage and the aerial becomes even more important. If the load presented is not correct, the Q of the final tank circuit will not be as the designer intended, and efficiency will be reduced. Should there be standing waves on the transmission line, a "low pass filter" inserted in the line cannot work correctly and instead of attenuating the undesired harmonics it may make matters worse.

Low Pass Filters

Many commercially-made low-pass filters have incorporated in them fixed capacitors of comparatively low

†This article is based on a lecture given by the author at a meeting of the Society held at the Institution of Electrical Engineers, London, W.C.2, on January 28, 1955.

*"Sixty-four", Garrick Close, Walton-on-Thames, Surrey.

voltage rating; a correctly terminated low impedance line has a voltage across it well within the rating of such capacitors, but should the filter be introduced at a point where high voltages exist (due to standing waves caused by incorrect load matching) then there is every likelihood of the capacitors breaking down and destroying the filter. In fact these very points were brought home to the writer when using parallel 807s in a final stage and a pi-network for matching the anode impedance of the 807s to 75 ohms. The low impedance line from the transmitter (75 ohms) to the aerial matching network was terminated by a single turn Faraday screened link. This single turn was made from the same coaxial cable as the line, and was of a rating suitable for 150 watts input to the transmitter. In spite of this the link got so hot that the inner conductor melted its way through the polythene insulant and shorted through to the outer screening. The insertion of an r.f. ammeter in the 75 ohms line showed a current of 6 amps! If all were well and the line correctly terminated then such a current into 75 ohms would indicate a power of 2.7 kilowatts—rather a lot for two 807s!

It was evident therefore that all was *not* well and that a bad standing wave existed on the 75 ohms line.

The Pi-network Circuit

For a pi-network final, conditions for C1-L-C2 must be of the correct calculated value for the frequency in use, and the Q value desired in the network. The network has a specific job to do—and that is to give an impedance transformation from that of the anode load impedance, of whatever valve is to be used in the final, to some specific impedance required to be presented to the transmission line. This specific output impedance is usually 50, 75 or 100 ohms to suit the characteristic impedance (Z_0) of the transmission line to be used. Only when these exact values and conditions are observed can the impedance presented to the line be correct. All possible variations of these values should be eliminated. In practice, the use of a large variable capacitor for C2 should be avoided, especially if L is also made variable. For ease of band switching C2 should be a fixed value as calculated for conditions required, and L either tapped and switched or made variable.

Theoretically, it can be shown that for any given set of conditions the values of C1-L-C2 are fixed and of one value only and can be made so in the transmitter; in practice, due to variations in the mains voltage and changes from one end of the band to the other, it is desirable to have some control of the final loading. Such a control can be arranged so that C2 is made up of a fixed value to very nearly the correct theoretical value, plus a small amount of variable capacity in parallel to take care of voltage and frequency changes. Better still, the whole of C2 should be fixed at the correct value and L made variable. With C1 and L at resonance and with the final stage operating under correct conditions of input, one can be sure that the impedance at the output and presented to the power end of the line will be of the correct calculated Z_0 .

Pi-network Calculations

Methods of calculating values for C1, L and C2 have been described many times both in the BULLETIN and other technical journals and the writer would refer the reader to a most excellent article entitled "The Design of Pi-network Tank Circuits" by H. Whalley (G2HW), in the R.S.G.B. BULLETIN for April, 1952. It may be as well, however, to re-emphasize here some of the more important points to bear in mind when designing such networks. In order to calculate the values of C1-L-

C2 for any given frequency it is necessary to know the values of R1 and R2, which are the resistances to be matched and XC1, XL and XC2 which are the reactances of the network components (see Fig. 1). In such a network the sum of the capacitive reactances must be equal to the inductive reactances when at resonance, and of a suitable Q value, in order to give the "flywheel effect" so essential for the operation of Class C r.f. amplifiers. Q values from 10 to 15 are suitable for efficient operation of the p.a. and for reasons explained in the article already referred to, the impedance ratio to be matched, i.e. R1 to R2, should be appreciably less than 100:1. R1 is the resistive impedance that the p.a. must work into in order to deliver its rated power output.

In class C operation and steady carrier condition, the r.f. voltage at the anode of the p.a. valve is about 80 per cent of the d.c. supply voltage. If the h.t. voltage be called Eb, then the peak r.f. voltage will be 0.8 Eb, and the r.m.s. value of this voltage E will be $0.707 \times 0.8 \times E_b$ or $0.57 E_b$. The r.f. power actually delivered from the p.a. valve may be taken as 66 per cent of the d.c. power input. This power is delivered into the effective anode load R1, thus $E^2/R1 = P$, and $R1 = (0.57 E_b)^2/P$. R2 is the surge impedance of the transmission line to the aerial system and in many cases will be around 75 ohms. This value will not be affected by the inclusion of a low pass filter provided the line is correctly terminated by the aerial system and the filter has been designed for an impedance input of 75 ohms.

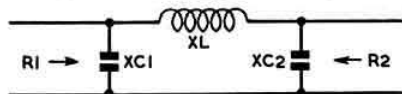


Fig. 1. Pi-network suitable for harmonic suppression.

Practical Example

Taking a specific example, suppose that the d.c. input to the final is 750 volts at 200 mA (150 watts input). Then Eb will be 750 and P will be 100.

From the formula,

$$R1 = \frac{(0.57 \times 750)^2}{100} = \frac{427.5^2}{100} = 1830 \text{ ohms}$$

$$R2 = 75 \text{ ohms and } \frac{R1}{R2} = \frac{1830}{75} = 23:1$$

For convenience and greater ease of the use of the excellent graphs in Whalley's article, an answer sufficiently correct can be found from $R1 = 2000$ ohms, $R2 = 75$ ohms and $R1/R2 = 25:1$, and the circuit Q value 12. From the curves we then get $XC1 = 185$, $XL = 220$ and $XC2 = 35$. From reactance tables the exact values of C1-L-C2 for each frequency required can be obtained. Since 750V x 200 mA is a popular condition, using such valves as a 4D22, 829B and QV06/40 (sections in parallel) or a pair of 807s in parallel, actual values are given in Table I.

Table I
Values of C1-L-C2 for conditions of 750 volts at 200mA and Q=12.

Frequency	C1	L	C2
3.5 Mc/s	250 μF	9.5 μH	1400 μF
7.0 Mc/s	125	5.0	650
14.0 Mc/s	65	2.5	300
21.0 Mc/s	40	1.75	210
28.0 Mc/s	30	1.2	150

For efficient operation and good harmonic reduction the ratio of R1/R2 should be as low as possible and the Q kept at 10 or 12. For this reason low voltage and high current type valves are easier to use with good

efficiency than those of the 4/65A or 813 types using high anode voltages.

With these features established and put into operation, one can be sure that the correct impedance will be presented to the power input end of the transmission line. There remains then only the problem of ensuring that the load or aerial will reflect back a similarly correct impedance at zero phase angle, for the total power generated by the transmitter to be transferred to the aerial. (Ignoring normal line losses which cannot be avoided.)

Matching the Transmitter to the Aerial

Unfortunately this problem is not so simple to resolve—somehow the aerial has to be arranged so that when coupled to the low impedance transmission line from the transmitter, it “looks back” along the line as a pure resistance of 75 ohms. Many devices have been used in Amateur Radio to tell when the transmitter is matched to its aerial load: impedance bridges, r.f. ammeters, s.w.r. detectors and similar devices all supply valuable information. Not one of them, however, is capable of telling the whole story. Ideally, what is required is some device that can be inserted in the low impedance line between the transmitter and the aerial matching network, a device that can be left permanently in the circuit and capable of passing the full power from the transmitter. This apparatus must be able to detect any deviation from correct impedance and zero phase angle and be able to compare these factors directly with conditions set up in a perfect load.

Such a device is The Antennamatch which has been devised and adapted for amateur use from a unit designed by Virgil True of the U.S. Naval Research Laboratories. It was originally intended to drive an automatic aerial tuning system and is capable of furnishing valuable visual information for any radiating system.

The Antennamatch as now developed and adapted will furnish the following information:

- (a) It will indicate when the load impedance is of the desired magnitude or if it is too high or too low.
- (b) It will indicate when the load is non-reactive, or if not, whether the reactance thrown back is capacitive or inductive.
- (c) When the load has been adjusted to the correct and desired value and is non-reactive, it will indicate the power output from the transmitter as accepted by the aerial.

The device consists essentially of three measuring instruments in one unit:

- (1) Impedance magnitude detector. (2) A phase angle indicator. (3) An output section containing an r.f. ammeter and a dummy aerial. The particular version described in this article is designed for use with 75 ohm line and a maximum r.f. power of 100 watts.

The theory of the impedance magnitude and phase angle detectors is not at first glance apparent and the following brief explanation as to their working may serve to show their particular suitability for helping to solve most of our aerial matching problems. Fig. 2 shows the essential circuitry of both the impedance detector and the phase angle detector.

Impedance Detector

From Fig. 2a we see that a resistor is placed in series with the transmission line. The r.f. voltage drop across this resistance is detected by means of a crystal diode D1. At the same time a voltage which is a portion of the line voltage is applied to a second diode D2.

The voltage applied to D2 is a constant fraction of the line voltage, determined by the ratio of C1 to C2. The voltage applied to D1 is the voltage drop across the one ohm resistance R1 inserted in series with the line. The ratio of C1 to C2 is approximately 1 to 75, thus when the total load impedance measured at the output of the sensing circuit is 75 ohms, the voltage applied to D1 is 1/76 the line voltage, i.e. the same magnitude as the voltage applied to D2. We have therefore two arms of a bridge circuit and the d.c. output voltage will be zero.

The accuracy of this circuit is such that as the ratio of C1 to C2 is 1 to 75; at balance condition the impedance seen by the sensing unit is 74 ohms. The terminal impedance to the feeder line is then 74 ohms plus the one ohm series resistance or 75 ohms. If the terminal load impedance is greater than 74 ohms, the voltage applied to D1 is less than the voltage applied to D2 and the d.c. output will be positive. Conversely if the load impedance is less than 74 ohms the voltage applied to D1 is greater than the voltage applied to D2 and the

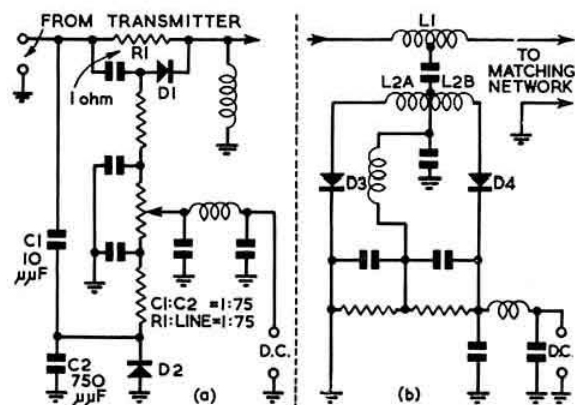


Fig. 2. (a) Circuit diagram of the impedance magnitude detector. (b) Circuit diagram of the phase angle detector.

d.c. output will be negative. Such a d.c. response varying both in polarity and magnitude according to whether any incorrect load presented to the output side of the detector is either too high or too low in impedance is ideal for indication on a centre zero reading meter or for operating a servo controlled balancing system.

The Phase Angle Detector

The phase angle detector (Fig. 2b) consists essentially of an inductance in series with the line, coupled to another inductance across which a Foster-Seeley type of discriminator is connected. The coupled inductance is centre tapped and is in effect two inductances L2A and L2B in series. The voltage applied to D3 (a crystal diode) is the vector sum of VC2 (a voltage in phase with the line voltage) and VL2A an induced voltage that leads the line current by 90°. Similarly the voltage applied to D4 is the vector sum of VC2 and VL2B, an induced voltage that lags the line current by 90°. The d.c. voltage VO is the difference in magnitude of these two rectified voltages.

A study of the vector diagram (Fig. 3) reveals that as the phase angle goes to zero, when the load becomes purely resistive, the output of the circuit goes to zero, and that the sign of the error voltage is dependent upon the sign of the phase angle and whether the change be caused by an inductive or capacitive reaction reflection. These are the two prime requisites of a de-

tector to control a servo system or indicate on a centre zero reading meter. Another desirable feature of this circuit is that the sensitivity, defined by the rate of change of voltage out with respect to a change in phase angle, occurs in the neighbourhood of zero phase angle. This permits extremely accurate phase angle correction.

From this theoretical explanation of the working of the impedance and phase angle detectors, it will be seen that the output from both detectors is zero when the terminal impedance of the line is 75 ohms in magnitude and has a phase angle of zero degrees. This is the condition for a perfect match between aerial and feeder line, and as such, a condition for maximum transference of power from transmitter to aerial.

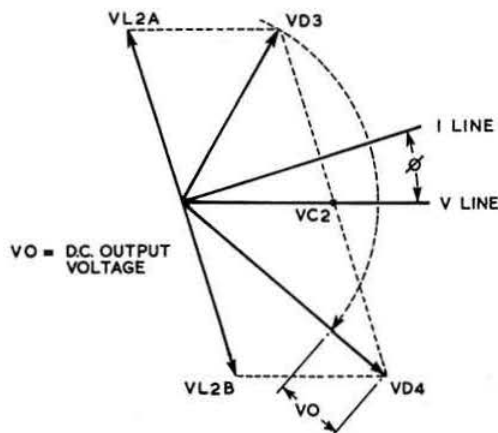


Fig. 3. Vector diagram of the phase angle detector.

When in practical use, the output side of the detectors is first connected to an ideal pure resistive load (i.e. dummy aerial) and the transmitter set up to its tuned up condition (i.e. minimum dip on the p.a. current meter at the correct current reading in loaded condition). In our specific example previously mentioned this would be 200 mA with the anode volts at 750. As the transmitter will then be operating into the correct load, both centre zero reading meters on the detectors should read zero. If this is not the case, small corrections can be made by use of the two variable potentiometers. The purpose of the potentiometers is to bring about a correct balance and to permit of some variation in the fixed ratio of C1 to C2 or R1 from one ohm thereby making the circuit components less critical.

The transmitter having been correctly set up into the dummy load the output is then switched to the aerial matching network which is so adjusted to bring both indicating meters to their centre zero point. When this has been achieved the aerial should present the correct load and accept the same power at exactly the same d.c. input to the p.a.

(Part 2, to be published next month, will describe the construction and use of the Antennamatch.)

Gramophone Records

LICENSED amateurs are reminded that special recordings for the reproduction of modulated tones for test purposes may be used but apart from these only recordings of messages for retransmission are permitted (see Clause 8 of the Amateur (Sound) Licence).

The playing of gramophone records over the air is not permitted.

Improved V.H.F. Transmitting Valves

MULLARD Ltd. is now manufacturing improved double tetrode transmitting valves in which the special construction makes possible efficient operation at frequencies up to 600 Mc/s. Lead inductance has been reduced to a minimum and built-in neutralizing condensers are employed.

The QQV03-20A (CV2799) has a maximum rating of 39 watts under telegraphy conditions at 200 Mc/s whilst 15 watts output is obtainable at 600 Mc/s. The QQV06-40A (CV2797), a larger valve with an anode dissipation of 20 watts per section (twice that of the QQV03-20A), is rated at 72 watts output at 200 Mc/s. Outputs of the order of 45 watts are obtained at 500 Mc/s.

H.M.V. Introduces "Stereosonic" Records

THE Gramophone Company Ltd. ("His Master's Voice") is making available "Stereosonic" (two channel) tape records in which every detail of the recorded sound is reproduced with "three-dimensional" realism. The two channels are recorded on the same 1 in. magnetic tape and played back through two identical sets of amplifiers feeding two loudspeakers. The spacing of the loudspeakers varies according to the size of the room and the system is suitable for home use. It is expected that the "Stereosonic" Reproducer will be on the market in the early Autumn.

B.B.C. Band II Service

ON May 2, the first of the B.B.C. v.h.f. frequency modulated transmitting stations, at Wrotham, Kent, came into regular service. The new station will serve a large area of South-East England with the Home Service and the Light and Third Programmes and is the first of a network which will bring interference-free reception of very high quality to 75 per cent. of the population. Other stations already authorized by the Government will be at Pontop Pike, Divis, Meldrum, Norwich, South Devon, Sutton Coldfield, West Wales and Holme Moss. All should be in operation by the end of 1956.

Visitors to Cyprus

MR. C. R. "Titch" Emary, M.B.E., ZC4XA, 8 Olympias Avenue, Nicosia, will be happy to extend hospitality to any radio amateur who visits or calls at Cyprus en route to another destination.



In this picture, taken during the South Staffs. R.A.E.N. Group Exercise "Porter", are (left to right) A. Large, G2HKS, G2FDY, G3DZT, G3ABG, Junior Op. G2COP, G2COP, and an interested spectator. (Photo by G3FZW)

The "Simplicity" Crystal Controlled Converter

An Easily Built Unit for Mobile Use

By JOHN CASSON (G2ACT)*

CAR radio receivers do not generally cover the amateur bands and a converter is therefore necessary for mobile work. The unit described in this article provides excellent reception of signals in the 14, 21 and 28 Mc/s bands with practically any type of receiver as the tunable i.f./a.f. chain.

The Circuit

It will be seen from the circuit shown in Fig. 1 that only two valves are used—one as an r.f. stage, the other as combined mixer and crystal controlled local oscillator. The triode mixer section of V2 (6J6) uses leaky grid bias and resistance coupled output, the

on 4330, 4000, 9166 and 5700 kc/s produce oscillator outputs on 13, 20, 27.5 and 28.5 Mc/s respectively. Crystals have also been used which have outputs on 11, 17 and 24 Mc/s (3666, 5677 and 8000 kc/s). With the first group, the 14 and 21 Mc/s bands are tuned between 1 and 1.5 Mc/s (which permits direct calibration merely by addition) and 28 Mc/s in two bands of 0.5 to 1.5 Mc/s; with the second group, the three bands are all tuned between 3 and 6 Mc/s on the main receiver.

The signal frequency circuits can be either above or below the oscillator frequency. For instance, an oscillator frequency of 17.5 Mc/s permits both 14 and

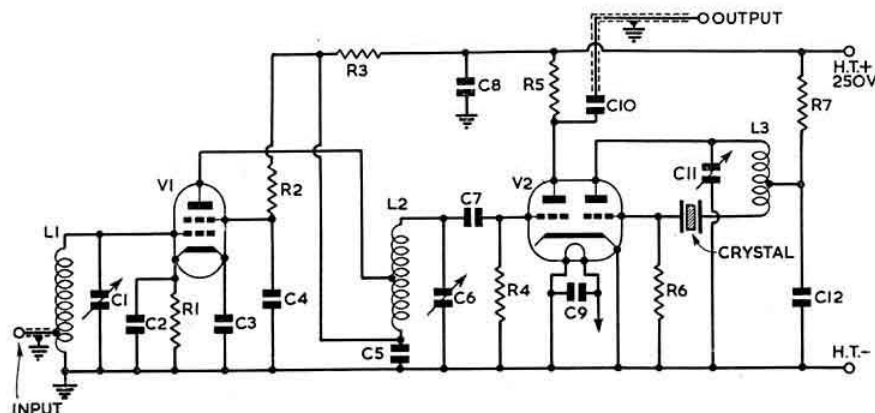


Fig. 1. Circuit diagram of the crystal controlled mobile converter. C1, 6, 11, 100 μ F; C2, 3, 4, 8, 9, 600 μ F; C3, 2500 μ F; C4, 10, 100 μ F; C5, 6000 μ F; L1, 12 turns 16 s.w.g., $\frac{1}{2}$ in. diam., $\frac{1}{2}$ in. long, tapped at 21 turns; L2, 13 turns 16 s.w.g., $\frac{1}{2}$ in. diam., $\frac{1}{2}$ in. long, tapped 51 turns; L3, 13 turns 16 s.w.g., $\frac{1}{2}$ in. diam., $\frac{1}{2}$ in. long, tapped 21 turns; R1, 200 ohms; R2, 25,000 ohms; R3, 6,000 ohms; R4, 1 Megohm; R5, 22,000 ohms; R6, 10,000 ohms; R7, 5,000 ohms; V1, 6AK5, 6AG5 or 9003; V2, 6J6. Crystal, see text.

latter enabling any frequency band to be employed as the variable i.f. Self oscillation may occur when the resonant frequencies of the grid and anode circuits are close to one another† but this can be avoided by using capacity coupling to the input of the main receiver. A reduction in the value of the coupling condenser C10 or the insertion of a stopper resistance will reduce any tendency towards mixer oscillation as well as the overall gain of the system. Such a reduction is unlikely to be troublesome as there is more than sufficient gain for any reasonably good receiver.

An overtone oscillator circuit is used in the second section of V2. All but a few very inactive crystals operate satisfactorily in the arrangement shown to produce output from 10 to 29 Mc/s on their third or fifth overtones. Injection to the mixer section can be varied by adjusting the sense of the oscillator coil L3 in relation to L2, to which it should be placed parallel. Coupling can be increased by using a small capacity between these coils but if the layout shown is adopted this should be unnecessary. The mixer will tend to pull the oscillator out of oscillation when tuned to exactly the same frequency unless an exceptionally active crystal is in use.

A wide combination of crystal frequencies and tunable i.f. ranges is possible. At G2ACT/M crystals

21 Mc/s to be tuned in the 3.5 Mc/s range. The disadvantage of tuning "backwards" due to having the oscillator on the high side of the signal frequency is not a disadvantage where a medium wave set calibrated in metres is used as the i.f. chain because the dial can be recalibrated by using a strip of adhesive tape or something similar. In a case of this sort it is not necessary to have an exact crystal frequency and a wide choice of crystals is therefore possible. Local oscillator frequencies between 12.75 and 13.5 Mc/s on the one hand and between 15.8 and 14.85 Mc/s on the other would both bring the 14 Mc/s band within the medium wave range of the average car radio. Dividing these frequencies by three or five will give the approximate frequencies of crystals likely to be useful. (The frequency of an overtone oscillator generally differs slightly from exactly three or five times the fundamental.)

If the unit is to be used with a 12 volt heater supply, the valves may be connected in series provided a suitable pilot light is wired in parallel with the heater of the valve selected for V1. It should be noted, however, that the heater currents drawn by the types suggested vary considerably. All other component values indicated for V1 are satisfactory for the 6AK5, 6AG5 or 9003.

Construction

The converter is built into a box measuring 5in. x 4in. x 2in. which should be provided with a

*Wycollar, Pedders Lane, Ashton, Preston, Lancs.

† The input coupling coils of many receivers are self resonant at frequencies very much higher than the signal frequency.

well fitting lid so that contact is made all round with the sides of the box and with the screen between the r.f. and mixer stages. Details of the general layout may be seen in the accompanying photograph.

Earth returns from the tuning condensers, which are mounted on the front wall of the box, are made only through their bushings and the chassis; any other form of return will introduce instability into the r.f. amplifier. The valve-holder for V1 straddles the screen to which its centre sleeve is earthed. No other leads are earthed to the screen. All by-pass connections should be kept as short as possible and taken to the wall of the box immediately adjoining. Cathode by-pass condensers for the r.f. valve are placed on each side of the screen, for the grid and anode circuits respectively.

After adjustment, L2 and L3 are doped with polystyrene cement to prevent variations in inductance due to vibration. L1 is left undoped so that it can be varied if required to suit the loading effect of the aerial in use. All the coils are self-supporting.

Power is obtained from a socket on the main receiver by means of a screened three-way cable and octal plug. The converter requires only 12 to 18 mA at 250 volts, depending on the activity of the crystal in use, and this should be within the capacity of almost any car radio h.t. supply. Output from the converter is by light coaxial cable which is also used for the aerial input. Effective screening and earthing is most important in order to reduce interference from the car electrical system and to ensure stable operation of the unit.

The converter is mounted on the steering column of the car by means of a suitable electric conduit clamp.

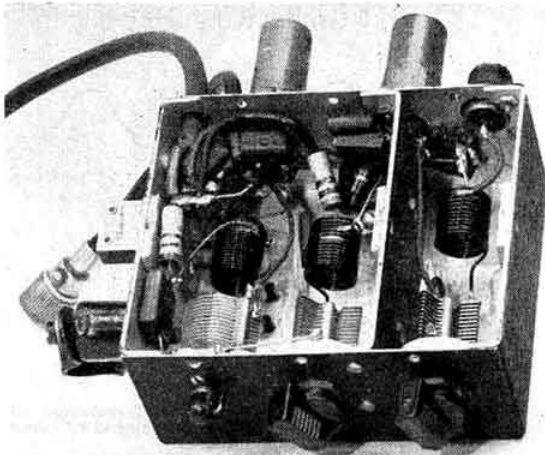
Adjustment

Operation of the crystal oscillator should first be checked. When C11 is rotated, symmetrical dips in the anode current should occur at the third and fifth overtones of the crystal frequency. Oscillation may, however, be sustained over part of the range by the feedback winding and the capacity of the crystal electrodes, thus making correct operation of the circuit difficult. This may be remedied by moving the tap on L3 to reduce the feedback portion or by increasing the separation between it and the tuned part of the coil. Fig. 2 shows how anode current varies with tuning of L3 and C11. The point of self oscillation with a crystal plugged in should be about 500 kc/s less than the lowest frequency in use. Small crystals of the FT243 type which have low inter-electrode capacity make for easier circuit adjustment than larger holders because a greater number of turns can be used in the feedback portion of the winding without uncontrolled oscillation taking place. In practice, no trouble due to the mixer grid

pulling the oscillator frequency has occurred even at 29 Mc/s with an intermediate frequency of 500 kc/s.

The writer frequently uses r.f. tuned circuits which cover a two-to-one frequency range and it is surprising they do not appear more often in published designs of both transmitters and receivers. No loss of gain, or sensitivity, can be detected due to their use. Even on 14 Mc/s the capacity in circuit is comparable with that in many high grade communication receivers, while the size of L1 and L2 should re-assure those who fear poor performance at that frequency. Tuning is simple and flexible and the controls are merely set to the desired band. If a weak station is heard it can be quickly peaked up by adjustment of C1 and C6.

When tuning 1-1.5 Mc/s as the i.f. range, the image rejection is quite adequate with a 12ft whip aerial. Image interference has only been noted on 21 Mc/s. No such trouble has been experienced on 14 or 28 Mc/s



The layout of the converter is clearly illustrated in this picture.

and there is no evidence of breakthrough from a local B.B.C. station on 1.5 Mc/s. In a similar converter used in the home station, the taps on L1 and L2 are lower down the coils (*i.e.* nearer earth and h.t. ends respectively) and higher i.f. ranges are used. It is recommended that the position of the taps should be varied to suit individual requirements. Where a high gain receiver is used as the i.f. channel, the mixer grid could probably be placed about two turns from the earthy end of L2 with advantage from the image rejection point of view. This is also a good way to reduce overall gain without spoiling the signal-to-noise ratio. The tap on L1 may be placed lower down the coil if the r.f. circuit does not peak sufficiently due to heavy aerial loading.

Results

Used with a CBY series 0.5 to 1.5 Mc/s Command receiver as the i.f./a.f. chain the simple converter described gives better results than any obtained with commercial receivers. The Command set in question has excellent selectivity and can be easily modified to give considerable gain, good a.v.c. action and plenty of audio output. A noise limiter of the AR88 type has been fitted to the receiver in use at G2ACT/M so that full facilities for working DX are available. For R.A.E.N. purposes, where high selectivity is perhaps a disadvantage, a 3 to 6 Mc/s Command set might be preferred as it has a reasonably wide i.f. passband.

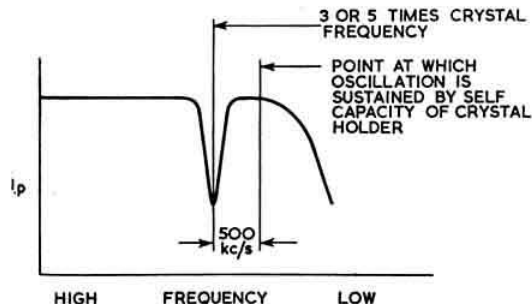


Fig. 2. Variation of anode current with tuning of the oscillator circuit.

An Introduction to Amateur Transmitting

Part 4—Keying the Transmitter

By LORIN KNIGHT, A.M.I.E.E. (G2DXK)*

THERE are a number of ways in which the radio-frequency signal from a transmitter can be made to convey a message to a listener. We can, for example, transmit speech by using the output of a speech amplifier to control the amplitude of the r.f. signal as shown in Fig. 14. This is a form of amplitude modulation and is officially referred to as a type A3 emission.

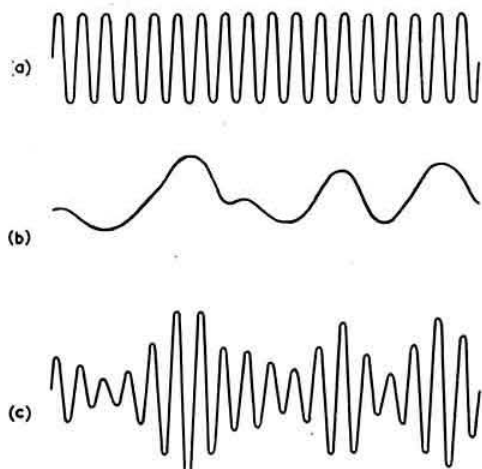


Fig. 14. Amplitude modulated telephony. (a) Unmodulated r.f. signal. (b) Typical speech waveform. (c) Speech modulated r.f. signal.

Alternatively, we can interrupt the r.f. output by means of a telegraph key and send our messages in Morse code. The r.f. waveform would then be as in Fig. 15. Since the amplitude of the signal is being periodically switched between zero and maximum this is actually another form of amplitude modulation. The transmitting licence would call it a type A1 emission but the old-timer usually prefers the older, if somewhat paradoxical, description continuous-wave telegraphy and often abbreviates it to simply c.w. Normally it is this type of emission which will initially concern the newly licensed amateur.

There is one extremely important characteristic of amplitude modulation. If an r.f. signal of frequency f is modulated by a sine wave of, say, 1 kc/s what will actually be emitted is a group of three frequencies. These will consist of the original carrier frequency f together with sideband frequencies of $(f + 1 \text{ kc/s})$ and $(f - 1 \text{ kc/s})$. The complete signal will thus occupy a frequency band of 2 kc/s.

In a typical amateur speech transmission there may be modulation frequencies extending up to 5 kc/s, so that the total bandwidth is 10 kc/s.

In a c.w. transmission, over which no care has been taken, the envelope of the r.f. waveform might be as in Fig. 16 (a). The modulation waveform would in effect consist of square waves and if analysed would be found to be composed of a large number of sine waves, the frequencies of which might extend to as high as

100 kc/s. The sidebands of such a transmission might therefore extend over an entire amateur band and be apparent to listeners as annoying clicks. To prevent this happening all the high frequency components of the modulating waveform must be severely attenuated. In practice this means that we should prevent any sudden changes in amplitude of the r.f. signal, and produce rounded dots and dashes such as in Fig. 16 (b). With suitable shaping it is possible to reduce the frequency band covered by a c.w. signal to considerably less than 1 kc/s.

H.T. Positive Keying

One method of producing a c.w. signal is to wire the key in series with the h.t. supply to the anode and screen of the final p.a. valve. Suitable shaping of the Morse characters can then be obtained by a click filter such as shown in Fig. 17. When the key contacts close the inductance of the iron-cored choke L prevents the anode current rising too suddenly. When the contacts are broken the capacitor C is initially in a discharged state and the anode current continues for a brief period, dying away as it charges C up to the h.t. voltage. When the key contacts close again they will

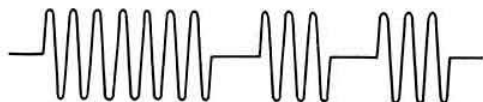


Fig. 15. Keyed r.f. signal.

short out the capacitor; the resistor R is therefore included to prevent the discharge current being excessive.

The larger the values of L and C the more gradual will be the rise and fall of anode current and the narrower will be the frequency band occupied by the radiated signal. In our enthusiasm to restrict the sidebands, however, we must not go so far as to produce a signal like that shown in Fig. 16 (c). The characters would then be indistinct and difficult to read. The optimum values of L and C are best found by experiment. In practice it is not very convenient to try a variety of different chokes. A useful dodge is to use one of about 5 Henrys and, if necessary, produce an effect similar to a reduction in inductance by shunting it with a resistor of 10,000 to 100 ohms.

When the key is open the contacts will have the full

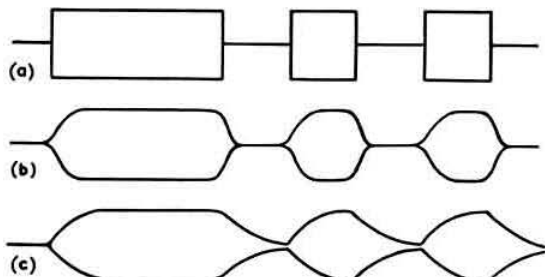


Fig. 16. Envelope of a c.w. signal. (a) No click filter. (b) Adequate click filter. (c) Excessive click filter.

h.t. voltage across them and some care must therefore be exercised. Not only is there the danger of electric shock to the operator; there is the possibility that if the spacing of the contacts is inadequate, or if the click filter is inefficient, there will be sparking. Apart from damaging the contacts this would also produce high frequency components in the modulating waveform.

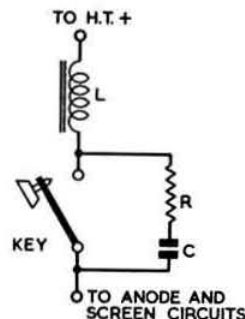
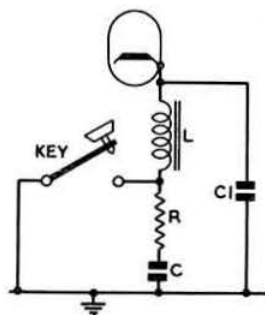


Fig. 17. Key click filter. Typical values for the components are: C, 0.005 to 0.5 μ F; L, 1 to 5 H; R, 100 to 1000 ohms.

Cathode Keying

An alternative method is to connect the key in the cathode circuit as in Fig. 18. When the key is open the cathode will rise to a high potential and the same precautions should be taken as for h.t. positive keying. The practice of cathode keying is usually not recommended by the valve manufacturer as it is liable to

Fig. 18. Cathode keying. C, L and R are the click filter. C1 is for r.f. by-passing and should be about 0.005 μ F.



cause electrical breakdown between cathode and heater. Nevertheless many amateurs continue to use it, often claiming it to give better results than h.t. positive keying and apparently without suffering a high valve mortality rate.

Screen Grid Keying

A rather better method is to key the screen grid supply only as in Fig. 19 (a). The current broken by the key will then be much smaller and the voltage across the contacts when they are broken will often be less. When the key is depressed the screen voltage will rise gradually as C charges up through R1. When the key contacts are broken the voltage will fall gradually as C is discharged by screen current. No other click filtering is usually necessary.

Sometimes merely breaking the h.t. supply to the screen is not sufficient completely to kill the anode current. In such a case the resistor R2 and a battery (or small negative voltage supply) can be added as in Fig. 19 (b) to bias the screen negatively when the key is up.

Blocked-grid Keying

Yet another way of interrupting the r.f. output is to arrange for the key to change the effective value of the grid bias voltage. A typical circuit is shown in Fig. 20.

When the key is up the grid receives the full bias voltage which must be large enough to prevent any r.f. output. When the key is depressed the resistors R2 and R3 form a voltage dividing network across the bias supply. A reduced voltage is then applied via R1 to the grid and the amplifier operates normally. Should it be desired to have no fixed grid bias at all with the key

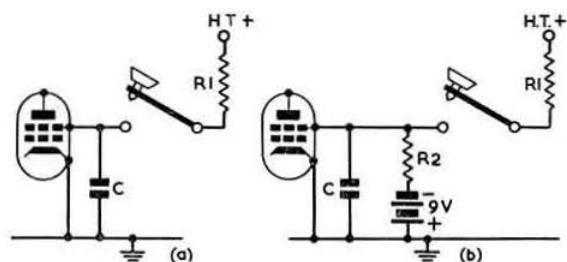


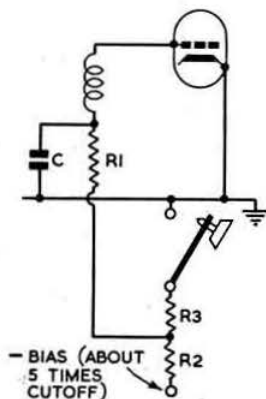
Fig. 19. Screen keying. (a) Simple circuit. (b) Modified to apply negative bias to the screen. The value of R1 will be governed by the h.t. voltage and the d.c. rating of the screen but might be 5000 to 50,000 ohms; C is the normal r.f. by-pass condenser and might be 0.001 to 0.01 μ F; R2 might be about 100,000 ohms.

down, R3 can be shorted out. The key will then connect the bottom of the grid resistor R1 direct to earth.

The capacitor C together with the resistance network prevents the bias voltage at the grid from changing abruptly when the key contacts make and break, and gives a click filtering action.

With a high-power amplifier blocked-grid keying is not very practicable because of the very high bias voltage which is required.

Fig. 20. Blocked-grid keying. R2 might be about 47,000 ohms. The value of R3 will depend on the fixed bias required with the key down. R1 is the normal grid resistor. C is the usual r.f. by-pass condenser.



Buffer Keying

If there is a buffer amplifier or frequency doubler preceding the final amplifier it is usually easier to key this instead of the final amplifier. Any of the keying systems described above can be used.

It must be remembered that none of the r.f. stages following the keyed valve will have any grid excitation when the key is up. They must therefore have protection against excessive anode current with no r.f. input. This protection can be given by some fixed grid bias or by a clamp valve, but for a low power stage the cathode bias arrangement of Fig. 21 is often more convenient.

With this circuit any h.t. current through the valve produces a voltage drop across the cathode resistor R, thus making the cathode positive with respect to the grid and limiting the anode current to a safe value.

It is important that all the stages following the keyed valve should be stable with low grid excitation, otherwise momentary parasitic oscillations may occur just as the excitation is rising or falling and these will give rise to key clicks.

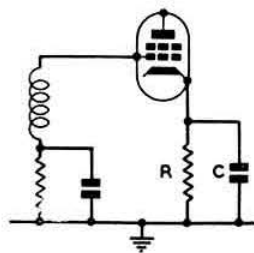


Fig. 21. Cathode bias. C is an r.f. by-pass condenser and a typical value would be 0.01 μ F. Typical value for R, 470 ohms.

Oscillator Keying

Some c.w. operators like to use what are called "break-in" techniques. That is to say they have the transmitter and receiver both switched on together but arrange for the receiver to be muted whenever the key is depressed. They can then listen during the pauses in their own transmission.

It is not intended to study all the details of this rather specialized subject here but it is worth noting that an essential requirement for break-in operation is that the master oscillator should be completely inaudible in the receiver when the key is up. It is difficult to achieve this state of affairs by screening and a more popular solution is to key the oscillator itself.

With an electron-coupled v.f.o. it is usually most satisfactory to key the screen. It is essential, however, that the oscillator frequency should be as immune as possible to changes in screen voltage. After the key contacts are closed it may take several milliseconds for the screen potential to rise from zero to its maximum value and, conversely, after the contacts have broken, it may take several milliseconds to fall. If these variations in screen voltage are accompanied by any appreciable changes in frequency the Morse characters will "chirp" and be difficult to read.

Voltage stabilizers will be of no help because it is in the transition from zero to the final voltage that the trouble occurs. Some apparent improvement can be made by reducing the time constant of the screen circuit, i.e., by reducing the values of C and R1 in Fig. 19. The chirp will then occupy an extremely short period of time and be barely perceptible. Unfortunately, the resultant r.f. output will have very abrupt changes in both amplitude and frequency and these may result in particularly objectionable key clicks being emitted.

These difficulties can be overcome by a really well designed v.f.o. or by a special circuit which causes a succeeding stage to be keyed in such a way that it is switched on just after the oscillator and switched off just before, thus missing the clicks and chirps. The newcomer, however, is advised to be very cautious about keying a v.f.o. on the 14 Mc/s band or higher.

Cathode keying is not to be recommended for a v.f.o. because with some circuits slight variations in key contact resistance can produce noticeable fluctuations in the frequency.

When keying a crystal oscillator it is usually best to connect the key in the h.t. supply to that stage. The

oscillator should be stable; otherwise chirps may be produced.

Bibliography

In this series we have now covered the most important considerations involved in the building of a c.w. transmitter. At this juncture the reader may wish to enlarge his knowledge of some of the points which have been discussed to date and a list is given below of additional reading matter which should be helpful.

- (1) "The Newcomer's Low Power Harmonic-Free Transmitter," Matthews, R.S.G.B. BULLETIN, November, 1953. (Correction in December issue, p. 275.) (Crystal or v.f.o. controlled bandswitched 25-watt c.w. transmitter for 14 and 21 Mc/s.)
- (2) "Novice 80- and 40-Meter One Tube Rig," McCoy, QST, November, 1953. (Crystal controlled 1-valve 10 watt c.w. transmitter.)
- (3) "The Pigmy Powerhouse," Countryman, QST, April, 1954. (Compact v.f.o. controlled 40 watt transmitter covering all bands from 3.5 to 28 Mc/s inclusive with bandswitching.)
- (4) "An Improved 75-watt TVI-proof Transmitter," Varney, R.S.G.B. BULLETIN, December, 1951, January, 1952. (All bands 3.5 to 28 Mc/s inclusive with bandswitching.)
- (5) "The Elizabethan," Varney, R.S.G.B. BULLETIN, July and September, 1953. (150-watt transmitter containing all the features of the 75-watt TVI-proof transmitter and a number of improvements.)
- (6) "The Design of Pi-Network Tank Circuits," Whalley, R.S.G.B. BULLETIN, April, 1952.
- (7) "How to Wire a Transmitter," Goodman, QST, February, 1952.
- (8) "TVI Can be Cured," Whalley, R.S.G.B. BULLETIN, April, 1954. (Clear description of well-tried methods of preventing television interference.)
- (9) "A Design for Break-In Operation," Segrott, R.S.G.B. BULLETIN, January, 1952.
- (10) *The Radio Amateur's Handbook*, A.R.R.L., New Edition each year.
- (11) *The "Radio" Handbook*, Editors & Engineers Ltd.
- (12) *Valve Technique*, R.S.G.B., 1948.
- (13) *Simple Transmitting Equipment*, R.S.G.B., 1949.
- (14) *Transmitter Interference*, R.S.G.B., 1948.
- (15) *Television Interference*, R.S.G.B., 1951.

Activity during N.F.D.

IN a letter to Headquarters, G3ELZ says that Nicosia (Cyprus) group—ZC4JA, ZC4BA, ZC4XA and ZC4RA—will be operating ZC4NFD/P on 3.5, 7 and 14 Mc/s during National Field Day. Famagusta group will be active on 3.5, 7 and 14 Mc/s under the call ZC4GF/P. G2MI and G2BSA report that in Eire, EI9Q/P will be on 3.5 Mc/s, EI4AB/P on 7 and EI3R/P on 14 from a site 475 ft a.s.l. 3 miles north of Dunmore East, Co. Waterford.

MB9BBJ/P in B.T.A.3 will operate on 3510 and 3525 kc/s crystal controlled. It is possible that MB9CC will also be active on 7 and 14 Mc/s, v.f.o. controlled.

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

A FAIR amount of attention has been given to 2 m as a DX band, but it might be as well to consider now those who have little or no desire to work stations outside a more or less local area. It is probably a truism, although widely contested, that the *natural* use of v.h.f. bands, and especially 2 m, is for "short-haul" communications of up to say 40-50 miles, with a signal level rarely experienced on any other band. The reliability of such communications, even with low power, is undoubted, and partly springs from the ease with which aerial systems can be built and erected. This gives the beam or stacked aerial a great advantage, with the ability to direct signals over the path required, which can rarely if ever be done on the lower frequency bands generally used for local work. The possibility of using the bands for "netting" is also obvious, whilst comparative freedom from heterodyne and other interference (except TV oscillators!) has to be experienced to be believed (except when an "opening" occurs!). Some operators are already working nets, and there are probably many more who could get together in this way. For purely local use of this kind there are quite a few satisfactory omni-directional aerials which are admirable for this purpose. Some, convinced by the foregoing remarks, will make plans of their own. However, there are others who need to be persuaded, and here we call on the active v.h.f. operators in every R.S.G.B. Group. Let the low frequency men hear v.h.f. in operation; let them decide, after hearing, whether they can apply v.h.f. to their special needs. If you can invite them to the shack, do so. You will earn the gratitude of many for introducing them to these bands. Another way is to stage "live" demonstrations at local meetings. An ounce of experience is probably worth a deal of talk in this important matter. Don't say "you ought to try it"; show them *how*.

West of Scotland V.H.F. Dinner

GM6ZV reports on the second annual Dinner and Meeting of the West of Scotland V.H.F. Group and the International V.H.F. Society which took place on March 30, 1955, in the Royal Hotel, Glasgow. Thirty-five v.h.f. enthusiasts were present, including G4KD (President, International V.H.F. Society), EI2W (Founder-President, I.V.H.F.S.), G15HV, G3BW, and almost all the active v.h.f. operators in Scotland. Following dinner, Harry Wilson (EI2W) paid tribute to the great work done for v.h.f. by Jock Kyle (GM6WL), whose enthusiasm has contributed in no small way to the present activity in Scotland, and asked Phil Thorogood (G4KD) to present to Mr. Kyle the Irish Perpetual V.H.F. Trophy for 1955. On behalf of the West of Scotland V.H.F. Group, GM2CHN thanked the representatives of the International V.H.F. Society for all the trouble they had gone to in order to be present. G4KD followed with a talk on v.h.f. and u.h.f. activities around London. The Rev. W. Ferrier (GM3BDA) proposed a vote of thanks to Mr. Thorogood. The meeting wound up with a general ragchew.

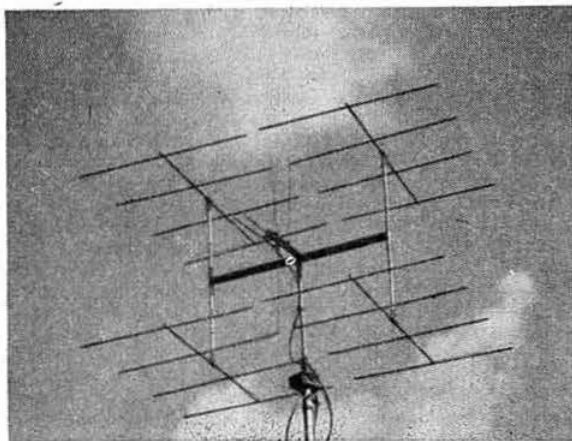
Two Metre Activities

The last month has not been outstanding for the DX hunter, but there have been two or three occasions on which conditions were above average. Activity usually increases steeply at these times, at any rate, in the south. The path to the west and south-west has been open on several evenings but only about three or four stations have been audible, always at excellent strength. Perhaps this may encourage some of the West Country operators to start up again. They will find their activities appreciated.

Towards the end of the period anti-cyclonic conditions brought steadily improving continental and G-DX openings and on April 19 the band was wide open, with DL1LB, PE1PL, PA0FB, F9JY, and, by no means least, ON4BZ, strong signals. G3IOE (Newcastle-on-Tyne) was audible in the south on the 18th, whilst the Yorkshire stations have been very happily working Scotland.

Station Reports—2 m

G3CCH (Scunthorpe), whose report was too late last time, had been missing many QSOs by reason of feeder trouble, now happily rectified. Leakage across the phasing lines owing to sooty insulators etc. caused an almost total loss of incoming signals. '3CCH is still active on s.s.b. and asks why nobody else seems to wish to try this method on 2 m? He reports a first-class opening in his area on the night of April 19-20 after a period of poor activity. Continental and G stations were excellently received; a first QSO was made with G5MR (Hythe, Kent), a more difficult direction than GM! ON4BZ told '3CCH (at 0130) that although conditions were good and SM6ANR was still calling CQ, '3CCH appeared to be the only G who hadn't gone to bed! During the remaining period only G5YV, '6XM, '6XX, '5GX, '6OS were regularly heard, with DL1LB, PA0BP and PA0DOK worked on March 30. The PA0s were



A view of G4AJ's two metre double four-over-four array.

*21 Bridge Way, Whitton, Twickenham, Middlesex

rather surprised to be worked on s.s.b. PE1PL can be heard nearly every morning now (at Scunthorpe) instead of rarely as was recently the case.

G8LN (Plumstead, S.E.18) is running a sked every Monday evening with **G3ANB** (Brightlingsea) which is usually maintained, in spite of variable conditions. **G3BTC** also participates from time to time. '8LN says that in his experience quite simple gear gives satisfactory results on 2 m; during a recent good spell he worked 3 countries with a simple dipole 30 ft up. He thinks that whilst the **SCR522** is a suitable transmitter to start with, it is much better to build the parts into a new transmitter. These remarks also apply (says '8LN) to the **TR1143**. '8LN will always be pleased to get reports from a reasonable distance and to help newcomers to the band by arranging tests with them. He agrees in principle with most of **G5YV's** comments last month but was impressed to hear from **G3KEQ** (Sanderstead), a potent newcomer to the band, that his input was 5 watts to two **6AK5s** in push-pull, with a slot aerial. This is very creditable and efficient and shows how miniature valves can be used to advantage. **G6OX**

successful and well proved its point. It will be resumed shortly. The Sunday morning **G5CP/G6XM** contact is always **S9** both ways over a 60 mile path. **G8PX** (Oxford) has been testing his portable gear, and was out at Beckley, 4 miles n.e. of Oxford, on April 14. The equipment includes a 7.5 watt transmitter, run from a small 200 V rotary converter, which also supplies the receiver. It works well and the noise level is low. A test is to be made later with a 250 V rotary for 10W input. The actual operating was a little discouraging, only 9 stations being worked at the rate of 2 per hour; '8PX says "not quite the contest feeling, but as good fun."

G3HHY (Solihull) is temporarily QRT for various reasons but will return to the band as soon as settled. He sends 73 to all friends and will QSL! **G5YH** (Chiswick) is assembling gear for frequencies above 144 Mc/s. Apropos our notes on power and general efficiency, he makes the point that the crucial thing is to keep the effective area of the aerial proportional to rises in frequency. **G3ION** (Southampton) erected a temporary mast on March 11 carrying a full wave pair of slots.



Some of those who attended the West of Scotland V.H.F. Group's Annual Dinner held in Glasgow on March 30. Holding the International V.H.F. Society's Perpetual Trophy are (left) Phil Thorogood **G4KD**, President of that society, and (right) John Kyle, **D.F.M.**, **GM6WL**, to whom the trophy was presented. Others attending the function were **E12W**, **G3BW**, **G15HV**, **GM2CHN**, **2CQI**, **2FZT**, **3NG**, **3BDA**, **3DDE**, **3DIQ**, **3EGW**, **3FOW**, **3FYB**, **3FAX**, **3IBV**, **3IMR**, **3INK**, **3JIN**, **3JPF**, **3JRP**, **3JFI**, **3KBZ**, **4HX**, **4QV**, **5VG**, **6KH**, **6MD**, **6XW**, **6ZV**, **8AH**, **8FM**, **8MJ** and **B.R.S.16925**.

(Hampton Court) is a strong signal and '8SC (Mill Hill) has been worked. Considering the good conditions, activity still leaves much to be desired—very few new stations seem to be appearing in London during television hours.

G4AJ (London, W.1) reports that his aerial (two 4-over-4s side by side) has been giving yeoman service since last summer, even though two forward directors were removed during the winter gales! **B.R.S. 19162** (Dewsbury) has had a "spasmodic and patchy" month. This is partly explained by the Ordnance Survey map which shows that he is situated between local high spots and would probably only hear DX stations at any strength when the conditions were exceptional. '19162 deserves praise for his patience.

B.R.S.6327 (Earlsfield) sends a remarkable list of "Calls Heard" and reports that the call **G3XT** is apparently being pirated, as he is at present QRT. Laurie notes that the end of March was excellent for signals from the south. The mobile/portable stations are beginning to appear, and **G3FSG/M** has been heard at Colliers Wood and Tooting recently with considerable fading and flutter on his signals.

G5CP (Chesterfield) was successful in working **ON4BZ** and **DL1LB** (his first ON and DL) on March 2 and 3 respectively. The **G5CP/G5MA** sked has had to be discontinued temporarily, after 124 contacts, owing to **5MA's** removal to another QTH. It has been very

Results are fairly satisfactory. Since then, conditions, however, have been poor, with the exception of March 15. '3ION can sympathize with **GM3EGW** regarding TV oscillators. Fourteen were counted one evening, three of them **S9+**. This makes 2 m working almost impossible in the area, unless the station to be worked is on a frequency where there is no "blip." '3ION accordingly apologizes to any who have called him during TV without results.

G3FEX (Bramber) reports for the first time and says he is active most evenings from 1830-2230 on 144.9 Mc/s. The final is a **3E29** at 90 watts and the aerial a 4 element Yagi, 45 ft up. **G3FEX/M** is also active, and contacts whilst mobile have been made up to 45 miles at **S9** both ways. '3FEX has now worked 161 stations in 22 counties. **G2CZS** (Chelmsford) considers April 18 the best recent opening when he heard **G2BMZ** (Torquay) at **S7**; no contact resulted, however, despite much calling. '2CZS has been trying out a tiny two valve superregen receiver. Using a dipole 6 ft from the ground at Mill Hill he heard several stations including two (**G3BY** and '2YC) never heard at Chelmsford. The line-up is **CV93** detector and **1T5GT** audio amplifier.

G3FKO (Bath) was out portable with **G3FIH** in the Mendips on April 17. In 1½ hours' operation they worked **G3YH**, '5BM/P, '6OZ, '3IER and '3ION/P. **G6NB**, '3AUS and '3HSD. The usual number of unidentifiable carriers were also heard, as were two Mid-

land stations working without call-signs! G3FIH mentions three mobile QSOs, two with G6AG/M (Stratford-on-Avon and Winchester) and G3MY/M (between Dorchester and Bournemouth). G3EMU (Canterbury), having erected a slot aerial, is experiencing the pleasure of extra S points. Stations previously inaudible are now being worked. '3EMU raises an interesting point—what will happen if everyone uses slots? G6XX (York) says conditions to Scotland and Eire have been good, but only the few stations listed in "Worked and Heard" have been audible. '6XM/P was operative near Thirsk on April 16 but, owing to failure of the receiver battery, only one hour's work was possible. In that time, however, nine stations were contacted.

G3HII (Liverpool) is on 2 m again after delays due to the November gales (the beam came down three days after erection), while the second beam, erected weeks after, lasted eight hours. Input is 80 W to an 829B. The receiver is a PCC84 cascode converter into a BC348. Test reports have been exchanged with G2HCH/M who has been roaming around quite a lot lately, and is delivering a very good signal. B.R.S.20354 (Knowle, Bristol) reports for the first time with a good list of calls heard. His location is approximately 150 ft a.s.l. and reasonably clear except n.w., n. and n.e. The aerial is a 4 element Yagi, normally facing due east. All stations in the list were heard in that position. The receiving equipment is home-built and includes two converters, one a c.c. cascode, the other an R.S.G.B. type. '20354, who is expecting his licence shortly, says that the R.S.G.B. converter is excellent for 'phone reception, the other possibly better for c.w. He mentions that interference in the Wenvoe TV area can be avoided by shifting the local oscillator of the G2UJ converter to the high side.

G6TA (Streatham) has had much difficulty lately with BCI and finds peculiar snags in endeavouring to clear it. The worked list is just as impressive as usual (97!). The sked with G3IOO is now at 2100 G.M.T. and has been maintained daily without failure. G3HHD (Birmingham) writes for the first time. He has been on 2 m since January and since mid-March has been using 6 watts to an 832. The aerial is a pair of slots with four reflectors, at 32 ft mean height. No mean signal, however! DL1LB has been worked, a fine achievement for such a QRP arrangement.

G8VN (Rugby) points out two errors in our April report. G3IOO has been worked many times, but had not been heard for two months previous to February 26. Secondly, the mention of G2CVI should have read G2CVD. As might be expected, '8VN takes up the cudgels on behalf of the low power indoor aerial enthusiast. In his experience, there is no desirable minimum in power or equipment. The man with 6 watts probably gets just as much entertainment working 50 miles as the one working 200 miles with 150 watts, and sometimes more! People could be discouraged from attempting the band if an exponent of the art came out in favour of the big guns and the big battalions by saying that QRP was no use and that elaborate outside aerials were essential. '8VN suggests that a good converter be built, and used in conjunction with a close spaced 4-element Yagi in the roof space (the easiest way to get it at a reasonable height). After listening for a few weeks, '8VN is certain those who do this will want to build a transmitter! Conditions at Rugby have been erratic and early promise of good working did not materialize. March 27 was satisfactory, however, with G6TA, '6XX and '6XM all worked. The month's high spot was March 30-31 when DL1LB was heard at 589, but '8VN was drowned under the Birmingham stations calling him! As for portable and mobile working, G6AG/M was contacted

Regional V.H.F. Ladder

TWO METRE BAND

Psn.	Call & Location	Worked		
		Regions	Stations	Countries
1.	G5YV Leeds, Yorks.	15	219	9
2.	G3CCH Scunthorpe, Lincs.	14	123	9
3.	G3IUD Wilmslow, Ches.	14	114	6
4.	G6XX Howden, Yorks.	13	131	8
5.	G2FJR Sutton Bridge, Lincs.	13	108	6
6.	G6TA Streatham, London	11	205	3
7.	G3DO Sutton Coldfield, Warks.	11	47	3
8.	G8VN Rugby, Warks.	10	90	3
9.	G3BW Whitehaven, Cumb.	10	20	5
10.	G5MR Hythe, Kent	8	94	6
11.	G2CZS Chelmsford, Essex		115	4

at Clevedon and Warwick and G5LJ/A at Moreton-in-the-Marsh.

G5MR (Hythe, Kent) reports that April 5 was excellent for French stations, and a new one, F8FA (nr. Rouen), was worked. April 8 was also good for F stations. On Easter Monday many G stations were heard peaking to great strength with heavy fading and flutter. April 12 was particularly good to the s.w. F8ME (St. Brieuc) was heard for the first time, but neither he nor GC2CNC and GC3EBK were raised. Later that evening F3ND (Rouen), F9JY (Cherbourg), G2DDD and ON4BZ were worked. F8GH was been bewailing the lack of activity on both sides of the Channel in spite of good conditions. On April 19-20, '5MR had a very pleasant session, working nine completely "new" stations (including G2AIW!). G5YV (Leeds) says that since the end of March conditions have been steadily improving with a consequent large increase in stations worked, including GMs, DLs, PA0s and ON4s. March 30 was the best day with DL3VJ, DL1LB, PA0BP, PA0DOK and PA0FB, with many G-DX stations for good measure. April 18 was also excellent with most of the above worked plus PE1PL, DL3QH, PA0BX, DL9ARA, ON4ZK, ON4BZ and many British stations. A pleasant surprise was a QSO with G5MR after a very long interval. Towards the end of the period activity was greatly increased; several stations unheard for months, and in some cases years, were audible again. Apropos Scottish stations, '5YV mentions that they are all between 144.0 and 144.19 Mc/s on which latter frequency GM3EGW (the strongest of them all) is found.

G6XX (Howden) worked DL1LB on March 30; conditions improved again from April 10 onward. PE1PL was S6 on 'phone at midday April 19. Several new stations have been worked including G3JZN/P (Fleetwood), G6XY (Kenilworth), G3EGV (Farnborough, Hants), GM6KH (April 14) and GM3EGW on April 18. A nice QSO was had with G2HCH/M in Cheshire on April 17, signal strength fluctuating with terrain from S7 to zero. '6XX thinks the good weather recently has brought a lot of the 2 m types out of hibernation. '6XX reports that he had a QSO with SM6ANR on April 19 at RST569.

G3WW (Wimblington) has been doing some low power Top Band work but has had some local 2 m contacts with G2DRA (Harrogate), '3IUK (Derby), '6XY

(Kenilworth), '8VN (Rugby) for the only real DX. G2COP and '6FO were heard. G3BPM is now back on 2 m, although not yet regularly, from his new QTH at Sunbury-on-Thames. Peter has been using a TV dipole with excellent results on reception (up to 100 miles) and with local success (as far as G3BII, Beaconsfield) on transmission!

The Hertfordshire Plan

The efforts being made under the aegis of the Welwyn Garden City Group are beginning to bear fruit, and a "live" 2 m demonstration was carried out with G3GDR (Watford) at the last group meeting. The saturation signal received at 15 miles range was very real proof of the type of communication which is so easily achieved on 2 m.

The Group now proposes to produce a standard type of transmitter and converter which will permit spot frequency working. The transmitter will be a simple 3 stage job ending in a 5763 power doubler (modulated); all converters will be crystal controlled with a tunable i.f. of approximately 12 Mc/s. After much discussion, it was decided that the operating frequency should be in the high end of the band (cf. French Band Plan—April BULLETIN) as very little is heard in the south in that portion of the spectrum. Accordingly a minimum of disturbance will be caused to others. Members pulling out of the net will leave the spot frequency and go back to Band Plan operation. Any tendency to remain on the net frequency would be doomed by jamming from the others! As regards the aerial, the first idea was to use quarter-wave vertical; however, some who do not have a v.h.f. aerial thought they would prefer to erect a horizontal one whilst on the job. The proximity of most should render communication easy, wherever the beams are turned. We wish this venture all good luck and hope that many members in and out of Hertfordshire will either join in or start their own nets on similar lines.

Seventy Centimetre News and Reports

Here is G2RD's monthly activity report: G2AIH (434.25), '2DD (434.82), '2DD/M (434.82), '2FKZ (435.95), '2HDY (435.5), '2RD (435.53), '2WJ (436), '2XV (435.2), '3ECA (434.85), '3EGV (435.9), '3EOH (434.55), '3EYV (435.06), '3FSD (435.42), '3FP (434.98), '3GDR (435.39), '3IOO, '3IRW (434.4), '3JQN (435.05), '5CD (434.6), '5DT (434.9), '5KW (435.75), '5KW/M (435.75), '5RD (435.25), '5UM (434.37), '6JI (435.9), '6NF (435.66), '6YP.

G8SK (Enfield) has been using a miniature 70 cm transmitter (ECL80 c.o.-multiplier, 6J6 tripler, 6J6 neutralized buffer amplifier and 6J6 p.p. doubler) operated from a dry h.t. battery, with 100 V on the c.o., and 80 V on the other valves. The final runs at 80 V 8 mA—0.64 watts! With this equipment G3IRW (RST559 c.w. and 55 phone) and G2WJ have been worked. The aerial is a 6 element Yagi.

G3WW (Wimlington) has been testing a 70 cm transmitter with a Norwich station. G2XV (Cambridge) is still listening on the band, but local activity seems to be almost nil. G3HKD (Norwich) is well equipped for 70 cm and says that G4PV (Lowestoft) is also active on the band.

International V.H.F. Society Honoured

Dr. R. L. Smith-Rose, Director of Radio, Department of Scientific and Industrial Research, has accepted the Patronage of the International V.H.F. Society—a gesture that will give widespread satisfaction.

Late News from Three Countries

Scotland. GM6WL reports that conditions recently have improved somewhat and Gs have been heard and worked by Scottish stations much more frequently. G6XM (York) is putting in a splendid 'phone signal, going over to c.w. if there is QSB, which is usually toward midnight. GM6KW, '3EGW and '3IBV have worked '6XM many times. G3GPT (Preston) was raised by GM3IBV and '6KH worked G2BDQ (Northumberland). '2BDQ was heard at very good strength by GM4HX (Paisley) using a c.c. converter and indoor beam. There have probably been many other QSOs but no further details are yet available. G stations regularly heard recently in Scotland are G5YV, '6XM, '6XX and '3CCH. GM6WL largely agrees with G5YV's remarks; he has experienced the same thing. GM6KH turned his 70 cm beam on Dunfermline and '3EGW received his 'phone RS57 on a new converter (G3BKQ-type) at 31 miles. GM3AYC put his 70 cm tripler on the now famous Zeppelin and was received by GM3NG (Carlisle) RS58 at 20 miles; '3NQ was using an improved 20 element stack.

Eire. EI2W returned to the 2 m band on April 11, when EI5Y and GI3GQB were worked. The following evening G6NB was worked at great strength, but general activity was low. Signals from GI were strong on the 13th with GI3GXP (Kilkeel, Co. Down) the strongest signal yet received from Northern Ireland. His location is good for Dublin as the distance is over an all-sea path of 65 miles. G5AU was also worked and G2NY made his first EI contact. From April 14 to April 20 activity was fairly good, but no signals from Scotland have been heard as yet. Other strong signals were GI3IJM, G6WF, EI6A, G3GZM, G2CBR and G3HII. G6XM (York) has been a consistent signal in Dublin. G5YV has been worked, but not at his usual strength. EI2W brought the new 24 element array into use on April 20 for the first time with excellent results.

Channel Islands. G2CNC (Jersey) is again on 2 m looking for QSOs. So far only F8ME has been worked (RST599); calls to G5TZ, '4KD and '3IIT have proved fruitless. Nothing has been heard from Guernsey; presumably beams are turned elsewhere. '2CNC wonders whether his dearth of QSOs is due to conditions or aerial as G5TZ has been regularly working the Guernsey stations and mainland contacts have also been made by them. '2CNC is on 145.13 Mc/s; the aerial is a 4 element Yagi, 33 ft above ground, 400 ft a.s.l. The transmitter comprises CV6, 832, 832, pair of 8012s. Operation is c.w. only, usually 1910-1930 but later if the band opens. G5TZ can always be heard in the Islands, but other Gs are invited to turn their beams in that direction.

Photographs

We should like to appeal for good photographs of v.h.f./u.h.f. interest for inclusion in this feature. Please remember that they should be sharply defined, bear a caption on the back for identification, and be printed on Kodak press bromide if possible.

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Reports for the GJC issue by May 20, please.

LONDON U.H.F. GROUP

will meet at the Bedford Corner Hotel, Bayley Street,
Tottenham Court Road,
at 7.30 p.m., June 2, 1955.
All u.h.f. enthusiasts welcome.

Worked and Heard on Two

B.R.S.6327 (Earlsfield) March 3-April 4.

Heard: G2ABD, 2AHP, 2AHY, 2AIW, 2BPN, 2CZS, 2DTP, 2FSY, 2HCG, 2HDZ, 2MV, 2BRX, 2BSU, 2BVU, 2BYV, 2CGO, 2CLW, 2CVO, 2DF, 2D, 2J, 2DOV, 2EGV, 2ENY, 2EYV, 2FAN, 2FD, 2FEX, 2FGZ, 2FQS, 2FPV, 2FSG, 2FSG/M, 2FUH, 2FYV, 2FZL, 2GDR, 2GHO, 2GOP, 2GOZ, 2GSM/A, 2HWJ, 2HXS, 2IIT, 2ION, 2IOO, 2IRW, 2ISA, 2ITF, 2JEP, 2JFR, 2JON, 2JXN, 2KEQ, 2KD, 2RO, 2SA, 2SD, 2SO, 2SL, 2SRD, 2SZ, 2UM, 2YH, 2YV, 2AS/M, 2AG/P, 2BO, 2FO, 2JK, 2LL, 2LV, 2MB, 2NB, 2OU, 2OX, 2RH, 2SG, 2TA, 2XM, 2BP, 2FK, 2JP, 2KW, 2LN, 2RW, 2UQ/P.

B.R.S.16075 (Southampton) April 4-23.

Heard: G2AIW, 2BMZ, 2DDZ, 2HCG, 2NM, 2UN, 2YB, 3BHS, 3CGE, 3EGV, 3FAN, 3FIH, 3GAV, 3GOP, 3GOP/M, 3GSE, 3ION, 3ION/P, 3JHM, 5HN, 5TZ, 6NB, 6OX, 6TA, 8IL, GC3EBK, GW2ACW, GW8UH.

B.R.S.19162 (Dewsbury) March 3-April 12.

Heard: G2FJR, 2HOP, 3IWJ, 3JZN, 4JJ/P, 5AU, 5HK, 5ML, 5TZ, 6NB, 6LI.

B.R.S.20354 (Bristol) March 1-April 18.

Heard: G2MV, 2YB, 2ABD, 2AIW, 2BDP, 2DDZ, 2FTS, 2HDZ, 2BMZ, 3WS, 3WV, 3YH, 3AMI, 3BII, 3BRX, 3DJX, 3EGG, 3EYV, 3EYH, 3FAN, 3FIH, 3FKO, 3FMO, 3GGI, 3GNJ, 3GVF, 3GSP/P (Salisbury), 3HSD, 3HLX, 3HXZ, 3IIT, 3IRA, 3KEQ, 3GHO, 4AP, 4GR, 4RO, 4SA, 5KW/P (nr. Wrotham), 5MA, 5US, 5TZ, 6NB, 6OX, 6OZ, 6TA, 6RH, 6DM, 8IL, 8KW, 8PX, 8RW, GW2ACW, 3EJM, 8SU, 8UH, PEIPL.

G2AIW (Twickenham) March 22-April 19.

Heard: DL1LB, F3LP, 9YJ, G2AHY, 2BMZ, 2DTP/P, 3BPM, 3CZU, 3ENY, 3EPW, 3GHU, 3GNJ, 3HHD, 3ION, 3IOO, 3IUK, 3WS, 5MR, 5TZ, 5YV, 6AG/M, 6FK, 6OX, 6TA, 6WF, 6XM, 8BP, 8PX, GW8UH, ON4BZ. Heard: G2BDP, 2HDZ, 2TP, 2J, 2WJ, 3BII, 3BJQ, 3BPD, 3BYV, 3CCH, 3CGO, 3CLW, 3EOH, 3FD, 3FEX, 3FFY, 3GHO, 3GSE, 3IJB, 3IIT, 3JFR, 3JON, 3JZN/P, 3KEQ, 3MI, 4AU, 4GT, 4RO, 5HN, 6BO, 6FO, 6LL, 6RH, 6UJ, 6WB, 6XX, 8KW, 8SK, 8VN, PEIPL.

G2CZS (Chelmsford) March 22-April 19.

Heard: G3ANB, 3CVO, 3EGV, 3GGJ, 3GOZ, 3IIT, 5TZ, 6LL, 6OX, 8LN, 8PX, 8SC. Heard: G2BDP, 2BMZ, 2DDZ, 2FTS, 2UJ, 2UN, 3FD, 3FFY, 3JXN, 3KEQ, 5YV, 6NB, 8NM, 8RW.

G3DGN (New Barnet) March 26-April 16.

Heard: G2MV, 2UJ, 2WJ, 2XV, 2DTP, 2HBY, 3BJS, 3BSU, 3CGO, 3CLW, 3DIX, 3EOH, 3EYV, 3FQS, 3FZL, 3GDR, 3GHI, 3GOZ, 3GSM/A, 3ISA, 3JXN, 3KEQ, 4AU, 4FB, 4GT, 4IB, 4RO, 5LK, 5MA, 5TZ, 5JM, 6AG/M, 6JI, 6LL, 6NB, 6OX, 6RH, 6SG, 8KW, 8LN, 8RW, 8SK.

G3EMU (Canterbury) March 14-April 14.

Heard: G2JF, 5MR, 8BJ, 8RK, 3ANB, 3BSU, 3DIV, 3IIZ, 4SA, 5TZ, PEIPL.

G3FEX (Bramber) To April 19.

Heard: G2UN, 2BDP, 2DDZ, 2DVP, 3GHU, 3IAM, 3IIT, 3IPB, 3JEP, 3IHM, 3JYV, 5TZ, 6AG/M, 6RH, 6TA, 6XM, 8OS/M. Heard: G2TP, 2AIW, 2HCG, 3EGV, 5MA, 5YV, 6FO, 6NB.

G3FEX/M:

Heard: G2UN, 2DSP, 2DVP, 3CHU, 3JEP, 3JHM, 3JYV, 5TZ, 8OS/M. Heard: G3IAM, 5KW/P, 5MA, 6NB.

G3HHD (Birmingham) March 20-April 18.

Heard: DL1LB, G2AOK, 2AIW, 2ATK, 2ATK/M, 2AVQ, 2COP, 2CVD, 2FKX, 3BA, 3MA, 3BJQ, 3CKQ, 3CRH, 3CUZ, 3DIX, 3DKF, 3EJO, 3ENY, 3EPW, 3GBJ, 3GHU, 3GKZ, 3GNJ, 3HAZ, 3HXS, 3HZF, 3IOO, 3IUD, 3IVF, 3JGY, 3JZF, 3JZG, 5TZ, 5YV, 6FK, 6TA, 6WF, 6XY, 8VN. Heard: G2XV, 2BMZ, 3NL, 3FMI, 3GHO, 3IWJ, 5BM, 5MA, 5SZ, 6CW, 6XM, 8BP, PEIPL.

G3HHI (Liverpool) March 7-April 18.

Heard: G2CVO, 2HCG/M, 2HGR, 2NY, 3AIM, 3AGS, 3BPJ, 3CCH, 3CC, 3DA, 3EPW, 3FKY, 3FMI, 3GHO, 3GHU, 3GXR, 3HTY, 3IHP, 3IUD, 3IWJ, 3JZN, 3JZN/P, 5AU, 5BD, 5VN/A, 5YV, 6FK, 6MI, 6NB, 6TA, 6WF, 6XM, 6XX. Heard: G2AIW, 2AKR, 2AOK, 2ADZ, 2AVC, 2CBB, 2FCI/P, 3AYT/M, 3IOO, 3KEQ, 3PY, 5TZ, 6KK, 8SB, GW3GWA, EI2W.

G3ION (Southampton) March 15-April 17.

Heard: G2PU, 2UJ, 2UN, 2AIW, 2BMZ, 2CZS, 3KW/P, 3ANB, 3BHS, 3BRX, 3CGE, 3EGG, 3FKO/P, 3GOP, 3GOP/M, 3GSE, 3HWJ, 5HN, 5TZ, 6NB, 6OX, 6RH, 6TA, 8IL. Heard: G2HDZ, 3WV, 3EGV, 3IAM, 3IIT, 4AU, 8KW.

G5MR (Hythe, Kent) April 5-20.

Heard: F3JN, 3ND, 8FA, 8GH, 9EA, 9YJ, G2AIW, 2DDZ, 2HDZ, 2IF, 3CCH, 3EMU, 3FD, 3GGJ, 3IES, 3IIT, 3IJB, 3WS, 5YV, 6NB, 6OX, 6XM, 8RW, ON4BZ. Heard: F3LP, 8ME, G2AHP, 2BMZ, 2FTS, 2HCG, 2UN, 3BSU, 3CGO, 3IEX, 3IIZ, 3KEQ, 3VI, 4AU, 5ML, 5RO, 5TZ, 6RH, 8BJ, 8KW, GC2CNC, 3EBK.

G5YH (Chiswick) March 16-April 7.

Heard: G2DTP, 2HDY, 3DF, 3BII, 3EYV, 3FFY, 3HQZ, 5TZ, 6AG/M, 6TA, 8SC. Heard: G2YC, 2ABD, 2AHP, 2BDP, 2BPC, 2DVP, 3FP, 3WV, 3CLW, 3DGI, 3DVO, 3FEX, 3FSG/M, 3FUH, 3GDR, 3GHI, 3IAM, 3IIT, 3ISA, 3JXN, 3KEQ, 4GT, 5KW, 5LK, 5MA, 5RD, 5US, 6JK, 6LL, 6NB, 6OX, 6RH, 6SG, 6YP, 8KW, 8RW, 8SK, 8UQ, 8UQ/P.

G5YY (Leeds) March 29-April 20.

Heard: DL1LB, DL3JH, DL3VJ, DL9ARA, PA0AJA, PA0BP, PA0BX, PA0DOK, PA0DSW, PA0FB, PA0FC, PA0FO, PA0NO, PA0WGC, PE1PL, ON4BZ, ON4ZK, EI6A, G2AKR, 2AIW, 2ANS, 2ATK, 2DCI, 2DRA, 2DUS, 2FCL, 2FCL/P, 2FJR, 2FNW, 2HCG, 2HJC, 2HJC/M, 2HQ, 2HDZ, 2NY, 2WJ, 3AIM, 3BA, 3BET, 3BII, 3BJQ, 3DA, 3DJX, 3AZU, 3DMU, 3DJX, 3DOV, 3ENY, 3EPW, 3FIH, 3FQS, 3FVK, 3GGJ, 3GHO, 3GNJ, 3GSO, 3HAZ, 3HHD, 3HII, 3HXS, 3HYH, 3IIT, 3IOF, 3IOO, 3IIT, 3IUK, 3IWJ, 3JZN, 3JZN/P, 3JFR, 3KEQ, 3WS, 5AU, 5BM, 5GX, 5HK, 5MA, 5VN/A, 5TZ, 6AG, 6AG/M, 6FK, 6LC, 6NB, 6OX, 6PJ, 6OU, 6RH, 6TA, 6WF, 6XX, 6XY, 8BP, 8KW, 8VN, GM3EGW, 3IBV, 6KH, GW3GWA. Heard: DL1CM, EI2W, G2AK, 2AHP, 2ADZ, 2ATK/M, 2BMZ, 2BVW, 2DDZ, 2IT, 2HGR, 2KO, 2XV, 2YB, 3ARX, 3AGS, 3BPD, 3CC, 3CCH, 3CGO, 3EGV, 3DO, 3FAN, 3FCB, 3FDF, 3FMI, 3FZN, 3GQR, 3GVL, 3GXT, 3HZF, 3IOE, 3IUD, 3IVF, 3JZG, 3KEF, 3NL, 3NT, 3OZ, 3PY, 3WW, 4JJ, 4MW, 4OT, 4SA, 5BD, 5CP, 5IU, 5ML, 5NV, 5SK, 6CW, 6LI, 6OS, 6UJ, 6XA, 6YU, 8NM, 8SB, G13GQB, G1SAJ, GM3FVB, GM3NG, GM6WL, PA0FP.

G6TA (Streatam) March 18-April 18.

Heard: G2ABD, 2AHP, 2AIW, 2ANS, 2ANT, 2AOK, 2BDP, 2BMZ, 2DDZ, 2DGY, 2DTP, 2DVP, 2DVO, 2GG, 2HGG, 2HJO, 2YB, 2YC, 3AGR, 3BA, 3BHJ, 3BJQ, 3BVU, 3BYV, 3CGO, 3CKQ, 3CRH, 3DF, 3DKF, 3DVO, 3EGV, 3ENY, 3EPW, 3FAN, 3FD, 3FEZ, 3FMI, 3FPV, 3FQS, 3FSG, 3FUH, 3GHO, 3GHU, 3GOP, 3GOZ, 3GSM, 3HHD, 3HII, 3HJZ, 3IES, 3IIT, 3IOO, 3ISA, 3IIT, 3IUL, 3JEP, 3JFR, 3MI, 3YZ/P, 4GT, 4HQ, 4SA, 5AU, 5BM, 5DF, 5HK, 5HN, 5JO, 5KW, 5KW/M, 5MA, 5SK, 5TF, 5YH, 5YV, 6AG/M, 6BO, 6CW, 6FK, 6FO, 6GR, 6JK, 6LL, 6NP, 6OU, 6OX, 6XM, 8BP, 8DA, 8DM, 8KW, 8LN, 8PX, 8SC, 8UQ/P, 8VN, GW3GWA.

G6XM (York) March 20-April 18.

Heard: EI2W, 2GA, 2HQ, 2KO, 2WJ, 2AIW, 2AOK, 2ATK, 2BDZ, 2DUS, 2FCL, 2HOP, 3AIM, 3ARX, 3AZU, 3BJQ, 3BPD, 3CGO, 3DA, 3DOV, 3EGV, 3FAN, 3FCB, 3FEX, 3FQS, 3FR, 3FVK, 3GGJ, 3GGY, 3GHO, 3GHU, 3GNJ, 3GSE, 3GSO, 3GXT, 3GZM, 3HAZ, 3HWJ, 3HXS, 3HZF, 3IIT, 3IOE, 3IOO, 3IRA, 3ISA, 3IIT, 3IUK, 3IWJ, 3JZG, 3JZN, 3NL, 4JJ, 4SA, 5AU, 4BD, 5BM, 5CP, 5GX, 5HK, 5TZ, 5YV, 6FK, 6KK, 6LC, 6NB, 6OU, 6PJ, 6RH, 6TA, 6UJ, 6WF, 6XY, 8KW, 8VN, GM3EGW, 3FYB, 3IBV, 6KH, 6WL. Heard: GW8SU, PEIPL.

G6XM/P (near Thirsk) April 16.

Heard: G2FCL, 2HCG, 3AZU, 3BPD, 3DOV, 3IUK, 5CP, 6PJ, 6WF.

G8PX/P (Beckley, Oxon) April 11.

Heard: G2AOK, 2ANS, 3AZT, 3BIQ, 3YZ/P, 4SA, 5LO, 6XY, 8VP. Heard: G2YB, 3DJ, 3IRA/P, 5YV, 6AG/M, 6JK, 6NB, 8DM.

G8VN (Rugby) March 16-April 17.

Heard: G2AIW, 2ANS, 2AOK, 2ATK, 2COP, 2DCI, 2FTS, 2HDZ, 2WJ, 2XV, 3AGS, 3AZT, 3BA, 3BJQ, 3CGO, 3CKQ, 3CUZ, 3DIX, 3DGF, 3DTG, 3EJO, 3EPW, 3FFC/A, 3FMI, 3FUW, 3GHO, 3GHU, 3GNJ, 3GWB, 3HAZ, 3HHD, 3HZF, 3IEY, 3IIT, 3IOO, 3IUD, 3IUK, 3IVF, 3KEF, 3KEQ, 3WV, 5IU, 5KW/P, 5LI/A, 5ML, 5SZ, 5SK, 5TZ, 5YV, 6AG/M, 6CW, 6FK, 6NB, 6PO, 6TA, 6XM, 6XX, 6XY, 6YU, 8BP, DL1LB. (27 of the above worked.)

Silent Keys

WALTER RICHARDS (G2AAW)

Amateur Radio in the West Country and South Wales has lost a very keen enthusiast by the death of Walter Richards (G2AAW) of Burnham-on-Sea, who passed away on April 12 after a long illness. He was a generous, honest and kind-hearted amateur who spent all his leisure hours on his hobby; he had been a member of the Society for many years. After the last war he received a certificate from the War Office for services rendered.

He leaves a widow and three sons to whom our sympathies are extended.

F. W. F.

G. E. S. HOLT (G2AXN)

It is with deep regret that we record the death, suddenly on March 28, 1955, of George Ernest Searle Holt (G2AXN) of Worcester Park, Surrey. Mr. Holt who had been employed by the Quartz Crystal Co., Ltd., for more than 20 years in a highly skilled capacity, was a keen amateur who spent most of his time constructing equipment for the 2 m and 70 cm bands. He was well known in New Malden and will be sadly missed by his many friends and colleagues.

W. J. T.

EDWARD CHARLES WRIGHT (G2HNY)

We record with deep regret the death at the age of 68 years of Mr. Edward Charles Wright (G2HNY) of Liverpool. Mr. Wright was active on the DX bands and particularly during the last opening on 28 Mc/s when his call G2 Happy New Year was frequently heard in the U.S.A. and Canada.

Our sympathies are extended to his widow,

R. W.

The 1955 Radio Components Show

The Influences of Competitive Television, F.M. Broadcasting and Printed Circuitry

ALTHOUGH radio amateurs unconnected with the Radio Industry were not able to visit the 1955 British Radio Component Show (officially, the 12th Private Exhibition of British Radio Components, Valves and Test Gear for the Radio, Gramophone, Television, Electronics and Telecommunications Industries) at Grosvenor House, London, from April 19 to 21, many of the exhibits were of considerable amateur interest, showing as they do the trends in contemporary commercial development. Particularly noticeable were the growing influences of printed circuit techniques, v.h.f. broadcasting and Band III television.

Printed Circuits

Examples of printed circuits were shown by several manufacturers including T.C.C. who demonstrated their uses in the radio and electronics industry, with a wide range of circuits covering high fidelity amplifiers (such as the Mullard 5-10 and Osram 912), receivers, aerial filters and i.f. transformers. Bakelite Ltd. showed an "Invicta" radio chassis employing their copper-faced material.

The real significance of printed circuitry was not, however, to be measured by the exhibits of complete

Aerials and Feeders

Aerials for Band III television were displayed by several manufacturers, some being "add-on" units for attaching to existing Band I aerials, others entirely separate arrays. A number of composite aerials were also shown. Antiference Ltd. exhibited a wide range incorporating the "snapacitor" principle. Polythene insulators are used in the arrays exhibited by Aerialite Ltd. who were also showing a new co-axial cable (Super Aeraxial type 499) which, although intended for use as television down-lead, should also interest the amateur. Its main features are: characteristic impedance 66-77 ohms; attenuation 2.6 db at 200 Mc/s; power handling capacity 300 watts at 200 Mc/s and velocity ratio 0.75. A similar but cheaper feeder—Aeraxial type 597—will carry 80 watts at 200 Mc/s, has an attenuation of 4.5 db at the same frequency and costs only 8½d. per yard. British Insulated Callender's Cables Ltd. and Telcon both showed feeder cables using cellular polythene insulation.

A wide range of aerials for both television bands were exhibited by Belling & Lee Ltd. together with many other specialized components including a new



A representative display of ferrite and magnetic powder products. Such components are becoming widely used in television, radio and telecommunications generally. Ferrite components are on the left, the powder cores and micro-powder magnets on the right.

(Photo by courtesy of The General Electric Co. Ltd.)

equipment made by this process but rather on the stands of the manufacturers making components for use with this new technique. A.B. Metal Products Ltd. showed special switches, Belling & Lee Ltd. printed circuit connectors, McMurdo Instruments Co. Ltd. specially designed valve-holders, Parmeko Ltd. transformers, and Telegraph Condenser Co. Ltd. new ranges of paper dielectric and electrolytic capacitors for printed circuit use.

The soldering of printed circuits, much of which is done by the dip soldering process, presents its own problems, and both Enthoven Solders Ltd. and Multicore Solders Ltd. exhibited suitable materials, in addition to their other well-known products. Enthoven showed "cored aluminium solder wire" which will readily solder cover conductors to aluminium etc., while Multicore showed a new solder bath thermometer.

range of fuseholders for Inter-Service use and interference filters for household appliances.

Probably the most interesting aerial development so far as the amateur is concerned was to be seen on the J-Beam Aerials stand. This firm, whose skeleton slot aerials are already well-known to 2 m operators, exhibited for the first time slot-beams consisting of single skeleton slots with directors as well as reflectors. As the directors have no influence on the feed-point impedance, stacked multi-element arrays are possible without the usual matching difficulties. The beams shown were scale models of the Double Four (4-over-4) and Double Six which will be available for Band III television and amateur 2 m use. The arrays are fundamentally broad-band affairs.

All the manufacturers mentioned exhibited aerials for the new Band II f.m. broadcasts.

Components

Some of the most outstanding advances in component design during the past year have been in the field of capacitors, due, in no small part, to the advent of v.h.f. broadcasting, Band III television, the increasing employment of v.h.f. communications and printed circuit techniques. A. H. Hunt (Capacitors) Ltd. have introduced special ranges for printed circuit applications, while Sidney S. Bird & Sons Ltd. are manufacturing high voltage trimmers for wide screen TV. Variable condensers for a.m./f.m. receivers have been produced by Jackson Bros. and Wingrove and Rogers Ltd. ("Polar"). Stability Radio Components Ltd. now have a range of top coupling condensers from 0.5 μF to 1.5 μF , $\pm 0.1 \mu\text{F}$.

T.C.C. showed new sub-miniature electrolytic condensers, specifically designed for transistor amplifiers, which are only $\frac{1}{2}$ in. long by $\frac{1}{8}$ in. in diameter. Dubilier Condenser Co. (1925) Ltd. introduced molded silver mica capacitors for printed circuits.

On Stratton & Co. Ltd.'s stand the full range of Eddystone components could be examined. A new addition is the type 839 condenser (350 μF) for use in pi-network tank circuits such as that in *The Elizabethan*.

Sidney Bird ("Cydon") showed their "Teletuner" 12 channel turret assembly for the reception of stations in Bands I, II and III which uses a PCC84 double triode cascode r.f. stage and a PCF84 combined pentode mixer and triode oscillator. For use in car radios, this firm produces the "Cydon" Auto Radio Tuner, a push-button, permeability tuned unit for medium wave use. N.S.F. Ltd. exhibited two Oak switch type tuners, one covering five channels in Band I and eight in Band III; the other, which is similar, has an additional switch position to enable it to be converted for u.h.f. working.

Weymouth Radio Manufacturing Co. Ltd. featured new coils for a.m./f.m. circuits and a.m./f.m. i.f. transformers. Cosmocord Ltd., in addition to Acos microphones for all applications, introduced two new pick-up cartridges, the GP61-1, an improved ceramic type, and the GP59-3 which uses a conventional crystal. Both have the new flat type stylus.

In television receivers, the new concentric switch potentiometers manufactured by Egen Electric Ltd. permit the potentiometer to be preset, the switch being used for turning on and off. Dubilier Condensers showed volume controls (type CP) incorporating copper heat conduction plates to increase the heat dissipation and permissible ratings. New micro-sensitive switches of wide application were shown by A. F. Bulgin & Co. Ltd., whose sub-miniature micro-sensitive switches are so small that a dozen will go into a match box yet they have a mains rating of 1 amp at 230 V a.c.!

Transistors and other semi-conductor devices were exhibited by several manufacturers including Brimar, Mullard, Oram and Pye Industrial Electronics whose junction transistors are primarily intended for hearing aids and low power audio frequency applications.

Edison Swan Electric Co. Ltd. showed a wide range of valves including a special new beam tetrode for use in stabilized power supplies which has the remarkable mutual conductance of 40 mA/V and a maximum anode dissipation of 90 watts.

Transformers of all types were exhibited by Woden, Parmeko, Partridge (a new range of high fidelity open "C" core type transformers costs less than half the price of the hermetically sealed type) and English Electric.

London Electric Wire Co. is now making a range of self-fluxing enamelled wires which may be soldered rapidly without prior removal of the enamel film.

Test Gear

AVO showed an improved valve tester and a tropicalized version of the Model 8 Avometer while Measuring Instruments (Pullin) Ltd. introduced a new 19 range testmeter (sensitivity 5,000 ohms per volt) costing £10 15s. complete. British Physical Laboratories exhibited a 5 in. scale voltmeter with a sensitivity of 1 Megohm per volt. Taylor Electrical Instruments Ltd. exhibited a new valve tester for all current British, American and Continental valves and (with an adaptor) cathode ray tubes.

Transistor Power Pack

A transistor power pack exhibited by the Signals Research and Development Establishment demonstrated the use of three new experimental germanium power junction transistors. Basically, the circuit comprised one transistor as an oscillator followed by two as class B push-pull amplifiers, the output circuit being in the form of voltage doublers using germanium rectifiers. The power output is about 3 watts but it is hoped to increase this considerably in the near future. The unit is intended to replace small vibrator packs or dry battery supplies.

This annual show is one of considerable importance to all who are connected in any way with radio and its allied fields, whether as professional or amateur. Eventually, many of the components exhibited at this show—the largest and most comprehensive of its type in the world—will find their way into British amateur equipment. The industry which supports the exhibition produces more than 1,000,000,000 parts every year. Is it too much to hope that some means will be found to make them available to amateurs before they become obsolescent?

London Members' Luncheon Club

MR. Arthur Milne (G2MI) took the chair at the April meeting of the Club in the absence of Mr. S. E. Vanstone (G2AYC), and presided over a company of 17 members and friends.

Mr. G. Smets of Evers, awaiting his ON4 call, and Mr. J. Sumner (VP7NF), now on his way back to Bahamas, addressed the meeting. VP7NF will soon be looking for G contacts on 15 metres.

The Club will meet again on May 20 at 12.30 p.m. at the Bedford Corner Hotel, Bayley Street (off Tottenham Court Road), London, W.C.1, when it is hoped that Mr. Ivan Westerlund (SM5WJ), Vice-President of S.S.A., and Sgt. Frank Johnstone (G3IDC), fresh from his Empire DX Tour, will be present. Telephone Ruislip 2763 or Holborn 7373 for table reservations.

G2FUX.

VS9GV in St. Thomas' Hospital

FROM Mr. C. J. Dempster, International Aeradio Ltd., c/o Aden Airways, Crater, Aden, we learn that Mr. Vinicio Giachetti (VS9GV) is at present in St. Thomas' Hospital, London, with a slipped disc.

Mr. Dempster suggests that there may be members in the London area who would be willing to visit or write to Mr. Giachetti who finds himself in the U.K. without knowing a soul.

The Ilkeston & District Amateur Radio Society

IN the *Résumé* of the Minutes of the Council Meeting held on February 15, 1955 (published last month), the word "Amateur" was omitted from the title of the Ilkeston Society. The correct title—Ilkeston and District Amateur Radio Society—was, however, used in our March issue.

NATIONAL FIELD DAY, 1955

OFFICIAL LIST OF STATIONS

REGION 1

Town or Area	Stn.	Call Sign	Location
Blackpool ...	A	G8GG/P†	nr. Moss House Farm, Peel, Blackpool.
	B	G5ND/P†	as A station.
Bury	B	G2GA/P	Hurst Farm, Ashworth nr. Bury.
Chester ...	A	G3HPM/P	Poulton Hall Farm, Poulton, nr. Chester.
	B	G3EXT/P	Bagley's Field, Coalpit Lane, Saughall, nr. Chester.
Liverpool ...	A	G3ELL/P	Manweb Sports Ground, Thingwall Road.
	B	G8DI/P	as A station.
Preston ...	A	G3DWQ/P	Jeffrey Hill, Longridge, nr. Preston.
	B	G2AXH/P	as A station.
Southport and Formby	A	G3EFA/P	Southport Sea Cadets H.Q., Esplanade, Southport Beach.
	B	G2ART/P	as A station.
Stockport ...	A	G3FYE/P†	Carr Brow, Disley nr. Stockport.
	B	G3AUB/P†	The Quarry, Marple Ridge, nr. Marple.
West Cumberland	A	G3BW/P†	Tarn Flatt Farm, St. Bees.
	B	G6WR/P†	as A station.
Wirral ...	A	G2AMV/P†	Top of Thingwall Reservoir, Barnston.
	B	G8BM/P†	as A station.

REGION 2

Barnsley ...	A	G3ABS/P†	Poole Hill, Denby Dale, nr. Barnsley.
	B	G5IV/P†	Hoylandswaine, nr. Barnsley.
Bradford ...	A	G4GJ/P	St. Barnabas Hall Grounds, Heaton, Bradford 9.
	B	G6KU/P	as A station.
Danecaster and District	A	G3GQ/P	Camping ground adjoining High Melton Training College, High Melton.
Hull	A	G2CPS/P†	The Westwood, Beverley.
	B	G3PL/P†	Field adjoining Flagstaff House, Welwick.
Newcastle-on-Tyne	A	G3JJD/P	Ogle Castle, Ogle, nr. Ponteland.
	B	G3BKE/P	as A station.
Pontefract ...	A	G6MF/P†	Hemsworth Grammar School Playing Fields, Hemsworth.
	B	G3US/P†	as A station.
Rotherham ...	A	G3AYS/P†	Listerdale, Brecks, 3 miles east of Rotherham.
	B	G3ELG/P†	Keppel's Column, 3 miles west of Rotherham.
Scarborough ...	A	G3DQ/P†	Field on Flamborough Head nr. lighthouse, Flamborough.
	B	G3KS/P†	Boys School Playing Field, Olivers Mount.
Sheffield ...	A	G8NN/P†	Field adjoining 580 Redmires Road, Sheffield 10.
	B	G5TO/P†	Lodge Moor Camp Site, Redmires Road, Sheffield 10.
Slaithwaite ...	A	G8NF/P	Worts Hill, Slaithwaite ½ mile n.w. of B.B.C. Moorside Edge Station.
South Shields ...	A	G8JO/P	Cleaton Pumping Station, South Shields.
	B	G6VG/P	as A station.
West Hartlepool	A	G3TO/P†	Tofts Farm, Seaton Carew.
	B	G3CHJ/P†	as A station.
York ...	A	G3DTA/P†	School Playing Fields, Beckfield Lane School, Acomb.
	B	G3FTS/P†	as A station.

REGION 3

Cannock and Lichfield	A	G3HRR/P†	Cavan's Hill (off Allport Street), Cannock.
	B	G3ABG/P†	as A station.
Coventry ...	A	G5PP/P†	Hall Farm, Allesley.
	B	G5SK/P†	as A station.
Solihull and District	A	G2AGR/P	Field at junction of Clyde Road and Gladstone Road, Dorridge, Birmingham.
	B	G5QI/P	as A station.

REGION 3—continued

South Birmingham	A	G8PN/P†	Kings Norton Grammar School Playing Field, Northfield Road, Birmingham 30.
	B	G6KI/P†	as A station.
Stourbridge ...	A	G8GF/P†	High Trees Farm, Shatterford, nr. Bewdley.
	B	G3BMY/P†	Hill Farm, Kinver.
West Bromwich and Handsworth	A	G2BJ/P	Stonecross, West Bromwich.
Walsall ...	A	G2FPR/P	Pleck Park, Pleck.

REGION 4

Boston ...	A	G6GH/P	Glebe Field, Stickney.
Derby ...	A	G4CO/P	Glebe Farm, Blagreaves Lane, Littleover, Derbys.
	B	G2DLJ/P	Rushley Lodge, Farley Moor, Matlock.
Grimsby and Cleethorpes	A	G2FT/P†	Site 26, Humberston Foreshore, Humberston.
	B	G4XC/P†	as A station.
Leicester ...	A	G4BB/P	Paddock at rear of "Dog & Gun," Kilby.
	B	G2BVW/P	as A station.
Lincoln ...	A	G3EBH/P†	Meadow Close, Sudbrooke Lane, Nettleham.
Newark ...	A	G3ELJ/P	Dairy Farm, Langford.
Nottingham ...	A	G3JKO/P†	Hill Farm, Epperstone.
	B	G2FRY/P†	as A station.
Peterborough ...	A	G2NJ/P	Manor Farm, Alwalton.
	B	G3FUR/P†	as A station.
Retford ...	B	G3BTU/P*	Hill Top Farm, Leverton Road, nr. Retford.
Worksop ...	A	G3AUZ/P*	Hill Top Farm, Leverton Road.

REGION 5

Cambridge ...	A	G2XV/P†	Rivey Hill, Linton.
	B	G5DQ/P†	as A station.
Chelmsford ...	A	G3RV/P†	"The Running Mare," Galleywood.
	B	G4VF/P†	as A station.
Danbury ...	A	G3INW/P	Field adjacent "Helmons Farm" West Hanningfield.
Great Yarmouth	A	G3AMK/P	Acle New Road Marshes.
	B	G6ZG/P†	as A station.
Lowestoft and Beccles	A	G3JMU/P†	Church Bungalow Farm, Oulton.
	B	G3JMX/P†	as A station.
Luton ...	A	G3ADK/P†	Playing Field, Bradgers Hill, Stopsley.
	B	G3ASD/P†	as A station.
Norwich ...	A	G3IOR/P†	Hellesdon Golf Course, Hellesdon.
	B	G2YU/P†	High Noon Farm, North Burlingham, Blofield.
Sheffield and Bedford	A	G2DPQ/P†	New Rowney Farm, Bedford Road, Shefford.
	B	G4OL/P†	as A station.
Southend-on-Sea	A	G5QK/P	Thundersley Glen.

REGION 6

Bletchley ...	A	G3AZ/P	London Brick Co., Newton Longville.
Cheltenham ...	A	G2AJ/P†	Field 400 yards s.e. of Elmstone Hardwicke Church.
	B	G5BM/P†	as A station.
Gloucester ...	A	G3MA/P	c/o E. Shaw, Green Farm, Maisemore.
	B	G2RT/P	as A station.
High Wycombe	A	G6JK/P†	W. J. Fountain's Farm, Cryers Hill.
	B	G3DDQ/P†	as A station.
Oxford ...	A	G2DU/P	Graces Farm, Berrick Salome, Benson.
	B	G5RP/P	as A station.

REGION 6—continued

Town or Area	Stn.	Call Sign	Location
Petersfield and District	A	G3DDM/P	Horndean Community Association Ground, Merchistoun Road, Horndean.
Portsmouth ...	A	G6NZ/P†	Gauntlett's Farm, Crookhorn Lane, Portsmouth Hill.
	B	G8BU/P†	as A station.
Southampton ...	A	G5LR/P	Netley Hill Common, Netley.
	B	G3KJ/P	as A station.
Stroud ...	A	G5HC/P	Hazelcote Farm, Kingscote, Tetbury.
	B	G3FFN/P	as A station.

REGION 7

Acton, Brentford and Chiswick	A	G5LQ/P†	L.T.E. (District Railway) Sports Ground, Bollo Lane, Acton, W.3.
Bexley and Bexleyheath	A	G3ISX/P	nr. The Pavilion, Baldwins Park, Bexley.
Brentwood ...	A	G3LA/P†	The Old Roman Camp, Sandpit Lane, Brentwood.
	B	G8PB/P†	as A station.
Bromley and Beckenham	A	G2MI/P	c/o Mr. Rose, Dairy Farm, Hayes Street.
	B	G4ZU/P	as A station.
Chingford ...	A	G4GA/P†	Bury Farm, Sewardstone Bury.
	B	G3YF/P†	Field nr. High Beech, Epping Forest.
Chislehurst and Sidcup	A	G3ANK/P	Edgebury, Chislehurst.
Coulsdon and District	A	G2DN/P†	Field above Messrs. Hall & Co. Lime Works, Coulsdon.
	B	G6JJ/P†	as A station.
Croydon ...	A	G3BCM/P†	Court Farm, Warlingham.
	B	G6LX/P†	as A station.
Dorking and Leatherhead	A	G3IAM/P†	Ranmore, nr. Dorking.
	B	G3JEQ/P†	as A station.
Ealing ...	A	G5SX/P†	Hanger Hill Estate, between Hanger Lane and the Ridings.
	B	G3ISU/P†	as A station.
East Ham ...	A	G2ZZ/P	Youngs Farm, Lambourne End.
	B	G4CM/P	as A station.
East Molesey ...	A	G8SM/P†	Broadmoor, nr. Dorking.
	B	G6MB/P†	as A station.
Edgware and Hendon	A	G5FG/P†	Weedons Farm, Nan Clarks Lane, Mill Hill, N.W.7.
	B	G2IM/P†	as A station.
Enfield and District	A	G8SK/P	"The Forge" (rear of the "Prince of Wales") Hertford Road.
Guildford and Woking	A	G3GIO/P	Puttenham Common, Guildford.
	B	G3ARM/P	as A station.
Gravesend ...	A	G6BQ/P	Brimstone Lane, Meopham.
	B	G3IEW/P	as A station.
Harlow ...	A	G6UT/P	Dorington Farm, Ryehill, Epping.
	B	G3JWW/P	as A station.
Hounslow ...	A	G3AZJ/P	Osterley Park, Osterley, Middx. (200 yards south of Osterley lane and 800 yards east of Norwood Green Road).
	B	G2QI/P†	East London Mission Field, Lambourne End.
Ilford ...	A	G6HU/P†	as A station.
Kingston-on-Thames	A	G3GXX/P	The Paddock at the Waffrons, Surbiton Golf Course, Woodstock Lane, Surbiton.
	B	G3DHz/P	as A station.
Lewisham Area ...	A	G2DHV/P†	Point Hill Park, Blackheath, S.E.10.
	B	G3IGZ/P†	Rowhill Grange, Wilmington, nr. Dartford.
Mitcham ...	A	G3HQX/P	The Top Field, Wingfield Farm, Walton-on-the-Hill, Tadworth (400 yards n.w. of junction of Ibbisham Lane and Hurst Lane).
	B	G3IIR/P	Old Crystal Palace Site, S.E.19.
Norwood and District	A	G2RX/P	as A station.
Reigate and Redhill	A	G5LK/P	Field off Madeira Walk, Reigate.
	B	G2AJ/S/P	Field off Caterham School, Caterham.
Romford ...	A	G2FWJ/P	Bedfords Park, Havering-atte-Bower.
Slough ...	A	G2HOX/P	Taplow Court, Taplow.
	B	G6CJ/P	as A station.

REGION 7—continued

Town or Area	Stn.	Call Sign	Location
Sutton and Cheam	A	G6KM/P	Henley Fort School Camp Playing Field, Guildford.
	B	G8DF/P	as A station.
Welwyn Garden City	A	G5UM/P	I.C.I. Sports Ground, Blackfan Road.
	B	G2CN/P	as A station.

REGION 8

Brighton...	A	G2FAD/P†	Ovingdean Grange Farm, Woodingdean.
	B	G3YY/P†	as A station.
Hove and District	A	G3CUY/P†	Pollards Farm, Ditchling.
	B	G3FXB/P†	as A station.
Maidstone ...	A	G8LZ/P†	Police Sports Ground, Sutton Road, Maidstone.
Medway ...	A	G3BRJ/P†	Common Road, Blue Bell Hill, Chatham.
	B	G3BSU/P†	as A station.
Thanet ...	A	G2JF/P†	Palm Bay Recreation Ground, Margate.
	B	G2IC/P†	as A station.
Tunbridge Wells and Tonbridge	A	G2UJ/P	Cemetery Hill, Hawkenbury.
	B	G4IB/P	nr. Tunbridge Wells.

REGION 9

Bath ...	A	G2ZR/P†	Soldier's Down, Claverton Down, Bath.
	B	G6UR/P†	as A station.
Bristol ...	A	G2IK/P†	Home Field, Hill Farm, Dundry.
	B	G3RQ/P†	as A station.
Dorchester ...	A	G2TZ/P	Grounds of Askers Road House, nr. Dorchester.
	B	G5UF/P	Field next to Moigne Court, Owermoigne.
Exeter ...	A	G3ID/P	Conways Farm, Exminster.
	B	G5QA/P	Huntsland Farm, Cheyney Gate, Pinhoe.
Falmouth ...	B	G6LV/P*	Mabe, nr. Falmouth.
North Cornwall	A	G2AYQ/P*	St. Agnes Beacon, St. Agnes.
Plymouth ...	A	G3GOV/P	Collaford Farm, Lyneham, Plympton.
	B	G3BLO/P	as A station.
Torquay ...	A	G3GDW/P	Little Haccombe Farm, Milber, 1 mile s.e. of Newton Abbot.
	B	G4RJ/P	Jawbones Hill, 1 mile east of Dartmouth.
Weston-super-Mare	A	G5TN/P†	Mr. Dibble's Farm, Wolverhill.
	B	G5DV/P†	as A station.

REGION 10

Neath, Port Talbot and District	A	GW3INO/P†	Llandarcy Fields, Llandarcy, nr. Skewen.
	B	GW2AVV/P†	Penton Hill, Port Talbot.

REGION 11

Wrexham ...	A	GW3GWA/P†	Cheetham's Manor Farm, Gyfeilia.
	B	GW3IHL/P†	as A station.

REGION 12

Aberdeen ...	A	GM6IZ/P	Cratches, Aberdeenshire.
	B	GM3BCL/P	as A station.
Dundee ...	A	GM4HR/P	Top of Carrot Hill, Inverarity, Angus.

REGION 13

Edinburgh and Lothians	A	GM8FM/P	Wester Melville Farm, Gilmerton, Midlothian.
	B	GM3UM/P	Edgfield Farm, Loanhead, Midlothian.

REGION 14

Town or Area	Stn.	Call Sign	Location
Ardrossan ...	A	GM3KET/P	Heathfield Aerodrome, Prestwich.
East Renfrewshire	B	GM4PW/P	as A station.
	A	GM3AR/P	North Kirkconmoor Farm, by Eaglesham.
Falkirk ...	B	GM8CH/P	as A station.
	A	GM6XW/P†	Mid Jawcraig Farm, 1½ miles north of Slamannan on Falkirk Road.
Fochabers and Elgin	B	GM4QV/P†	as A station.
	A	GM3HXT/P	Whiteash Hill Wood.
Forfar ...	B	GM3JGS/P	Balmacoul Wood (on the Roches/Garmouth Road).
	A	GM2HIK/P	Tannadice, by Forfar.
Glasgow...	B	GM3FEU/P	as A station.
	A	GM8MJ/P	Lickprick Farm, East Kilbride, nr. Glasgow.
	B	GM6MD/P	as A station.

REGION 15

Ballymena ...	B	GI3DZE/P†	The Cross, Moorfields, Ballymena.
Belfast ...	A	GI5UR/P	Harbour Airport, Sydenham, Belfast.

CHANNEL ISLANDS

Guernsey ...	A	GC3HFE/P	lcart, St. Martins.
	B	GC2ASO/P	as A station.
Jersey ...	A	GC3GS/P†	La Preference Farm, St. Martin.

* Indicates station is combining with another for the purposes of scoring. Where no asterisk is shown, and only one station call is given, the town or area is not operating a second station.

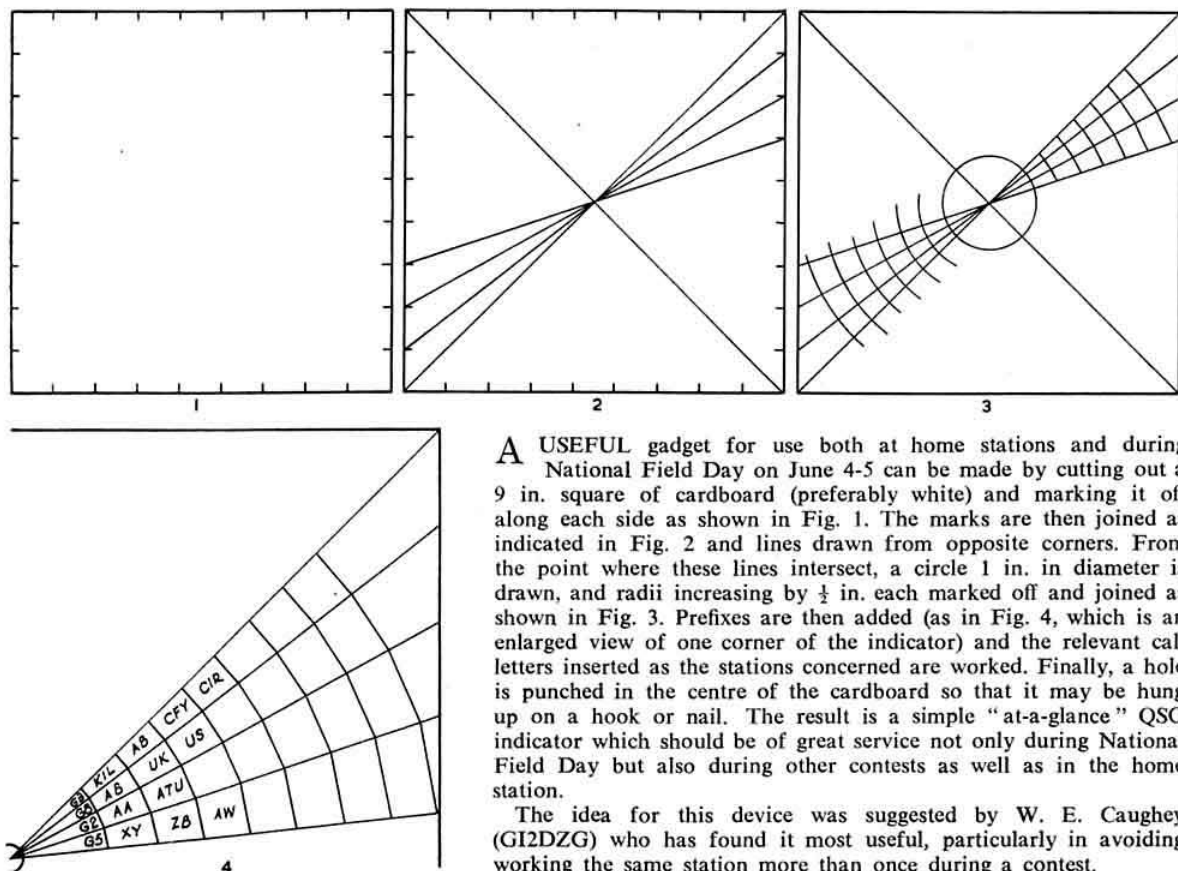
† Indicates A station will operate on 1.8 and 7 Mc/s and B station on 3.5 and 14 Mc/s.

National Field Day

TOWN Representatives are reminded that operators of portable stations competing in the National Field Day event must each hold a current United Kingdom Amateur (Sound) Licence and must be fully paid-up Corporate Members of the R.S.G.B. at the time of the contest.

Members who have not amended their Bankers' Order or remitted the balance due of their subscription are not eligible to operate N.F.D. stations. Failure to take note of this warning may lead to the disqualification of entries.

"At-a-glance" QSO Indicator



A USEFUL gadget for use both at home stations and during National Field Day on June 4-5 can be made by cutting out a 9 in. square of cardboard (preferably white) and marking it off along each side as shown in Fig. 1. The marks are then joined as indicated in Fig. 2 and lines drawn from opposite corners. From the point where these lines intersect, a circle 1 in. in diameter is drawn, and radii increasing by ½ in. each marked off and joined as shown in Fig. 3. Prefixes are then added (as in Fig. 4, which is an enlarged view of one corner of the indicator) and the relevant call letters inserted as the stations concerned are worked. Finally, a hole is punched in the centre of the cardboard so that it may be hung up on a hook or nail. The result is a simple "at-a-glance" QSO indicator which should be of great service not only during National Field Day but also during other contests as well as in the home station.

The idea for this device was suggested by W. E. Caughey (GI2DZG) who has found it most useful, particularly in avoiding working the same station more than once during a contest.

THE MONTH ON THE AIR

By S. A. HERBERT (G3ATU)*

SUNSPOT activity appears to be increasing most encouragingly and even at this early stage, there have been DX openings on ten metres, while fifteen has been rather more populated than is usual. Twenty is open until the early hours—due to the advent of B.S.T. and the seasonal increase in night-time M.U.F.s while forty and eighty users now have static to contend with in addition to the usual distractions. However, Top Band provided the biggest surprise during the month by producing a first-rate trans-Atlantic opening in the middle of April. As the cycle progresses it will probably be a good idea to keep a watch on this band, even during months which normally are "written off" from a DX point of view. There may be some more surprises.

Top Band

The opening referred to was on April 10, and B.R.S.20106 (Petts Wood) was there to take advantage of it. He logged c.w. from W1BB at S9+ (0454 G.M.T.) and K2BWR at S7-8. WISS was heard on phone. Conditions were just right. What a pity there were so few stations on at the time. When HK4DP put in his promised appearance, Norman logged his signals, while other DX heard since mid-March includes VE1ZZ, YV5DE, W8KIA, W2, W3 and UB5BP (1751 kc/s—1940). G3DGI (Barnet) was active during Easter as GW3DGI. Despite a high noise-level some 30 stations were worked from Pembroke and cards have been sent. G3IUN is not on the band and, in fact, has been off the air since 1954. The person using that call on phone is a pirate. G3IXE on eighty is in the same category. The genuine 3IXE never uses the band.

Ten Metres

There are no reports of any DX worked, but one or two enthusiastic listeners found the band open to South America, mostly between 1600-1930 G.M.T. A1290 (Blackheath) heard CX, LU, PY and a lone African—ZD3BFC. A1291 (Ashted) logged the ZD3 and LU. A ZB1 was heard to say the band was open to Africa almost daily. B.R.S.20135 logged CX, LU and PY to complete the tale. G3ATU and G2HMI (Sunderland) keep a check, but so far with negative results. If anyone as far north has heard a DX opening, they would like to hear about it!

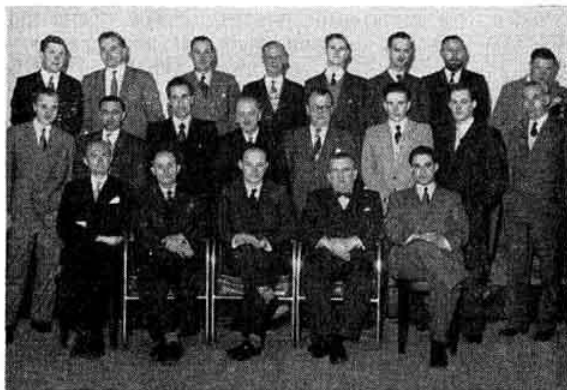
Fifteen Metres

Here again, nobody will own up to working anything! However, there appears to be activity even during the week, which makes a pleasant change. B.R.S.20133 (Melton Mowbray) combed the phone segment for CR7, FQ8AK, OQ5, VQ5EK, VS1FK, CX, HC1, KZ5, YV, VP6 and OA5G, while A1290 heard a rare one in HC8GI (Galapagos Is.), OQ0DZ, ZS9G, EL, ZS, ZE and sundry 4X4s. Most openings were from 1200-1930, but KZ5WA was heard as late as 2215. A1291's best was undoubtedly VP8AQ (R5 S7—1750),

with ZD1SS, OA4G, VS1FK, VS6CL, VS1AY and ZP5IB for good measure. Phone DX heard by B.R.S.20135 included OD5AJ, CR6AI, EA9AR and PZ1RM. B.R.S.20106, with 121C logged on the band, mentions such phone DX as VP8BD (1550), HC8GI, VS6CL (S9), CP5EK, ZS9, EL and VQ2, while on c.w. he heard the "untouchable" UG6KAA, VS6CL again, OA4C and OA4ED. R. J. R. Crocker (Plymouth) in another 21 Mc/s-only log, mentions HZ1TA, OA4CL, OA5B, ZP5IB, CR4AP, CR4AF, ZD3BFC, VP4LL, PZ1RM, FF8AP, CE2 and 3, lots of the more usual S. Americans and Maritime Mobiles W1RIT (440 m.n.e. of the Amazon), W4DGW (59°N—38°W, on s.s.b.), W8QOH (off Liberia) and W2NXO (07°N—48°W).

Twenty Metres

Most users of the band seem to have found things better, especially noon-day, although earlier in the day it sounds more like a commercial channel than an amateur band. One regular offender, who must be using several megawatts, has appropriated 14050 kc/s and sits there radiating key-clicks far outside the limits of the band. (The Society has protested to the G.P.O. about this station—EDITOR.) Other intruders are dotted all over the place to the detriment of the usually weak morning DX. VK, KA, VE5, KH6, ZL and an occasional W7 are oft-times there and sometimes something exotic like ZD9AB turns up but the going is tough. ZD9AB was on c.w. recently (0700) but has now returned to South Africa. He used 700 watts to a long wire and says



Malta Amateur Radio Society Hamfest held at Modern Imperial Hotel, Sliema on January 22, 1955. Back Row (l. to r.) D Keeler (ZB1DK), C. Curless (ZB1CU), E. V. Scott (ZB1TD), Mr. Bird, J. Stockley (ZB1FMW), J. R. Killeen (ZB1JP), C. Lusted (ZB1AY), H. Seckts (ZB1LU), Middle Row (l. to r.) G. Falding (ZB1GBF), V. Genovese (ZB1BF), J. J. Gatt (ZB1JG), J. N. Burtoo (ZB1BT), C. H. Holmes (ZB1CH), J. A. York (ZB1JY), E. Briggs (ZB1EB), Mr. Grech, Front Row (l. to r.) F. L. Postlethwaite (ZB1KA), R. J. Galea (ZB1E), R.S.G.B. Representative, H. M. Gilmour (ZB1AUV), President, J. Spafford (ZB1BZ), Hon. Secretary, Dr. V. Borg Grech (ZB1CA).

*Roker House, St. George's Terrace, Roker, Sunderland.

ZD9AC will take over and should be on regularly. Cards for ZD9AB should go via ZS1FD.

G2DH (Manchester) worked **G3IDC/VSI**, who answered his CQ. '2DH has been building a six band 813 transmitter and is looking forward to the new experience of using a full 150 watts. Several recent QSOs have been with Gs overseas—VQ8AY, VQ4FM, VE3CDM, VP6KL, CO5FL, VO6N, VE7GI were worked, but he was unlucky with VP5AD, ZD6EE, DU7SV, VP8AQ, VP7MD, FM7WD, CE7ZJ (somewhere in the Antarctic), OY7ML, CP3CA, JZ0AG, VK9BW and MP4NL.

G3JFF (Kingswear) says he is "back in the rut" and working DX again. He has reached 96 countries with KL7AWB and an unexpected UA4KPA, who asks for QSLs via Box 74, Odessa. KH6ER was worked at 1836 and MP4QAL, VQ2AB, VP9BL, VE8MW, ZP5GM, JA, VS6 and VK4YP were accounted for on c.w. Mike reports KS4AW (Swan Is.) active on 14205 phone and 14004 c.w., with YN1AA on 21 Mc/s phone. During his recent trip, he visited VP2VA, who is the only station in the British Virgin Islands. '2VA has so far not worked a G but the completion of a new "shack," complete with beams, should alter all that. In Bermuda, Mike operated club station VP9BDA but being the centre of attraction on forty for masses of Ws during a DX contest was too much so he turned and ran! Our QRM from Europe is nothing when compared with short skip over there. **G2BUJ** (Swindon) was intrigued to work 4W1AM, who was causing a stir one morning. He is in Yemen, if genuine. '2BUJ would like to hear from anyone who worked W6ONP/KW6, back in 1947 and got a QSL. Cards sent to W6 have so far not done the trick.

G3KBN (Stockport) is finding his single frequency 17 watt c.o.p.a. giving him good schooling in listening and learning when to jump! He has done well recently with W1, 2, 4, 9, KP4, CO5, VP9, CE3AG and KL7AWB. Phone DX logged by **A1290** includes DU1AP, ET2AB, FM7WN, KG4AP, KL7ZG, SU1AS, TI2, VK and VSI. **B.R.S.20133** logged a new one on phone with VK9SP (Papua) while **B.R.S.20135** heard YN1RA, HH2RM, OA4AI and the hefty ZD3BFC. **B.R.S.20317** turned to c.w. for CP5EP, EL2L, ET3GB, FB8BR, FR7ZB (14010), FY7YE, ZD3A, ZS7D and ZD8AA—a mouth-watering assortment; phone produced CE, DU, FM7, FY7YE, KC6CG (14200), MP4KK, VE5HL, VP7NS and YN4CB.

A. G. Edwards (N. Finchley) logged FM7WN, OQ5, VQ5EK, PJ2CO and VU2RC on phone. **B.R.S.18107** logged a rare one on 14100 kc/s at 1215—KS6FA (Pago Pago). KC6CG was another new one while FB8BR and 4S7AU were heard on c.w. and ZS2MI (Marion Is.), HZ1NA, VU2DT and M1B on phone. **B.R.S.20249** (Sutton) managed ZS3AH, EL1FI, HK, ZP, 4S7 and VU2JP on phone and FF8AJ, ET3 and VQ3FN on the key. He fears that things may get difficult now that neighbour G3IRU—who lives but a few yards away—has replaced his 5 watt rig with a 100 watt sender! **B.R.S.20605** (Torquay)—a blind listener—is doing well with his first real s.w. receiver—a BC342—on which he heard HZ1NA, F18, ZD2, KA7DM, FA6AR, H16, TI, HC1 and sundry Africans. **B.R.S.20106** has heard 168 countries this year and 242 on twenty only since resuming listening in December, 1950. His latest c.w. catches are LA7XE (Spitzbergen?), KH6IJ (1744), VP8AI, UA0s 'KFA, 'SK, 'FE, 'VB, HK0AI, HH3L, EQ1ND, KR6MC (1847), YS10, HS3A, JZ0AG, MP4JO and FI8BG. On phone he pulled in VE5HL, ZL4AQ (S8 at 2125), YN4CB, YN4OC, VP4TT, ZD4BX, ZD4BD and lots more usual DX. **G3ATU** worked

KC6CG for his 237th country, VK9GV (Port Moresby) and some DUs. Noteworthy items on c.w. were CR9AI (T7), KL7CGA and other KLS, workable in the early evening, ZD3A (Bathurst), ZD8AA (heard on 14005 kc/s as late as 2250), SM8CWC (tantalisingly ship-borne while in Ciudad Trujillo (H16) harbour), MP4NL (Basra: QSL via G3EMR), VP8AQ (S. Shetlands), CE7ZJ (Antarctic: QSL to Box 2849, Santiago, Chile), ZD2WAF and ZD2WAG. Active on phone are CT3AF, MP4BAM and 3A2AL. MP4QAL has also been on, though usually he uses c.w. **G6ZO** passes on '4QAL's address for direct QSL: Fergus Walshe, Decca Navigator, c/o Shell Doha, Qatar, via Bahrain.

Forty Metres

Forty becomes more neglected as summer approaches, but **G3JWT** (Slough) was rightly pleased to work VS6CQ at 2215. His 30 watts and 85 ft wire netted him a 56/79 report, too. **B.R.S.20106** heard some good stuff: EA9DF, LU8ZC, MP4BBL, OX3NB, W5, 6, VKs '2AMB, '2XZ, '7UW and nine ZLS. Norman is the only one to mention eighty metres, on which band he unearthed YV5BJ, TI2PZ, VP7NM, 7NX, PY7AN, HK4DP, HR4WH, ZL3JT, ZL1BY, W6MBA, W9, W0KIC, UF6, UA9 on the key and the lone CT3AN on phone.

Overseas News

An interesting overseas mail starts with a note from **VS2DB** (Kuala Lumpur) giving details of two new DX stations. **VS5CT** (Brunei) is active on phone around 14190 kc/s. The operator is Pete Green (ex-G3DCT). QSL via the VS2 Bureau, P.O. Box 600, Penang, Malaya. **ZC5AC**, Christmas Is., Indian Ocean, is crystal-controlled on 14163 kc/s. QSL to V. E. Mathew, via G.P.O., Singapore, or via the VS2 Bureau. (**VS2DB** does say ZC5, though this may be a mistake for ZC3. A watch on 14163 may provide the answer!) W6 and 7 are heard most days in VS2 from 1430 to 1630 local time. **MP4BBV** is newly active from Bahrain and will operate on fifteen and twenty until October next. He is looking for Gs, especially those near his home in Hereford. In a note to **G2MI**, **VU2JP** says he sails from Colombo in May, for furlough in the U.K. He has re-applied for his GM call (GM3FPJ). During his absence, the VU Bureau will operate as usual from Box No. 1. Munrar, Travancore.

DL2YN active after a spell as VS1YN, is finding the going tough. In Singapore stations queued up but he remarks that DL has no scarcity value whatever! When QSOs do come, reports are good. RST579 from ZE and 589 from W6 prove the 120 watts are getting out. It seems to be a matter of perseverance! **DL2YD** (ex-5A2CE) is another new call, whose main interest is 14 Mc/s phone. He has worked W3YFK/VO, KT1 and YV5 and is looking for VQ4 and 5A2C calls.

EX-MF2AA is hoping to start up from G3BQZ very shortly. Bob had a batch of MF2 QSLs returned from various addresses marked "Gone Away." These he has sent to G2MI who will forward them to claimants on application. After the closing down of all MF/AG stations last year the rules for the F.T.T. Certificate were amended but it is still available. IINZ deals with claims thereto. **VQ4EG** comments on the rapid increase in the number of VQ4 licences. He finds 6 watts gets around East Africa on Sunday mornings but at night the band is full of Asian and Arabic B.C.; protests apparently do no good. Mike awaits news of his progress in the VK/ZL Contest—his first effort. Although he could make only 22 QSOs—11 of them on 40 c.w.—he believes he was the sole participant in Zone 37! His DX score is 96c, with a gratifying QSL

return. VQ4HJP is now **VQ3HJP** (Mafia Is.) and should be heard fairly soon.

B.E.R.S.195 (N. Fairfield, Victoria) reports more interesting news from "Down Under". He heard G3ATU calling "CQ DX" on 7 Mc/s (that must have been the time when seven S9 YUs, an EA and a DM2 replied!) and was reminded to write. The past year produced only 5 new ones for Eric whose score now stands at 232/224. No ZC2 has been heard since VK1HM left Cocos, nor has FB8AX (Adelie Land) yet showed up. QSLs this year are slow, but a natty postcard from SM8CWC arrived from Honolulu, which the Swedish Training Ship visited in the course of a world tour. VK1PG was calling FO8AM recently. The VK1 will now be home and nothing more will be heard from Heard Is. as that Base has been abandoned. Most activity has been in logging Europeans on 7 c.w. between 1400-2200. Eric reckons he has logged more than 1,000 different stations on the band this year. The loudest recently were G6ZO, TA3US, F9HR, DM2ADL, D11MK, LZ1KSI and a couple of Us. On 3.5 Mc/s, DU7SV, KP4CC, KR6LJ and W6/7 are good around 1000 local time. Ex-VK9YY is now VK2AIR. Well-known DX man VK3XK has been transferred to Port Moresby, so VK9XK should soon be on. VK9OK (Norfolk Island) is still active on 14 Mc/s phone. VK9RH had to be flown to Sydney for an operation but he made a good recovery and is well on the mend. JZ0DN, under-cover from an island in the PK7 area, is active on 7 Mc/s c.w. and gets through to Europe. VK7UW (ex-G1SUW) is very active chasing DX on the same band. The VK2s did a fine job of work during the flood emergency around the Newcastle area (see "It Happened There" elsewhere in this issue—EDITOR). Eric had travelled through the area shortly before the floods which were the worst in Australian history.

Two items with acknowledgments to the Northern California DX Club's *The DX'ER*. The A.R.R.L. has announced that Amateur Radio operation for U.S. citizens is now permitted from Greenland. The Com-

manding General, N.E. Air Command will prescribe rules and will assign calls from the block KG1AA to KG1LZ inclusive. W7HXG worked KS6AB on about 14070 kc/s A1. **TF5TP** recently told **GM3GCH** that Icelandic stations are now allowed to operate on the fixed frequency of 3520 kc/s. G2MI worked SM5ARP, who said he would be active as **3A2AW** from May 23 to June 1, using c.w. on 7, 14 and 21 Mc/s. QSLs will be sent against those received. **3A2AL**, now active on phone, is the sister of **3A2AM**.

Empire DX Tour—3

READERS of this feature will remember that Sgt. Frank Johnstone did not manage to make any QSOs from Hong Kong—now we know why! He was resident at the time in an R.A.F. Transmitting Station where the noise level was too much even to permit local VS6 signals to get through. On returning to Singapore, G3IDC/VS1 certainly hit the high spots with an S7 signal, and comfortable contact was maintained with G8FC for an hour every afternoon.

Between March 25 and April 17, the R.A.F. aircraft *Iris*, with Sgt. Johnstone on board, flew to New Zealand and Australia, visiting many R.N.Z.A.F. and R.A.A.F. stations en route. G8FC made no QSOs with G3IDC/ZL or G3IDC/VK during this period although Frank heard G8FC whilst visiting VK3QK who, unfortunately, could not transmit on 14 Mc/s at the time. Only one New Zealand station was contacted from G8FC—ZL2ADS—who passed 73 to G3IDC.

On April 18, Frank was in VS1 again, from which country he worked several G stations. Long QSOs were made with G8FC each afternoon until April 21. The *Iris* was in Mauripur on April 25 from where G3IDC had a good contact with R.A.F.A.R.S. Headquarters. The aircraft left for Habbaniya on April 26 and the DX tour concluded on April 28.

R.A.F.A.R.S. Headquarters are grateful to those members who kindly forwarded details of signals heard from G3IDC whilst abroad.

"Pop"

Frequency Predictions for May, 1955

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
28 Mc/s	2000	1900	1800	1530	1600	1600	1600	0700
21 Mc/s	2000	1830—1930	1600—2000	1400—2000	1500—1700	1600	1600	0700
14 Mc/s	1130—0000	0930—0030	1030—0100	0600—2100	0530—2215	0400—2100	0800—1900	0500—0800 2100—2300
7 Mc/s	2300—0800	0000—0800	0100—0800	2100—0500	2300—0400	2230—0200	2200—0200	1700—2200
3.5 Mc/s	0200—0700	0400	0800	0330	0100—0300	0000	0000	1800

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T.

It should be noted that between May and September propagation by sporadic E may result in short skip contacts on the 14, 21 and 28 Mc/s bands. The incidence of sporadic E is unpredictable but is most pronounced around midday and dusk.

Mobile Column

Longer Days bring Increased Activity—420 Mc/s Operation Reported

By JOHN A. ROUSE (G2AHL)*

FINER weather and longer days have brought the mobiles out in force in recent weeks and more letters on all aspects of such operation have been received for this feature than at any time since the granting of mobile facilities nearly a year ago. During those twelve months amateur interest in mobile operation has grown tremendously in the United Kingdom and British amateurs are now regularly active from moving vehicles on all bands from 1.8 to 420 Mc/s.

One of the most frequent queries received at Headquarters is "How do I get a mobile licence?" The answer is simple—apply to the Radio Branch, Radio and Accommodation Dept., Post Office Headquarters, London, E.C.1. The extra charge is £1 p.a. Incidentally, the Mobile Licence is supplementary to the Amateur (Sound) Licence, the general conditions of which apply equally to mobile operation.

Mobile on 420 Mc/s

Since the *Mobile Column* for March was published, at least three 70 cm mobile stations have appeared. As reported in *Two Metres and Down* last month, **G5KW** and **G8KW** were the first to have a mobile-to-mobile contact on this band, with excellent results over distances up to 20 miles. **G2DD** is now regularly active on 70 cm mobile and has worked **G2HDY**, **G3GDR** and **G5DT** from Wembley, **G3FP** (Thornton Heath) from the Hog's Back near Guildford (a distance of 24 miles), **G5ML** and **G5SK** whilst in Coventry, and **G2HDY** and **G5KH** from the Hertfordshire side of Stanmore Hill (20 miles). The best contact so far has been with **G3FP** while in Basingstoke, a distance of about 44 miles. The report on this occasion was RS54 both ways on 'phone. It is interesting to see how reports vary: **G5DT** was worked at a distance of 22 miles for reports of RS59 both ways while on the same day **G3GDR** at only ten miles was RS58. Attempts to contact **G2HDY** from home proved fruitless but a move of only one mile to another location 400 ft a.s.l. produced S9 signals.

The equipment used by **G2DD/M** is housed in a box somewhat smaller than a TU cabinet and comprises a 12AT7 (oscillator on 18 Mc/s, second half doubling to 36 Mc/s), EL91 doubler to 72 Mc/s, 5763 doubler to 144 Mc/s followed by a QV03-20 tripler to 420 Mc/s. The clamp modulator line-up is Z77-Z77-5763. For reception a standard **G2DD** flat line converter (as described in *The Short Wave Magazine* for March, 1953) feeds into a home-built miniature communications receiver covering 25-29 Mc/s as the tunable i.f. Power is derived from a type 22 set power supply which gives 100 mA at 220 volts (it is rated to give 80 mA at 280 volts). The aerial is a 4 element Yagi (folded dipole), fed with a short length of 300 ohm ribbon, mounted 20 in. above the car roof to which it is fixed by a rubber sucker.

Out and About with the Mobiles

Availability of the popular New Zealand ZC1 Mk. II transmitter-receiver has made mobile operation on the i.f. bands possible for many. Among those successfully using this unit is **G3FYZ** (Blackpool) who operates principally on 3.5 Mc/s. A centre-loaded 7 ft whip is used. Best DX so far is 25 miles, but **EI2G** has

been raised from Blackpool for an RS57 report; unfortunately, contact was lost before completion of the QSO. **G3FYZ** is now in the Norfolk Broads area and is looking for contacts. **G3FZW** (Lichfield) is another using a ZC1 with a modified G8TL-type whip made from a 6 ft length of 1½ in. dural tube. Top capacity loading is provided by 6 sections of a Canadian No. 58 Set whip from which the base section has been removed. The loading coil is as described in the BULLETIN. The extra length gives a considerable increase in signal strength, phone tests with local R.A.E.N. members indicating a Top Band ground wave range of 6-10 miles under the worst conditions. The best contact so far has been with **G8TR** at 30 miles. **G3FZW** is on from the centre of Birmingham from 13.30-13.50 B.S.T. daily on 1910-1912 kc/s looking for c.w. or m.c.w. contacts.

G3WW and **G6WA** have been testing ZC1s with good results. Associated with them is **G3BK** who uses a very compact Top Band and 3.5 Mc/s transmitter comprising EF91-EF91-QV04-7, modulated by a 12AX7.

G3GJX (Oxford) reports that both he and **G3HYZ** are active on Top Band. The latter uses a base-loaded whip while **G3GJX** himself employs the aerial described in his recent BULLETIN article. **G3BLE** (Witney) is active on 3.5 and 28 Mc/s. **G2DHV** is on 1.8, 3.5 and 7 Mc/s from Norfolk until May 28. QSOs and listeners' reports will be appreciated.

GM3HLQ, who uses an ex-Army 22 set on 3.5 Mc/s, has had many good contacts including **G3EGR** (East Ilsey) and **G3FQU** (Twickenham) whilst travelling between Strathaven and Glasgow and with **G2AON** (Eastbourne). Even if these contacts are not records for British mobile work on 3.5 Mc/s they certainly represent very good going for such a lower power phone rig. Stations worked whilst in motion include **GMs** 2DBK, 3IWU, 3HXT (Fochabers), 3GZC, 3JDH, 3JNE, 3GSX, **G6QA** (Rochdale), **G3GWR** (Sheffield), **G2RU** (Dunstable), **G3HZF** and **G12DZG**. The aerial is a centre-loaded whip, using a coil of 74 turns of "Perlite" wire wound on a 7 in piece of blind roller, cemented with "Dencofix". The top and middle sections of a standard 3 section 12 ft whip complete the set-up. Others known to be operating mobile in Scotland are **GM2AZN**, **3AEI**, **4QU**, **4BK** and **3HY**.

B.R.S.15458 although unable to transmit is installing receiving equipment in his car. **G3FKO** reports that mobile tests have shown 28 Mc/s far superior to Top Band in the hilly country around Bath.

Components for Mobile Use

Following the note in the last *Mobile Column*, several correspondents wrote regarding small transformers for mobile modulators. Messrs. Radio and Electronic Engineering, 34 Stoke Abbott Road, Beaminster, Dorset, tell us that they can supply a unit suitable for matching a 6V6 modulator to a 5763 p.a. (ratio approximately 1:1) for 17/- (delivery ten days), while P.C.A. Radio Ltd. can provide a transformer similar to that used in the "Hamobile" (push-pull 6BW6s to QV04-7 p.a.) for 17/6. **G3FKO** points out that the transformer used in Pye commercial mobile equipment is a useful item (part No. 770220). **G2ACT** says that receiver output transformers designed to match high impedance loads make good modulation transformers and mentions those used in the National HRO. For miniature gear, the small

*Assistant Editor, R.S.G.B. BULLETIN

output transformers from Command receivers are suitable.

G3FKO draws attention to the availability of brand-new "Nelco" rotary converters which are obtainable at very reasonable prices from the Midland Instrument Co., Moorpool Circle, Birmingham, 17. Two types can be supplied (both 6 V input): the receiver type gives 170 volts at 60 mA, the transmitter type 355 volts at 150 mA.

Mobile Operation in Sweden

Mobile operation is popular in Sweden where operation is principally on 3.5 Mc/s using inputs ranging from 5 to 60 watts. Those to look out for include SMs 1AMZ, 5BL, 5KG, 5OH, 5TF (who writes the Mobile Corner in *QTC*, the Swedish society journal) and 6BER.

Lecture and Demonstration of Mobile Equipment

Kingston and District Amateur Radio Society has arranged for Pye Telecommunications Ltd. to give a lecture and demonstration on v.h.f. mobile equipment at Penrhyn House, Penrhyn Road, Kingston-on-Thames, on May 19 commencing at 7.45 p.m. Amongst the equipment to be shown in operation will be Pye business radio, "Walkiephone", "Reporter" and control station equipment. All interested in mobile and v.h.f. work are invited to attend.

Mobile Humour

G4FO, who in order to simplify his mobile installation connected his car battery negative to earth, so making the ammeter read backwards, tells the story of how he was informed by a somewhat baffled motor mechanic that a mysterious fault had developed on the vehicle: the headlamps were charging the battery!

* * *

Thanks are again recorded to all those members who by their enthusiastic co-operation have made this feature possible.

U.B.A. Phone Contest

A PHONE Contest organised by the Belgian Society, U.B.A., will commence at 12.00 G.M.T. on June 18 and end at 24.00 G.M.T. on June 19. Contacts with Belgian (ON4) stations on all bands from 3.5 to 28 Mc/s will gain 2 points each. The final score will be the number of points multiplied by the number of Belgian provinces worked on each band. Contestants will call "CQ Phone U.B.A." and exchange six figure groups comprising the RSM report and the number of the QSO, commencing with 001. Full details may be obtained from the Traffic Manager, U.B.A., Maigre Andre (ON4MC), 32 Rue Joseph Wauters, Charleroi, Belgium, to whom entries must be posted to arrive not later than July 19.

Portuguese Contest

DURING the twenty-four hours of May 29—when a Portuguese contest will be taking place—stations in Portugal will only work stations in Portuguese possessions overseas; they will not reply to calls from other parts of the world.

Bermuda N.F.D.

AS in previous years, the Radio Society of Bermuda N.F.D. coincides with the R.S.G.B. event. Under the rules for the contest, Bermudan stations will score 6 points for contacts with U.K. portable stations. Among those expecting to be active is VP9BO/P.

Report of the Mobile Radio Committee

THE Mobile Radio Committee was set up in May, 1954, to advise the Postmaster-General on questions affecting the users of v.h.f. mobile radio services and especially on the problems arising from the decision to clear Band III (174-216 Mc/s) for television. The Report of the Committee, issued last month by the Post Office, analyses the problem and suggests an interim solution.

After considering a number of alternatives the Committee decided to recommend a plan which provides 7.3 Mc/s of frequency space for private land mobile services (taxi cabs, ambulance services and the like) between 165 and 173 Mc/s (the remaining 0.7 Mc/s being required for other services). The plan also provides for a "guard band" 3 Mc/s wide between the upper limit of the new band (173 Mc/s) and the lower limit of the nearest television channel (176 Mc/s).

The Committee considers that a reduction in the width of the existing mobile radio frequency channels from 100 kc/s to 50 kc/s should be fostered.

The Report refers to the future development of the land mobile services in the u.h.f. band. The channel 460-470 Mc/s is already allocated to fixed and mobile services in the U.K., but so far manufacturers have considered it too narrow to make it worthwhile to develop and market land mobile equipment to operate in it. The Post Office in consultation with other users (including the Amateur Service) is planning to extend the band downwards to 450 Mc/s so as to make it 20 Mc/s instead of 10 Mc/s wide as at present. Appendix 5 sets out the present and recommended frequency plans.

The proposed allocations are as follows:—

Mobile Frequency Mc/s	Channels	Class of User	Base Frequency Mc/s
169.85—170.05	2	Municipal Public Utilities and Industrial	165.05
170.05—170.35	3	Electricity	165.55
170.35—170.75	4	Municipal Public Utilities and Industrial	
170.75—170.85	1	Reserve	166.05
170.85—171.25	4	Ambulance	166.45
171.25—171.45	2	Medical	
171.45—171.55	1	Taxis, Trade Cars	166.75
171.55—171.95	4	Press	167.15
171.95—172.05	1	Demonstrations	
172.05—172.95	9	Taxis, Trade Cars	168.15
172.95—173.05	1	Municipal Public Utilities and Industrial	168.25

The Committee recommended that the Postmaster-General should give an assurance, subject to certain qualifications, that no change will be made for at least five years in the bands of frequencies in the v.h.f. range which may be allocated to the land mobile service.

At a Conference held on April 6, the then Postmaster-General (Earl de la Warr) informed representatives of the Technical and National press that he had accepted the recommendations of the Committee.

The Report can be obtained from H.M.S.O., price 9d.

RADIO AMATEURS' MOBILE HANDBOOK
NOW IN STOCK. Price 17/6

Amateur Television

By M. BARLOW (G3CVO)*

AFTER much patient work, television pictures from G2WJ/T (Dunmow) are now being regularly and well received by G3CVO (Chelmsford) and by A. Sale (Rayleigh)—12 and 30 miles away respectively. Tests are also being made with B.R.S.17902 at both Henlow R.A.F. Camp and on a hill near Cambridge. Several other operators are known to receive extremely strong signals from G2WJ/T, and it is hoped that they too will build the necessary converters. An interesting point is that, in spite of its extreme simplicity, G3GDR's original 70cm converter has consistently out-performed various beautifully-finished articles. Readers are reminded that G2WJ much appreciates reports on the reception of his television signals (recognised as a characteristic buzz on 436 Mc/s) whether or not they have been resolved into a picture. The sound accompaniment is on 145.4 Mc/s at the moment but a new sound transmitter, the necessary 3.5 Mc/s away from the vision channel, is under construction. Transmissions always take place on Saturdays at 18.00 B.S.T., and at various other times during the weekends. G2WJ now possesses r.f. distribution equipment for feeding both sound and vision out on the appropriate B.B.C. channel—a great help at exhibitions. On May 8, Ralph and Jeremy Royle demonstrated their equipment to the Mayor and Mayoress of Southgate (Councillor and Mrs. R. C. Evans). In spite of aerial difficulties (the 64 element beam had come down in a gale two days earlier) fairly good pictures were received by G3GDR and G3CVO. The General Secretary, Mrs. Clarricoats and Miss Gadsden were also in the party.

Amateur Colour Television

At Easter, Grant Dixon (Ross-on-Wye) received a stream of visitors to view his colour camera. The writer saw for himself the excellent colour pictures produced. Being a lone operator, C.G.D. cannot easily run camera and monitor except in the one room, but with a surfeit of operators at Easter several "OBs" were produced in the garden. It came as a surprise to the monochrome visitors how the subjects needed for good colour pictures are so different from black and white requirements, pastel shades being much the best. High contrast colours and bright whites tend to overload the camera, producing colour contamination effects, but with a little care the results are very good.

Notes and News

From Birmingham—where G3DFL has been "flying a lone spot" for some time—comes news that G3KBA/T (Aston Brook)—bedfast until recently—has been transmitting 9.5 mm. cine films (silent, but projected at sound speed!) and test patterns on 436.8 Mc/s. The transmitter is a QV03/10 power tripler, screen modulated. An RF105 unit is used as a balun to couple into the 8 element array. Only ten minutes walk away is G3KFE/T, who is naturally in a very easy position to "see" G3KBA. G5KS (Bradford) is rumoured to be moving into the area too, so it looks as if Birmingham will soon have as many "alternative programmes" as Chelmsford and Abbots Langley! A neat twist to the TVI problem was noted at G3CVO when the third harmonic of a local 2m station produced severe patterning on the pictures being received from G2WJ/T!

G3BLV (Sunderland) who hopes to put a picture into

Bradford this summer, is building a completely mobile /T station for the purpose. G2FGD (Southampton) has joined B.R.S.16075 and they hope to start transmitting pictures shortly. B.R.S.16075 has a slide scanner in process of being brought up to date, a 5FP7 being used instead of the old ACR2X. A Staticon camera is also under construction. Help is required in the area. P. Burrage (Leiston, Suffolk) has constructed his own zoom lenses; he admits they are not as good as the commercial type but quite useful over a restricted range. Television activity in Scotland is practically nil, but A. Bartholomew (Kirkcaldy) has a flying spot scanner in action. Wales, too, is in the depths, perhaps because most of the active Welshmen can only get home from their jobs at odd weekends. GW3IJE (Pontypool) is one, but he has spent some time designing a trick effects amplifier for producing inlay and overlay, and any symmetrical fade or dissolve.

The casual reader of this column may be convinced by now that no change ever occurs in the activities of the TV enthusiasts, but in defence we must point out that to make a satisfactory slide scanner takes about one man-year (spare time, that is), a live camera two-man years, and the 70 cm transmitter another two-man years. Just as with r.f. gear for lower frequency work, the results obtained with simple gear whet the appetite, but, unlike l.f. gear, practically nothing can be pressed into service unmodified, not even power supplies; the amount of constructional work involved is enormous. Amateur TV may be said to be in roughly the same state as Amateur Radio was in the 'twenties—and any old-timer will tell you what that means in effort and enjoyment.

New Recorded Lecture

To help spread the word, a new lecture tape lasting one hour at 3½ in./sec has been made by Grant Dixon and the writer of this column, entitled "Getting Started with Amateur Television." It is intended for the use of radio clubs and for the lone worker miles from other enthusiasts. The tape may be borrowed free of charge, as may "Amateur Colour Television" (one hour, 7 in./sec). Further lecture tapes on "Flying Spot Scanning" and "70 cm TV Converters" are in preparation. All tapes are twin track to B.S. specifications.

The Case of G3IOL

CONSIDERABLE interest has been shown by a number of members in the difficulties in which Mr. A. Barlow (G3IOL) of Ramsbottom, Lancashire, found himself over allegations of broadcast and television interference. Mr. Barlow had been called upon by the Ramsbottom Urban District Council (owners of the house in which he lives) to remove his aerials and subsequently was given notice by the R.U.D.C. to close down his station.

The R.S.G.B. Council having studied the protracted correspondence which had taken place between Society Headquarters, the R.U.D.C. and with Mr. Barlow himself, finally decided to accept the offer of a member of the Governing Body to visit Ramsbottom with a view to resolving the difficulties that had arisen. After personally interviewing officials of the R.U.D.C., as well as several of the complainants and Mr. Barlow, the Council's representative was able to report to his colleagues that the matter had been cleared up to a great extent. Although Mr. Barlow has not yet received a notice rescinding the order to close down his station, we await what we think will be a complete settlement of this involved matter.

*10 Baddow Place Avenue, Gt. Baddow, Essex

It Happened There

Amateur Emergency Communications during the Australian Floods

By A. O. MILNE (G2MI)*

IN late February and early March of this year there occurred the worst flooding in the history of New South Wales. Record rainfalls on the tablelands caused rapid rises of water level in the many rivers in the western part of the State, including the rivers Macquarie, Hunter, Castlereagh, Namoi and Gwydir and their tributaries. Damage amounted to tens of millions of pounds and nearly fifty people lost their lives.

It was early on the morning of February 24 that Noel Watkins (VK2APE) of Dubbo, notified Jim Corbin (VK2YC), President of the N.S.W. Division of the Wireless Institute of Australia, that serious flooding was imminent. The amateur emergency network was alerted and from then on for nearly two weeks, amateur stations carried an enormous load of flood traffic, becoming, in the process, probably one of the most complex radio networks ever operated. Messages were handled for the R.A.A.F., the Army, Police, various Broadcasting Stations, the G.P.O., Relief Authorities, Weather Bureau, Electricity Commission, Fire Brigades, Main Road Board, local Councils and many other bodies.

The dozens of stations in the affected areas were continuously assisted by hundreds in other parts of Australia who came on to relay messages and re-route traffic when required. One well-known station, VK2DX (Macksville) passed an important message to ZS5DE who in turn relayed it back to Australia on 14 Mc/s.

Any attempt to record the events of that terrible fortnight would take up many pages; many call-signs well known to the DX fraternity in this country were in the forefront of the relief work and the nets ran day and night. During the first few days of crisis some operators worked till they dropped and few had more than an hour or two of sleep.

Operation by day was mainly on 7 Mc/s and by night on 3.5 Mc/s.

Flooded Towns

Many towns were utterly devastated, a typical case being that of Maitland in the Hunter Valley. Communication ceased soon after the flood water hit the town and was not restored until Harold Whyte (VK2AHA) of Newcastle fought his way through with a battery set. Technicians at the local telephone exchange had got a transmitter on the 3.5 Mc/s band but they were without a receiver. He operated for 72 hours without a break until joined by VK2TY, 2NX, 2VU and 2JZ of Singleton who had rescued sufficient equipment from their own flooded homes to give him some relief.

Newcastle, centre of the Australian coalfield was the control for this net and sterling work was done by VK2AUH, VK2AA and VK2ZC. In Dubbo, a number of amateurs were flooded out and VK2AXS and VK2APE carried most of the traffic for the area.

The town of Tamworth, which has an airport, was an important emergency centre and here VK2APS, 2YU, 2ATD and 2ASQ were all active. Rod Pike (VK2ACU) of Coonamble was that town's sole outlet and he operated unaided for more than a hundred hours carrying traffic for the Post Office and other bodies. Jack

Hill (VK2ADT), a schoolmaster of Inverell, was directed by the police to forsake the schoolchildren for a week and he spent the entire period on the amateur bands. Ray Carter (VK2HC), another call well-known in this country, was the focal point for what became known as the North West Line. It is generally agreed that the procedure, speed of traffic handling and operation of this net was outstanding.

Many graphic stories have been told of the floods, that of Hart Wall (VK2JC) being of particular interest. Hart, who was in Sydney when the floods broke, chartered a plane and flew home, putting his station on the air right away. Soon the flood waters ravaged the town splitting it into three separate sections, causing tremendous damage and putting VK2JC off the air. As soon as the major flood had passed VK2JC and VK2DK took their equipment to the airfield where it was found to be unserviceable. However, they borrowed some R.A.A.F. gear and a few hours later were on the air again from 2JC's home with a foot of water on the shack floor!

After the floods left Dubbo, VK2APE followed them westward journeying to the town of Warren with portable equipment where he set up a link station to cover the area.

Transmitters were set up in tree tops, Army DUKWS and other vehicles and many stations worked in rooms through which the flood waters were swirling. In several desperate cases portable amateur radio stations complete with operators were dropped by helicopter.

A relative of the writer tells in a letter how her son was marooned in Dubbo and managed to get a message out that he was safe. For nearly two hours her telephone rang with callers from all over Australia who had intercepted the message and were passing it on.

The G.P.O.'s Station

The Newcastle and Sydney ends of the many nets were handled by both official and amateur stations. VK2AA was the call of the G.P.O. station which received hundreds of telegrams routed through amateur stations. The W.I.A.'s own Headquarters station VK2WI was active throughout the entire period, VK2YC, 2AD, 2FM, 2AYP, 2DA and 2FL providing its staff.

The ZIs Lend a Hand

At times most of the band 3500-3600 kc/s was full with emergency nets, up to seven operating simultaneously. Long skip was a problem on 7 Mc/s but also had its uses, as stations in New Zealand were able to relay back messages which were skipping over their destinations.

The Amateurs' Great Service Recognised

So for more than a week Amateur Radio kept open the only lines of communication, acting as the sole link with the hungry, rescue to the helpless and news to the anxious. It is encouraging to note that official recognition of the amateur's usefulness to his community was complete; the Australian Post Office as well as other official organizations did not allow any questions of Departmental pride to hamper their better judgment in

(continued on p. 541)

*29 Kechill Gardens, Hayes, Bromley, Kent.

From All Quarters

Proposed Old Timers' Association

SEVERAL Old Timers have expressed interest in a suggestion that an Old Timers' Association of Radio Amateurs should be formed within the United Kingdom. Others interested in this suggestion are invited to communicate in the first place with the General Secretary. If the response is satisfactory, arrangements will be put in hand to inaugurate the Association at an Old Timers' Dinner to be held in London later in the year.

At this stage, only those members who have held a *United Kingdom full transmitting licence continuously for the past 25 years* are asked to reply to this invitation. The only break in continuity allowed will be for the war period from September, 1939, to January, 1946.

The Association, if formed, will run independently of the R.S.G.B. although the Society's Journal and other Amateur Radio publications will be requested to give publicity to its activities.

British Wireless Dinner Club

AMATEUR Radio was well represented at the Thirty-Second Annual Dinner of the British Wireless Dinner Club held at the United Service Club, Pall Mall, London, on Friday, April 29, 1955, when the guest speaker was the Rt. Hon. The Lord Brabazon of Tara, P.C., M.C.

The Chair was taken by the President, Major-General C. H. H. Vulliamy, C.B., D.S.O., who was supported by the Chairman of the Committee (Captain B. R. Willett, C.B.E., D.S.C., R.N.).

Among the company of 125 were Tony Welch (G3AYO), David Deacon (G3BCM), Michael Dormer (G3DAH), Douglas Walters (G5CV), Rowley Scott-Farnie (G5FI), Jerry Walker (G5JU), John Clarricoats, O.B.E. (G6CL), Douglas Johnson (G6DW), Jim Kirk (G6ZO) and Robin Addie (G8LT).

Old Timers of the Amateur Radio Movement included Philip Coursey, Major Basil Binyon, O.B.E., and Wing Commander Noel Hamilton, D.S.O. Also present were Sir Archibald Gill, Vice Admiral J. W. S. Dorling, C.B., Capt. H. J. Round, M.C., Air Vice Marshal Nutting, C.B.E., D.S.C., Air Vice Marshal E. B. Addison, C.B., C.B.E., Capt. J. A. V. Echevarri, Brigadier L. H. Harris, C.B.E., T.D., H. Faulkner, C.M.G., and the new president Harold Bishop, C.B.E.

The Club was founded in 1922 by Colonel L. F. Blandy and now has a membership approaching 600 (the maximum).

Lancaster Hobbies Exhibition

AMATEUR Radio activities were brought to the notice of the public who visited the Lancaster Rotary Club Hobbies Exhibition from April 13 to 16. The equipment exhibited by the Lancaster & District Amateur Radio Society included a "live" station comprising G3AEP's *Elizabethan* transmitter, G3BAP's Top Band rig and, as a standby, a modified type 12 set loaned by G3FJO. The receivers used were an S640, R107, BC342 and several 1155s. Some of these receivers were available for use by the public.

During television hours, a TV receiver built by H. C. Sampson was in operation without any interference from the transmitters in use nearby. Other items shown included tape recorders, high fidelity gear, oscilloscopes, R.A.E.N. equipment and commercial exhibits. The international aspects of Amateur Radio were featured in a display of magazines published by various I.A.R.U. Societies and a large selection of QSL cards.

Olympic Games, 1956

RADIO amateurs visiting Melbourne for the Olympic Games to be held there from November 22 to December 8, 1956, will be able to attend special events arranged by the Victorian Division of the Wireless Institute of Australia. As a special attraction, the Federal Executive of W.I.A. proposes to hold a Conference of all I.A.R.U. societies in Region III.

In order to realise the plans outlined above, those who anticipate visiting Melbourne during the period of the Games are asked to communicate with the Olympic Games Committee, Wireless Institute of Australia, 191 Queen Street, Melbourne, C.1, Australia, by August 1, 1955. Personal enquiries may also be sent to H. J. Albrecht (VK3AHH), 10 Belgrave Avenue, Box Hill North, E.12, Melbourne. (We are at a loss to understand why information is required 16 months before the Games start. Few people—even star athletes and Press correspondents—know their plans so far in advance.—Ed.)

Wakefield Hobbies and Home Safety Exhibition

WAKEFIELD Rotary Club is sponsoring a Hobbies and Home Safety Exhibition at Wakefield Technical College on June 2, 3 and 4. A section, devoted to Amateur Radio, will show equipment loaned by amateurs living in the district. The exhibition station will be active on Top Band and 3.5 Mc/s (principally 'phone) and possibly on 144 Mc/s. Contacts will be appreciated for which direct QSLs are invited. A special "GB" licence has been applied for.

Offers of assistance in manning the stand and station and of the loan of equipment should be addressed to G. R. Foster (G2BM), 5 Cliff Street, Balne Lane, Wakefield.

The "5 ACK R" Senior Trophy

JOHN Lepper (G3JHL) has been awarded the East London District "5 Ack R" Senior Trophy for the year 1954-55. The trophy is for outstanding Constructional Merit. Mr. Lepper's entry was a tape recording amplifier and power supply incorporating separate record and playback amplifiers, two channel mixing, "dubbing in," "echo" and cathode follower output. Other features of the design were a cross-over network, tuner unit and record level indicator. Judging was carried out by a committee under the chairmanship of Dr. A. H. Koster (G3ECA). The Junior Trophy was not awarded as some prospective contestants had left the district, while the remaining entries were not considered of sufficient merit.

D.A.R.C. Meeting at Reichenau

THE Sixth Annual Meeting and Convention of the D.A.R.C., will be held on June 11 and 12 on the Isle of Reichenau, Lake Konstanz. Foreign amateurs are cordially invited to attend. Further details may be obtained from the Hon. Secretary, D.A.R.C., H. Hansen (DL1JB), Roonstrasse 9, Kiel, Germany.

Czech U.H.F. Contest

THE Radio Society of Czechoslovakia U.H.F. Contest on 420 and 1250 Mc/s will commence at 05.00 G.M.T. and end at 14.00 G.M.T. on Saturday, June 18, 1955. Foreign participation is invited. Many of the Czech stations will be in operation from their portable sites on the day before the contest.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, March 15, 1955, at 6 p.m.

Present.—The President (Mr. H. A. Bartlett in the Chair), Messrs. W. H. Allen, L. Cooper, C. H. L. Edwards, D. A. Findlay, A. C. Gee, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, R. G. Lane, W. H. Matthews, W. R. Metcalfe, A. O. Milne, H. W. Mitchell, R. L. Varney and John Clarricoats (General Secretary).

* * *

Membership

Resolved (i) to elect 44 Corporate Members and 17 Associates, (ii) to grant Corporate Membership to 25 Associates who had applied for transfer, including 8 whose original application had neither been proposed by a Corporate Member nor supported by references.

The Secretary reported that of the 761 members whose subscription became due on December 1, 1954, 185 became 3 months' overdue on February 28, 1955. Of this number 39 were London, 85 were Country and 18 were Overseas Corporate Members, and 43 were Associates. Of those overdue 17 were London, 40 Country, and 12 Overseas members held callsigns.

The Secretary submitted details of the 24 members (including 11 Associates) who had written to resign during the four weeks ending March 12, 1955.

The Secretary reported that 799 members had not amended their Bankers' Order or remitted the balance of subscription due.

Resolved that warning be given, in the form of a suitable notice, published in the April, 1955, issue of the R.S.G.B. BULLETIN, that steps will be taken, in accordance with the provisions of the Society's Articles of Association, to terminate the membership of those persons who at April 30, 1955, have not amended their Bankers' Order or remitted the balance due for their subscriptions.

Balance Sheet

The Honorary Treasurer submitted a draft Balance Sheet for the half year ended December 31, 1954. The Balance Sheet showed that income exceeded expenditure by £67 for the period—an improvement of about £400 compared with the first six months of the previous financial year.

Resolved to receive the Balance Sheet to December 31, 1954, as prepared by the Honorary Treasurer.

I.A.R.U. Region I Division

Resolved to authorise the Secretary to pay the R.S.G.B. contribution to Funds 2 and 3 of the I.A.R.U. Region I Division for the year 1954.

Mr. Milne, in his capacity as Hon. Secretary, Region I Bureau, reported that only three of the smaller Societies in Region I had failed to pay their full contribution for 1954.

Mr. A. Barlow (G3IOL)

The Secretary and Mr. Milne reported in some detail on correspondence which had passed between the Society on the one hand and with Mr. Barlow, the Bury T.R., the Ramsbottom Urban District Council and various members on the other. The Secretary reported that after a long drawn-out series of exchanges between Mr. Barlow and the R.U.D.C. he had now been given one month's notice to close down his station.

After carefully considering the correspondence the Council accepted with thanks an offer made by one of their colleagues to call upon the Clerk to the Ramsbottom Urban District Council and other parties to the dispute.

Letters were read from the T.R. for South Manchester and from three other members asking the Council to intercede with the Ramsbottom Urban District Council on behalf of Mr. Barlow. The replies which had been sent by the Secretary to Mr. Barlow and to the other members concerned were approved.

Army Stations

The Secretary reported that he had written to the G.P.O. regarding complaints that had come to hand from members who have been called by Army Stations working on frequencies in the 3.5 Mc/s band. The G.P.O. had been asked to give advice as to the procedure to be adopted by amateurs when they are called by such stations. In one case, as the result of prompt action on the part of a member who telephoned Headquarters immediately he had been called by an Army station, the G.P.O. had been able to trace the station concerned. The War Office subsequently took disciplinary action. A reply was awaited from the G.P.O.

Pirate Broadcast Station

The Secretary submitted Press cuttings dated March 15, 1955, relating to the case of a Mr. Alan Walker of Nottingham who had been prosecuted by the G.P.O. for operating a pirate broadcasting station on 38 metres under the call G3ASI. In some Press accounts of the case prosecuting counsel for the Post Office was alleged to have stated that "these stations (amateur) were cluttering up the air and spoiling programmes people wanted to hear."

After discussion it was agreed that (a) the President should write, officially, to the Editors of the newspapers which had published the unfortunate remarks about amateur stations, (b) a suitable letter should be sent to the G.P.O. seeking information on the briefing which the Post Office solicitor received.

(This matter was reported upon in our April issue—Ed.)

Meeting in Birmingham

The Secretary submitted a lengthy report dealing with the matters discussed at a meeting held in Birmingham on February 20, 1955, between representatives of the Council, R.A.E.N. Committee, M.A.R.S., Slade Radio Society, Bournville Radio Society and Region 3. It was reported that good results had been achieved at the meeting.

Resolved to receive the Report.

The meeting terminated at 8.25 p.m.

Resignation of Dr. A. C. Gee

THE Council has accepted with regret the resignation of Dr. A. C. Gee (G2UK) from the Governing Body of the Society. In a letter to the President, Dr. Gee explained that his resignation was due to increasing pressure of professional duties. The question of filling the casual vacancy thus created will be discussed by the Council at its May meeting.

Tests and Contests

Affiliated Societies Contest, 1955

HAS the Stourbridge and District Society come to stay as the "Ace of Clubs"? Two years ago they were joint winners, but pulled clear in 1954 and have again finished at the top this year, once more winning the Edgware Trophy. A very praiseworthy effort. Harlow, whose position has steadily improved over the past five years, now come into second place. Stourbridge will have to look to their laurels in 1956. Medway, in third position, and Surrey in fourth, have each fallen back one place this year, but their turn may come yet, as they are consistently "knocking at the door."

In a less fortunate position are York, at the other end of the table, who keep pegging away and can still say "a good time was had by all." It is believed that marauders, who ran into and damaged the feeder in their flight, had lead-stealing intentions; we understand there is no truth in the rumour that they were trying to make sure that York would not emulate the example of their football team. It must be admitted that crawling along an icy sloping roof to effect repairs is not considered one of the normal hazards of this contest.

The use of c.w. on both dates receives general approbation, particularly from the fringe areas where 'phone working is thought to be "a trial rather than a pleasure," but even this change has not persuaded many of the north country stations to enter. Nine of the first thirteen clubs worked all the other entrants on both dates and only three pairs failed to make contact on either date.

TT.11s and 807s were equally popular as p.a. valves; the majority of aeriels were half-wave, though one station in the lower half of the list managed to put up 500ft. of wire.

Thanks are due to G3DGN, G3FAS, G3JRD and GW3GCZ for check logs.

Position	Name of Society	Call-sign	Feb. 12 Points	Feb. 13 Points	Total Points
1	Stourbridge & District Amateur Radio Society ...	G3BMY	256	269	525
2	Harlow & District Radio Society ...	G3ERN	260	255	515
3	Medway Amateur Receiving & Transmitting Society ...	G2FJA	243	267	510
4	Surrey Radio Contact Club	G6LX	252	256	508
5	Gravesend Radio Society ...	G3GRS	253	254	507
6	Ariel Radio Group, B.B.C....	G3GDT	246	246	492
7	Courtalds Amateur Radio Group ...	G3CQD/A	240	251	491
8	Isle of Thanet Radio Society	G3DOE	242	244	486
9	Sutton & Cheam Radio Society ...	G2AYC	235	247	482
10	Slade Radio Society ...	G3JBN	240	237	477
11	Scarborough Amateur Radio Society ...	G4BP	228	245	473
12	Cheltenham Amateur Radio Society ...	G3GPW	236	236	472
13	R.A.F. A.R.S., Locking	G8FC	225	241	466
14	Vickers-Armstrong, Weybridge ...	G31VW	229	229	458
15	B.T.H. Recreation Club, Rugby ...	G3BXF	218	235	453
16	Edgware & District Radio Society ...	G3ASR	231	222	453
17	Nottingham University Radio Society ...	G3DBP	216	234	450
18	Kingston & District Amateur Radio Society ...	G3DHz	216	220	436
19	Admiralty Electronics, Bath	G3BPU	211	192	403
20	North Kent Radio Society...	G3JBK	208	189	397
21	Liverpool & District Amateur Radio Club ...	G3AHD/A	200	195	395
22	Ravensbourne Amateur Radio Club ...	G3HEV	199	193	392
23	York Amateur Radio Society	G3HWW	184	155	339

Direction Finding Contests, 1955

DETAILS of the South Manchester and High Wycombe qualifying events are as follows:

Sunday, June 12

Organizer: M. Denny (G6DN), 18 Willoughby Avenue, Didsbury, Manchester 14.

Call-sign: G3FVA/P.

Frequency: 1820 kc/s.

Assembly Point: Ladybarn House Boys' Club, Mauldeth Road, Manchester 14, N.G.R. 33/855933.

Map: Ordnance Survey, New Popular Edition, Sheet No. 101.

Assembly Time: 13.15 B.S.T.

Sunday, June 19

Organizer: G. T. Peck, c/o Ernest Turner Electrical Instruments Ltd., Chiltern Works, High Wycombe, Bucks.

Call-sign: G8VZ/P.

Frequency: 1854 kc/s.

Assembly Point: Leyhill Common (two miles east of Chesham), N.G.R. 42/993019.

Map: Ordnance Survey, New Popular Edition, Sheet No. 159 (The Chilterns).

Assembly Time: 13.30 B.S.T.

Intending competitors should notify the Organizer of the appropriate event at least 7 days in advance, stating the number in their party requiring tea. Competitors will be informed of the venue for tea when their entries are acknowledged.

Rugby D/F Qualifying Event

DETAILS of the Rugby Qualifying Event to be held on Sunday, May 22, 1955, were published on page 497 of the April issue of the BULLETIN.

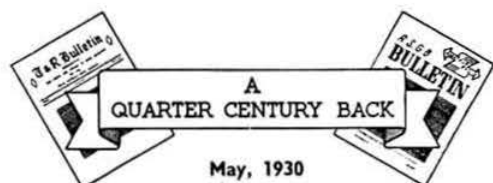
Contests Diary

1955

May 21-22	-	420 Mc/s Contest (No. 1)
May 22	-	D/F Qualifying (B.T.H.—Rugby/Slade)†
June 4-5	-	N.F.D.*
June 12	-	D/F Qualifying (South Manchester)
June 19	-	D/F Qualifying (High Wycombe)
July 2-3	-	Two Metre Open
July 10	-	D/F Qualifying (Peterborough)
August 7	-	Two Metre Field Day (No. 2)
August 7	-	D/F Qualifying (Edgware)
August 21	-	D/F Qualifying (Salisbury)
September 4	-	Low Power Field Day
September 10-11	-	420 Mc/s Contest (No. 2)
September 11	-	D/F National Final
September 24-25	-	420 Mc/s Contest (No. 2)
October 1-2	-	Low Power
November 12-13	-	Top Band (No. 2)

†For details, see page 497, R.S.G.B. BULLETIN, April, 1955.

*For rules, see page 138, R.S.G.B. BULLETIN, September, 1954, page 272, December, 1954, and page 446, March, 1955.



FROM the Editorial. "After months of trying Mr. Marcuse, our President, has at last obtained permission from the Post Office for amateur work in this country on the 3500 kc/s band, a concession for which we have long been waiting. Holders of Trans-Oceanic Permits have already had this extra band included in their new permits which were issued in April, but the Postmaster-General will grant this necessary permission to any other applicant whether he possesses a high or low (power) permit, provided his application is endorsed by the Society. A time limit is imposed, and operation is only allowed between 1500 G.M.T. Saturday and 2400 G.M.T. Sunday".

(Gerald Marcuse (G2NM)—Gerry to all his friends—still puts out a potent signal from Bosham, Sussex.)

"The first London Hamfest of the year was held at Pinoli's Restaurant on April 1, 1930, when just over 30 persons attended. Mr. Gerald Marcuse took the chair, supported by Mr. H. Bevan Swift. Chief event of the evening was the presentation of the Somerset Trophy to Mr. K. C. Wilkinson (G5WK) as a memento of his pioneer 28 Mc/s contact with South Africa. Mr. Wilkinson attributed his success to the use of crystal control".

(Pinoli's—famous as a venue for Convention Dinners until numbers grew too large—closed down during the 1939-45 war.)

Col. Dennis (EI2B) described "A Universal Tuning Arrangement for Short or Medium Waves" which was stated to be original in design. The basic idea was to use a band-set condenser and a band-spread condenser for fine tuning.

(The late Col. Dennis built his first piece of wireless gear in 1898. He claimed to be the first person in Europe to conduct experiments as an amateur.)

"Notes on Harmonic Crystal Control" was the title of a prize competition article submitted by Mr. J. H. Harker (G6HK). . . . Arthur Watts (Honorary Publicity Manager, R.S.G.B. and B.E.R.U.) wrote about the British Empire Radio Union. . . . G. H. Ramsden (G6BR) described a Portable Long-Wave D.F. Receiver . . . a list of first contacts was published . . . plans for visits to Dorchester and Somerton Radio stations were announced.

"The R.S.G.B. Calibration Service (Standard Frequency Transmission) will be transmitted from station G5BR on the first and third Sundays in each month and from G5YK on the second and fourth Sundays." The service operated on 7050 and 7250 kc/s nominal frequencies.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 12.30 p.m. on Friday, May 20, and June 17, 1955.

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

Slow Morse Practice Transmissions

B.S.T.	Call	kc/s	Town
Sundays			
09.00	G3GYV	1900	Hartford, near Northwich
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
10.30	G3DGN	1930	New Barnet
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	G3JBU	1850	Northampton
12.00	G15UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
23.30	G13CFI	1900	Coleraine, N.I.
Mondays			
19.00	G3NC	1825	Swindon
19.00	G3JBU	1850	Northampton
21.00	G3BLN	1900	Bournemouth
21.00	G3FSM	1900	Brentwood
22.15	G2BRH	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
23.30	G13CFI	1900	Coleraine, N.I.
Wednesdays			
19.00	G3HUB/A	1902	Chelmsford
22.30	G3FBA	1910	Bath
23.30	G13CFI	1900	Coleraine, N.I.
Thursdays			
19.00	G3NC	1825	Swindon
19.15	G2FRX	1850	Plymouth
20.00†	G2CPS	1910	Hull, Yorks.
20.00†	G2CNX		
20.00†	G3GWT		
20.30	G3JQM	1878	Barwick, Yeovil
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
23.30	G13CFI	1900	Coleraine, N.I.
Fridays			
18.00	G3GEN	1900	Gloucester
19.00	G3BLN	1900	Bournemouth
20.00†	G3CSG	1875	Wirral
20.00†	G3tGX		
20.00†	G3ERB		
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees

† Alternately.

Slow Morse transmissions are organised by Mr. C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex. Members using the service are requested to send listener-reports to the stations concerned.

It Happened There (Continued from page 537)

making full use of the facilities put at their disposal by the radio amateurs.

Press and public are loud in their praise for what was accomplished. The work done by the amateurs has prompted the Post Office to consider setting up their own radio flood network throughout the N.S.W./Queensland river system where periodical disasters of this nature are unavoidable.

Australian radio amateurs hope that their work will bring about an easing of some of the irksome restrictions to which they are subject at present. There is no doubt that those in New South Wales acquitted themselves with great credit and have earned the lasting gratitude of thousands of their fellow citizens.

(This record has been compiled from newspaper reports, a comprehensive survey which appeared in the Australian magazine, *Radio, Television and Hobbies* for April, 1955 and from private correspondence.)

Regional & Club News

BRISTOL.—At the April meeting E. C. Halliday (G3JMY), deputising at short notice for R. G. Lane (G2BYA), gave an illustrated talk on "Amateur Applications of the Cathode Ray Tube." At the May meeting, G3JMY will lecture on "Transistors" while portable operation will be the subject of a talk by T. C. Bryant (G3SB) in June. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol, 7.

CAMBRIDGE & DISTRICT AMATEUR RADIO CLUB.—The following officers were elected at the recent A.G.M.: *President:* C. H. Babbs (G5IG); *Chairman:* L. Gostelow (G2FOW); *Hon. Treasurer:* P. Broom (G5DQ); *Hon. Secretary:* F. A. E. Porter, 38 Montague Road, Cambridge. Meetings are held at "The Jolly Waterman," Chesterton Road, on the fourth Friday in each month. Potential members are cordially invited to attend.

CHELMSFORD AMATEUR TELEVISION CLUB.—A crowded meeting on April 14 heard M. Pemberton (Marconi's) lecture on "Flying Spot Scanning." The lecture, illustrated with various slide and telecine scanners, was recorded and will be available on loan to other clubs in due course. *Hon. Secretary:* M. Barlow, 10 Baddow Place Avenue, Great Baddow, Essex.

CHESTER & DISTRICT AMATEUR RADIO SOCIETY.—Recent activities have included a lecture on "U.H.F.," demonstrations and preparations by local R.S.G.B. members for N.F.D. next month. Meetings are held on Tuesdays at the Tarran Hut, Y.M.C.A., commencing at 7.45 p.m. Further details of the society may be obtained from the *Hon. Secretary:* D. Rickers (GW3HEU), 97 Ruabon Road, Wrexham, Denbs.

EAST LONDON.—More than 100 members attended the East London District meeting at Ilford Town Hall on April 17 to hear Capt. P. P. Eckersley, M.I.E.E., lecture on "Radio over the Years." Among those present were G2AIW (Region 7 Representative) and old-timer Harry Lassman, G2PX, who selected the wavelength used by the B.B.C. for their first London station 2LO. The lecture was recorded for the R.S.G.B. Recorded Lectures Library.

GRAFTON RADIO SOCIETY.—The Society's annual field day will be held at Hampstead Heath, on June 11-12. Two stations will be on the air: one on Top Band and 3.5 Mc/s using c.w. and phone; the other, using c.w. only, on 7, 14 and 28 Mc/s. Recent lectures have included "V.H.F." by D. N. Corfield (G5CD), and "Minibeams and Miniplanes," by L. Skipper (G4LS). *Hon. Secretary:* A. W. H. Wrennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

KINGSTON & DISTRICT AMATEUR RADIO SOCIETY.—Mr. Thomas, of AVO, lectured and demonstrated a wide range of his company's products at the meeting on May 4. Pye Telecommunications are staging a special demonstration of their v.h.f. mobile radio equipment and associated control station at the meeting on May 19 at Penrhyn House, Penrhyn Road, Kingston. All mobile and v.h.f. enthusiasts are invited to attend.

SCARBOROUGH AMATEUR RADIO SOCIETY.—Recent meetings have featured a Mullard film on the cathode ray tube, a lecture on "Relays" by G3JCZ, and an "El-bug" demonstration. Junk sales on the first Thursday in each month are proving popular. *Hon. Secretary:* P. B. Briscoe (G8KU), 31 St. John's Avenue, Scarborough.

SLADE RADIO SOCIETY.—E. G. H. Brown (G5BJ) will give a talk on "Past and Present in Amateur Radio" on May 27; "The Application of Valves for Communication Purposes" will be the title



This picture was taken at the Doncaster and District Group's recent dinner held at the Rockingham Hotel, Doncaster. Among those present at the function, organised by Alan Mills (G3KDO) and Mrs. Mills, were G2BOJ, G2CNK, G6SH, G3FEZ, G3GQ, G3KAD, G8IC, G3KDO and G3FFW.

of a talk by G. Nicholson (G3HKC) on June 10. All meetings are held at The Church House, High Street, Erdington. Visitors are invited to attend. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham, 23.

SOUTHEAST & DISTRICT RADIO SOCIETY.—At the Society's recent Hamfest the "Pocock" cup was presented to J. L. Goss, the "Hudson" cup to A. D. Asher and the "Peck" cup to R. K. Seabrook. The event, held at the Royal Stores Restaurant, was attended by about 100 members and friends. Recent lectures have included one on "Electronic Musical Instruments" by P. Baldwin. *Hon. Secretary:* J. H. Barrance, M.B.E. (G3BUJ), 49 Swanage Road, Southend-on-Sea.

SOUTHPORT & FORMBY.—The group has acquired the tenancy of a bungalow on the Southport Sea Cadets Camp, Esplanade, halfway between the Pleasure Beach and the Palace Hotel. Meetings are held on Thursdays. Visitors should take a bus to the Palace Hotel, walk past the "Fisherman's Rest" towards the beach, over the railway bridge, turn right and the bungalow will be found 150 yards further on. *Area Representative:* N. Horrocks (G2CUZ), 32 Sandbrook Road, Ainsdale, Southport.

TORBAY AMATEUR RADIO SOCIETY.—At the A.G.M. on April 16, all the officers of the society were re-elected, with the addition of L. Mays, G2CWR (*Hon. Auditor*). The President (G5SY) spoke of the sound position of the society. The next meeting is arranged for May 21 at the Y.M.C.A., Torquay. *Hon. Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

THAMES VALLEY AMATEUR RADIO TRANSMITTERS' SOCIETY.—At the April Meeting, F. J. H. Charman, B.E.M. (G6CJ) gave a talk entitled "More on Aerials by the Aerial Wizard." The lecture was recorded for the R.S.G.B. Recorded Lectures Library. Members were due to visit the B.B.C. Receiving Station at Tatsfield on May 14. A visit to the B.B.C. TV studios at Lime Grove is arranged for July 13. Forthcoming lectures include "Aspects of Two Metre Operation" by G2AIW (August 3) and "Mobile Radio and R.A.E.N." by G8TL (September 7). Preparations are being made for N.F.D. in which society members operate as the East Molesey R.S.G.B. Group. *Hon. Secretary:* K. Rogers, 21 Links Road, Epsom.

Representation

THE following are additions to the list of County Representatives published in the December, 1954, issue:—

Region 1—Westmorland

G. B. Moser, 6 Hodge How, Windermere.

Region 7—London (West)

P. J. H. Matthews (G3BPM), 18 Kings Avenue, Sunbury-on-Thames, Middlesex.

Region 9—Dorset

C. E. Briggs (G2TZ), Winterborne Abbas, Dorchester.

The following are additions or amendments to the list of Town Representatives published in the December, 1953, issue:—

Region 2—Yorkshire (East)

Hull

G. W. Taylor (G3GWT), 124 Beverley Road, Hessle.

Region 6—Hampshire

Portsmouth

D. Metcalf (G3GHQ), 80 Kings Road, Southsea.

Region 7—London (West)

Edgware, Hendon and Mill Hill

P. A. Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

Region 10—Glamorganshire

Cardiff

R. Morris (GW3HJR), "The Shack," St. Cenydd Road, Caerphilly.

Region 13—Selkirkshire and Roxburghshire

Hawick, Selkirk and Galashiels

G. Shankie (B.R.S.20526), 17 Etrick Terrace, Hawick.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the August, 1954, issue of the BULLETIN:—

AMATEUR RADIO CLUB, R.A.F. STOKE HOLY CROSS, Framingham Earl, nr. Norwich, Norfolk.

HABBANIYA RADIO CLUB, c/o Flying Wing Officers' Mess, R.A.F. Habbaniya, Iraq, M.E.A.F. 19.

HARROW RADIO SOCIETY, c/o S. C. J. Phillips, 131 Belmont Road, Harrow Weald, Middlesex.

ROYAL AIR FORCE RAIGMORE RADIO CLUB, c/o Officer Cadet MacCallum, 3510 F.C.U., R.A.F. Raigmore, Inverness, Scotland.

HONG KONG AMATEUR RADIO TRANSMITTING SOCIETY.—The Council of the Society now comprises the following: *President:* J. E. Jeckway (VS6CL); *Hon. Treasurer:* P. J. O'Brien (VS6AE); *Hon. Secretary:* J. W. Lucas (VS6CV), P.O. Box 541, Hong Kong; *Members:* M. S. Duke (VS6BJ), R. H. Dorab (VS6CI).

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—May 24, 7.30 p.m., 161 Penrose Avenue, Marton.
Bury.—June 9, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (L.O.M.A.R.S.).—May 18, June 1, 15, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—June 1, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., St. Barnabas Hall, Penny Lane, Liverpool, 15. (M.R.S.).—May 25, June 8, 22, 8 p.m., Larkhill Mansion House, Queen's Drive, Liverpool, 13.
Manchester (M. & D.R.S.).—June 6, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester. (S.M.R.C.).—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 14.
Preston.—May 20, June 3, 17, 7.45 p.m., St. Saviour's Parish Hall, Manchester Road.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., No. 1 Law Street, Sudden.
Southport.—Thursdays, 8 p.m., Sea Cadet's Camp, Esplanade, Southport.
Stockport (S.R.S.).—May 25, June 8, 22, 8 p.m., Blossoms Hotel, Buxton Road.
Warrington (W. & D.R.S.).—May 19, June 2, 16, 7.30 p.m., "King's Head Hotel," Winwick Street, Warrington.
Wirral (W.A.R.S.).—May 18, June 1, 15, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—May 27, June 10, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—May 24, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—June 8, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics Institute, 7 Whitehall Road.
Hull.—May 31, June 14, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., Swarthmore Educational Centre, 3 Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract.—June 16, 30, July 7, 8 p.m., Fox Inn, Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., "Cutlers' Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—May 25, 8 p.m., "Dog and Partridge," Trippet Lane; June 8, 8 p.m., Albreda Works, Lydgate Lane.
Slough.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spokenborough.—May 18, 7.30 p.m., Spencer Wire Works, Thorne, Wakefield; June 1, 15, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—June 6, 7.30 p.m., Friends Hall, Watford Road, Cotteridge. (M.A.R.S.). May 17, 6.45 p.m., Midland Institute. (Slade). May 27, June 10, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—May 27, 7.30 p.m., Priory High School, Wheatley Street. (C.A.R.S.). May 23 ("Frequency Modulation," G6WH), June 2, 6, 9 Queen's Road, Coventry.
Kenilworth, Warwick, Leamington.—May 19, 7.30 p.m., Dalehouse Lane.
Malvern.—June 6, 8 p.m., "Foley Arms."
Solihull.—May 30, June 13, 7.30 p.m., Defence H.Q., Sutton Lodge, Blossomfield Road.
Stoke-on-Trent.—May 25, 8 p.m., Lion's Head, John Street, Hanley.

Stourbridge (St.A.R.S.).—June 7, 8 p.m., King Edward VI School.
Rugby.—June 2, 7.30 p.m., B.T.H. Recreation Club, Hillmorton Road.
Walsall.—May 25, June 8, 8 p.m., Technical College, Bradford Place.
Wolverhampton.—May 23, June 6, 8 p.m., Stockwell End, Tetterhall.
Wrekin.—Venue and dates from G. Myatt, 10 Swan Street, Broseley.
Redditch.—May 17, June 14, 8 p.m., "Scale and Compasses," June 2, 10 Woodland Road.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College of Arts and Crafts, Sub-basement, Green Lane.
Ilkerton (I. & D.A.R.S.).—Thursdays, 7 p.m., Room 5, Ilkerton College of Further Education, Field Road.
Leicester (L.R.S.).—May 9, 23, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—June 1, 7.30 p.m., Technical College, Cathedral Street.
Mansfield (M. & D.A.R.S.).—No June meeting.
Newark.—June 5, 7 p.m., Northern Hotel, Appleton Gate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., June 3, 6 p.m., Clubroom, 8 Duke Street.
Nottingham.—May 20, June 17, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—June 1, 7.30 p.m., 21 Hankey Street.
Workshop.—No June meeting.

REGION 5

Chelmsford.—June 2, 7.30 p.m., Marconi College, Arbour Lane. (B.A.T.C.).—June 9, 7.30 p.m., 10 Baddow Place Avenue, Great Baddow.
Lowestoft and Beccles (L. & B. A.R.C.).—May 25, June 8, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—June 6, 8 p.m., Great Western Hotel, Clarence Street.
Gloucester (G.R.C.).—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road, Gloucester.
High Wycombe.—May 17, 7.30 p.m., GSWW, Nethercote, Tottenham Lane, High Wycombe, May 31, 7.30 p.m., G3FAS, 51 Tyzack Road, Tottenham.
Jersey, C.I.—May 31, 7.45 p.m., Chamber of Commerce, Royal Square, Jersey.
Oxford (O. & D.R.S.).—May 25, June 8, 7.30 p.m., "Magdalen Arms," Ilfrey Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m., British Legion Club, Queen's Crescent, Southsea. (Club room open every evening.)
Southampton.—June 4, 5, meet at N.F.D. site.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford and Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, W.4.
Barnes, Putney and Richmond.—June 3, 337 Upper Richmond Road, S.W.14.
Bexleyheath.—May 26, June 9, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—June 3, 8 p.m., Shortlands Hotel, Station Road, Shortlands, Kent.
Chineford.—May 27, 8 p.m., Venue from G4GA (SIL 5635) or B.R.S.19765 (SIL 6055).
Croydon.—June 7, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road, Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—Tuesdays, 8 p.m., 12 Leigh Road.
East Molesey (T.V.A.R.T.S.).—June 8, 8.30 p.m., "Carnarvon Castle Hotel," ("Design of Modulating Equipment," G4ZU).

Enfield.—May 15, June 19, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—May 17, June 21, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Guildford and Woking.—May 22, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Hendon and Edgware.—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill.
Hoddesdon.—June 2, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—Mondays (R.A.E.), and Fridays (Club Night), 7 p.m., Grafton School, Eburne Road, N.7, June 12-13, Field Day (Hampstead Heath).
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road, (May 19, "Mobile Radio," Pye Telecommunications, Ltd.).
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
London (L.M.L.C.).—May 20, June 17, 12.30 p.m., Bedford Corner Hotel, Bayley Street, off Tottenham Court Road, London, W.C.1.
London (U.H.F. Group).—June 2, 7.30 p.m., Bedford Corner Hotel.
Norwood.—May 21, June 18, Windermere House, Weston Street, Crystal Palace.
Southgate and Finchley.—May 12, June 9, Arnos School, Wilmer Way.
Slough.—June 7, Venue from G2HOX or G3HTP, 13 Quaves Road, Slough.
Sutton and Cheam (S. & C.R.S.).—May 17, June 21, "The Harrow," Cheam Village.
Welwyn Garden City.—June 7, 8 p.m., Council Offices, Welwyn Garden City.

REGION 8

Brighton (B.D.R.C.).—Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road.
Chatham (M.A.R.T.S.).—May 23, June 6, 20, 7.30 p.m., "Services Rendered Club," 14 High Street, Brompton, Chatham.
Hastings (H. & D.R.C.).—May 17, 31, June 14, 7.30 p.m., Saxons Cafe, Denmark Place.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Maldstone (M.K.A.R.S.).—Tuesdays, 7.30 p.m., Elms School, London Road.
Worthing (W. & D.R.C.).—June 13, Adult Education Centre, Hawley Street.

REGION 9

Bath.—May 23, 7.30 p.m., 14 Pierpoint Street.
Bristol.—May 20, June 17, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol, 1.
Exeter.—June 3, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth (W.C.R.C.).—May 19, June 2, "The Fifteen Balls," Penryn.
North Devon.—June 2, G3BO, "Rosebank," Westcombe, Bideford.
Plymouth.—May 21, June 18, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—May 21, June 18, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—June 7, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—June 13, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath and Port Talbot.—June 7, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline.—Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.
Edinburgh.—May 26, June 23, 7.30 p.m., Chamber of Commerce Rooms, 25 Charlotte Square, Edinburgh.

REGION 14

Falkirk.—May 27, June 10, 7.30 p.m., The Temperance Cafe, High Street, Falkirk.
Glasgow.—May 27, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2 (Hi-fi Demonstration).

Letters to the Editor

Transitron Oscillator

DEAR SIR,—I am grateful to you and the author (Dr. A. H. Koster, G3ECA) for the recent article on the EF50 transitron oscillator (January, 1955, issue). I have built a unit based on this circuit and I find that it oscillates readily over a wide range of inductance and capacity. So as to improve the stability—it "pulls" badly—I have included a cathode-follower stage, and in order to increase the frequency range at low expense, I have used a 3-section 500 μ F tuning condenser. Some time ago in the columns of the BULLETIN I pointed out that an ordinary broadcast long-wave coil could be used with the primary and secondary windings in series to provide a cheap 100 kc/s oscillator. Using the same (Weirite) coil, I get the following ranges:

Coil	Condenser	Range
whole	1000	62-160 kc/s
half	1000	110-300 "
whole	500	100-170 "

I have also included switched positions with no capacity in circuit, for testing crystals and external tuned circuits, and I intend to build in a 100-1000 kc/s calibrating crystal.

I find that the whole unit has cost me 2s, 10d.; 1s, 4d. for a bakelite chassis and 1s, 6d. for a 3-gang condenser.

Yours faithfully,

JOHN ROSCOE (G4QK)

South Croydon, Surrey.

Crystal Controlled Converter for the HRO Required

DEAR SIR,—Two items in the February issue have prompted this letter.

One was your footnote "Technical articles are urgently required" and the second "HRO receiver remains the most popular receiver." I would very much like to see a design with full specification of a crystal control converter for the HRO. As a basis for the specification I would suggest:—

- (1) Stage of r.f. amplification.
- (2) One HRO coil only, i.e., 3.5 Mc/s bandwidth.
- (3) Separate crystals for 7, 14, 21, and 28 Mc/s (to plug into a socket on the front panel).
- (4) Bandspread on each band: 1 kc/s per division of dial, e.g., 7.1 Mc/s dial 100; 7.25 Mc/s dial 250; 14.125 Mc/s dial 125; 21 Mc/s and 28 Mc/s Bands ditto (it is not suggested that this should be accomplished on 27 Mc/s).
- (5) Coil unit to be designed in conjunction with a firm of manufacturers and an agreement reached that unit will be made available at a reasonable price (many amateurs do not have the facilities to construct complicated coil units).
- (6) Built-in power supply.
- (7) Unit to match HRO receivers.

It is my opinion that there will be quite a large market for such unit, provided it is a first-class job and offered at a reasonable price. Such a unit has been designed and operated satisfactorily by KG6AEX. It is surprising the number of HRO receivers that are in use throughout the world and many of them are not the latest models.

Yours faithfully,

S. A. FAULKNER (VS2DB)

Kuala Lumpur, Malaya.

Home-built Receivers

DEAR SIR,—During a recent conversation with a number of amateur operators I put forward my opinion that it was possible and, indeed, very desirable for the amateur to design and build his own receiver, as I felt that he could then obtain a receiver suitable to his individual needs, and equal in performance to an equivalent commercial product. (I stressed performance, because I was prepared to admit that the external appearance of the home-built article might not be as "flashy" as its commercial counterpart, as the average "ham" obviously had no facilities for stoving and chromium plating.)

I was very distressed to find that any statement brought forth the following remarks:—

- (a) It could not be done without extensive workshop facilities.
- (b) Complicated test-gear would be needed.
- (c) It would cost more in the end than an equivalent commercial article.
- (d) It was impossible for the average "ham" to build a good receiver.

I feel that with the average small tools, plus a signal generator (what is wrong with a BC221, or a Type "D" Wave Meter?), it is

possible and I would be greatly interested to hear, via your columns, the opinions of members on this subject.

In support of my view, I would say that I have in use at the moment a home-constructed receiver (nine valves plus rectifier and stabiliser valve) which, when compared with a commercial receiver with a similar line-up, more than held its own. The total cost of materials, etc., was in the region of £18.

Yours faithfully,

D. K. POWELL (B.R.S.20277).

Hereford.

(The Society is planning to describe a communications receiver in the Autumn which will embody various interesting features and which will be designed to be as economically constructed as possible. It will be so arranged that additional improvements can be easily added when desired.—Editor.)

The R.S.G.B. Amateur Radio Exhibition

DEAR SIR,—I notice in the March issue of the BULLETIN under "Council Proceedings" that a tentative reservation has been made at the Royal Hotel for the 1955 Amateur Radio Exhibition. Now that this yearly event seems firmly established and in view of its growing popularity I feel the Exhibition has outgrown the limited accommodation afforded by the Royal Hotel, therefore, only selected Exhibitors can be offered space.

In the past the Exhibition has consisted mainly of pieces of equipment of interest to the transmitting amateur and the short-wave listener only, leaving untapped the vast field of enthusiasts who are not strictly interested in radio communication but who do nevertheless construct electronic gear in the form of audio frequency quality amplifiers and recorders, model control equipment, television receivers, etc.

This equipment is just as costly to purchase as that of the radio enthusiast and in consequence the majority of it is home constructed. Who, therefore, would be more interested in an exhibit on where all the necessary component parts are on show to aid them in their hobby?

I think the time is ripe for the Council to look round for more spacious accommodation to embrace the maximum number of component manufacturers and allow breathing space for the various "get togethers" that usually take place at an event of this sort against some exhibitor's stand for want of more room.

The Exhibition should be widely publicised in all the journals covering hobbies which utilize electronics in any form and I am sure it would be a great success.

I would be interested to read other members' views on this.

Yours faithfully,

Sidcup, Kent.

CYRIL R. WATERER (G2HP).

Local Radio Exhibitions

DEAR SIR,—I visited a Hobbies Exhibition recently. Finding an Amateur Radio station mentioned in the programme, I went along hoping to meet a few kindred spirits; instead I found

- (1) One operator working "another station" situated in the same building, talking technicalities with no interest for the spectators.
- (2) The "other station" consisted of a modified B2 Transmitter/Receiver located behind a screen so that none of the public could have seen it had they wanted to. It was operated (as was the main station) with no idea whatever as to the publicity value of a well-run station which should attract visitors.
- (3) No one to show any of the gear (such as it was) nor to explain it to the general public.
- (4) No inclination on the part of anyone to interest the visitor, who appeared to go away as mystified as on arrival.

The above are but a few of the things that I found which could have been remedied to make the show so much better a shop-window of Amateur Radio. I suggest that clubs wishing to show off our hobby to the public would do well to seek guidance from other clubs who know the ins and outs of exhibitions. The R.S.G.B. Exhibition (Home Constructors' Section) Committee would doubtless be willing to give good advice as how best to make the most of the chance of publicity offered by a stand at a local exhibition.

Yours faithfully,

Windermere, Westmorland.

B.R.S.15076

Mobile Operation

DEAR SIR,—As I am "a member in the legal profession" as mentioned in Mr. Aldred's letter published in the BULLETIN for March, 1955, I have read his letter with interest.

I fear that Mr. Aldred is missing the main point. In my opinion, merely to operate a microphone and controls whilst driving would be to invite a prosecution for driving without due care and attention. Surely no one, except in emergency, would operate when driving himself but would leave the driving to another person.

The accident mentioned by Mr. Aldred appears a highly probable occurrence but is certainly not a necessity for a conviction for driving without due care and attention or a more serious driving offence.

Yours faithfully

CAVEAT OPERATOR.

Constructive Criticism

DEAR SIR,—I wholeheartedly support the opinion of Mr. W. E. Thompson in his letter "Constructive Criticism" published in the April issue of BULLETIN.

First, and foremost, may I remind Mr. Varney that we only lay claim to being AMATEURS, and as such, perhaps at times, stray from the very professional lines upon which his corrections are based. There is little doubt that the transmitter designed by Mr. Jessop does really work, and it seems almost certain that he achieved some large degree of success with it before writing it up for the BULLETIN. Why then should it be openly torn apart? Mr. Thompson's suggestion that Mr. Varney could possibly have written up a few tactful modifications in a later issue is good common sense, and is also the opinion of many fellow amateurs with whom I have discussed this matter.

Agreed the BULLETIN should maintain a reasonably high standard so far as written articles are concerned, also accuracy in putting to paper the circuit diagrams, but why must we stick to convention? The world would be a dull place indeed and little scientific achievement would be recorded were we all to work "by the book."

May I ask Mr. Varney if he knows the number of amateurs today who can afford to produce at the bench exactly the same piece of equipment as is sometimes described in the pages of this magazine? Good circuits accompanied by long "shopping lists" look very impressive, but very few of us are able to spare the necessary cash when it comes to making up any particular piece of gear we fancy. Even when exact duplicate parts are used the results are seldom similar to the original. Recently I had the urge to build *The Elizabethan* transmitter described by Mr. Varney, and therefore had to lay out quite a sum of money to ensure the best results possible. Many patient hours of painstaking work were put into this job, the ultimate result being far from that reached by G5RV himself. I discovered that I had an e.c.o. so prolific in harmonics it could have been put into service as a harmonic wavemeter covering all bands down to 2 metres, and a p.a. that had more bugs than a henhouse! The latter was cured by adding a further two turns to the anti-parasitic chokes in the 807 plate lines but to this day I have not been able to get the e.c.o. stage sufficiently screened.

Even the Clapp oscillator described as an alternative in a later issue is not the complete answer to this trouble although it is more efficient from the unwanted radiation point of view. May I suggest to Mr. Varney that the Clapp oscillator is a MUST even in an area such as this where a strong TV signal is received? Fortunately for Mr. Varney, no written criticism of his article has appeared but had he been cavedropping on the air recently when I was soliciting help from many "old-timers" regarding this transmitter, he would have agreed with me that a number of "mods." were necessary.

Surely then, if we are to get the type of circuits most popular with the amateur fraternity in general, let them be as the article writer found them to work best—conventional or not—and let the professionals and experts rack their brains trying to perform modifications that "work better." By refusing to let technical article criticism monopolise this page, I feel sure the Editor's appeal for more articles will be well met.

Yours faithfully,
J. E. ALBAN (G3JEA).

London, W.2.

DEAR SIR,—The recent letters to the Editor concerning the Varney-Jessop controversy, have not made pleasant reading. I feel sure that such correspondence would make for reluctance on the part of amateurs to offer manuscripts to the BULLETIN.

To prevent such a recurrence I would suggest that, in common with scientific societies, manuscripts submitted to the Editor should be passed to two independent people, who remain anonymous and are fully conversant with the particular subject. These people would act as referees. They would read the paper carefully, offer criticisms, and return it to the author for clarification before it finally appears in print. Such a procedure would eliminate major points of controversy.

Yours faithfully,
K. C. HOOPER, PH.D., D.I.C., B.Sc. (G3DGI).

Barnet, Herts.

Editorial Note.—For very many years all technical articles submitted for publication have been "vetted" by members of the Technical Committee. That procedure was followed in the case of Mr. Jessop's article. It is regretted that certain errors were not noticed before publication.

In addition to the Letters published above from Messrs. Alban and Hooper, correspondence in similar vein was received from Mr. J. B. Walker (G3CYS) (on behalf of ten members of the Pontefract R.S.G.B. Town Group), Mr. R. J. Donald (G3DJD) (Region 8 Representative), Mr. N. Ashton, M.I.E.E. (G3DQU), Mr. W. B. J. Hackney (G5YP) and Mr. S. W. Woolford (G2ASW).

Mr. Varney Replies

DEAR SIR,—I am distressed to find that a number of Members have taken exception to my letters criticising Mr. Jessop's article. I had no intention whatsoever of hurting anyone's feelings and least of all of being offensive. I therefore wish to take this opportunity to apologise to all those to whom I may, however unwittingly, have given offence. This is not to say, however, that I retract my criticism, which I maintain was justified and technically accurate. But that I now realise that it should not have appeared in the form of a Letter to the Editor.

Nevertheless, may I point out that my original Letter was sent by the Editor to Mr. Jessop in order to allow him to frame his reply and that Mr. Jessop made no protest that the matter was to be dealt with in this manner. Had he done so, I am quite sure that you, Sir, would have informed me of his protest and that the matter would then have been dealt with "behind the scenes." I would have been entirely agreeable to such a proceeding but, unfortunately, it was not suggested. Furthermore, may I be permitted to point out that, since Mr. Jessop's article appeared in the January BULLETIN and my first Letter did not appear until March, Mr. Jessop had ample time to come forward with his own corrections after reading his article in print and thus render the writing of my Letter unnecessary? This would have been by far the most satisfactory thing for all concerned. The reason for the publication of my second letter was that I felt that certain of Mr. Jessop's answers were unsatisfactory and misleading. The additional points which I then felt obliged to bring forward were ones which I had deliberately omitted to mention previously so as not to embarrass the author more than was absolutely necessary in such a matter.

It is quite evident that the article did not receive the care it should have done, either in "vetting" by the member of the Technical Committee who checked it before publication, or by the Editorial Staff, and it is to be hoped that my criticism will at least result in a tighter and more effective application of the existing checking methods to which all BULLETIN articles are subjected before publication.

I sincerely hope that this affair will not discourage intending contributors of technical articles to the BULLETIN from submitting their work since, normally, they would be advised of any errors and given every opportunity to correct them before publication.

In order that there shall be no further misunderstanding of my motives for making the criticism of his article, I have written a personal letter of apology to Mr. Jessop for any embarrassment that the publication of the correspondence, albeit with his agreement, may have caused him. Mr. Jessop has accepted my apology.

Referring to Mr. Alban's letter above, I am surprised that it did not occur to him to write to me about the difficulties he encountered with his *Elizabethan*. I would have been glad to have offered helpful advice, as I have done in several cases where such inevitable teething troubles have been met with and eventually satisfactorily overcome. To expect any e.c.o. to be inherently free from harmonics is, of course, to labour under a misapprehension. The basic intention of my design was to prevent such unwanted harmonics from reaching the aerial and this is achieved by adequate screening and lead filtering, the use of wide-band couplers, the Pi-filter p.a. tank circuit and a low-pass filter. Perhaps G3JEA is unaware of the fact that there are at least some 300 "G5RV type" transmitters giving excellent results to those who have built them?

In conclusion, may I make it quite clear that I realise that my own contributions to the BULLETIN are not faultless, but that I do take the greatest care in their preparation and that where errors have come to my notice I have always furnished corrections which have appeared as soon as possible in the BULLETIN? I am always willing to accept constructive criticism and my own articles are always "vetted" by the Technical Committee before publication.

Yours faithfully,
LOUIS VARNEY, A.M.I.E.E. (G5RV).

Chelmsford, Essex.

The correspondence is now closed—EDITOR.

The Amateur Television Licence

DEAR SIR,—I was interested to read the letter from "Ex-DX" about the Morse exam., because a similar state of affairs exists with regard to the technical exam. As you will be aware, the P.M.G. insists that applicants for an Amateur TV licence pass the normal Radio Amateurs' Examination, although this could scarcely be less of a test of technical proficiency on u.h.f. and TV subjects. In view of the small number of people concerned we have not felt it necessary to complain about this, having assumed, wrongly it seems, that the P.M.G. would naturally view technical abilities in this direction in a favourable light.

A local member, who has been engaged for some years on secret radar research, has several patents to his name, and is an authority on u.h.f. problems, recently wished to take out a /T licence. He had no difficulty in obtaining a letter from the Director of Research at this particular establishment to the effect that his technical knowledge was far above that required by the P.M.G. His application was turned down. Like "Ex-DX," this man could easily take the R.A.E., but fails to see why it should be necessary to go to so much inconvenience, waste of time and money. His old R.A.F. qualifications, it appears, were sufficient to give exemption; the fact that he has taken a refresher course each year since, and that in any case his daily work is of a much more technical nature, apparently carries no weight at the G.P.O. It also appears that he can immediately obtain his Grad. Brit. I.R.E. without any further examination, and that this would automatically give exemption from the R.A.E. The qualifications giving exemption from Brit. I.R.E. are apparently not good enough on their own for the R.A.E. I.

I should like to endorse most heartily the Society's view expressed in the footnote to "Ex-DX's" letter, and hope that we shall hear more of this matter.

Yours faithfully,
M. BARLOW (G3CVO),
Chelmsford Amateur Television Club.

Book Review

THE RADIO AMATEUR'S HANDBOOK (Thirty-second Edition, 1955), by the HQ Staff of the A.R.R.L. 619 pages, fully illustrated. Obtainable from R.S.G.B., price 31/6 post free from stock.

Some changes appear in the latest edition of this book, which should be in every amateur's shack. Such a work is all the more necessary now that TVI, s.s.b., f.m., and other such subjects demand an appreciation of technical matters to a degree which increases every year. None of these matters, for ordinary amateur purposes, is either very difficult or very mathematical, but normal textbooks must treat them much more rigidly than amateurs require. If the amateur is to keep pace with developments in his own art he must have simple and correct explanations of the new techniques. Nowhere could he find these better done than in this Handbook, for he will see theory and practice side by side, and none of the half-truths so common to "simplifications." Even those of some technical attainment will find fresh viewpoints, and few, one imagines, will not learn a great deal from a study of this publication which is so familiar to all that one forgets how extraordinary it is, in itself, in its world-wide use, and in the number of its editions and copies sold.

Many new valves, transistors, crystal diodes, and cathode-ray tubes, have been added to the tube tables. The v.h.f. chapters have been considerably modified to deal with new apparatus. The h.f. transmitter chapter is revised to deal with such matters as multi-band tuning circuits and clamp-tube protective circuits: elsewhere, the difficulties connected with "clamp-tube" modulation are discussed, and should be carefully read.

The new edition well maintains the high reputation and usefulness of this unique publication.

T.P.A.

Can You Help?

● R. Lowde (B.R.S.20594), 14 Poucher Street, Hill Top, Kimberworth, Rotherham, Yorks., who requires information on fitting an S-meter to the R1155a receiver?

● H. G. Newland (G5ND), 161 Penrose Avenue, Blackpool, who requires the manual for the Hammarlund HQ120 receiver?

● E. R. Ward (B.R.S.18301), Ward's Electrical Services, Ltd., Westgate, near Chichester, Sussex, who urgently requires the manual and/or circuit diagram for the Collins TCS-5 transmitter and the Collins COL52245 receiver which covers 1500 kc/s to 12 Mc/s?

● D. K. Jagger (G3KAJ), Sgts' Mess, R.A.F. Shawbury, Shrewsbury, Salop, who wishes to borrow the manual for the B2 transmitter-receiver?

● T. R. Whittaker (G3JNM), 528 Church Road, Smithills, Bolton, Lancs., who requires information concerning the American Power Unit type RA-62-C, particularly the current ratings of the h.t. transformer?

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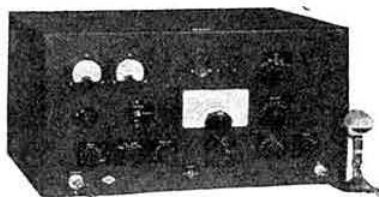
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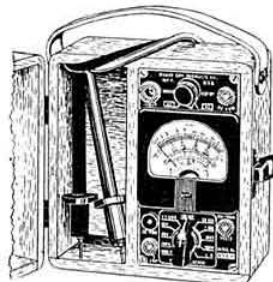
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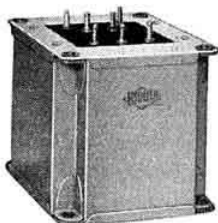
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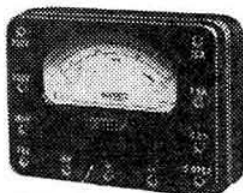
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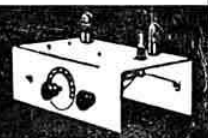
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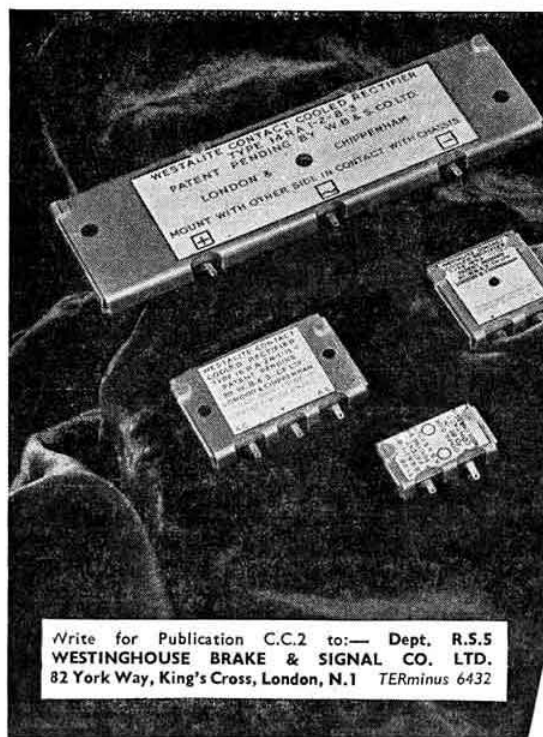
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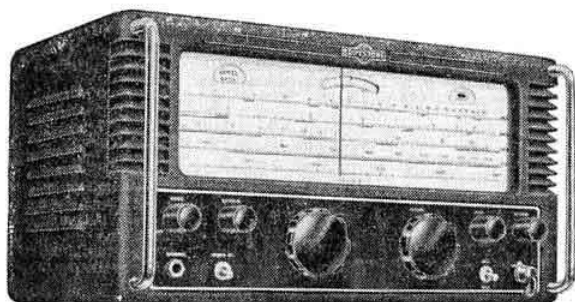
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An extremely interesting vacancy has arisen within the Co., for an ENGINEER to take responsibility for the solution of problems associated with the installation of all types of electronic equipment in aircraft. The successful applicant must have had wide experience in this field: he must appreciate both the aeronautic and the electronic engineer's viewpoint. The post is pensionable, the salary will be commensurate with ability and experience, and the prospects are excellent.

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Personnel Dept. (ED/241)

E.M.I. ENGINEERING DEV. LTD.

Blyth Road, HAYES, Middlesex

EXCHANGE AND MART SECTION

(Continued from page 551)

WANTED: Dial and drive Marconi B28 CR100, good price given. G3FX, Bracken Bank, Glen Road, Eldwick, Bingley, Yorks. (646)

WANTED: G.E.C. Miniscope i.f. alignment unit Cat. No. M863B. Details to G3JGL, 361 Greenford Avenue, Hanwell, London, W.7. (622)

WANTED: HRO coils, receivers, power packs, AR88Ds, AR88LFs, SX28s, BC348s, AR77s, and many other types, also laboratory test equipment and R54/APR4, TN17, TN18 and TN19 units. Details please to R. T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11 (LEY 4986). (101)

WANTED: service instructions books for buy, hire or borrow concerning following equipments: Model SK-3 radar, Model VE radar indicator, Model BM-1 or BO-1 radio, BC-640, AR88LF, WS38, WS21, WS-SRO5 and SRHQ; and in general all ex-service radar and radio equipments. Write to ON4PR, 41 Atrebatas Street, Brussels.

WANTED: Woden choke PSC12, Woden modulation transformer UMI, 25/- offered for each if good condition, Winchcombe, R.A.F. Unit, Aberporth, Cardigan. (633)

WANTED: v.f.o. with power pack and manual, £5. Wanted: HRO dial, swap pair beam indicators or buy, G5WG, 32 Quebeck Road, Ilford, Essex, VAL 0238. (653)

IMPORTANT NOTICE

All Exchange & Mart advertisements must be sent with remittance made payable to:

THE NATIONAL PUBLICITY CO., LTD.
36-37 Upper Thames Street, London, E.C.4

APPOINTMENTS SECTION

Situations vacant

ASSISTANT LECTURER (Radio Engineering) required for the Education Dept. Nigerian Federal Government for two or three tours totalling 36 months. Appointment either (a) on temporary terms with salary scale (including expatriation pay) £807 rising to £1,453 a year plus resettlement grant at rate of £100/£150 a year or (b) with prospect of permanency with salary scale (including expatriation pay) £750 rising to £1,315 a year. Outfit allowance up to £60. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for maintenance in United Kingdom. Liberal leave on full salary. Candidates, with H.N.C. in Electrical Engineering, must have had sound training in radio receiving and transmitting work and must be able to teach feeder and aerial theory; theory and practice of all types of recording apparatus and general audio and acoustic theory. They should have had wide experience in the industry and experience of teaching. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/40373/R.C. (617)

BC requires men (British) for appointment initially as Probationary Technical Assistants, at their Receiving and Measurement Section at Tatsfield, Surrey. Duties include radio frequency measurements and listening for and identifying British and foreign transmissions. Applicants (20 to 25 years or older if experienced) should have attained at least G.C.E. ordinary level in mathematics and science; have a general interest in radio receivers and have completed National Service. Knowledge of Morse an advantage. Those appointed will be expected to continue their studies and will be given technical training at various points in their early career. Starting salary £400 with annual increments to £635. Excellent prospects of promotion. Appointments permanent and pensionable subject to two years' probation. Requests for application forms to Engineering Establishment Officer, Broadcasting House, London, W.1, quoting ref. XT/R.S.G.B.B. (661)

GAED Experimental Television Transmitter, South Norwood, A full-time operator is required, capable of locating and rectifying circuit and component faults, academic qualifications not essential: training period given. Applicants should be mobile and prepared to move to the Midlands for a short period if necessary, after a few months. On closing down the transmitter the operator will be transferred to the Company's permanent technical staff. Applications (in confidence) giving full details of qualifications and experience with some indication of salary required to The Secretary, Belling & Lee, Ltd., Great Cambridge Road, Enfield, Middlesex. (663)

HATFIELD INSTRUMENTS, LTD., who are now expanding their laboratories require senior and junior electronic engineers with experience in the design and test of high grade Radio and Industrial Laboratory Equipment. Apply in writing in the first instance stating age, experience and salary required to Hatfield Instruments, Ltd., 175 Uxbridge Road, Hanwell, W.7. (581)

UNIQUE opportunity for the right man. Medium sized Engineering Company in S.W. London requires enthusiastic Electronic Engineer to take charge of small development section. Academic qualifications necessary, but breadth of interest even more important. Products range from aircraft radio equipment, and radio components to domestic appliances and tape recorders. Substantial salary and assured future for the right man. Box 636, The National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (636)

WANTED: Car radio mechanic for car distributors specializing in all makes car radio. Smiths, Radiomobile and Ekco dealerships held. Permanent position and good salary for suitable applicant. Must be experienced. Also boy trainee required. Apply Sales Promotion Manager, J. Davy, Ltd., 181 Kensington High Street, London, W.8. Telephone WES 9641. (629)

Maintenance of Multi-Channel Demonstration Links

Two Engineers, with suitable radio experience, required for the maintenance of the above.

Apply, to the Personnel Manager,

Pye Telecommunications Ltd.,
Ditton Works,
CAMBRIDGE

ELECTRONIC ENGINEERS are required by the **ENGLISH ELECTRIC CO., LTD.**, to fill vacancies in the Company's Laboratories at LUTON and STEVENAGE.

SENIOR MICROWAVE ENGINEER—applicant should have a good theoretical background to degree standard and experience of design or engineering of microwave equipment. The work includes investigation of new methods of construction with a view to miniaturisation and weight reduction.

SENIOR ENGINEER—to lead a group of engineers in the development of specialised electronic test gear.

SENIOR ENGINEER—for work on general circuit development, with sound fundamental knowledge of electronics and the ability to apply it.

SENIOR INSTRUMENTATION ENGINEERS—with a degree or H.N.C. and experience of the design of equipment for use in the instrumentation field.

SENIOR ENGINEER—to lead a group concerned with development and field trials of ground radar. Previous experience essential.

SENIOR RADAR & ELECTRONIC ENGINEERS—for development and field and flight experiments of radar equipment. Degree or H.N.C. standard preferred but applicants without these qualifications but with wide experience of this work considered.

SENIOR ENGINEER—for missile telemetry installation planning. Applicants must be familiar with existing telemetry systems and measuring techniques, suitable to a man with trial experience.

JUNIOR ENGINEERS & LABORATORY ASSISTANTS—are required to assist in the above work. Vacancies also exist for junior staff with experience of, or an interest in Microwaves.

Housing assistance may be given in some cases.

All of the above posts are permanent and progressive and pensionable after qualifying period, attractive salaries are offered to the successful applicants. Applications should be sent to Dept. C.P.S., 336/7 Strand, W.C.2, quoting ref. No. 1260B.



The soldering bit which lasts indefinitely, does not become pitted or lose its face and requires no re-shaping, filing or maintenance. Fixed bit models and replaceable bits available in all sizes.

(British and Foreign Patents Pending)

- No Transformer Necessary.
- For Mains or Low Voltages.

20 models—Bit sizes, 1/8" 3/16", 1/4", 5/16", 3/8" —Prices from 19/6. All voltages. (State voltage when ordering.) Details of full range in folder No. S.P.7 sent on request.

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Knowledge and Proficiency

- in Morse have to be worked for, but there
- is a pleasant, simple yet sure way of
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Read these extracts from students' letters:—

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For G.P.O. Morse Code test for securing Amateur Transmitting Licence, and for S.W.Ls.

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A Complete Course for the Beginner.

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For all who desire to increase their accuracy and speeds up to 20 or more w.p.m.

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6J5GT	3/9	6O7G	7/9	80	8/0	ECL80	10/6
6J7	7/6 6/6	6Q7GT	8/0 7/6	EB34	2/0	EF92	5/6
6J7G	7/6	6SH7	5/6	EB91	2/0	RK34	2/3 1/9
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Send for price-list of parts, also for Booklet containing full constructional details, price 3/6.

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Open all day Saturday — Hours 10-6 p.m.

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OUR RANGE OF QUALITY EQUIPMENT IS MOST COMPREHENSIVE

Whether new or used, it is all guaranteed to be in perfect condition

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EDDYSTONE 640, 1.2-30 Mc/s.	£22 10 0
740, 550 kc/s-30 Mc/s.	£30
750	£45
680	£60
RCA AR88LF-D from	£55
RCA AR77E	£32
HAMMARLUND HQ120	£40
HAMMARLUND HQ129X	£85
HALLICRAFTERS SX28, 550 kc/s 42 Mc/s	£45
HALLICRAFTERS SX24	£32
HALLICRAFTERS S20R	£28
HALLICRAFTERS S20	£25
HALLICRAFTERS Marine HT11	£40
transmitter/receiver	£40
RADIOVISION Commander Double	£17
Superhet	£40
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RME 69 550 kc/s-32 Mc/s. As new	£30
HRO Junior and Senior receivers	£28
complete from	
ZENITH Battery a.c./d.c. transoceanic	£26
portable receiver	

MANUALS for the following receivers:
AR88LF-D, AR77E, R107, Marconi CR100,
Hallicrafters SX24, SX28, S20R, S20, B2
Transmitter/Receiver, HQ120, HRO, Junior
and Senior, Photostatic copies of the originals
£1.7.6 each.
Set of main dial, bandspread and name plate
for AR88D, £1.10, set of three.

TEST EQUIPMENT

FERRANTI Universal Test Meters, a.c./d.c.	£4.17.6
pocket size. Complete in case	post 1/6.
AVO Voltage Range extenders for AVO Model	
40. Up to 4800V. New in Box	5/6, post paid U.K.
AVO 9 Pin Couplers	7/6 each
AVO Model 40, As New	£12
AVO Model 7	£15
AVO Wide Signal Generator	£13
AVO Oscillator	£9 10 0
AVO roller panel valve testers	£10
TAYLOR type 260A, TV. Wobulator	£28
TAYLOR type 70A test meter	£9 10 0
GEC Miniscope	£14

TAYLOR 82 A.C./D.C. TEST METERS

In wooden box 6in scale. In good condition.
£7.15.0. Post 2/-

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RECONDITIONING

of all types of British and U.S.A. COMMUNICATION RECEIVERS

Every receiver stripped, recrackled and realigned at a moderate figure by our skilled staff. Work guaranteed, and figures supplied.

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Hallcrafters S27, S27CA, SX28, etc. RCA AR88, R1359 and R1294 VHF receivers.

Transmitters APT5 and receivers ASB8.

Frequency meters Type BC221, £20 paid. All USA TS prefix equipment, TS13, TS35, TS69, TSX-4SE, TS174 and TS175, £80 given.

All British and USA Microwave equipment and valves type. 707A, 707B, 2K33, 2K45, 2K25, 723/AB.

Any manuals for any equipment purchased.

Please write, call or 'phone, and our offer will be given.

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Write Call or Telephone
GERrard 4447 and 8410 (Day)
MEAdway 3145 (Night)

G2AK

THIS MONTH'S BARGAINS

G2AK

Talking of Table Toppers

The Ideal Power Transformer for the Table Top Rig

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We regret that we cannot accept orders for these from EIRE or Abroad.

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VIBRATOR POWER UNITS. 12V d.c. input. 300V 100mA output. Fully smoothed and filtered. In black crackle finished case. Only 39/6, postage 1/6.

METERS: 2 1/2" Scale Flush Mounting. 0-10mA. Ditto 0-30mA, ditto 0-100mA 12/6 each. 2" Scale Square Flush Mounting 0-50mA, ditto 0-150 mA, ditto 0-3 Amp Thermo, ditto 0-20V d.c., ditto 20/0/20 Amp d.c., 7/6 each. 2 1/2" Scale Projecting Type 0-15 Amp Thermo 7/6. 2" Scale Round Flush 0-1 Amp R.F., ditto 0-350mA Thermo 7/6.

SPECIAL VALVE OFFER: TZ40, 35/-; 6L6G, 10/6; 5R4GY, 12/6; 829/3E29, 60/-; 100TH, 90/-; 866A, 17/6, or 30/- per pair.

CONDENSERS: 8µF 600V Trop. 750V normal condensers. New ex-W.D. stock, 5/6 p. & p. 1/6. H. S. KEYING RELAYS (Siemens): 1700 x 1700 coils, 12/6.

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AIR-SPACED CO-AXIAL Cable. 150 ohms. (normal price 3/11 per ft.), 20-yd. coils only £1 per coil, post free.

DEAF AID CRYSTAL MIKE UNITS: 12/6 Postage and packing 9d.

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RACK MOUNTING PANELS: 19in. x 5 1/2in., 7in., 8 1/2in., or 10 1/2in., black crackle finish, 5/9, 6/6, 7/6, 9/- respectively, postage and packing 1/6.

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ALL CALLERS TO 110 DALE END, BIRMINGHAM

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