R·S·G·B AMATEUR RADIO

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOLUME 29 No. 7 PRICE 2/6

JANUARY 1954

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R·S·G·B· BULLETIN

Devoted to the Science and Advancement of Amateur Radio

Contents

Vol. 29. No. 7. JANUARY, 1954.

R.S.G.B. BULLETIN

Published on or about the 15th of each month as its Official Journal by the Incorporated Radio Society of Great Britain and issued free to Members.

Editor:
JOHN CLARRICOATS

Editorial Office :
NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, LONDON, W.C.1.

Telephone : HOLborn 7373

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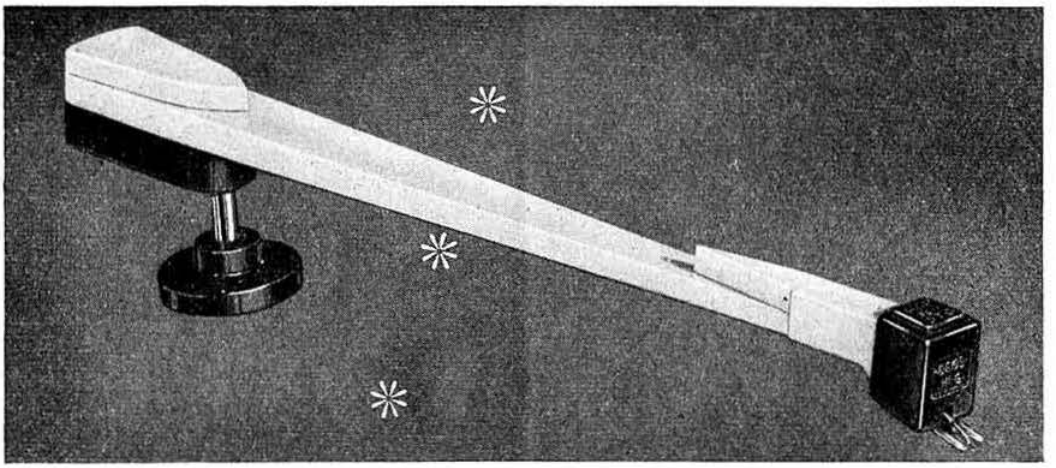

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TO SUM UP:

HGP 40 pick-up is discontinued.

HGP 39-1 (STD. or LP) heads are available to modernise the GP 20.

GP 20 fitted with HGP 39-1 head will in future be known as the GP 20/Hi-g.

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Current Comment...

ITAMKITH ?

NO doubt the "rare country" winklers will prick up their ears—or at least raise their eyebrows—at the mysterious word "Itamkith" which heads this paragraph. No, it is not the name of a new country; but it *does* have a very definite interest to those who set store by good radio operating techniques, since it stands for:

"Is there a Morse key in the house?"

That, indeed, is a question to conjure with. For if the "Station Descriptions" to be seen in the world's radio magazines are anything to go by, it is a question which has "No" for its answer. A considerable number of the station photographs published nowadays do not include a Morse key at all, and it must therefore be assumed (since the subject is usually careful to include in his photograph everything that he feels reflects him as "a ham") that no particular prestige attaches to its appearance.

It is not only in station descriptions that this antipathy to telegraphy is apparent. It can be heard expressed, also, where amateurs foregather, on the air and off it.

Here is a trend that should be halted. Without wishing to revive the old argument of "'phone *versus* c.w." (a sure-fire subject for any harassed T.R. short of something for the next meeting!) one will say simply that there is hardly anything that is transmitted on telephony which cannot be equally well transmitted on telegraphy—*provided that proficiency in c.w. operating has been achieved.* It could be argued, too, that in the overcrowded amateur bands of today the use of telephony becomes morally indefensible.

Proficiency in operating . . . there's the rub. It does seem that a fair proportion of licensees fail to put in the necessary intensive listening and logging that are such vital pre-requisites to confidence in operating after the G.P.O. Licence arrives. Skill at conversing through the fingers is thus never acquired.

Maybe too much listening is done at the 'phone end of the 80-metre band rather than at the c.w. end—where, as it happens, telegraphy operating of a very high standard is commonly heard. And maybe the necessary hard graft that precedes the mastering of the art of talking in Morse deters the faint-hearted. In the famous words of a well-known Midlands amateur: "I mugged up enough Morse to pass the test, and then with a sigh forgot it all."

Is there a Morse key in the house? The telephony adherents would do well to look—for he who operates only one mode of emission can be accused with reason of being only "half a ham."

RAEN

IF there are among us those who could be called "only half a ham" there are others who are very much the "whole ham"—in fact "a ham and a half" would be a fair, if colloquial, description!

One refers to the members of the newly formed Radio Amateur Emergency Network, for here are men prepared to do a man's job. There is no "kid's game" (remember the phrase used here last month?) about *their* outlook on Amateur Radio.

For years there has been a feeling among many members that the operating skills they had developed in the pursuit of their hobby could be turned to uses other than routine amateur communication. During the war they were. Why not, then, during peace—in an emergency?

The desire to serve had been expressed at various times over twenty years or more. Then last winter under the impact of natural disaster the desire was translated into action, and immensely valuable aid was rendered by amateur operators.

To canalize the effort should disaster strike again is the purpose of the new R.A.E.N.—and the Network's inauguration has caught the enthusiasm of the transmitting amateur in no uncertain terms.

More power to them—even though, in a time of crisis, they may be somewhat QRP! They will be among the *elite* of British amateurs in knowing which bands to use and when, what type of equipment to use and where, and above all, *how to operate,* and in which mode.

The "whole ham"? The answer's R.A.E.N.

BERU

FOR our third set of initials this month we come to "BERU"—and they will be heard a great deal a fortnight from now.

The annual British Empire Radio Union contest is not an easy contest. Perhaps this fact has deterred some of those operators who might otherwise go in for it. But it is a very *fair* contest, and it is, moreover, one that calls in no small measure for those first-grade operating techniques which are referred to in the two preceding "Comments" on this page.

Empires come and Empires go—and the British community of nations has metamorphosed from Empire to Commonwealth in the last dozen years. That does not make a scrap of difference to the feeling behind those magical letters "BERU" as they come through the phones with that faint "10,000 mile echo." They mean "red on the map." Listen for them on January 30!

—J. H.

Single Sideband Technique

Part 2—Filter Type Exciters

By H. M. HUMPHREYS (GI3EVU)*

This article, the second of a short series, deals with the problem of generating the single sideband suppressed carrier signal. It also provides complete information on the construction of a simple crystal filter type exciter unit.

IN the previous article (November, 1953) the simplicity with which the unwanted carrier can be eliminated was described. It was also shown that the resultant double sideband suppressed carrier signal was useless for amateur communication purposes. It is, therefore, necessary to examine methods of attenuating one of the sidebands to such an extent that its effect at the receiver is negligible. No matter what system is used, the unwanted sideband is not eliminated completely; it is merely attenuated until its "nuisance value" has been so far reduced that it is unimportant, although the balanced modulator, when very carefully adjusted, is theoretically capable of suppressing an unwanted carrier completely. A minimum standard for sideband attenuation is difficult to set because that indefinable factor "quality" must be considered. However, 30 db attenuation over the desired audio frequency range is generally considered a practical figure for initial experiments.

Sideband Attenuation Systems

There are two methods of sideband attenuation at present in use by amateurs:

1. The filter system;
   (a) using LC filter elements;
   (b) using crystal networks.
2. The phasing system.

The LC Filter System

The filter system employing LC filter elements is the classic way of producing a single sideband signal and has long been used successfully in commercial equipment. It has never proved popular for amateur use, owing to the difficulty of designing really effective filters. Fig. 7 shows how exacting are the requirements for an ideal filter. If *fc* be taken as 3.5 Mc/s and only the upper sideband is to be radiated, the filter would have to attenuate all frequencies below 3500 kc/s by at least 30 db. The slope of the response curve in the region of the cut-off frequency would require to be almost vertical and the curve should have

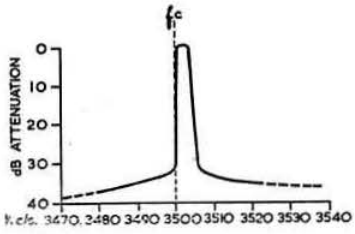


Fig. 7.—Response curve for ideal s.s.b. band pass filter.

a virtually flat top between 3500 kc/s and 3503 kc/s. This specification is practically impossible to meet. Commercial designers have solved the problem by first generating a carrier at a very low frequency—of the order of 10 kc/s—where sufficient adjacent-channel selectivity may be obtained more easily. The 10 kc/s carrier, when modulated by an audio waveform containing frequency components up to 3 kc/s, produces sidebands of 7 to 10 and 10 to 13 kc/s. It is possible to design a reasonably good bandpass filter in this frequency range to remove the unwanted sideband. It is not practicable, however, to design a filter with a passband much wider than 3 kc/s. The cut-off at the side approaching the carrier cannot be made steep enough to attenuate all of the unwanted sideband to the required minimum of 30 db. This is shown graphically in Fig. 8. The defect is

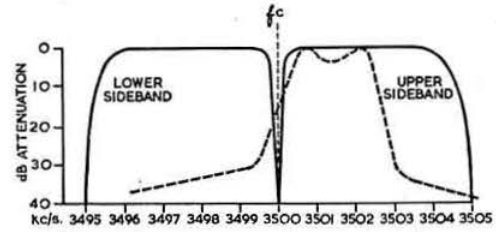


Fig. 8.—Response curve of a practical filter.

inherent in all filter systems, and although there is, at present, no cure for it, it can be circumvented by removing all components of the modulating frequency which lie below 300 c/s or so.

When a single sideband signal has been produced at low frequency in the manner described, it is necessary to change its frequency so that it will lie within one of the amateur bands. This cannot be accomplished in one step, due to the difficulty of image rejection. For example, suppose that a sideband with a nominal first carrier frequency of 10 kc/s is to be converted to 3750 kc/s. If it were to be mixed with the output of an oscillator working on 3740 kc/s, the output circuit would contain the unwanted difference-component of 3730 kc/s as well as the required sum-component of 3750 kc/s. The oscillator component would also be present, but could be removed by use of a balanced modulator. Unfortunately, no output circuit could be made selective enough to give sufficient rejection of the image. The difficulty can be overcome by first heterodyning the 10 kc/s sideband to an intermediate frequency in the region of 500 kc/s where adequate image rejection may be easily obtained. The single sideband signal then undergoes a second heterodyne conversion, but as the image now lies about 1000 kc/s from the output frequency, it can cause no trouble. A simplified block diagram of an LC filter type exciter capable of producing an s.s.b. signal in the 3.5 Mc/s band is shown in Fig. 9. The complexity of a practical transmitter of this type is obvious, and this is probably the most

* *94 Locksley Park, Finaghy, Belfast.*

important reason for the lack of amateur interest in single sideband before the last war.

The LC filter system has been touched upon briefly for the purpose of historical record only as it does not appear to offer a profitable avenue for amateur exploration. However, for those experimenters who would like to see what can be done with the circuit, a suitable arrangement is shown in Fig. 10. The writer has not built this type of filter but has used an amateur-constructed unit of a similar type. It worked very well. The inductances may be made by modifying standard television correction coils. The unit should be built in a metal screening box with the coils so mounted as to minimise stray mutual coupling. Before being connected together, the individual LC sections should be tuned to the frequency shown in Table 1. It is again emphasised that this system is not recommended for general amateur use as better results can be obtained more simply and more cheaply by either of the two alternative methods.

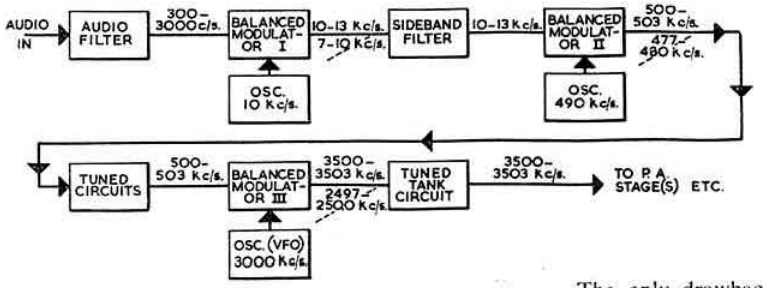


Fig. 9. — Simplified block diagram of filter system of generating an s.s.b. signal.

Crystal Filter Networks

The crystal filter method of attenuating the unwanted sideband offers the easiest way by which an amateur with limited resources in time and equipment can put a reasonably satisfactory s.s.b. signal on the air. The theory of bandpass crystal filters is dealt with in the R.S.G.B. *Amateur Radio Handbook* and need not be repeated here. The most important point is that, due to its high "Q," a simple crystal filter operating in the region of 400 to 600 kc/s can give a degree of attenuation at least as good as that of a complex and expensive LC unit at 10 kc/s. Circuits have been published in which crystals of very much higher frequencies were employed, but they are not favoured because the cut-off is not steep enough. There are two further sound reasons for preferring the 400 to 600 kc/s region. The first is that crystals of suitable frequency separation can be obtained cheaply on the surplus market, and the second is that there is no difficulty in constructing the necessary tuned circuits because standard receiver i.f. components may be employed. Minor modifications are necessary but these can be carried out with little difficulty. A block diagram of a crystal filter type s.s.b. exciter is given in Fig. 11. Its simplicity in comparison with the circuit of Fig. 9 is clear. As the first carrier is generated in the region of 500 kc/s it may be heterodyned to the required output frequency in one operation, without any image rejection problems.

TABLE 1

ELEMENT	TUNING POINT
C1 L1	9·0 kc/s.
C2 L2	13·0 kc/s.
L3 CX	ADD CX (·1uF.) TEMPORARILY AND TUNE TO 9·4 kc/s.
C3 L4	11·6 kc/s.
C5 C4 L5	9·8 kc/s.
C6 L6	10·9 kc/s
C7 L7	9·6 kc/s.
C8 L8	13·6 kc/s.

The only drawback to the crystal filter circuit is the restriction imposed on the modulating frequencies which may be used. If the filter response curve is to have a reasonably flat top, a total bandwidth of 2.5 to 3 kc/s is the maximum which can be obtained. Further, the cut-off is not sufficiently steep to allow audio frequencies below about 300 c/s to be used. As with the LC filter arrangement, a high-pass filter must be incorporated in the speech amplifier. For the best results, this must cut-off fairly steeply below 300 c/s. An effective roll-off can be achieved by choosing appropriate time constants for the coupling condensers and associated grid resistors in the speech amplifier. A high-pass LC filter would give a steeper cut-off, but suitable inductors are expensive and difficult to obtain. This type of filter is also prone to an objectionable degree of hum pick-up when used in a low-level stage and needs careful layout and screening. For average amateur use, RC frequency compensation is good

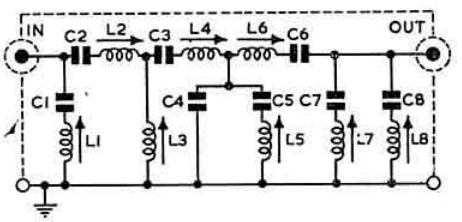


Fig. 10.—Sideband filter 10–12 kc/s.

L1	13.5 mH	L8	19 mH
L2	7.5 mH	C1	0.023 μF
L3	2.9 mH	C2, C5	0.02 μF
L4	18 mH	C3, C7	0.01 μF
L5	13 mH	C4	0.11 μF
L6	17 mH	C6	0.012 μF
L7	27 mH	C8	0.007 μF

enough. Fortunately, the loss of all modulating frequencies below 300 and above 3000 c/s does not have an adverse effect on intelligibility. In fact, it is often considered an improvement, especially in the usual amateur-band conditions of heavy interference and noise. Fidelity, however, suffers fairly severely, so that the "quality" enthusiast is unlikely to be satisfied with a filter type single sideband transmitter.

Experiments with several different types of filter have led to the conclusion that the simplest of circuits can give results virtually indistinguishable from the most complicated. A complex crystal-filter exciter becomes expensive and is just as difficult to align as the phasing type, despite the fact that it cannot compete with the latter for fidelity, because of its limited bandwidth. The advantages of the crystal filter arrangement can best be gained by using the straightforward circuits which combine the merits of simplicity, economy and ease of adjustment.

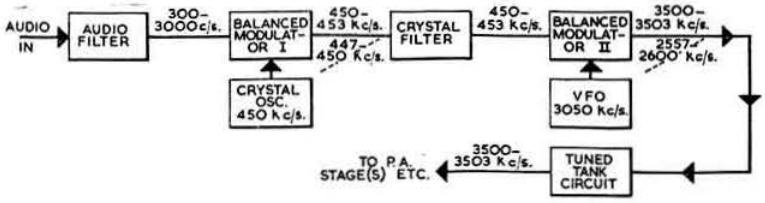


Fig. 11.—Block diagram of a crystal filter type s.s.b. filter.

A Practical Design

The circuit shown in Fig. 12 represents just about the minimum with which an adequate s.s.b. signal can be generated. Let there be no doubt about the purpose of this circuit. It is intended for the newcomer to this system of transmission, and is unlikely to satisfy the requirements of the "quality" enthusiast or advanced experimenter. It will, however, produce a clean, carrier-free signal, with at least 30 db attenuation of the unwanted sideband over a speech frequency range of 300 to 3000 c/s. Inexpensive, easy-to-get components are used throughout, and elaborate test equipment is not necessary for alignment. One amateur claims to have set up an exciter of this type by whistling into the microphone, but most constructors will find it more satisfactory to use a signal generator. As the requirements are not at all stringent a simple r.f. oscillator will serve the purpose admirably.

Although a speech amplifier section is included for completeness, there is no reason why an existing unit should not be used, provided it is capable of giving about 4 volts of audio and that speech frequencies below 300 c/s are restricted. Speech clipping is neither necessary nor desirable, as it merely adds to circuit complexity without giving any advantage in increased sideband power.

The output from the speech amplifier is fed in push-pull to the grids of the first balanced modulator (V1). The output from V2, which is a crystal oscillator operating in the region of 450 kc/s, is also fed into V1, but in such a manner as to excite the grids in parallel. As the anodes of the balanced modulator are connected to opposite ends of the centre-tapped primary of T1, the carrier frequency is eliminated and the sidebands only appear in the secondary.

Filter Transformers

Transformer T1 is a standard interstage i.f. component, preferably an air-cored, condenser-tuned type. The primary and secondary are modified by the addition of the condensers C10, C11, C12 and C13 to provide effective centre taps. These condensers should be the high-stability silvered mica type. Care should be taken to see that C10 equals C11 ± 1% and that C12 equals C13 ± 1%. Most dealers who cater for the radio amateur will co-operate in providing necessary pairs by measurement on a capacitance bridge of types selected from their normal stock. Some modification of the original trimmer condensers C9 and C14 may be necessary to enable the transformer to be tuned to the correct frequency; in extreme cases it may even be necessary to remove a number of turns from the windings.

Selection of Crystals

The crystals X2 and X3, which are connected in a bridge circuit with the secondary of T1, form the filter. By selection of components of appropriate frequencies, either of the sidebands may be rejected at will. There is quite a lot of latitude in the selection of crystals for this exciter. The only strict requirements are that X2 should equal X1, and that X3 should differ in frequency from X2 by not less than 1.6 kc/s and not more than 2 kc/s. If X3 is of a higher frequency than X2, the upper sideband will be passed, and vice versa. For the greatest constructional convenience, it is advisable to select crystals in the 425-450 kc/s range in order to avoid extensive modifications to T1 and T2. Suitable crystals may be obtained from dealers who advertise in the R.S.G.B. BULLETIN. A particularly suitable series, with a channel separation of 1.8 kc/s, is available at

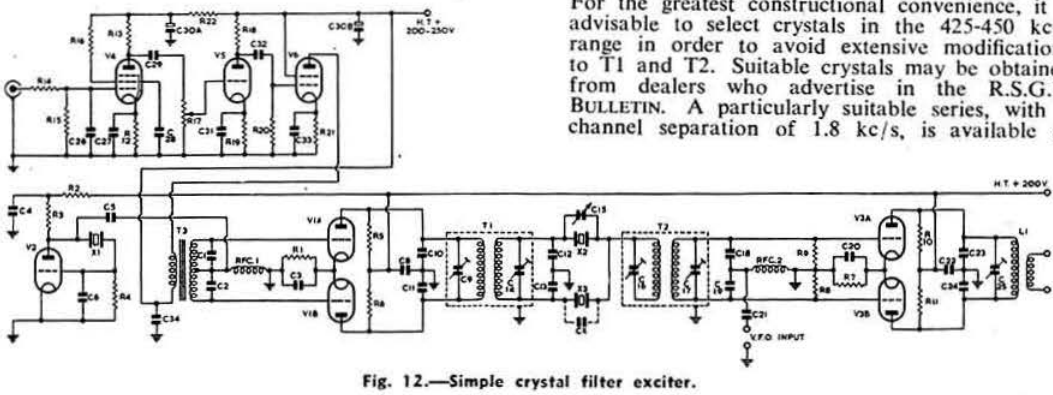


Fig. 12.—Simple crystal filter exciter.

12/6 for each crystal. X2 and X3 may be socket mounted but it is better to solder them into position. They should be so located as to minimise stray capacitance between each other and to earth. Cx will probably not be needed in most cases but should be added if it is found impossible to align the filter without it. It should be a high stability silvered mica component of 5-10 $\mu\mu$F capacity. The exact value is determined by trial and error as it depends on the stray capacitance of the wiring.

It should be noted that as T2 is tuned to the centre of the pass-band a choice of sidebands cannot be obtained with this type of filter by providing alternative crystals for position X3. If sideband switching is desired, it may be obtained by arranging for a second crystal, equal in frequency to X3, to be substituted in the crystal oscillator circuit for X1. This does not allow the operator to stay on one spot frequency and switch from one sideband to the other, but in practice this facility is rarely required.

A filter of the type described will only provide a satisfactory bandpass when working into a high impedance load. In this respect, it differs from the receiver crystal gate, which works best into a low impedance. The filter load is provided by the tuned primary of T2, which is identical to T1, except that the secondary only should be provided with a capacitative centre-tap. The sideband passed by the filter is fed *via* the secondary of T2 to the grids of the second balanced modulator (V3) where it appears in push-pull. The output from a v.f.o. is also fed into this balanced modulator, in parallel. As the anodes of V3a and V3b are connected to the output tank circuit in push-pull, the only component frequency which will appear in the output is the selected sideband, now heterodyned to the frequency of transmission. It follows therefore that by selection of the appropriate frequency, output may be obtained in any desired band.

Construction

No difficulty should be experienced in constructing the unit. The only trouble which can occur arises from leakage of the carrier or unwanted sideband into V3 or any subsequent stage. This can be avoided by laying out the stages so that V1 and V2 are positioned well away from other r.f. stages. Sound constructional practices, such as short leads and good decoupling to the chassis at the valveholders, should also be observed. Some slight difficulty with carrier breakthrough may be encountered if X1 happens to be an unusually active crystal and so overexcites V1. The fault may be cured by increasing the value of R2 until the trouble disappears.

Alignment

Alignment of the exciter is very simple. The only test gear required is an oscillator (capable of giving a few volts of r.f. over the frequency range of the filter) and some means of measuring output. The valve voltmeter and the oscilloscope are the best, because they do not load the circuit to which they are coupled. Sharper and more accurate readings are therefore obtained than with other measuring devices. Contrary to general belief, neither of these instruments need be expensive, and in the section of this series dealing with test gear an oscilloscope, which can be built for about £2, will be described. The filter exciter may, however, be aligned without either of these instruments. A receiver with an "S" meter may be used, but great care would be necessary to see that only the output from L1 on the exciter was fed into the aerial terminals. Even a small amount of pickup of the radiation from the test oscillator or from any of the circuits preceding the filter would ruin the results. Positive and accurate results may also be obtained with the simple device shown in Fig. 13. This indicator should be coupled loosely to L1 by a two or three-turn link and the degree of coupling subsequently adjusted to give adequate sensitivity.

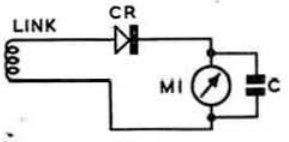


Fig. 13.—Carrier and sideband suppression indicator. C1, 0.001 μF, mica; CR, Germanium diode; M1, 0–1 mA m.c. meter.

With the measuring instrument connected to the exciter output, the oscillator valve should be removed and the audio gain turned to minimum. An r.f. signal set midway between the frequencies of X2 and X3 should then be injected into the grids of V1 and the trimmers C9, C14, C16 and C17 adjusted for maximum output. The test oscillator is then altered in frequency by 4 kc/s and C15 adjusted for minimum response. The indicator must be coupled very tightly to the output circuit when making this measurement, as the minimum should be at least 30 db below the maximum. These adjustments should be repeated several times because they are, to some extent, interdependent.

Components List for Fig. 12

C1, 2, 5	500 $\mu\mu$F silver mica
C3, 7, 8, 28	0.1 μF paper
C4, 20, 22	0.01 μF mica
C6	10 $\mu\mu$F silver mica
C9, 14, 16, 17	Trimmers in i.f. transformers
C10, 11, 12, 13, 18, 19	100 $\mu\mu$F silver mica
C15	1–8 $\mu\mu$F Philips trimmer
C21, 29, 32	0.001 μF mica
C23, 24	50 $\mu\mu$F silver mica
C25	50 $\mu\mu$F variable
C26	100 $\mu\mu$F ceramic
C27, 31, 33	10 μF 25 V electrolytic
C30, A & B	32 x 32 μF 350 V electrolytic
Cx	See text
R1, 7	4,700 ohms
R2	3,300 ohms
R3	33,000 ohms, 2 W
R4, 8, 9, 18	100,000 ohms
R5, 6, 10, 11	10,000 ohms
R12	2,200 ohms
R13, 20	470,000 ohms
R14, 16	1 Megohm
R15	3.3 Megohm
R17	0.5 Megohm pot.
R19	3,900 ohms
R21	220 ohms, 1 W
R22	47,000 ohms
	All resistors are $\frac{1}{2}$ watt types unless otherwise stated.
RFC1, 2	2.5 mH r.f. choke
T1, 2	465 kc/s i.f. transformer
T3	1:2 audio transformer with centre-tapped secondary
V1, 3	12AU7 (or 6SN7)
V2, 5	6C4 (or 6J5)
V4	6BR7 (or EF37A)
V6	6BW6 (or 6AQ5 or 6V6)
L1	24 turns, 22 s.w.g. enam., close wound on $\frac{3}{4}$in. diam. former, with 3-turn link.

Although the exciter will produce a reasonable signal, some may not be satisfied with only 30 db attenuation of the unwanted sideband. However, the addition of a second filter section, as shown in Fig. 14, will increase the attenuation to about 55 db. The alignment procedure is the same as for the single section filter.

The output of the unit described is in the 3.5 Mc/s band, the most popular frequency for amateur single sideband activity under present conditions. The method may, however, be used on any of the communication bands. Band changing must be done by heterodyne conversion; frequency multiplication is definitely out of the question. As this is common to both crystal and phasing-type exciters, it will not be discussed until the phasing system has been described.

The lower sideband is commonly used for s.s.b. transmissions on 3.5 Mc/s.

Summary

The crystal filter exciter is simple to build and adjust and is extremely stable. The only real disadvantage is that it cannot be used to transmit modulating frequencies below 300 c/s. Those to whom this limitation is unacceptable will have to use the phasing system which will be described in Part III.

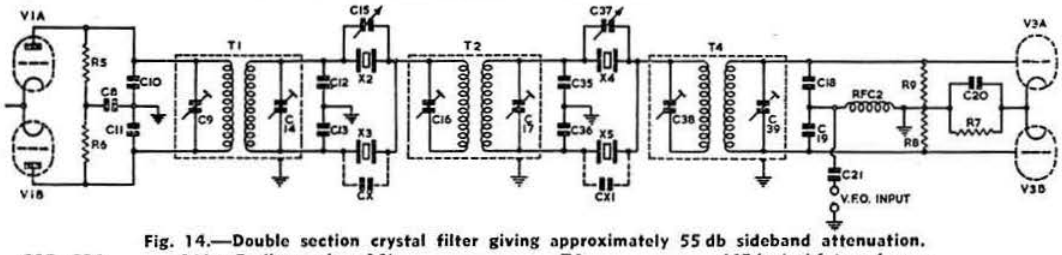


Fig. 14.—Double section crystal filter giving approximately 55 db sideband attenuation.

C35, C36	100 $\mu\mu$F silver mica, 1%	T4	465 kc/s. i.f. transformer
C37	1–8 $\mu\mu$F Philips trimmer	X4	Same frequency as X2
C38, 39	Trimmers in T3	X5	Same frequency as X3
Cx1	As Cx—see text		

All other values as shown in the components' list for Fig. 12.

International Conference on Radio Interference

SOME interesting results were recorded at a four-day Conference of the Special Committee on Radio Interference (C.I.S.P.R.) organized by the British Standards Institution and held at the Institution of Electrical Engineers during October. Sixty delegates from eighteen different countries and international bodies attended. The delegates represented the National Committees of the I.E.C. member-nations, together with representatives of other international bodies which have a special interest in radio interference suppression, such as the International Radio Consultative Committee, the European Broadcasting Union, the International Union of Producers and Distributors of Electrical Energy and the International Union of Railways.

The Committee sought agreement on three specific problems, namely: the limits which should be imposed on the production of "man-made" interference; methods of measuring interference; and the type of equipment to be used, so that measurements made in one country may be related to those made in other countries: and safety considerations involved in the use of suppression devices on electrical appliances and machinery.

So far as interference limits are concerned, it was agreed to recommend that all countries should adopt the following limits of noise voltages measured at the terminals of appliances:—

150-200 kc/s	1500	microvolts
200-285 kc/s	1000	„
525-1605 kc/s	1000	„

It was also recommended that the limit specified for the frequency range 525-1605 kc/s should, as far as practicable, be met over the wider range from 1605 kc/s to 25 Mc/s.

The recommended limits are applicable to domestic, industrial and commercial appliances rated up to 1 kilowatt, and are intended for direct connection to a distribution system operating at not higher than 750 volts between conductors, or 375 volts between one conductor and earth, but excluding electric traction systems and apparatus intended to generate continuous waves.

The conference noted that the United Kingdom and the United States of America—both possessing highly developed television services—had applied, or were about to apply, either legally or voluntarily, a limit of field strength for the frequency range 40-70 Mc/s corresponding to 50 microvolts per metre at a distance of 10 metres from the source of interference. It was recommended that all countries should study and consider the adoption of this limit for Band I (41-68 Mc/s).

It was recognized that the general use of standard measuring sets would facilitate comparison of measurements made in different countries. Useful progress was made in the preparation of a specification for such a standard set.

A considerable measure of agreement was also reached on the capacitor currents (at mains frequency) to frame or earth which could be accepted for various classes of domestic appliances without danger of shock to the user.

A number of specific problems were referred to national delegations for further consideration. Among these are: a study of interference limits over the higher frequency ranges extending up to 216 Mc/s; interference between radio receivers—for example, that due to oscillator and line-time-base stages; the susceptibility of receivers to interference; interference from high-tension power lines, and from radio-frequency equipment such as industrial, scientific and medical high-frequency apparatus.

In the United Kingdom this study is being undertaken by the various B.S.I. Committees and Joint B.S.I./I.E.E. Committees on radio interference.

The meeting concluded with an exhibition of radio interference measuring equipment submitted by some of the delegations, together with examples of the steps which can be taken to suppress radio interference.

Low Power Portable Transmitter-Receiver for 144 Mc/s

by A. G. BLACKMORE (G3FKO)*

The equipment described here was designed specifically to be used in conjunction with a Velocette 200 c.c. lightweight motorcycle as the means of transport. Despite its low power consumption, it has performed excellently on a number of Two Metre Field Days.

BEFORE the portable equipment described in this article was finally evolved a number of experimental units were constructed and field-tested. As a result of the experience gained, it was decided that, on the grounds of simplicity and low power consumption, the following features were desirable: (a) inclusion of as much as possible in one cabinet in order to reduce the number of connecting cables and to keep down the overall weight; (b) the use of as few different types of valves as possible, thereby reducing the number of spares needed; (c) use of a 12 volt heater and dynamotor l.t. system because dynamotors of suitable rating are easily obtainable and because voltage drop in a 12 volt system is less than in a 6 volt system; (d) balanced 300 ohm input to the receiver and a balanced push-pull p.a. stage operating into the same impedance in the transmitter; (e) provision of a band edge marker as a check on the local oscillator in the receiver; (f) omission of an a.f. power output stage for h.t. economy and provision of an output socket for a second operator; (g) quick changeover to permit c.w. keying of the call-sign at the end of telephony transmissions; (h) use of miniature low drain valves; (i) metering of grid drive to all stages in the transmitter and (j) construction on small sub-chassis to facilitate later modification and servicing. In the unit to be described, these features have been successfully incorporated. It is not proposed to discuss the circuits in detail because they are quite straightforward, but certain points appear to be worthy of mention.

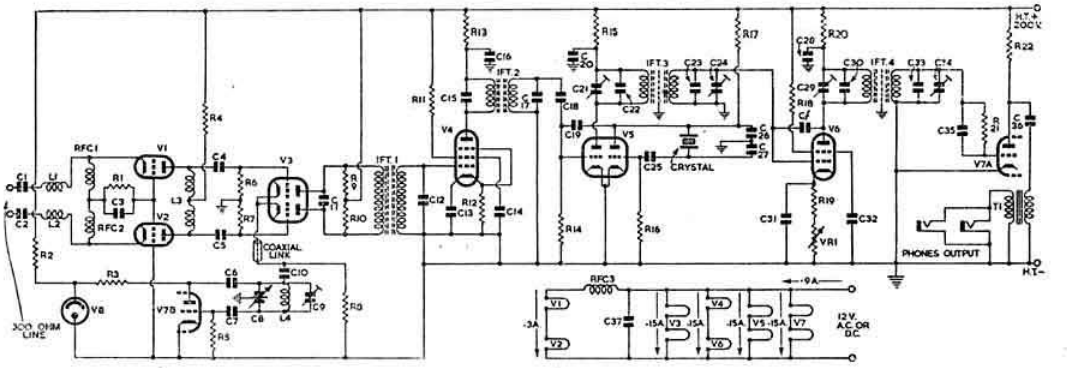


Fig. 1.—Circuit diagram of the receiver section.

C1, 2	27 $\mu\mu$F, ceramic
C3, 35	470 $\mu\mu$F, mica
C4, 5, 25, 26, 27	47 $\mu\mu$F, ceramic
C6, 7	47 $\mu\mu$F, silver mica
C8	Polar split-stator midget tuning condenser modified to leave 1 rotor and 1 stator plate per section
C9	Philips, 1–8 $\mu\mu$F, concentric trimmer
C10, 19	2.2 $\mu\mu$F, ceramic
C11, 12, 15, 17	Existing condensers in 7 Mc/s i.f. transformer
C13, 14	0.01 μF, mica
C16	0.006 μF, mica
C18	100 $\mu\mu$F, ceramic
C20, 36	0.1 μF, 350 V wkg., paper tubular
C21, 22, 23, 24, 29, 30, 33, 34	Existing condensers in 1,415 kc/s i.f. transformers
C28, 31, 32	3 x 0.05 μF paper (Sprague)
Cf	Two loosely coupled wires from grid and anode pins of V6 adjusted so that smooth control of regeneration is obtained by means of VR1
Crystal	8 Mc/s
I.F.T. 1, 2	7 Mc/s i.f. transformer
I.F.T. 3, 4	1,415 kc/s i.f. transformer (Command receiver type)
L1, 2	4 turns, 18 s.w.g., $\frac{3}{8}$in. diam., spaced wire diameter
L3	4+4 turns. 18 s.w.g., $\frac{3}{8}$in. diam., in form of coiled Lecher Line (see Fig. 2)
R1	100 ohms
R2	15,000 ohms, 6 W
R3	10,000 ohms., $\frac{1}{2}$ W
R4	2,200 ohms
R5	33,000 ohms
R6, 7	270,000 ohms
R8	4,700 ohms
R9, 10	68,000 ohms
R11	56,000 ohms
R12	330 ohms
R13	1,000 ohms
R14	560,000 ohms
R15	2,200 ohms
R16	10,000 ohms
R17	47,000 ohms
R18	100,000 ohms
R19	330 ohms
R20	2,200 ohms
R21	470,000 ohms
R22	47,000 ohms
	All resistors are $\frac{1}{2}$-watt unless otherwise indicated.
RFC1, 2	19in. 26 s.w.g., enamelled wire on $\frac{1}{4}$in. former, cemented with polystyrene solution
RFC3	19in. 22 s.w.g. enam. wire, close wound on $\frac{1}{4}$in. diam. former
T1	A.F. transformer to match headphones to 12AT7
V1, 2	EC91 or CV417
V3, 5, 7	12AT7 or CV455
V4, 6	9001 or 9003
V8	7475
VR1	25,000 ohms pot., wire-wound

Receiver Section

The receiver (Fig. 1) is a double superhet, the first i.f. being in the 7 Mc/s region and the second at 1415 kc/s.

The degree of selectivity, obtained by holding a signal at a point where the 1415 kc/s i.f. stage is almost oscillating, is good.

The r.f. stages provide high gain, with excellent signal-to-noise ratio, without the necessity for neutralisation as with the Wallman cascode or the push-pull 6J6 circuits. By using a "Coiled Lecher Lines" anode load (Fig. 2) for the push-pull EC91s, high gain—comparable to that of a pentode—is achieved with a superior signal-to-noise ratio. The cathode input circuit is flatly tuned and a good match is obtained to the 300 ohm impedance of the aerial system.

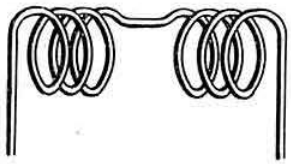


Fig. 2.—Construction of coiled Lecher Line type coils. The coil is wound in a clockwise direction for one-half the total number of turns. The direction is then reversed and the remainder of the turns added in an anticlockwise direction. The coil can thus be regarded as a coiled Lecher Line, a larger number of turns being needed for a given value of inductance than with the conventional single-direction type.

The first local oscillator operates on the low frequency side of the signal and tunes from approximately 137 to 139 Mc/s, the exact coverage being adjusted by means of the trimmer (C9) across the main tuning condenser (C8). Bandspread is adjusted by spacing the vanes of the latter condenser. A T9 note is obtained without resorting to any special precautions other than ensuring that all components in the oscillator and mixer sections are rigidly wired in place. The oscillator is fed with h.t. from a neon stabilised supply. No ceramic dielectric capacitors are used owing to their poor temperature co-efficient.

By using an 8 Mc/s crystal to control the second local oscillator, the 18th harmonic is available as a band edge marker on 144 Mc/s.

Transmitter Section

The transmitter, the circuit of which is shown in Fig. 3, employs one half of a 12AT7 as a regenerative crystal oscillator, the second half acting as a tripler to 72 Mc/s. A second 12AT7 (V2) acts as a push-pull doubler to 144 Mc/s, and drives the power amplifier.

Although the use of push-pull 6AK5s as a p.a. stage has been tried in America, the idea does not appear to have been employed in the United Kingdom. The power requirements of these valves are very low and compared with a pair of 6C4s the grid drive needed is small. The main factor limiting the input that can be used is the maximum cathode current (18mA per valve). Nevertheless, a pair in push-pull will produce about 2.5 watts output for 5 watts input (25 mA at 200 volts). If the anode voltage is raised above 200 V, the screen voltage should be maintained at a value which will avoid exceeding the cathode current rating and the anode and screen dissipation. Due to the low internal capacity of the 6AK5, neutralisation is generally unnecessary provided a screen is placed between the earthed cathode pins on the valve base, and short, heavy earth-return braiding is used.

A considerable improvement in r.f. output is obtained by using the coiled "Lecher Lines" type of anode coil. A larger diameter than that specified could be used for the p.a. and link coupling coils with some improvement in performance. The link coil should be wound back on itself in the same way as the tank circuit. The exact number of turns required to match the circuit to the aerial is found experimentally.

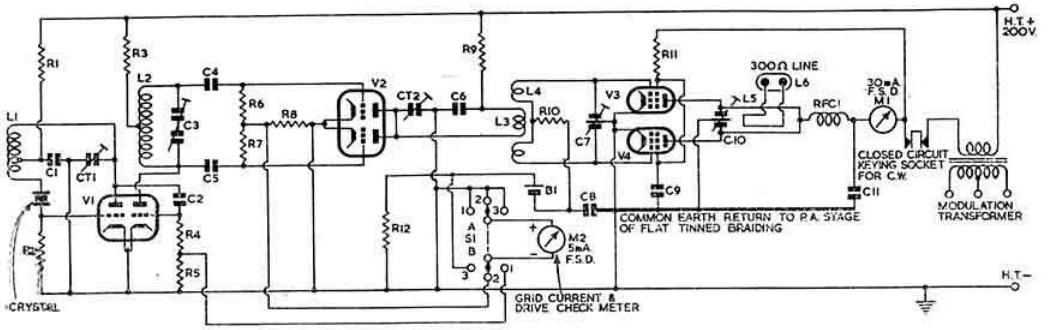


Fig. 3.—Circuit diagram of the low power transmitter.

C1	1,000 $\mu\mu$F, 300 V wkg., mica
C2, 4, 5	47 $\mu\mu$F, 300 V wkg., ceramicon
C3	2–20 $\mu\mu$F per section midget butterfly-type condenser
C6, 8, 11	470 $\mu\mu$F, 300 V wkg., ceramic hi-K type or mica
C7, 10	2–10 $\mu\mu$F per section midget butterfly-type condenser
C9	100 $\mu\mu$F, 300 V wkg., mica
CT1, 2	Philips 3–30 $\mu\mu$F trimmers
Crystal	24 Mc/s overtone crystal, Q.C.C. Type FO
L1	19 turns, 32 s.w.g., close-wound, $\frac{3}{8}$in. diam., tapped at 5 turns
L2	10 turns, 22 s.w.g., $\frac{3}{8}$in. diam., spaced wire diam., centre-tapped.
L3	2 turns, 18 s.w.g., $\frac{3}{4}$in. diam., spaced wire diam.
L4	5 turns, 16 s.w.g., $\frac{3}{8}$in. diam., centre-tapped with space for L3 in centre
L5	4+4 turns, 16 s.w.g., air-spaced, $\frac{3}{8}$in. diam., with gap of $\frac{1}{4}$in. in centre for coupling in L6. "Coiled Lecher Line" construction.
L6	3+3 turns, 22 s.w.g., air-spaced, $\frac{1}{4}$in. diam.
R1, 3, 5, 8, 9	1,000 ohms
R2	8,200 ohms
R4, 6, 7	47,000 ohms
R10	10,000 ohms
R11	6,800 ohms
R12	1,000 ohms
RFC1	20 turns, 24 s.w.g., close-wound on $\frac{1}{2}$ W resistor
V1, 2	12AT7
V3, 4	6AK5 or EF95
S1	3-way, two-pole wafer switch
B1	1.5 V miniature torch cell

The Modulator

In its early form, a carbon microphone and a 12AT7 provided sufficient input to drive a pair of EL91s as modulators, but the circuit shown in Fig. 4 has proved superior in tests with distant stations as it permits the use of a moving coil microphone. The increased intelligibility is alone equal to about two "S" points.

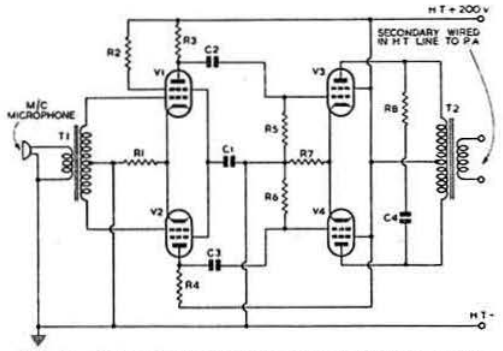


Fig. 4.—The speech amplifier and modulator circuit. C1, 0.02 μF 350 V wkg., tubular paper; C2, 3, 0.002 μF 500 V wkg., mica; C4, 0.01 μF 500 V wkg., mica; R1, 2,200 ohms, ¼ W, 20%; R2, 3, 4, 5, 6, 470,000 ohms, ¼ W, 20%; R7, 560 ohms, ½ W, 20%; R8, 100,000 ohms, ½ W, 20%; T1, microphone transformer, c.t. secondary, 100:1 step-up ratio; T2, modulation transformer, 2:1 step-down ratio (ex-SCR522); V1, 2, 6AK5 or EF95; V3, 4, EL91 or 6AM5.

Power Supply

The combined mains/battery power unit is perfectly straight-forward. Provided the plugs are wired as shown in Fig. 5 the change-over from mains to battery operation is automatic when the mains plug is removed and the dynamotor lead plugged-in in its place.

Construction

The complete transmitter-receiver is accomodated in a surplus radio altimeter cabinet type AYF. The only external units are the dynamotor, batteries, key, headphones and aerial system. The layout of the principal components may be seen in the photograph.

Results

Excellent results were achieved, using a 3-element wide-spaced Yagi in a reasonably good location, when the equipment was tested during the First Two Metre Field Day, 1953. Even under poor conditions and incessant rain, telephony communication with any station within range of 50 miles was possible at any time.

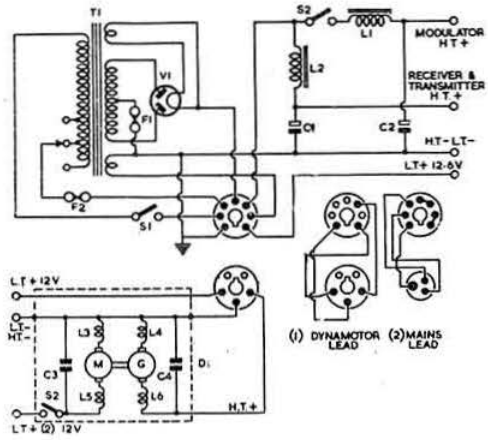


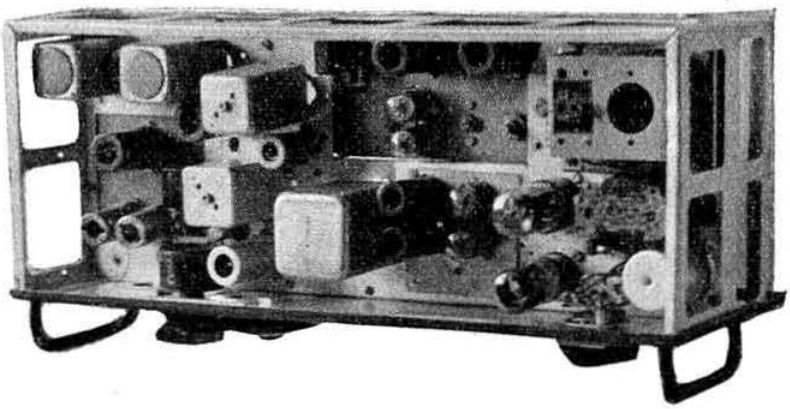
Fig. 5.—The mains/battery power supply unit. C1, 2, 32 μF, 350 V wkg., dry electrolytic; D, dynamotor, 12 V d.c. input, 200 V 80 to 100 mA output; F1, 150 mA fuse, Belling Lee cartridge type; F2, 1 A fuse, Belling Lee cartridge type; L1, L2, smoothing choke, 10 H, 40 mA; T1, 250–0–250 V, 80 mA, 12.6 V, 2 A, 5 V, 2 A; V1, 5Y3GT/G or 5Z4; C3, C4, L3, L4, L5 and L6 are filter components for the dynamotor: values found experimentally.

In conclusion, it would seem that the transmitter-receiver described would prove useful in the mobile section of the Radio Amateur Emergency Network.

Acknowledgments

The author wishes to acknowledge the assistance rendered by G2BYA, G3EKS, G3FIH and G3IWA.

* *c/o 5 Rivers Street, Bath, Somerset.*



Top view of the low power transmitter-receiver showing the double superhet receiver section to the left, with the transmitter sub-assembly in the centre. The crystal oscillator and frequency multiplier stages are at the top of the picture with the 6AK5 p.a. valves just below. The modulator section is at bottom centre, with the modulation transformer to the left. The internal mains power supply is at the right-hand end of the chassis.

Fifty-four Years of Amateur Radio

by A. L. MEGSON (G2HA)*

Senatore Marconi always maintained that he was an amateur at heart. In this short article the author recalls his own early experiments —the first of which was made in 1899— very soon after news of Marconi's success had been published. Today, 54 years later, Mr. Megson still operates an amateur station under the call-sign G2HA.

IN 1899 an article describing an experiment by a young man named Marconi appeared in the *Strand Magazine*. As a result of reading that article, which dealt with the transmission of signals without connecting wires, and after studying the work of Hertz and Branly, I decided to carry out my own tests, using a coherer, battery and electric bell as a receiver. The coherer consisted of a ¼ in. glass tube, 1 in. long, filled with iron filings. Corks were pushed into the ends of the tube and copper wires passed through into the iron filings so that they did not quite meet.

For a transmitter, I built a Wimshurst machine consisting of two glass plates 16 in. in diameter and two Leyden jars. A spark gap completed the unit.

With the Wimshurst machine about a yard from the receiver, I revolved the plates to charge the jars which then discharged through the spark gap. After various adjustments, it was possible to cause the bell to ring without any connecting wires. As time went by, the distance over which this could be done was increased. Eventually, I constructed a simple but sensitive relay which was connected in circuit with the receiver. The use of nickel filings in the coherer also improved the overall sensitivity.

A recent photograph of G2HA

Early Portable Work

In front of my home at that time there was a large area—probably about a square mile—of flood water. Three hundred yards from dry land there was a small island to which I took the receiving equipment. When all was ready, I flag-signalled to my brother to operate the transmitter in the house. The bell on the receiver rang! Gradually, the distance was increased to one mile with this equipment. An account of the experiments appeared in the *English Mechanic and World of Science.*

This is the crystal receiver which G2HA built in 1912. It is still in working order.

A Crystal Receiver

Experiments continued intermittently until 1912 when I made my first crystal receiver, on which I received signals from Liverpool (GLV) and other British coast stations. At this time I did not know the Morse code, but hearing that Eiffel Tower (Paris) was sending out slow time signals I constructed a slider coil with which I was able to hear that station and several others.

The crystal which I used was made of bornite and zincite. A minute current, regulated by a non-inductively wound potentiometer, was passed through the crystal. (This development was due to A. V. Hughes, of Canterbury). The arrangement was very sensitive. I then proceeded to wind a coil 5½ in. in diameter and 7 in. long with 28 s.w.g. wire. Tuning was accomplished by means of a sliding contact. With this crystal and coil I made up a receiving set on which I could hear Clifden in Ireland, and the American stations at Cape Cod and Cape Race. A description of the coil was later published in the *Model Engineer.*

Early Contacts

In 1913, I built my first spark transmitter, using a half-inch spark coil, and with this I was able to work other experimenters up to distances of 15 miles or so. A little later I used a microphone to transmit speech and music.

After the first World War I built several other transmitters with inputs of from 10 to 50 watts, which brought contacts all over the world. The 10 watt transmitter is still in use under my present call sign G2HA. Much of my apparatus has always been home-made, including coils, chokes and resistances and, in the earlier days, variable condensers.

* *5 Macclesfield Road, Buxton, Derby.*

Around the Stands

at the Seventh Annual R.S.G.B. Amateur Radio Exhibition

THE increasing interest shown by some sections of the radio industry in the amateur market was made evident by the appearance at the recent R.S.G.B. Exhibition of a number of new products expressly designed for amateur use. On the stands devoted to home-constructed equipment, the ingenuity and pioneering spirit of individual amateurs was again well exemplified. A noteworthy idea adopted by commercial and amateur exhibitors alike was the use of transparent assemblies which allowed the equipment to be inspected closely without fear of damage to wiring or components. Two devices using transistors—one commercial, one amateur—were exhibited.

ARE YOU IN THIS PICTURE?

A view of Headquarters' stand taken during the Saturday afternoon when a peak attendance was recorded.

Headquarters' Stand

As in previous years, Headquarters' stand was again the focal point for visiting radio enthusiasts and those on duty were kept fully occupied throughout the Exhibition answering questions and selling Society publications, particularly the Third Edition of the *R.S.G.B. Amateur Radio Call Book* and the *Supplement to "Television Interference,"* both of which were published on the day the exhibition opened.

The selection of amateur equipment displayed included the R.S.G.B. Two Metre Converter (W. H. Allen, G2UJ), the Reflectometer (F. Charman, G6CJ and J. W. Mathews, G6LL), Microwave Components (D. Clift, G3BAK), a Top Band Transmitter (C. H. L. Edwards, G8TL), an All Band Antennamatch (F. Hicks-Arnold, G6MB), a 420 Mc/s Transmitter-Receiver (A. H. Koster, G3ECA), the Newcomer's Low Power Harmonic-Free Transmitter and a Shunt Selectoject (J. W. Mathews, G6LL), the *Elizabethan* transmitter with built-in narrow band f.m. unit (L. Varney, G5RV), a Transistor Transmitter (D. Walters, G5CV) and a Simple Noise Generator (J. A. Rouse, G2AHL).

The Commercial Stands

A newcomer to the Exhibition was **David Godwin** whose display of *Minimitter* foundation units attracted much interest. The main items are the *Miniciter*—a complete band-switched exciter for all bands from 3.5 to 28 Mc/s—and the *Minipa*, an all-band r.f. amplifier for inputs up to 150 watts. Although each foundation unit is available separately, a unique cabinet, large enough to contain all the units necessary to make a complete table top transmitter with space for an additional 6 in. by 23 in. chassis, can also be supplied.

Telecraft Ltd. exhibited a large selection of aerials for television reception and v.h.f. communications purposes. Their Yagi-type amateur arrays employ an *evacuated* matching stub which gives constant impedance under all climatic conditions.

Another firm showing at the exhibition for the first time was **Grundig (Great Britain) Ltd.**, who displayed their *Reporter* and *Console* tape recorders together with a wide range of accessories. The new Grundig test instruments — the TG1 Valve Voltmeter and the TG5 Distortion Factor Meter—were also on show.

The **Denco** stand was devoted to a display of the company's wide range of components and accessories for the radio and television enthusiast, including a new inexpensive modulated test oscillator, 10.7 Mc/s i.f. and discrimator transformers, and an entirely new range of coloured polythene feed-through insulators and coil formers. Working examples of the *Universal*, *Supervisor*, and *Magnaview* large screen home-built television receivers and a simple car radio attracted much interest.

A wide selection of technical books, including the new edition of the *Radio Designer's Hand-*

A corner of the stand devoted to amateur built transmitters, receivers and ancillary equipment.

book, as well as recent issues of *Wireless World* and *Wireless Engineer* were featured on the stand occupied by **Iliffe and Sons Ltd.** The **Short Wave Magazine Ltd.,** in addition to the *Short Wave Magazine* and *Radio Quarterly*, exhibited American books and publications.

Interesting items on the **Avo** stand were a valve tester Type 160 and a new power factor and wattage unit. A selection of the company's other products, including items from the famous range of Universal Avometers and small coil winding machines were also on show.

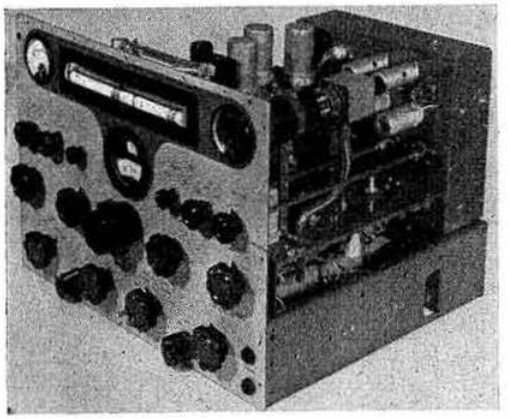
E. J. Philpott's Metalworks Ltd. again exhibited examples of metalwork and cabinets for the home constructor, all of which are available in a wide variety of finishes, including the attractive "hammertone." All this firm's products are "made-to-measure" to each customer's requirements.

The General Electric Co. Ltd. exhibited several new pieces of equipment, including a metal cone loudspeaker, two types of ribbon microphone head and a 12 watt home constructor amplifier. A novel item was an experimental bedside radio using transistors.

Panda Radio Co. made a particular feature of their popular *PR-120-V* table top transmitter, the 1954 model of which is built on a heavy gauge, cadmium plated, passivated chassis. The cabinet now has a metal-to-metal seal on the lid and all louvres are screened. A new product, on show for the first time, was the *Panda Cub*, a complete all-band (1.8 to 30 Mc/s) band-switched phone (25 W)/c.w. (40 W) transmitter housed in a 19in. by 10in. by 8in. cabinet. The final amplifier uses a single 807 in a pi-network circuit.

A new pickup — the HG.P39-1 — and a new range of inexpensive microphones suitable for home recording and amateur purposes were among the products featured by **Cosmocord Ltd.** The performance of one of these new units (the Mic 33-1) is said to be comparable with that obtained from the more expensive *Acos* Mic 22-1.

A new range of wire-wound toroidal precision potentiometers was shown by **Salford Electrical Instruments Ltd.,** who also exhibited a full range of quartz crystal units for all frequencies from 400 c/s to 22 Mc/s, *Gecalloy* radio and TV cores, synthetic sapphire gramophone needles and selenium and copper oxide rectifiers. This company can now supply overtone crystals for frequencies up to 33 Mc/s; 36 Mc/s types for doubling twice to the 144 Mc/s band are expected to become available shortly.



A three-quarter view of Eric Yeomanson's home constructed receiver.

Taylor Electrical Instruments Ltd. showed a number of new products, including a wide range RC oscillator (Type 191A), an electronic test meter (Type 171A), an electrostatic megohmmeter and insulation tester (Type 131A) and a TV sweep oscillator (Type 92A). A television sync. pulse and pattern generator and a cathode ray oscilloscope (Type 31A) were also shown.

Some idea of the fine equipment displayed on the V.H.F. and U.H.F. stand can be gathered from this picture.

The Service Stands

The Armed Services were once again represented by the Royal Signals and the Royal Air Force.

The exhibits on the Army stand included an electro-mechanical loud-hailer, a pack-set (A40)—probably the smallest complete station in the world—which will eventually replace the Type 88 set, a novel ionospheric training aid (presented to the Royal Signals by the Royal Norwegian Signals), a selection of amateur microwave components, an amateur-built communications receiver, and the Army receivers Type GFR562 and Type R219. The latter is a 6-band double superhet, suitable for the reception of a.m., f.m. and c.w., and incorporates a noise limiter and crystal calibrator. Due to the unique dial mechanism, the scale length is exceptionally good, the 7 Mc/s amateur band, for example, occupying 5½in. The stand was manned by personnel from 21st S.A.S., the Royal Signals T.A., 5 Corps Signal Regt. and the Women's Royal Army Corps.

The Royal Air Force stand was principally devoted to a display, by radio mechanics from No. 30 Maintenance Unit, of the third line servicing of radio equipment actually collected in the normal way from R.A.F. stations. Among the other exhibits were a number of test sets now in use by the R.A.F., a 10-channel v.h.f. set used in most Service aircraft and a selection of equipment built by members of the Royal Air Force Amateur Radio Society.

Amateur Equipment Stands

With one or two exceptions, the standard of workmanship displayed on the stands devoted to home constructed equipment was again very high.

On the V.H.F. and U.H.F. Equipment stand much interest was shown in a modulated light beam transmitter and receiver (C. E. Newton, G2FKZ) and a 420 Mc/s tripler using an 8012 valve in a co-axial line circuit (L. F. Dyke, G3GZM). Other interesting exhibits included a flat dweller's 144 and 420 Mc/s transmittor (J. Ballard, G2HDY), a 420 Mc/s receiver (S. Weber, B.R.S. 19317), a 144 Mc/s transmitter-receiver (A. G. Blackmore, G3FKO), a 420 Mc/s

super-regen receiver (14-year-old Terry Clements, Associate), and a miniature crystal-controlled 420 Mc/s converter (H. F. Smith, G2DD).

The Single Sideband stand attracted a great deal of attention. Particular interest was shown in a working exhibit embodying a phase-shift exciter (built in 12 hours) the output waveforms of which were displayed on a cathode ray oscilloscope, to illustrate the various stages of the setting up procedure. Other items exhibited included an advanced phase-shift exciter (B. Price, G3ECH), an all-band phase-shift exciter (S. Horne, G3IXL), a Top Band transmitter (C. Tranter, G3BQQ), a selectable sideband a.f. adapter and an i.f. filter alignment oscillator (G. Bagley, G3FHL), a constant volume amplifier and a vectorscope (H. F. Knott, G3CU), and 1.8 to 21 Mc/s filter exciter (B. Bowen, G3COJ).

The outstanding exhibit on the Transmitters, Receivers and Ancillary Equipment stand was undoubtedly the very fine home-built communications receiver (E. Yeomanson, G3IIR) illustrated in the accompanying photograph. Other items amongst a highly interesting selection were an electronic key (A. J. Worrall, G3IWA), a communications receiver (F. G. Stow, G3IUP), a portable transmitter-receiver (F. Clarke, G4FC), a cathode ray oscilloscope and wobbulator (E. J. Watts, G2DSW), Cheltenham Group N.F.D equipment, and a universal test meter (L. Pennélegion, G3FIO).

Paul Sollom (G3BGL), shown here, displayed three-dimensional aerial models and diagrams.

Models and diagrams of simple amateur aerials —the work of Norman Keith Adams prizewinner, Paul Sollom (G3BGL) — were displayed on a special stand. The models were arranged as a sequence to emphasise the three dimensional nature of radiation patterns and to illustrate a method by which such three dimensional radiation patterns can be represented on a chart. Coloured polar diagrams provided the key to the contour colour schedule employed and transparent great-circle wave-angle maps were available for visitors to compare the coverages of different arrangements.

Examples of equipment being developed for amateur television purposes were exhibited on the British Amateur Television Club stand. On the last day an electronic organ was displayed and demonstrated by Ivan Howard (G2DUS).

Amateur Constructors' Section

The members of the Committee responsible for organising this highly successful section of the Exhibition were:—

C. H. L. Edwards (G8TL), *Chairman*, F. Hicks-Arnold (G6MB), D. C. Jardine (G5DJ), H. F. Knott (G3CU), G. W. Norris (G3ICI), F. F. Ruth (G2BRH), M. Wallace (B.R.S. 18241), E. Yeomanson (G3IIR) and J. A. Rouse (G2AHL). Mrs. C. H. L. Edwards acted as Committee Secretary.

Thanks

Thanks are recorded to the following members who loaned equipment or undertook stand duty:—

Equipment: C. E. Newton (G2FKZ), F. A. Jefferies (G8PX), A. G. Blackmore (G3FKO), C. W. Touch (G2HDJ), E. Yeomanson (G3IIR), J. Worrall (G3IWA), F. Stow (G3IUP), J. Ballard (G2HDY), M. J. Frost (G3GNL), E. Rayner (G6IO), L. Pennélegion (G3FIO), A. J. Gould (Associate), D. K. Smith (Associate), D. W. Furby (G3EOH), L. F. Dyke (G3GZM), E. J. Watts (G2DSW), D. S. Froome (Associate), R. Cutts (G3HRC), K. Ireland (G3IKW), M. C. Bunting (G6BZ), W. D. Lacey (G3CWK), G. Perring (B.R.S. 19427), J. Parker (Associate), T. V. Clements (Associate), E. G. Styles (B.R.S. 15648), H. F. Smith (G2DD), G. Turner (G3DGN), J. C. Tranter (G3BQQ), S. Horne (G3IXL), B. Price (G3ECH), A. H. B. Bower (G3COJ), H. F. Knott (G3CU) and G. C. Bagley (G3FHL).

Stand Duty: G. C. Bagley (G3FHL), G. Breed (Associate), E. J. Brett (B.R.S. 19675), R. C. B. Cutts (G3HRC), J. Davie (G2XG), E. A. Dedman (G2NH), W. D. Gilmour (G2VB), E. Green (Associate), D. E. Hill (G3IRF), J. J. Hollington (G4GA), K. W. Ireland (G3IKW), H. F. Knott (G3CU), F. H. Lawrence (G2LW), E. C. Lark (G3CWC), G. N. Myatt (G3FRN), C. E. Newton (G2FKZ), G. W. Norris (G3ICI), G. F. Painter (G3CFO), E. Rayner (G6IO), F. F. Ruth (G2BRH), G. M. C. Stone (G3FZL), M. Wallace (B.R.S. 18241), S. F. Weber (B.R.S. 19317) and A. J. Worrall (G3IWA).

Thanks are also recorded to Horace Freeman, who, for the seventh year running, acted as Exhibition Manager; to the management and staff of the Royal Hotel for their willing co-operation and to the many members who volunteered to man Headquarters' stand and who loaned equipment.

EXHIBITION PHOTOGRAPHS

Copies of photographs used to illustrate this and the previous article on the Amateur Radio Exhibition may be obtained from Mr. Eric Yeomanson, G3IIR, 9 Trewsbury Road, Sydenham, London, S.E.26, at the following prices :—

10" × 8" — 3/3 *plus* 3d. *postage;*
8½" × 6½" — 2/8 *plus* 3d. *postage;*
6" × 5" — 2/- *plus* 3d. *postage.*

"The Year that made the Day"

SIR IAN JACOB, K.B.E., C.B., Director-General of the B.B.C. writes in the Foreword to a new B.B.C. publication bearing the title "The Year that Made the Day," "that the Second of June, 1953, the day on which Her Majesty, Queen Elizabeth II was crowned, is one that none of us will ever forget. Millions of people all over the world were able to participate in the ceremonies and rejoicings of that day in London because of the services of the British Broadcasting Corporation."

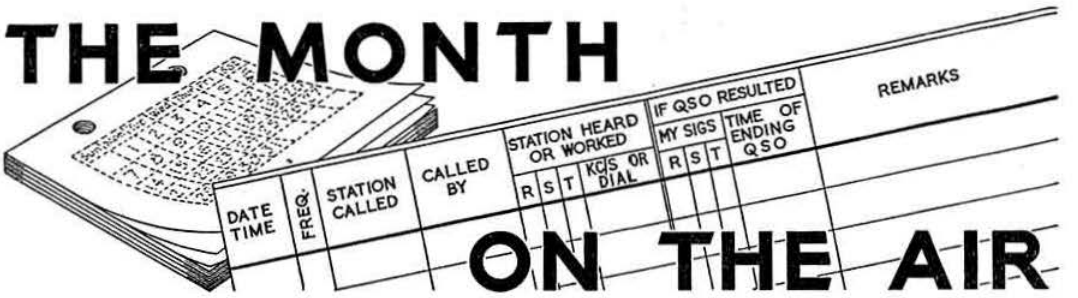
This semi-technical and informative account of the planning and preparation that enabled these services to achieve outstanding success in an operation unique for scale and complexity in the whole history of broadcasting is worthy of a place in every British home.

Beautifully printed on art paper, the book contains a wealth of illustrations, including 36 large size reproductions of photographs taken from the television screen during the Great Day. It can be obtained from any bookseller or direct from the B.B.C price 6/-.

"Guide to Broadcasting Stations"

THE 7th Edition of the *Wireless World* "*Guide to Broadcasting Stations*" gives details of over 1,600 short-wave stations throughout the world, in addition to all the European long and medium-wave transmitters. More than 40 TV and 160 v.h.f. stations in Europe are listed. The *Guide* runs to 104 pages and costs 2s.

THE MONTH ON THE AIR



By S. A. HERBERT (G3ATU)*

ALTHOUGH 1953 certainly did not go out in a blaze of DX glory, the year itself has been notable for the record number of expeditions to exotic places. SV9WP, CE0AA, VQ1NZK, EA9DD, LB8YB and the incredible journeyings of ST2UU (who has now been active from *at least* thirteen different countries), have all helped to swell numerous country totals. We hope this year, too, will produce its quota of rare ones. It makes a pleasant change from counting sun-spots!

Saudi-Arabia

HZ1HZ (Mecca) sends the interesting news that H.R.H. Prince Talal (HZ1TA) has been appointed Minister of Communications and is reorganising all branches of his Ministry on a sound, modern basis. With his help, it is hoped that HZ amateurs will be officially recognised. Already the following calls have been issued:—HZ1AM—H.R.H. Prince Abdul-Mushin; HZ1NA—H.R.H. Prince Nasir; HZ1SA—H.R.H. Prince Saad (all in Reyadh) and HZ1SS—H.R.H. Prince Saud Bin Saud (Jedda). They use phone and are keen to give HZ QSOs to those needing them.

Twenty Metre News

GM2DBX (Methilhill) has had phone QSOs with ZS6Z, OQ0DZ, VK2KS, HK4FV, KP4, a three-way with 3A2AH and 3A2AX, YV and ZD6LN. Jimmy has worked FI8AC twice and has two cards to prove it! He enjoys reading s.w.l. DX reports and comments that many keen listeners hear far more DX than most of us ever manage to work! We quite agree. **GM3DHD** (Edinburgh) comes up with the following useful news. LB8YB, who operates mostly c.w., was hooked on 7 Mc/s phone at 1600. KS4AU has left Swan Is., and expects to start up soon from KZ5. The safest way to reach AC4NC is to QSL *via* VU2RC. VU5AB is at R.A.F. Detachment, Car Nicobar Is., c/o R.A.F. Changi, Singapore, 17.

DI9AA is expected to go ashore and operate while at the Galapagos Is., and he may do likewise from other islands in the area. (It is known that TI2TG is actively interested in the project and is providing a portable "set-up" for shore use. Clipperton Is. is due for a visit—the call there will be TI9AA.) EA2CA will operate phone from Rio de Oro for two or three weeks during the A.R.R.L. DX Contest, with 120 watts on 3.5, 7, 14, 21 and 28 Mc/s. Did you miss VQ7/VQ9UU? If so, take heart, for VQ4NZK hopes to visit both places during February. Phone only, though. 'DHD has QSOd G3AAT/OX more than fifty times on phone, 3.5, 14 and 21 Mc/s. He reports that there are two stations using the call. One of them is on the Central Ice Cap, 8,750 ft. a.s.l., and runs 35 watts into long, long wires laid on the snow. On 3.5, they hear U.K. stations easily, but get no replies to their calls. The other station, at the main base, uses 250 watts to a rhombic, so they should be audible on any band! **GM3EYP** (ex-VP8AP) is active again from Dundee looking for old friends.

Bands Available

THE following is a summary of the bands in which amateur operation is now permitted. The table also shows the maximum power input and types of emission allowed to holders of unrestricted licences. In general, during the first year, power in excess of 25 watts is not permitted and on frequencies below 420 Mc/s operation is restricted to A1.

Frequency in Mc/s	Maximum d.c. input (Watts)	Types of Emission*
1.8-2.0	10	A1, A2, A3, A3a, F1, F2, F3
3.5-3.635	150	A1, A2, A3, A3a, F1, F2, F3
3.685-3.8	150	A1, A2, A3, A3a, F1, F2, F3
7.0-7.3	150	A1, A2, A3, A3a, F1, F2, F3
14.0-14.35	150	A1, A2, A3, A3a, F1, F2, F3
21.0-21.45	150	A1, A2, A3, A3a, F1, F2, F3
28.0-30.0	150	A1, A2, A3, A3a, F1, F2, F3
144-146(1)	150	A1, A2, A3, A3a
144.5-145.5(1)	150	F1, F2, F3
420-460(1)	150	A1, A2, A3, A3a, F1, F2, F3
425-455(2)	150	A5 & F5
1215-1300(2)	150	A1, A2, A3, A3a, F1, F2, F3
1225-1290(2)	150	A5 & F5(4)
2300-2450	150	A1, A2, A3, A3a, A5(1), F1, F2, F3, F5(1)
2350-2400	25 (mean) and 2.5 kW peak(3)	P1, P2d, P2e, P3d, P3e
5650-5850	150	A1, A2, A3, A3a, A5(1), F1, F2, F3, F5(4)
5700-5800	25 (mean) and 2.5 kW peak(3)	P1, P2d, P2e, P3d, P3e
10000-10500	150	A1, A2, A3, A3a, A5(1), F1, F2, F3, F5(4),
10050-10450	25 (mean) and 2.5 kW peak	P1, P2d, P2e, P3d, P3e

(1) *Subject to non-interference to Government Services in the band*

(2) *Subject to non-interference to other Services in the band*

(3) *Under a 10-watt d.c. input licence, peak power is limited to 1 kW.*

(4) *An additional Amateur (Vision) licence (£3 p.a.) is required for television.*

* *Types of emission were set out on Page 252 of the December, 1952, issue of the R.S.G.B.* BULLETIN.

* *Roker House, St. Georges Terrace, Roker, Sunderland*

G. Curtis (S. Harrow) heard some good ones, but missed some even better! Catches were XW8AA, FB8ZZ (14085, 1410), UA0KKB (Zone 19). DX being called included C3BF, AC4NC, VR4AE and ZK2AA. He mentions VK9YY/FK8, reported in Noumea, JZ0 (which replaces PK7) and VK1BM, who is with an expedition to Queen Maude Land. The two Christmas Islands come in for comment. The "ZC3" one is off Java. The other is a Pacific atoll and is part of the Gilbert and Ellice Group. **B.R.S. 19894** has been listening for a year and votes last month the worst yet! Still, c.w. gave him KH6MG, VE7VC, FQ8AT, FK8AC (0820) and ZD5AB (?). A suspiciously strong EQ1AC was heard and ZL2BE was outstanding on phone.

G3ATU logged c.w. users YK1AB, YK1AH, YK1AU (on the same morning!), XE1OE (1500), VK1BA (Macquarie—1400) and AX8BA, but couldn't raise any of them! AX8BA, heard weakly, working VS6CG and an FI8, gave his QTH as Alice Springs, Central Australia We have a hunch he's genuine.

H. D. Woodward (Manchester) heard KZ5MC and VU2CQ on phone and MP4BBE on c.w. He has received QSLs from MP4BBE, 4BBD and PZ1WX. **A. G. Edwards** (N. Finchley), using an HRO worked from a rotary converter, picked up FF8AP and SV0WD/AM on phone.

Overseas News

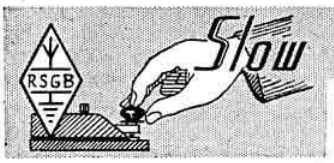
B.E.R.S.195 now has 216 confirmed countries, with 227 heard. A new one was ZC3AB, on Christmas Is. (near Java). The latter uses 14 Mc/s c.w. and is ex-VK2DE. Two well-known DX calls—VK3OP and VK4AP—are now cancelled. VK3ADZ is one of the radio crew of the next Heard Is. Expedition. VK1AF, 'BA, and 'RL expect to reach home from Macquarie this month. JZ0KF, believed to be operated by the former PJ0X, may be reached *via* VK9YY, P.O. Box 13, Lae, New Guinea. Eric's best on 14 Mc/s recently have been FI8AE, 8AZ, HP1AT, HR1AT, SM8LS/MM (Bay of Bengal), VQ3RJB, FK8AB, VK9WZ (Admiralty Is.). On 7 Mc/s, VQ4AQ was outstanding, while OQ5GU and OQ5VN were also logged.

ZC4FB (Famagusta) points out that he is *not* ex-G3CEP, who is still very much "at home" in West Hartlepool! G3JMW is on his way out to Cyprus and will bring the Famagusta total to eight. ZC4CA, 'CK, 'FB, 'GF, 'PB and 'MW will be active, with 'LW and 'GT in reserve!

G2MI, responsible for much of the "gen" in these columns, would like the present address of Tony Child, SV0AJ, for whom he has a certificate. Arthur points out that G6OR and GD6OR should be shunned. Neither call-sign has been issued. ZB2A (R.A.F. Gibraltar) is now being operated by G3DBT and G3GFM. They hope soon to have their own call-signs and will QSL 100 per cent. during their two years' tour of duty. Ken Ellis, ex-HZ1KE (to mention only one of his many DX calls), is now at H.Q., N.A.G. Signal Regt., B.A.O.R. 15. **GW2FDF** (ex-YI2FDF) is active again with a 150 watt TVI proof transmitter and a ground-plane, which is really doing its stuff.

VK6EJ (Bencubbin, W. Australia) is the new call-sign of Jack Cowles (ex-G2AJU), who is now settled in a QTH 1,164 ft. a.s.l. Jack has been using a B2 receiver and 12ft. whip. On 7 Mc/s c.w., this combination pulled in DL4EF, HZ1SD, SM5AQV, YU1AD (all consistently good signals), LU1DU, ZS2HI, ZE3JP, 4X4RE, DF, G2BY, '3HGB and GW5SL.

Frank Unstead (ex-G3BCY, MT2FU, ST2FU), now living permanently in Northern Rhodesia, has been allotted the call-sign VQ2FU. He hopes for increasing numbers of U.K. contacts when conditions improve. **ZD2HAH** (Posts and Telegraphs Headquarters, Lagos, Nigeria), is taking over the ZD2 QSL Bureau from ZD2DCP, who is now on leave. Harry is always pleased to work G stations and is to be found on 14072 kc/s. ZD2JM has



Slow Morse Practice Transmissions

The following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence. More volunteers are still required for parts of the British Isles not already covered, particularly in the London Area. Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. L Edwards, A.M.I.E.E. (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

†*Alternately.*

G.M.T.	*Call*	*kc/s*	*Town*
Sundays			
09.00	G3LP	1850	Cheltenham
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3GZA	1837.5	Bristol
12.00	GI5UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
Mondays			
19.00	G3NC	1825	Swindon
21.00	G3BLN	1900	Bournemouth
22.15	G2BRH	1900	Ilford
22.30	G8TL	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
21.00	G3EFA	1855	Southport
Wednesdays			
19.00	G3GZA	1837.5	Bristol
22.30	G3FBA	1910	Bath
Wednesdays (contd.)			
19.30†	G3HGY, G3HVU, G5PP	1900	Coventry
22.00	G2BND	1918	Dalston
Thursdays			
19.00	G3NC	1825	Swindon
20.00	G2CPS, G2CNX, G3GWT	1910	Hull, Yorks.
21.30	G3ICX	1915	Sutton Coldfield
22.00	G3IFX	1910	Derby
22.30	G3OB	1803	Manchester
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
Fridays			
19.00	G3BLN	1900	Bournemouth
19.00	GW3HJR	1900	Caerphilly, South Wales
20.00	G3CSG	1870	Wirral
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees

MEMBERS USING THIS SERVICE ARE REQUESTED TO SEND LISTENER REPORTS TO THE STATIONS CONCERNED

been heard on the bands, but is a pirate. Apart from ZD2S (who is quite genuine), all other pukka ZD2s have three letters (their initials) after the prefix.

According to the *West Gulf DX Club Bulletin* G2RO will operate as VP3RO from January 15 to February 2, and will then return to the U.K. for three months, before setting off on an Asian tour, which will include visits to Brunei, Sarawak and North Borneo. He will use 7030 and 14060 kc/s only. When he *does* fire up from those spots, people tuning anywhere near the frequencies will be well advised to remove their aerials!

For aspirants to the D.U.F. certificate, there is news that FF8CG is active from the Ivory Coast, while FF8AZ remains in French Soudan. (Neither, of course, counts separately from French West Africa for DXCC.) Joseph Klein, who operated FB8ZZ in 1951-52, will work from Kerguelen Is. this year. VS7NW hopes to visit Pakistan and Afghanistan, before moving on to East Africa. The QSL address of XW8AA is c/o The Radio Station, Vietiane, Laos, Indo-China. ZS8MK, now in England, may be reached *via* G5RI. LB9IC is on Andoy Is., off the Norwegian coast. He counts as Norway.

A certain ZC4XP/YP1 has been causing increased electricity bills in all W call areas. '4XP has, in fact, been in the U.K. for months. Nuff said!

The familiar R.S.G.B. badge served as a means of introduction when John Murray, GI3HGV (left) met M. B. Skinner, GW3DOF aboard the T/V Sydney. The photograph was taken by David Reed, B.R.S. 19852. All three have emigrated to Canada.

Forty Metres

N. C. Smith (Petts Wood) sums up the position thus. "Forty, commercialised (almost); eighty, jammed up with weird c.w.; Top Band full of Dutchmen, coastguards, etc. (plus the odd amateur!)." However, he dug deep into the mess on 7 Mc/s and emerged with ZS7D, FR7ZA (S7-8 at 1800, working FA8IH), UH8KAA (1640), UA0KKB, SV0WG (Rhodes), ZD4AB (2045), OQ0DZ, CR4AG and VP4LZ, all c.w. G3ATU unearthed VQ3EO, JA3AF (1800), I5LV and ZL4GA (RST339 at 1630). UI8KAA and UA9KCC were both good signals as early as 1300 recently. I4DS, active on c.w., is in Leghorn.

Top Band DX and News

On Top Band, despite ear-splitting interludes from Scheveningen Radio and sundry other QRP exponents, "things" have been happening. Early morning DX conditions have been good and may get better. Your commentator cannot attract any trans-Atlantic attention (a fact which does not surprise him), but lots of people have been having fun. **G3BMY** (Halesowen) gave ZC4GF his first U.K. contact and also worked CN2AO (ex-EK1AO), 'BMY hasn't managed W or VE, yet, but that shouldn't worry him.

N. C. Smith pulled in W8GDQ (1890 kc/s—calling W7OIZ), W1BB, '1LYV, '1EFN, '1VDB, '1AHX, '2JIL, 2AMC, 2WC, 2MCU, 3RGQ, 3FCQ, 3FNF, 4KFC, 9EWC, VE1EA, CN2AO, HB and twenty-three OKs! **G2HKU** (Sheerness), whose gear took such a beating in last year's floods, has things under control again, but he's keeping his fingers crossed! He has worked GD3FBS, HB9CM, GM3JFG, GI5UR and heard W1BB, '1LYV, '4KFC, VE1EA, CN2AO and K2ANR (RST578). **W2WC** sends a note to say he is "getting across"—See above.

G3ATU heard sundry W1s and 2s (with W1LYV booming in for long periods and peaking S8), W9CZT, W9JLH, W9JIL (RST579 at 0825!) and W0NWX. W4KFC was also outstanding, being fully readable on his bug key. W8BDQ (or W8GDQ) was heard on phone, working a W5 and fighting a losing battle with one of the above-mentioned aids to deafness!

G3IOI (Launceston) sends the interesting information that PA0YZ (near Leyden) is anxious to work cross-band with Top Band U.K. stations, lots of which have been S7-8 on c.w. and S5-6 on phone. PA0YZ has a v.f.o. and uses both phone and c.w. As Dutch amateurs are not permitted Top Band operation, he will be on 3.5 Mc/s, each evening from 1900 to 1930 G.M.T. He will listen on 1.8 for calls and would like stations to indicate the frequency they want him to use.

G3JBR (Scarborough) is receiving reports and QSLs for Top Band contacts, despite the fact that he has never used the band. So unless the notes above cause him to move there, anyone hearing "G3JBR" on Top Band knows what to do.

A recent evening produced several calls to a station signing SM5AQW. The SMs are not licensed for Top Band, but it *is* possible that 'AQW has special permission. At any rate, we hope to have definite information by next month.

Late Notes

SM5ARP will be active as 3A2AW (Monaco) on c.w. and phone for three weeks, from May 5. All bands will be used, with 14 Mc/s preferred. ZC4RX, in addition to activity on other bands, has been working G stations on 3.5. VK9GM, 'RH and 'OK (Norfolk Is.) are again active using high power and are looking for DX contacts.

* * *

Now that the Christmas rush is over and things have more or less settled down again, may we hope to hear from all of you with news of bigger and better DX during 1954!

French QRP Contest

THE annual QRP Contest, organised by Reseau des Emetteurs Francais will take place this year on February 8 from 0500 to 2200 G.M.T.

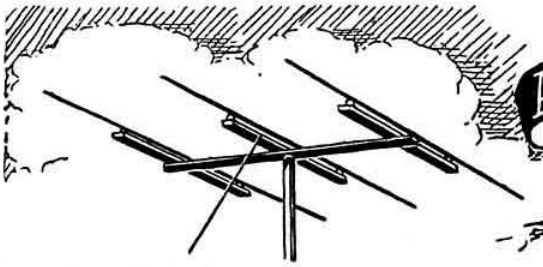
The maximum power input allowed is 8 watts. Both c.w. and telephony may be used on all bands from 3.5 to 28 Mc/s. Calls should take the form of "CQ de REF/QRP de . . ." and include a figure indicating the power being used. Every contact must include the exchange of a five figure group, the first three being the RST or RSM report followed by the number of the contact (02, 03, etc.).

Logs, including a description of the station, should be addressed to Pierre Herbert (F8BO), Authie (Somme), France, and posted not later than February 15, 1954.

Full details of the rules appear in the January, 1954, issue of *Radio REF.*

A.R.R.L. DX Contest

THE Telephony section of the A.R.R.L. DX Contest will take place during the weekends of February 12 to 14 and March 12 to 14, and the Telegraphy section from February 26 to 28 and from March 26 to 28.



AROUND THE V.H.F.'s

By W. H. ALLEN, M.B.E. (G2UJ)*

Two Metres in Scotland

ONE of the first sufferers from "TVI in reverse," **GM3EGW** (Dunfermline), finds this interference so bad at times as to prohibit the reception of all but strong signals. Most of the band is affected but the greatest concentration is between 145.2 and 145.4 Mc/s. He has sent a tape recording of what it sounds like to G3FRG who suffers acutely from the same menace in Sussex following the opening of the local TV booster station which operates on the Kirk o' Shotts frequency.

Two metre activity appears to be high in parts of Scotland and in three weeks GM3EGW worked GM3BQO, DDE, EQY, FGJ, 5YW, 6LS, SR and 8FM, all in Edinburgh, and GM3DBA in North Berwick. In the west there are fewer stations on the band and only GM3DIQ, 4HX, 6WL and 6ZV figure in the log. GI5AJ puts in a strong 'phone signal on occasions. To the south contacts have been made with G2FO, 3GHO, 5BD, GX, YV, 6LI, NB and 6XX.

A sked with ON4BZ, arranged by G5YV for 2215 G.M.T. on November 21, brought the Belgian station back straight away — the first reported GM/ON contact on the band. This was repeated in the early hours of the next morning when GM3EGW was peaking up to S8. At that time ON4BZ could be heard by GM3ENJ but efforts to effect a QSO were unsuccessful.

GM3FYB, also in Dunfermline, is most unfortunately situated on the northern slope of a hill. However, by dint of much work on aerials —he has a 5-over-5 with one wave-length spacing —and the development of a p.p. cascode converter employing a 6BQ7A, "hotted-up" with the aid of a crystal diode noise generator, he has succeeded in working several Gs. On November 20 a 320 mile contact was made with G6NB who subsequently worked both the other 2 m stations in Dunfermline, GM3EGW and 3ENJ.

Other 2 m News

Up to December 7 conditions were fair to very good on 2 m, the best period being between November 20 and 23. **G3DO** (Sutton Coldfield) increased his "Ladder" score from 9—81—5 to 10—101—5, the new Region being No. 9 from a contact with G3FIH. **G5MR** (Hythe, Kent) raised DL6EP on December 1 bringing his country score to 7 since July 1.

G8VN (Rugby) took advantage of the evenings of November 21-22 to work G2FJR, FWW, HOP, 3CKQ, IRA, 5JU, TZ/A and 6CI. Those heard included G2AIW, OI, PU, YC, 3BKQ, IIT, 6AG, LI, RM, YU, 8OU. **G8VN** voices the views of many 2 m operators when he says that in times of poor conditions and low activity more contacts result from CQ calls on c.w. than on 'phone.

G3GHU, writing on behalf of the University of Nottingham Radio Society, reports that during the past term, the Club station, G3DBP has been active on 2 m. The equipment in use includes a c.c. cascode converter into a BC454, a BC640 transmitter running 100 watts input to p.p. HK24Gs and a 3-element Yagi aerial at 30 feet, firing south. Stations worked, mostly in November, include G2BVW, 3BKQ, ENS, GFW, GHO, IVF, 6NB and 8DD. Heard were G2FJR, 3CHY, IAI, WW, 5YV, 6CW and 8AO/MM. Skeds with G3DBP are invited for lunch-time or at any time during the week-ends.

70 cm Report

G2RD's activity list for the month ending December 20 reads as follows:—G2DD, DTO, HCG, MV, QY, RD, WJ, XV, 3BKQ, ECA, EYV, FP, GDR, IRW, MI, 4RO, 5CD, DT, RD, TP, 6NF, 8SM. The latter is welcomed back to the band after an absence of two years.

LONDON U.H.F. GROUP

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, **at 7.30 p.m., on February 4th, 1954.**

All u.h.f. enthusiasts welcome.

The Year in Retrospect

Looking through reports for the year 1953 reveals an astonishing number of 2 m openings, so many, in fact, as to form an obvious conclusion that there is no real "closed season" for the v.h.f.'s as was once supposed. DX in summer still remains a possibility, but last year the best times were before and after June with a definite bias towards March when conditions for long distance working were better and longer in duration than at any time since our own observations began.

There were almost certainly many more openings on 70 cm than would appear from the reports, owing to the smaller scale of activity. With continued improvement in receivers, aerials and transmitters, as well as greater occupation, it will doubtless be found that there is little to choose between the results to be obtained on the two bands. In a number of instances where contact was first made on 2 m and continued on 70 cm, signals were not only stronger but more consistent on the higher frequency.

Early in January, 1953, contacts with France and Belgium were reported on 2 m and ON4BZ worked stations in Denmark and Sweden. In February somewhat similar conditions were experienced. Throughout March, a series of anticyclones produced one of the best and longest periods of good conditions yet experienced on the band. Belgian, Danish, Dutch, French, German and Swedish stations were worked from various parts of the United Kingdom and, for the first time, reception was reported of signals from 2 m stations in Norway (LA4BR) and Czecho-Slovakia (OK1AA). GC3EBK contacted the Danish station OZ2FR at 620 miles, G5YV worked DL7FS in

* 32 Earls Road, Tunbridge Wells, Kent.

Berlin and on March 22 the European 2 m record changed hands again when signals were exchanged between G5UF (Dorchester) and SM6ANR (Gothenburg) over a distance of 752 miles.

In March also came news that a 362 mile contact between GW2ADZ and ON4UV had brought the 70 cm record to Europe, an honour which again passed to the United States four months later when W1RFU and W4TLM worked over a distance of 410 miles. ON4UV contacted several stations in the U.K. and was, for strength and consistency, one of the outstanding signals on the band.

DL3FM (Essen) provided several British stations with their first experience of reception of 70 cm signals from Germany. GW2ADZ heard DL3FM at 435 miles, but owing to receiver trouble (later rectified by technical assistance from this country) all contacts were made cross-band from 2 m.

The R.S.G.B. 1953 V.H.F. Contests

The R.S.G.B. Two Metre Open Contest was held during the week-end of May 2-3 when conditions were fair to good but, as usual, the really good spell came just as the event closed, with the result that only a few stations on the East Coast were able to take advantage of it and so work across to the Continent. G5YV won the event with the tremendous score of 13,966 points from 117 contacts, nearly 4,000 points ahead of G3WW who worked 103 stations. Old timer, G5MA, operating portable in Monmouthshire, worked 87 stations for 8,845 points and was placed third.

On June 21 the First 1953 R.S.G.B. Two Metre Field Day took place and was marked by poor weather and only fair conditions. The event was won by G3GWB/P operated from Honey Hill, Cold Ashby, Northants, by members of the Northampton Short Wave Radio Club. They made 91 contacts, 11 of which were over 100 miles. The aerial system consisted of four stacked skeleton slots with reflectors devised by G2HCG, one of the operators, who described this ingenious type of array in the January, 1953, BULLETIN. G3BEX/P, at the Devil's Dyke, near Brighton, was second with four of his 62 contacts over 200 miles, and third place was occupied by G6XM/P, in Yorkshire, only two points behind. The latter station made the longest distance contact of 236 miles with G3HVO (Poole, Dorset).

More European Openings

At the end of the month, and again between July 5 and 7, the band opened strongly to the north and two Norwegian stations, LA8RB and LB9T, who had waited so long for 2 m QSOs with the British Isles, were rewarded with literally dozens of G contacts. LA8RB, near Oslo, the first across, was heard by G6LI and later worked by G6NB on June 29 while others, who heard no British stations, were well received in Belgium, Denmark, Germany, Holland and Sweden. At about this time G5YV heard the first Austrian 2 m signals in this country — from OE5EB. G5BD and GM3EGW reported that up to the end of June contact had been established between them on 26 out of a possible 33 days, a feat considerably more difficult of achievement than is suggested by the distance of 240 miles.

On July 1 GW2ADZ and PA0NL set up the first 70 cm contact between their respective countries.

Operating from a site on the west coast of Ireland, members of the International V.H.F. Society ran a series of tests between July 4 and 12 with United States amateurs in an attempt to bridge the Atlantic on 2 m. No definite results were obtained but, early in the morning of July 11, a weak c.w. signal was heard signing W4 . . . Unfortunately identification was impossible.

Mention has already been made of DL3FM's transmissions on 70 cm and on August 10 he, and Ralph Royle, G2WJ, another prominent u.h.f. operator, made the first 70 cm contact between England and Germany.

Regional Ladders

In the August BULLETIN appeared the final placings in the 2 m and 70 cm "Regional Ladder" competition which covered the period July 1, 1952, to June 30, 1953. G3BW (Whitehaven, Cumberland), was the only station to work all R.S.G.B. Regions and this he accomplished inside three months. G5YV's score for second place—401 stations in 14 Regions and 13 countries—gives some idea of the opportunities open at the present time to a 2 m station superbly sited. Third place was occupied by G3CCH (Scunthorpe, Lincs.), and fourth by G3WW (March, Cambs.), whose scores were 14 Regions, 121 stations and 11 countries and 13 Regions, 290 stations and 12 countries respectively. The 70 cm "Ladder" was supported by only two stations — G2FKZ and GW2ADZ—who each worked stations in six Regions and two countries, the former finishing three stations ahead of the latter with a score of 22.

Autumnal Conditions

Conditions continued generally good during August and the early part of September, but were somewhat patchy for the Second R.S.G.B. Two Metre Field Day held on August 30. This event was supported by at least 34 portable and many fixed stations and was won again by G3GWB/P with G3BEX/P second. The winners' score was 8,929 points from 103 contacts, including one with portable station F9CQ at 190 miles, while 'BEX was some 1,600 points behind but included in his score was a contact with G6XM/P, in Yorkshire, at 235 miles. The latter station made, with G2BAT/P at St. Agnes, Cornwall, the longest haul secured that day—323 miles. G3ERD/P (15 m. N. of Derby) occupied third place with a score of 7,264 derived from 71 contacts.

Operating from the summit of Mount Pilatus, HB1IV worked G6OU for the first HB/G 2 m contact on September 12, this being followed by several others including G5YV and GW2ADZ.

The 420 Mc/s Tests

The annual 420 Mc/s Tests were held on September 13. Fairly good conditions prevailed and a number of stations were active up and down the country, but at the time of compiling this report the results are not available.

October opened well and on the 10th signals from Denmark, France, Germany, Holland and Sweden were heard and worked from mid-morning until well after midnight. West of England signals were particularly strong during the late evening. In November, too, conditions were excellent at times, French stations being well received on the 15th. GW2ADZ raised PE1PL on 70 cm on the 21st and found his signals steadier than on 2 m.

Starting in January, 1953, G2RD compiled monthly lists of activity on the 70 cm band based on his own observations and upon those of stations worked by him. In eleven reports the calls of 59 stations appeared, including three PAs, one ON and one DL.

(Continued on page 317)

Sur les toits de Monaco

The Story of 3A2AY

THIS is Ron Glaisher's (G6LX) story, since he provided 95% of the effort and 99% of the equipment; it is fitting therefore that it should be told by someone else.

During January, 1953, Ron decided that he had the equipment and the experience—and, above all, the enthusiasm—to run a DX-pedition. He realised he would need assistance, particularly as the personal travel allowance was then only £25. He therefore enlisted the support of J. E. Blore (G3BZL/YI3BZL) for his experience in foreign parts; John Roscoe (G4QK) also fell an easy victim to the scheme. Finally, R. M. Herbert (G2KU) and P. J. Pollard (G3DIV), who operated 3A2AL in 1952, were asked for advice about obtaining a licence. Thus it was that a new three-man expedition to Monaco was born.

The Equipment

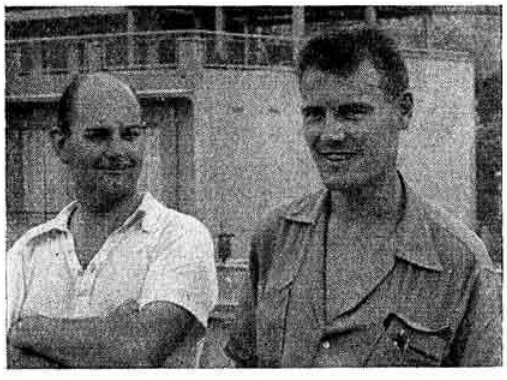
While the licence application was being approved, the equipment was assembled and tested. The transmitter was v.f.o. controlled and bandswitched for all bands from 3.5 to 28 Mc/s. Running on reduced power, it was used successfully during National Field Day at the Croydon "B" station. The receiver selected for the trip was a *Hammarlund* HQ120X with crystal controlled converters for 14 and 21 Mc/s.

After some difficulty permission was granted, through the French Consulate General, to take the apparatus across France, one of the conditions being that a bond for £25 (payable in francs) to cover the import duty should be deposited with the French Customs.

On Monday, July 6, G6LX and G4QK drove to Dover to catch the night ferry. Although a T3 foghorn prevented sleep during the crossing, G6LX drove 449 miles after landing at 5 a.m. On the following day only 410 miles were left to travel. At the last moment a sudden posting prevented G3BZL making the trip.

On Site

Accompanied by 3A2AH, with whom contact had been made soon after the trip was planned, the licence was collected from the Ministry of State on the Thursday morning. At 1742 G.M.T., G3CNM was worked on 14 Mc/s c.w. for the first QSO. From then on there was rarely a dull moment and at times, on 21 Mc/s, contacts were being made at the rate of 15 to 20 an hour.



G6LX with 3A2AH on the roof of the Hotel Siecle, Monaco.

Conditions generally were poor: 21 Mc/s opened to the U.K. most evenings but was not much use for DX; 14 Mc/s opened to North America only once but 7 Mc/s was more consistent and contacts with American stations were made on several occasions. QRM from Europeans (some of it, unfortunately, deliberate) was terrific. Contacts could be made most mornings on 3.5 Mc/s.

The 400th QSO was made on the ninth day of operation and in ten days more than 50 countries and over 100 British stations were worked. The DX included W1, 2, 3, 4, 8, 9, MP4BBD, FF8AG, FQ8AP, PY7MO, KP4KD and KV4BB on c.w. and MP4KAC, VQ4AA, VQ2DT, VS1CZ and HZ1AB on 'phone. QSL cards have been sent to all concerned.

In retrospect, it was a thoroughly successful holiday, full of good food and sunshine, and with a strong sense of purpose achieved. Next year, however, G4QK is not going to Monaco: he is going to stay at home and work a new country!

Some members seem to be under the impression that, besides relinquishing the responsibility for "Month on the Air," the President (Mr. Arthur Milne, G2MI) has also given up handling the QSL Bureau.

This is definitely NOT SO. The address of the R.S.G.B. QSL Bureau remains "G2MI, Bromley, Kent." No change has been made nor is one contemplated.

AROUND THE VHFs.—(Continued from page 316)

World Record on 24 Mc/s

On the frequencies higher than 420 Mc/s there was little to report apart from the magnificent effort put up by G8DD and G3QC who raised their 24 cm world record to 100 miles by a contact between Clee Hill, near Ludlow, and a hill-top site eight miles south of Lancaster. Signals were very strong over this far from line of sight path and there is every possibility that further attempts in the coming year will raise the record still higher.

Future Trends

1953 has been a good year during which much progress has been made: what shall we have to report in January, 1955? Probably an easing of the v.h.f. valve situation consequent upon the marketing of valves by British manufacturers for the projected Band III television receivers. Almost certainly the 2 m European record will pass the 1,000 mile mark and the 70 cm record should be raised to around half that distance. It would be no surprise if the 3 cm record also showed a surprising increase over its present figure of 27 miles.

* * *

As will be seen, few reports were received this month, no doubt owing to pressing commitments in connection with Christmas! Please send reports for the February issue to arrive not later than January 20.

Annual General Meeting

Minutes of the Twenty-Seventh Annual General Meeting of the Incorporated Radio Society of Great Britain held at the Institution of Electrical Engineers, London, W.C.2, on Friday, December 18, 1953, at 6.30 p.m.

Present

The President (Mr. Leslie Cooper in the Chair), Messrs. I. D. Auchterlonie, H. A. Bartlett, F. Charman, C. H. L. Edwards, D. A. Findlay, F. Hicks-Arnold, J. H. Hum, A. O. Milne, L. E. Newnham, R. Walker, P. W. Winsford (Members of the Council).

Messrs. H. A. M. Clark, D. N. Corfield, J. W. Mathews and H. V. Wilkins (Vice-Presidents), Mr. John Clarricoats (General Secretary), Miss May Gadsden (Assistant Secretary) and about 120 members.

In Attendance

Mr. Douglas H. Johnson (Solicitor).

Notice Convening the Meeting

The Honorary Secretary (Mr. C. H. L. Edwards) read the notice convening the Annual and Extraordinary General Meetings.

Minutes

It was moved by Mr. Winsford, seconded by Mr. Glaisher and resolved that the Minutes of the Twenty-Sixth Annual General Meeting and of the Extraordinary General Meetings held on December 19, 1952, February 27, 1953, and October 23, 1953, as published in the January April and November, 1953, issues of the R.S.G.B. BULLETIN be approved and confirmed.

Matters Arising

In answer to questions by Mr. C. E. Newton the General Secretary explained that the business dealt with at the previous Annual General Meeting was of a normal routine nature which did not warrant the publication of a Report in addition to the Minutes.

The agenda for the present meeting, which had been drawn up by the Society's legal advisers, did not include a specific item relating to the Minutes of the previous meeting or of the various Extraordinary General Meetings held during the year, but as the Minutes of such Meetings are normally submitted for approval at the next following Annual General Meeting that procedure had been followed in the present instance.

Annual Report of the Council

It was moved by the President, seconded by Mr. Dales and resolved that the Annual Report of the Council, as circulated to the Members and published in the November, 1952, issue of the R.S.G.B. BULLETIN, be approved and adopted.

In answer to a question by Mr. Newton the General Secretary gave information on the steps which the Technical Committee are taking in an attempt to establish a new Headquarters' station. A statement would be published when the arrangements had been approved by the Council.

Report of the Honorary Treasurer and the Audited Accounts

The Honorary Treasurer (Mr. D. A. Findlay) made a brief statement on the Society's finances in the course of which he pointed out that the deficit on the previous year's working (amounting to £2,143) had been reduced to £1,324 for the year under review.

In answer to a question by Mr. Wallace the Honorary Treasurer stated that the item of £3,523 for Salaries, Staff Pension Premiums, and National Insurance was made up as follows: Salaries £3,110, Staff Pension Premiums £338 and National Health Insurance contributions £75. The corresponding figures for the previous year were £3,383, £338 and £67 giving a total of £3,788.

Mr. Findlay confirmed that the figure of £3,110 for Salaries, represents payment made to persons in the employ of the Society.

It was then moved by Mr. Findlay, seconded by Mr. Clews and resolved that the Audited Accounts for the year ended June 30, 1953, be received, approved and adopted.

Election of the Council for 1954

The President announced the result of the election of the Council for 1954, as follows:

Officers

President.—Mr. A. O. Milne, G2MI, unopposed.
Acting Vice-President.—Mr. H. A. Bartlett, G5QA, unopposed.
Hon. Treasurer.—Mr. D. A. Findlay, G3BZG, unopposed.
Hon. Secretary.—Mr. C. H. L. Edwards, G8TL, unopposed.
Hon. Editor.—Mr. J. H. Hum, G5UM, unopposed.

Ordinary Members

Mr. R. L. Varney	G5RV	1429 votes	Elected
Mr. R. H. Hammans	G2IG	1204 votes	Elected
Mr. L. E. Newnham	G6NZ	1166 votes	Elected
Mr. I. D. Auchterlonie	G6OM	1128 votes	Elected
Dr. A. C. Gee	G2UK	1075 votes	Elected
Mr. F. Hicks-Arnold	G6MB	1011 votes	Elected
Mr. N. F. O'Brien	G3LP	789 votes	Elected
Mr. E. G. Ingram	GM6IZ	740 votes	
Mr. H. McConnell	GM2ACQ	676 votes	
Mr. R. Walker	G6QI	652 votes	
Mr. F. G. Lambeth	G2AIW	611 votes	
Mr. D. Deacon	G3BCM	604 votes	
Mr. F. A. Russell	G3BHS	556 votes	

Total Number of Ballot Papers Accepted	1663
Total Number of Ballot Papers Rejected	48
Total Number of Ballot Papers Received	1711

The President thanked the scrutineers, Messrs. F. Barnard, H. W. Evens, C. E. Newton, G. Leicester, F. Ruth and Mrs. M. Mills, for their help, and congratulated Messrs. Gee, O'Brien and Varney on their election to the Council.

Auditors

It was moved by Mr. Findlay, seconded by Mr. Knott and resolved to confirm the appointment of Edward Moore & Sons as Auditors for the year ended June 30, 1954, at a fee of Seventy-Five Guineas.

Institution of Electrical Engineers

The President moved and it was resolved that a cordial vote of thanks be recorded to the President and Council of the Institution of Electrical Engineers for allowing the Society to continue to use the building of the Institution for the holding of meetings. In moving the resolution, the President recalled that the Society had been privileged to meet at the Institution of Electrical Engineers for upwards of 40 years.

Other Business

Mr. Wallace suggested that in future years when presenting the accounts it would prove help-

(Continued on page 320)

Trophy Winners

It is a tradition for the President, at each Annual General Meeting of the Society, to present trophies and prizes won by members during the year. At the Annual General Meeting held last month at the Institution of Electrical Engineers, London, a photographic record was made of the presentations, highlights of which are depicted below.

(1) Mr. Arthur O. Milne, President-Elect (G2MI), was the first recipient of the Calcutta Key, presented by Mr. W. A. Scarr, M.A. (G2WS). (2) Mr. H. F. Knott (G3CU) was awarded the Courteney Price Trophy in recognition of his work in connection with the single sideband system of transmission. (3) Mr. W. H. Allen, M.B.E. (G2UJ) received the Founder's Cup for outstanding services to the Society. (4) Mr. A. E. Livesey, D.F.H. (G6LI) was awarded the Wortley Talbot Trophy. (5) Mr. Roy Poeton (G3CTN), Bristol County Representative, received the National Field Day Shield for the second successive year on behalf of Bristol Group. (6) Mr. A. E. Glozier (G3CRR), winner of the D/F Contest National Final, was awarded the 1950 Council Trophy. (7) Mr. J. N. Walker (G5JU), winner of the Second Top Band Contest, 1953, received the Victor Desmond Trophy.

Prints of the above photographs may be obtained from Mr. Eric Yeomanson (G3IIR) at prices announced on page 311.

Extraordinary General Meeting

Minutes of an Extraordinary General Meeting of the Incorporated Radio Society of Great Britain, held at the Institution of Electrical Engineers, London, W.C.2, on Friday, December 18, 1953, at 7 p.m. The Meeting followed the Twenty-Seventh Annual General Meeting of the Society.

Present

The President (Mr. Leslie Cooper in the Chair), Messrs. I. D. Auchterlonie, H. A. Bartlett, F. Charman, C. H. L. Edwards, D. A. Findlay, F. Hicks-Arnold, J. H. Hum, A. O. Milne, L. E. Newnham, R. Walker, P. W. Winsford (Members of the Council).

Messrs. H. A. M. Clark, D. N. Corfield, J. W. Mathews and H. V. Wilkins (Vice-Presidents), Mr. John Clarricoats (General Secretary), Miss May Gadsden (Assistant Secretary) and about 120 members.

In Attendance

Mr. Douglas H. Johnson (Solicitor).

Notice Convening the Meeting

The President explained that the notice convening the Extraordinary General Meeting had been read by the Honorary Secretary at the opening of the Annual General Meeting.

Special Resolutions

The President proposed and Mr. R. Walker seconded the following Special Resolution:

"That the name of the Society be and is hereby changed from the Incorporated Radio Society of Great Britain to Radio Society of Great Britain."

At the request of the President the General Secretary read to the meeting a statement dealing with the proposal to change the name of the Society which had appeared in the December, 1953, issue of the R.S.G.B. BULLETIN. Mr. Walker spoke in amplification of the statement.

The motion was then put to the meeting and the President declared that it had been carried by the unanimous vote of the meeting.

The General Secretary, in response to a request by the President, reported that 804 proxy votes had been received and that of this number 604 were in favour of Resolution No. 1, 158 were open proxies held by Members of the Council or himself, 28 were open proxies held by others and 14 were against the Resolution.

The President proposed and Mr. R. Poeton seconded the following Special Resolution:

"That the following Articles of Association be and are hereby adopted as the Articles of Association of the Society in substitution for the present Articles of Association."

(A copy of the new Articles of Association was sent to every Corporate Member in November, 1953, and a copy is appended to the official Minutes).

The President spoke briefly on the work which had been done by the present and past Councils in connection with the new Articles of Association.

The motion was then put to the meeting and the President declared that it had been carried by an overwhelming majority.

Vote of Thanks

Mr. Dales moved, Mr. Metcalfe seconded and it was resolved to record a vote of thanks to the President and Council and to the General Secretary for their services to the membership during the year now ending. Mr. Dales made particular mention of Mr. Cooper's work as President and Chairman of the three Extraordinary General Meetings held during his term of office. The motion was carried with acclamation.

The meeting was declared closed at 7.35 p.m.

ANNUAL GENERAL MEETING.—**(Continued from page 318)**

ful if the item "General" under the heading "Travelling, Entertainment and Meetings" could be "broken down" to show the main items of expenditure. The President explained that a high proportion of the current figure of £695 was due to travelling and out-of-pocket expenses incurred by Council Members resident outside London. The membership would appreciate that with a further increase in the number of provincial members on the Council the item would probably show an increase next year.

The meeting terminated at 7 p.m.

Presentation of Prizes and Trophies

AT the conclusion of the Annual General Meeting on December 18th, 1953, the President (Mr. Leslie Cooper) made the following presentations:—

Wortley Talbot: Mr. A. E. Livesey, D.F.H., G6LI.
Courtenay Price: Mr. H. F. Knott, G3CU.
Founder's: Mr. W. H. Allen, M.B.E., G2UJ.
Calcutta Key: Mr. A. O. Milne, G2MI.
N.F.D. Shield: Bristol Group.
N.F.D. Shield Replicas: East Molesey and Croydon Groups.
Victor Desmond: Mr. J. N. Walker, G5JU.
1950 Council: Mr. A. E. Glozier, G3CRR.

The **Norman Keith Adams Prize** was presented to Mr. Paul Sollom, B.Sc.(Eng.), A.C.G.I., G3BGL, and the **Bevan Swift Memorial Premium** to Mr. D. Clift, G3BAK.

Trophy winners who were unable to attend the meeting included, Messrs. G. A. Massey, G6YQ **(ROTAB),** G. J. Dent, VQ4AQ **(B.E.R.U. Senior Rose Bowl and Senior Telephony Miniature),** J. C. van Wyk, ZS6R **(B.E.R.U. Junior Rose Bowl),** I. S. Cashmore, G3BMY **(1930 Committee),** D. E. Davies, GW3FSP **(Somerset),** J. J. Yeend, G3CGD **(Houston Fergus),** H. Beaumont, G5YV **(Mitchell-Milling),** H. W. Parker, GW2ADZ **(Arthur Watts),** Coventry and Stourbridge Amateur Radio Societies (Joint Winners, **Edgware),** J. Banner, GW3ZV **(Milne),** F. J. U. Ritson, G5RI **(Col. Thomas** and **Braaten),** W. H. Hodgson G3BW **(Thorogood),** Northampton Short Wave Radio Club (Miniatures).

Certificates of Merit were also awarded to a number of other Contest competitors.

Radio Amateur Emergency Network

SINCE the announcement last November of the formation of the Radio Amateur Emergency Network more than 1,000 registration forms have been distributed. But by no means all have been returned to Headquarters. All those who already have such forms are, therefore, urged to complete and return them without delay. Many more volunteers are still required. There is a place in R.A.E.N. for every worth-while amateur. Present ownership of special emergency equipment is not a requirement: all that is necessary is a willingness to help should an emergency ever arise. No special drills are laid down but every member should acquaint himself with the workings of his local group and endeavour to co-operate with practice nets as frequently as possible. For those who cannot commit themselves to even these easy conditions limited membership, involving registration only, is available. Registration forms are obtainable from all E.C.O.s and from Headquarters on request.

A number of additional volunteers have offered their Services as Emergency Communications Officers since the first list was published last month but many areas are still not represented. Further offers will be welcomed immediately so that they may be considered by the R.A.E.N. Committee at their February meeting.

Progress Report

Excellent progress is being made by most of the groups so far functioning. In **Essex**, for example, a county-wide net was in operation within a few days of the R.A.E.N. coming into being, while in many other areas equipment is being built and exercises regularly held. The **Middlesbrough** R.A.E.N. Group is taking part in an outdoor Civil Defence exercise this month and contact has been made with many local organisations, all of whom are enthusiastic. The **Leicester** and **Loughborough** groups have already worked out a scheme of co-operation to cover the low lying area between the two towns, which is liable to flooding. In **Portsmouth** the R.A.E.N. control station is being installed in the Police Headquarters building. It is natural that particular interest in R.A.E.N. should be shown by those living in coastal towns and judging by the number of registration forms ordered, the **Grimsby** Group is no exception. A meeting of members in the **Wirral** was held recently at which the problems of thickly populated areas, such as Lancashire, were discussed. From experience gained, this Group believes that 144 Mc/s will prove more useful than 3.5 Mc/s for emergency working, particularly to County Control stations. Similar views are expressed by Groups who favour 28 Mc/s rather than the lower frequencies.

Equipment

A number of questions have been raised on the subject of equipment. Although suitable designs are scheduled for publication in the BULLETIN this year, there appears to be no suitable single source of information available in this country at the moment. However, the *Radio Amateur's Mobile Handbook*, a new book published by *CQ Magazine*, provides a great deal of excellent practical information and copies will be available from R.S.G.B. Headquarters shortly. The price is not yet known. Judging by reports from E.C.O.s, the formation of R.A.E.N. has stimulated constructional programmes and many member stations are actively engaged in designing and building equipment for both portable and fixed station use on all bands.

* * *

Brief progress reports for publication should be sent to reach Headquarters not later than the 20th of the month preceding publication.

Thames Valley Comes of Age

WAY back in 1932 a group of enthusiasts from the area around Hampton Court decided to form a local radio society for the benefit of those living in, what is usually termed, the Thames Valley. Among the founders were Fred Crocker, G2NN, George Spencer, G2KI, and Frank Wadman, G2GK. It was all the more pleasing then that these three stalwarts should be present at the Carnarvon Castle Hotel, Hampton Court, on Saturday, December 5, 1953, when the Thames Valley Amateur Radio Transmitters' Society celebrated its coming of age with a dinner-dance.

Presided over by Leslie Cooper, G5LC (President of the Society and at that time President of R.S.G.B.) the function went with the customary swing which has marked all previous social events organised by this well known Society. The attendance of 115—which severely tested the available accommodation—was a record for the Society.

Toast List

To Stanley Vanstone, G2AYC, President of nearby Sutton and Cheam Radio Society fell the honour of proposing the toast to the Thames Valley Society. It was appropriate that Founder President Fred Crocker and Ken Rogers, G3AIU, the present Honorary Secretary should be linked in the reply. Executive Vice-President Alan Mears, G8SM, welcomed the many distinguished visitors, including "Dud" Charman, G6CJ (Past President, R.S.G.B.) and "Master" John Gilbert, of the B.B.C. Television Inventor's Club, both of whom replied.

Council Member Frank Hicks-Arnold, G6MB, proposed the health of the ladies and the response —neatly given—came from Mrs. Margaret Spencer, wife of G2KI.

The General Secretary of the R.S.G.B. (John Clarricoats, G6CL) who is himself a Vice President of T.V.A.R.T.S. proposed a toast to the President and Mr. Cooper replied.

A 21st birthday cake—donated by Alan Mears —was cut by the President's wife and distributed to the assembled company. Earlier in the proceedings a specially made "cake" suitably decorated was played into the hall. This when "opened" revealed the ladies' prizes—a silk scarf apiece.

A raffle followed for a number of valuable prizes donated by various radio manufacturers.

Kenneth Price (Baritone), Gladys Cowper (Soprano) and Joyce Lock (Piano) entertained whilst Roy Barrett and his band provided music for dancing.

The proceedings finally terminated with the singing of Auld Lang Syne at midnight.

As from the February 1954 issue the closing date for copy for the Bulletin will be the 20th of the month preceding publication.

The R.S.G.B. Bulletin

Results of a Readership Survey

FOR some time past the Technical Committee and the Editorial staff have felt that the opinions of non-transmitting members were insufficiently well known to them.

A questionnaire, designed to obtain the maximum information regarding the views of such members, was therefore sent to a number of B.R.S. and Associate members selected at random. The results of the survey—a kind of miniature Gallup Poll—have now been collated.

Regular Features

Members were asked to express their appreciation or otherwise of certain regular features. The percentages recorded in favour of those features were as follows:—

"Letters to the Editor"	94%
"Current Comment"	92%
"Council Proceedings"	77%
"Month on the Air"	69%
"Around the V.H.F.s"	67%
"Contest Rules and Reports"	52%
"Regional and Club News"	43%

Technical Standard

In reply to a question regarding the technical standard set by the BULLETIN, 80% considered it about right, 16% thought it was too high; the remainder expressed no opinion.

Types of Articles Wanted

More than 80% of those questioned asked for more articles expressly designed for the newcomer, while 73% said they were interested in tape recording and high fidelity audio equipment. A large proportion expressed interest in receiver, test gear and simple transmitter construction and in v.h.f. and microwave technique. No other topic received major support.

Suggestions for articles were, however, very freely made and covered practically the whole field of Amateur Radio and its allied arts. One important fact stands out clearly from an examination of the correspondence and that is the demand for many more technical contributions. The theme, running through all the letters and comments received, was bluntly summarised by the member who wrote "We want more technical information."

The BULLETIN, unlike its American contemporary, does not employ a team of technicians with extensive laboratory facilities but relies entirely upon contributions from the membership at large. Whether or not the individual member has written a technical article before is unimportant. If he has a piece of equipment, a novel aerial system, a piece of useful ancillary equipment or just a helpful gadget which other members might find of interest, he should write to the Editor outlining the nature of the proposed article and requesting a copy of *Hints to Contributors*. Every assistance possible will be given by the Editorial staff in the preparation of such articles. Literary masterpieces are not necessary. All that is required is a simple description in straightforward English, with suitable diagrams from which the BULLETIN draughtsman can prepare final drawings for block-making. Nevertheless, an article should be set-out, in so far as is possible, in the way in which it is expected to appear in print, using the abbreviations commonly used in the BULLETIN.

"Hints and Tips" Feature

Practically every radio amateur uses unusual but ingenious gadgets in his station. If these ideas could be sent in to the BULLETIN, the request for a "Hints and Tips" feature on the lines of the famous *QST* article could soon be met. Once again, nothing elaborate is necessary. Just a clear description in simple English with any necessary sketch. If required, the idea can be re-written by the staff.

One final note about the members who were asked to answer the questionnaire: 71% said that they hoped to get a transmitting licence eventually.

* * *

At a later date, it is intended to carry out a similar survey of the views of transmitting members.

Mobile Radio Users' Association

THE object of this newly-formed Association is to promote and encourage the use of civil mobile radio and to protect the interests of those users.

The Association is particularly concerned with the recommendation of the Television Advisory Committee that Band III (174-216 Mc/s) shall be given over to television. This recommendation, if adopted, will mean that business radio equipment, which now operates on frequencies within Band III, will have to be modified for operation on some higher frequency.

The Association argues that no mobile radio user asked to be placed in Band III—he was told to go there by order of the P.M.G.

The Association proposes a three-pronged drive to secure for business radio users certain prescriptive rights. The first is planned allocation of frequencies. The Association suggests there must be a thorough scrutiny on the part of the P.M.G. of *all* problems of frequency allocation to ensure that due provision is made for all users and potential users—Commercial, Government and Service. The second is security of tenure. The Association contends that it is just and right when mobile radio users move this time, that they move for the last time, subject only to over-riding considerations of national defence in the event of war.

Having been moved with care and foresight and having been given security of tenure the Association, for its third point, asks for compensation.

The Association has agreed to act on behalf of the ship-to-shore users, transport users, the ambulance services, radio cabs and industrial users, who between them have already invested £500,000 on mobile equipment.

The President of the Association is Sir Robert Renwick, Bart, K.B.E.; the Chairman is Captain L. P. S. Orr, M.P.; and the Secretary Mr. Ronald Simms. The Association operates from Buckingham Court, Buckingham Gate, London, S.W.1.

True Ham Spirit

AT the Second Annual "Get Together" held at the Hulton Arms Hotel, Over Hulton, Westhoughton, near Manchester, it was unanimously agreed that the proceeds of a sale of surplus equipment, donated by those attending the gathering, should be utilised to buy Christmas gifts for G3BZF, G5XF and G6QF, all of whom are in hospital. The organiser was Norman Tomlinson (G3HNT).

Society News

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the July, 1953, issue of the BULLETIN :

Amateur Radio Society of Uganda, c/o L. A. Seeley, P.O. Box 1803, Kampala, Uganda.

B.T.H. Recreation Club (Radio and Television Section), c/o R. Claxton, The British Thomson-Houston Co., Ltd., Recreation Club Office, Rugby.

The Church Lads' Brigade, Liverpool Diocesan Regiment, c/o The Commanding Officer, The Priory, 5 Canning Place, Liverpool 1.

Hounslow & District Radio Society, c/o R. J. Parsons, 16 Cypress Avenue, Whitton, Twickenham, Middlesex.

Lancaster and District Amateur Radio Society, c/o A. O. Ellefsen, 10 Seymour Avenue, Heysham, Lancs.

Loughborough College Radio Society, c/o J. B. Hooton, Loughborough, College, Leics.

R.A.F. Yatesbury Amateur Radio Society, c/o K. Smith, No. 2 Radio School, R.A.F. Yatesbury, Calne, Wilts.

Singapore Amateur Radio Transmitters Society, c/o S. P. Shotam, P.O. Box 176, Singapore.

Society Films

WITH regret the Council has heard from Mr. J. R. Wenn that he is unable, due to pressure of private business, to continue in office as Honorary Film Curator to the Society.

The Council wishes to place on record its thanks to Mr. Wenn who, for the past two years, has undertaken his duties with great thoroughness and technical skill.

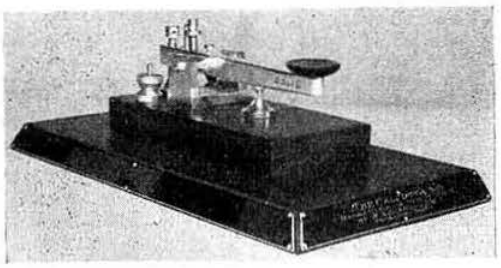
Consequent upon Mr. Wenn's resignation, coupled with the fact that the Society's films are suffering from severe wear and tear, the Council has decided, reluctantly, to suspend the film service temporarily.

TVI in Reverse

DURING recent months several members have complained to the Society that their reception of amateur signals on certain bands has been seriously affected by noise generated in the oscillator circuits of nearby television receivers.

As the result of discusions which have taken place between the Society and the G.P.O., the Society is now in a position to state that, in individual cases, the G.P.O. will treat interference with amateur reception in the same way as they treat interference with broadcast sound and television reception ; that is to say, when a complaint is received an engineer will first check whether the complainant's installation is technically sound and whether he is trying to receive a reasonably strong signal. (With regard to broadcast interference, for example, the G.P.O. only investigate complaints about the reception of national or appropriate local B.B.C. programmes.) If the complainant fulfils both these conditions the G.P.O. will try to trace the source of interference and, when found, will endeavour to get it suppressed.

It is understood that the G.P.O. will make a small charge when called upon to investigate interference to amateur signals.



The Calcutta Key donated to the Society by Past President, W. A. Scarr, M.A., (G2WS), and presented for the first time at the recent A.G.M. to Mr. Arthur O. Milne (G2MI) for outstanding services to the cause of international amateur radio.

LONDON MEETINGS

Programme, 1954

January 29, 1954: **Mr. Arthur O. Milne, G2MI.** PRESIDENTIAL ADDRESS, Followed by **Mr. F. H. Brittain, D.F.H.** (Research Laboratories, The General Electric Co., Ltd.)
"ART AND SCIENCE IN SOUND REPRODUCTION."

February 26, 1954: **Mr. S. A. Lacey** (Research Department, Murphy Radio, Ltd.)
"PRACTICAL ASPECTS OF TAPE RECORDING."

March 26, 1954: **Mr. G. P. Thwaites, B.Sc.(Eng.), A.M.I.E.E., A.M.Brit.I.R.E.**
"'TRUSTWORTHY' VALVES AND THEIR MANUFACTURE."

All meetings are held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2 Buffet Tea from 5.30 p.m. Meetings commence at 6.30 p.m.

London Members' Luncheon Club

NEARLY 40 members and friends attended the Christmas meeting of the London Members' Luncheon Club held at the Bedford Corner Hotel on Friday, December 18, 1953. Especially welcome were Lt.-Col. J. D. Andrew, W4EFG and Mrs. Hilda Andrew, W4HWR.

The Chair was taken by Stanley Vanstone, G2AYC, who had the support of the President-Elect (Arthur Milne, G2MI), Council Members Herb. Bartlett, G5QA and Frank Hicks-Arnold, G6MB and the General Secretary, G6CL.

Following a number of informal toasts during the luncheon Arthur Milne thanked the Chairman for his many services to the Club. Mr. Vanstone's gift of a box of chocolates to each lady was acknowledged by Ernest Dales.

The Club will meet again on January 15 and February 19. Reservations should be made in advance to Miss May Gadsden at R.S.G.B. Headquarters (HOL. 7373).

PRELIMINARY ANNOUNCEMENT

A NATIONAL CONVENTION

will be held in

BRISTOL

from September 17 to 19, 1954.

Book the Dates Now!

The Amateur Sound Licence

THE G.P.O. have recently had under review the whole field of Amateur Radio licensing with a view to reducing to a minimum the clerical work involved and, as a corollary, the cost of administering the Amateur Radio Service.

In furtherance of those aims a new basic licence is to be introduced which will cover the facilities at present provided by the fixed station, alternative address, temporary alternative address, and portable licences. There will be a separate licence for mobile working.

The G.P.O. also intend to introduce an Amateur Radio Certificate which will be awarded to those who are declared successful at the Radio Amateurs' Examination.

The schedule of exemptions (introduced just after the last war to assist those who had served in certain radio trades) is to be revised, with a view to encouraging prospective amateurs to take the Radio Amateurs' Examination.

Finally, the G.P.O. proposes to simplify the fees structure by abolishing the initial charges and variations of fees with power authorised. There is to be a single annual fee for the basic licence and a separate fee for the mobile licence. The amount of these fees has not yet been fixed.

In view of the impending changes the G.P.O. have decided that, as from January 1, 1954, new alternative address and portable licences will be issued free of charge and also that no renewal fees will be charged for existing licences for these purposes after that date. It will, of course, still be necessary for persons who wish to avail themselves of alternative address and portable facilities in the interim period, to take out licences for these purposes, and licensees will still be bound by the conditions of those licences.

The Society hopes shortly to be in a position to publish the terms and conditions of the new licences.

Empire Broadcasting

OLD TIMERS with long memories were disappointed when no reference to the pioneer work of Past-President Gerald Marcuse, G2NM, was made in any of the special programmes broadcast last month to mark the 21st Anniversary of the start of the Overseas Service of the B.B.C.

It was Mr. Marcuse who first demonstrated, from his home in Caterham, Surrey, and at his own expense, that Empire Broadcasting was possible. As a result of the interest shown in his broadcasts, which were officially authorised by the P.M.G., the B.B.C. eventually decided to inaugurate a regular overseas service on short waves.

In the January issue of *The Short Wave Magazine*, the Editor (Mr. Austin Forsyth, G6FO) rightly draws attention to the omission by the B.B.C. of any reference to Mr. Marcuse's work.

More Piracy

THE Whittlesey (Cambridgeshire) magistrates on December 21, 1953, fined T. W. Cullup, K. H. Hancock, J. W. Kirby, and K. C. Smith, £2 each with £1 1s. costs, for using transmitting sets without licences on October 25, 1953.

On behalf of the prosecution it was stated that in all the cases the P.M.G. did appreciate that it was more a matter of enthusiasm as amateurs that led to the offences and not a question of transmitting to foreign stations. It was further stated that this type of offence was regarded as somewhat more serious than having no licence for receiving apparatus. The forfeiture of the apparatus was not asked for in these cases.

Statements made by each defendant were read to the magistrates.

Cullup installed his equipment in August, 1951; Hancock had used his equipment fairly regularly since it was installed 18 months earlier, Kirby admitted that his equipment was installed two or three years ago and that it had been used frequently on different frequencies. Smith stated that the equipment had been installed by his late father and admitted using it after his father's death.

Commenting on piracy in general, one member wrote: "Fines, imposed without confiscation of equipment, and amounting to less than the licence fee, seem to be a very poor deterrent to the kind of behaviour which brings unjust blame on the genuine amateur experimenter already overburdened with TVI and congested channel problems."

Lectures on Atomic Energy

A SERIES of six lectures, sponsored by the University of London Department of Extra-Mural Studies and the Atomic Scientists' Association, is to be given by eminent scientists in the Beveridge Hall, Senate House, Malet Street, W.C.1, on Wednesdays at 7 p.m.

The speakers and their subjects are as follows: *January 20*, Sir John D. Cockcroft ("Atomic Research at Harwell"); *January 27*, Professor O. R. Frisch ("Atomic Weapons"); *February 3*, Professor F. E. Simon ("Power from Atomic Energy"); *February 10*, Dr. J. F. Loutit ("Radiation Hazards of Atomic Energy"); *February 17*, Dr. E. E. Pochin ("Medical Uses of Atomic Energy"); *February 24*, Professor Kathleen Lonsdale and Sir George P. Thompson ("Atomic Energy and Moral Issues").

The admission fee for the course is 10s. Application for tickets should be made to the Cashier, University of London, Senate House, Malet Street, London, W.C.1. Tickets may also be obtained (price 2s. each) at the lecture room on the occasion of each lecture.

Transistor Lectures

A SERIES of lectures on "Semi-conductors and Transistors" is being given by J. S. Blakemore, B.Sc., Ph.D., J. Evans, B.Sc., Ph.D., and K. W. Cattermole, at the Technical College, Queensway, Enfield, on Tuesday evenings. Applications for admission to the course (the fee for which is £1 1s.) must be made in the first instance to the Head of the Department of Electrical Engineering at the College.

Slow Morse Practices for London

THE organiser of the R.S.G.B. Slow Morse Practice Transmissions (Mr. C. H. L. Edwards, G8TL, 10 Chepstow Crescent, Newbury Park, Ilford, Essex), urgently requires the services of seven volunteers living in the Greater London area. Offers, stating day, time and frequency, should be made direct to Mr. Edwards.

This request is made as the result of a number of enquiries from members living in and around London who wish to learn Morse.

SOUTH LONDON TVI COMMITTEE

A meeting will be held on February 2 at the "Walmer Castle," Peckham, to discuss the formation of a South London TVI Committee, the aims and objects of which would be to assist members suffering from television interference troubles, to investigate difficult cases and to keep technical records of the cases so investigated.

The meeting is open to all interested members.

TVI Public Relations

The article reproduced below, written by a prominent member with a long experience of Society affairs, provides an excellent example of the type of Press publicity that serves well the Amateur Radio cause. It appeared recently in the "Ilford Recorder."

MANY who have acquired TV sets have become aware of various types of radio interference. These have been suffered by the radio short-wave amateur these last 30 years or more.

TV users who have just discovered these nuisances have on occasions turned their vengeance upon the amateur, thinking that he is the cause, rather than the co-sufferer.

The amateur is licensed and severely controlled by the P.M.G. He has sometimes to do nearly the impossible or restrict his operations, despite the fact that he existed long before TV sets were installed near him.

War Service

As an amateur, and the word means "lover," he is less likely to cause radio nuisance than others. It might fairly be said that were it not for the amateur, TV, radar, taxicab, fire service and ambulance radio might not have been.

He served you well during the war. Perhaps, had it not been for him, we could have been on the defeated side. Many facts of his service are still official secrets.

If an amateur causes, is suspected of causing, or even if he is not causing interference, he may be asked by the G.P.O. to cease operating, except as instructed, yet he pays licence fees as you do, only more so.

His gear may cost several hundred pounds and his receiver be as costly as your TV set, yet his operating times can be, generally speaking, only during the normal free (hobby) hours.

What then, having succeeded in making contact with a rare distant station, are his feelings if some radio interference blots out reception?

Causes of Interference

Maybe it is caused by some boy playing with his electric train set; a fellow over the road with an old car which he is "racing." Or, someone decides to shave himself with his electric razor—suppressed according to the manufacturers, but not so in fact, due perhaps, to a faulty component.

Perhaps some young lady is drying her hair, using an electric drier, or George is doing a bit of woodwork using his new electric drill, or mother is using her vacuum cleaner. A faulty switch in a neighbour's house; an imperfect thermostat or someone easing his rheumatism with a "health" lamp, may be the cause. All the interference you get and more, spoils reception for the amateur.

No Redress

For the amateur there is no redress, as yet, but he looks forward to legislation on electrical interference; you may be very severe nuisance to him, whilst the G.P.O. takes care that he causes you no trouble.

If you have TV you have just met these effects—they have been the bane of our existence for years and it did interfere seriously with vital communications during the war. So far, the law cannot touch the offenders; most of them apparently oblivious to the fact that they are sources of interference.

Nevertheless, cures can be effected, usually, at the cost of a shilling or two.

If the interference is caused by the amateur you should know that the P.M.G., whether with malice aforethought or not, allocated the television wavelength just where the amateur might interfere and, believe it or not, quite a number of TV sets have circuits built in them by the manufacturers, who should know better, which are tuned to the amateur wavelengths and, in fact, can interfere with the amateur or make it impossible for him not to interfere with the TV set.

Pity the poor amateur, he's given much and is still friendly, but not if he is blamed for what he does not do. He is human!

G. TOOSE-EADY.

Transistor Transmitter

RECENT Top-band contacts with G3CCA (operated by Mr. C. L. Wright, B.Sc.(Eng.), of Leicester) have been made with a transmitter working at an input of 0.5 watts. The transmitter uses five transistors and the output stage has two working in push-pull. So great has been the interest shown in this equipment that Mr. Wright, who is Publicity Officer to the Leicester Radio Society, is arranging to deliver a series of lectures on transistors. At the first (on February 1, 1954) the basic principles of transistor circuits will be dealt with, whilst at the second (on March 1) the practical application of transistors to amateur transmitting will be discussed.

Since his transistor transmitter first went into operation, Mr. Wright, who is an electronic research engineer by profession, has received numerous enquiries for circuitry information, but he regrets that until after the lectures he cannot satisfy this demand.

Medium Wave DX

THE B.B.C. monitoring station at Tatsfield, Kent, recently received, for a period of one month, a "Voice of America" station operating on 1170 kc/s in Okinawa—a distance of over 9,000 miles. Reception was during the afternoons.

Condolences

FRIENDS of Mr. G. Williamson, G3FYZ, of Blackpool, will be deeply distressed to learn that his wife and son were killed in a car accident just before Christmas.

Members of the Blackpool and Fylde Amateur Radio Society in particular, will mourn the passing of Mrs. Williamson, whose hospitality they frequently enjoyed at the home of G3FYZ.

Thanks

The General Secretary and Miss Gadsden thank their many friends in the Society who sent them Christmas and New Year greetings.

Tests and Contests

R.S.G.B. D/F Contest: National Final, 1953

IT is regretted that the following tabulation of the results of the 1953 D/F National Final was omitted from the December issue of the BULLETIN.

Posn.	Name	Group or Club	Time of Arrival
1	A. E. Glozier	Romford	1455
2	A. J. Hallett	Romford	1527
3	P. N. Prior	B.T.H. Rugby	1529
4	R. K. Seabrook	Southend	1538
5	C. H. Young	Slade	1542
6	H. Drury	Romford	1551½
7	I. T. Haynes	B.T.H. Rugby	1552
8	J. Walley	Slade	1553
9	G. T. Peck	High Wycombe	1555

Low Power Contest, 1953

THE number of entries for this Contest shows a big improvement over last year, and judging by the comments received, the alterations made in the rules were as much responsible for this as the rather better conditions which prevailed.

Winner this year, by a very large margin, is I. T. Cashmore, G3BMY, of Blackheath, near Birmingham. In second place is J. J. Yeend, G3CGD/P (Cheltenham), closely followed by D. O. O'Connor, G3GIO (Guildford, Surrey).

Equipment

The tendency towards multi-stage transmitters noted last year continues; only eight of the forty entrants used single-stage transmitters, and only two of these were crystal oscillators. G4XC used two transmitters, one of them a self-excited t.p.t.g. with keyed aerial (shades of 1928!).

Honours for lowest-power operation go to GW3IHL, who made 30 contacts with a maximum input of 0.12 W, five of them with only 0.076 W.

Results of Low Power Contest, 1953

Posn.	Call sign	Power in watts	Scoring contacts	Score
1	G3BMY	0.48	116	2340
2	G3CGD/P	0.3-0.48	81	1620
3	G3GIO	0.45	80	1600
4	G3HXI	0.48	77	1540
5	DL2RO	0.48	74	1480
6	G5LQ	0.475	65	1300
7	G4NS	0.45	63	1260
8	G3GDW	0.5	58	1160
9	G6WR	0.5	54	1080
	G2AVC	0.5	54	1080
11	G6VC	0.5-1 0	68	1020
	G2AOL	0.42	51	1020
13	G3DFV	0.96	98	980
14	G3IEW	0.4-0.75	67	870
15	G3HQQ	0.48-1.75	54	765
16	G3AZ	0.9	76	760
	G5JL	0.45	38	760
18	G3EUE	0.48-0.9	40	630
19	G3AZY	0.95-1.32	63	605
20	GW3IHL	0.076-0.12	30	600
21	G3FFH	0.42-0.46	29	580
22	G4AL	0.45	27	530
23	G3DOP	1.0	51	510
24	G3DGN	0.4-1.8	26	445
25	G3AKY	1.75	81	405
26	G3GMK	1.0	38	380
27	G5HH	0.5	17	340
28	G4JW	0.45-0.75	17	330
29	G4XC	0.35-3.0	49	300
30	G2BOF	1.0-2.0	54	295
31	G5DZ	0.96	29	290
	G3FNM	0.9	29	290
33	G3CAZ	3.0-5.0	114	265
34	G6AH	0.45	10	200
35	GC2FZC	3.0	58	174
36	G2ZR	1.56	29	145
37	G3HTI	0.21-2.7	11	101
38	G3EZM	1.9-3.0	20	88
39	G3GZJ	1.5-2.0	5	25

Equipment used by the three leading stations was as follows:

G3BMY: SP61 e.c.o., 6J6 buffer and p.a., power supply stabilised by a CV45, 132 ft. Zepp aerial and CR100 receiver.

G3CGD/P: 3S4 Hartley v.f.o., 3S4 b.a., 3S4 p.a., 90 V battery h.t., two half-wave dipoles and 1-V-1 receiver.

G3GIO: 6SN7GT v.f.o. TT11 p.a., 130 V stabilised power supply, 300 ft. long wire aerial and HRO receiver.

The equipment used by G3CGD/P was the same as that employed during the Low Power Field Day, and illustrated in the November BULLETIN. With an additional aerial the whole station still weighed less than the 20 lb. limit.

Comments

The suggestions made by entrants after the 1952 Low Power Contest were carefully considered when the rules were formulated for the 1953 event, and the result was very well received. A few entrants expressed regret at the omission of the county bonus. The operating standard was extremely high, and there were several expressions of appreciation of the co-operation of non-competing higher power stations.

Several suggestions were made concerning adjustment of the operating period on the Sunday, and lowering of the maximum power permissible in the contest.

Check logs were received from G2DHV, 3ACC, 3HJL, 5IV and GI3IVJ.

Second Top Band Contest, 1953

THE number of logs received for this Contest was rather smaller than usual, although checking has revealed that most of the "regulars" were active at some time during the period.

The Leading Stations

J. N. Walker, G5JU (Birmingham), who has been consistently in the first half-dozen in many Top Band contests, is the winner this time. He used a four-stage transmitter with 4033A p.a., and an Eddystone 750 receiver. In second place is J. C. Foster, G2JF (Wye, Kent), closely followed by N. P. Haskins, G8JR (Potters Bar, Middx.) and H. J. M. Box, G6BQ (Gravesend, Kent), who tie for third position.

Conditions

It appears that many would-be participants were deterred by the very poor conditions and apparent low activity during the first few hours of the Contest, and this probably accounts for the smaller entry. However, there was some improvement after midnight and the scoring rate between 0100 and 0800 G.M.T. was much as usual.

Only three stations outside the British Isles were contacted—OK1AEH, HB9T and 3A2BM, the latter operated by G5MP. Unfortunately no check log has been received from this station (representing a new country on Top Band), but his rather weak signal was apparently unnoticed by the majority of operators and only a handful of contacts were reported. A check log from OK1AEH shows that he contacted 48 stations in the British Isles between 2100 and 0300 G.M.T.

Scoring System

The Contests Committee apologises for the confusion caused by the incorrect layout of the entry form in the October BULLETIN—no entrant was penalised for incorrect interpretation. To give the

Second Top Band Contest, 1953, Results

Position	Callsign	Points	Scoring Contacts	Position	Callsign	Points	Scoring Contacts
1	G5JU	151	147	38	G3BKE	95	95
2	G2JF	149	147	39	G3HQQ	94	90
3	G6BQ	145	143	40	G2ZZ	88	88
	G8JR	145	141	41	G3EKD	85	85
5	G3BMY	144	142		G3FZC	85	85
6	G5TN	142	140	43	G3CWW	83	81
	G3GGN	142	140	44	GM6IZ	77	77
8	G6VC	139	137	45	G4CM	76	76
9	G6PD	137	135		G3IIS	76	76
10	G3GZJ	131	129	47	G3HTI	74	72
11	G3IEW	130	130	48	G3IBL	73	73
12	G5TO	128	126	*	G3JAM	73	73
13	G8GF	124	122	49	G2AYG	71	69
14	G5PP	123	123		G3FVW	71	69
	G3IGZ	123	123	51	G3GXV	70	70
16	G3HXI	121	117	52	GI5UR	69	69
17	G3IVH/A	119	119	53	G3GXG	68	68
18	G3GZB	117	117	54	G3CBW	67	67
19	G5JL	116	114		G3IQG	67	67
20	G2HPF	109	107	56	G3EPV	66	66
21	G3FCL	108	108		G3JWB	66	66
22	G3YF	107	107	58	G3HDQ	65	63
23	G3ELZ	106	104	59	G6JJ	62	62
24	G6UT	105	103	60	G3ACC	60	60
	G3CFG	105	103	61	G2KK	55	55
26	G3AZ	104	104	62	G3GDW	54	54
	G5MR	104	104	63	G3CO	52	52
28	G3ABS	103	101	64	G3HTE	51	51
	G3AKY	103	101	65	GW2HH	48	48
	G3HIW	103	103	66	G2AOL	46	46
	G3IIR	103	101	67	G3IYT	45	45
32	GM3IGW	101	99	68	G3ISX	40	40
33	G3DGN	100	98	69	G6NK	36	36
34	G3IWC	99	97	70	G5DZ	33	33
35	GW3QN	98	96	71	G3HYJ	32	32
36	G3BWQ	97	97	72	G3GOX	31	31
37	G3ABG	96	96	73	G8KU	24	24

* *Disqualified under Rule 5—late entry.*

Committee an opportunity to study the working of the new rules as intended, these rules are being used again for the First 1954 Contest, and comments will be most welcome.

To those who regularly comment that rules favour the highly populated areas, it should be pointed out that stations remote from these areas have won Top Band contests on many occasions. The Committee does acknowledge that the ideal system has yet to be found (and will continue their efforts to find it!); it is their view, however, that good equipment and operating ability are the main factors in deciding these contests, not location.

Check Logs

The number of check logs received for this contest was unusually large. The Contests Committee is always very pleased to receive these logs, but would much rather receive entries—several of the check logs this time would show very creditable scores if fully completed!

Acknowledgments for check logs is made to: G2IM, 2JB, 2XP, 2ZR, 3DC, 3CXM, 3CYY, 3HVX, 4BP, 5AO, 8TS, GI3HFT, GM3EFS, 3EHI, 4FK, GW3ZV, 8WJ and OK1AEH.

First Two-Metre Field Day, 1954

THE Rules for this contest have been amended to allow participation by all R.S.G.B. members in Europe, instead of restricting entry to members resident in the British Isles as previously. Otherwise, the rules remain the same as for the Second 1953 Two-Metre Field Day. Check logs from non-competing stations and photographs of portable stations will be appreciated.

Rules

1. The event is open to all fully paid-up members of the R.S.G.B. resident in Europe.

2. Contacts may be made on telephony, c.w. or m.c.w.

3. Entrants must operate according to the terms of their licence; the input to any stage of the transmitter must not exceed 25 watts.

4. The station must be operated from the same site for the duration of the event. The National Grid Full Six-Figure Reference must be given in all entries from G, GD, GM and GW. In all other cases, entries must show the latitude and longitude of the station location.

5. Only one contact with a specific station will count for points.

6. Contacts with unlicensed stations will not be permitted to count for points. Proof of contact may be required.

7. Entries should be written on lined foolscap or quarto paper, or typed on plain paper, and must be set out in the form shown below:

TWO-METRE FIELD DAY

May 9, 1954

Name..... Call Sign.....

Home Address..... Claimed Score.....

Site of Station.....

National Grid Full Six Figure Reference (or Latitude and Longitude—see rule 4).....

Transmitter..... Receiver.....

Aerial System(s).....

B.S.T.	Call sign of station worked	My report on his signals	His report on my signals	Location	Estimated distance	Points claimed
					TOTAL	

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the ruling of the Council of the R.S.G.B. will be final in all cases of dispute.

Signed.....

8. Multiple-operator entries will be accepted provided that:

(i) the call sign and signature of the operator concerned is recorded for each contact;

(ii) the declaration is signed by only one operator, who will be regarded as the entrant.

9. The event will start at 1100 B.S.T. and finish at 2000 B.S.T. on Sunday, May 9, 1954.

10. Power supply must not be derived from public or private supply mains.

11. No part of the station may be situated in any building existent on the site prior to the date of the event.

12. No apparatus may be erected on the site prior to the day of the event.

13. An exchange of reports (RS or RST) as well as location will be required before points for contact may be claimed. The location given must consist of distance and direction from the nearest town or village, e.g. "RST569 6SE Caterham" (i.e. 6 miles south-east of Caterham).

14. Points will be scored on the basis of one point per mile for contacts with fixed stations and two points per mile for contacts with portable stations.

15. Entries should be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1, and must bear a postmark not later than Monday, May 17, 1954.

16. A miniature cup will be awarded to the winning station, at the discretion of the Council, and the runner-up will receive a Certificate of Merit.

Direction Finding Contests, 1954

A MEETING was held in London last November to discuss the 1953 events and to make recommendations concerning the 1954 programme. As a result, several minor alterations were made in the rules for the qualifying events, and a new set of rules was formulated for the National Final.

The programme for 1954 is shown in the Contests Diary. As in previous years, the first three competitors to locate the hidden stations, not having qualified in earlier events, will be eligible to compete in the National Final.

The National Final will be held over ground not within five miles of the centre of any town in which a qualifying event has been held, and the 1950 Council Trophy will be awarded to the winner, provided he is a fully paid-up member of the Society.

Contests Diary

1954

January 16-17 -	"Top Band" (No. 1)‡
January 30-31 -	B.E.R.U.*
February 13-14	Affiliated Societies §
May 2 - - -	D/F Qualifying (Slade/Rugby)
May 9 - - -	144 Mc/s Field Day (No. 1)
May 23 - -	D/F Qualifying (South Manchester)
June 12-13 -	National Field Day†
June 20 - -	D/F Qualifying (High Wycombe/Oxford)
July 3-4 - -	144 Mc/s Open
July 11 - - -	D/F Qualifying (Peterborough)
August 8 - -	D/F Qualifying (Salisbury)
August 15 - -	144 Mc/s Field Day (No. 2)
August 29 - -	D/F Qualifying (Romford/Southend)
September 5 -	Low Power Field Day
September 12 -	D/F National Final
September 12 -	420 Mc/s
October 2-3 -	Low Power
November 13-14	"Top Band" (No. 2)

‡ *For rules, see page 277,* R.S.G.B. BULLETIN, *December, 1953.*

* *For rules, see page 132,* R.S.G.B. BULLETIN, *September, 1953.*

§ *For rules, see page 278,* R.S.G.B. BULLETIN, *December, 1953.*

† *For rules, see page 179,* R.S.G.B. BULLETIN, *October, 1953.*

Rules for D.F. Qualifying Events

1. Qualifying events will be open to members of the R.S.G.B. and of Affiliated Societies, and will be held on Sunday afternoons, commencing at 1400 B.S.T. and concluding at 1630 B.S.T.

2. Transmissions will take place on fixed, published, frequencies in the 1.8 Mc/s band, with not more than 10 watts input, and power will remain constant throughout the event. Identification signals will be given in Morse for the first two minutes of the first transmission, followed by three minutes telephony. Transmissions will be audible at the start and competitors will be permitted to leave at the end of the five-minute period detailed above. Permission to leave will be indicated by the starter raising a white flag. In the event of the signal not being audible at the start, the starter will keep the competitors together, and when the signal is heard will advise the competitors of the latest known conditions. The next sending period will then be substituted for the starting period, at the end of which the starter will raise the white flag.

3. Transmission times :—

1400 to 1402 Morse.
1402 to 1405 Telephony.
1420 to 1420½ Morse.
1420½ to 1424 Telephony.
1435 to 1435½ Morse.
1435½ to 1438 Telephony.
1450 to 1450½ Morse.
1450½ to 1452 Telephony.

Subsequent transmissions, which will be speech modulated, will take place at irregular intervals, but with a minimum continuous transmission of two minutes, and a maximum silent period of 15 minutes at the discretion of the organiser.

4. The aerial will be connected directly to the transmitter without the use of non-radiating feeders. The transmitter will not be operated by remote control.

5. The hidden station will be located at a fixed point at least 50 yards from any inhabited building, and directly accessible to the competitor without entering, crossing, or trespassing upon property in private occupation or passing through a gateway. Organisers will specify an Ordnance Survey Map, New Popular Edition, scale 1 in. to the mile, covering both the starting point and the transmitter location(s), and showing a practicable route between these points.

6. Each competitor must sign-on at the start on the starter's sheet, and will be given a form containing a copy of the rules. The winner of the event will be the competitor whose form is first accepted at the hidden transmitter. ONLY THE COMPETITOR MAY ACTUALLY LOCATE THE TRANSMITTER. Searching for the transmitter by any other member of the competitor's party is strictly forbidden, and may entail disqualification of the party. Competitors arriving at the transmitter shall disperse under the directions of the operator.

7. Only one receiver tuned to the 1.8 Mc/s band shall be carried by any party during the event, and the competitor, at the time of his arrival at the hidden transmitter, must have his receiving apparatus with him and, if required, demonstrate that it is in working order. No transmitting equipment shall be carried during the event, but no objection will be made to the use of frequency measuring equipment. In the event of extra receivers and any transmitter being permanently installed in a competitor's car, they shall be immobilised to the satisfaction of the starter.

8. The Organiser of each event shall act as the starting umpire, and the transmitter operator or his assistant as the finishing umpire. The Organiser shall send a written and signed declaration to the Contests Committee that the event has been run strictly in accordance with the rules. In the case of dispute, the decision of the Council of the R.S.G.B. shall be final.

9. No objection shall be raised to the use of a second transmitter, provided that it be clearly understood that the first competitor whose form is accepted by the transmitter operator (or his assistant) at the first transmitter is the winner (see Rule 6): any transmitter used in addition to the first transmitter shall operate on a frequency at least 10 kc/s removed from that of the first (main) transmitter.

Rules for National Final

1. The National Final will be organised and conducted by the R.S.G.B. Contests Committee, and will be held on Sunday, September 12, 1954, commencing at 1330 B.S.T. and concluding at 1630 B.S.T. (final transmission 1600 B.S.T.).

2. Two transmitters on separate frequencies (separated by at least 10 kc/s) will be used, both on the same fixed scheduled transmissions (i.e. operating simultaneously) until 1422 B.S.T., and both subsequently operating independently. Competitors may locate the stations in either order, and upon arrival at each station will have their form initialled by the transmitter operator or his assistant and will receive a token containing a portion of a National Grid map reference. These taken together will give the location of the Finishing Point, where both tokens and the form must be handed to the official R.S.G.B. umpire. The first competitor whose tokens and form are accepted by the umpire, who will display an R.S.G.B. pennant or similar form of identification, will be the winner.

3. Frequencies will be disclosed to competitors at 1300 B.S.T. The transmitters will commence operating at 1330 B.S.T. and close at 1600 B.S.T., and the official R.S.G.B. umpire will remain at the Finishing Point until 1630 B.S.T.

4. Transmissions will take place on fixed frequencies in the 1.8 Mc/s band, with not more than 10 watts input, and power will remain constant throughout the event. Identification signals will be given in Morse for the first two minutes of the first transmission, followed by three minutes telephony. Transmissions shall be audible at the start, and competitors will be permitted to leave at the end of the five-minute period detailed above. Permission to leave will be indicated by the starter raising a white flag. In the event of either signal not being audible at the start, the starter will keep the competitors together, and when both signals are audible will advise the competitors of the latest known conditions. The next sending period will be substituted for the starting period, at the end of which the starter will raise the white flag.

5. Transmission times :—

1330 to 1332 Morse.
1332 to 1335 Telephony.
1350 to 1350½ Morse.
1350½ to 1354 Telephony.
1405 to 1405½ Morse.
1405½ to 1408 Telephony.
1420 to 1420½ Morse.
1420½ to 1422 Telephony.

Subsequent transmissions will be speech modulated, and will take place at irregular intervals, but with a minimum continuous transmission of two minutes, and a maximum silent period of 15 minutes at the discretion of the organiser.

6. The aerial in each case will be directly connected to the transmitters without the use of non-radiating feeders. The transmitters will not be operated by remote control.

7. The hidden stations will be located at fixed points at least 50 yards from any inhabited building, and, together with the Finishing Point, will be directly accessible to the competitor without entering, crossing or trespassing upon any property in private occupation or passing through a gateway. The Committee will specify an Ordnance Survey Map, New Popular Edition, scale 1 in. to the mile, covering

(Continued on page 329)

Council Proceedings

A Message from the President

AS your President for 1954, may I take this opportunity on behalf of the Council, Headquarters Staff and myself to wish all members of the R.S.G.B. everywhere a Happy and Prosperous New Year.

I should also like to extend warmest good wishes to all I.A.R.U. Societies and their members and to express the hope that during the coming year the bonds between us may be strengthened.

A. O. MILNE,
President.

Résumé of the Proceedings at a Meeting of the Council of the Incorporated Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, November 10th, 1953, at 6 p.m.

Present.—The President (Mr. Leslie Cooper in the Chair), Messrs. I. D. Auchterlonie, H. A. Bartlett, F. Charman, C. H. L. Edwards, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, A. O. Milne, L. E. Newnham, R. Walker, P. W. Winsford and John Clarricoats (General Secretary).

Apology.

An apology for absence was submitted on behalf of Mr. D. A. Findlay.

Membership.

Resolved:—

(a) to elect 41 Corporate Members and 6 Associates;
(b) to grant Corporate Membership to 4 Associates who had applied for transfer.

Application for Affiliation.

Resolved to grant affiliation to the Ravensbourne Amateur Radio Club.

Aberdeen O.R.M.

The Secretary was instructed to thank the Region 12 Representative for a vote of confidence in the Council passed at the recent Aberdeen O.R.M.

Council Ballot.

Arrangements for scrutinising the Council Ballot were approved.

Special Resolution.

It was reported that printed copies of the Special Resolution passed at the Extraordinary General Meeting on October 23rd had been signed by the President and sent to the Society's legal advisers for filing with the Board of Trade.

The Secretary reported that he had, that day, received a letter from the East Ham T.R. in which he criticised Headquarters for not conveying the result of the voting on the Special Resolution to T.R.s and other Representatives by means of a circular. The Secretary explained that a circular outlining the result of the voting was, in fact, sent to all R.R.s on October 26th. It was assumed by Headquarters that the R.R.s would pass on the information to local representatives.

The Region 9 Representative stated that, on receipt of the circular, he arranged for copies to be made and circulated forthwith to local representatives.

Empire DX Certificates.

The Secretary reported that, to date, 88 Empire DX Certificates had been issued whilst another 5 had been reserved for members whose claims had been approved but who were not yet eligible to receive the certificate as they had not completed 3 years' membership. The Secretary also reported that 14 certificates were issued in 1951, 7 in 1952 and 9 to date in 1953. The price of each certificate, hand-drawn on vellum, was £2 12s. 6d.

Resolved to continue the present arrangement whereby Empire DX Certificates are prepared by hand.

The Secretary was instructed to bring to the notice of the Council any undue increase in the number of claims for the Empire DX Certificate. (A prominent firm of printers quoted a figure of £60 for producing 100 Empire DX Certificates similar in design to the present hand-produced certificate. For a quantity of 200, a figure of £64 was quoted.—Ed.).

Society Trophies.

The President read to the meeting correspondence he had received from Mr. H. W. Parker, GW2ADZ. Mr. Parker had complained initially to Mr. W. H. Matthews (in his capacity as Chairman of the Contests Committee) that the Mitchell-Milling Trophy, which he was awarded in connection with the 1952 Two Metre Contest, had been badly packed by Headquarters. Mr. Cooper informed the Council that he had ascertained from Miss Gadsden that the trophy was sent to Mr. Parker securely packed by registered post in the same container and wrapping as used by the Society's silversmiths. He (Mr. Cooper) was fully satisfied that no blame could be or should be attached to Headquarters. Each year, for many years, Miss Gadsden had personally packed and despatched trophies to those members who had not been able to attend the A.G.M. No previous complaint had been received.

The Secretary explained that most of the trophies were despatched in wooden packing cases, but a few, including the one in question, were despatched in stout cardboard containers.

Resolved to have made suitable wooden packing cases for those Society trophies which at present are despatched in cardboard containers.

Cash Account.

Resolved to accept and adopt the Cash Account for October, 1953, as prepared by the Secretary.

Audited Accounts—Report of the Honorary Treasurer.

The Secretary read to the meeting the Report of the Honorary Treasurer.

Subscription Rates.

Resolved:—

(a) that in the case of applications for membership the following annual subscription rates shall become effective as from November 11th, 1953:

Home Corporate Members ..	£1 - 7 - 6
Overseas Corporate Members ..	£1 - 1 - 0
Associates	15 - 0

(b) that the annual subscription rates as set out in (a) above shall apply to all members whose subscriptions are due for renewal on or after December 1st, 1953;
(c) that the Life Composition Fee shall be increased to £20 as from November 11th, 1953.

Membership and Representation Committee.

Resolved to accept, and adopt as a Report, the Minutes of a Meeting of the Membership and Representation Committee held on October 22nd.

The Report dealt with, *inter-alia*, C.R. vacancies; Representation 1954/5; Circular to Representatives; a proposed new publication dealing with the historical development of the Society; reports covering a meeting of Region 9 C.R.s held in Exeter and an O.R.M. held in Edinburgh; T.R. and A.R. vacancies.

A recommendation to offer (when present stocks are exhausted) a cheaper type of members' notepaper was approved.

Exhibition Committee (Home Constructors' Section).

Matters associated with the forthcoming Amateur Radio Exhibition were reported upon by Mr. Edwards.

Contests Committee.

Various matters of detail which had been dealt with by the Contests Committee were reported upon by Mr. Walker.

Convention 1954.

Mr. Bartlett reported upon the progress which had been made to date by the Bristol Convention Committee.

The meeting terminated at 7.50 p.m.

CONTESTS NEWS.—(Continued from page 328)

both transmitter locations, the starting point and the finishing point, and showing practicable routes between these points.

8. Each competitor must sign-on at the starting point on the starter's sheet, and will receive a form containing a copy of the rules. ONLY THE COMPETITOR MAY ACTUALLY LOCATE THE TRANSMITTERS AND THE FINISHING POINT. Searching for the transmitters or the finishing point by any other member of the competitor's party is strictly forbidden, and may entail disqualification of the party. Competitors arriving at the transmitters shall disperse under the directions of the operator, and at the finishing point under the directions of the R.S.G.B. umpire.

9. Only one receiver tuned to the 1.8 Mc/s band shall be carried by any party during the event, and the competitor, at the time of his arrival at each hidden transmitter, must have his receiving apparatus with him and, if required, demonstrate that it is in working order. No transmitting equipment shall be carried, but no objection will be made to the use of frequency measuring equipment. In the event of any extra receivers or any transmitting equipment being permanently installed in a competitor's car, they shall be immobilised to the satisfaction of the starter.

10. In case of any dispute, the decision of the Council of the R.S.G.B. shall be final.

IF YOU PAY YOUR SUBSCRIPTION BY BANKER'S ORDER PLEASE ADVISE YOUR BANK OF THE NEW RATE.

Forthcoming Events

REGION 1

Bury.—February 11, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., The Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.O.M.A.R.S.).—February 3, Broadway House, Douglas.
Lancaster (L. & D.A.R.S.).—February 3, 7.30 p.m., George Hotel, Torrisholme.
Liverpool.—Alternate Saturdays, 3 p.m., Larkhill Mansion House, West Derby, Liverpool.
Manchester (M. & D.R.S.).—February 1, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Rochdale. (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester (S.M.R.C.).—Alternate Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Manchester 14.
Southport.—Thursdays, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—Alternate Tuesdays, 8 p.m., A.T.C. Headquarters, St. Petersgate, Stockport.
Warrington (W. & D.R.S.).—January 19, February 2, 16, 7.30 p.m., King's Head Hotel, Winwick Street, Warrington.
West Cumberland.—February 4, 7 p.m., Kell's Community Centre, Whitehaven.
Wirral (W.A.R.S.).—January 20, February 3, 17, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—January 22, February 12, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—January 19, February 2, 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.—February 10, 7.30 p.m., "Black Bull," Market Place.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull (H. & D.R.S.).—January 26, February 9, "The Rampant Horse," Paisley Street, Hull.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Newcastle-upon-Tyne (N.E.A.T.S.).—February 2, 7.30 p.m., Barras Bridge Hotel, Sandyford Road.
Rotherham. — Wednesdays, 7 p.m., "Cutlers Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—January 27, 8 p.m., "Dog and Partridge," Trippet Lane. February 10, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—January 27, Works Visit; February 10, 7.30 p.m., Temperance Hall, Cleckheaton.
York (Y.A.R.S.).—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—February 5, 7.15 p.m., Stirchley Institute (Room 7). **(M.A.R.S.).**—January 19, 7.15 p.m., Imperial Hotel, Temple Street, Birmingham.
Coventry.—January 22, 7.30 p.m., Priory High School, Wheatley Street.
Kenilworth, Warwick & Leamington.—January 21, 7.30 p.m., Dalehouse Lane.
Malvern.—February 1, 8 p.m., "Foley Arms."
Stourbridge (S. & D.R.S.). — February 2, 8 p.m., King Edward's School.
Wrekin (W.A.R.S.).—Mondays, 8 p.m., Wrekin Service Club, Roseway, Wellington.

REGION 4

Alvaston.—Tuesdays and Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Tuesdays, 7.15 p.m., Derby College of Arts and Crafts, Sub-basement, Green Lane.
Leicester (L.R.S.).—January 18, February 1, 15, 7.30 p.m., Hollybush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—January 20, February 3, 7.30 p.m., Technical College, Cathedral Street.
Loughborough.—January 20, 7.30 p.m., Gt. Central Hotel.
Mansfield (M. & D.A.R.S.).—February 10, 7.30 p.m., Denmans Head Hotel, Market Place, Sutton-in-Ashfield.
Newark.—January 17, 31, February 14, 7 p.m., Northgate House, Northgate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., February 5, 6 p.m., Clubroom, 8 Duke Street.
Nottingham.—January 15, February 19, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—February 3, 7.30 p.m., New Inn, New England, Peterborough.
Retford.—February 1, 7 p.m., Community Centre, Chapel Gate, Retford.

REGION 5

Chelmsford. — February 2, 7.30 p.m., Marconi College, Arbour Lane.
Lowestoft & Beccles.—January 27, February 10, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—February 4, 8 p.m., 128 Prestbury Road.
Gloucester (G.R.C.).—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road.
High Wycombe.—January 26, 7.30 p.m., G5WW, "Nethercote," Totteridge Lane, Totteridge (Junk Sale).
Oxford (O. & D.A.R.S.).—January 27, February 10, 7.30 p.m., The Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m., Signals Club Room, Royal Marine Barracks, Eastney.
Southampton.—February 13, 7.30 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66-68 High Road, Chiswick, W.4.
Barnet.—February 12, 7.30 p.m., Elizabeth Allan School, Wood Street.
Bexleyheath (N.K.R.S.).—January 28, February 11, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—February 5, 8 p.m., "Shortlands Tavern" Station Road, Shortlands.
Chingford.—January 26, February 9, 8 p.m., A.T.C. Hall, Pretoria Road.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
Dulwich & New Cross.—February 2, 7.45 p.m., "Walmer Castle," Peckham High Street, S.E.5. Formation of TVI Committee.
East Ham.—Alternate Tuesdays, 8 p.m., 57 Leigh Road.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.
East London. — January 31, 3 p.m., Town Hall, Ilford. "TVI-proof Transmitter Design," Louis Varney, A.M.I.E.E. (G5RV).
Guildford & Woking.—January 24, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Harlow (H. & D.R.S.).—January 26, February 9, 8 p.m., 6 High Street, Harlow. January 19, February 2, 8 p.m., Harlow War Memorial Institute.
Hayes & Uxbridge.—January 25, February 8, 7.30 p.m., Hillingdon Primary School, Uxbridge Road.
Hendon & Edgware (E. & D.R.S.).—Wednesdays, 8 p.m., 22 Goodmans Avenue, Mill Hill, N.W.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Rd., Ilford.
Kingston.—Alternate Wednesdays, Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
Norwood.—January 16, 7.30 p.m., Windermere House, Weston Street, Crystal Palace. "Aerials," G4ZU.
Sutton & Cheam (S. & C.R.S.).—January 19, February 16, "The Harrow," Cheam Village, Surrey.
Welwyn Garden City.—February 2, 8 p.m., Council Offices, "Aerials Queries Answered," J. A. Hutton.

REGION 8

Brighton.—T.R. at home, Wednesdays, 7.30 p.m., 27 Warren Avenue, Woodingdean. **(B.D.R.C.).**—Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road.
Chatham (M.A.R.T.S.).—January 18, February 1, 15, 7.30 p.m., Troy Town School for Boys, King Street, Rochester.
Hastings (H. & D.R.C.).—January 26, February 9, 23, 7.30 p.m., Saxons Cafe, Denmark Place.
Isle of Thanet (I.O.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.
Maidstone (M.K.A.R.S.).—Tuesdays, 7.30 p.m., Elms School, London Road.
Worthing (W. & D.R.C.).—February 8, 8 p.m., Adult Education Centre, Worthing.

REGION 9

Bristol.—January 22, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.
Exeter.—February 5, 7 p.m., Y.M.C.A., St. David's Hill.
North Devon.—February 4, 7.30 p.m., Rose of Torridge Cafe, The Quay, Bideford.
Penzance.—February 4, "Railway Hotel."
Plymouth.—January 16, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.
Torquay.—January 16, 7.30 p.m., Y.M.C.A., Castle Road.
West Cornwall (W.C.R.C.).—January 21, February 4, "Fifteen Balls," Penryn, near Falmouth.
Weston-super-Mare.—February 2, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Rd.

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Regional and Club News

BRISTOL.—At the December meeting H. W. Shipton (B.R.S. 10762) described the "Electroscope" which has been designed at the Burden Neurological Institute for studying the electrical activity of the brain. A ballot for the award of the G5FS Memorial Trophy will be held at the meeting on January 22. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bristol 7.

CAMBRIDGE UNIVERSITY WIRELESS SOCIETY.—A lecture on "Television Transmitting Equipment" will be given by V. J. Cooper, B.Sc.(Eng.), in the Maxwell Lecture Theatre on January 25. *Hon. Secretary:* R. C. Marshall, B4, New Court, St. John's College, Cambridge.

CHELTENHAM.—At the January meeting members were due to discuss R.A.E.N., as well as Gloucestershire's inconvenient position in Region 6, made more difficult by the detachment of Bristol. Consideration was also due to be given to a solution of the problem offered by the C.R.

CHESTER & DISTRICT AMATEUR RADIO SOCIETY.—Morse practices and lectures in preparation for the R.A.E. take place on the first and third Tuesdays of each month at Club Headquarters (Tarran Hut, Y.M.C.A.). The Club station, G3GIZ, is active on Tuesday evenings on Top Band and 3.5 Mc/s. *Hon. Secretary:* A. N. Richardson (B.R.S. 19678), 23 St. Mary's Road, Dodleston, near Chester.

COVENTRY.—Members who visited the Sutton Goldfield Television station on December 19 discussed technical matters with the engineer who conducted the party round. Thanks are recorded to W. R. Worden (G8PJ) who, on leaving the city, generously donated his equipment to the Group.

COVENTRY AMATEUR RADIO SOCIETY. — W. Grimbaldeston (G6WH) will talk on "Aerials for Long Waves" on February 1 at 9 Queen's Road, Coventry. *Hon. Secretary:* K. Lynes (G3FOH), 58 Shorncliffe Road, Coventry.

DERBY.—Plans for N.F.D. will be discussed on January 29 commencing at 7.30 p.m., in the sub-basement of Derby College of Art, Green Lane, Derby. All local members are invited to attend. *Town Representative:* F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby.

DORSET HAMFEST.—About 35 members, including small contingents from Bournemouth and Exeter, attended the Third Annual Dorset Hamfest, held at the Junction Hotel, Dorchester, on November 29. Guest of honour was R.R. and Council Member Herb. Bartlett (G5QA), who was warmly welcomed by the C.R. The proceedings at the business meeting, at which Mr. Bartlett spoke on matters of topical interest, were recorded on tape by G3CWZ. Highlights of the programme were a radio message received from G2HKJ, who was airborne over India at the time, visits to the B.B.C. and G.P.O. stations, a sale conducted by G3MT, and films loaned by Shell Mex and B.P.

DORSET HAMFEST

A highly successful hamfest took place in Dorchester on November 29, 1953. In this picture, the Region 9 Representative (Herb. Bartlett, G5QA) is third and the Dorset C.R. (Charles Biggs, G2TZ) fourth from the left at the back. The Devon C.R. (Tom Smith, G3EFY) is fourth from the right in the same line.

GLOUCESTERSHIRE.—A County Dinner and social evening will be held at the Mercers' Hall, Gloucester, on Thursday, February 4, 1954. Assemble 7.30 p.m. Tickets, price 10/6 each, can be obtained from the Gloucestershire C.R. (B. L. Horton, G3CBH, 27 Haven Avenue, Bridgend, Stonehouse, Glos.). Members and friends from within and without the county will be warmly welcome.

HASLEMERE.—G2AYA, G3BAK and G3CBO ran an Amateur Radio stand at the recent Rotary Club Hobbies Exhibition. Great interest was aroused by the display of equipment which included receivers, transmitters (operating under the call-sign G2AYA/A), tape recorders and a high fidelity demonstration using a Williamson amplifier.

LANCASTER & DISTRICT AMATEUR RADIO SOCIETY.—During an informal "Christmas Dinner," held at the Elms Hotel, Morecambe, on December 14, the Chairman (A. L. Thwaites) expressed the hope that the event would become an annual function. Those present much enjoyed a talk by Mr. O. Ellefsen, director of a local electrical manufacturing firm, who spoke of the early days of wireless. *Hon. Secretary:* A. O. Ellefsen, 10 Seymour Avenue, Heysham, Lancs.

LEICESTER RADIO SOCIETY.—At the A.G.M., the following officers were elected: *President:* L. Ridgeway (G2RI); *Chairman:* R. Frisby (G2CFC); *Hon. Treasurer:* D. Hoff (G3AVM); *Hon. Secretary:* N. Wibberley (21 Pauline Avenue, Belgrave, Leicester). M. Storey (G4BB) and C. L. Wright (G3CCA) were re-elected *Contests Officer* and *Publicity Officer* respectively. After the official business, a talk was given on the Radio Amateur Emergency Network.

MID-KENT RADIO SOCIETY.—Meetings are now held on Tuesdays at 7.30 p.m. in the Elms School, London Road, Maidstone.

NORWOOD & DISTRICT.—There was a good attendance at the December meeting, when a "Junk Sale" took place. On January 16 at 7.30 p.m., G. A. Bird (G4ZU) will talk on "Aerials." All local members are invited to attend.

TORBAY AMATEUR RADIO SOCIETY. — The "lecturettes" on aerials given by G2GM, G3AVF and G3GDW at the December meeting proved to be of so much interest that they will be continued on January 16. G2GK is forming a local group of the Radio Amateur Emergency Network.

WOLVERHAMPTON AMATEUR RADIO SOCIETY.—The Society has moved to new Headquarters at Stockwell End, Tettenhall, Wolverhampton, where its station (G8TA) is being installed. Meetings alternate with Morse classes on Monday evenings. *Hon. Secretary:* H. Porter (G2YM), "Applegarth," 221 Park Lane, Wolverhampton.

Regional and Club News

Contributions to this feature should be topical, concise, and typed—using double spacing—and sent to reach Headquarters by not later than the **20th** *of the month preceding publication.*
Items for inclusion in "Forthcoming Events" should be sent to reach Regional Representatives not later than the **18th** *of the month preceding publication.*

N.F.D. is coming!

Only about 90 Groups have nominated Town Representatives.

Is YOUR town without a Representative.

If so, act NOW!

FORTHCOMING EVENTS.—(Continued from page 330).

REGION 10

Cardiff.—February 8, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.

Neath & Port Talbot.—February 10, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline.—Mondays & Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.

Edinburgh (L.R.S.).—January 21, February 4, 18, 7.30 p.m., 25 Charlotte Square, Edinburgh.

REGION 14

Falkirk.—January 29, February 12, 7.30 p.m., Temperance Cafe, High Street.

That "Miniature Top Band Transmitter" Again

DEAR SIR,—With reference to the comments published in the November BULLETIN, I would like to endorse the remarks of G3FHL, G3FRN and G3CWC. Furthermore, I would like to advise younger members of the Society that Mr. Barlow's statement about "erroneous conclusions" must not be taken seriously. Please do not throw your copy of *Terman's Radio Handbook* and other well known theoretical works upon the fire.

I would like to challenge the last paragraph of Mr. Barlow's letter with the following comments. There are many obvious reasons why the transmitter cannot "work perfectly." I will repeat some of them.

(1) The correct bias for the microphone input stage is 8 to 10 volts. This necessitates a 1,500 ohm cathode resistor. Assuming it is intended to use one of the cheap G.P.O. telephone microphones its nominal resistance is of the order of 400 ohms. Of course, this will fluctuate when excited but the V3B will obviously not function as a linear amplifier. The stage gain of V3B is 14, the peak-to-peak input to V3A grid will, therefore, be of the order of 12 volts!

(2) The correct bias to enable V3B to operate as a Class A amplifier is 8 to 10 volts *d.c.* R7 will limit grid current in this stage, the resulting effect being d.c. restoration of the modulating waveform. Assuming a 250 volt h.t. supply, the screen of V2 will be swung between the limits of 50 and 150 volts and the modulating envelope will be severely clipped during positive half cycle excursions.

(3) The flash lamp tuning indicator will consume 60% of the transmitter output if the line is matched at 80 ohms. It would be better to put this lamp in series with the line. C10 carries the full p.a. circulating current and so it will need qualification as a stacked or silver mica condenser.

(4) The practise of directly keying an oscillator is to be deprecated, particularly when not using a stabilised h.t. supply. It will certainly give rise to key clicks and frequency pulling.

(5) The use of similar r.f. chokes in a single stage of an oscillator (V1) will lead to unstable operation. RFC.2 should be replaced by a 47,000 ohm resistor.

(6) Reference to the valve data sheets will show that current requirements necessitate R6, R9 and R10 to be at least 1 watt rating.

(7) The use of a QS.70/20 stabiliser as suggested in shunt with the oscillator h.t. supply is not permissible because the maximum rating will be exceeded. (The values of R4 and R2 will need altering.)

Finally, I do not understand the last sentence of Mr. Barlow's letter. What on earth has plate and screen modulation got to do with microphone sensitivity?

Yours faithfully,
F. R. ELLORY (G3CUI).

Hillingdon, Middlesex.

DEAR SIR,—My most heartiest congratulations to G3CVO for his brave answer to the critics of his Clamp Modulator used in the "Miniature Top Band Transmitter" (October issue). He appears to be one of the few people who really understand the action of a clamp valve modulator. I can verify from experience his statement that the modulator described in the September, 1952, issue of *S.W.M.* does work. This particular example used n.f.b., and, correctly adjusted, gave results comparable with plate and screen modulation, at least as far as quality was concerned. When I first put my version of this modulator on the air, a series of very careful checks with the local net were made but all agreed that the speech quality was good (yes—even excellent), and no splatter was present. I might add that all the stations giving these reports reside within two miles of my QTH, one only 300 yards away. I worked some 200 stations on 3.5 Mc/s 'phone with this modulator and not once received a poor speech report.

We are fully aware that, on paper, clamp valve modulation is not an ideal system, but the whole point is that it *can* be made to work quite satisfactorily once the action of the valve under signal and no-signal conditions has been grasped. G3CVO has given the correct explanation of its action, and I strongly advise his critics to ponder deeply on his words. I am in absolute agreement with him when he says that only a small amount of positive peak-clipping takes place and that negative clipping will also be present if the valve is driven too hard. The distortion of the positive speech peaks can be easily reduced by use of n.f.b., as I have already pointed out, and no negative clipping should be allowed to take place.

The proof of the pudding is in the eating, gentlemen.

Yours faithfully,
F. H. IRVINE (G3GKE).

Farnborough, Hants.

DEAR SIR,—With the kind permission of G3CVO, I would like to point out that linear modulation is achieved only when the carrier peak input at the most positive excursion is four times that of the idle carrier. In anode and screen modulation both anode voltage and anode current double their static value, but with screen modulation alone, the anode voltage does not alter. It is imperative, therefore, that the anode current be *four times* the static value.

This implies a square law $Vg2/Ia$ characteristic which G3CVO has provided. A further implication is that the average 100% modulated power input is double that for the idle carrier. Objectors to the facts may care to ponder "Where does the sideband power come from?"

Yours faithfully,
B. J. P. HOWLETT (G3JAM).

Woodford Green, Essex.

DEAR SIR,—I see that once more a torrent of technically unjustified criticism has descended on the Editor, the Technical Committee and the author, in connection with Clamp Modulation. It is a pity some of these critics cannot credit people other than themselves with sufficient theoretical knowledge and practical ability to be able to judge whether or not a system of modulation produces undesirable splatter.

It is said that a learned professor once proved from theoretical considerations that a heavier-than-air flying machine is impossible. A few years later, two brothers by the name of Wright, proved he was wrong in the most direct way possible—they built one which flew.

After these critics have built a transmitter to Mr. Barlow's design, and have made some measurements of the amounts of spurious sideband components produced by the system of modulation, they will no doubt be in a position to decide whether or not they are in the same category as the learned professor. Until then, I suggest they are talking through their hats.

Yours faithfully,
ALAN G. DUNN (G3PL).

Hull, Yorks.

DEAR SIR,—Any non-linearity in the audio-signal chain in a transmitter will cause adjacent-channel splatter, unless special precautions are taken. Mr. Barlow's reply in the November BULLETIN says: "Only the very peaks of positive half-cycles are clipped." Clipping is a well-known form of non-linearity. No special measures are taken to reduce this non-linear behaviour.

Once I had a rig very similar to Mr. Barlow's. It covered about 60 kc/s completely. On two metres this would not have been prohibitive. But I used it on 80 and 40—and got excellent reports from everybody, except the locals. No BCI, no TVI! But I rebuilt it, and when I am on the air not even the nearest local is forced to listen to me.

Yours faithfully,
J. A. KLIFFEN (PA0KC).

Zaandam.

Single Sideband Techniques

DEAR SIR,—May I join issue with Mr. Humphreys, G13EVU, (Single Sideband Technique, R.S.G.B. BULLETIN, November, 1953) and Mr. May, G2BB (Letter to Editor, R.S.G.B. BULLETIN, December, 1953) on the subject of modulation?

While disagreeing with some of their arguments, I, too, believe that s.s.s.c., by virtue of the reduced bandwidth requirement, has a great future. However, I deeply regret that some of the protagonists of the system make claims which are unsound technically.

Some years ago, claims were made that frequency modulation eliminates ignition interference, produces improved quality and economises transmitter power. Figures were published to prove that a watt of carrier, frequency modulated, was capable of results equal to ten, twenty or even fifty watts of carrier with amplitude modulation. Alas, practical results belied the (unsound) arithmetic. Published accounts of work by the B.B.C. and by services in the "communication" field show conclusively the advantages of f.m. in certain cases. The advantages, however, are not of the same order as some of the claims.

Now similar claims are being made with respect to s.s.s.c. May I make the plea that accounts of the system should not be allowed to exaggerate its undoubted merits?

Assuming sine-wave modulation, I cannot agree with Mr. Humphreys' suggestion that the *peak* sideband power of a 150 watt transmitter of 70% efficiency, with 100% modulation, is only 26.25 watts. Nor can I agree when Mr. May says that the sideband power would be 105 watts. The *average* sideband power will, in fact, be 52.5 watts, or exactly half the carrier power.

Mr. May continues to say that 105 watts of carrier requires 105 watts of modulator output to produce 100% modulation.

This will be true if, and only if, the p.a. efficiency is 50%. Surely, the problem with which a modulator is faced is to modulate the *input* power to the amplifier. (Restricting the discussion to the anode modulation case, and neglecting such examples as f.m. and efficiency modulation systems.) The fact that the output is modulated linearly is due to the fortunate property of a Class C amplifier that its output power is proportional to the input power, as the anode voltage is varied. Thus, irrespective of efficiency, an amplifier of 150 watts input requires a modulator of 75 watts output to produce 100% modulation. The sideband power will be equal to half the carrier power. Thus, in the hypothetical case of 100% efficiency, the output will consist of 150 watts of carrier and 75 watts of sideband power; or, in the case of 70% efficiency, the output will be 105 watts of carrier and 52.5 watts of sideband power.

Mr. Humphreys states that, in the case of s.s.s.c., " the p.a. may be operated at a peak input of 150 watts of sideband signal, giving an output of 100 watts of intelligence carrying r.f." and claims that " compared with the a.m. transmitter, this represents a really worth-while improvement."

Presumably, this improvement is calculated relative to the 26.25 watts already discussed. As shown above, this claimed value of 6db improvement is reduced, by half, to 3 db.

Mr. Humphreys has quoted, presumably as typical, efficiencies of 70% for the a.m. Class C amplifier, and 66.6% for the amplifier in the s.s.s.c. case. He does not mention that, in the latter case, a linear amplifier is necessary to avoid distortion. According to Terman, typical efficiencies are 60-80% in the a.m. Class C case, and only 50-65% in the linear case at full output.

Finally, I should be glad if Mr. May would enlarge upon his claim that " the communication efficiency of s.s.b. R/T under conditions of difficult reception is greater than c.w. . . "

I would have thought that the c.w. receiver has merely to detect the presence or absence of a signal, whereas the s.s.b. receiver has to reproduce variations in the signal. If one cannot detect whether the signal is there or not I fail to see how its *variations* can be detected.

Yours faithfully,
T. LYELL HERDMAN (G6HD).

Beckenham, Kent.

The State of Amateur Radio
G2HW asks G2JG Some Questions

DEAR SIR,—I was quite puzzled by G2JG's letter in the December BULLETIN until I appreciated that (a) no one would despair of TVI without having first ensured that his transmitter was harmonic free—in which case 95 per cent. of the trouble would be cured, and (b) no one would close down because of i.f. breakthrough when a receiver has only one i.f.—and we have six bands in the normal short wave spectrum available to us. Having realised that G2JG was writing with his tongue in his cheek it occurred to me that, favourably situated though he is in a strong signal area with a fairly typical concentration of TV receivers in the neighbourhood, if he could be persuaded to write in a more serious vein he could no doubt provide some interesting statistics which might serve to relieve the minds of the few members who might take his letters seriously.

Assuming that he is using a harmonic free transmitter (the power input is relatively unimportant) could he tell us:

(1) How many receivers have been cured by fitting high pass filters supplied from stock by the manufacturer of the receiver?

(2) How many receivers have been cured by high pass filters constructed by himself because the manufacturers could not or would not supply their own? In the case of such home constructed filters was the manufacturer informed of the details of each case?

(3) In how many cases was it necessary to call in assistance from the G.P.O. engineers before a complainant could be persuaded to fit a filter?

(4) In how many cases was it necessary for the manufacturer to partially rebuild the receiver before a cure was effected?

(5) What is the total number of receivers that have been affected by his transmitter?

(6) Are there *any* receivers in his neighbourhood which have failed to respond to the routine methods adopted nowadays in the case of receiver TVI?

Yours faithfully,
HARRY WHALLEY (G2HW)

Sale, Cheshire.

DEAR SIR,—Your correspondent John E. Hodgkins (G3EJF) has adequately expressed my own reaction to recent pessimism regarding the State of Amateur Radio and I warm to his sentiments as he is obviously a c.w. disciple.

No doubt things do get hard at times for the " 80-metre phone " men but it keeps them on their operating toes and helps to make some of the drivel unintelligible.

Yours faithfully,
J. WORTHINGTON (G3COI).

Birmingham.

V.H.F. Band Planning

DEAR SIR,—With reference to the Editorial comments published in November on v.h.f. band planning may I ask what is "unfair" in an amateur station, operating 2 metres, moving his frequency to obtain a DX contact, or any other contact for that matter? Let us not lose sight of the fact that the plan was adopted, reputedly, to assist in searching a relatively large portion of the radio spectrum when compared with the lower frequency bands.

Are we always to be " rock bound " on 2 or are we to progress as in the case of l.f. bands? I agree that those bands are now a " shambles " but not in the main due to amateur activities. If it is necessary in order to have a "well ordered 144-146 Mc/s Spectrum," that stations be confined to a particular portion of that spectrum dependent upon where the operator resides at the time, then logically the condition should be extended to *all* bands and the licence modified to enforce it. Which I think would be repugnant to all.

Yours faithfully,
J. BRADBURN (G3AUR)

Wroughton, Wilts.

More " High Angle Propagation " Wanted

DEAR SIR,—I cannot let Mr. Farrar's letter (in the November issue) pass without saying how much I disagree with him regarding Mr. Sollom's most interesting article on " High Angle Propagation " in the October issue. I am not one of the one per cent. who can understand the article fully but I have read it and learnt a great deal. I shall go back to it again and shall discuss it with others who are more mathematical than I am. I may even get further along my own favourite line of amateur interest than Mr. Farrar along his.

Radiation at high angles concerns all local skip working and if we are to improve our methods where horizontally directive beams do not help, an understanding of wave angle is of first importance and deserves thorough treatment in the BULLETIN.

Yours faithfully,
J. GOODACRE (G6GO)

Ashby Parva, Rugby.

DEAR SIR,—Mr. Farrar's reaction to the article " High Angle Propagation " surprised me. His guess that only 1 per cent. of the readers would be interested in this matter allows me to conclude the following: (i) I met with a lot of British hams. By a strange coincidence all of them seem to fall in the 1 per cent. class; (ii) I happen to fall in the same class; (iii) If the articles in the BULLETIN would have fitted Mr. Farrar's 99 per cent. for the past 30 years, I think they would not surpass the " A Revolutionary New Spark Gap " and " A Home-made Electrolytic Detector " level.

Yours faithfully,
J. A. KLIFFEN (PA0KC).

Zaandam.

More About De-Humidifiers

DEAR SIR,—G3CGH is under a misapprehension in his letter, published on page 184 of the October issue. If he burns paraffin in his shack in an attempt to improve atmospheric conditions he will:

(a) remove valuable oxygen from the air and add carbon-dioxide,

(b) add water vapour to the air, which may later condense on cool equipment.

For every gallon of paraffin burned, about a gallon of water vapour is thrown off into the air. The cones on the heater he mentions are probably for de-humidifying the products of combustion—and *not* the shack! The drying of the air comes from raising the temperature and with a rise of even 10°F, the air can contain a lot more moisture without damage to equipment, *provided* the equipment is warm and is *kept* warm. The only protection for equipment housed in "outdoor" shacks is additional warmth—even on summer days whenever the relative humidity of the outside air is over 70 per cent. Keeping the equipment warmer than the surrounding air by even a few degrees, say 6°F, can be most effective.

Electrical warming is, of course, the best. If paraffin heaters *have* to be used, look-out for the products of combustion, for the sake of the operator and the equipment! Ventilate the shack well. Humidistats are useful instruments to check upon the atmospheric conditions but they are expensive if they are to be reliable.

Yours faithfully,
JOHN PIGGOTT (G2PT)

Northwood, Middx.

The R.S.G.B. Year Book

DEAR SIR,—I should like heartily to endorse the letter written by Mr. Allan Herridge (G3IDG) in the November issue of the BULLETIN.

We have just had considerable controversy over the financial affairs of the Society and after managing to cull a few more hard earned shillings from the members we are about to squander the additional revenue on a Year Book.

I, being overseas, would like a Year Book, but would willingly pay for it and the postage as well, and so would anyone else who really wants such a book.

My suggestion is to publish a Year Book but before so doing obtain firm orders WITH CASH from members who want it. In this way there will be no wastage.

Yours sincerely,
F. HAGUE (ZB1AH),
Life Member.

Sliema, Malta.

New Books

RADIO ENGINEERING. By E. K. Sandeman, Ph.D., B.Sc., A.C.G.I., M.I.E.E. Volume 1 (2nd Edition). 779 pages, fully illustrated. Page size 8½in. x 5½in. Published by Chapman & Hall, Ltd. Price 60/-.

The origin of this book was an instruction manual written primarily for maintenance engineers at B.B.C. transmitting stations. It was designed so that newcomers with no knowledge of radio technique could acquire familiarity with working principles in the shortest possible time. Subsequently it was extended so as to constitute a book of reference for experimental engineers. How well the author succeeded can be judged by the fact that this, the second, edition follows only a few years after the book was first published.

There are 16 full-length chapters including a new one to this edition on Transmission Line Filters.

Some idea of the scope of the book—which should be in every Public Library—can be seen from the contents section which lists some 500 separate entries.

* * *

LOW FREQUENCY AMPLIFICATION. By Dr. N. A. J. Voorhoeve. 510 pages, 479 illustrations. Page size 9in. x 6in. Published by Philips, Eindhoven, Netherlands. English distributors, Cleaver-Hume Press, Ltd., London, W.1. Price 50/-.

This book, the latest in the Philips Technical Library series, deals comprehensively with the varied applications of audio-frequency amplification. The volume, which is illustrated with a large number of diagrams and photographs, contains 17 chapters ranging from a detailed consideration of the principles of low frequency amplification to lengthy discussions on such subjects as feed back, matching, control and limiting. There is an extensive section devoted to a description of the electrical components used in l.f. equipment. Input sources, reproducers, radio relay systems and measurements on sound systems are all dealt with in a most satisfying manner. Particular importance is paid to the theory of sound and to the principles guiding the assembly of large installations.

A wealth of practical data, partly in tabulated form, is included. Finely produced, the book fully conforms to the usual high standard set by the publishers.

* * *

BATTERY CHARGERS & CHARGING. By Robert A. Harvey, B.Sc.(Eng.), A.M.I.E.E. 400 pages. 283 illustrations. Page size 8¼in. x 5¼in. Published by Iliffe & Sons, Ltd. Price 35/-.

There has been steady progress in the design of storage batteries over the last twenty-five years, but during this same period there have been fundamental changes in the methods used for battery charging and control. This book describes these new methods as well as the older methods still in current use, and shows how battery control problems have been solved in many industries.

The construction and chemistry of each type of storage battery is first explained, and there is a description of the fundamental principles of charging, together with much general information on charging technique. The book then describes how the principles are used in various specialised applications. These include electric vehicles and locomotives, emergency lighting and power systems, power stations, telephone exchanges, mines, ships, aircraft, railways, trolley buses, cars and commercial vehicles, and generating plant for country houses and other isolated buildings. Home chargers for car and radio batteries, and charging arrangements for commercial garages and radio and electrical shops, are dealt with in a special chapter. Reference and design data are given in appendices.

Throughout the book, the diagrams are simplified as far as possible, the intention being to make clear the basic principles used in each case rather than to go into unnecessary detail.

The book will be of interest to all concerned with the installation, operation and maintenance of battery charging systems in any field, and particularly to engineers considering new or unfamiliar applications.

* * *

DATA & CIRCUITS OF TELEVISION RECEIVING VALVES. By J. Jager. 226 pages, 226 illustrations. Page size 9in. x 6in. Published by Philips, Eindhoven, Netherlands. English distributors, Cleaver-Hume Press, Ltd., London, W.1. Price 21/-.

This book, another in the famous Philips Technical Library series, deals with a wide range of television receiving valves. The treatment given to the EF80 is typical. After a full description, its application (with appropriate circuit diagrams) as an i.f. amplifier, r.f. amplifier, frequency changer and video amplifier is then dealt with exhaustively. Technical data is followed by a number of characteristic curves. The treatment given to this one valve alone occupies 21 pages.

OSRAM VALVE GUIDE. Part 2. Published by The General Electric Co., Ltd., of England. Price 10/-.

This manual—which runs to 217 pages of tabulated matter—deals with transmitting and industrial valves of all types. Full characteristics, operating data and curves are given for power-amplifying, modulating and rectifying valves. Valves described include types applicable to a.f., r.f., v.h.f. and u.h.f., bands up to 9500 Mc/s and for power outputs up to 400 kW.

* * *

RADIO & TELEVISION READERS' GUIDE, New Series No. 22. 20 pages. Pocket format. Obtainable from the Publications Secretary, County Library, County Hall, Hertford. Price 10d. a copy plus 2d. postage.

This guide to books on radio and television is one of a new series of select bibliographies being published by the County Libraries Section of the Library Association. Many hundreds of titles are listed covering a wide range of subjects allied with radio and television. The books are listed in sections and in addition to the author's name, each entry gives the name of the publisher, year the current edition was published, and the price.

A most valuable little *vade mecum* for all who read radio and television books for profit or pleasure.

Representation

County Representatives

Mr. Guy Moser (G3HMR), 6 Hodge How, Windermere, who has recently filled the office of Area Representative for Westmorland, has been appointed County Representative for Westmorland (Region 1).

Mr. Cliff Metcalfe (G3DQ), Carr Farm, Flamborough, has been appointed C.R. for East Yorkshire (Region 2), and Mr. A. E. Clipstone (G8DZ), 71 Melton Road, West Bridgford, Nottingham, C.R. for Nottinghamshire (Region 4).

Vacancies still exist, however, in a number of counties as shown in the list published in the November, 1953, issue of the BULLETIN (Page 239). Members in the counties concerned are again invited to submit nominations *via* their respective Regional Representative for the various vacancies.

Town Representatives

The following are additions to the list published in the December, 1953 issue :

Region 1—Cumberland
West Cumberland Area
H. S. Roberts (G3HSI), 93 High Road, Arrowthwaite, Whitehaven.
Lancashire
Barrow-in-Furness
J. G. Jackson (G3HQU), 40 James Street.
Crosby
F. W. Clasby (B.R.S. 20073), 78 Selby Road, Orrell Park, Liverpool 9.
North-West Manchester
L. G. Cratchley (G3IXC), 18 Duckworth Road, Prestwich.
Southport and Formby
N. Horrocks (G2CUZ), 32 Sandbrook Road, Ainsdale, Southport.
Region 2—Yorkshire West
Leeds
E. Batty (G3DGB), 12 Beamsley Mound, Leeds 6.
Northumberland
Hexham
J. G. Wardhaugh (G4LA), 20 Hallgates.
Newcastle-on-Tyne
R. G. Jack (G3BKE), 4 Windfall Way, Newcastle-on-Tyne 3.
Region 3—Warwickshire
South Birmingham
A. T. Eley (G3GHB), 31 Franklin Road, Bourneville, Birmingham 30.
Region 4—Nottinghamshire
Nottingham
B. Shortland (G3DJL), 58 Bracebridge Drive, Bilborough.
Region 7—London South
Coulsdon
L. C. B. Blanchard (B.R.S. 3003), 122 St. Andrew's Road.
Region 9—Dorset
Dorchester
K. O'Brien (B.R.S. 18516), 18 St. Helen's Road.
Region 12—Aberdeenshire
Aberdeen
G. Jamieson (GM3HTL), 93 Craigton Road, Mannofield.
Kincardineshire
Stonehaven
J. Carr (GM3AXR), Uras, Dunottar.

Change of Address

The address of the Region 6 Representative, Mr. H. G. Hunt (G3ECV), is now 101 Brownhill Road, Millbrook, Southampton.

Correction

The address of the Chelmsford Town Representative, Mr. P. J. Naish (G3EIX), is 39 Yarwood Road, and not 39 Yarwood Close.

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1S5	8/6	6CD6	11/6	6X5gt	7/6	215SG	5/-	KT66	10/6
1T4	8/6	6CH6	9/-	7C7	7/6	846Z4	7/6	KTZ41	7/6
1625	4/6	6F6	8/6	7D8	8/-	807	12/6	KTW61	7/6
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2C34	4/6	6H6	3/6	8D2	3/-	1626	4/-	PEN46	8/-
2V3g	3/6	6J5	6/6	10F9	7/6	1632	7/6	PEN220A	
3D6	2/3	6J6	10/-	12AT7	10/6	A915	5/-		5/-
3S4	8/6	6J7	9/-	12BA6	8/6	D1	2/6	RK34	3/6
4D1	3/-	6K6	7/6	12BE6	8/6	EI148	3/-	S130	5/-
5R4g	12/6	6K7gt	6/6	12J5	5/-	EA50		SP41	3/-
5U4g	9/-	6K7g	6/6	12K7	12/6	3 for	5/-	SP61	3/6
5Y3	10/-	6K8m	10/6	12SC7	6/-	EB91	9/6	VR116	3/6
5Z4	10/-	3K8g	10/6	12SG7	5/-	ECC32	10/6	V39A	10/6
6AB7	6/6	6L6g	10/6	12SH7	5/-	EF36	6/-	VU111	3/6
6AC7	10/-	6Q7	10/6	12SJ7	6/-	EF39	6/6	VU120A	3/6
6AT6	8/6	6SA7	9/6	12SK7	8/-	EF50	5/6	VU133	3/6
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(Continued on page 340.)

EXCHANGE & MART SECTION

(*Continued from page 339.*)

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Printed in Great Britain for the Inc. Radio Society of Great Britain, New Ruskin House, Little Russell St., London, W.C.1. by the South London Press, Ltd., London Rd., S.E.1, and Streatham, S.W.16.