

RSGGB

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Bulletin

Vol. 30 No. 10

APRIL, 1955

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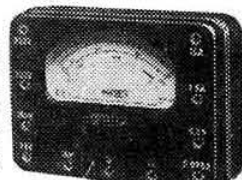
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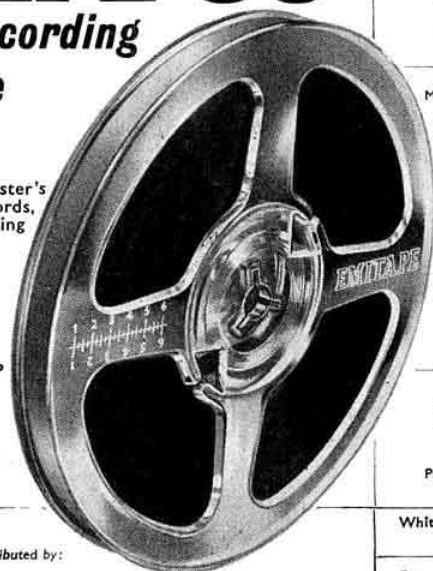
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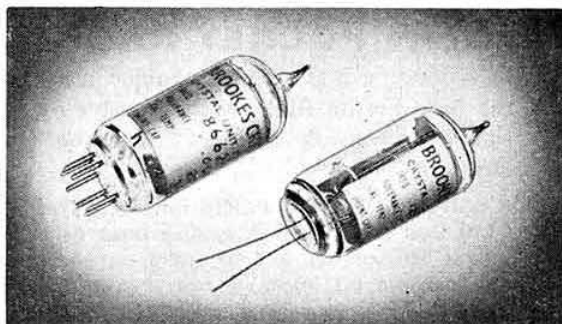
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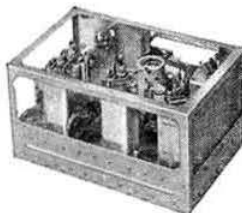
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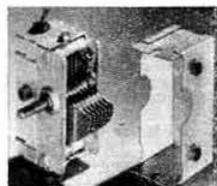
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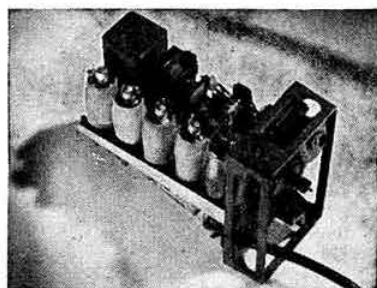
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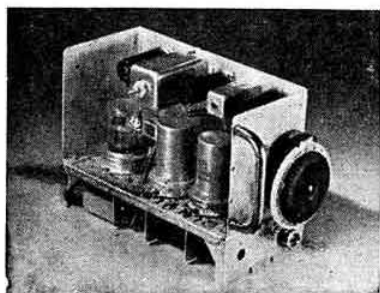
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From Outer Space

THE London meeting held at the I.E.E. on February 25 will live long in the memories of those who were fortunate enough to be present. The occasion marked the disclosure of what, to the great majority of members, will be an entirely new field for exploration. "Exploration," as it happens, is the precisely accurate word to use in the literal as well as the metaphorical sense, for the subject at that memorable meeting was "Radio Astronomy."

Here is something which has come to the fore during the last decade or even less. It had been known for many years, of course, that solar noise could be detected by quite ordinary aerials and receivers on earth; but the possibility that stars other than our sun were "radio active" has been explored much more recently by research workers in various parts of the world and especially at Jodrell Bank, near Manchester, where, under the inspired leadership of Dr. A. C. B. Lovell, O.B.E. (Professor of Radio Astronomy, University of Manchester), some extremely valuable investigations into radio astronomy have materially added to man's knowledge of the universe around him.

It was from Jodrell Bank on February 25 that Dr. Jennison travelled to deliver his lecture. On few occasions before, surely, can the dignified precincts of the I.E.E. buildings have contained such an enthusiast for a cause. It was indeed the blazing enthusiasm which Dr. Jennison radiated that must have persuaded many of his listeners that here was an entirely new branch of the art which not only *should* be investigated by the radio amateur movement of this country in keeping with their pioneering tradition, but which *could* be investigated by them without unreasonable expenditure of hard-earned cash on costly equipment. Here was no impractical, "long-haired scientist," out-of-this-world approach. Having been a transmitting amateur himself, Dr. Jennison "spoke the language," showed himself fully aware of the practical limitations often facing the radio amateur, and exhibited in his descriptions of some of the experimental equipment used at Jodrell Bank the true amateur's approach of trying it out for oneself to see how it works.

It is sometimes said that science knows all the answers, and the layman, encountering the more cocksure members of the scientific world, might be tempted, out of sheer awe, to believe that this is true. It was refreshing, then, to see that Dr. Jennison's regard for this new development of radio astronomy was one almost of humility, in spite of his enthusiasm, in the knowledge that many of the answers are as yet unknown, and the more people who manifest interest in the subject, the greater will be the fund of information made available to science and society.

Wanted: A Pasteboard

WHEN, after discussing the contemplation of the universe with a radio telescope, one considers next

nothing more vital to man's advancement than the collecting of QSL cards, then indeed we have a situation embracing at once the sublime and the ridiculous.

At this point a thousand irate members may feel inclined to retort: "The collecting of QSL cards is not ridiculous." And the point must be conceded that in certain circumstances the amassing of pasteboards from far and wide does at least give some indication of a man's prowess at making radio contacts over the air.

Nor should it be forgotten that the allure of the QSL card frequently brings into the radio amateur movement useful members who are attracted in the first place by its colourful appeal. The craze soon wears off, in just the same way that new television set purchasers grow out of the indiscriminate viewing which accompanies the first few honeymoon months of induction into the medium.

Let it be agreed, then, that the QSL card has its uses up to a point. The coloured pasteboard, impressive to the non-radio visitor to the shack, can be depressing—indeed, irritating—to the active amateur down the road who is asked to part with a card to enhance the collection.

Time and again members relate how they receive quite worthless listener-report cards that often bear no valuable data and often omit the frequency used; or how they are pestered for cards from transmitting amateurs who seem afflicted with some nervous tick that it is of vital importance to prove that they have communicated with every parish in Moreton-in-the-Marsh, rather akin to the habit of the venerable Dr. Johnson, who was alleged to tap every other paving stone with his walking stick!

The QSL card has some value, yes—but probably less often than many of us think.—J. H.

Nottingham Piracy Case

JUST before this issue went to press the Post Office advised the Society that on April 6, 1955, Mr. Charles Ian Orr-Ewing, M.P., asked the Assistant P.M.G. whether he endorsed the opinion expressed by the Post Office prosecuting counsel in the Nottingham piracy case, a report of which appears on page 489 of this issue.

The following reply was given by Mr. Gamman: "I am glad to have this opportunity of clearing up any misunderstanding that may have arisen. The case before the Court related to a transmitting station which was not only operated without a licence, but was also worked on a frequency not available to amateurs. The solicitor's comment, of which varying reports have appeared in the press, was to the effect that the air was crowded with transmitting stations of all kinds, and unless there was a close check on them, listeners' enjoyment would be spoiled. There was no intention whatever to cast any reflection on the numerous able and devoted amateurs who operate within the terms of their Post Office licences and their properly allotted wavelengths".

Single Sideband Technique

Part IV—Linear Amplifiers

By H. M. HUMPHREYS (G13EVU)*

Part I of this series (General Principles and Reception) was published in the November, 1953, issue of the BULLETIN, Part II (Filter Type Exciters) in January, 1954, and Part III (Phasing Type Equipment) in June, 1954. In Part V the author will describe the alignment and practical operation of linear amplifiers. The series will conclude with Part VI (Test Equipment).

WHEN a single sideband suppressed carrier signal has been generated in the normal manner it is usually found desirable to amplify it to a rather higher power level before it is radiated. To do this, a linear amplifier must be used.

Class A Amplifiers

The commonest form of linear amplifier is the class A type used in receivers and speech amplifier equipment; it is not usually found in transmitters owing to its low efficiency. The circuit diagram of a typical class A stage is given in Fig. 28. As constants are given for both the 6AG7 and 807 there should be no difficulty in adapting the circuit to any power level which is required in practice. As with all r.f. amplifiers, care must be taken to ensure that stray coupling between input and output circuits does not take place, otherwise self-oscillation may occur. Short grid and anode leads, decoupling of screen and cathode at the valve base, and adequate screening between input and output tank coils are all essential if really high stability is to be obtained. If these sound constructional practices are followed, the amplifier will give virtually distortionless output as long as it is not overdriven.

As with all amplifiers using cathode bias, the valve must be operated on the straight portion of its characteristic. Even a small amount of excessive drive can give rise to a most objectionable degree of distortion. The only real drawback of the class A amplifier is its low efficiency. Although textbooks suggest that 50 per cent is attainable in theory, few practical amplifiers are likely to produce more than 30 per cent at full output. This is of little importance at power levels of 5 to 10 watts but it can scarcely be tolerated at higher levels.

Class B Amplifiers

To make the most economical use of valves and power supplies, the class B amplifier is the obvious choice. This type of amplifier is theoretically capable of 78.5 per cent efficiency at full output although practical designs may not normally be expected to attain more than 65 per cent.

Most readers will no doubt be conversant with class B amplifiers in high level audio service. The class B r.f. linear amplifier bears a strong family resemblance, the principle variation being that tuned r.f. circuits replace the audio transformers in the grid and anode circuits. There is, however, one really important difference between a.f. and r.f. applications: due to the fly-wheel effect of the tuned output tank, a single-ended class B stage will work quite well in r.f. service whereas a

balanced push-pull arrangement is essential in audio work.

It is important to note that efficiency percentages and typical operating conditions for class B service quoted in valve data sheets refer to the amplification of carrier-type waveforms and are not directly applicable to single sideband use. The class B amplifier is a variable efficiency device—its overall efficiency is zero at zero output and rises linearly to about 65 per cent at maximum output. With a conventional a.m. signal, the peak amplitude (which is double the amplitude of the carrier) must be accommodated within the maximum capability of the stage. It therefore follows that the average efficiency cannot exceed half the maximum efficiency so it is pegged at the low figure of 32.33 per cent. With s.s.b. there is no carrier and therefore no yardstick against which to measure average efficiency. Class B amplifiers are used to give the highest possible amplification of one sideband and are rated by their performance at maximum output. As yet, few manufacturers publish performance figures for single sideband suppressed carrier service and the best we can do, therefore, is to use the class B audio ratings. If a valve is suitable for r.f. operation, the audio ratings give a good indication of what to expect from it as a single sideband linear amplifier.

Practical Considerations

In theory, almost any type of r.f. valve may be used but there are two important factors which narrow the field. The first is the question of bias. Fixed bias is essential and the supply must have excellent regulation so that it does not vary over any part of the input cycle. This means that either batteries or an electronically stabilised supply must be employed. Batteries are cheap but are only satisfactory if the amount of grid current flowing through them is strictly limited. At high values of reverse current, the battery will have (or will develop) enough internal resistance to cause the instantaneous bias voltage to fluctuate with input. In any event, the cells will have a short life. This tends to restrict the use of batteries to tetrode and pentode stages. An electronic

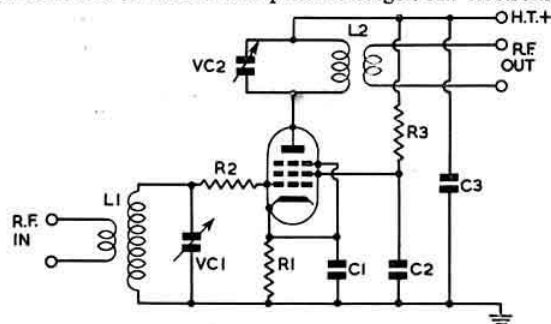


Fig. 28. Class A Amplifier.

C1, 2, 3, 0.01 μ F mica or ceramic; L1, 2: 3.5 Mc/s—24 turns 18 s.w.g. 1 in. diam., 16 t.p.i.; 7 Mc/s—12 turns 18 s.w.g. 1 in. diam., 16 t.p.i.; 14 Mc/s—7 turns 18 s.w.g. 1 in. diam., 8 t.p.i.; 21 and 28 Mc/s—4 turns 14 s.w.g. 1 in. diam., 2 t.p.i. (self-supporting); R1, 150 ohms 1 watt (6AG7), 680 ohms 2 watt (807); R2, 100 ohms; R3, 22,000 ohms 2 watt (6AG7), 56,000 ohms 2 watt (807) (or fixed supply of 300 volts); VC1, 2, 160 μ F variable (with 100 μ F air padder in parallel on 3.5 Mc/s). Anode voltage (maximum): 300 (6AG7) or 600 (807).

*94 Locksley Park, Finaghy, Belfast.

ally regulated supply is virtually a necessity with all triodes, except types such as the TZ40 and 811A which have been expressly designed for zero bias class B operation.

The second important consideration is that the driving source must have excellent regulation, otherwise considerable distortion will occur. With pentodes, tetrodes and those triodes which require fixed bias, grid current will flow over part of the input cycle only. The grid impedance changes abruptly at the onset of grid current flow, so the driver stage is presented with a load which fluctuates widely. To stabilise the load a swamping resistor, calculated so that it will dissipate at least five, and preferably ten times, the driving power required by the valve or valves in the class B stage, must be placed across the grid tank circuit. With tetrodes or pentodes, which require only a fraction of a watt input, this requirement gives rise to no difficulty. Low μ triodes are more or less ruled out, however, because they would need far too much drive to make them either practical or economical. Zero bias triodes, used in push-pull, are in a rather special position. As grid current flows

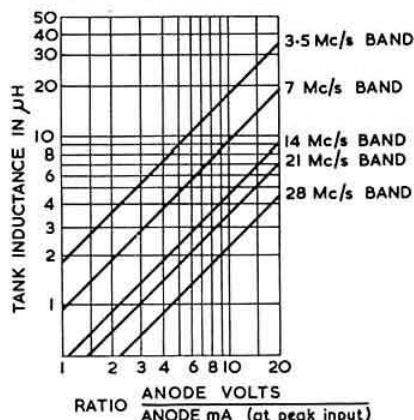


Fig. 29. This chart gives the appropriate inductance values for various operating conditions. The values shown are satisfactory for single-ended tank circuits but should be doubled for use in push-pull p.a. stages.

throughout virtually the whole of the input cycle, the load presented to the driver stage is more constant than with any other arrangement. Little or no swamping is called for but if adequate driving power is available it is considered advisable to place a resistor, which will dissipate about one-half the power needed to drive both valves, across the grid tank coil. Single-ended triode stages are not particularly favoured because they are no more simple to construct than a push-pull stage and they do not give the stability of neutralisation which can be obtained with a bridge circuit.

Before going on to practical circuits, the design of r.f. tank circuits must be considered. For the best results, the L/C ratio should be about half that for a comparable amplitude modulated stage. While it is not possible to give winding instructions to cover all eventualities, the appropriate inductance values for most practicable operating conditions may be obtained from Fig. 29. When this has been ascertained, the number of turns required on a standard 2½ in. diameter coil former may be obtained from Fig. 30. If, for any reason, there is any doubt about component values, it should be remembered that C must be on the high side. A less precise but usually fairly satisfactory method is to use a 3.5 Mc/s coil for Top Band, a 7 Mc/s coil for 3.5 Mc/s and so on.

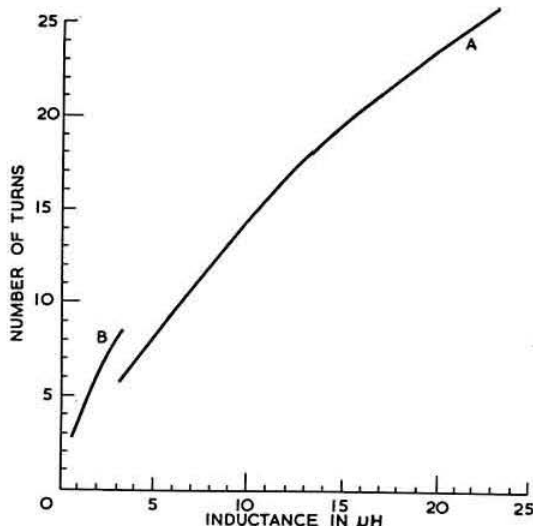


Fig. 30. The number of turns to obtain a required inductance on a standard 2½ in. diameter ceramic former can be obtained from this chart. Curve A is for single spaced windings and curve B for double spaced windings.

Practical Amplifier Circuits

In practical class B linear amplifiers, we are more or less confined to the use of tetrodes, either single-ended or in push-pull, or push-pull zero bias triodes. On the grounds of performance, there is little to choose between any of these arrangements, so the final selection may be influenced by such considerations as cost and the contents of the junk box! Unlike their confreres in the U.S.A., who are faced with a bewildering number of alternatives, many U.K. amateurs will no doubt be

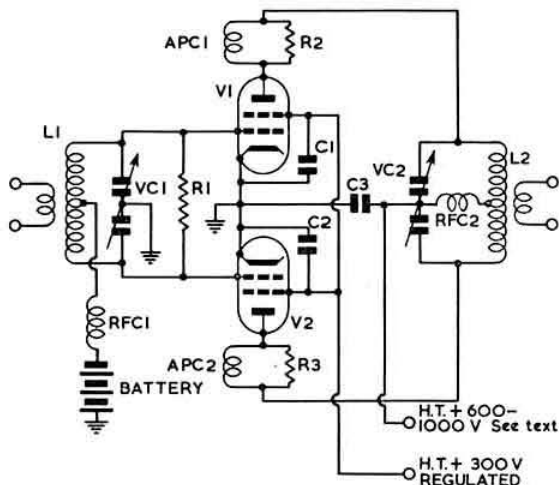


Fig. 31. Tetrode Push-pull Linear Amplifier.

APC1, 2, 10 turns 20 s.w.g. enam. closewound on R2 and R3 respectively; battery, deaf aid type in series with standard grid bias battery to give range 30-35 volts adjustable; C1, 2, 3, 0.001 μ F mica; L1, 3.5 Mc/s—30 turns 1½ in. diam., 16 t.p.i.; 7 Mc/s—16 turns 1½ in. diam., 16 t.p.i.; 14 Mc/s—9 turns 1½ in. diam., 8 t.p.i.; 21 and 28 Mc/s—4 turns ½ in. diam., 2 t.p.i.; L2, see text; RFC1, 2, 2.5 mH choke; R1, 10,000 ohms 10 watt, non-inductive; R2, 3, 100 ohms 1 watt, carbon; V1, 2, 807; VC1, receiver-type 2-gang, 160-250 μ F per section; VC2, 100 μ F split stator (with 50 μ F vacuum padder in parallel with L2 for 3.5 Mc/s).

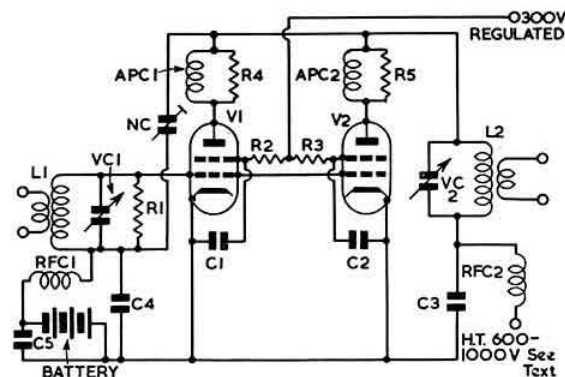


Fig. 32. Single-ended Tetrode Linear Amplifier.

APC1, 2, 10 turns 20 s.w.g. enam. closewound on R4 and R5 respectively; battery, deaf aid type in series with standard grid bias battery to provide range of 30-35 volts adjustable; C1, 2, 3, 5, 0.001 μF mica; C4, 200 μF mica; L1, as in Fig. 28; L2, see text; NC, disc type neutralising condenser, 6 μF max.; R1, 10,000 ohms 10 watt non-inductive; R2, 3, 4, 5, 100 ohms 1 watt, carbon; RFC1, 2, 2.5 mH r.f. choke; V1, 2, 807; VC1, 250 μF receiving type; VC2, 200 μF variable (with 100 μF vacuum padder in parallel for 3.5 Mc/s).

influenced by the fact that a pair of inexpensive and ubiquitous 807s will handle all the input power permitted. Whether the valves should be used in parallel in a single-ended circuit or whether it is better to connect them in push-pull is so much open to question that both arrangements are illustrated (Figs. 31 and 32).

As it is not so very long since the theorists changed their minds about the efficacy of push-pull r.f. stages for harmonic reduction, the writer embarked upon a fairly elaborate series of experiments to see whether it could be established which of the circuits was the most suitable for amateur work. The results were most interesting if not particularly conclusive.

If great care was taken to ensure that both valves were well matched and equally driven, the push-pull stage was slightly better than the single-ended stage. With a badly matched pair of valves, physical unbalance in construction or unequal drive, the output of the push-pull stage was more distorted than that of the single-ended. The writer's personal preference is for the single-ended tetrode stage, as it is simpler to construct and may be used with a pi-coupler in the anode circuit, but there is really very little in it. It is, however, suggested that those with limited experience and elementary test gear should serve an apprenticeship on single-ended stages before trying their hands with push-pull linear amplifiers. It should perhaps be mentioned that when valves are being matched for a push-pull stage, a pair which draw equal currents at maximum input should be chosen. Equality of anode currents under no-drive conditions is relatively unimportant.

No matter which of the circuits is used, it is essential that the amplifier should be so laid out and wired that no trace of regenerative or parasitic instability is present. Of the many p.a. stages built by the writer at one time or another, the layout shown in the sketch opposite proved most satisfactory. This particular amplifier was designed around PT15s, but it is equally applicable to 807s or indeed to any other tetrodes. If this form of construction is used, it should not be necessary to neutralise the 807s in the push-pull circuit of Fig. 31.

With the single-ended circuit of Fig. 32, however, the anode-grid capacity of two valves in parallel becomes somewhat high and as bridge neutralisation is so easily

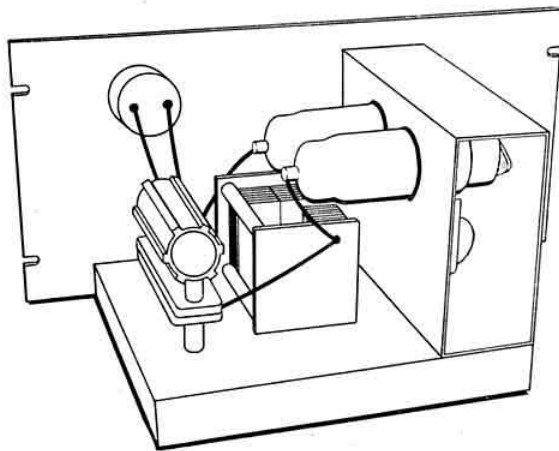
carried out its inclusion is strongly recommended. NC is the neutralising condenser and is so chosen that when

$$\frac{NC}{C4} = \frac{Ca-g}{C \text{ input}}$$

the stage will be perfectly neutralised. In practice, precise adjustment of NC is extremely simple. With excitation applied to the grid circuit and the d.c. returns of anode and screen temporarily disconnected, the anode tuning condenser should be rotated through resonance. This will cause the grid circuit to vary, indicating feedback; such feedback should be reduced to a minimum by adjusting NC until little or no variation in grid current occurs when the anode circuit is tuned through resonance. For a final touch-up, anode and screen voltages should be applied and NC adjusted (if necessary) until a slight peak in grid current coincides with the maximum dip in anode current which indicates resonance.

Operating Voltages

Both amplifier circuits will work satisfactorily (at maximum permissible output) at anode voltages of 600 to 700, but for higher efficiency and best linearity it is recommended that a supply in the region of 1000 volts should be used. As this may sound like a revolutionary notion the reasons underlying it will be explained. Valve manufacturers state that under ICAS* ratings a pair of 807s in a class AB2 audio amplifier can take an input of 180 watts at 750 volts on the anodes and will deliver an output of 120 watts. The ICAS rating system is such that one would be justified in operating the valves under maximum input conditions with sine wave input for periods as long as ten minutes at a time. That is the way these ratings are intended to apply. But under speech signal conditions the average output level would be materially below the peak, so the valves would not actually be operating at maximum power ratings for extended periods. These are, of course, exactly the circumstances that exist in a single sideband linear amplifier.



A satisfactory layout for a linear p.a. stage. Two chassis are used, the smaller one being bolted to the larger as shown.

The next thing to consider is whether the internal construction of the valves is such that the voltage peaks attained will be within their handling capacities. Reference to the data sheets shows that 807s in anode modulated r.f. service may be operated with a d.c. anode supply of 600 volts. With sine wave modulation, the

*Intermittent Commercial and Amateur Service.

actual supply voltage becomes twice this amount on peaks; that is, it reaches 1200 volts for many r.f. cycles. There seems to be no doubt, therefore, that valves of this type will stand 1000 volts on the anode, although the average anode dissipation must naturally be kept below the rated 25 watts per valve by appropriate adjustment of the bias. If this is done, the valve will be running well within its capabilities even though the peak output may be high. The proof of the pudding is in the eating and since 1951 the writer has had a pair of 807s in an AB2 audio amplifier with 1100 volts on the anodes. So far no replacements have been necessary.

The only remaining point which merits special mention concerns the screen supply. The screen current fluctuates widely under speech input conditions so the supply must have really good regulation if the linearity is not to suffer. An electronically regulated supply is, of course, the ideal but a pair of gaseous voltage stabilisers in series is quite adequate.

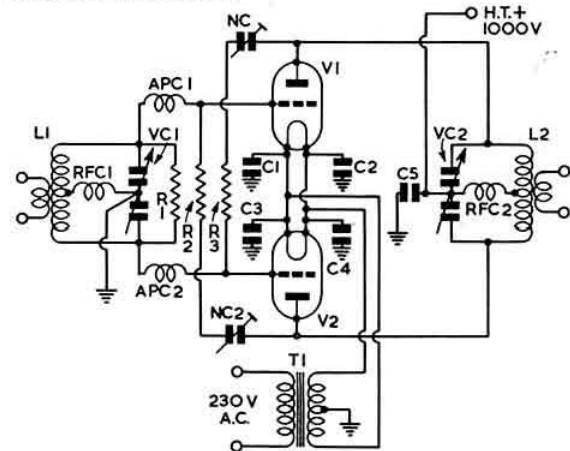


Fig. 33. Triode Push-pull Linear Amplifier.

APC1, 2, 10 turns 20 s.w.g. enam. closewound on 1 watt resistors; C1, 2, 3, 4, 0.01 μ F mica; C5, 0.001 μ F mica; NC1, 2, disc type neutralising condensers, 6 μ F max.; R1, 2700 ohms 5 watt, non-inductive; R2, 3, 20 ohms 2 watt, carbon; RFC1, 2, 2.5 mH r.f. chokes; V1, 2, TZ40; VC1, 2, L1, 2, as for Fig. 31.

Triode Linear Amplifiers

So much for tetrode linear amplifiers. Before describing alignment it would be unfair not to say a few words about the use of triodes. A circuit which is suitable for use with either TZ40s or 811s is given in Fig. 33. There is no physical difference between this circuit and a class C arrangement which enjoyed widespread popularity until quite recently; the only difference is in the operating conditions. The class B linear arrangement requires rather more careful handling, however, because the valves are operated with no resistance in the d.c. grid return. If self-oscillation should occur, it is likely to be disastrous, so neutralisation should be as perfect as it is possible to make it. Anti-parasitic chokes in the grid leads and stopper resistors (R2 and R3) in the neutralising leads are almost invariably essential. The resistor R1 serves the dual purpose of acting as an anti-parasitic device and at the same time does a little towards improving driver regulation.

Complete Transmitters

As there is scope for numerous combinations to be made up from the various exciters and amplifiers referred to in this series, it would not be practicable to give circuit diagrams to cover all eventualities. The block diagrams in Fig. 34 should, however, enable the construc-

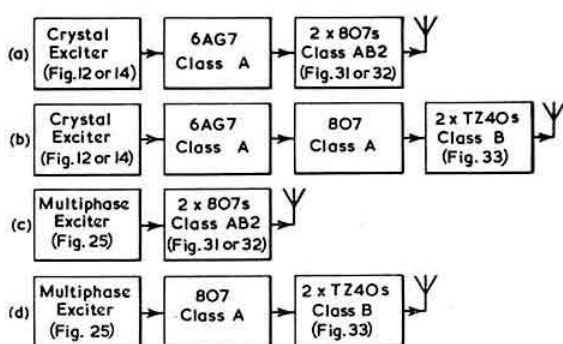


Fig. 34. Block diagrams of complete s.s.c. transmitters.

tor to assemble a piece of equipment which will suit his particular taste. As all the individual circuits in the series have been depicted with self-contained input and output circuits, they may be used with link coupling in the normal manner. In certain circumstances, it may be possible to simplify construction by using capacitive interstage coupling. Some suitable arrangements are shown in Fig. 35. This method has the advantage that

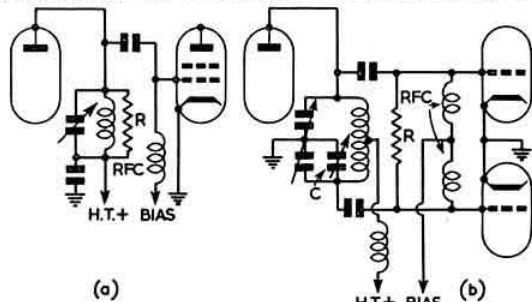


Fig. 35. Alternative methods of interstage coupling. (a) Single-ended driver to single-ended final. R is a swamping resistor. (b) Single-ended driver to push-pull final. C is the circuit balancing condenser, equal to the output capacity of the driver valve. It should be adjusted for equal drive to the amplifier valves.

fewer tuning adjustments have to be made each time frequency is changed, but it can also introduce pitfalls for the unwary. For instance (although the writer holds no brief for the idea), a push-pull final may be capacitatively coupled to the balanced tank circuit of a multiphase exciter without causing any trouble. If, however, a single-ended amplifier were coupled in this manner, the whole system would become unbalanced. R.f. chokes in the grid returns of class B triode amplifiers can also cause trouble by introducing resistance into the circuit. This may be avoided by employing components designed for anode circuit transmitter use.

Electronics Exhibition, 1955

THE Tenth Annual Electronics Exhibition organized by the Northern Division of the Institution of Electronics will be held at the College of Technology, Sackville Street, Manchester, from July 14 to 20, 1955. The exhibition will be open from 2 p.m. to 10 p.m. on the 14th, from 10 a.m. to 10 p.m. on the 15th, 18th, 19th and 20th, and from 10 a.m. to 6 p.m. on the 16th. Among the many attractions will be a manufacturers' section, scientific and industrial research section and a programme of lectures and film shows.

Admission will be by tickets obtainable free of charge from the Hon. Exhibition Secretary, Mr. W. Birtwistle, 78 Shaw Road, Rochdale, Lancs.

The Screw-ball

A Miniature Two Element Array for the Back Yard

By ROBERT A. HOSIE (G8RI)*

MANY amateurs must have found themselves in the same position as the writer: namely, with a keen desire to work DX, an efficient transmitter but alas! no space to erect a normal 14 Mc/s beam. The array described in the present article—a miniature two element beam with 8ft elements and 7ft spacing—is believed to be one answer to the problem. It is, in fact, a centre-loaded beam for 14 Mc/s which will fit into the smallest back-yard. In developing the design, every effort was made to keep the cost to the minimum. Some parts of the insulation may be regarded as poor but in extended tests, signals have been well maintained regardless of weather conditions.

Construction

The materials needed for the construction are as follows:—

Elements: 125ft of 6 s.w.g. aluminium wire.
2 wooden bearers 8ft by 1in. by 1½in.
4 stand-off insulators.
32ft of ½in. wood dowel.

Boom: Two 7ft lengths of 1in. dural angle.
Four 8in. lengths of 1in. dural angle.

The dowel rod is cut into 6in. lengths, dried in a hot oven and then thoroughly soaked in hot paraffin wax until well impregnated. The waxed "spokes" are fixed to the bearers on alternate sides at each half turn of the helical elements. Before the wire is put on it should be wound onto a former of approximately the same diameter as the helix—a large round toffee tin is suitable—so that it can be conveniently stretched out and lashed to the spokes with wire as shown in Fig. 1. The elements are identical with the exception of the loading coils, details of which are also given in Fig. 1. The driven element has a 3 turn air spaced link round the centre of its loading coil.

No details as to the exact method of making the boom will be given, as this will have to be constructed to meet the user's particular requirements. In the writer's case, the entire array weighs less than 12lb.

Tuning

Success or failure with this type of array depends largely on the tuning and it is therefore strongly recommended that great care should be taken in this operation.

A grid dip oscillator is essential: at ground level the driven element should be adjusted to about 14 Mc/s and the reflector to 13.3 Mc/s. Tuning can be accomplished by clipping the ends of the elements; 1in. being equivalent to a change in frequency of about 50 kc/s. This operation should be done with the link in place but the feeder disconnected. When checking the frequency, the g.d.o. should be coupled to the centre of the loading coil.

When the beam is raised off the ground, the frequencies to which the elements are tuned will rise; they should therefore be checked. At this stage, the simplest method of adjustment is to alter the spacing of the loading coils. The final setting for the driven element should be 14150 kc/s and for the reflector 13500 kc/s.

No difficulty should be experienced in feeding the

beam with 75 ohm co-ax coupled directly to the final tank circuit in the transmitter, but the use of an aerial coupler is to be preferred because, apart from its normal function of matching, it does serve as a TVI preventive measure. Transmitters with Collins or pi-network output circuits can of course be coupled to the beam without difficulty. In some circuits it may be found necessary to insert a small variable condenser in series with one side of the co-axial feeder but it should not normally be required.

Results

In practice the beam has worked out very satisfactorily; recent DX worked on phone has included W1, 2,3,4,7,9, VS1, VO8, LU, ZS, VQ4,5, and KR6 plus the usual Europeans. In view of its cost—about £4—and the fact that it compares very favourably with full-size two element beams, the writer is well satisfied with its performance. A photograph of the beam appears on page 483.

Acknowledgements

The writer wishes to acknowledge his indebtedness to George Tebolt (W2BT) for technical assistance.

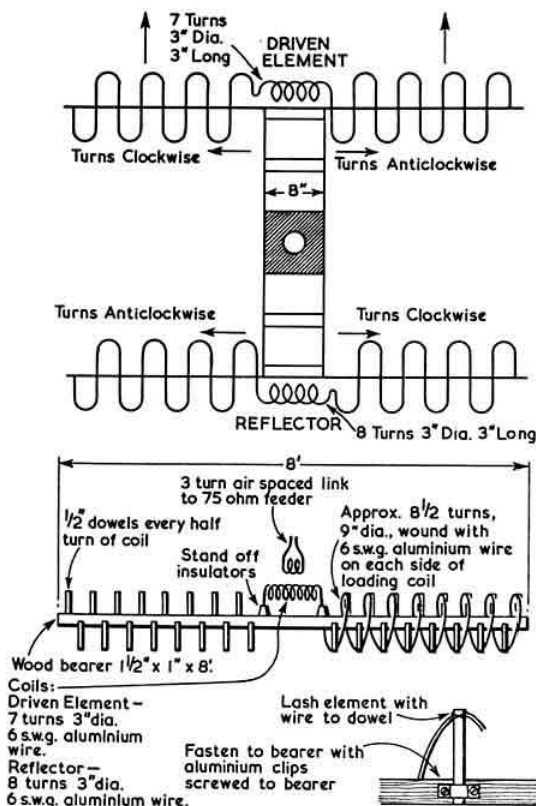


Fig. 1. Constructional details of the "Screwball" miniature 14 Mc/s beam.

* 94 Norway Street, Liverpool, 22

Improving the National HRO

By O. M. DERRICK (GM3OM)*

MANY HRO receivers still in use employ the UX base series of valves. This article, which deals with improving the performance of these excellent receivers, is the result of work carried out on the writer's own instrument—a wartime MX type. The modifications, however, hold good for any model using valves of the 6D6/6C6 type.

Replacing the Fixed Condensers

The first step is to replace the original filter and coupling condensers. This in itself gives an improvement in most cases. Although it entails the replacement of fourteen 0.1 μ F, seven 0.01 μ F and one 0.25 μ F condensers the task is not so irksome as it sounds because the component layout makes servicing easy. The only difficulty that may be experienced is in releasing the old condensers from their fixings due to the wire ends being wrapped round the tag supports. A miniature soldering iron should be used but if damage to other components is likely, owing to the heat, the condenser wires should be cut off close to the tag. A word of warning: do not use condensers from surplus equipment as they may lead to more trouble than the original ones. New, good quality, condensers of adequate voltage rating are essential. Hunts, Moldseal Type L51 600 V working are suitable.

Valves

After the valves have been checked with a reputable tester, it will probably be advisable to change over some of them to take advantage of improvements made in recent years. In the writer's case the second detector V7—a double diode pentode type 6B7—was replaced with an octal 6B8G which has identical characteristics and is easily obtained in the U.K.

For the r.f. stages, the 6BA6 (EF93, W727) was selected. This is a miniature high slope variable- μ pentode with a mutual conductance of 4.4 mA/V compared with 1.5 mA/V for the 6D6. Replacement of the latter types in the r.f. stages with 6BA6s entails no alteration to existing components except the cathode bias resistors which should be reduced to 68 ohms. In mounting bases for the miniature valves the writer found that the simplest method was to take out the old UX base and use it as a template to cut out a piece of aluminium the same size and shape, on to which the B7G holder was fastened. When bolting the new bases into place, the original screening cans should be fixed to the upper side of the chassis. The leads which come out of the upper side of the coil housing compartment can be fed through small slots at the rear and taken direct to the grid pins of the 6BA6 bases which should be suitably orientated before being finally fixed in position. If this is done no trouble will arise from unwanted coupling and the receiver will operate with absolute stability throughout its tuning range.

At this stage the receiver should be tested. In the writer's case it was found that sensitivity had risen considerably while the signal-to-noise ratio was much better.

Before carrying out the next modification it is essential to have available an accurate signal generator for re-alignment purposes.

In the writer's case the mixer (V3) and oscillator (V4) valves were replaced with Mullard EF36s. Their use improves the stability of the receiver to a marked degree, particularly on 21 and 28 Mc/s. To give greater oscillator stability, the screen supply to the valve should be regulated with a voltage stabilizer such as the VR150/30 which can be mounted beneath the chassis without alteration to the existing component layout.

The original valves may be retained in the other stages of the receiver but octal based 6K7s could be used in the i.f. amplifier and a 6J7 in the b.f.o. if desired. However, there would be little, if any, difference in general performance. The type 80 rectifier (UX base) in the power pack can be changed to one of the more common octal based types such as the 5Z4, thus facilitating replacement in the event of failure.

Alignment

After these modifications have been carried out, it is essential to re-align the receiver, an operation which will be greatly simplified if the Instruction Book is available. The correct alignment of the HRO, or for that matter any communication receiver that has been in use over a long period, is essential to obtain satisfactory results. Many receivers show a marked improvement after this has been carried out correctly as the falling off is a gradual process which is not observed until it becomes acute.

It was found that provision of an r.f. trimmer (aerial) condenser was a worthwhile improvement; accordingly a 75 μ F midge type was mounted and insulated on the upper part of the front panel between the S meter and the main tuning control.

Although the foregoing suggestions entail a fair amount of work, the time spent will be amply repaid in improved results. The performance will provide a receiver which can hold its own with any other available to the amateur at the present time.

Alaskan DX Certificate

WITH a view to promoting world-wide interest in working Alaskan Amateur Radio stations, the Anchorage Amateur Radio Club (KL7AA) is issuing an Alaskan DX Award. Applicants are required to submit QSL cards from ten different (Alaskan) KL7 stations, of whom four must be members of the Anchorage Amateur Radio Club. Contacts may be on either phone or c.w. on any band or combination of bands.

Applications for the award should be sent to the Anchorage Amateur Radio Club, Post Office Box 211, Anchorage, Alaska, from whom further details may be obtained.

OZ-CCA Contest

THE Fourth "OZ Cross Country" Contest organized by the Danish Society E.D.R. will commence at 21.00 G.M.T. on May 7 and end at 21.00 G.M.T. the following day. From 00.01 to 07.00 G.M.T. on May 8, Danish stations will not work European stations for contest points. Full details of the rules may be obtained from the Traffic Department, E.D.R., P.O. Box 335, Aalborg, Denmark. Entries must be postmarked not later than June 1, 1955.

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An Introduction to Amateur Transmitting

Part 3—The Tank Circuit, Harmonics and Parasitics

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

REGARDLESS of the actual method by which power is absorbed from a tuned circuit it is always convenient to suppose that it is being used to heat up a fictitious resistance which is in series with the coil and the capacitor. Thus we can regard the anode circuit of a power amplifier, the tank circuit as it is often called, as being as shown in Fig. 11 (a) where R_L accounts for all the losses in both the coil and the capacitor. When the aerial is coupled to the tank circuit another resistance R_A can be imagined as appearing in series with the coil as in Fig. 11 (b). The value of this resistance will grow as the coupling is increased; the power supposedly dissipated as heat by R_A will in fact be that supplied to the aerial for radiation as radio waves.

Now, if the transmitter is to operate efficiently, R_L must be low and R_A high. Only a small fraction of the available power will then be dissipated as heat in the tuned circuit and the major part will be passed to the aerial.

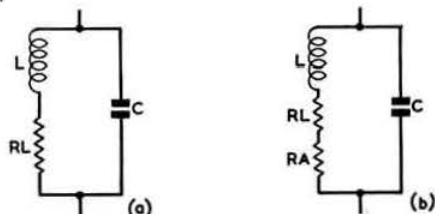


Fig. 11. The tank circuit.

(a) Equivalent circuit unloaded. (b) Equivalent circuit loaded.

R_L will be low if a high Q coil and a good quality capacitor with ceramic or polystyrene insulation are used. There is a limitation to how high we should make R_A . If it is too high the tuned circuit will be damped too drastically and its "pendulum" action spoilt. The aerial current waveform, instead of being a pure sine wave, will then be considerably distorted. A distorted sine wave of, say, 14 Mc/s is equivalent to a pure sine wave of that frequency plus smaller sine waves of some or all of the harmonic frequencies, 28 Mc/s, 42 Mc/s, 56 Mc/s, etc. To feed these harmonics into the aerial would almost certainly result in the radiation of signals at these frequencies and interference to television reception.

The value of R_A must therefore be something of a compromise and it is generally agreed that the best value is that which reduces the Q of the tuned circuit to 12†. The amateur usually has no facilities for accurately assessing Q and it is therefore safer to aim for a value of 15, thereby erring on the side of lower efficiency rather than that of increased harmonic output.

At resonance the tuned circuit will be equivalent to a resistance ($=2\pi fLQ$), the value of which will be dependent on those of L and Q. This resistance is in effect the anode load of the p.a. valve and must have some definite value if the valve is to operate at maximum efficiency.

*The value of Q is given by $2\pi fL/(R_A+R_L)$, where f is the frequency in c/s and L the inductance in Henrys.

*28a Glebe Road, Letchworth, Herts.

We need not follow the actual algebra here but the three requirements—(a) that L and C must tune to a certain frequency, (b) that the Q must be 15, and (c) that the effective resistance at resonance must have a predetermined value—all result in there being only one possible value for L and only one for C. In practice a transmitter will give an acceptable performance if there is some deviation from these values. Nevertheless, we should aim to be as close as possible to the ideal and not be content to use any handy coil and capacitor which happen to tune to the correct frequency.

TABLE I

Values of L and C to give Q of 15 in the circuit shown in Fig. 12(a).

V _a I _a	C (μF)		L (μH)	
	1.8 Mc/s	3.5 Mc/s	1.8 Mc/s	3.5 Mc/s
4	630	330	11	6
6	420	220	17	9
8	310	160	23	12
10	250	130	28	15

V_a = h.t. volts on p.a. anode. I_a = anode current in milliamperes.

Assuming the valve to be a typical tetrode the optimum values of L and C will be as given in Table 1. Table 2 shows the peak r.f. voltage which will be present at the anode when the transmitter is correctly loaded and operating on telegraphy (c.w.). When the transmitter is operated with a lighter load, such as

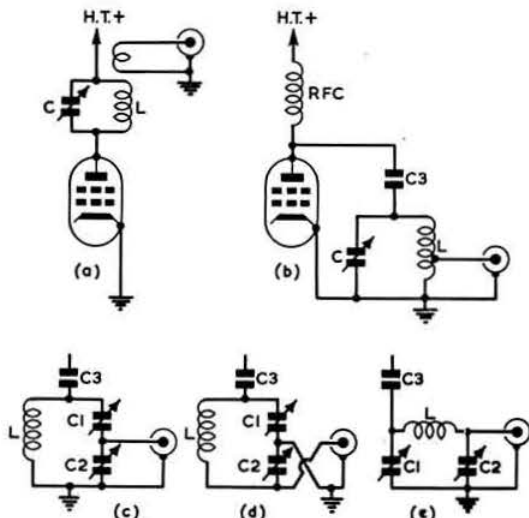


Fig. 12. Methods of feeding output to a co-axial cable. The pi-network circuit (e) is recommended because of its low harmonic output.

when tuning up, this voltage may be two or three times greater, and when using anode-modulated telephony it will be twice as high again. With the circuit shown in Fig. 12 (a), this r.f. voltage will be across the tuning capacitor C, so the spacing of the vanes must be sufficient to prevent any flashover. As a rough guide it is advisable to allow at least 0.02 in. per 500 volts. If the capacitor is connected direct from anode to earth it will also have the h.t. voltage across it and this should be added to the peak r.f. voltage.

As an example of tank circuit design, suppose we have a type 5763 miniature tetrode in a power amplifier which is to operate at frequencies within the 1.8 Mc/s band with an h.t. voltage of 300 and an anode current of 30 mA, i.e. with an input of 9 watts. The value of V_a/I_a is 10 and, by reference to Table 1, we find the values of L and C to be 28 μ H and 250 μ F respectively. From coil design tables, or from the formula given in

TABLE 2

Approximate peak r.f. voltages occurring in a tank circuit loaded to have Q of 15 and fed from tetrode p.a. valve.

$\frac{V_a}{I_a}$	Peak r.f. volts at anode (across C1 in Fig. 12(e))			Peak r.f. volts across 72 ohm output (across C2 in Fig. 12(e))		
	150W	25W	10W	150W	25W	10W
4	630	260	160	120	50	30
6	780	320	200	120	50	30
8	900	360	230	120	50	30
10	1000	410	260	120	50	30

Voltages are for telegraphy (c.w.) and must be multiplied by 2 for anode-modulated telephony.

Part 1, we see that 28 μ H can be obtained by approximately 50 turns of 22 s.w.g. enamelled wire close wound on a 1 in. diameter former. C could be a 500 μ F receiver type variable capacitor. These usually have specially shaped vanes, in which case the correct setting of 250 μ F would not be in the centre as might be expected but would be at about 120° rotation.

When tuning up the transmitter the loading would be adjusted to give the desired anode current at the dip, in the case of the example—30 mA; it could then be assumed that the valve had something like its correct anode load and that the Q was about 15.

Coupling the Transmitter to the Aerial Tuner

It is now a common practice among amateurs to terminate the aerial by what is known as an aerial tuner and to adjust this so that the aerial appears to the transmitter like a 72 ohm resistor. This simplifies the transmitter design because, whatever the actual characteristics of the aerial, the tank circuit will always be supplying power to the same load. The transmitter is usually connected to the aerial tuner by standard coaxial cable, such as that used for television aerial downleads, which is very efficient when terminated by a resistance of about 72 ohms.

One way of connecting the tank circuit to the output lead is to join the latter to a small coupling winding wound around the "cold" (or low r.f. potential) end of the tuned circuit as in Fig. 12 (a). The tank circuit then becomes an r.f. transformer and the coupling can be regulated by varying the number of turns on the output winding or by adjusting its proximity to the main winding.

Several other possible arrangements are illustrated. In Fig. 12 (b) the h.t. has been removed from the tuned circuit by the buffer capacitor C3 and an r.f. choke has been added to give a d.c. connection from the anode to the h.t. supply. Instead of using a coupling winding the output lead has been tapped into the coil.

A more elegant arrangement is to tap the output lead into the capacitance as in Fig. 12 (c). If both C1 and C2 are variable we can use them not only to alter the tuning but also to adjust the effective tapping point. In order that the rotors of both capacitors can be earthed the connections may be modified to those shown in Fig. 12 (d).

Pi-Network Tank Circuit

The circuit in Fig. 12 (d) is extremely valuable. It is usually drawn as in Fig. 12 (e) and, because of the resemblance of the network C1-L-C2 to the Greek letter π , is known as a pi-network tank circuit. Its great merit is that it is far more successful than most other circuits in suppressing harmonics. C1 is effectively from anode to earth and provides a fairly low impedance at harmonic frequencies; L is between the anode and the output socket and presents a high impedance; C2 provides a low impedance shunt right across the output socket. The suppression of the second harmonic is, in fact, four times better than with the circuit in Fig. 12 (a). With the higher harmonics the improvement is greater still and the suppression of the seventh harmonic, for example, is 49 times better. In the interests of reducing television interference, therefore, the use of the pi-network circuit is to be strongly recommended for 7, 14, 21 and 28 Mc/s—and for 3.5 Mc/s also if the input power exceeds 10 watts.

Assuming that the network is to feed from the anode of a tetrode into 72 ohms, and that the Q is to be 15, the correct values for C1, C2 and L will be approximately as given in Table 3. A typical pi-network tank circuit derived from this table is shown in Fig. 13.

The adjustments of C1 and C2 will be to some extent interdependent but C1 can be considered as the tuning control and C2 as the loading control. The tuning procedure is first to set C2 to maximum capacitance (to give minimum loading) and then to tune C1 for the anode current dip. The meter reading should then be low, indicating insufficient loading. The value of C2 is therefore decreased a little and C1 retuned, the process being repeated until the anode current at the dip has been brought to the desired value.

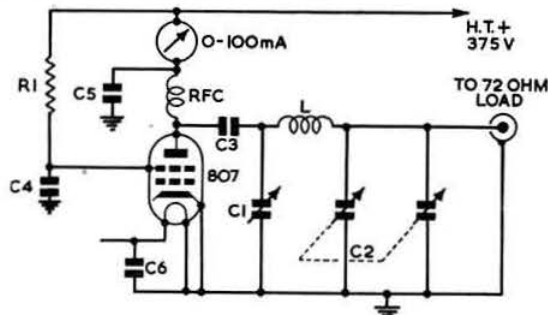


Fig. 13. A typical pi-network circuit for a 25 watt 14 Mc/s transmitter. Assuming the anode current to be 62.5 mA with the transmitter loaded, $V_a/I_a = 6$, the correct values ($Q = 15$) for C1, C2 and L are 50 μ F, 320 μ F and 3.05 μ H respectively. Practical component values are C1, 100 μ F variable; C2, 350 + 350 μ F receiver type; C3, 0.002 μ F mica 500 V wkg.; C4, 5, 0.001 μ F 500 V wkg.; C6, 0.001 μ F 350 V wkg.; L, 13 turns 14 s.w.g. enam., 1 in. diam., 1½ in. long, self supporting; R1, 6,800 ohms; RFC, 1 mH.

Harmonic Suppression

The mere use of a pi-network tank circuit alone does not guarantee that there will be negligible harmonic radiation in the television bands and it is still important to pay attention to a number of practical points. Among the most important are (a) enclosing the entire r.f. section of the transmitter in a metal box, ensuring that all parts of the box make good electrical contact to each other; (b) taking all earth connections associated with the p.a. stage by the shortest possible length of heavy gauge wire to one common point on the chassis close to the cathode pin; (c) using screened wire for all leads carrying h.t., g.b., or heater supplies; (d) fitting by-pass capacitors of 0.001 to 0.005 μ F from all unearthed heater pins and from each side of the mains input to chassis; (e) avoiding excessive r.f. input to the grid of the p.a.

TABLE 3

Correct values for C1, C2 and L to give Q of 15 in a pi-network tank circuit feeding from a typical beam tetrode into a 72 ohm load.

$\frac{V_a}{I_a}$	C1* (μ F)	C2* (μ F)	L* (μ H)
4	140	730	4.3
6	100	640	6.1
8	75	560	7.8
10	61	510	9.5

*Values are for 7 Mc/s. Multiply by 4 for 1.8 Mc/s, 2 for 3.5 Mc/s, $\frac{1}{2}$ for 14 Mc/s, $\frac{1}{3}$ for 21 Mc/s, and $\frac{1}{4}$ for 28 Mc/s.

Provided that sufficient care is taken with the above points there should be no appreciable v.h.f. radiation from the transmitter itself or from the mains lead. There may, however, still be a large enough harmonic content in the output to cause troublesome radiation from the aerial and it may be necessary to connect a filter between the transmitter and the aerial tuner. If this filter is to give severe attenuation of frequencies above 40 Mc/s and yet have negligible effect on frequencies in any amateur band from 1.8 to 30 Mc/s it must be carefully designed. Any newcomer contemplating the building of such a filter would be well advised therefore to copy the one described by Louis Varney (G5RV) in the BULLETIN for June, 1952, and to follow the adjustment procedure advocated.

Parasitic Oscillations

Spurious signals from a transmitter need not necessarily be caused by harmonics. They can also be due to parasitic oscillations occurring in one of the r.f. amplifiers or even in the oscillator. Sometimes they make themselves apparent by unstable or inefficient operation of the transmitter but sometimes are only noticeable as additional signals, usually rough in tone, picked up on a receiver.

Parasitic oscillations in the v.h.f. range can often be traced to poor screening or long wiring. Lengths of wire in the grid, anode, cathode and screen connections can act as tuned circuits which resonate at v.h.f. and, even though their Q may be low, the gain of a modern tetrode is so high that oscillation can easily result. Oscillations at v.h.f. are particularly liable when two or more valves are connected in parallel. It is then always advisable to include a parasitic stopper in the lead to each grid and to each anode. The stopper should

be wired direct to the valveholder and can be made by winding 5-10 turns of about 20 s.w.g. wire around an insulated type 100 ohm $\frac{1}{2}$ watt resistor, connecting the coil in parallel with the resistor. The optimum number of turns may have to be found by experiment.

If any stage has grid and anode chokes resonating at the same frequency, the feedback through the inter-electrode capacitance of the valve may occasionally give rise to spurious oscillation. The frequency will then usually be lower than the transmitter frequency. The remedy in such cases is to use a different type of choke in one position or to replace the grid choke by a resistor.

(To be continued)

Around the Trade

S. KEMPNER, Ltd., 29 Paddington Street, London, W.1, are now supplying an improved version of the "Primax" Soldering Gun, a particular feature of which is that the plastic case is practically unbreakable in use. The switch mechanism is contained in a small metal box which can be easily replaced should the need ever arise. The gun weighs 24 oz and uses an alloy tip which does not require re-tinning.

Mullard, Ltd., have announced the production of a new output pentode—the EL34—for use in medium power audio amplifiers. A pair in push-pull with fixed bias will give an output of 100 watts with 800 volts h.t. while a triode connected pair in push-pull gives an output of 14 watts at less than 1 per cent distortion with 430 volts h.t., or 16 watts at 3 per cent distortion with 400 volts h.t.

The EL34 is of single-ended construction and has a 6.3 volt, 1.5 A heater. The mutual conductance is 11 mA/V and the rated anode dissipation 25 watts.

Contests Diary

1955

May 1	-	-	Two Metre Field Day (No. 1)†
May 1	-	-	D/F Qualifying (Southend/Romford)‡
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)
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 rules, see page 497.

†For details, see page 497.

*For rules, see page 138, R.S.G.B. BULLETIN, September, 1954.

THE MONTH ON THE AIR

By S. A. HERBERT (G3ATU)*

ON the whole, conditions were rather quiet for much of the month under review. Ten metres resumed its role as a relay of ignition noises, while fifteen opened and shut like a feeding oyster—not a very hungry one at that! However, the remaining bands produced DX of varying quantity and quality, even though some of the openings were at inconvenient times. Twenty is beginning to stay open later and should soon be producing a good crop of strong Central and South American signals until far into the night. Already, the dusk period is often good for PY and LU, while sundry VP8s and LU...Zs are workable. Mornings remain disappointing, but there have been some excellent afternoon openings, with DX coming in from the Middle East, Far East and the Eastern Pacific. The other bands have had their moments and will be dealt with in detail later. In the meanwhile, as twenty has the biggest following this time, here are some of the things that have been happening on that band.

Twenty Metres

G3JKV (Liverpool)—active a year or so ago as VS1EV—took advantage of some leave to do a spot of serious phone operating using 75 watts to a dipole. Results achieved have convinced him that conditions are on the up-grade. Far Eastern DX has been especially good. The VS1EV log for 1951-53 shows mid-March as the earliest time of year for working G stations, yet this year G3JKV had his first QSO with VS1FK(R5-S8) in February, while for the next three weeks stations in VS1/VS2 were heard or worked on phone every afternoon, which seems to rule out any question of freak conditions. '3JKV also worked or heard VU2RC (most days—16.00), KR6, KA, VK, ZL, DU, 4S7LB, ZC2RR (R5-S9 at 1630), EL1LC and EL2A (1430), plus the usual Americans. He passes the news that ZD3BFC has plans for eighty and Top Band working. (If he *does*, some people will be in need of new ear-drums. The row will be terrific!)

GM3ITN (Clydebank), also on leave, using a mere 20 watts, worked W5OGS (Tex.), W7DL (Wash.), W6GAL/7 (Ariz.), KA2FC, OQ5CP on c.w., and VP2KM (St. Kitts). CT2AG, 4X4BO, PY, W and VE on phone. **DL2WM**, who left Germany recently, should soon have his home station (G3JQJ) in action once more. Before closing down in Germany, '2WM added PY1NAS, VU2MD, VK3VJ and FB8BE to make his total 43 countries worked. He had no luck with the U.S.S.R., although his friend DL2VX worked UB5KBE and received a QSL—on which "QSO" had been crossed out and "Hrd" substituted. '2WM overheard one UB5 saying that although the maximum input allowed to Soviet amateurs is 200 watts, his own rig was running at 500!

G2DHV reports **G3HEV** (R.A.R.C., Downham) active on 3.5, 7 and 14 Mc/s with a new 25 watt transmitter. On twenty phone, EL9A, ET2MZ, HK3PC, VK6DX,

XZ2ST, ZP5CF, HH2LR, PJ2AF and VP5BP were noted recently.

P. M. Crawford (Darlington) finds the band improved. On c.w. he has picked up UM8AR, VE5LK, KG4EP, while phone produced such DX as VS6CL, '6CG, KA, VK, VE8ME (Baffin Is.), VS2DO, CR6BX, CR7BZ, CM9AA, HK3PC, KR6MC, CE2 and ZL, with ZL2BE putting in his usual potent signal. PI1RRS, also logged, is at the Dutch Air Force Radio and Radar School at Arnhem. **B.R.S.20487** (N. Finchley) heard A3 from SU1AS, VK5MS, Y12AM, W7ESK and ZS, while **B.R.S.20135** used Sundays and odd evenings to log ZS3AB, OQ5GM, VP2KM, VP9BN, ET2US, HC1FG, ZD3BFC, ZD4BF, VK and CR6. **B.R.S.13386** heard

"... we've had a table topper here for many years."



TI2GC and KL7AON (Biorka Is., Alaska) and was pleased to receive cards from both. **B.R.S.20249** (Sutton) heard HZ1AB on phone during the A.R.R.L. Contest. PY, VP9BN, VQ2DT and PJ were good signals. C.w. loggings included LU8FAN and a CO5. '20249 mentions the unwitting help provided him by G3HLS, who digs out some good DX for him from time to time! **A1291** (Ashted) sends in a list of useful phone DX: YS1MS, VP9XX, VP2KM, KS4AW, FM7WN, FY7YE, TI2RAZ, VK9BS, JA, VU2FX, VS1BO, VS2EB, VK7RX, KR6AZ, KX6AF, KC6CG, DUIAP, 3A2AM (QSL via G6LX) and VQ4AR/P were his best.

B.R.S.20106 was in the thick of things as usual and lists such c.w. DX as FB8BR, FB8AK, ET3GB, FM7WD, FY7YE, FG7XB, KH6s 'CT, 'ER and 'ES (1800), OA1MS, UH8, VE6 and 7, VP3VN, VP7MD, VQ8AY, JA0BR (Tokyo—which means presumably that Iwo Jima is due for a change of call-sign). During the R.E.F. Contest, Norman heard stations calling YJ1KV, FY7YE was also heard on phone, as were MP4BBL, VP4TB, VS2DS and some VP2s.

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

G2FT (Mablethorpe) will long remember the East Coast floods in which his misfortune included the loss of all his QSL cards, dating back as far as 1929. Interest in radio waned for a time, but recently he has been playing with a "ZL Special" in the roof space and, with 90 watts c.w. and 60 watts on phone, he has successfully worked VQ4BNU, VQ8AY, FF8AQ, CR5SP, VQ2AB, ZS5DE and ZS6JZ, the last two on phone. A temperamental ground plane accounted for VP6AM, W6, 7 and 0, but '2FT was pleasantly amazed to get a QSL from LU8CW, reporting his signals R5-S6 in Buenos Aires while working a PA0 on eighty metre phone. His input was 50 watts to a 25ft. high 132ft. wire, sagging in the middle. The same post brought a report from Eric Trebilcock, who heard his 7 Mc/s signals—from the same aerial—at RST569. Seems a good wire!

G3ATU was one of the lucky ones to work TI9MHB and, later, on his return to W6MHB. John remarked that he would have worked many more Europeans if only they had kept clear of his own frequency. He used "break-in", but his v.f.o. was running continuously and he answered calls 10-15 kc/s away. Some of the c.w. heard by '3ATU includes MD7AB (logged on two successive Sunday mornings, calling "CQ G", but apparently replying to nobody), a UA3 calling UPOL4, a W1 calling ZD3A, a PY calling ZD3AD, CN8MM working ZD8AA, G7DW/MM making a "CQ" and



G3COI
". . . she really needs to be fitted with a noise limiter . . ."

some hopeful calling ZL7AR! MP4QAL is extremely active and MP4QAK (Qatar) is also on. JZ0AG was a strong signal one afternoon and appears to be genuine. He is under cover in Dutch New Guinea and asks for cards to be sent via PA0NOL. WSGAX/KG6 operates in the mornings; VK9GV (Papua) was worked at 1150 and KC6CG at 1340. (This is a new KC6CG. QSLs should go via W2UDI.) VK2FU is quite active and is ex-GM2OY. He is still using the old '2OY transmitter. It sounds fine, though '2FU confesses the v.f.o. needs an occasional "clout" to calm it down! On phone, VK9SP was heard for a microsecond, before disappearing for good and all under a cataract of calling Europeans. Some people, it seems, will never learn.

Fifteen Metres

Most people still concentrate on weekends for work on the band, but an exception is **R. J. R. Crocker** (Plymouth) whose long list is devoted entirely to 21 Mc/s with over 70 stations logged. His best are VS6CL, VU2CY, XZ2OM (daily at 1400, 21200 or 21360 crystal-controlled), MP4KAC, VQ4, ZS3BC, ZS3G, ZS9G, ZS4FP, PZIRM, EL, OA4AQ, KZ5, CE, CP5EK, ZE3JD, PY, LU, KV4, CX5AF, W5AXI/MM (in the Persian Gulf), W2ZXM/MM (at Hong Kong) and

W8QOH/MM (in the Congo River). That's good coverage so the band is not quite as dead as people think. **B.R.S.20135** heard W3NVI/MM (Persian Gulf), MP4KAC, ZS1, 2, 4, 6, VQ2FU, VU2CY and VS6CL. On phone, **B.R.S.20106** mentions CR6, MP4BBR, VK6BO, VP7NT, VQ5BVF, VS6CL (S9), ZS9G and ZS3BC, who was using s.s.b.

Forty Metres

Forty has been quiet of late, with patches of brilliance which rewarded the patient. **B.R.S.19107** heard JA3AF at RST579 on c.w. during the A.R.R.L. Contest. He often hears FG7XB and HK0AI. EL2X and ZS6DW were both S8 at 0330 during the Phone Section. In addition, John has a QSL from KR6KS for 7 Mc/s reception last January. **G3IRU** (Sutton) did well with only 5 watts c.w., working HB, SP and 9S4CH. He heard PY6FI and VQ3FN, the latter calling a PA0 and getting replies from rude people all over Europe. **G3ATU** struck a good morning when ZL, VK3AJA, W6ECE, W6BGX and W6RW were on the key. W6RW peaked S8 around 0800. **B.R.S.20106's** c.w. offerings are reminiscent of 14 Mc/s on a goodish day: CE6AB, CR6, CR7, FF8, FY7YC, FG7XB, OA5G, OQ5, ST2AR, VKs '2EO, '2AMB, '7KM, VP4BN, VQ2HR, W6, W7GHU, YV, ZC6UNJ and ZL!

Eighty Metres

Still with **B.R.S.20106**, who, on c.w., heard FP8AP, KP4TF, KN2KZF, KN4AAI, KV4AA, VP7NX, W5ZD, W6RW, W7PQE and ZLs '2ACV, '3JT, '3QX, '3GQ and '4IE. **B.R.S.19107** points out that he logged EL2X on c.w. and not on phone, as reported last month. Conditions were good during the first leg of the A.R.R.L. Phone Contest when PJ2AF, PJ2AO, VP4BN, VP6WR, VP7NX, KG4AJ, CT3AN, HB1MX/HE, CO2CY and HR1BG were heard between 3700-3800 kc/s. Conditions for the second leg were terrible: not even a W came through, but the c.w. weekend did produce FP8AP, HK4DP and VP7NX. John mentions TI9MHB's outstanding signal around 0500. He worked some Gs but the QRM (mainly from four FA8s) had to be heard to be believed. **A1291** heard LX1AY for an uncommon one on phone.

Top Band News

DX continues to be audible during the early hours and interest remains high. **B.R.S.19107** heard TI2BX (1828 kc/s, RST559) on March 13 and W2SKE was a strong phone signal during the A.R.R.L. Contest, second leg. YV5DE reports QSOs with G5JU and G3PU, but European QRM on 1830 kc/s has prevented other contacts, so he will henceforth use mainly 1870 or 1905 kc/s. HK4DP says he was active on March 27, between 1870-1900 kc/s with 1kW. We hope he got across. John has heard 38 countries on the band, despite missing LU, TI9, ZL, ZB1, YU and VP4, all of whom have been heard over here.

B.R.S.20106 heard W2SKE on phone and also managed to log VE, VO3X, KV4AA, VP4LZ, TI2BX, KP4CC and numerous Ws, so there is plenty of life in the band still. **G3EJF** reports that the Army Wireless Reserve Squadron will do their best to provide Westmorland activity during the period May 7-21. **W6MHB** has firm intentions of trying Top Band next winter. He has a good location and has high hopes of getting across to Europe.

Overseas News

Ex-ST2NW, now in Sarawak, hopes to be active as a VS4 when his gear arrives. QSLs should be sent to C. N. Webber, c/o International Aeradio, Ltd., c/o P.M.G., Kuching, Sarawak (via Singapore). **ON4QX**

writes intriguingly that there is a possibility of his going to Tibet in July. He envisages operation as ON4QX/AC4, providing he gets the necessary permission. Cards are already printed! He promises to send definite details later. Curt Olofsson (W6GT) 3809-A, 18th St., San Francisco, proposes to visit the U.K. this year and would like to correspond with a few British amateurs.

Ed Hopper (W2GT) confirms that ZD8AA is genuine. He is at a R/T repeater linking New York and Bahrain and frequently talks to W2AH via commercial circuits. 2GT worked him at 1830 and hears he is active from 2130-2330, with no lack of callers. G3GUK (ex-VS9AW) is licensed as VS1GO and should be active soon. Thanks to G2MI for passing along the above items.

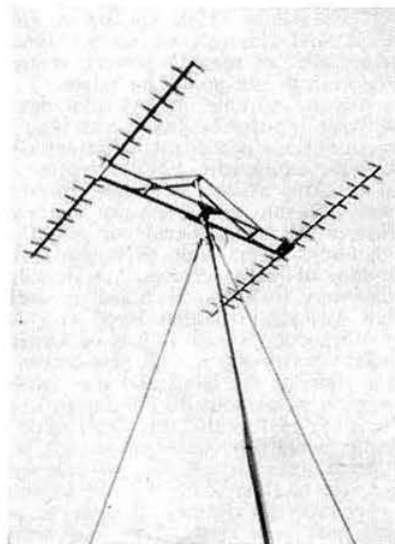
Bob Ballantyne (B.E.R.S.859), who is Radio Officer on the *S/S Itinda*, writes from Rangoon that in his travels he is able to listen from some out-of-the-way places and can cover 1.8 to 21 Mc/s, although 14 Mc/s is used most. From Burma on that band he hears VU and FI (locals!) and has logged KC6CG calling GW3FYR (c.w.) and VS1FS calling G4JB (phone). He checks 1.8 Mc/s but the only stations heard recently were VU5DU and VU5DP (believed to be commercial). He will be pleased to arrange listening skeds with U.K. stations and would particularly like to try Top Band. The Andamans, Ceylon and Pakistan are due for a visit (with a transmitter, next time?). '859 would also like to hear from other /MM *M.O.T.A.* readers. His address is *S/S Itinda*, c/o MacKinnon, MacKenzie & Co., Calcutta.

G3JFF has visited sundry beautiful islands, Barbados proving the highlight of the cruise, with wonderful hospitality. VP6WR took charge and introduced Mike to half of the 43 active VP6s, including old timer VP6KL—ex-G2KL of Manchester—who claims to have worked 30-odd countries without a modulator. A carbon microphone is coupled to his oscillator grid coil and away he goes! During a stay in Antigua, G3JFF/VP2 joined the 3865 kc/s "Antilles Net" and worked such DX (to us) as VP2, KP4 and KV4. The

net links the islands and passes met. information to Puerto Rico. Net control is a YL, KP4YX. G4MJ is the "most heard G" out there. Ex-ZC4CA/VU2CA has returned from Cyprus and hopes to put G3CAA back on the air soon. He has visited G6NN, who was recently in Cyprus, and was delighted with the true "Ham" welcome and the beautiful fire! He thinks 7 Mc/s is quieter than in Cyprus, where there were only two holes in the band, each about 3 kc/s wide.

F9HB/MM is on board the French Sea Scout ship "*Montjoie II*" and operates on 3.6 Mc/s.

The Screwball miniature 14 Mc/s two element beam, the construction of which is described by G8RI on page 476 of this issue. Despite its small size, the results achieved compare favourably with those of more conventional directive aerials of this type.



And that's the lot for yet another month. Please send reports and comments direct as usual, to arrive by April 20. Good hunting and 73.

Frequency Predictions for April, 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	1530	1600	1615	1430	1400	1400	1430	1000
21 Mc/s	1530	1600	1330—1900	1100—1800	1330—1430	1400	1430	1000
14 Mc/s	1200—2300	1000—2300	0930—2330	0700—2100	0630—2000	0700—1800	0800—1730	1100—1200 2230—2330
7 Mc/s	2000—0800	2200—0800	2200—0800	2200—0400	2000—0500	2100—0300	2000—0200	1600—2100
3.5 Mc/s	0000—0700	0200—0600	0400	0400	0000—0400	0200	0100	2000

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

TWO METRES AND DOWN.

By F. G. LAMBETH (G2AIW)*

HAROLD Beaumont (G5YV) of Leeds, has made some comments which contain a good deal of sound sense, and although we do not agree with all he says (especially as regards power), many could benefit by attention to the points he raises.

Anyone working on 2 m these days soon realises that activity appears to dwindle as time passes. One of the main reasons is that many newcomers tend to start with inferior equipment. Power is often far too low (5YV gives 50W as the desirable minimum) while on the receiving side, converters are frequently used with noise factors rendering signals of less than about S8 or 9 inaudible. If (as happens sometimes) operators have an indoor or badly screened low outside beam, it is found that very little can be heard or worked so that after a few weeks 2 m is abandoned as a dead loss.

Within a 50 mile radius of Leeds there are at least a dozen stations, *not* all newcomers, who often deplore the state of the band and the absence of all but local signals, when actually conditions are good. They never seem to realise that the fault may be with their own equipment. One case noted was of a station which started up with 150 W, was on regularly, putting out CQ calls and working only up to about 50 miles radius, when actually stations all over the country were receiving him well, and calling him without success. Owing to the weak link in his equipment chain he heard none of them and missed scores of possibly interesting QSOs.

Sympathy is expressed to those who have the misfortune to live in localities screened by hills or other obstacles, and these remarks do not apply to them, as however efficient their stations may be, they are limited by their local circumstances and can rely only on "wide open band" conditions. They could, of course, go out portable to the hill-tops or move to another, more favourable, address! The point which emerges very forcibly is, of course, that while a fair amount of inefficiency can be tolerated on the lower frequencies without undue penalty, the v.h.f. bands demand the utmost from aerial, receiver and transmitter alike if success is to be achieved. We earnestly exhort all those to whom these remarks apply to consider how they can improve their 2 m equipment. We are certain that many will return to the band if they will take the trouble to try again in this way. On a main point of disagreement, we would say that many stations are working successfully with 10-25 watts, although it is realised this usually owes something to QTH and efficiency of aerial.

Mobile 70 cm Contacts

The first mobile 70 cm QSO (at least as far as the U.K. is concerned) took place between G2DD/M (on Stanmore Hill) and G6NF (Shirley) on March 6. G2DD/M was on c.w., as a valve in his modulator was faulty, and received a report of RST 579 from G6NF who was S9 on phone. G2DD informs us that the whole mobile gear, including speech equipment, is in a case smaller than a TU box.

On March 20, G5KW/M and G8KW/M made the first mobile-to-mobile 70 cm contact. Working on a circuit of about 20 miles around Wilmington (Kent) they kept up contact for approximately two hours. They started with a "back to back" QSO which lasted for 500 yards and then contact was lost. After re-aligning the two cars contact was established portable at 800 yards. Then the divergent QSO was recommenced, and although the stations were in undulating country (*i.e.* very rarely line of sight) contact was then maintained as stated above. The maximum distance apart was 20 miles. Very heavy flutter was noticed at times. The aerials used were: G5KW/M: 7 element Yagi for transmission, half-wave dipole for reception (sometimes changed over); G8KW/M: two half-wave dipoles, one for transmission, one for reception.

French Band Plan

From *Radio REF* come the following particulars of the new French Band Plan for 2 m which has apparently been favourably received in France, and should be fully operative shortly. An interesting point is the provision of 300 kc/s for "local working."

144—144.15 Mc/s (Zone 7). Côte d'Or, Cher, Doubs, Hte. Saône, Jura, Nièvre, Saône et Loire.

144.15—144.3 Mc/s (Zone 4). Charente, Charente Maritime, Corrèze, Creuse, Deux Sèvres, Dordogne, Gironde, Hte. Vienne, Indre et Loire, Vienne.

144.3—144.5 Mc/s (Zone 9). Alpes Maritimes, Basses Alpes, Bouches du Rhone, Corsica, Gard, Hérault, Lozère, Var, Vaucluse.

144.5—144.65 Mc/s (Zone 5). Ariège, Aude, Aveyron, B. Pyrénées, Gers Hte. Garonne, H. Pyrénées, Landes, Lot, Lot et Garonne, Pyrénées Orientales, Tarn, Tarn et Garonne.

144.65—144.8 Mc/s (Zone 1). Eure, Eure et Loir, Loir-et-Cher, Seine et Marne.

144.8—145 Mc/s (Zone 1 a). Paris and environs (Seine, Seine et Oise).

145—145.2 Mc/s (Zone 8). Ain, Allier, Ardèche, Cantal, Drôme, Htes. Alpes, Hte. Loire, Hte. Savoie, Isère, Loire, Puy de Dôme, Rhone, Savoie.

145.2—145.35 Mc/s (Zone 3). Calvados, Côtes du Nord, Finistère, Ile et Vilaine, Loire Inf., Manche, Mayenne, Maine et Loire, Morbihan, Orne, Sarthe, Vendée.

145.35—145.5 Mc/s (Zone 2). Aisne, Ardennes, Nord, Oise, Pas de Calais, Seine Inf., Somme.

145.5—145.7 Mc/s (Zone 6). Aube, Bas Rhin, Hte. Marne, H. Rhin., Marne, Meurthe et Moselle, Meuse, Moselle, Vosges.

145.7—146 Mc/s. Local working.

Station Reports—2 m

The month under review has been one of odd openings with some fairly poor periods, although the impression persists that the band was never quite so dead as it sometimes seemed. The beginning of March marked a blossoming out which repeated past history and augured well for the future. On March 14 and 15 openings occurred again, and although not spectacular, were nevertheless very pleasing. Good hunting to all.

*21 Bridge Way, Whitton, Twickenham, Middlesex

and may awakening enthusiasm lead to real 2 m band activity this summer which, as hinted above, *could* be synonymous with "conditions."

G3DEN (New Barnet) hopes to return to the band shortly with an 829 p.a., a pair of slots, and a G2IQ converter. **G8PX** (Oxford) erected his slots during a spot of good weather and found they showed 1½ S points gain over the 4 element Yagi previously used, both on transmission and reception. However, '8PX didn't trust the wind, and they are now down again pending more permanent mast fixtures. G8PX/P will be out at Easter.

GW3GWA (Wrexham), reporting after a long period, says he has changed frequency to 145.04 Mc/s, but hopes to be in his correct Zone (and, he thinks, also out in the cold) very soon. This is a reminder to everyone to search the whole band, as stations are beginning to appear all over the range. With 20 watts to an 832, and a 4 element Yagi, '3GWA has worked ON4BZ (559/569) and many other DX stations. He is on most evenings with the beam usually southeast and looking for new stations.

G8VN (Rugby) says conditions were poor at the start of the period although he had two contacts with G3HTY (Far Forest, Worcs) on February 26. G3IOO was also worked; and three more QSOs with him up to March 10 were remarkable because '8VN had never heard '3IOO until two months ago! February 27 produced some good activity and 10 contacts were made with the Midlands and London. March 2 was good also, with ON4BZ heard at S7. First time QSOs were made with G2CVI, '5MR and '3IWJ. This last was a three-way including G3FMI in Chester. G5KW/P was heard and called on March 3 and 15, without success. On the latter date, '8VN says that '5KW/P was heard in Lancashire. A particularly good day was March 14 when several distant stations were worked. G2FTS (Hailsham) was heard on March 14-15 and repeatedly called without result. The regular sked G8VN/G6TA has been maintained with only one miss since January 23. On that occasion, '6TA was heard at RST 549. '8VN would like to have reports and experiences from anyone using indoor aerials exclusively on 2m.

G5MR (Hythe, Kent) considers that the opening of March 2 was widespread, and cites as evidence his QSOs with G8VN (Rugby), G3HAZ (Birmingham), G3WW (Wimblington), G3FIH (Bath), and G3IOO (Oswestry). '8VN and '3HAZ were first contacts. On March 15 the opening was more limited and appeared to be confined to South and West England and the near continent. PE1PL was worked for the first time, a pleasant surprise, as this was over the worst direction for '5MR, who had to fire straight through a hill to make contact. '5MR has experienced much of the identification trouble mentioned in this column last month, and says he prefers using c.w., but often has to operate phone to get replies! **G5YH** (Chiswick) also refers to this subject, his particular "bêtes noires" being (a) the stations signing "G gabble over to G gabble"; (b) the whistlers (they whistle a lot, say nothing, and then disappear); (c) the two stations who work each other without giving call-signs at all.

B.R.S.6327 (Earlsfield) now has 27 counties verified on 2 m since September, 1954. The Yagi is still at 18ft (see also "Worked and Heard"). **G2DDD** (Littlehampton) agrees that 2 m has been somewhat better lately. On March 2, with 8 watts of r.f., G6CW, '3WW and '2FJR were worked. Stations as far north as York were easily readable on telephony. On March 15 conditions were above average, and stations as far north as York were strongly audible; two first contacts were with

G2JF and '5JD. G2AIW puts an S9 signal down to the South Coast "off the back" of the beam. Sorry, the front to back ratio is bad, but the beam will sometimes be turned round! '2DDD says if we could only find some means of imparting v.h.f. "know-how" to all the workers on the lower frequencies, there would be far greater v.h.f. occupancy. Well, that is what we are trying for, so what about someone spreading the good news? '2DDD reminds us that in the great opening of March, 1953, there appeared to be hundreds of stations on (there were—Ed.), whilst on March 13 *this year* during a wide open period, G6XM (York) was audible at S9 and only four other stations were heard during a whole hour. Another plea is for "Activity Periods" irrespective of conditions. Please let us have your views.

B.R.S.19162 (Dewsbury) heard both sides of the ON4BX/G6NB on March 2, the first occasion he has heard a complete QSO over 100 miles. This incidentally was the first time a continental station had been heard by '19162; 4 or 5 stations in Lines, and Cambs. were very strong at the time. Turning the beam in the other direction brought nothing, not even weak carriers! The maxim that conditions are good on the morning after a good evening didn't hold good in this case, as '19162 heard no stations on the morning of March 3, although special search was made. Listening time is 17.30-19.30, 21.45-22.30. '19162 says there are plenty of stations on Top Band all the evening, so why cannot there be plenty on 144 Mc/s also?

G3LB (Ripon) hopes soon to be active from home and car on 2m. Several types of aerial will be used and the frequency will be between 144.2 and 144.4 Mc/s, output about 10 W. '3LB will welcome reports. Ripon is in a basin between high ground, and some shielding is feared, but "you never know."

G2AHP (Perivale) has not been so active as usual, but has worked some 30 stations, of which G2AHY (Crowthorne), G3KEQ (Sanderstead) and G2BDP (Guildford) were new ones. **G3IIT** (Cambridge) is now getting

First International V.H.F.—U.H.F. Convention

Saturday, May 14, 1955

Bedford Corner Hotel
Bayley Street, Tottenham Court Road,
London, W.C.1

Programme

Exhibition of u.h.f. equipment	-	10 a.m.
Exhibition closes	-	12 noon
Lunch	-	1 p.m.
Lecturettes on v.h.f./u.h.f. topics	-	2.15 p.m.
Reception	-	6.30 p.m.
Dinner	-	7 p.m.
Conversazione followed by Grand Raffle	-	8 p.m.

Inclusive charge £1 (Convention only—2/6, Lunch only—7/6,
Dinner only—12/6). Tickets may be obtained from P. A.
Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

excellent reports from 4 stacked slots. The feeder system, which earlier broke down, has now been renewed and reports of S9+ have been received from a distance of 150 miles with only 15 watts input.

G5YV (Leeds) reports conditions poor until March 17, when the band was open for G- and E-DX but activity was low, especially on the continent. DL3VJ was S8-9 throughout the evening and was raised more than once; ON4BZ was the strongest. The following were also worked: DL9ARA, F8HIL, PA0FB, PA0HAK, PA0YZ and PA0RK. DL6MH was heard but not worked. GM and GI stations are again appearing from time to time, particularly GM3EGW, GM6KH and GI5AJ.

G3AIM (Liverpool), a newcomer to 2 m, is building gear for portable working in the Hebrides for three months from May. A good one to look for! **G5CP** (Chesterfield) had his first contact on 2 m with Belgium—ON4BZ (58 each way on phone)—on March 2. The G5CP/G5MA sked now totals 113. '5CP came to Ashstead during the period and had a personal QSO with '5MA, enjoying '5MA's and his XYL's excellent hospitality. **G5MA** (Ashstead) has worked G6CW (Nottingham), '6XM (York), '2HOP (Stanford) and, among others, GC3EBK (Guernsey). '5MA regrets he will be unable to make a portable trip this Easter, as he will be fully occupied moving to another Surrey QTH, which he hopes will be more favourable for 2 m DX!

G3WW (March) found March 2-3, 4, 12, 14 and 15, good days. First contacts during the period were with G3JJB (Burnham) and G3JXN (Highgate). G2FQP is leaving Ramsey (Hunts) to go to Weston-super-Mare; Huntingdonshire, therefore, loses its last active resident v.h.f. operator until G5YK (who has moved to Upwood) starts up. A peculiar high speed flutter was noticed on London and Birmingham phone stations from 19.23-22.50 G.M.T. on March 4, a phenomenon also noticed by others.

G6XX (Howden) worked PA0RK on March 2, and PA0HAK was heard. PE1PL was raised on the 15th at midday and GM3EGW in the evening. G5TZ and G3DOV were both S9+ phone signals on March 2. '6XX would like to see an article on v.h.f. aeriels showing comparative radiation angles of stacks, slots, Yagis and stacked Yagis. There are many varying opinions and '6XX would like to get something authoritative. How about it someone? **G2CZS** (Chelmsford) was prevented by indisposition from taking part in the opening of March 2-3, but G3FIH (Bath) was heard. G6FO was worked on March 10. March 13 was quite good and G5AM, '3DOV, and '6OX, were worked. The next good spell was March 15, with G3IEH, '3WW, '5TZ, and '3ION worked, the latter a first contact. Much time is being spent on aerial matching and the new i.f. head amplifier gives a better noise factor.

B.R.S. 16075 (Southampton) reports again and is pleased to note that G3ION, '3CGE, '3FAN, '5TZ, and '3BNC still keep the local area well represented on 2m. '3ION is using a pair of slots which show promise; they will be put higher soon. G3BHS and '3CGE still have no beams, but are working locally. '16075 is again using a cascode with a 6BQ7A. '3ION has a similar one with a PCC84. '3ION and '16075 are to design a "good" v.f.o. for 2 m, to move off the TV local oscillators. The interference is so bad that sometimes a local 2 m station cannot be read! The local R.A.E.N. group are pressing on with the 2 m "handy-talkie" sets.

G6TA (Streatham) found there was quite a falling off in activity during the very cold weather (hearing remarks about temperatures in some shacks we are not surprised), but recently things have improved. '6TA is

running a daily sked with '3IOO at 19.00, besides the weekly one with '8VN at 09.35 on Sundays. 87 different stations were worked during the month.

A welcome letter from **GC2FZC** (St. Peter Port, Guernsey, C.I.) reports that apart from G5TZ (I.o.W.), who is always audible, very few stations are heard in the Channel Islands. There are, of course, openings sometimes and on March 1 phone QSOs were made with G5TZ, '2HDZ, '6NB and with '2XV and '5KW/P on c.w. G5MA was heard. The following evening, however, G5TZ, who was the only station audible, said that conditions were good to the north. GC2FZC listens most evenings between 18.30-19.15 and after 22.45. He uses phone or c.w. with 17 watts input to an 832.

GW8UH (Penylan, Cardiff) has not been very active lately owing to pressure of business but a new 8 element stack will be erected shortly, and an improvement is hoped for over the pair of slots now in use. **GW5BI** has moved QTH, but is still in Cardiff. When he reappears on 2 m it will be with a higher aerial, rotatable from within the shack. **G2AOK** (Stow-on-the-Wold) has received confirmation of a c.w. QSO with LA8RB in the summer of 1953. The report was 579.

On March 30, DL1LB (f.m. phone), DL3VJ and several PAOs were worked by a number of stations.

News from Scotland—2 m

GM6WL (Glasgow) reports several additions to the list of active 2 m Scottish stations. GM8AH, one of the early 5 m pioneers, and one of the first on 2 m, is active again. **GM8MJ**, his sparring partner in the 5 m days, is also back on 2 m. He is a keen DX man on the h.f. bands and it is hoped he will reinforce the ranks of the Scottish stations interested in long distance communication on 2 m. Apart from GM3EGW (who is in a class by himself) '6KH has probably been the most successful with QSOs with G5YV (several), '3CCH, '6XX and has also been called by G6XM. On March 10, GM6WL received a welcome visit from G3IUD (Wilmslow) and fortunately conditions were good enough for a QSO with GI5AJ (Bangor, Co. Down). This interested G3IUD and a tentative sked was fixed up between Wilmslow and Bangor (Co. Down). On his return home, '3IUD turned his beam north and immediately had a QSO with GM3EGW. It seems it takes a personal visit to find out ways of penetrating the mysteries of the GM ether on 2 m.

March 15 was good, with GI5AJ very strong (working GM3EGW and '6WL). GI3GQB called GM6WL afterwards but fading was bad by then and the QSO was inconclusive. The most promising outcome of all this is that stations who have been constructing 2 m converters are hearing new stations for the first time. GM3NG who, with the aid of GM6KH, had just finished a new 6J6 converter, heard GI5AJ and G5YV. GM2CQI heard GI5AJ who was also logged by GM6ZV. GM3DYC, the purveyor of surprises from the built-up area, finding his 2 m Yagi somewhat unsatisfactory, coupled the 2 m gear to his 40 m Zepp with vastly improved results as far as Dunfermline. The assumption is that the long wire, being higher and in the clear, is better than the Yagi surrounded by water tanks and chimney cowl. Moral: hoist the Yagi up a bit!

GM3EGW (Dunfermline) has returned to 2 m and finds activity very low in E. Scotland. **GM6KH** has a v.f.o. working and is getting quite good results. He has worked G5YV several times and also G6XM. Many carriers have been heard from the south lately and it is a great shame the call-signs were not sent on c.w. One heard was almost certainly G2ATK, and another G3IOO. The latter was in QSO with G5YV who was

arranging to have '3IOO on at a suitable time to work GM3EGW! Shortly after this, however, conditions deteriorated and confirmation with G5YV is yet lacking. On the 10th an interesting QSO was had with G3CCH (Scunthorpe) whose s.s.b. signal was R5 with a signal S3/5. Remarkable demonstration! Amplitude modulation could never have succeeded in such conditions. The sked with G5BD is still "off" but a Saturday and Sunday 23.00 arrangement has been made with G3IUD. The path is bad, but it's worth trying! There is trouble in Dunfermline from TV receiver oscillators, and the band from approximately 144.7 Mc/s up is virtually unusable with dozens of whistles, squeals and other emanations. It is better below 144.7 Mc/s but it is not possible to hunt for DX during TV hours. Apologies, therefore, to those who have called GM3EGW and received no reply. G5YV has been heard several times working PE1PL at midday, but neither '3EGW nor '6KH has yet heard the Dutch station.

Seventy Centimetre News

The monthly activity report from G2RD (Wallington) is as follows (February 17 to March 15): G2DD, '2DD/M (434.82), '2DDD (435.66), '2FKZ (435.95), '2HDI (434.5), '2HDY (435.5) '2RD (435.53), '2WJ (436),

'2WS (434.37), '2XV (435.2), '3ECA (434.85), '3EOH (434.55), '3EYV (435.06), '3FD (434.6), '3FP (434.98), '3GDR (435.39), '3HBW (434.61), '3HKD (434.7), '3IRW (434.4), '3JHM (434.92), '3JQN (435.05), '3MI (434.13), '5CD (434.6), '5DT (434.9), '5KW (435.75), '5RD (435.25), '6NF (435.66), G8SK (435).

G2DDD (Littlehampton) says the sked with G3HBW (Wembley) has been discontinued, as it has been proved that they can make regular contact at the distance, in spite of the poor path between the two stations. G2DSP and '2DDD have come to the conclusion that apart from G3HBW, '2DD and '3FP, London stations are not interested in regular QSOs with stations on the South Coast. Accordingly, they hope that their efforts with F8OL and other new French 70 cm stations will be more successful. G5YV (Leeds) hopes to have a 48 element stack up by the time this issue is published.

Seventy Centimetres in Scotland

GM6WL was glad to be able to let G3IUD hear how GM6KH and '3NG come in on phone on a new receiver (built by Mr. Campbell of Nitshill, a keen 70 cm constructor) of G3BKQ design. It seems very promising.

Reports for the May issue by April 20, please.

Worked and Heard on Two

G2AIW (Twickenham) February 21-March 20.

Worked: G2BDP, '2COP, '3GGJ, '3GHO, '3GOP, '3HAZ, '3ION, '3IUD, '3IYX, '3WW, '5BD, '5DT, '5KW/P, '5SK, '5YH, '6CW, '6NB, '6XM, '6XX, '8VN, GWSU. Heard: G2ABD, '2ADZ, '2ATK, '2FTS, '2HCG, '2HDP, '2HOP, '2PU, '3BJQ, '3CCH, '3CGO, '3CLW, '3FAN, '3FMO, '3FYY, '3GKZ, '3HXS, '3IAM, '3IOO, '3ISA, '3JQN, '3JXN, '3KEO, '3CP, '3JO, '3TZ, '6FO, '6OX, '8KW, '8RW.

G2CZS (Chelmsford) March 1-15.

Worked: G2YB, '3ANB, '3DOV, '3IEH, '3ION, '3JXN, '3KEO, '3VI, '3WW, '5AM, '5KW/P, '5TZ, '6FO, '6LL, '6OX, '8LN. Heard: G2HCG, '2MV, '3BSU, '3BTC, '3FAN, '3FIH, '3IOO, '5MA, '5UM, '5YV, '6NB, '6TA, PE1PL.

G3IIT (Cambridge) March 1-17.

Worked: G2ABD, '2COP, '2FTS, '2HCG, '2MV, '2WJ, '2XV, '2YB, '3CRH, '3DKF, '3DOV, '3GGJ, '3IRA, '3WW, '4MW, '4SA, '5KW/P, '5TZ/A, '5UM, '5YV, '6TA, '6XX, '8VN. Heard: G3BRX, '3FAN, '3ION, '5CP.

G3WW (Wimbleton) February 27-March 16.

Worked: G2AHL, '2AIW, '2AOK, '2BVW, '2CZS, '2DDD, '2FNW, '2FOP, '2HCG, '2HOP, '2WJ, '2XV, '2YB, '3BDP, '3BII, '3BRX, '3BSU, '3FAN, '3FIH, '3GGJ, '3HAZ, '3IAM, '3IIT, '3IJB, '3IOO, '3ISA, '3JHM, '3JXN, '3KEO, '5KW/P, '5ML, '5MR, '5SK, '6TA, '6YP, '6XM, '8KW. Heard: G2ABD, '2MV, '2RD, '3EGG, '3GHO, '3HXS, '4MW, '6NB, ON4BZ.

G5MA (Ashted) To March 20.

Worked: G2DDD, '2HOP, '3ION, '3IRA, '3JZG, '5CP, '6CW, '6XM, '8BP, GC3EBK.

G5MR (Hythe, Kent) February 27-March 15.

Worked: G2IF, '3FIH, '3HAZ, '3IIZ, '3IOO, '3WW, '5KW/P, '5US, '6CW, '6YP, '8RK, '8VN, PE1PL. Heard: F3JN, '8GH, G2AIW, '2AOK, '2DDD, '2HCG, '2UN, '3BSU, '3DJX, '3EMU, '3GHO, '3HXS, '3IEH, '3ION, '3JHM, '4SA, '5TZ, '5YV, '6NB, '6OX, '8KW, ON4BZ.

G5YH (Chiswick) February 16-March 15.

Worked: G2MV, '2AHP, '2BDP, '3DF, '3ANB, '3EYV, '3FSG, '4AJ, '5KW, '6OX, '6TA, '8UO. Heard: G2MO, '2PU, '2RD, '2TP, '2UO, '2WS, '2AHL, '2AIW, '3FD, '3BRX, '3BYI, '3EOH, '3FAN, '3FIH, '3FOS, '3FYY, '3GGJ, '3GHO, '3GSE, '3GSG, '3HJW, '3IAM, '3IIT, '3ION, '3ISA, '3JQN, '3JXN, '3KEO, '4AU, '4KD, '4SA, '5MA, '5MR, '5RD, '5TZ, '5UM, '5YV, '6CW, '6JP, '6NB, '6XH, '6XX, '8KW, '8SK, '8RW.

G5YV (Leeds) February 17-March 17.

Worked: DL3VJ, DL9ARA, F8HL, G2AIW, '2ANS, '2FCL, '2HOP, '2HO, '2MV, '2RD, '3AIM, '3AGS, '3CUZ, '3DA, '3FMI, '3FYY, '3GGJ, '3HXS, '3IIT, '3IJB, '3IOE, '3IOO, '3IJB, '3MY, '3NT, '5KW/P, '5ML, '5TZ, '6LL, '6NB, '6OX, '6TA, '6XM, '6XX, '8BP, '8RW, '8UO/P, '8VN, G1SAJ, GM3EGW, GM6KH, ON4BZ, PA0FZ, PA0HAK, PA0YZ, PE1PL. Heard: DL6MH, F8GH, G2ACD, '2ADZ, '2ATK, '2BVW, '2COP, '2DCI, '2FJR, '2FZN, '2HCG, '2KO, '2YB, '3APY, '3ARX, '3CCH, '3DOV, '3ENS, '3FAN, '3FMO, '3FUW, '3GHO, '3GMX, '3IUD, '3WW, '5BD, '5CP, '5GX, '5MA, '5VN/A, '6CW, '6FO, '6FK, '6OS, '6OU, '6UJ, '6SN, '6SB, PA0RK.

G6TA (Streatham) February 19-March 18.

Worked: G2ABD, '2AHP, '2AHY, '2ANS, '2ANT, '2AOK, '2ATK, '2BBN, '2BDP, '2BVW, '2DUV, '2RD, '2WS, '2YB, '3ABA, '3AGR, '3ANB, '3BII, '3BJQ, '3BNC, '3BSU, '3BYI, '3DF, '3DKF, '3EGG, '3ENY, '3EPW, '3FAN, '3FIH, '3FSG, '3FUH, '3FUW, '3FYY,

'3GGJ, '3GHO, '3GKD, '3GKZ, '3GOP, '3GOZ, '3GWB, '3IAM, '3IIT, '3ION, '3IOO, '3IRA, '3ISA, '3ITF, '3IWI, '3IYX, '3JEP, '3JFR, '3JH, '3KEO, '3VI, '3WW, '4SA, '5BC, '5CP, '5KW, '5KW/P, '5LO, '5ML, '5SK, '5TZ, '5US, '5YH, '5YV, '6CW, '6FK, '6FO, '6GR, '6LL, '6NB, '6OU, '6OX, '6WU, '6XH, '6XX, '6XY, '8CK, '8KW, '8LN, '8RW, '8UO, '8UO/P, '8VN, '8VZ.

G8VN (Rugby) February 15-March 14.

Worked: G2ABD, '2AIW, '2ANS, '2ATK, '2BVW, '2COP, '2CDV, '2FNW, '2FTS, '2HOP, '2MV, '3BA, '3BJQ, '3CKO, '3CUZ, '3DKF, '3EJO, '3EPW, '3FAN, '3FMI, '3FUW, '3GGJ, '3GHO, '3GKZ, '3HAZ, '3HHD, '3HHY, '3HTY, '3HZE, '3IAI, '3IIT, '3IOO, '3IWI, '3JZG, '3KEF/A, '3KEO, '3WS, '3WW, '4SA, '5CP, '5GN, '5JU, '5KW/P, '5ML, '5MR, '5SK, '5TZ, '5YV, '6CW, '6NB, '6SN, '6TA, '6XA, '6XM, '6XY, '6YU, '8RW, ON4BZ (33 worked).

GM3EGW (Dunfermline) February 17-March 17.

Worked: G3BW, '3CCH, '3IUD, '5YV, '6UJ, '6XM, '6XX, G1SAJ, GM3FYB, '3NG, '3DYC, '3INK, '3JWS, GM6KH, GM8AH, '8MJ. Heard: G3IOE, G13GQB, GM3DDE, '3JFI, GM5VG, GM6WL.

GW3GWA (Wrexham) December 29-March 17.

Worked: G2AIW, '2XV, '2HCG, '3DQO, '3FMI, '3HWC, '3IOO, '3IWI, '3WW, '5AU, '5IU, '5MA, '5YV, '6XA, '6XM, '8VN, ON4BZ. Heard: G2AIW, '2COP, '2MV, '3EPW, '3IIT, '6TA, '8BP, '8SB.

GW8UH (Cardiff) January 28-March 18.

Worked: G3BII, '3BNC, '3FAN, '3FIH, '3GNJ, '3HXS, '5MA, '6OX. Heard: G2ADZ, '2AIW, '2YB, '3HZE, '3ITF, '3YH, '5BD, '5TZ, '5YV, '6FO.

B.R.S.6327 (Earlsfield) February 13-March 10.

Worked: G2AHP, '2AHY, '2AIW, '2AOK, '2BDP, '2DTP, '2MO, '2MV, '2RD, '3ABA, '3AGR, '3AMB, '3BII, '3BJQ, '3BYI, '3DF, '3GG, '3ENY, '3EYV, '3FAN, '3FIH, '3FSG, '3FUH, '3FUL, '3FYY, '3GOZ, '3GSM, '3HGO, '3HJW, '3IOO, '3IRA, '3JFR, '3JQN, '3JXN, '3KEO, '3MI, '4AJ, '4SA, '5CP, '5DS, '5KW, '5KW/P, '5MA, '5UM, '5YH, '6CW, '6FK, '6LL, '6LX, '6NB, '6OX, '6TA, '6XH, '6XX, '6XY, '8KW, '8KZ, '8UO/P (Hog's Back, Surrey), '8VN.

B.R.S.16075 (Southampton) February 19-March 19.

Worked: G2AIW, '2HDS, '2HCG, '3BNC, '3BHS, '3CGE, '3FAN, '3FIH, '3FMO, '3GOP, '3ION, '3IRA (using f.m.), '3JFR, '2NM, '2YB, '3WW, '5TZ, '6NB, '6TA, '6UH, GWSBI, GWSUH.

B.R.S.19162 (Dewsbury, Yorks) February 18-March 18.

Worked: G2HOP, '2XV, '3WW, '5AU, '5CP, '5ML, '6LI, '6NB, '8BP, ON4BZ.

Can You Help?

- G. V. Haylock (G2DHY), 63 Lewisham Hill, London, S.E.13, who wishes to borrow the circuit diagrams and handbooks for the British Army 38, 46 and 68P sets?
- G. Henry (G13BHX), Carrowlaverty, Armoey, Co. Antrim, Northern Ireland, who wishes to borrow the manual for the New Zealand ZCI Mk. II transmitter-receiver?
- Headquarters who have received a request for the loan of the Philips Model 666 and Philips Model 747A Service Sheets?
- R. Reynolds (G3IDW), 136 Beech Avenue, Swindon, who would like to hear from any member who has modified the r.f. section to incorporate bandspread and added a noise limiter and S-meter to the CR100/2 receiver?

Society News

Recorded Lecture Library

THE following recorded lectures are now available to R.S.G.B. Groups and Affiliated Societies:

- "V.H.F.", by Sir Noel Ashbridge
- "The Engineer and Society," by Capt. P. P. Eckersley, M.I.E.E.
- "TVI-proof Transmitter Design," by Louis Varney, A.M.I.E.E. (G5RV)
- "Interplanetary Travel," by W. A. Scarr, M.A. (G2WS)
- "Modern Disc and Tape Recording," by H. A. M. Clark, M.I.E.E. (G6OT)
- "Hints on Mobile Operation," by C. H. L. Edwards, A.M.I.E.E. (G8TL)

These lectures are available for use on both Scophony-Baird and standard *twin-track* recorders (Wearite, E.M.I., etc.). When applying for the loan of a lecture, the type of machine to be employed for the playback should be stated.

Applications for the loan of tapes should be sent to Mr. E. Fish (G2HCZ), 107 Eton Road, Ilford, Essex. Those borrowing tapes are asked to take great care of them and to return them promptly by registered post. There is no charge for the service.

London Meeting

PAST Presidents Arthur Milne (G2MI), Gerald Marcuse (G2NM) and Alfred Gay (G6NF), together with Vice-Presidents J. W. Mathews (G6LL), H. A. M. Clark (G6OT) and D. N. Corfield (G5CD), were among the small, but enthusiastic, audience present at the Institution of Electrical Engineers on Friday, March 25, 1955, to hear Mr. Maurice Child lecture on "The Historical Development of Wireless Communication."

Mr. Child, himself a Vice-President of the Society and a pioneer in the field of wireless, showed a number of interesting slides and demonstrated several pieces of historic equipment. Mr. Child paid warm tribute to the co-operation he had received from the Science Museum in preparing the lecture.

The Chair was taken by the Immediate Past President (Mr. Arthur Milne) who was deputizing for the President.

A vote of thanks to the speaker was proposed by Mr. H. A. M. Clark.

False SOS

APPROPOS the paragraph headed "False SOS" published in the March, 1955, issue of the BULLETIN under "Council Proceedings," the Hon. Secretary of

SUBSCRIPTIONS PAID BY BANKER'S ORDER.

IT is now well over a year since subscription rates were increased and most members who renew by means of a Banker's Order have given the necessary instructions to their bank to increase the amount of the annual payment. There are still, however, nearly 800 members who despite repeated requests from Headquarters have neither amended their instructions nor paid the balance due for last year in cash.

Up to now the BULLETIN has been sent to these members each month but the time has now come when, in fairness to other members, this practice must cease.

ACCORDINGLY, AS FROM MAY 1, 1955, THE BULLETIN WILL NOT BE SENT TO ANY MEMBER WHOSE SUBSCRIPTION IS AT THAT DATE, OR BECOMES THEREAFTER, THREE MONTHS OR MORE IN ARREAR.

Members must bear in mind that, in accordance with Article 22, if their subscription is three months or more in arrear they are not entitled to receive notices, attend or vote at meetings or nominate members for any position in the Society. They are still, however, liable for any amount that may be due. In addition, the rules of all contests organised by the Society require entrants to be fully paid-up members.

Just in case there are any doubts as to the current subscription rates they are as follows:—

Home Corporate Members	27/6
Overseas Corporate Members	21/-
Associates	15/-

Incidentally, it would reduce the cost of collection and greatly ease the burden on Headquarters' staff if those members who have not already done so would make arrangements to pay subscriptions by Banker's Order. A postcard to Headquarters will bring the necessary form.

G3BZG.

Reminder

If you do not receive the May BULLETIN make sure you have paid the full amount of your subscription

the Finnish National Society (S.A.R.L.) in a letter to Mr. Arthur Milne states that the call-sign OH2AV/MM is unknown in Finland.

Members will recollect that the Society recently wrote to the Commander-in-Chief, Home Fleet, concerning an allegation that a radio amateur was responsible for sending a false SOS.

In his reply the Commander-in-Chief informed the Society that the call-sign used by the station concerned was OH2AV/MM.

On hearing from Mr. Milne the S.R.A.L. reported the facts to the Finnish Post and Telegraph authorities but they could throw no light on the matter. The organization which looks after the interests of professional radio telegraphists has also agreed to make enquiries.

Question and Answer

IN the House of Commons on March 7, 1955, Mr. Langford-Holt, Member of Parliament for Shrewsbury, asked the Assistant Postmaster-General how many licences had been issued in the United Kingdom at the latest convenient date and what restrictions, as to broadcast matters, are placed on these broadcasters. Mr. Gammans replied as follows:—

"There were 7,535 licensed radio amateurs in the United Kingdom on 22nd February. Amateur licences permit the use of a station only for the purpose of sending to, and receiving from, other amateur stations messages of a personal nature. The broadcasting of messages to amateur stations in general is prohibited."

Headquarters has no knowledge of the reason which prompted the question.

The Post Office Should Have Known Better

ON March 15, 1955, the *Daily Telegraph*, *Daily Express* and other newspapers carried a report of court proceedings in Nottingham the previous day when 27 year old Alan Walker was fined £5 for operating a home-made transmitter without a licence. According to the reports, Walker presented a "Family Favourites" type of programme on 38 metres every Sunday morning from his home.

It was reported that Mr. Henry Massey, prosecuting for the Postmaster-General, told the court that in the interests of national security it was essential that the Post Office should know where amateur transmitters were situated. He then went on to say, according to the press report, "These stations were cluttering up the air and spoiling programmes others wanted to hear. They might even hinder SOS messages."

It came as no surprise to Headquarters when dozens of members wrote or telephoned to protest indignantly at Mr. Massey's alleged remarks about the licensed amateurs of the United Kingdom.

By a coincidence the Council met on the day the offensive notices appeared. Consequently prompt action was taken, with the full approval of the Governing Body. That evening the President wrote, personally, to the Editors of the *Daily Telegraph* and *Daily Express*. Mr. Bartlett drew attention to the comments attributed to Mr. Massey and pointed out that either prosecuting counsel had been badly briefed or misquoted. Mr. Bartlett emphasised that every amateur transmitting station in the United Kingdom is licensed by the P.M.G. to operate on specific frequencies. He also mentioned that Government Services and the Electronic Industry each hold the amateur in the highest esteem not only because of the research work which is done but also because of that vast reserve from which qualified operators can be drawn at short notice in the event of a National Emergency.

Under date of March 21, 1955, the Manager of the Readers' Letters Department of the *Daily Express* wrote as follows to Mr. Bartlett:—

"I think it is fairly obvious that his (Mr. Henry Massey's) remarks concerned only those amateur transmitting stations, of the existence of which the Post Office are not aware, in other words those which are not licensed."

It is regretted that neither paper had the good grace to publish Mr. Bartlett's letter.

In addition to the action taken by the President, a letter was sent by the General Secretary to the Radio and Accommodation Department of the G.P.O. drawing attention to the statement made by Mr. Massey. After setting out the facts, Mr. Clarricoats concluded his letter by saying:—

"My Council feels that this will be construed by the general public as an 'official' statement and that it is calculated to bring Amateur Radio into disrepute. They think the remarks attributed to Mr. Massey are highly improper and ask that steps be taken to ensure that, in future, the legal representatives of the Post Office be asked to refrain from making expressions of their own opinion when conducting official business, assuming of course that the reports are true."

"Any efforts which your Department can make to repair the damage done would be greatly appreciated by my Council."

Up to the time this issue closed for press no reply had come to hand from the G.P.O.

Interference Suppression

TWO sets of regulations,* laid before Parliament on

March 1, 1955, will give the Postmaster General power to control interference with radio (including television) from (a) domestic and industrial appliances which are driven by small electric motors, e.g. vacuum cleaners, hair driers, and drills; (b) refrigerators. Both sets of regulations come into force on September 1, 1955, and lay down the requirements which must be complied with by (a) users of new and old electric motors; (b) manufacturers, assemblers and importers of all electrical refrigerators. These arrangements were recommended by the Advisory Committee appointed under Section 9 of the Wireless Telegraphy Act, 1949.

The new regulations in respect to electric motors do not mean that everyone using a vacuum cleaner, hair drier, or similar piece of domestic electric equipment will have to fit a suppressor at once. Only a proportion of these appliances cause interference and the Postmaster General hopes that in such cases the owners will co-operate by having the trouble rectified when it is pointed out to them by the Post Office. The new powers will be used only where it is necessary for the Post Office to insist on an appliance being put right because it causes interference and the owner will not voluntarily have a suppressor fitted.

The Postmaster General hopes that there will be a progressive extension of the current practice of certain manufacturers who produce appliances incorporating suppressors or who provide for the easy addition of a suppressor if it proves necessary. The question of making the regulations for small electric motors apply to manufacturers is to be reviewed during the next two years.

The standards laid down in the regulations, i.e. the

* *Wireless Telegraphy (Control of Interference from Electric Motors) Regulations, 1955.*

Wireless Telegraphy (Control of Interference from Refrigerators) Regulations, 1955.

limits of interference and the frequency ranges over which they are to apply, have been based on data derived from existing sound and television broadcasting services, for which they are designed to give adequate protection in areas of moderate field-strength, provided the receiving installation (which includes the aerial system) is satisfactory. The standards are also expected to give adequate protection to the proposed frequency-modulated v.h.f. sound broadcasting service in Band II (87.5 to 100 Mc/s) and to go some way towards eliminating interference in the higher range of frequencies (Band III) to be used for the new I.T.A. service.

The Advisory Committees, when submitting to the Postmaster General their reports upon which the present regulations are based, recommended that information should be issued drawing attention to the importance of earthing, in accordance with Regulations issued by the Institution of Electrical Engineers. The Advisory Committees also pointed out that components of suitable quality should be used for interference suppression, and that they should be connected in circuit in a suitable manner. These two aspects of interference suppression are dealt with respectively in B.S. 613 "Components for Radio Interference Suppression Devices" and the shortly to be published B.S. Code of Practice on "The General Aspects of Radio Interference Suppression."

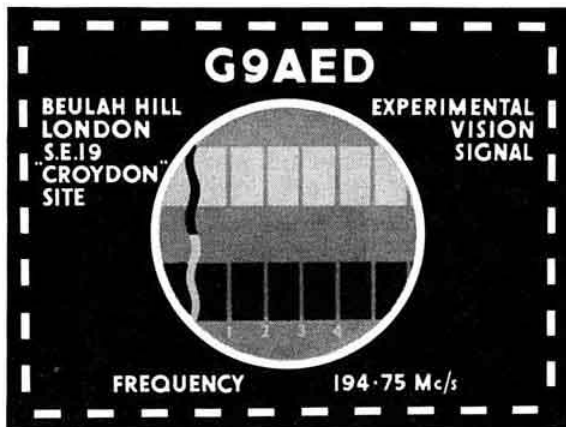
Mr. T. P. Allen (G16YW) now Belfast University Professor

THE Senate of Queen's University, Belfast, recently appointed Mr. T. P. Allen, M.Sc., to the Chair of Light Electrical Engineering. Professor Allen, known to old timers as the founder of Contact Bureau, has operated under the call G16YW since 1926.

His many friends in the Society will wish to join us in offering him congratulations on a well-merited promotion.

Belling-Lee Band III Transmitter

G9AED is the call-sign allocated to Belling and Lee, Ltd., for use at their experimental Band III station at Beulah Hill, Croydon. Transmissions, consisting of the test card shown in the accompanying illustration,



were due to commence on April 1. The test card is primarily intended for the investigation of ghost images.

The transmitter has an output of 250 watts and an e.r.p. of 1 kW. The aerial system, mounted on a 75ft Belling-Lee "Skytower" to which a 16ft top has been added, consists of four stacked bays, each of four vertical half-wave folded dipoles spaced equidistant.

Empire DX Tour—2

IN last month's account of Sgt Johnstone's Empire Tour it was reported that the *Iris* aircraft had just left the tea plantations of Ceylon for the rubber plantations of Malaya. The first contact between G3IDC/VS2 and the U.K. took place on March 3 on 14 Mc/s when Frank's signal peaked up to S7 and then faded out at about 17.00 G.M.T.

At this point of call there were two operators on the key because well-known DX man S/Ldr H. Bennett (G8PF) was there to await the arrival of G3IDC. Visitors to the last Amateur Radio Exhibition will remember "Benny" whose smiling face was in regular evidence on the R.S.G.B. Headquarters' Stand.

Whilst the *Iris* was in Malaya the operators at G8FC listened several times on 21 Mc/s but nothing was heard from G3IDC/VS2 although some South American and African stations were logged. Between March 3 and 9 regular skeds were maintained in spite of QRM from various sources including other amateur stations but most of the latter moved off the frequency once G3IDC/VS2 broke through to the U.K.



Sqn. Ldr. H. E. Bennett (G8PF/VS1BP) and Sgt. Frank Johnstone (G3IDC/VS1) with the 25 watt transmitter used by G3IDC to contact G8FC, Headquarters station of the R.A.F. Amateur Radio Society, during the Empire tour of the aircraft "Iris". This picture was taken at the R.A.F. Station, Butterworth, North Malaya. (Self-photo by VS1BP)

On March 10, the *Iris* left for Hong Kong but not a whisper from G3IDC/VS6 was heard in England. Whilst this is rather to be expected, due to screening by mountains, it had been hoped that Frank's call would have disturbed the ether over Weston-super-Mare. Great efforts were made to raise this little DX station but apparently it was a case of sending a boy on a man's errand—the boy, of course, being Frank's kit bag special transmitter!

At the time of writing (March 20) the *Iris* should be on her way to Singapore for a short spell.

G3IDC/ZL and G3IDC/VK may be heard around 14025 kc/s during the next period but transmissions should be made at least 5 kc/s off this frequency.

R.S.G.B. and R.A.F.A.R.S. Headquarters will be interested to hear whether signals from G3IDC/VS6 and G3IDC/VS1 were heard in the U.K. and especially if two-way QSOs took place. "Pop".

East London Coronation Trophy, 1955

FOR the third year in succession, Ilford group have won the East London Coronation Trophy. The scores were: Ilford—242, East Ham—240 and Chingford—233.

It is the organizers' hope that more East London District groups will take part in the 1956 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, February 15th, 1955, at 6 p.m.

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

Apologies.—Apologies for absence were submitted on behalf of Messrs. C. H. L. Edwards, D. A. Findlay and A. C. Gee.

National Field Day Rules

Resolved to advise the Contests Committee that the Council agrees that an N.F.D. station may work any other station (portable or otherwise) provided that the operator is not a signatory of the N.F.D. log. In the case of mobile stations, only one contact per band will be permitted with any given N.F.D. station.

Membership

(a) **Resolved** (i) to elect 46 Corporate Members and 12 Associates; (ii) to grant Corporate Membership to 48 Associates who had applied for transfer, including 15 whose original application had neither been proposed by a Corporate Member nor supported by references; (iii) to waive for a period of one year the subscriptions when due of Messrs. P. H. H. Jones (G3DRE), and L. A. Nicholas (G3FHX), both of Sheffield, on the ground that they suffer from blindness.

(b) The Secretary reported that of the 780 Members whose subscription became due on November 1, 1954, 185 became overdue on January 31, 1955. Of this number 22 were London, 95 were Country and 23 were Overseas Corporate Members, and 45 were Associates. Of those overdue 10 London, 47 Country and 21 Overseas Members held call signs.

The Secretary submitted details of the 32 members (including 10 Associates) who had written to resign during the four weeks ended February 12, 1955. Of this number 8 had resigned on financial grounds, 15 gave no reason, 7 stated they had lost interest and 2 Associates did not wish to transfer.

(c) The Secretary reported that lists of members who had not amended their Banker's Order or remitted the balance due of their subscription had been sent to the Representatives for Regions 1 to 9. It was hoped to complete the task within the next two weeks. The Secretary explained that it was too early yet to expect any marked improvement in the position, although a small number of the members affected had remitted the balance due. The lists had not been sent to C.R.s direct because, on investigation, it had been discovered that only 30 C.R.s had been appointed out of a nominal total of 77.

Applications for Affiliation

Resolved to grant affiliation to the Radio Society of the Northern Polytechnic; Royal Air Force Habbaniya Radio Club; Amateur Radio Society of Trinidad and Tobago; Ilkeston and District Radio Society.

Headquarters Lease

Resolved to authorize the Society's legal advisers to negotiate a new Lease for five years, as from June 24, 1955, at a rent of £400 per annum plus £40 per annum for heating, etc., and the usual insurance charges. (The

current lease provides for the payment of a rent of £360 per annum plus £40 per annum for heating, etc.—Ed.)

Headquarters' Decorations

Resolved to authorize the Secretary to have put in hand redecorations at Headquarters provided the total cost does not exceed £100.

Amateur Radio Exhibition

Resolved (a) to confirm the Secretary's action in making a tentative booking at the Royal Hotel, (b) to invite Mr. Thorogood to run the 1955 Exhibition at the Royal Hotel.

Scheme of Representation

The Secretary reported that at a meeting of the Membership and Representation Committee held that afternoon careful consideration had been given to the Scheme of Representation with a view to putting forward a recommendation to assist the Council in their deliberations. The Committee had formed the opinion that as the T.R. is the "king pin" in the Scheme an effort should be made to arrange a meeting to which all T.R.s could be invited. The cost of such a meeting would be about £500.

Resolved to defer for consideration at a later meeting the recommendation of the Membership and Representation Committee.

Several Members of the Council expressed the view that it would appear desirable to arrange a number of local meetings of a social character rather than to spend £500 on a meeting of T.R.s.

Radio Show 1955

It was reported that the Radio Industry Council had written to confirm the rental to be charged the Society for space at the Radio Show, 1955.

Civil Defence

A Member reported that the Hertfordshire County Council were anxious to have the co-operation of radio amateurs in connection with the work of their Civil Defence Wireless Section but no specific proposals had yet been put forward by the County Civil Defence Officer. The County C.D. Officer had, however, intimated that his Council would approach the Home Office with a view to that Department making frequencies available for Civil Defence communication exercises.

London Lectures

Resolved that, in view of the success of the lecture given by Mr. Hicks-Arnold (G6MB), at the Institution of Electrical Engineers on January 28, 1955, he be authorized to repeat the lecture at certain main centres of R.S.G.B. activity.

The 144 Mc/s Band

The Secretary submitted a photostat copy of a document issued by the European Broadcasting Union in April, 1954, on the subject of intermediate frequencies for television receivers. The gist of the argument put forward in the document is that Members of the E.B.U. should do their best to persuade their respective

Governments to deprive radio amateurs of the use of frequencies in the 144-146 Mc/s band.

Resolved to take no action on the document.

The Secretary was instructed to write a suitable letter of thanks to the member who furnished the photostat copy and to explain to him that the views of the E.B.U. in this matter are unlikely to receive much consideration from those responsible for allocating frequencies to radio amateurs. It was also agreed to point out that even if the Amateur Service vacated the 144-146 Mc/s band another Service would move in.

Meeting in Birmingham

It was reported that a meeting between representatives of the Council, R.A.E.N. Committee, Region 3, Midland Amateur Radio Society and the Slade Radio Society would take place in Birmingham on Sunday, February 20, 1955. The purpose of the meeting would be to discuss the Radio Amateur Emergency Network and other matters of mutual interest to the parties concerned.

Licence Matters

The Secretary reported that a meeting had recently taken place at G.P.O. Headquarters between representatives of the Society and representatives of the Radio and Accommodation Department of the G.P.O. Consideration was given to the following matters:—

(a) *Present arrangements for conducting the Morse Test in parts of the country remote from examination centres.*

(b) *The requirement that licensed amateurs must submit evidence of a minimum number of telegraphy contacts before they can be granted permission to use telephony.*

(c) *Service and other forms of exemption.*

The G.P.O. representatives stated that the Department were at present studying views put forward by the three Services on the general question of exemption.

The Society's representatives expressed the opinion that the time may have now come to require all applicants for a licence to pass the Radio Amateurs' Examination.

(d) *Proposed R.S.G.B. News Bulletin Service.*

The G.P.O. representatives regretted that they were not yet in a position to give a final decision on this matter but they hoped to do so within one month. It was stated that the G.P.O. had written to the various Empire and foreign administrations who permit amateur societies to operate a News Bulletin Service, to obtain their views.

(e) *"Shared" Amateur Bands.*

The Society's representatives submitted evidence in support of their contention that the "shared" 3.5 Mc/s band is being made unusable by the activities of certain U.K. commercial stations who operate with powers up to 20 kilowatts.

The General Secretary suggested that some form of time sharing should be introduced. The G.P.O. representatives agreed to examine the suggestion.

(f) *"Intruders" in "Exclusive" Amateur Bands.*

The Society's representatives submitted evidence in support of their contention that the "exclusive" portion of the 7 Mc/s band is being used by a wide variety of broadcasting stations most, if not all, of which are used for propaganda purposes. Evidence was also submitted to show that frequencies in the 14 Mc/s "exclusive" band are being used by non-amateur stations.

The General Secretary suggested that the G.P.O. should convene a high level conference at which the

Society's representatives could put forward a case for fair treatment for radio amateurs. The G.P.O. representatives agreed to consider the suggestion and to look into the other points raised by the Society.

(g) *New TVI Policy.*

The Society's representatives suggested that the time has come for the G.P.O. to agree that if interference to television reception, due to swamping, can be cleared by the insertion of a simple high-pass filter, then the onus for clearing the interference should be on the viewer and not, as at present, on the amateur.

The Radio and Accommodation Branch Representatives agreed to discuss the suggestion with the Engineering Branch and if necessary arrange a meeting between representatives of that Branch and members of the Society's Technical Committee.

(h) *Maritime Mobile Operation.*

The G.P.O. representatives regretted that due to pressure of other duties they had not yet been able to give consideration to the Society's request for an extension of the facilities available to those who hold a Maritime Mobile Licence.

TVI in Reverse

A letter was submitted from a member in Chesterfield in which he stated that during television hours five very strong carriers modulated with 50 cycle tone can be heard between 14 and 14.1 Mc/s. He alleged that these carriers are produced by local television receivers with i.f. stages of the order of 14 Mc/s. He had reported the matter to the local G.P.O. inspector who had stated that the Department would be prepared to investigate the complaint on condition that he "foots the bill." The member concerned had expressed the view that as it is the duty of the G.P.O. to prevent unauthorized transmissions the P.M.G. is not legally empowered to make a charge of this nature.

A member of the Technical Committee agreed to draft a suitable letter to the G.P.O.

Cash Account

Resolved to accept and adopt the Cash Account for January, 1955, as prepared and submitted by the General Secretary.

Reports of Committees

R.A.E.N.

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the R.A.E.N. Committee which met on January 29, 1955.

The Report contained no recommendations.

Contests

It was reported that Mr. S. E. Fryer had agreed to take over, once again, the duties of Honorary Secretary to the Contests Committee. Consideration was given to a 17-page letter from an entrant in the November Top Band Contest.

Resolved to authorize the Secretary to inform the member concerned that his letter had been considered by the Council.

The meeting terminated at 9.15 p.m.

LONDON U.H.F. GROUP

will meet at the Bedford Corner Hotel, Bayley Street,
Tottenham Court Road,
at 7.30 p.m., May 5, 1955.
All u.h.f. enthusiasts welcome.

CQ Single Sideband

By H. F. KNOTT (G3CU)*

VERY few reports have been received this month and we must therefore remind members that the success of this feature can only be assured by the regular contribution of information by those actively engaged in single sideband operation. There is, however, no reduction of enthusiasm for the system as is shown by its ever increasing use on the amateur bands.

Eighty Metres

Three newcomers to the list of active European s.s.b. stations are G3BFP (Croydon), DJ1VA and PA0ZR. G2CDN, incorrectly reported in the February issue as G2CDM, has been receiving excellent reports on signals from his "S.S.B. Jr.", using only an indifferent aerial made of 30 s.w.g. cotton covered wire at what must be one of the most difficult QTHs—a block of 1,000 flats in a confined area of Central London. Plans are ready for an increase in output power, using a grounded grid 805 linear amplifier. G3GWI (York) and G3HQZ (Frimley) are building s.s.b. equipment and should be active soon.

FT241A Crystals

The diminishing supplies of suitable FT241A crystals for use in filter type driver units has initiated several enquiries regarding the possibility of re-grinding those crystals which would otherwise not be used owing to their widely different values. Various methods have been suggested and those outlined by G3ESV may be of some help. FT241A crystals are either DT or CT cuts and rely on their perimeter measurement for the frequency of operation. It has been found that, provided care is exercised in unsoldering the tiny wires from the heavier supporting wires, the crystals can be demounted from their holders fairly easily. It is a tricky job and a miniature soldering iron is a definite help, but you do not need to be a watchmaker's apprentice to do it. The crystal can be held between finger and thumb and the top edge ground on a fine carborundum stone. Care should be taken to hold the crystal perpendicularly, and it is wise to grind evenly along the whole length of the edge and not just round off the corners. About 15 rubs forward and the same backwards raised the frequency 1 kc/s, with no appreciable loss of activity. Should a shift of greater than 1 kc/s be required, it would be wiser to take equal amounts off opposite edges. If the frequency required is overshoot by a small amount, one can still save something from the wreck: rubbing a fairly soft pencil over both the gold-plated faces will bring the frequency down about 200 c/s (all measurements should be done carefully with a BC221 frequency meter).

The carrier frequency crystal in G3ESV's present drive unit was both edge-ground and "pencilled" and works perfectly. The results obtained were checked by grinding several other crystals to see if it was mere luck that counted. All worked, though it is hard to guess how far the frequency shifts with a given number of rubs; the pressure can vary without being noticed.

GM3BEA and G3COJ have actually electroplated crystals and this will move the frequency downwards much more than pencilling. However, this is a little more complicated, although not difficult.

Power Unit for Linear Amplifiers

The power unit shown in Fig. 1 has been developed by G13ZX and whilst it has aroused considerable con-

troversy on 80 m. the results have been confirmed by G3EPL, G3FHL and G3CWC. It would seem that the best power supply for an s.s.b. linear amplifier is also the simplest! The three diagrams show the improvement in the voltage stability for a given speech transient for various h.t. output filter arrangements. All voltage measurements were made with a cathode ray oscilloscope (i.e. instantaneous indicator), and current measurements on the final anode milliammeter. The circuit in Fig. 1c has been tested with class AB1 and AB2 tetrodes and class B triodes with identical results. Hard vacuum and mercury vapour rectifiers produce the same answers. However, it would seem prudent to restrict the r.m.s. anode voltage on mercury vapour rectifiers to about two-thirds of the maximum rating.

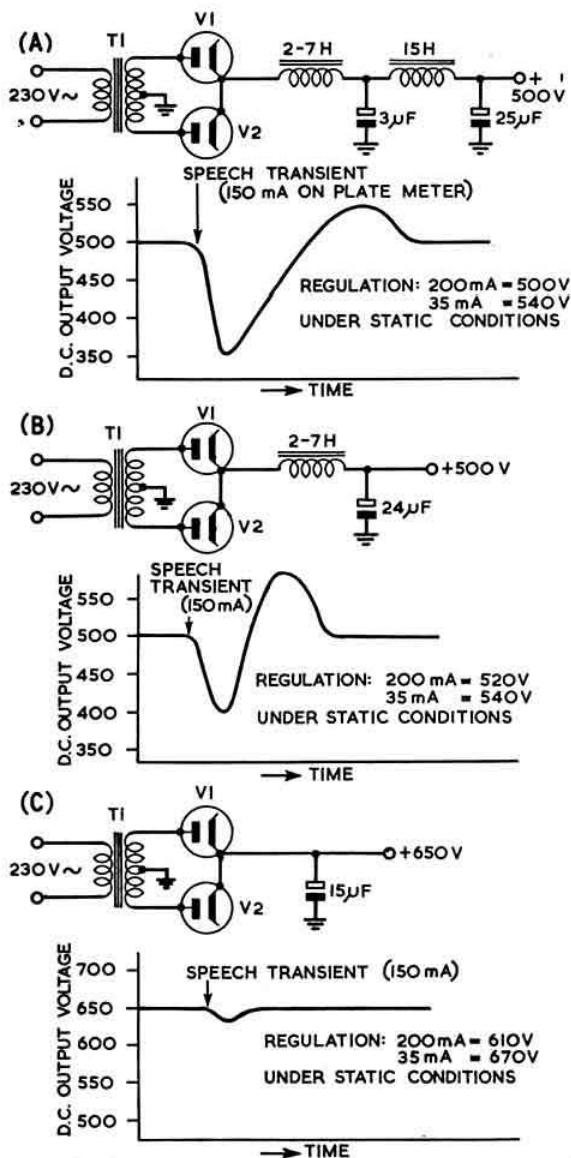


Fig. 1. Development of a power unit suitable for s.s.b. linear amplifiers. T1 has a 550-0-550 volt secondary and V1 and V2 are Mullard RG1/240As.

*5 Kevington Drive, St. Paul's Cray, Orpington, Kent.

Radio Amateur Emergency Network

By C. L. FENTON (G3ABB)*

DESPITE what may be said to the contrary by those who prefer to act as "lone wolves," careful preparation and practice are necessary ingredients for the success of organisations such as R.A.E.N. There is no doubt that properly established groups could have done wonderful work during the recent heavy snowfalls but such groups just did not exist in the affected areas, although there were plenty of individual members. In Scotland, for instance, there is now only one group with an E.C.O.—that centred on Larbert in Stirlingshire. There are, however, members scattered throughout the country, and it is to them that we appeal to prepare now for next winter by nominating E.C.O.s—particularly in Glasgow, Aberdeen and Inverness—so that active, co-ordinated groups may then be in being. There is a similar urgent need for E.C.O.s in Westmorland, Lancashire, Cheshire, Cornwall, Devon, Sussex, North London and North Wales.

Exercise "High Tide"

The latest **East Yorkshire** practice, held on January 23 and mentioned briefly in the February issue of the BULLETIN, was an outstanding success. Portable rigs were installed in police headquarters at Hull, Beverley and Bridlington. High-ranking police officials took an active interest in the exercise. Top Band and 144 Mc/s were used. A major lesson learned is that discipline on the air must be strict and no transmissions made without invitation from Control. Special mention must be made of the valiant effort of G6UJ who, though indisposed, took part in the exercise.

H.M. Coastguards have installed receivers covering Top Band at the Lifeboat Coxswain's House, Flamboro' Head, Lifeboat Coxswain's House—Spurn Lifeboat, and the look-out at the tip of Spurn Point. Tests have resulted in the County Controller's (G2ACD) signals being heard S9 at all points. During the 1953 floods, both Spurn and Flamborough were completely cut off, and these receivers, one of which was presented by G3DQ, should help to avoid complete isolation in the future. H.M. Coastguards have invited Yorkshire R.A.E.N. officials to a film show of sea rescue work at which E.C.O.s will meet Commander Kitcat, R.N., the officer in charge of this district of the coast.

Another result of Exercise "High Tide" is that the names and addresses of all R.A.E.N. members are to be supplied to the East Riding Police, Hull City Police, East Riding County Council and the W.V.S. at the request of these organisations.

Reports from the Groups

South Wigston (Leics.) reports continued interest in mobile work. Close liaison with local authorities is being maintained. **Retford** (Notts) has 28 Mc/s portable equipment under construction. A county meeting for R.A.E.N. members is planned. **Bristol** group has distributed some excellent circulars to members, and a small committee has been formed to organise future activity. A weekly net operates on 1850 kc/s on Sundays.

Weston-super-Mare is another group with a weekly net—1890 kc/s on Thursdays at 20.00 (control station G5TN). **Belfast** is to carry out tests on Top Band between the city and Portadown. Their c.w. net is on

3550 kc/s on Saturdays, commencing at midnight. **Portadown** continues to operate in close liaison with Belfast and the E.C.O.s concerned hope to start a Northern Ireland R.A.E.N. News Sheet soon. **Larbert** (Stirling) group has been carrying out Top Band mobile tests which have proved most successful. Exercises are held on 1920 kc/s on Saturdays (22.30) and Sundays (11.00). Members in the more northerly areas are invited to join in.

Romford now has four portables, while all fixed stations are equipped to work push-to-talk. Good results are being obtained on Top Band with a ZC1 Mk. II transmitter-receiver using a 14ft whip in a car. **Berwick-on-Tweed** members are busy building and testing mobile aeriels. Practices are held on Sundays with mobile as well as fixed stations participating. **Steyning** (Sussex) requires more volunteers. Efforts are being made to increase interest throughout the county. **Whitstable** (Kent) group holds regular meetings at the Civil Defence Headquarters. Tests are being carried out with 7 Mc/s walkie-talkies. **Isle of Thanet** group continues to make good progress and 28 Mc/s walkie-talkies are under construction.

R.A.E.N. MEMBERSHIP CARDS

All R.A.E.N. membership cards issued during 1954 have now expired and should be returned to the E.C.O.s concerned who will issue new cards for the current year. E.C.O.s should return cards in bulk to the Hon. Secretary for re-issue.

Members not attached to a local group should return their old cards direct to the Hon. Secretary (C. L. Fenton, G3ABB), "Niarbyl," Gay Bowers, Danbury, Essex.

All applications should be accompanied by stamped-addressed envelopes for the new membership cards.

Chelmsford is concentrating on Top Band for long haul traffic, with 28 Mc/s for walkie-talkies. A c.w. net is held at 09.30 and a phone net at 18.30 on Sundays, the control stations being G4VF and G3ABB respectively. Initial calls are made on 1980 kc/s, followed by a move to a nearby working frequency. Members in adjacent areas are invited to take part. A large-scale exercise was held in Essex on April 3 in conjunction with Romford and Ilford.

R.A.E.N. Committee Member Douglas Willies (G3HRK) recently gave a talk to the **Norwich Radio Club** and it is hoped that there will be an increase in the number of active R.A.E.N. members shortly. In Lincolnshire, Acting E.C.O.s have been appointed for **Mablethorpe**, **Boston** and **Stamford**. A county practice net on 1.9 and 3.5 Mc/s is held on the second and last Sundays of each month. The Head-postmaster of Mablethorpe listened to one of the practices and expressed his appreciation of the efficiency shown by all concerned.

Efforts are being made to form an active group in **Bath** and it is expected that about 12 stations will join in. The E.C.O. for the **Wirral** (G3ERB) recently addressed a meeting in **Chester** and is now endeavouring to find volunteers as E.C.O.s in other parts of the county. **G3IIR** is acting as deputy E.C.O. for **South London** who

*Hon. Secretary, R.A.E.N. Committee, "Niarbyl," Gay Bowers, Danbury, Essex

now have practice nets every other Sunday, alternating with mid-week practices. A meeting is to be held shortly in **Stoke-on-Trent** at which it is hoped to exhibit typical R.A.E.N. equipment. **Hull** group has recently had several flood warnings but fortunately it was unnecessary to alert the whole area.

Listening Watches

G3ABB maintains an almost nightly watch on the National Calling frequency of 1980 kc/s from 19.00 to 20.30 clock time. Occasionally, other stations are heard working on the frequency but generally the channel is fairly free. Members are reminded that G3ABB will answer any calls heard on this frequency.

It has been suggested that there should be a weekly phone or c.w. net on 3.5 Mc/s for E.C.O.s Views and comments will be appreciated.

R.A.E.N. Membership

Since its inauguration eighteen months ago, the response to appeals for volunteers for R.A.E.N. has been most satisfactory; there are now almost 1,000 in all parts of the United Kingdom, with the exception of the Isle of Man. However, individuals can do little on their own and for this reason the Hon. Secretary is always pleased to hear from members willing to act either as E.C.O.s or as organisers prior to the nomination of an E.C.O.

Message Pads

Members are reminded that special R.A.E.N. message pads are available from R.S.G.B. Headquarters, price 2s. 9d. post paid. All members should have at least one of these pads for any emergency that may arise. Incidentally these are the proper forms to use.

County Controller

F. R. Peterson (G3ELZ), 58 Peaksfield Avenue, Grimsby, has been appointed County Controller for Lincolnshire.

E.C.O. Appointments

The following are additions to the list of E.C.O.s published in the March, 1955, issue of the BULLETIN: Mablethorpe.—J. W. Marlow (G2FT), Elton, 83 George Street, Mablethorpe, Lincs.

Stamford.—F. K. Parker (G3FUR), 122 Empingham Road, Stamford, Lincs.

Boston.—L. J. Coupland (G2BQC), 214 Wyberton West Road, Boston, Lincs.

The following E.C.O.s have resigned:

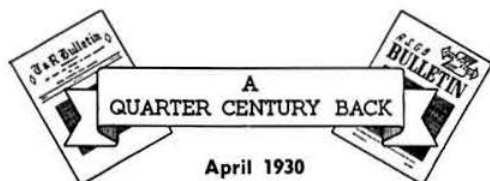
R. R. Morrison (GM5ST), electoral area of West Renfrew; T. Griffin (G3GUV), Middlesbrough.

The following E.C.O.s have failed to make any reports or to reply to recent correspondence and are therefore considered to have resigned:

W. F. Limehouse (G2FDF), Newport, Mon.; H. M. Gardner (G3FFN), Stonehouse, Glos.; B. Gale (GC3EBK), Guernsey, C.I.; D. G. Thompson (G3ANS), Whitehaven, Cumberland; S. Oake (G3GBF), Hebburn-on-Tyne; R. R. Wilson (G13CTU), Bushmills, N.I.; S. Clarke, Jnr., Ballymena, N.I.

Nominations for successors to the above E.C.O.s should be sent to the Hon. Secretary as soon as possible.

Reports for inclusion in the next R.A.E.N. feature, which will appear in the June issue of the BULLETIN, should reach the writer by May 20.



STATION G6DW, owned and operated by Douglas H. Johnson, was the fifth in a new series of station descriptions. G6DW began operations in 1923 on 440 metres. "A receiving station has been in existence since 1921 and during the Transatlantic broadcasting tests of 1923, this was the only station that was successful in receiving WDAR of Pittsburgh. As regards transmitting almost every known circuit has been tried. Crystal control is now in use on 14000 kc/s. H.T. is derived from an eliminator employing a Raytheon full wave rectifier. H.T. for the self excited DET1 unit is supplied by a separate eliminator employing a Marconi-Osram U8." (Mr. Johnson is now Legal Adviser to the Society. During the 1939-45 war he served in the Royal Air Force as a Group Captain.)

Harmonic Crystal Control was the title of an article by A. M. H. Fergus (G2ZC). The author set out to refute an earlier suggestion made by E. A. Dedman (G2NH) that harmonic control is not reliable.

(G2ZC now lives at Farnham, Surrey. For many years he was one of the "king pins" in the organization of the First Class Operators' Club.)

"Oil Cooled Valves" were discussed by E. C. S. Megaw (G6MU) writing from the City and Guilds Engineering College, London.

(Dr. Megaw was Chairman of the I.E.E. Radio Section a year or so ago. He is now on the research staff of a Government organization.)

R. Holmes described a 6 valve all mains S.W. receiver which employed "two screened grid h.f. stages, detector, one straight transformer coupled i.f. stage and a stage of push-pull with provision for inserting headphones, after the first i.f. The aerial is choke fed to the first S.G. valve."

(DX exponent Bob Holmes (G6RH) is now Chief Engineer of Burndeft Radio, Ltd.)

Directional Aerials were discussed by B. Warren (G6CI). Experiments showed that the Herz definitely exhibits directional properties.

(Brian Warren is still active from Coventry.)

An article entitled "Improving the S.W. Screen Grid Receiver" by H. C. Page (G6PA) recorded results obtained in attempts to overcome the pull between the two tuned circuits.

(Cecil Page, now with the Ministry of Civil Aviation, was a Squadron Leader in the R.A.F. during the 1939-45 war.)

"Uncle Tom" wrote the first of a series of—soon to become famous—articles. "On Starting Up" was the title of his first contribution.

("Uncle Tom" disguised the identity of L. H. Thomas (G6QB). "Tommy," now Assistant Editor of The Short Wave Magazine—also a Squadron Leader in the R.A.F. during the last war—was awarded the M.B.E. for work in connection with Radar.)

The Social Side

City and Guilds Radio Society

MR. Harry Faulkner, C.M.G. (Director of the Telecommunication Engineering and Manufacturing Association, and until recently Deputy Engineer-in-Chief of the Post Office), in his Presidential Address to The Radio Society, City and Guilds College, London, on Friday, March 18, 1955, described how the International Telecommunications Union and its associated Technical Consultative Committees function. Mr. Faulkner explained the difficulties which arose when the administrations in Region I (Europe and Africa) attempted to implement the Atlantic City Frequency Allocation Table. He also referred to the I.T.U. Regional Conference held in Copenhagen during 1952 and to the C.C.I.R. VIIIth Reunion held in London during 1953. (Mr. Faulkner led the U.K. Delegations at both meetings and was Chairman of the C.C.I.R. Reunion.—Ed.)

At the Annual Dinner which followed the Presidential Address the guests included Dr. Willis Jackson, F.R.S. (President Elect), Sir Archibald Gill, Mr. Paul Adorian, M.I.E.E., Mr. Harold Bishop, C.B.E., M.I.E.E., Mr. T. E. Goldup, M.I.E.E., Dr. R. L. Smith-Rose, C.B.E., M.I.E.E., Mr. C. E. Strong, O.B.E., M.I.E.E. (Past Presidents), and Mr. John Clarricoats, O.B.E.

During the after proceedings the Student Chairman (Mr. S. G. Reece) proposed the health of the guests and Mr. Adorian responded. A toast to the Society was offered by Dr. Willis Jackson to which Mr. D. I. Urquhart-Pullen (Honorary Secretary) replied.

There was an attendance of 70 at this function, which is always one of the high lights in the academic year at The Guilds.

Thanet Radio Society

SOCIETY Headquarters was represented at the Annual Dinner-Dance of the old-established Thanet Radio Society, by the Immediate Past President (Mr. Arthur O. Milne, G2MI), Council Members W. H. Allen, M.B.E. (G2UJ), and R. H. Hammans (G2IG), and by the General Secretary (Mr. John Clarricoats, O.B.E., G6CL). The Chair was taken by the President of the Society (Mr. G. A. Chapman, G2IC) who had the support of the Chairman (Mr. N. R. Cramp, B.R.S.16756), the Vice-Chairman (Mr. E. R. Dolman, G2DCG) and the Hon. Secretary (Mr. J. Barnes, G3BKT) all with their ladies.

The Dinner took place in the spacious ballroom of the Fort Lodge Hotel, Margate, on March 5, 1955, with an attendance of 80 recorded.

A novel competition—the theme of which was "The Satisfied XYL"—attracted a fairly good entry and resulted in a win for Mr. Arthur Cook, Mr. L. King (G4IB), Mr. F. G. Lambeth (G2AIW) and Mrs. Clarricoats were also among the several prize winners. A large number of prizes—many of them donated by members of the Society—were raffled.

The organisation of the event, as usual excellent in every way, was in the capable hands of Norman Cramp.

Sutton and Cheam Radio Society Dinner

MORE than 80 members and guests attended the Seventh Annual Dinner-Dance of the Sutton and Cheam Radio Society at Wilson's Restaurant, Sutton, on March 12. Stanley Vanstone (G2AYC), President of the Society, was in the chair. R.S.G.B. Headquarters was represented by the Immediate Past President

(Arthur O. Milne, G2MI), the Penultimate Past President (Leslie Cooper, G5LC) and Council Member Frank Hicks-Arnold (G6MB). Others present included Fred Lambeth (G2AIW), Region 7 Representative, John Brodsky (G3HGX), Chairman of the recently formed Mitcham Radio Society, and John A. Rouse (G2AHL), Assistant Editor of the BULLETIN.

The toast to the Society was proposed by Mr. Cooper (G5LC), who was later presented with a unique "illuminated address" commemorating his outstanding performance during the 1954 N.F.D. In the absence of the General Secretary of the R.S.G.B., John Clarricoats, O.B.E. (G6CY), due to indisposition, Mr. Milne replied to the toast to the Guests.

Each lady received a box of chocolates and there was the usual raffle.

Entertainment of a very high order, written and devised by the "Duke of Ashted" (Reg. Pearson, G4DH) was provided by the Top Band Toppers and the "Corpse" des Ballets. A particularly noteworthy performance as a red-headed ballerina was given by G2AYC. Nigel Harvey (G3IRU) sang songs to a guitar and Cliff Bridges and his Trio played music for dancing.

The function was arranged by Stanley Vanstone and Les Seaton (G3HKS).

Television Society Medal for Dr. Glyn E. Daniel

THE Television Society's Silver Medal instituted in 1948 for outstanding artistic achievement in television has this year been presented to Dr. Glyn E. Daniel (Director of Studies in Archaeology and Anthropology at St. John's College, Cambridge, Fellow and Steward). The award was made at the Society's Annual Dinner on March 22.

The Dinner, held at the Dorchester Hotel, Park Lane, was a landmark in the Society's history, in that it was attended by over 450 television and radio industry members and friends — an all time record. It was also a unique occasion as the heads of the two rival television services — Sir George Barnes, B.B.C., and Sir Robert Fraser, I.T.A.—were in attendance. Mr. R. H. Hammans, G2IG (Executive Vice-President, R.S.G.B.) and Mr. John Clarricoats, O.B.E. (General Secretary), were among the many guests.

The chief speakers were Sir George Barnes (Director of Television, B.B.C.), Sir Robert Fraser (Director-General, I.T.A.), and Mr. D. C. Birkinshaw (Chairman of Council).



THE LADIES MAKE THE PICTURE

Fred Lambeth (G2AIW), Reg. Hammans (G2IG), Bert Allen (G2UJ) and Tony Chapman (G2IC) with some of the ladies who helped to make the Thanet Radio Society Dinner-Dance such a happy occasion. The ladies in the picture are from left to right:— Mrs. G2IC, Mrs. G2MI, Mrs. G2AIW, Mrs. G2IG, Miss G2MI, Mrs. G6CL.

Photo: Vogue Photographic Service, Alexandra Road, Margate.

The winner will retain the "G2AAN Trophy" donated by the President of the Grafton Radio Society (John H. Clarke, G2AAN).

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—April 26, G3FYZ, 7.30 p.m., 351 White Gate Drive, Blackpool.
Bury.—May 12, 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 (I.o.M.A.R.S.).—April 20, May 4, 18, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—May 4, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 7.30 p.m., St. Barnabas Hall, Penny Lane, Liverpool, 15, (M.R.S.).—April 27, May 11, 25, 8 p.m., Larkhill Mansion House, Queens Drive, Liverpool, 13.
Manchester (M. & D.R.S.).—May 2, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester. (S.M.R.C.).—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 14.
Preston.—April 22, May 6, 20, 7.45 p.m., St. Saviour's Parish Hall, Manchester Road, Preston.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
Southport.—Thursdays, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—April 27, May 11, 25, 8 p.m., The Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.R.S.).—April 21, May 5, 19, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington.
Wirral (W.A.R.S.).—April 20, May 4, 18, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—April 29, May 13, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—April 26, May 10, 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.—May 11, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics Institute, 7 Whitehall Road.
Hull.—April 26, May 10, 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.—April 21, May 5, 8 p.m., "Fox Inn," Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., "Cutler's Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—April 27, 8 p.m., "Dog and Partridge," Trippett Lane, May 11, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spennorth.—April 20, 7.30 p.m., visit to G.P.O. Repeater Station, Burley Street, Leeds; May 4, 7.30 p.m., G.P.O., Leeds; Sunday, May 15, Annual Trip.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—May 2, 7.30 p.m., Friends Hall, Watford Road, Cotteridge. (M.A.R.S.).—April 19, 6.45 p.m., Midland Institute, (Slade).—April 29, May 13, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—April 22, 7.30 p.m., Priory High School, Wheatley Street. (C.A.R.S.).—April 25 ("Civil Communications," G5BJ), May 5, 9 ("Receiver Servicing," G3HDP), 7.30 p.m., 9 Queens Road, Coventry.
Kenilworth, Leamington and Warwick.—April 21, 7.30 p.m., Dalehouse Lane.
Malvern.—May 2, 8 p.m., "Foley Arms."
Redditch.—April 19, 8.0 p.m., "Scale and Compasses," Birchfield Road, May 5, 8.0 p.m., 10 Woodland Road.
Rugby.—May 5, 7.30 p.m., B.T.H. Recreation Club, Hillmorton Road.
Solihull.—April 18, May 2, 16, 7.30 p.m., Defence H.Q., Sutton Lodge, Blossomfield Road.
Stoke-on-Trent.—April 27, 8.0 p.m., "Lion's Head," John Street, Hanley.
Stourbridge.—May 3, 8.0 p.m., King Edward VI School.
Walsall.—April 27, May 11, 8.0 p.m., Technical College, Bradford Place.
Wolverhampton.—April 25, May 9, 8.0 p.m., Stockwell End, Tettenhall.
Wrekin.—Venue and dates from G. Myatt, 12 Swan Street, Broseley.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m.; Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, 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.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Room 5, Ilkeston College of Further Education, Field Road.
Leicester (L.R.S.).—April 25, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—May 4, 7.30 p.m., Technical College, Cathedral Street.
Mansfield (M. & D.A.R.S.).—May 10, 7.30 p.m., Denmans Head Hotel, Market Place, Sutton-in-Ashfield.
Newark.—May 1, 7 p.m., Northern Hotel, Appleton Gate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., May 6, 6 p.m., Clubroom, 8 Duke Street.
Nottingham.—April 15, May 20, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—May 4, 7.30 p.m., 21 Hankey Street.
Retford.—May 2, 7 p.m., Sun Inn, Cannon Square.

REGION 5

Chelmsford.—May 5, 7.30 p.m., Marconi College, Arbour Lane.
Lowestoft & Beccles (L. & B.A.R.C.).—April 27, May 11, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—May 5, 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.—April 26, 7.30 p.m., G6JK, 17 New Drive, Totteridge.
Jersey, C.I.—April 26, 7.45 p.m., Chamber of Commerce, Royal Square, Jersey (visitors cordially invited).
Oxford (O. & D.R.S.).—April 27, May 11, 7.30 p.m., Magdalen Arms, Ifley Road, Oxford.
Portsmouth.—Tuesday, 7.30 p.m., British Legion Club, Queen's Crescent, Southsea. (Club room open every evening.)
Southampton.—May 7, 7 p.m., 1 Prospect Place.
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.—May 6, 337 Upper Richmond Road, S.W.14.
Bexleyheath.—April 28, May 12, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—May 6, 8 p.m., Shortlands Hotel, Station Road, Shortlands, Kent.
Chingford.—April 22, May 6, 8 p.m., Venue from G4GA (SIL 5635) or B.R.S.19765 (SIL 6055).
Chislehurst and Sidcup.—May 11, "Seven Stars," High Street, Footscray.
Croydon.—May 3, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
East Ham.—Tuesdays, 8 p.m., 12 Leigh Road.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East London.—April 17, 2.30 p.m., Town Hall, Ilford.
Enfield.—April 17, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finbury Park.—April 19, May 16, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Guildford and Woking.—April 24, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Hendon and Edgware.—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill.
Hoddesdon.—April 7, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—Mondays, (R.A.E.) and Fridays, 7 p.m., Grafton School, Eburne Road, London, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
London (L.M.L.C.).—April 22, 12.30 p.m., Bedford Corner Hotel, Bayley Street, off Tottenham Court Road, W.C.1.
London (U.H.F. Group).—May 5, 7.30 p.m., May 14 (Convention), Bedford Corner Hotel, Bayley Street, off Tottenham Court Road, W.C.1.
Norwood.—April 16 ("The Professional Finish to Amateur Equipment," G3HJR), May 21, Windermere House, Weston Street, Crystal Palace.
Southgate and Finchley.—May 5, 7.30 p.m., Arnos School, Wilmer Way.
Slough.—May 3, Venue from G2HOX, or G3BTP, 13 Quaves Road, Slough.
Sutton and Cheam (S. & C.R.S.).—April 19, May 17, "The Harrow," Cheam Village.
Welwyn Garden City.—May 3, 8 p.m., Council Offices, Welwyn Garden City.

(Continued on page 501)

Regional & Club News

BRISTOL.—"The Transmission of Voice and Video Frequencies by Landline" was the title of the talk by R. E. Griffin (G5UH) at the March meeting at which there was also a free raffle for equipment donated by G5FF. Members visited the G.P.O. Repeater Station in Bristol on April 1. Forthcoming lectures include "Communication Receivers for Amateurs" by G2BYA (April) and "Transistors" by G3JMY (May). Morse classes are held weekly and details may be obtained from the C.R. or from the Hon. Secretary: D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol.

CHELMSFORD AMATEUR TELEVISION CLUB (B.A.T.C.).—There was a large attendance at the lecture on "The N.T.S.C. Colour Television System" during which some of the engineering and circuit problems associated with colour TV were explained. An excellent demonstration of reception of G2WJ/T's signals followed. Hon. Secretary: M. Barlow (G3CVO), 10 Baddow Place Avenue, Great Baddow, Essex.

CHELTHAM.—At the March meeting, J. E. Squire (G6ZQ) gave an introductory talk on "Single Sideband Transmission." Future talks will deal more fully with the various circuits and techniques. Arrangements for N.F.D. were discussed. Town Representative: John J. Yeend (G3CGD), 30 St. Luke's Road, Cheltenham.

GRAFTON RADIO SOCIETY.—At the meeting on March 4, members enjoyed a lecture on "New Ideas in TVI Suppression" by Louis Varney, A.M.I.E.E. (G5RV). Other recent lectures have included "Miniature Top Band Rig" (G3JFM), "Microphones and Pickups" (Cosmocord, Ltd.) and "TV Servicing" (G3JZX). Hon. Secretary: A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

GRAVESEND AMATEUR RADIO SOCIETY.—Subjects of recent talks were "Resonant Circuits" (G3HLE), "Break Operating" (G3JLB), "Frequency Modulation" (G3EJK) and "Receivers" (G3HLE). There will be a sale of surplus equipment on April 21 and a discussion on "Phone Operation" on April 28. Meetings are held at the Terrace Hotel, Gravesend, commencing at 7.45 p.m. The Society took part in the M.C.C. event with good results. Hon. Secretary: R. E. Appleton, 23 Laurel Avenue, Gravesend.

SCARBOROUGH AMATEUR RADIO SOCIETY.—The local phone net operates on Tuesday evenings on 3620 kc/s. G3CRY (ex-ZC2MAC) is a new member active on the DX bands. Plans for portable operation during the summer are well advanced and G4BP (the club station) will be active on 144 Mc/s. Hon. Secretary: P. B. Briscoe (G8KU), 31 St. Johns Avenue, Scarborough.

SOUTHEAST & DISTRICT RADIO SOCIETY.—Recent activities included an "Any Questions?" session. Hon. Secretary: J. H. Barance, M.B.E. (G3BUJ), 49 Swanage Road, Southend-on-Sea.

STOCKPORT RADIO SOCIETY.—At the A.G.M. the following officers and Committee members were elected: Chairman: G. R. Phillips (G3FYE); Vice-Chairman: D. Birch (G3A00); Hon. Treasurer: R. Hobson (G3JRO); Hon. Secretary: D. Hall (G3KAH), 13 Hallam Street, Heavily, Stockport; Hon. Auditor: F. E. Wood (G4JM); Hon. Syllabus Secretary: R. Dawson (G3JLX); Committee Members: W. H. Banks (G2ARX), N. Paul (G3AUB), H. Smith (G3AYT), S. May (G3ENL), H. Shields (G3GB), R. Kilminster (G3JHK) and E. Wigzell.



For the second year running the "Stanley Harrison Trophy", donated by G3EPK, has been won by Gerald Gibbs (G3AAZ). The trophy is awarded annually for the best entry in the Constructors' Exhibition organized by the Welwyn Garden City Group. Nearly three dozen exhibits were entered for judging on March 1 by the London R. R., Fred Lambeth (G2AIW), here seen in the centre of the group presenting the trophy to G3AAZ. Co-judge was Clem Jardine (G5DJ) on the right of this picture. For his trophy-winning entry Mr. Gibbs submitted a 5-band-switched table top transmitter with a wide-band coupler exciter section driving an 813.

STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY.—At the A.G.M. on March 8, the following were elected to the Committee: President: J. Timbrell (G6OI); Chairman: C. D. Barlow (G3HGD); Vice-Chairman: T. Cashmore (G3BMY); Hon. Treasurer: J. Hogg (G2OG); Hon. Secretary: A. K. Davies, 48 Church Lane, Vicarage Road, Amblecote; Transmitting Members: E. Brickstock (G3IVQ); S. Hemmings (G8SR); Non-transmitting Members: F. D. B. MacNamara, R. MacIntosh; Co-opted Member: F. A. Bills (G3CLG). R.S.G.B. Town Representative. The Senior "J. Timbrell Trophy" was presented to E. Morgan (G3COD) and the Junior to J. V. Pearson, A Mullard film showing the construction, manufacture and testing of radio valves proved most interesting. A wide variety of interests is catered for and prospective members and visitors to the district are always welcome.

TORBAY AMATEUR RADIO SOCIETY.—At the March meeting, R.S.G.B. members discussed arrangements for N.F.D. Later G2GK gave a talk on R.A.E.N. and appealed for volunteers for the local group. The A.G.M., followed by a Junk Sale, will take place at the Y.M.C.A., Castle Road, Torquay, on April 16. Hon. Secretary: L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

YORK AMATEUR RADIO SOCIETY.—The following were elected to the Committee at the A.G.M.: Chairman: E. Warwick (G3GDE); Hon. Treasurer: C. J. L. Brown (G3HLT); Hon. Secretary: J. O. Yarker (G3GIY), 14 Bewlay Street, Bishopthorpe Road, York; Committee Members: G. F. Nottingham (G3DTA), P. S. Robson (G3FYP), A. Horner (G3FTS) and P. Dekker. Meetings are held on Thursdays in the Club Room, Fetter Lane, facing the entrance to the Queen's Hotel. The club station (G3HWW) is active on Top Band and 3.5 Mc/s. Morse classes are due to commence shortly.

Representation

THE following is an addition to the list of County Representatives published in the December, 1954, issue.

Region 8—Sussex

J. D. Heys (G3BDQ), 201 London Road, St. Leonards-on-Sea.

The following are amendments to the list of Town Representatives published in the December, 1953, issue.

Region 5—Essex

Danbury

A. W. Butcher (B.R.S.20545), Rectory Cottage, West Hanningfield, nr. Chelmsford.

Region 14—City of Glasgow

Glasgow and District

I. Hamilton (GM3CSM), 66 Greystone Avenue, Burnside, Rutherglen.

Region 15—Co. Antrim

Ballymena

W. Davison, 1 Clarence Street, Ballymena.

Correction.—Members in Region 3 are asked to note that for the purposes of the R.S.G.B. Scheme of Representation the areas covered by the T.R. for West Bromwich and Handsworth and the T.R. for Solihull are within the Birmingham District.

Staffordshire County Meeting

MAY 15, 1955

THE SWAN, LICHFIELD

Programme

Assemble	-	-	-	3 p.m.
Business Meeting	-	-	-	3.30 p.m.
High Tea	-	-	-	4.45 p.m.
Film Show or Technical Lecture	-	-	-	5.45 p.m.
Exhibition and Raffle	-	-	-	6.30 p.m.
Informal "Ragchews"	-	-	-	7 p.m.

Representatives of the Council will be in attendance.

Inclusive Charge 6/6. Reservations to Mr. W. A. Higgins, GSGF (C.R. for Staffordshire), by not later than May 12, 1955.

Letters to the Editor

Low Loss Balanced Feeder for 144 Mc/s

DEAR SIR,—I was very interested in the recent article by Rev. Walter Ferrier (GM3BDA) dealing with an open wire transmission line for 144 Mc/s. Having been active solely on that band for some years I have tried most of the available types of feeder and I agree with GM3BDA that improved results can be obtained using the open wire variety, especially with line lengths of 50 feet or more.

I do not, however, agree with either GM3BDA's choice of conductor spacing or the material selected for the spacers. Admittedly the 1/4 in. spacing he uses should reduce radiation losses but this advantage will be nullified by loss caused through impedance variations due to small discrepancies in conductor spacing which are, in practice, most difficult to avoid and which become much greater as spacing is reduced. At my home QTH I have to employ a line of 120ft length and have not found any appreciable loss of power at the aerial end when using a spacing of 1 1/4 in., at which average distance any minor discrepancies between the conductors have little effect on the line impedance.

Regarding the spacer material used I cannot see how GM3BDA is going to prevent rain water from eventually seeping through the conductor holes and becoming trapped in the central hole of the coax-polythene. This would of course virtually short circuit the feeder and I do not think that the varnishing process mentioned would form a permanent preventative. Polystyrene rods is a far more satisfactory material for spacers and is reasonably cheap to purchase in such relatively small quantities; using this rod one can set 8 B.A. screws in the spacer ends to look down as grub screws on to the conductor and, being outside the field, such screws have no effect on the line performance.

I trust that GM3BDA will not take exception to my bringing forward the foregoing criticisms which are intended to be constructive.

Yours faithfully,

LIONEL J. S. JACKSON (G3DLU).

Royal Air Force, Compton Bassett.

The Post Office Morse Test

DEAR SIR,—On my recent return from a "DX" country, I applied for a G licence from the powers-that-be, enclosing details of my previous licence and an official "Certificate of Competency" from my employers—a Government Department—stating that I had been in their employ for more than five years and that I could receive and send Morse at 25 w.p.m.

I had a reply from them stating that I could not claim exemption from either the R.A.E. or the Morse test. Whilst I did not expect exemption from the R.A.E. I did from the Morse test. Not that I have any fears about passing at 13 w.p.m.; it is inconvenient having to travel miles to a centre in order to take the test.

Could it be that the G.P.O. do not recognise the operating abilities of employees of another Government Department or is it because they like to see the 7s, 6d.'s rolling in!

Yours faithfully,

"EX-DX."

A copy of the above letter to The Editor was sent to the Radio and Accommodation Department of the Post Office for their comments.

The following statement has been received.

The list of Service and other Trade qualifications giving exemption from the Post Office Morse test and the Radio Amateurs' Examination, contained in the Post Office list, has been carefully drawn up in consultation with the authorities concerned, to ensure that the standards are uniform and that they correspond with the minimum required from applicants who take the examination. Certificates from other employers could not be accepted unless a similar check were made in each case.

The fees charged by the Post Office for amateur licences are based on the average cost of issuing and administering this class of licence, spread over a number of years. Any increase in the cost of issue, such as would result from the need to check the standards of certificates of competency issued by other employers in certain cases, could only be recovered by an increase in the amateur licence fee. The Post Office recognises that strict adherence to the list of exempting trades and qualifications means that a few applicants for amateur licences who hold equivalent qualifications are required to sit for the Radio Amateurs' Examination or to take the Post Office Morse test (or both), but considers that in the circumstances the interests of amateurs generally must outweigh the convenience of the individual.

(It is the view of the Society that when a Government Department is prepared to certify that a person in their employ is competent in Morse to a certain standard it is a waste of time and money to require that person to sit the Radio Amateurs' Morse test.—ED.)

"Constructive Criticism"

DEAR SIR,—Whilst I regard the "Letters to the Editor" feature in the BULLETIN as a sort of platform upon which anyone with something to say can stand and air his views or opinions (within certain limits), I cannot help feeling that Mr. Varney's letter in the March issue was somewhat out of place. In common with other members, I have the greatest respect for Mr. Varney's abilities and technical knowledge, but I cannot find much enthusiasm for the manner in which he has publicly torn to shreds Mr. Jessop's design and article.

It would appear that Mr. Varney hoped his letter would be published and that he realized it contained a great deal of criticism, otherwise why should he take such pains to adjure Mr. Jessop to accept the remarks as "constructive criticism."

As one who is not without experience of technical writing, Mr. Varney must surely appreciate Mr. Jessop's feeling in having his article so strenuously dismembered before all and sundry.

Since Mr. Varney is a member of the Technical Committee, it seems to me that a better way of drawing members' attention to necessary corrections would have been for the Committee to consider Mr. Varney's comments, and for their decision to appear as an Errata.

There does not seem to be any real need for this sort of wrangling in the Correspondence columns when a quieter but equally effective diplomatic course might be pursued. One cannot help feeling that the frequent Editorial appeals for more technical articles are in danger of being strangled at birth, or even murdered in the embryo stage, if a would-be author has to risk having his labours unmercifully mangled when read by knowledgeable members.

An author no doubt expects his story to be read intelligently and critically, yet at the same time find that his structure will not be brought down around him in the fashion that Mr. Jessop's building has been blasted by one of the big guns.

The decision to reproduce such a broadside in print suggests that the Editorial armchair is propped up by such a policy. The implication is sufficient to frighten off relatively unknowns like myself who might otherwise be tempted to rise to the appeal of "More Technical Articles, Please."

Yours faithfully,

St. Leonards-on-Sea, Sussex. W. E. THOMPSON (B.R.S.19773).

More About that Compact 75 Watt Table Top Transmitter for 14, 21 and 28 Mc/s

DEAR SIR,—I have read Mr. Jessop's reply to my letter published in the March, 1955, BULLETIN, and wish to thank him for the frank manner in which he has replied to my criticism of his article. However, although he has admitted the correctness of the majority of my points, I am afraid I cannot agree with one or two of his answers.

In his paragraph (2), he says that the fact that S2b appears to operate in the opposite direction to S2a and S2c is not incorrect because Fig. 1 is not a "wiring" diagram. Surely this is most unhelpful to the poor constructor who has no other diagram to guide him? If Fig. 1 is not intended to be a "wiring diagram" what is it? I suggest that it is simply a matter of common-sense to show the three ganged wafers in the same manner, i.e., anti-clockwise rotation to increase frequency as viewed (conventionally) from the rear of the panel. This method, of course, ensures clockwise rotation of the switch knob to increase frequency. However, whether or not one chooses to follow this convention is immaterial so long as the wiring permits all the ganged wafers to select any desired band simultaneously. As shown in Fig. 1, this is not so!

I am afraid that I remain unconvinced by his para. (5). To say the least, the use of such high values of capacity as 0.01 μ F in the positions shown in order to provide attenuation of the high audio frequencies is an inelegant and inefficient way of achieving this object. A simple audio frequency low pass filter section would have proved much more effective.

Mr. Jessop's answer in paragraph (6) is incorrect as an inspection of the photograph on page 325 of his article will show. The small skirt of the valve holder does not constitute effective screening and the actual screening can be not fitted as shown.

I regret to say that there are, in fact, a number of further errors in the article. They are as follows:

(1) On p. 321, in the text, the h.t. blocking condenser C27 (yet another 0.01 μ F where .002 or .005 max would be more suitable!) is stated to be a 2,250 v test type! With the 550 V h.t. stipulated, this condenser will be subjected to 550 V d.c. plus 550 (approx.) peak audio which is 1,100 V. It is well known that a margin of safety of at least 50 per cent working volts is desirable in this application. The use of a condenser of working value less than, say, 1,500 volts d.c. in this position is therefore potentially dangerous.

(2) On p. 325, Fig. 5 shows the power supply switching sequence (as conventionally indicated by the switch numbering) incorrectly. As shown, the h.t. switch is made before the heater switch. However, this is a small point. More important is the fact that, as shown in Fig. 5, there is no provision for switching off the 550 V h.t. to the p.a. while testing and adjusting the exciter portion of the circuit! This is most unhandy! The difficulty of separately switching the 300 and 550 V h.t. when using a combined h.t. transformer could have been off-set if a suitable power reducing control had been provided for the p.a. valve.

(3) Page 326, Under "Tuning Adjustments," immediately above Table 2, the author says "... Before h.t. is applied to the p.a. stage ... etc." This implies that the testing and adjustment of the exciter stages

(described just previously) has been done without h.t., on the p.a. How?

(4) Page 323, Fig. 2. It seems quite unnecessary to employ a phase-inverter valve (V3) and an audio transformer arranged for push-pull working when the use of either would have sufficed. If it is argued that there would be insufficient gain without the use of T1 in addition to V3, then it would appear that the choice of valves for V1, V2 and V3 is incorrect.

I trust that this correspondence, space for which you, Sir, have kindly provided, will serve to stress the importance of great care in the writing of technical articles for the BULLETIN so that it may continue to merit its high reputation.

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

A Window on the World for the Bedridden

DEAR SIR,—An idea has occurred to me with such possibilities of bringing infinite happiness to those who are seriously maimed that I felt I must put pen to paper.

As a wireless operator of a number of years standing (B.R.S.12115) I appreciate the pleasure which can be derived from making contacts and cannot help feeling thrilled with the possibilities if only those who are afflicted with permanent or semi-permanent disabilities, seriously restricting movement, could be helped to learn to run their own amateur stations.

I have in mind a polio victim friend (he lives in Hither Green, Lewisham), who has not moved his legs for many years and who seldom leaves his own room. His mind is more alert than most fully active people and his spirit is not less than an inspiration to all who meet him.

There are many others who are unable to leave their beds and wireless could bring them right back into society. It would be a wonderful thing indeed if R.S.G.B. members could each adopt a bedridden invalid in his neighbourhood and help him to learn to manage a set. R.S.G.B. may be able to secure ex-military sets becoming redundant and make them available at low cost to such parties and I am confident that organisations such as the Infantile Paralysis

Fellowship, British Legion, Round Table and others, who do so much for these handicapped people, would be only too willing to provide funds for the purchase of equipment in cases of need.

Here in Southern Rhodesia, mercifully, the need is nothing like so great, and the suggestion would have to come from me and not one of those to whom I refer, because their pride would forbid them writing.

Pray consider these suggestions from one whose experience includes both "ham" activity and "polio" inactivity. I know that the Infantile Paralysis Fellowship, Rugby Chambers, Gt. James Street, London, W.C.1, would only be too pleased to furnish members with a list of names and addresses of those who are permanently immobilised and consider furnishing funds for the necessary equipment. R.S.G.B.'s great contribution would be to make available some suitable equipment and shepherd in these new members to full activity by coaching and encouragement.

Yours faithfully,
LEONARD HARRISON (B.R.S.12115).

Gwelo, S. Rhodesia.

Amateur Licences

DEAR SIR,—In these days, when Amateur Radio has progressed almost to the point of a professional art, I am of the opinion that a survey of and a change in Amateur Licences would be beneficial.

I should be delighted to see the following suggestion discussed by members of the Society in the relevant part of the BULLETIN or hear of it being raised at a Society Meeting: I suggest either the return of the pre-war A.A. Licence or alternatively something on the lines of the American Novice Licence (in which field they appear to lead us considerably). Were a Novice Licence to be introduced I would suggest (on brief lines) a fairly high licence fee, crystal control, limited power (say in the region of 2 to 5 watts), frequency modulation, a restriction of bands available to Novice Licence holders, or a v.h.f. band made available for their use, simpler licence exam., the usual Morse Test, etc., and a system whereby a Novice holder could "graduate" to a fuller licence in due course.

Yours faithfully,
RICHARD WINTERS (B.R.S.20133).

Melton Mowbray, Leics.

Forthcoming Events (Continued from page 498)

REGION 9

Bath.—April 18, 7.30 p.m., 14 Pierrepont Street.
Bristol.—April 15, May 20, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol, 1.
Exeter.—May 6, 7 p.m., Y.M.C.A., St. David's Hill, Exeter.
North Devon.—May 5, G2FKO, 38 Clovelly Road, Bideford.
Plymouth.—April 16, May 21, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—April 16, May 21, 7.30 p.m., Y.M.C.A., Castle Road.
Falmouth (W.C.R.C.).—April 21, May 5, "The Fifteen Balls," Penryn.
Weston-super-Mare.—May 3, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

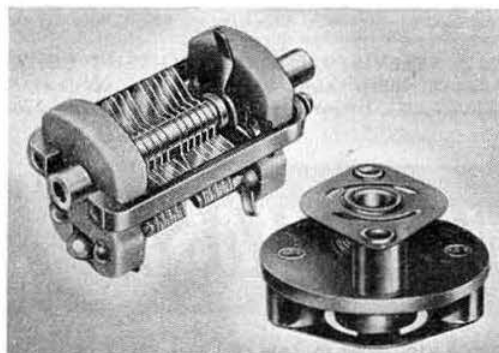
Cardiff.—May 9, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath & Port Talbot.—May 11, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline.—Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.
Edinburgh.—April 28, May 12, 7.30 p.m., Chamber of Commerce Rooms, 25 Charlotte Square, Edinburgh.

REGION 14

Falkirk.—April 29, May 13, 7.30 p.m., Temperance Cafe, High Street, Falkirk.
Glasgow.—April 29, 7 p.m., The Christian Institute, 70 Bothwell Street, Glasgow, C.2.



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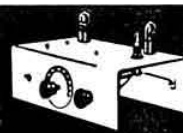
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AR88D partly assembled, all components, handbook, case, etc., £18, BC348, no case, £11, BC453 unmodified + 24V transformer + crystal converter for BC348, £4. New full vision dial, 17/6, Electronic Key, £1 10s, Mains operated Class D wavemeter, £4, Masts (1) type 55, wooden 30ft suitable N.F.D., complete, £3. (2) Telescopic copper sections, 27ft, £2. Also power supplies, valves, etc. Owner going abroad, S.a.e. for list. G3IXL, 4 Cherrydown Road, Sidcup, Kent. Foo: 1544. (586)

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BC221, £12. No case. Book needs calibration, B2, complete v.f.o. clamp modulator 1-7 to 28 Mc/s, £18, 2 variacs 110 volt 500W, £3 each, One damaged 110 volt 500W, £1. 2 coil pick ups with sapphires, £3 each, Mullard TV Projection unit, £12, ACRI tubes, 15/- each, C43 150W 5 bands 813, 807 AB2 mod v.f.o., Not TVI. No power supplies, £18. Buyer collects. Would lend itself to a rebuild 150 TVI job, BC639A, 90 Mc/s f.m. band, 6AK5s, front end, £18, G2UDS, "Sunnyside", Wallington, nr. Baldock, Herts. (614)

BC342, little used, £18, RF 26 unit, unused, 30/-, Class 'D' wave-meter and handbook, unused, £4, BC456 Modulator, 30/-, E. Hooper, 32 Beckingham Road, Guildford GU6033. (596)

BC348 parts, coilpack, dial, drive, crystal filter, i.f.s, b.f.o., with handbook, £3, BC342 chassis (complete receiver, less valves, power pack, some knobs) with handbook, £5 10s, Command receiver, 6-9 Mc/s (may need attention), £1, A.R.R.L. handbooks, 1952, 10/-, 1950, 7/6, Box 582, The National Publicity Co., Ltd., 36/37 Upper Thames Street, E.C.4. (582)

BC453 unmodified, 57/6, RF27 (3) good condition with valves, 30/- each, RCA 203A, 7/6, Split Stator condensers all ceramic, Eddy-stone 50+50 type 612 with neutralizing condensers, 12/6, Johnson 100+100 type 100E30, 12/6, midget 160+160, 7/6, Single Cydon (2) 00035 large transmitting type, 4/6, Eddy-stone 65 pF large transmitting ceramic, 3/-, Disc type neutralizing condensers silver-plated, 2/6 each, Postage extra, Folland, "Southview", Kingsdown Avenue, Luton, Phone: 4036. (613)

CLASS D wavemeter, £4, BC454; Japanese communications receiver (turret tuning, crystal gate, etc.), Universal Avomitor; 10 metre converter: 1 valve transmitter, etc. Offers: Miss Stent, Orchard Cottage, Laleham Road, Staines, Middlesex, Staines 2420. (599)

ELIZABETHAN—one 50% complete set components including meter, valves, £5 10, "Modern Q-5'er" 95 per cent, complete components including "Denoco" I.F.s valves, £3 10s, S.a.e. details SCR522 Mod. transformer, 7/6, 25ft alloy mast 2in. in 5 sections, £2, "CQ" Mobile Handbook, 12/6, Ball races, meters, crystals, etc. S.a.e. list, Box 573, The National Publicity Co., Ltd., 36/37 Upper Thames Street, E.C.4. (573)

FIFESHIRE Ham selling up, Elizabethan cw transmitter 120W, 640 receiver with preselector, wavemeter, Avo, desk, valves, etc. All at bargain prices. Buyers collect. Callers please advise XYL by p.c. Will sell to one buyer the lot £30. Reason for sale—emigrating, I. O. Shaw, GM3ANO, 1 Beech Avenue, Ladybank, Fifeshire. (594)

FOR SALE, B2 transmitter/receiver power pack spares in special wooden carrying case, unused, £18, 1131 converted 3.5/28 Mc/s and 1131 unmodified, must sell; offers, 145 oscillator, £3, BC348/0 separate p.p., £15, 579 High Road, Ilford. (606)

FOR SALE: manuals on following equipment AR88D, BC221, BC224, BC348 (less circuit diagram), BC375, BC640(2), SCR269, SCR274N (Command transmitter and receivers), SCR522, MN26, Packard Bell Preamplifier, Offers to Box 572, The National Publicity Co., Ltd., 36/37 Upper Thames Street, E.C.4. (572)

FOR SALE, 3 standard ball microphones, £5 10s, each, G3FZM, 46 Whirlow Grove, Sheffield, 11. (583)

FOR SALE, 25W rack transmitter, power pack mod. p.a. a.t.u., Eddy-stone 640, Bendix transmitter 2X807 p.a. Mod. and power pack. Sundry meters, etc. Cash offers, J. Forbes, 12 Perham Road, West Kensington, W.14. (615)

G3GDA going overseas as previous advertisement under Box No. 540, March issue, Transmitter, £40, Receiver, £10, BC221, £10, Any reasonable offer taken, must sell, Box 610, The National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (610)

G3IDG needs "CQ," January, March, April, June, November, December, 1945, Any "Radio" before 1936, Any "R/9" before April, 1935, Any "QST" before 1924, "Calling CQ" (de Soto), What "Amateur Radio," "Break-in," "Radio ZS," "Xtal" have you? 95 Ramsden Road, London, S.W.12. (607)

HAMBANDER, £12 o.n.o. Q-5'er for same, £3, Buyer arranges carriage. No reasonable offer refused, Box 591, The National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (591)

IMPROVED HRO Senior 9/30 Mc/s, bandspread 28, 100 kc/s oscillator, break in, power pack, manual, spare crystal, £25, TU5B, 15/-, R1132, 45/-, Eddy-stone bug, 37/6, 2XEF39 pre-selector 1.7/30 Mc/s, 35/-, Details, offers, Trowell, 4a Clyde Avenue, Sheerness 2634. (612)

MCR 1, 4 coils, powerpack, excellent condition, £5 carriage paid or offers. Various valves, S.a.e. list. All letters answered, G2BOU, 48 Fairview Avenue, Stanford-le-Hope, Essex. (584)

METALWORK.—All types cabinets, chassis, racks, etc., to your own specifications. Philpott's Metal Works Ltd. (G4BI), Chapman Street, Loughborough. (599)

MORECAMBE holiday, near sea, overlooking bay and lakeland mountains, ham shack, write brochure, G3AEP, "Ferncliffe," Dretton Avenue, Morecambe. (530)

MOVING QTH, Must clear, 35ft internally climbable sectional steel tower, Nearest to £10, Also unused valves: 100TH's, 25/-, 8025's, 8/6, HK24G's, 17/6, 15E, 10/-, 717A, 4/6, post extra, G5BM, 41 Arle Drive, Cheltenham. (604)

NEW, boxed, 830B (2), 10/6, 801A (2), 6/-, VCR 138A (1), 15/-, New, unboxed, 805 (3), 12/6, 830B (1), 7/6, 801A (2), 5/-, CV72 (3), 6/-, VR136 (3), EC52, 6F8, 1D8GT, 4/6, prices each, FL8A, new, 8/6, 805 bases (6), 2/- each p.p. extra, Box 608, The National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (608)

PATENTS and Trade Marks, Handbooks and advice free, Kings Patent Agency, Ltd. (B. T. King, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146a Queen Victoria Street, London, E.C.4. Phone: City 6161. 50 years' refs. (598)

Q-MAX converter 27-205 Mc/s with power pack, £9, G.R. wave-meter 55-400 Mc/s, £1, Crystals in holders 8050, 8036, 7/6 each, 832, 10/-, 811 (2), 10/-, 866A (2), 7/6, 808 (2), 10/-, Box 598, The National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (598)

QS.L.s and log book (P.M.G. approved), Samples free, State whether G or B.R.S. Atkinson Bros., Printers, Eiland. (400)

RACK, 6ft tapped sides, heavy base, 30/-, carriage extra, 20 Coniston Drive, Tilehurst, Reading, Berks. (597)

SALE, Buyer to collect. Can be seen by appointment. Reasonable offers entertained. AR88D with manual, £55, HRO Senior and p/pack in rack, 4 b/s coils 14/30 Mc/s with manual, £25, RCA CRO 3in. tube with spare tube and manual, £15, RCA Junior VoltOhmyst and manual, £10. One special mains transformer for above two units. Taylor Meter 85A and manual, £12, Mullard C x R Bridge and manual, £7, Wilcox-Gay Master Oscillator slightly modified to include top band and Crystal Multiplier modified for top band amplifier can be modulated externally, separate units, manuals for both, £7, Rich & Bundy transformers, 1,000V 120mA, and 4V 3A and 7.5V 6.5A, £6 pair. All the above in excellent condition, Advance No. 3 Signal Generator, £8, B-Max B4/40 modified, 807 final and speech clipper, D104 microphone and two Q.C.C. crystals 3514 and 7003 kc/s, £25, G2AIM, 64 Cecil Park, Pinner, Middlesex. (609)

SALE HRO senior 1.7 to 30 Mc/s and p.p., £25, Latest type Truvox tape deck switch unit, needs attention, otherwise new, £16, Alpicco AC/54 tape recorder amplifier, £8 10s, Bug key, 35/-, New, boxed, 829B, 50/-, G3FPS, 13 Church Road, E. Molesey, Surrey, Phone: Molesey 2917. (600)

SALE or Exchange: BC342. No power supply but new mains transformer and components included in deal. Wanted: portable or miniature phone/cw transmitter (14 Mc/s, etc.) and power supply. Box 593, The National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (593)

SALE, Valves at 2/6; 6AC7, 12SA7, 617, 6K7, 12SK7, 6SQ7, 12SG7, 6AR, 6SH7, At 4/-; DAF91, DL92, 35A, IT4, X17, 616, At 20/-; pair DA30s, At 35/-; 813, L1 and L2 coils for B2 at 4/- each, 5A Thermocouple RF meter, 5/-, Please send S.a.e. with order, Harvey (G2CQJ), Llanfair, Yelverton, Devon. (580)

SUPERB 1132A tropicalised: 4in. aluminium panel: circuit in cover, 60/-, Wavemeter W1432: tropical: 160-260 Mc/s: spare valves: 0/1 mA meter: circuit: commercial TV coverage, 45/-, Unused Eimac 35T, 15/-, 700/700 volt 175 mA Thordarson transformer, 32/6, Felton, G3IEF, 46 Prebendal Avenue, Aylesbury. (571)

SWAP HRO (9-30 Mc/s) five coils including b/s 40:20:10 (two), spare valves, copy of handbook, for S740 (or S640 with cash adjustments) or sell, £25, 1951 edition of "Technical Instructions for Marine Radio Officers" (Dowsett & Walker) the complete theoretical course for P.M.G.'s certificates, mint condition, 37/6 (cost £3); 832s (3) new, boxed, 20/- each, G3GUP, 12 Saffrow Way, Chatham. (588)

(Continued on page 504)

EXCHANGE AND MART SECTION (Cont.)

VALVE clearance. Brand new. HK254, 100T, 50T, HK4E27, 30/- each. GU50, PT15, 10/- each. 832, 25/-, 829B, QVO7/40, 55/-, DET19, 3/-, W. G. Sherratt, G5TZ, 82 High Street, Newport, Isle of Wight. (579)

WANTED, B.C.610 Hallicrafters, ET4336 transmitters, and spare parts for same. Best prices, P.C.A., Radio, Beaver Lane, Hammer-smith, W.6. (577)

WANTED, Copies of QST for June, 1952, April, July, August, September, 1953. Offers, G3JW, 7 Heversham Road, Bexleyheath, Kent. (592)

WANTED, odd coils, or complete set for Eddystone 358X. Buy, or exchange Hallicrafters "Super Skyriders," requires attention, 72 Spring Terrace, Aversoyd, Golcar, Huddersfield. (602)

WANTED, 75-100 W transmitter 14/21/28 Mc/s or similar FD/PA unit. Also Top Band cw/phone transmitter (v.f.o.) and separate universal ATU (metered). All must be compact and good. Full details, offers Box 587, The National Publicity Co., Ltd., 36/37 Upper Thames Street, London, E.C.4. (587)

WEBB'S 5 and 10 converter, unused, £6. Woden DT1, unused, 30/-, W191A complete, £6. Premier 6in, TV O.K., £10. Carriage extra. Stamp for details. Wanted, July, 1948, BULLETIN, 3 Gorecourt Road, Sittingbourne, Kent. (611)

WRL Globe Trotter transmitter table top 25-40W cw/phone 160-80-40-20-10. Complete with auto-transformer for 230V a.c. and home built v.f.o. and a.t.u.s., £30, BC342 r.f. and a.f. gains, 'S' meter, a.n.l. TC, crystal, auto-transformer 230V a.c. f.b. receiver very good condition, £15, TUSB, top band transmitter, TTH v.f.o., TTH p.a., £3, TUSB 80 meter transmitter 807 v.f.o., 813 p.a., £5. Both complete with valves, E, Bastilio, G3HVH, 111 Vale Road, Portslade, Sussex. (589)

W.S. NO. 38 walkie-talkies, 2 sets working, phones, microphones, etc., complete except h.t. batteries. With spare valves and 3 spare chassis, £5 10s, the lot, or offer, Bramham, 6 Chapel Road, Redhill, Surrey. (590)

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APPOINTMENTS SECTION

Situations vacant

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)

TECHNICAL INSTRUCTOR (BROADCASTING) required by the Broadcasting Service, Nigerian Federal Government for two tours of 12 to 15 months each, with possibility of permanency. Salary scale (including expatriation pay) £1,307 rising to £1,453 a year plus Gratuity at rate of £150 a year. Outfit allowance of £60. Liberal leave on full salary. Free passage for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for maintenance in U.K. Candidates should have instructional experience and should have a good theoretical and practical knowledge of radio communication as applied to MF, HF, and VHF transmitters and receivers with a knowledge of mathematics, electricity and magnetism. Write to the Crown Agents, 4 Millbank, London, S.W.1, State age, name in block letters, full qualifications and experience and quote M2C/30513/RC. (585)

TRANSFORMER and Filter design Engineer required to take charge of design and manufacture. Qualifications and experience essential. Apply to Personnel Manager, Pye Telecommunications, Ltd., Ditton Works, Cambridge. (560)

WIRELESS STATION SUPERINTENDENT required for the Posts and Telecommunications Department, Gold Coast Local Civil Service, for two tours of 18 to 24 months in the first instance. Consolidated salary scale £990 rising to £1,230 a year. Gratuity at the rate of £100/£150 a year. Outfit allowance £60. Liberal leave on full salary. Free passages. Candidates should possess C and Gds, Final Certificate in Telecommunications (Radio) or C and Gds, Certificates Radio III and IV equivalent, and have had three years' experience in two or more of the following fields: V.H.F. link systems; H.F. communications systems; Frequency shift keying and teleprinter maintenance; V.H.F. and H.F. Cathode Ray Direction finding system; Aeronautical navigation aids (ground); Manufacture of light engineering equipment. Candidates from the British Post Office should apply through departmental channels. Write to the Crown Agents, 4 Millbank, London, S.W.1, State age, name in block letters, full qualifications and experience and quote M2C/29100/RC. (575)

APPOINTMENTS SECTION (Cont.)

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.

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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.

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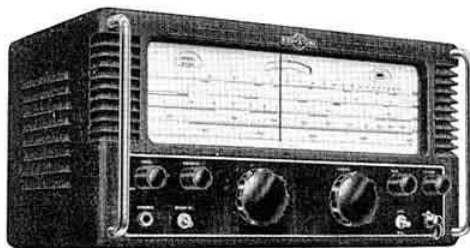
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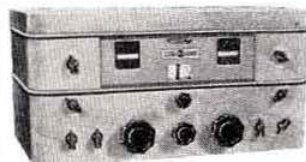
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MEAdway 3145 (Night)

TEST EQUIPMENT

We have a large range of Test equipment in stock, including: AVO model 7 at £15. AS NEW, model 40, £12. AC/DC minors, £5.10. FERRANTI multi-range test meters in cases, NEW, £4.10. AVO valve tester roller panel, £9.10. TAYLOR 260 TV Wobulator, £28. AVO electronic test meter, £25. AVO METER, MODEL 40 VOLT-AGE-MULTIPLIERS to 4,800V 5 - each. Brand New, post paid.

**REALIGNMENT
SERVICING AND
RECONDITIONING**

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

COMMUNICATIONS RECEIVERS

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

URGENTLY REQUIRED

Hallcrafters S27, S27CA, SX28, RCA AR88, R1359, and R1294 VHF receivers. Transmitters APT5 and ASB8, £20 paid for BC221 Frequency Meters. ALL USA TS equipment TS13, TS174, etc. £100 paid for TS175.

IF UNDELIVERED

Return to:—
R.S.G.B., NEW RUSKIN HOUSE,
LITTLE RUSSELL STREET, W.C.1

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