

R.S.G.B.

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

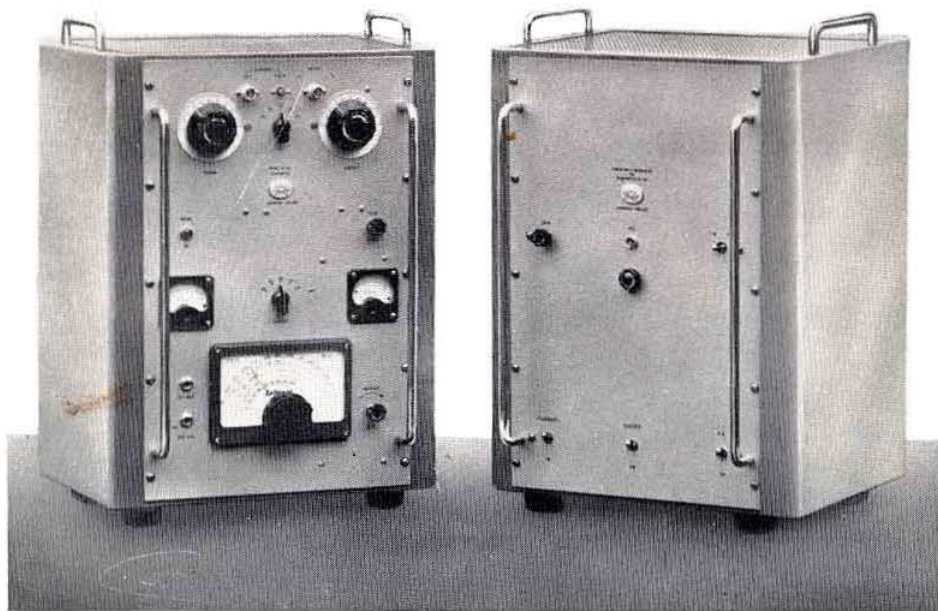
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Vol. 32 No. 7

JANUARY, 1957

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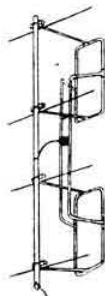
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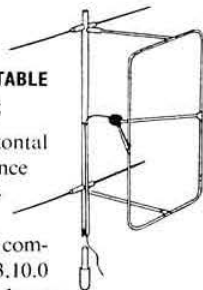
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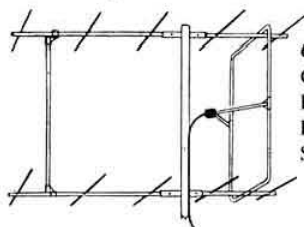
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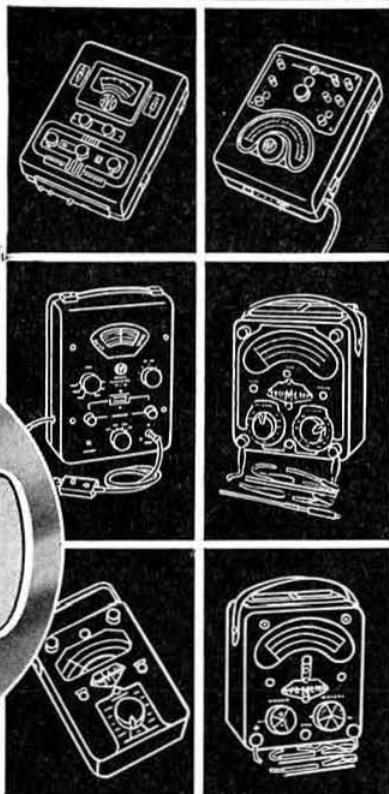
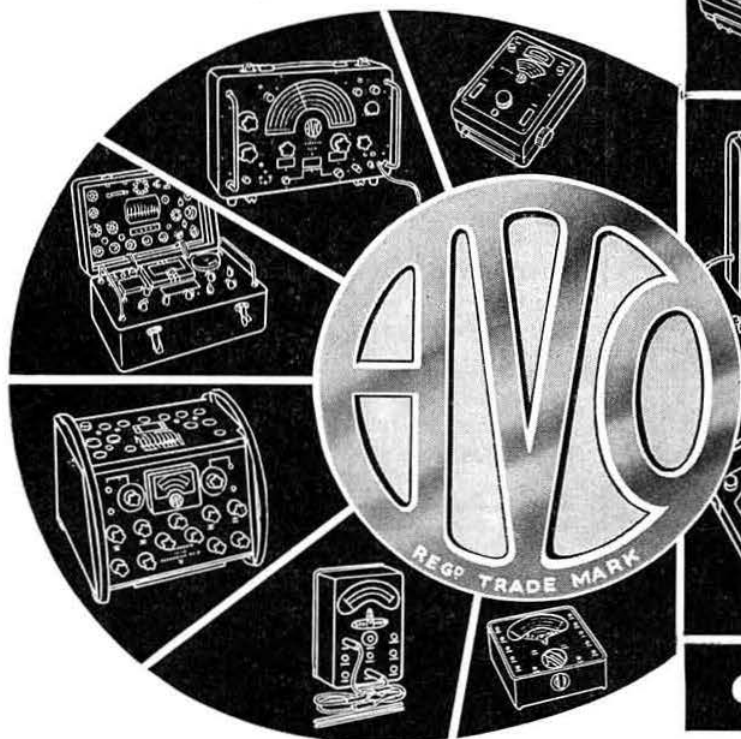
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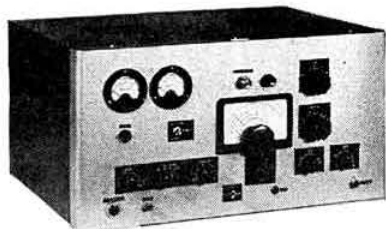
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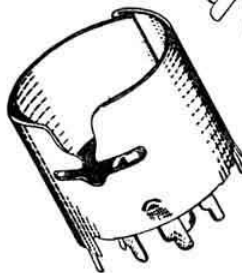


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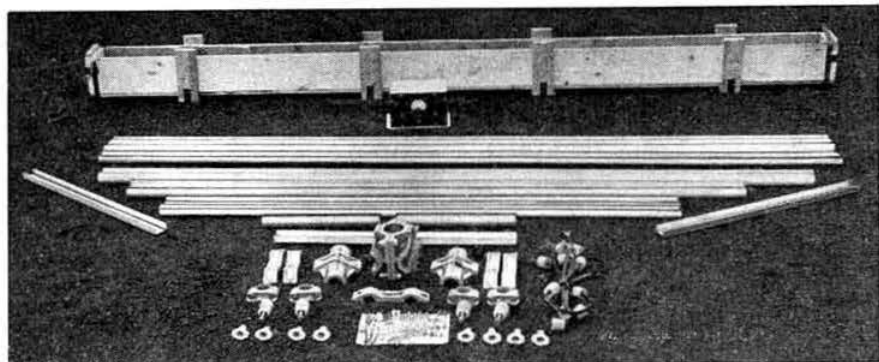
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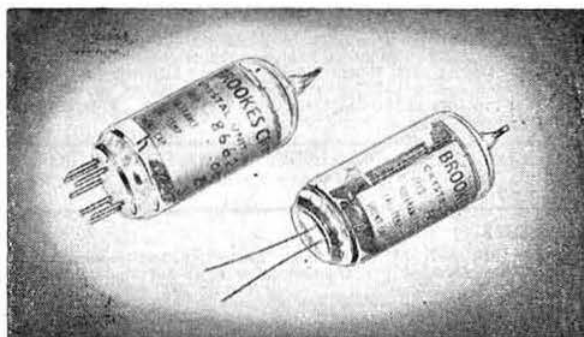
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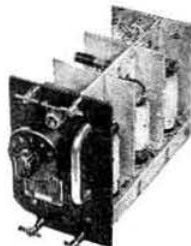
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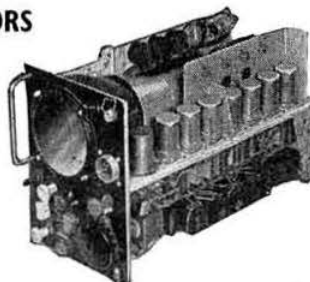
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R.S.G.B. BULLETIN

Devoted to the Science and Advancement of Amateur Radio

Vol 32, No. 7

January, 1957

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ASSISTANT EDITOR: JOHN A. ROUSE, G2AHL

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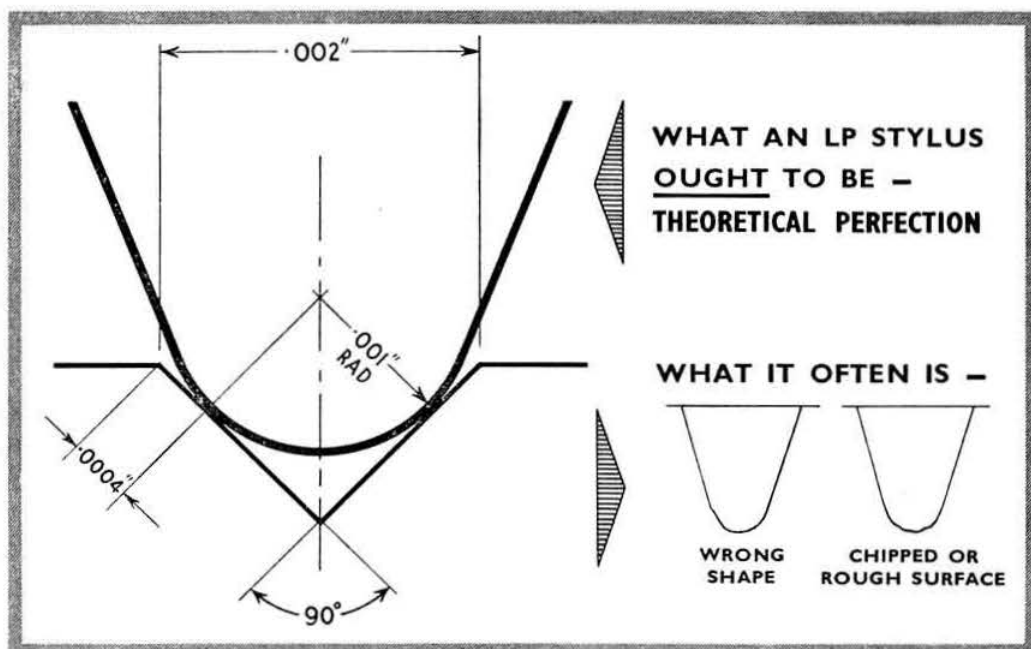
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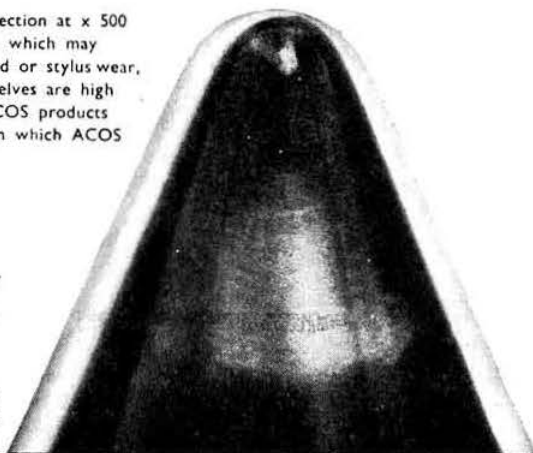
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Current Comment

Annual General Meeting—1: Another Low Poll

WHEN in the calendar of the average town group or affiliated society the words "Annual General Meeting" appear, this is the sign for most members to stay away, either because they think the proceedings will be boring or lest they should be appointed to office!

It is quite true that Annual General Meetings of most bodies, radio or otherwise, are rather dull affairs, mainly on account of the fact that all that is called for is the disposal of formal business. While this is the accepted statutory procedure at this Society's A.G.M. every December, nearly always the meeting enjoys its informal half hour when members are able to ask and have answered any questions of importance which may interest them—not part of the strictly statutory proceedings but a useful safety valve, nevertheless.

Uppermost in the minds of members who attended the A.G.M. last month, must have been a feeling of regret that, once again, the poll in the ballot for Council members was so low. Ill-disposed persons will no doubt cheerfully jump upon this phenomenon as showing an alleged apathy in the affairs of the Society and indeed so far as Amateur Radio "politics" are concerned (and this is how many members regard elections and so forth) there is no doubt a certain amount of apathy. Construction, communication and consort with men of like mind is, after all, the main purpose of Amateur Radio to most of us.

Perhaps at the end of the present year more intense publicity turned on to the subject of the Council ballot may produce a better poll.

What is interesting about last month's poll is that all four nominees of the retiring Council have been returned as members for 1957, which is something that has not happened for a long time. Whether the same result would have occurred if the poll had been larger, no one can say. It is to be hoped that on the occasion of the next ballot, 11 months hence, there will be a higher poll than at the last one.

Annual General Meeting—2: Award of Trophies

A PLEASANT feature of each Annual General Meeting is the presentation of the Society's trophies and shields to groups and individuals who have performed good work during the past 12 months.

The Society's trophies fall into two broad cate-

gories; those awarded for success in contest operation, and those which are granted in recognition of meritorious work done either in a technical capacity or "for the good of the cause."

Many members who have wondered how a selection is made in the latter category may like to know that this is a matter which engages the close attention of the Council for some weeks towards the end of each year. To be sure that every award shall be fair and meritorious, the assistance of the Society's local representatives is sought so that if any outstanding work should be going on unheralded or unsung, then its existence, possibly quite unknown to those in London, may be brought to light.

Insofar as the Norman Keith Adams and Bevan Swift Memorial Prizes are concerned the Council's Technical Committee assists each year by making recommendations to the Governing Body to ensure that the Prizes are awarded strictly in accordance with the rules.—J.H.

"Itwa"

NO, our title is not a slightly misprinted version of a very famous radio feature of yesteryear; it means "it's that wall-paper again." It is intended to act as a gimmick to get members thinking once again upon that "wall-paper" subject of *safety*—by which is meant immunity from electrocution in the radio amateur's station.

In commenting upon this subject some time back we made the point that "safety in the shack" tends to be taken very much for granted, rather like the paper gracing the walls of it. We make no apologies for reiterating once again that while familiarity breeds contempt, death is permanent, nor do we make any apology for trotting out these two platitudes which have been uttered time and again on this—literally—vital subject.

Prominence is given this month to a revised set of safety recommendations for the guidance of radio amateurs and to an article on the treatment of electric shock written by a well known radio amateur who is a physician by profession. The newcomer as well as oldtimer would do well to read both contributions carefully and then to see that they are understood by at least one other member of his—or her—household.

Let it be remembered, as we remarked in our previous "Current Comment," on the subject that that wall-paper can be hot!—J.H.

A Single Sideband Exciter for 144 Mc/s

By B. J. ROGERS (G3IL)*

Single sideband is already well established as a most effective means of communication on the high frequency amateur bands and the number of operators using the system is rising rapidly. So far, however, little use has been made of s.s.b. on v.h.f., probably due to the lack of constructional information. In fact, this article is believed to be the first to give a practical description of how to build a single sideband exciter for the 2 metre band. It is sure to be read with great interest by v.h.f. workers throughout the world.

THE merits and theoretical considerations of the s.s.b. system have been discussed at great length in Amateur Radio journals and it is not proposed to take that aspect further here, except to comment on the problem, if any, of receiving s.s.b. on v.h.f.

In order to decide this point the writer tried receiving standard A3 144 Mc/s signals under s.s.b. conditions. The carrier and one sideband were rejected by a selective bandpass i.f. system and a locally generated carrier (the b.f.o.) inserted to recover the audio component of the single sideband signal. Using a standard crystal controlled converter, the stability was determined by the tunable oscillator in the main receiver rather than by the crystal oscillator in the converter. Recently a number of 2m operators have reported no trouble in receiving s.s.b. signals using self-excited local oscillators. Reception of s.s.b. on 144 Mc/s is thus no more difficult than on lower frequencies.

Initial Experiments

The first consideration in the design of the s.s.b. transmitter is whether it shall be the filter or phasing type. Since filters must work on a somewhat low frequency, usually between 300 and 500 kc/s, conversion to 144 Mc/s would involve a number of mixers. Such a chain of mixers would tend to give rise to an immense number of unwanted products. Bearing this in mind first thoughts

were directed towards producing an s.s.b. signal directly on 144 Mc/s by the phasing method. This consisted of two balanced modulators, the r.f. and audio supplies to which differed in phase by 90°. Initially the r.f. phase shifting device seemed to offer little difficulty, a quarter wave of transmission line being the natural choice. The first pair of balanced modulators constructed along these lines using small triodes was not a success, however: adjustments were indefinite and the output was at best microscopic.

The second design was similar in concept but used 832s in an attempt to obtain greater output. This was more promising, since it did produce an s.s.b. signal but as before, the adjustments were subject to rapid drift. The output was indeed greater than before but, as the efficiency of balanced modulators is inherently low, it was still small. Amplification of the signal proved disastrous, in that tuning the following stages upset adjustments to the balanced modulators, resulting in an ever increasing spiral of adjustments and readjustments.

After these failures the writer pulled himself up sharply while contemplating further balanced modulators using four 4X150s or perhaps 4X500s! A new approach was certainly due. It was clear that s.s.b. signals must be generated on a lower frequency and then persuaded to "come quietly." The previously considered objections to mixing would be removed if the number of conversions were limited and arranged in such a way that it would be possible to predict the whereabouts of the unwanted products. It would then be just a matter of reducing them to an insignificant level. The final design is such that all possibly troublesome "fellow travellers" occur on the actual operating frequency; being so grouped together steps can be taken to ensure their harmlessness.

The R.F. Stages

The s.s.b. signal is generated on 16 Mc/s by phasing and converted first to 48 Mc/s and then to 144 Mc/s. Reference to the block diagram (Fig. 1) illustrates how all the requisite frequencies are obtained from a single 8 Mc/s crystal. Its output is multiplied first by two, then by two again and finally by three, giving respectively 16, 32 and 96 Mc/s. The multipliers are coupled by

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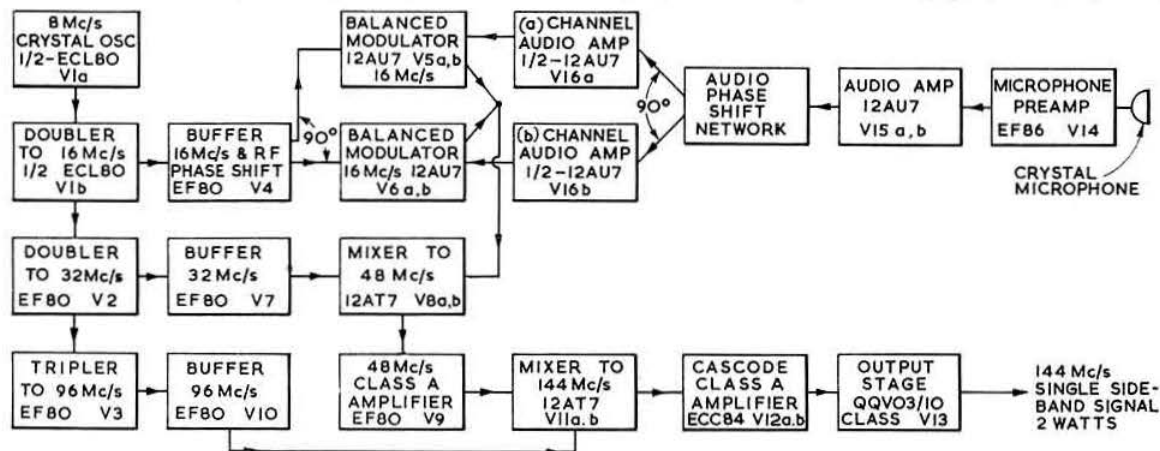


Fig. 1. Block diagram of the 144 Mc/s s.s.b. exciter.

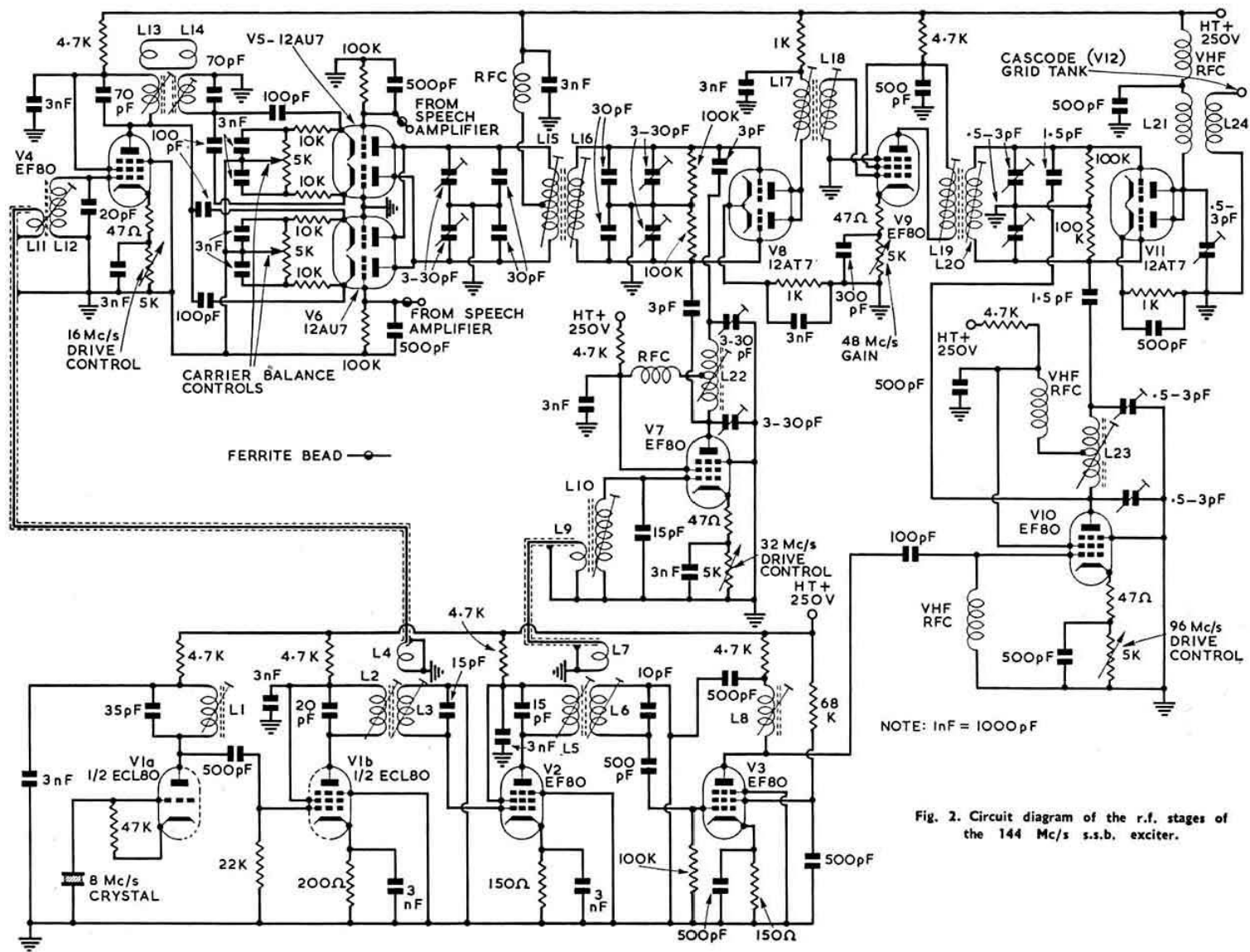


Fig. 2. Circuit diagram of the r.f. stages of the 144 Mc/s s.s.b. exciter.

double tuned transformers and operated under such conditions that a minimum amount of unwanted higher harmonics are produced. The multipliers are loosely coupled to class A buffer amplifiers to provide an easy means of varying each output and to further attenuate undesired frequencies.

The anode of the 16 Mc/s buffer (V4) consists of two link coupled tuned circuits (L13 and L14), one tuned slightly l.f. and the other slightly h.f. of resonance. These tank circuits provide the r.f. drives differing in phase by 90° for the balanced modulators (V5a, b, V6a, b) that generate the primary s.s.b. signal.

The balanced modulator circuit employed is one used and suggested by G3GKA in which the r.f. is applied to the cathodes and the audio to the grids. It has been found stable and reliable but there is no reason why one of the many other balanced modulator arrangements should not be used provided it will perform satisfactorily at a frequency as high as 16 Mc/s. The circuit in use has the advantage of being able to apply r.f. and audio signals to separate electrodes, while still maintaining the stability of adjustment of triodes.

The s.s.b. signal generated on 16 Mc/s is applied to the first mixer (V8a, b) together with the 32 Mc/s multiple of the crystal frequency. This mixer is of the push-push

Audio Stages

The audio stages (Fig. 4) of the exciter follow normal s.s.b. practice, which entails limiting the frequency response so that only frequencies within the operating range of the audio phase shift network are passed. This is achieved by using small cathode bypass and coupling capacitors and by shunting suitable capacitors across the anode load resistors. The only other precaution is that the amplifiers following the audio phase shift network shall not disturb the phase relationships of the two channels. To this end negative feedback is provided by unbypassed cathode resistors and the decoupling of the anode load resistors by large capacitors to ensure that the anode supply impedance is low.

Sideband switching is accomplished by transposing the audio inputs to the balanced modulator. Phase and amplitude modulation are produced by applying audio to one balanced modulator only. A.m. will result if the modulated stage is unbalanced and p.m. if the other is allowed to supply the carrier.

Construction

Considerable flexibility is possible in the mechanical layout provided normal precautions are taken. In the case of the writer's equipment the entire exciter is built on a chassis 16in. x 9in. The cascade and QQV03/10 stages are both enclosed in brass boxes with feed through decoupling capacitors, screens being placed across the valveholders to shield input from output.

All tuning inductors are wound on standard Alladin 0.3 in. screened formers except the last two stages in which the coils are self supporting

To save space, decoupling chokes in h.t. and heater leads have been replaced by ferrite beads. These beads have also been placed strategically on leads in the audio stages and are very effective in preventing the ingress of stray r.f. To prevent undesirable radiation all

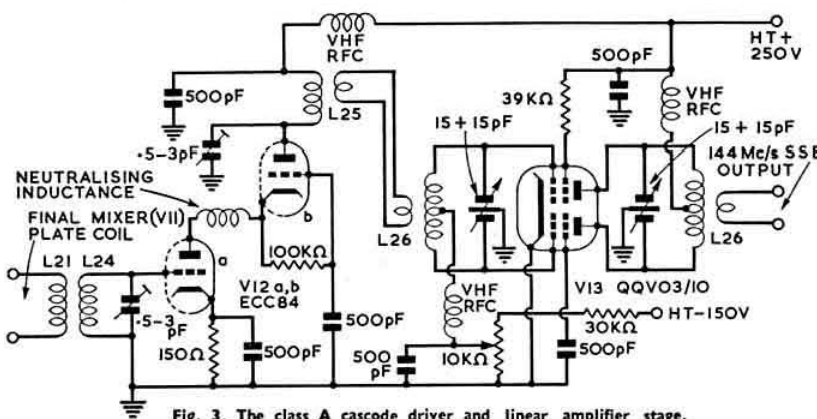


Fig. 3. The class A cascode driver and linear amplifier stage.

type, the only unusual feature being the provision of adjustments for balancing both the input signal and the heterodyning voltage to ensure that neither input nor their odd harmonics appear in the anode circuit. This is very necessary as the output is tuned to three times the input frequency.

The resulting s.s.b. signal on 48 Mc/s is amplified by a single class A stage to provide means of varying the level of the signal and further attenuate unwanted frequencies. The amplified 48 Mc/s s.s.b. signal is then applied together with the 96 Mc/s multiple of the crystal frequency to a second mixer (V11a, b), identical with the first except in frequency, giving output on 144 Mc/s. This signal is only at an amplitude of a few volts and requires considerable amplification to raise it to a usable level. In order that the equipment be manageable it is important that the first stages of amplification shall have both stability and high gain. Early efforts were more noteworthy for their capability to produce sounds associated with faulty plumbing rather than stable amplification. The final design (Fig. 3) uses an ECC84 (V12a, b) cascode class A stage; it is quite stable and provides sufficient drive for the following stage, a QQV03/10 (V13) which raises the power output to about 2 watts.

heater and h.t. leads have been screened. The only other important feature of the layout is that no stray 16 Mc/s r.f. should be allowed to reach the first mixer except by way of the balanced modulators. If it does, carrier balance may be impossible or very critical.

Alignment

It might be thought that the adjustment of a device using 22 interdependent tuned circuits would be involved and laborious but if attacked systematically it offers no great problem. The following sequence is suggested. First the crystal oscillator is adjusted, followed by the frequency multipliers, checking that they are on the correct frequencies—8, 16, 32 and 96 Mc/s. Next the grid circuit of the 16 Mc/s buffer is resonated and the two tuned circuits in the anode adjusted to give the 90° phase difference, the anode circuit first being tuned "on the nose" and then adjusted towards the l.f. side until the r.f. voltage drops to 70 per cent of the peak value. The same procedure is used for the other tank circuit except it is tuned to the 70 per cent point on the h.f. side of resonance.

The trimmers in the anode circuit of the balanced modulators are set to approximately half capacitance

each and the core adjusted to tune to 16 Mc/s. The 16 Mc/s signal is now tuned in on the receiver and the carrier balance controls adjusted for minimum carrier. The trimmers in the anode circuit are then adjusted in opposite directions for any improvement in carrier suppression, the core afterwards being readjusted for resonance. A tone of, say, 1 kc/s. is then injected into the

oscilloscope, adjustments then being as easy as at low frequencies.

Results

Driving an 832 linear amplifier this exciter has now been in use for some time and many stations worked. The writer would like to thank all operators who have

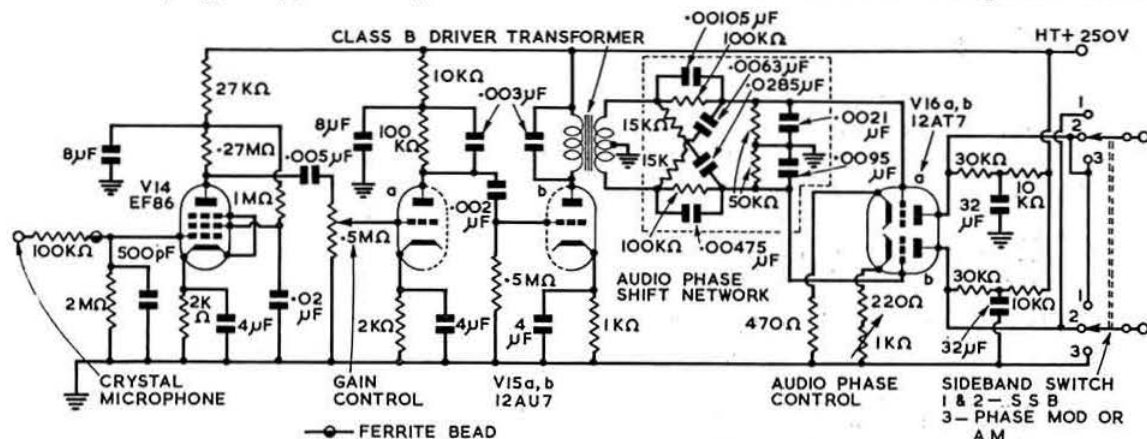


Fig. 4. The audio stages and audio phase shift network.

audio amplifier and with the aid of the b.f.o. the two sidebands and residual carrier (if audible) will be easily distinguished. By operating the sideband switch the weaker of the two can be recognised and the audio balance control adjusted for greatest attenuation. Final adjustments can now be made to the h.f. phase shifting tuned circuits for any improvement in sideband suppression.

Next, the trimmers in the grids of the first mixer are set to about half capacitance and the grid tank circuit tuned to 16 Mc/s with the core. Inserting plenty of carrier, the anode circuit is tuned to 48 Mc/s and the grid trimmers adjusted in opposite directions; when the grid circuit is balanced the 48 Mc/s harmonic will vanish. The grid circuit of the 32 Mc/s buffer is then tuned. The anode circuit trimmers are set to about half capacitance and the circuit resonated with the core. The mixer anode circuit is temporarily tuned to 32 Mc/s by clipping an adjustable capacitor across the coil. The buffer anode can now be adjusted for balance as indicated by minimum output in the mixer anode circuit. The temporary capacitor can then be removed from the mixer output. Next the 48 Mc/s amplifier is tuned by means of the cores. The second mixer to 144 Mc/s and the 96 Mc/s buffer are tuned and balanced in exactly the same manner as the 48 Mc/s and 32 Mc/s stages.

The grid and anode circuits of the cascode stage are checked for resonance with a grid dip meter. No improvement in stability was obtained by neutralising the cascode amplifier.

After inserting a tone in the audio amplifier, the cathode resistors in the 16, 32 and 96 Mc/s buffers are adjusted for maximum output. In order to set bias and coupling between the amplifier stages it is necessary to observe the envelope of a two tone test signal on an oscilloscope. This is by no means easy at 144 Mc/s as few simple oscilloscopes operate well at so high a frequency. A solution was proposed by G3FZL that works perfectly. A small amount of the signal is picked up by a loop placed near the last tuned circuit and converted to a frequency of 10 Mc/s in a normal frequency converter. After two stages of amplification it is displayed on the

helped with constructive reports, in particular G3FZL and G2RD.

Finally it must be gratefully acknowledged that without the encouragement of G3CCH, PA0KC and DL6WL this equipment could never have been completed.

COIL TABLE

Wound on standard Aladdin 0.3in. dust-cored screened
formers

- L1 ... 50 turns 36 s.w.g. enam.
L2 ... 35 turns 36 s.w.g. enam.
L3 ... 30 turns 36 s.w.g. enam. spaced $\frac{1}{2}$ in. between L2 and L3.
L4 ... 3 turns 26 s.w.g. enam. at 'cold' end of L3.
L5 ... 14 turns 26 s.w.g. enam.
L6 ... 14 turns 26 s.w.g. enam. spaced $\frac{1}{2}$ in. between L5 and L6.
L7 ... 2 turns 26 s.w.g. enam. at 'cold' end of L6.
L8 ... $3\frac{1}{2}$ turns 26 s.w.g. enam. $\frac{1}{2}$ in. long.
L9 ... 2 turns 26 s.w.g. at 'cold' end of L10.
L10 ... 14 turns 26 s.w.g. enam.
L11 ... 3 turns 26 s.w.g. enam. at 'cold' end of L12.
L12 ... 30 turns 36 s.w.g. enam.
L13 ... 25 turns 36 s.w.g. enam. tapped at 12 $\frac{1}{2}$ turns.
L15 ... 28 turns 36 s.w.g. enam. spaced $\frac{1}{2}$ in. between L15 and L16.
L17 ... 11 turns 26 s.w.g. enam.
L18 ... 9 turns 26 s.w.g. enam. spaced $\frac{1}{2}$ in. between L17 and L18.
L19 ... 11 turns 26 s.w.g. enam.
L20 ... 11 turns 26 s.w.g. enam. spaced $\frac{1}{2}$ in. between L19 and L20.
L22 ... 14 turns 26 s.w.g. enam. tapped at 7 turns.
L23 ... $4\frac{1}{2}$ turns 26 s.w.g. enam. $\frac{1}{2}$ in. long tapped at 2 $\frac{1}{2}$ turns.

Wound on $\frac{1}{2}$ in. formers with combination brass and iron
dust core

- L13 and L14 ... 12 turns 26 s.w.g. enam. $\frac{3}{16}$ in. long coupled by 2 turn link at 'cold' end.
- Self supporting**
- L21 ... 3 turns 18 s.w.g. silver plated $\frac{3}{16}$ diam. $\frac{1}{16}$ in. long.
- L24, 25 ... 4 turns 20 s.w.g. silver plated $\frac{3}{16}$ in. diam. $\frac{1}{16}$ in. long (L24 spaced $\frac{1}{16}$ in. from L21).
- L26 ... Same as L24 but with tap at 2 turns (L25 and L26 are coupled by a two turn link).
- L27 ... 5 turns 18 s.w.g. silver plated $\frac{3}{16}$ in. diam. tapped at 2 $\frac{1}{2}$ turns.

Speech Clipping and Volume Compression

Part 1—Increasing the Effective Level of Modulation

By G. L. BENBOW, M.Sc., A.M.I.E.E. (ex-G3HB)*

BEFORE considering speech clipping and volume compression in detail, it is necessary to examine further some of the implications of radio telephony which were discussed in the first article of this series in the R.S.G.B. BULLETIN, January 1956.

Overmodulation, or the breaking up of the carrier wave by excess audio output from the modulator, gives rise to appreciable harmonic distortion and the production of spurious sidebands which may be as much as 20 to 30 kc/s wide. Thus the total bandwidth occupied by an over-modulated transmission can be as much as 60 kc/s. While this excessive bandwidth may not be apparent to a distant listener who might receive it as a badly distorted signal of little more than normal bandwidth (*i.e.*, the familiar "spitch"), it can cause extreme inconvenience to stations in the immediate vicinity. These spurious sidebands, which only occur on the peaks of modulation, may be received at appreciable signal strengths at stations within a radius of a few miles or so. This form of interference, or "splatter" as it is usually known, obviously prevents the reception of weak signals nearer than 20 or 30 kc/s to an over-modulated transmission.

For intelligible communication by speech, it is not necessary to transmit audio frequencies above about 3000 c/s. Hence the total bandwidth of an a.m. communications transmitter need not exceed 6 kc/s. This is a very important point, which perhaps is not appreciated as much as it should be. With the possible exception of the v.h.f. and u.h.f. bands, there is, quite literally, not the room in the overcrowded amateur bands of today for telephony transmissions which occupy a bandwidth greater than that really necessary for intelligible communication.

Although a pure sine wave and a speech waveform may have the same peak value, due to the peaky nature of the speech waveform, the average value of the latter is lower than that of a sine wave. This is shown in Fig. 1 where (a) represents a pure sine wave having just sufficient amplitude to modulate a given transmitter to a depth of 100 per cent. (b) is a typical speech waveform, also with just sufficient amplitude to give 100 per cent modulation on peaks. In the latter case, if the audio level is conscientiously adjusted to give 100 per cent modulation on peaks which may not occur very often, the average modulation depth will be much less than 100 per cent, probably of the order of 30 per cent. If the audio level is increased in order to increase the average modulation depth, then overmodulation will obviously occur on the peaks.

Speech Clipping

The process of speech clipping consists simply of clipping or limiting the audio level at the value corresponding to 100 per cent modulation and at the same time increasing the audio level, as shown in Fig. 1 (c). Thus overmodulation is prevented and the average level of modulation is increased.

This process obviously cannot be continued too far, otherwise the speech waveform loses the characteristics required for amplitude modulation, namely variation of amplitude. It is also obvious from Fig. 1 (c) that speech clipping will introduce distortion due to the squaring

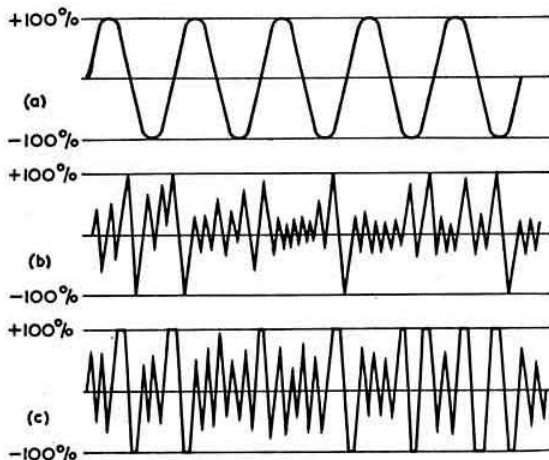


Fig. 1. The process of speech clipping. (a) Pure sine wave modulating a transmitter to a depth of 100 per cent. (b) Typical speech waveform with low average intensity and high peaks. (c) The same waveform after higher amplification but with speech peaks limited at a level corresponding to 100 per cent. modulation.

of the individual peaks. The high frequency components resulting from the clipping action produce distortion and an unnecessarily wide bandwidth, so they must be filtered out. Any speech clipping system must therefore be followed by a low pass filter to confine the audio bandwidth to the required 3 kc/s. Even if speech clipping is not used, such a filter is a very worth while addition to any telephony transmitter.

In Fig. 1 (c) both positive and negative peaks are clipped. This is by no means essential, but is preferable from some points of view. Either peak may be clipped (asymmetrical clipping) provided that the phasing of the audio chain is adjusted so that the unclipped peak drives the carrier upwards. Asymmetrical clipping results in the displacement of the speech waveform about its zero line. Normal interval couplings adjust themselves to give equal areas above and below the zero line and so asymmetrical clipping will upset this equality causing a momentary shift in the zero axis. It is advisable to make all succeeding coupling condensers small enough to allow rapid restoration of the natural zero position.

It is quite possible for this momentary displacement of the zero axis at a.c. couplings to cause the clipping level to be exceeded and therefore overmodulation may occur in spite of the speech clipping action. This effect can also occur in the case of symmetrical clipping as a result of the asymmetrical character of the speech waveform. It may be obviated by ensuring that there are the least possible number of couplings after the clipper stage, *i.e.*, the clipper should be as late as possible in the audio chain.

Speech clipping may be achieved by two methods: "high-level" clipping and "low-level" clipping. "High-level" clipping, as its name suggests is carried out between the modulator and the modulated r.f. stage, whilst "low-level" clipping takes place at some point in the speech amplifier chain. Filtering may also take

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place at high or low level, but of course, the filter must always follow the clipper. High-level clipping and filtering have the disadvantage that the necessary components must be of a correspondingly higher rating, but on the other hand a filter between the modulation transformer and r.f. amplifier takes account of distortion in the whole a.f. chain from input to modulation transformer. A combination of high and low level filtering, with the low-level filter providing most of the attenuation is the best arrangement.

As the action of clipping or filtering commences, there will be an abrupt change in the impedance presented to the previous stage. This is generally of little significance at low level, but may cause damage to the modulation transformer or modulator values in the case of high level clipping or filtering. However, such damage is likely to be caused in any case by severe over-modulation.

Volume Compression

A volume compressor is an automatic gain control circuit which reduces the gain of an audio amplifier when the audio level is high and conversely increases the gain when the level is low. The volume range is therefore reduced.

Such a device is commonly used in sound recording and also for increasing the average depth of modulation in commercial radio telephony but its application to Amateur Radio does not appear to be as common as speech clipping.

A volume compressor circuit may be adjusted to prevent overmodulation and, while it may not necessarily be as effective as a properly designed and adjusted speech clipper and filter system, it is simpler in that a low pass filter is not necessary.

Speech Clipping Circuits

Peak limiting of speech waveforms is a similar operation to the limiting of impulsive interference by the noise limiter of the modern communications receiver. The circuits employed are very similar and consist of a series or shunt arrangement of diodes suitably biased to give the desired clipping level. A typical low level asymmetrical series clipper is shown in Fig. 2. If the

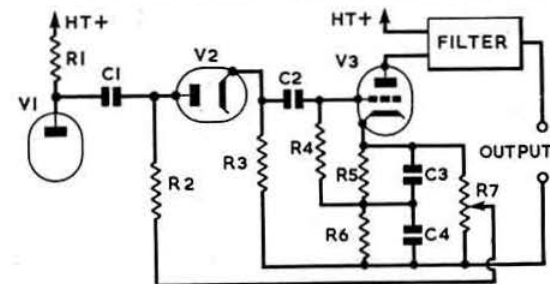


Fig. 2. Low level asymmetrical series clipper. C1, 2, 0.05 μ F; C2, 4, 25 μ F; R1, 47K ohms; R2, 3, 2.2 Megohms; R3, 1 Megohm; R4, 5, 6, cathode resistor for V3; R5, 100K ohms; V1, previous a.f. stage, V2, 6H6 or 6AL5 etc.; V3, following stage.

anode of V2 is held at say +5 volts by means of R7 then signals up to 5 volts peak will be passed on unchanged, but all negative going signals of more than 5 volts peak will cause the diode to become non-conducting, hence they will be clipped. The corresponding shunt diode clipper is shown in Fig. 3. In this case the diode is normally non conducting, but it conducts when positive signals on the anode exceed the positive bias on the cathode and so peaks which exceed this value are bypassed by the diode. An interesting arrangement, due to P. F. Cundy (G2MQ) which avoids the use of

an extra diode is shown in Fig. 4. The grid bias on the valve may be varied between 0V and -4.5V by means of R4. At -4.5V the operation of the stage is normal. On reducing the bias, a point is reached where positive going peaks drive the valve into grid current, but a positive excursion of the grid potential is prevented by the flow of grid current through R1 and R2. If the subsequent phasing and gain is correct, this can also prevent downward modulation of the carrier.

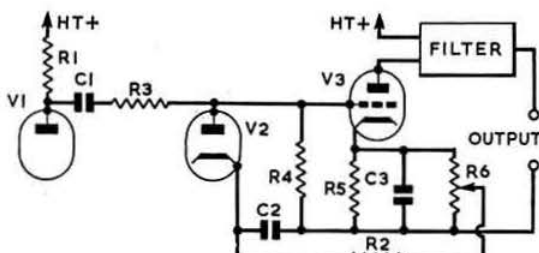


Fig. 3. Low level asymmetrical shunt clipper. Component values as in Fig. 2.

The corresponding symmetrical series and shunt clipping circuits are shown in Figs. 5 and 6. The series circuit includes an extra pair of diodes to equalize the load on the previous stage. As either series diode stops conducting and in effect disconnects the following stage, its partner conducts and presents an equivalent dummy load.

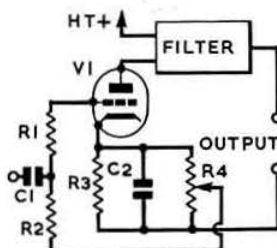


Fig. 4. Low level shunt clipper without clipping diode. C1, 0.002 μ F; C2, 25 μ F; R1, 100K ohms; R2, 220K ohms; R3, bias resistor for V1; R4, 100K ohms; V1, 6L3, 6J5, etc.

The diodes in low level clipping circuits may be double diodes of the 6H6 or 6AL5 (or equivalent) class or alternatively miniature metal rectifiers such as the Westinghouse type WX2 or S.T.C. "Sentercel" type H5 may be used. These have two advantages,

- No heater power is required and a more compact layout is possible;
- There is consequently no risk of hum being introduced into the clipper stage from the heater circuit.

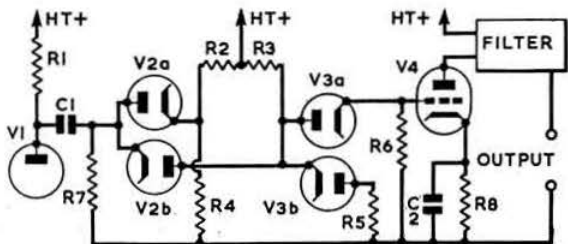


Fig. 5. Low level symmetrical series clipper with constant loading of previous stage. C1, 0.05 μ F; C2, 25 μ F; R1, 47K ohms; R2, 3, 4, 5, 6, 220K ohms; R7, 100K ohms; R8, bias resistor for V4; V1, previous stage; V2, 3, 6H6, etc.; V4, following stage.

The necessary operating bias for the clipper valves is most conveniently obtained from taps on the cathode bias resistor of the following stage.

The "sharpness" of the clipping action depends on the characteristics of the diode used. Thermionic diodes, providing that the input is large enough, give almost perfect limiting, i.e., the clipped peaks are "flat topped."

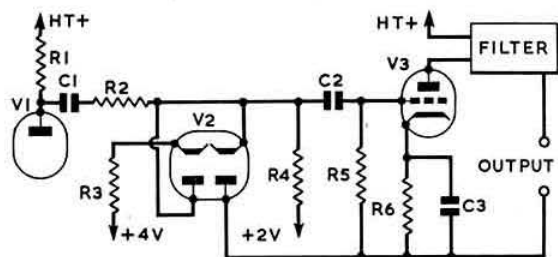


Fig. 6. Low level symmetrical shunt clipper. C1, 2, 0.01 μ F; C3, 25 μ F; R1, 47K ohms; R2, 3, 4, 100K ohms; R5, 1 Megohm; R6, bias resistor for V3; V1, previous stage; V2, 6H6, etc.; V3, following stage.

In the case of the smaller metal rectifiers, such as the copper-oxide instrument type, the limiting action is not so good, and the output waveform resembles a "compressed" signal rather than a limited one. This is not necessarily a condition to be avoided, as it makes the succeeding filter somewhat simpler as the filter has not got to remove such a wide range of undesired harmonics.

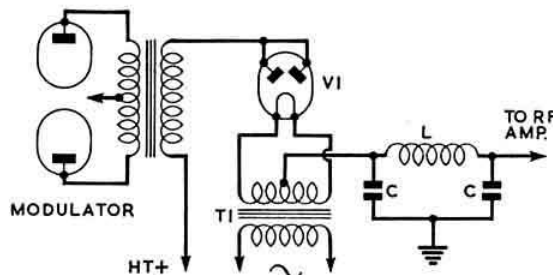


Fig. 7. High level series diode clipper. L and C, filter circuit; V1, any 500 volt 250mA rectifier. T1 must have high insulation between primary and secondary.

High-level Clippers

The high-level series diode negative peak clipper is probably the best known arrangement. The circuit is shown in Fig. 7. The diode, V1, conducts only when its anode is positive with respect to its cathode, therefore the modulated anode voltage cannot swing the anode of the r.f. amplifier negative. V1 may be a rectifier of the 500 volt 250mA class, with the two anodes connected together. It should be noted that the filament transformer (T1) for this valve must be insulated between primary and secondary for at least twice the anode voltage of the r.f. stage.

Used in conjunction with a good filter, this form of clipper makes a very effective means of splatter suppressor. It also has the advantage that relatively few extra components are required, although the filter is likely to be bulky if appreciable attenuation is required.

(Volume compression and the design of filters will be dealt with in Part II, to appear next month.—Ed.)

Reception of B.B.C.-TV Signals in Australia

MR Norman Burton (B.R.S.11494), who emigrated to Australia seven years ago from Lancashire and is now resident in Revesby, New South Wales, in correspondence with Mr. Milne (G2M1) reports having received the B.B.C. television sound and vision transmissions from the Crystal Palace transmitter on 41.5 and 45 Mc/s respectively.

The transmissions were first heard on November 26, 1956, at 10.45 G.M.T., but at that time were unidentified. They have been heard on a number of dates since and particularly on December 6 when several items in a musical programme, accompanying Test Card "C" were positively identified with the programme script, a copy of which had been made available, through G2M1, by the B.B.C. On December 6, the noise made by the picture transmitter was also clearly received and Mr. Burton is of the opinion that, had he possessed a suitable receiver, some sort of a picture could have been resolved.

The signals appeared to arrive over the short path and were received on a three-element beam and an SX28 receiver. Sound signals were at times up to S9, but were extremely erratic and subject to sudden complete fade-out. When at good strength, the quality was excellent.

According to prediction tables, the m.u.f. is at its highest at this time and a regular watch is now being kept each day.

The reception of these signals is something of a record and far outstrips the previous maximum distance over which they had been received under favourable conditions. Mr. Burton is hoping to make a tape recording of the reception of Crystal Palace which he will make available to the B.B.C. early in the New Year. Although it is realized that this outstanding feat is possible only because of the peak sun-spot conditions at present prevailing and that the regular reception of TV signals from Britain is unlikely in Australia, possibly some enterprising British television set manufacturer might be sufficiently interested to make a receiver available to Mr. Burton in time for the peak conditions next year. We hope to publish further reports from Mr. Burton in subsequent issues.

JOSE de Oliveirae (CT1FP), in a letter to Headquarters, reports that he frequently receives B.B.C. television programmes, on all five channels, in Oporto, using no aerial at all. On other occasions he employs a six-foot telescopic mast as used in motor-car radio installations.

DX Television Predictions for February 1957

Prepared by J. Douglas Kay (G3AAE)

Barbados	1200/1700	Bombay	0730/1500
Bermuda	1330/1700	Colombo	0730/1600
New York	1500/1700	Karachi	0730/1500
Trinidad	1200/1700	Singapore	0730/1500
Buenos Aires	1300/1600	Cairo	0800/1700
Rio de Janeiro		Accra	0830/1630
	1100/1700	Cape Town	1200/1600
Santiago	1400/1600	Dakar	1000/1600
Aden	0730/1700	Johannesburg	1000/1700
Baghdad	0700/1600	Nairobi	0800/1700
Bahrein	0700/1600	Salisbury	0800/1700
Tel Aviv	0730/1700	Cyprus	0800/1700

G.M.T. throughout

These predictions are based on the B.B.C. Television sound channel on 41.5 Mc/s. The video frequency is 45 Mc/s.

Disc Type Tuning Capacitors

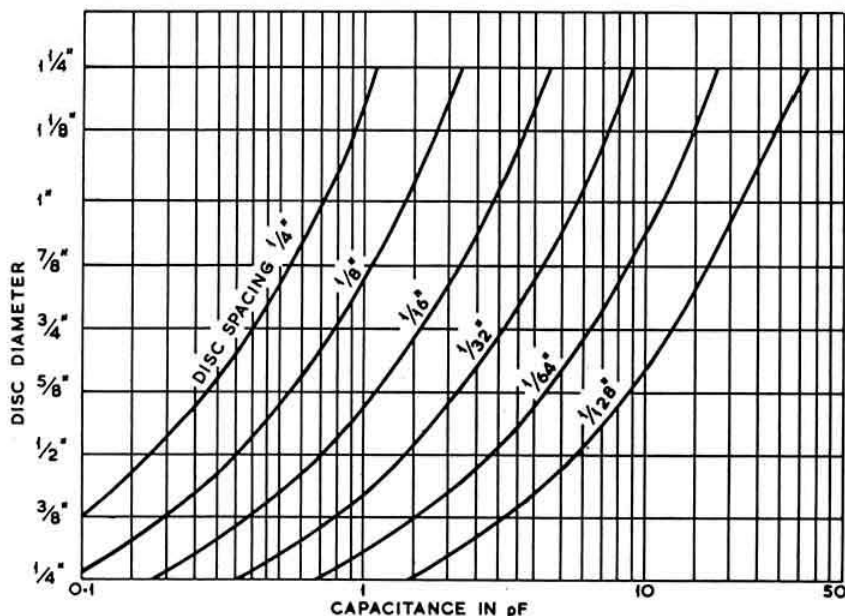
By D. N. CORFIELD, D.L.C. (Hons), A.M.I.E.E. (G5CD)*

MANY designs of v.h.f. and u.h.f. equipment employing parallel lines or concentric tuned circuits are conveniently tuned by means of a variable air capacitor comprising two parallel discs. When such equipment is being designed the calculation of the capacitance range of different size discs with differing spacing is tiresome and a chart from which values can be read directly is very convenient.

The chart herewith plots the capacitance between two parallel discs of various convenient diameters with spacings between $\frac{1}{4}$ in. and $1\frac{1}{2}$ in., calculated according to the formula

$$C_{pF} = \frac{0.224 \times \text{area (inches)}}{\text{spacing (inches)}}$$

G3HBW in the May 1956 issue show that if "C" is taken as 7.5pF plus a minimum disc capacitance of, say 0.5pF, i.e., 8pF, the inner conductor length is 4.2cm or 1.65in. If a $\frac{1}{2}$ in. disc capacitor is chosen then the range of tuning is from 0.2pF at $\frac{1}{4}$ in. spacing to 1.5pF at $\frac{1}{2}$ in. spacing. We dare not use closer spacing in view of the drive voltage being of the order of 100 volts. It is clear that a $\frac{1}{2}$ in. disc will not do as the spread between top and bottom limit valves is 2pF so that $\frac{1}{2}$ in. discs will have to be used giving a range of 0.4 to 3.0pF which is sufficient for fixed frequency working, but if it is necessary to cover a frequency band then a greater range is required. If at times the drive frequency were 420 Mc/s then this would require a maximum capacitance across the tuned circuit of the original 8pF multiplied by the square of



The diameter of the disc employed may be fixed by space considerations but it determines the minimum and maximum capacitance and the range available. Very close spacings should be avoided unless extremely accurate parallelism can be maintained, and must be avoided where high voltages exist, as in transmitters.

For example, a cathode concentric tuned circuit was required for a 2C39A valve used as a tripler from 420 to 1200 Mc/s tuned by a disc capacitor. This valve has an input capacitance of 6.5 ± 1 pF. If the cavity has an outer diameter of $2\frac{1}{2}$ in. and an inner conductor of $\frac{1}{2}$ in. the ratio is 7:1 and at 430 Mc/s the curves in the article by

the frequency ratio, i.e., $\frac{(430)^2}{(420)^2}$ or 1.05. This means a maximum disc capacitance of 2.4pF and the $\frac{1}{2}$ in. diameter will still just do but $\frac{1}{4}$ in. would not.

If it is found that the range of the capacitance is larger than the maximum size disc that can be accommodated, then the solution is to use two sets of discs located, for example, each side of a cavity and use one as tuning and one as a kind of band-set. Valve capacitance limits must be taken into account otherwise the replacement of a valve can result in the circuit no longer tuning. Where the tolerances in input and output capacitance are not known they can be taken as ± 30 per cent which would adequately cover most cases.

*20 Hoop Lane, London, N.W.11

An Improved Clemens Match

By N. ASHTON, M.I.E.E. (G3DQU)*

ABOUT four years ago the writer carried out a series of experiments to find a practical and efficient method of matching coaxial feeder to multi-element beam aerials of the "plumber's delight" variety. Various known matching systems were tried without securing a s.w.r. approaching unity but the "Clemens Match" (*QST*, February, 1951) appeared to be the most promising system and a considerable amount of experimental and theoretical work has since been devoted to finding out the characteristics of this matching device. It is thought that the results of this work will be of interest to other amateurs now that the 21 and 28 Mc/s bands are "open" again.

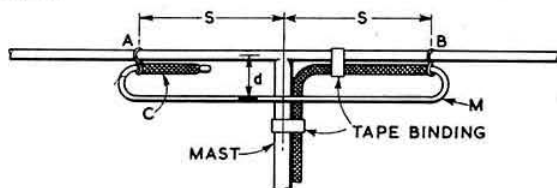


Fig. 1. The Clemens Match

For some reason or other the Clemens match has received little attention in this country. This is regrettable because the system possesses outstanding advantages over other well-known systems as will be evident from what follows.

The first experiments were conducted with a rotary dipole of lin. diameter aluminium tubing 16ft 10in. long, using a frequency of 28.4 Mc/s. The system was first tried out in its original form (Fig. 1). In this arrangement the braiding of the coaxial feeder is connected to the radiator at point B at a distance S from the centre of the radiator. The inner conductor and polythene insulation, from which the braiding has been stripped, is then carried across to the other side of the radiator and terminated in a short length of feeder on which the braiding is retained (C); the braiding is connected to the radiator at point A.

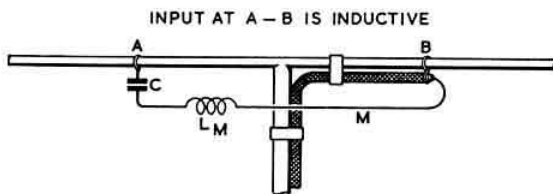


Fig. 2. Equivalent Circuit

It will be noted that the inner conductor of the feeder is not connected to any part of the aerial; this might appear confusing until it is realized that the short braided section, C, is merely a series capacitor to tune out the inductive reactance of the radiator when fed across points A and B, and of the wire M. The arrangement is shown diagrammatically in Fig. 2.

During the early trials it was noticed that quite small changes in dimension d (Fig. 1) had a considerable effect on the s.w.r. This resulted in the wire matching piece M being replaced by a length of 5/16in. diameter

aluminium tubing supported by insulators as shown in Fig. 3. To simplify the experiments the coaxial capacitor C was replaced by a conventional variable capacitor so that the capacitance could be varied at will. After a few adjustments a s.w.r. of 1.05:1 was obtained with dimension S at 22in. and d at 5in. This gave an almost perfect match into the 63 ohm coaxial feeder in use at that time.

Multi-element Arrays

The writer found it inopportune to extend the experimental work to multi-element arrays, but at his suggestion several other amateurs, notably G3DH and G3GNC, employed the system on three- and four-element arrays

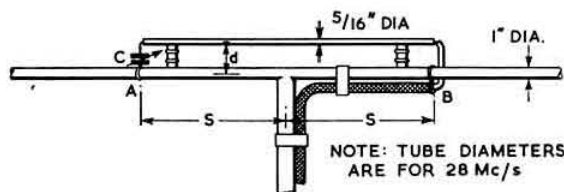


Fig. 3. The improved form of the Clemens Match developed by the writer.

for 14, 21, 28 and 144 Mc/s. It has since been discovered that G2ALN, working quite independently, employed the system on a 14 Mc/s three-element array at an earlier date.

An interesting fact emerged from the experiments: although the radiation resistances of these multi-element arrays must be in the region of 10 to 20 ohms (as measured at the centre of a half-wave radiator) compared with about 55 ohms for the simple dipole, the dimensions S and d , in terms of wavelength, were very similar in all instances, and in each case, by adjustment of the tuning capacitance C, standing wave ratios very close to unity were obtained, using 50 ohm coaxial feeder.

Theoretical Considerations

It was apparent that the relationship between the radiation resistance R_r and the resistance load presented to the feeder R_f was non-linear, and the writer has since carried out a theoretical study of the system which shows the manner of this relationship. The results of this work, which agree quite closely with the practical experiences of the amateurs previously mentioned, and with the writer's own experiments, are presented here.

Fig. 4 shows graphically the typical relationship between R_r and R_f when dimensions S (Fig. 3) is 0.06 of the wavelength for various values of dimension d (in terms of wavelength), with the capacitor C adjusted to present a purely resistive load to the feeder— R_f . It will be observed that, with d equal to 0.015λ , the variation in R_f is between 30 and 90 ohms for radiation resistances R_r between 6 and 55 ohms, so that these dimensions, $S=0.06\lambda$ and $d=0.015\lambda$, will give a s.w.r. in 50 ohm coaxial feeder of less than 2:1 with almost any type of multi-element array. A s.w.r. of about unity can be obtained by adjustment of dimension d , and capacitor C. The approximate values for dimensions S and d and the values of capacitance, for both 50 ohm and 70 ohm feeders are given in Tables 1 and 2.

It should be noted that the information applies to radiators having a length:diameter ratio of about 200

*65 Ridgeway Road, Timperley, Altrincham, Cheshire.

and of resonant length, about 0.485λ , and to matching tubes, M , about one-third the diameter of the radiator. Any considerable deviations from these proportions will probably require values of dimensions S and d somewhat different from those predicted. No great accuracy

Table 1. Dimensions and Capacitances for 50 ohm Coaxial Feeder

Rr Ohms	S = .05λ					S = .06λ					S = .07λ				
	d λ	C (pF)			d λ	C (pF)			d λ	C (pF)					
		14 Mc/s	21 Mc/s	28 Mc/s		14 Mc/s	21 Mc/s	28 Mc/s		14 Mc/s	21 Mc/s	28 Mc/s			
55	.012	42	28	21	.009	36	24	18	.008	32	21	16			
40	.010	40	27	20	.008	34	23	17	.007	30	20	15			
30	.010	38	25	19	.009	32	21	16	.008	26	17	13			
20	.011	32	21	16	.010	26	17	13	.009	22	15	11			
10	.02	22	15	11	.018	18	12	9	.017	14	10	7			

is claimed for the results of the theoretical work, since certain simplifying assumptions had to be made.

The tuning capacitor C can conveniently be a variable capacitor housed in a weatherproof box mounted on the radiator, which will render adjustments a simple matter. Alternatively, having decided the precise value of capacitance required for any particular array, it is preferable to substitute a short length of coaxial cable as the capacitor, since it will be less likely to suffer from the effects of the

Table 2. Dimensions and Capacitances for 70 ohm Coaxial Feeder

Rr Ohms	S = .05λ				S = .06λ				S = .07λ			
	d λ	C (pF)			d λ	C (pF)			d λ	C (pF)		
		14 Mc/s	21 Mc/s	28 Mc/s		14 Mc/s	21 Mc/s	28 Mc/s		14 Mc/s	21 Mc/s	28 Mc/s
55	·016	36	24	18	·013	30	20	15	·011	26	17	13
40	·014	34	23	17	·012	28	19	14	·010	24	16	12
30	·014	32	21	16	·012	26	17	13	·011	22	15	11
20	·017	26	17	13	·015	22	15	11	·013	18	12	9
15	·02	22	15	11	·018	20	13	10	·016	16	11	8

weather. In either event it should be noted that for normal maximum inputs to the aerial (about 100 watts of r.f.), the voltage across the capacitor may be as high as 1000 volts, and suitable precautions should be taken. The smallest polythene cable will stand this r.f. voltage and if the required capacitance is finally to be provided by a length of such cable, then it can be estimated at the rate of 22pF per foot for 70 ohm cable and 30pF per foot for 50 ohm cable.

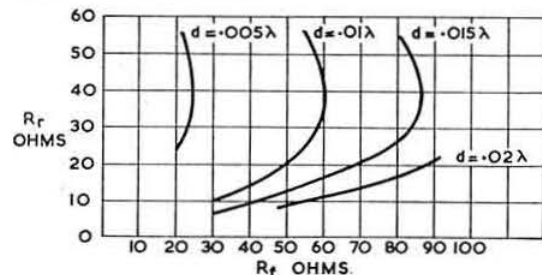


Fig. 4. Radiation resistance R_r and feeder load resistance R_f for $S = 0.06\lambda$.

As will be seen in Fig. 3, the feeder should be taped closely to the radiator from point B to the centre, where it should leave the radiator at right angles. If this is properly carried out there will be little unbalance current in the feeder, i.e., the braiding of the coaxial cable will be "cold."

It is beyond the scope of this article to enter into a detailed discussion on the effects of element lengths and spacings on the value of radiation resistance, but with element spacings about 0.1 to 0.15λ and with directors and reflectors about 5 per cent less and more respectively than resonant length the radiation resistance will be in the region of 10 to 20 ohms. Adjustments of element lengths to secure maximum gain or high front-to-back ratio might result in values of R_r appreciably below 10 ohms, but at the expense of band-width, and it is usually not worthwhile to carry the adjustments to such extremes. Band-width, as far as s.w.r. is concerned, will, of course, depend on radiation resistance, since the lower the value of R_r , the higher the Q of the system. It can, however, be stated from G2ALN's measurements that for a close-spaced three-element array with the parasitic elements plus and minus 5 per cent of resonant length it should be possible to cover a bandwidth proportionate to that of the 14 Mc/s band without the s.w.r. rising higher than 1.3/1.

Acknowledgments

The writer acknowledges with thanks the work carried out and the information given to him by the amateurs previously mentioned, without which this article would not have been written.

Worked All GM Award

THE Aberdeen Amateur Radio Society is now offering the "Worked All GM Award (WAGM)" to licensed amateurs able to submit proof of contact since October 1, 1946, with one GM2 station, fifteen GM3, one GM4, one GM5, one GM6 and one GM8. Contacts may be phone or c.w. or mixed, with minimum reports of RS33 or RS338. Cross-band contacts will not be accepted.

Claims for the award, accompanied by the 20 QSL cards and a remittance for 2s. 6d. (or 10 International Reply Coupons) should be sent to A. G. Anderson (GM3BCL), "Helford", Pitfodels, Aberdeen, from whom full details may be obtained.

VA-JF Certificate

THE Richmond (Virginia) Amateur Radio Club is issuing the VA-JF Certificate in connection with the 1957 Jamestown Festival which will be opened in April next to commemorate the 350th Anniversary of the first permanent English Settlement in America in 1607.

To claim the award, amateurs must submit QSL cards confirming two way contacts with twenty-five different stations in the Commonwealth of Virginia during the period January 1 to December 31, 1957.

Claims should be addressed to the Richmond Amateur Radio Club, P.O. Box 1985, Richmond 16, Virginia.

Trotter-Patterson Memorial Lecture

SIR Lawrence Bragg, F.R.S., will deliver the Trotter-Patterson Memorial Lecture on "Some Experiments on the Interference of Waves" to the Illuminating Engineering Society at The Royal Institution, Albemarle Street, London, W.1, on February 11, 1957, at 6 p.m. R.S.G.B. members wishing to attend can obtain tickets from the Secretary at 32 Victoria Street, London, S.W.1.

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

European V.H.F. Contest, 1956

THE results of the Region I I.A.R.U. European V.H.F. Contest held last September have now been published by D.A.R.C. G5KW won the second section (Multi-band, fixed stations) with G3HBW a good runner up. Section 4 (Multi-band portable) was a "walk-over" for Czechoslovak amateurs. Congratulations to all concerned.

British Entries and Placings

Section 1 (Single band fixed stations)

1. G2DVD	..	..	..	156 points
2. G3HRH	..	..	..	102 points
3. G5MR	..	..	..	66 points

Section 2 (Multi-band fixed stations)

1. G5KW	..	..	..	1656 points
2. G3HBW	1479 points

Section 3 (Single band portable station)

1. G3BFP/P	198 points
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These are of course British placings only. With relation to the whole contest, our results are as follow:

Section 1

1. ON4WI (operated by DL3QA)	408 points
2. PE1PL (honorary position only)	356 points
3. DL3YBA	322 points
10. G2DVD	156 points
16. G3HRH	102 points
29. G5MR	66 points

Section 2

1. G5KW	1656 points
2. G3HBW	1479 points
3. OK1KKD	1174 points
4. FA8IH	568 points

Section 3

1. OK1SO/1	656 points
2. OK2KEZ/1	630 points
16. G3BFP/P	198 points

Section 4

1. OK1KKA/1	1986 points
2. OK1KRC/1	1858 points
3. OK1KMM/1	1264 points

OK stations took the first 12 placings in Section 4.

G5KW and G3HBW are third and fourth in the overall points placings, a very creditable achievement for both, as although their locations are good they are certainly not so good as some of the mountain locations used by others, who also have the possibility of all round DX at good distances.

V.H.F. Contests, 1957

The 2m contest in July will be an open one, fixed and portable stations competing on equal terms. This should go far to satisfy those critics who have deplored the omission of portables in the last one.

There are to be two 4 metre contests in 1957. Keep your eye on this column for details.

London V.H.F. U.H.F. Convention, 1957

The Society and the London U.H.F. Group are again holding a V.H.F. Convention in London on May 25 next. Keep the date free in your diary; further information will be given as soon as possible.

Two Metre Activities

General conditions on the 2m band have been rather poor, but there have been one or two bright patches when things "came alive", but nothing that could be called an opening.

B.R.S.21136 (Ruislip) has logged over 60 stations, the most distant being G2JF (Ashford). **'20133** (Melton Mowbray) found activity in fits and starts with a small peak on Monday's "Activity Night"; however, weather and propagation conditions "have not been up to it either". A very powerful signal from G6XM (Tollerton, Notts) gave the tenth county confirmed. G8CZ is quite active on 2m and on December 10 worked G5KS for a first contact. **'20133** thinks December 9/10 was the best period.

G3KHA (Bristol, 4) says activity was a great deal lower than conditions, this being borne out by two very good phone QSOs with stations just north of London (G2FMJ and G3HRH) on the "Activity Night" of December 10; only about half a dozen stations were otherwise heard during the whole evening. The transmitter has been rebuilt with a screened end loaded line tank to the QV06/40A. This seems very efficient and has an output of 60 watts.

G8LN (Plumstead) reports that G3ANB (Brightlingsea) is again experiencing TVI trouble and is closed (pro tem only, we hope) during television hours. **G6XM** (Tollerton, Notts) is operating under somewhat restricted conditions with a dipole in the bedroom. In the first month from October 20, 43 stations were logged, quite a number from the south, notably, G5MA, '5KG and '5KW. The old "blunderbuss" was fired up towards the end of November and G5KG, '5MA and many locals were contacted on the indoor dipole with about 12ft of 72 ohm twin feeder! The aerial now in use is a 16 element stack only 10ft high. The best QSOs on this (December 2) were G13GXP and GD3UB. The QTH (150ft a.s.l.) does not appear to be too bad, although surrounded (except to the north east) by 600ft hills only 3 to 5 miles away.

G3JGJ (Plympton) has fitted parallel lines to the r.f. push-pull stage in the converter and added a 12AT7 grounded grid r.f. amplifier. '3JGJ expects to be on 4m

*21 Bridge Way, Whitton, near Twickenham, Middlesex.

soon. **G5MR** (Hythe, Kent) whilst checking 28 Mc/s recently heard SM5BRT say that he is active on 144.52 Mc/s. **G5MA** (Bookham) reports that by courtesy of G6XM he was able to make two QSOs with GD3UB (I.O.M.) on December 6 and 7. '5MA also heard '3UB on December 8 and informs us that the I.O.M. station is now often on after 23.00 G.M.T.

G3HHY (Bristol, 6) has a QOV03/20A p.a. running on both 2m and 4m with about 35 watts r.f. output. Also in use is an "Eimac Twin 30" giving 75 watts on 2m (in a Lecher line p.a.). The only problem is to get it all into the aerial! '3HHY says "ask the Monday Activity lads to remember the West—there is nearly always someone around, although rumour has it that some of the stalwarts have become m.u.f. minded and migrated to 10m!"

B.R.S.19162 (Dewsbury) doing bench work on converters has found many snags. However, much research and modification is developing into what sounds like a very good receiver, especially after a bad harmonic from the new B.B.C. v.h.f. station was disposed of. **B.R.S.20162** (Selsdon) sends a list of stations heard during the Monday Activity period. The best evening was December 10 when 19 counties were heard in spite of low barometer and damp and windy weather. '20162 observes that activity on Monday appears to be at the expense of the rest of the week; this could, and should, be remedied.

G6LI (Grimsby) reports: The very unsettled weather of the month has made communications poor. The second and third activity nights proved effective for signals from the south, and a reasonable number of regulars was heard. However, the north produced the customary silence. **DL1LB** writes that he heard a QSO with G2CIW on December 10. This is rather a nice proof of what an activity night can do! G6LI was received at RST449. **DL1LB** wants a regular sked, with an East Coast station but '6LI is not yet sure if this can be taken up. So, are there any other bidders? As **DL1LB** is making scatter-propagation studies it looks as if the "taker" requires no less than the full 150 watts input to do any good.

Scottish Two Metre News

GM6WL reports low activity but an interesting QSO with GM3FMD (Maybole) on December 1. GM4PW

(Prestwick) is also very active and hopes to have his 6-over-6 array on a proper mast soon. On December 7 conditions were rather better; GM6KH and '3NG had a QSO with GM8MN (Crieff). The same evening '3NG contacted '4PW at S8 fading to S1.

Six Metre News

G5BD (Mablethorpe) reports that he has had over 80 QSOs (cross-band to 28 Mc/s) with 50 Mc/s stations in W1, 2, 3, 4, 5 and 8 and VE1 since December 1. As no European stations appear to be on 50 Mc/s the transatlantic stations are increasingly listening on 28 Mc/s for replies. 50 Mc/s openings usually occur between 13.30 and 17.30 G.M.T. '5BD is only using a type 26 converter and a television aerial (which is far better than a long wire).

G3COJ (Maidenhead) has been working WIHOY, through G3AYC, and from his own station. He has also worked VE1PQ and heard VE1EF and many Ws and Ks from the 1, 2, 3, 4 and 8 call areas. Russian TV signals have been very strong recently (vision on 49.75 Mc/s and sound on 56.25 Mc/s S9+). **WILGE** was worked on December 11 and WIUVB on the 12th.

G5MR (Hythe, Kent) has heard many W and VE stations, usually between 15.30 and 16.30 G.M.T. His best day was December 9 when VE1WL was S9 on phone. W5 stations have also been particularly good.

G3FXB (Southwick, Sussex) is somewhat screened to the west, but nevertheless on December 9 worked several W1, K2, W3 and VE1 stations, all on phone. Conditions were then quiet until December 17, when more W1s and one W8 station were worked. The receiver is an RF26, using a TV aerial for reception on 50 Mc/s.

Seventy Centimetres

G2XV (Cambridge) would still welcome a schedule on this band with any station in Derbyshire.

Activity is keeping up fairly well in Scotland. GM3GUO, '6KH, '3NG, '3INK, '6WL, and '2CQI (the latter listening only) have a fairly regular five way QSO on Sundays. **GM3DDE** (Corstorphine) has got '3DGI started, and they have had their first 70 cm QSO in Edinburgh. It is hoped that Glasgow-Edinburgh on 70 cm will be achieved in 1957. The distance is only about 40 miles but the real problem for city dwellers is to get

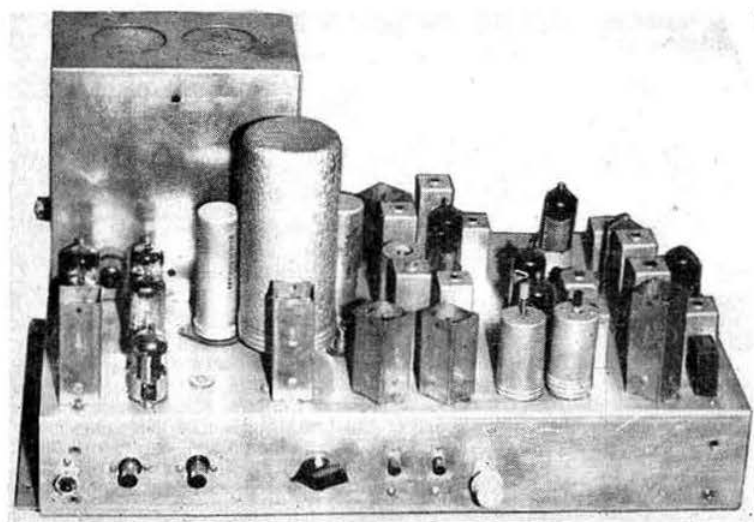
beams in a suitably clear position as both cities are very hilly. The gales pose the great problem of keeping the beams up! '6WL is now busy with a 446A "Lighthouse" r.f. stage to go in front of a '3BKQ converter. It is entirely home designed and constructed. A QOV06/40A p.a. is also being tried out, and seems better than the old QOV06/40.

Four Metre News

G5MR (Hythe, Kent) has temporarily adapted his ECC84 cascode converter to cover both the 70 and 50 Mc/s bands. This was not difficult as the oscillator fundamental tunes (band-set) from 17 to 23 Mc/s and is followed by one or two multipliers as desired. A good cross-band QSO (to 2m) was made with G5KW.

G3KHA (Bristol, 4) asks if other

A close-up view of the Single Side Band VHF Transmitter described by Bernard Rogers (G3ILI) in this issue.



countries are aware that we have the 4m band. We have done all we can to publicize this, and it is certain that there will be no dearth of listeners abroad! '3KHA joins many others in thanking the Society for their efforts.

G2ABD (Kenton) now on 4m had a cross-band contact with **G2DD** (on 2m). Due to haste to "try things out" this was achieved with a wire dipole across the shack. A more efficient aerial is expected soon.

West Country TVI on Four Metres

G3HHY (Bristol) has had a series of tests with very helpful G.P.O. representatives. The worst case (with the TV aerial only 15 to 20ft away) was cured by a half-wave stub tuned to the transmitter frequency. ('3HHY strongly recommends all West of England 4m operators to stick to the high end of 4m.) Although this has led to some inactivity on 4m, cross-band QSOs (2m) have been had with '3KPT and '3YH. Duplex has also been worked (4/2m) with '3KPT.

G3BFP/A points out that his call was incorrectly stated as '3FPA/A in the December BULLETIN. Later QSOs were made with **G2AOL**, '3EOH, '3FD, and '5DS. **G3FAN**, '3HBZ, '3IUL, and '3JJQ have been heard.

News from South Africa

An interesting letter has been received from **ZS2Y** of 100 Sixth Avenue, Newton Park, Port Elizabeth, South Africa, who writes the v.h.f. notes for the S.A.R.L. Radio ZS. He thinks our m.u.f. predictions somewhat optimistic, but agrees that the m.u.f. will certainly go above 50 Mc/s. **ZS2Y** has receiving gear which will cover 70 Mc/s and says "I'm sure, if there is a possibility of hearing you on 70 Mc/s others will build converters as well".

An interesting point is that the ZSs have been hearing the 48.5 Mc/s B.B.C. TV sound on many occasions and a **ZS3** reports that the Scottish TV (52 Mc/s) has also been heard. On 41.25 Mc/s the London sound was heard throughout September, October and early November, but the m.u.f. (checked daily) has only been around 35 Mc/s since then. During September while the 48 Mc/s TV was audible, **ZS1PV** (Capetown) made several 50 Mc/s transmissions beaming north and has just received a report that his signals were heard in Turkey. **ZS2Y** finds that the m.u.f. from Europe appears to peak around 14.00 G.M.T. Although 41.25 Mc/s TV sound comes in at 11.00 G.M.T. it invariably fades out around 16.00 G.M.T. The best times to listen are weekdays 11.00 to 12.00 G.M.T. and after 16.00, Saturdays and Sundays after 11.00 G.M.T.

V.h.f. generally in South Africa is difficult, mainly owing to the great distances and scattered populations. Most of the activity is centred in the seven large cities. With a few exceptions these are separated by distances of around 500 miles from each other. The total number of active v.h.f. stations (all bands) is about 50.

MONDAY NIGHT AT 8 IS TWO METRE ACTIVITY TIME

Everyone who has two metre equipment in operation should switch it on between 8 and 10 p.m. every Monday evening, whether conditions seem likely to be good or not.

Monday night is two metre activity night. See how many stations you can work, and report the results to **G2AIW** (V.H.F. Editor).

AND WEDNESDAY NIGHT, TOO

Listen on 70.2 to 70.4 Mc/s on Wednesdays. This is 4 metre activity night.

Worked and Heard on Two

G2JF (Wye, Kent) October 19–November 18.

Worked: **F8GH**, **G2ANS**, **2CIW**, **2CPX**, **2DPK**, **2FMJ**, **3ABA**, **3ALC**, **3ANB**, **3AZU**, **3BIC**, **3CNF**, **3COJ**, **3EJO**, **3EMU**, **3FCQ**, **3FGT**, **3GGJ**, **3GHO**, **3GNR/P**, **3GOZ**, **3IEX**, **3INU**, **3ION**, **3JRW**, **3IUL**, **3JNI**, **3JON**, **3JWQ**, **3KEF**, **3KQG**, **3KSR/P**, **3KTK**, **3JR**, **3MI**, **3WW**, **4PS**, **5BD**, **5KG**, **5KW**, **5MR**, **5OX**, **5UM**, **5YV**, **6AG**, **6LL**, **6RH**, **6BJ**, **6LN**, **6PX**, **6RJ**, **6SK**, **6C3EBK**.

G3KHA (Bristol) October 23–November 11.

Worked: **G2ADZ**, **2CIW**, **3AYL**, **3BII**, **3DKF**, **3FIH**, **3FKO**, **3GNR/P**, **3CYQ**, **3HBW**, **3HHY**, **3HKT**, **3IOO**, **3IRA**, **3IRS**, **3JWQ**, **3KPT**, **3WW**, **3YH**, **4PS**, **5BM**, **5KG**, **6AG**, **GW8UH**. Heard: **G2ANS**, **2ATK**, **2BVW**, **2CPX**, **2FM**, **2FNW**, **2HCG**, **2IT**, **2JF**, **2NM**, **2RD**, **2YB**, **3ABA**, **3FCQ**, **3FMI**, **3GHO**, **3GVK**, **3GXN**, **3HXS**, **3IIT**, **3IYJ**, **3KEF**, **3KEQ**, **3XC**, **5HN**, **5KW**, **5MA**, **5ML**, **5MR**, **5R0**, **5YV**, **6OX**, **6KW**, **6VZ**, **GW5BI**.

G3KHA (Bristol) November 19–December 15.

Worked: **G2DVD**, **2FMJ**, **2YB**, **3FIH**, **3GYQ**, **3HHY**, **3HRH**, **3IRA**, **3JON**, **3KPT**, **3YH**, **5DW**, **5KG**, **5MA**, **6OZ**, **GW2ACW**. Heard: **G2CIW**, **2HCG**, **2JF**, **3AYL**, **3FCQ**, **3GGJ**, **3HAZ**, **3HBW**, **3IIT**, **3JWQ**, **5KW**, **5ML**, **6RH**, **6XM**, **6KW**, **6SK**.

G3WW (Wimbleton) November 13–November 18.

Worked: **G2AIQ**, **2AJ5**, **2CIW**, **2CPX**, **2DVD**, **2XV**, **3ABA**, **2ALC**, **3DVK**, **3ENY**, **3EPW**, **3FIB/A** (Sussex), **3FVK**, **3GDR**, **3GFD**, **3GGJ**, **3GPT**, **3GSO**, **3HA**, **3HAZ**, **3ICK**, **3IIT**, **3IRA**, **3IRS**, **3JWQ**, **3JNI** (Holland-on-Sea, Essex), **3JXN**, **3JZG/A**, **3KHA**, **3KUH**, **3LHA**, **5BD**, **5BQ**, **5LL**, **5MA**, **6AG**. Heard: **G2ATK**, **2FJR**, **2FNW**, **3FD**, **3GHO**, **5JO**, **5KG**, **5KW**.

B.R.S.6327 (Earlsfield).

Heard: **G2DPK**, **3GPT**, **3JNI**, **3JR**, **3KBS**, **3KQC**, **3KTK**, **5KW**, **6AG**, **8KW**.

B.R.S.16075 (Shirley, Southampton) October 20–November 18.

Heard: **G2AK**, **2NM**, **2YB**, **2XV**, **2ANS**, **2ATK**, **2BMZ**, **2DVD**, **2HCG**, **3WW**, **3AUS**, **3FGT**, **3FZL**, **3GHO**, **3HCW**, **3HXS**, **3IIT**, **3IOO**, **3IRA**, **3JWQ**, **3KPT**, **3LIM**, **3LJS**, **5BD**, **5BM**, **5KW**, **5MA**, **6AG**, **6JK**, **6NB**, **6OX**, **6DA**, **6VZ**, **GC3EBK**, **GW8SU**, **ON4UD**.

B.R.S.20133 (Melton Mowbray) October 22–November 20.

Heard: **G2BVW**, **2FNW**, **3ALC**, **3GFD**, **3GFW**, **3GPT**, **3GSO**, **3IYJ**, **3JWQ**, **3JXN**, **3KAG**, **3KEF**, **3WW**, **4MK**, **5AU**, **5KG**, **5MA**, **5ML**, **5YV**, **6XX**, **8CZ**.

B.R.S.20162 (Selsdon). (Between 20.00 and 21.30 G.M.T. on Activity Nights.)
December 3

Heard: **G2AJ5**, **2CIW**, **2DD**, **2JF**, **2UJ**, **3AAZ**, **3ALC**, **3CNF**, **3FCQ**, **3GDC**, **3HRH**, **3JWQ**, **3JZG**, **3KQC**, **5BC**, **5KG**, **5KW**, **5MA**, **5UM**, **6LL**, **8KW**, **8SK**.

December 10
G2BRH, **2CIW**, **2DD**, **2FM**, **2FMJ**, **2HDY**, **2JF**, **3ALC**, **3AST**, **3CNF**, **3EJO**, **3FCQ**, **3FD**, **3HBW**, **3HRH**, **3IRS**, **3IUL**, **3JWQ**, **3JZG**, **3KHA**, **3KQC**, **4FB**, **5BC**, **5BD**, **5KG**, **5MA**, **5UM**, **6LL**, **6XM**, **8CZ**.

December 17
G2DD, **2FMJ**, **2HDY**, **2YB**, **3FCQ**, **3FD**, **3IIT**, **3JR**, **3JWQ**, **3KFX**, **3KQC**, **5KG**, **5KW**, **5MA**, **5TP**, **5UM**, **6LL**, **8KW**, **8RV**.

B.R.S.21136 (Ruislip) November 21–December 17.

Heard: **G2AJ**, **2AJ5**, **2BDP**, **2DVD**, **2FM**, **2JF**, **2TP**, **2UJ**, **3ABA**, **3BFP/A**, **3BII**, **3FCQ**, **3FQS**, **3JQJ**, **3JON**, **3KEQ**, **5MA**, **5RD**, **6AG**, **6LL**, **6NB**, **6NF**, **6RH**, **6YP**, **8KW**, **8RW**, **8SK**.

B.R.S.21136 (Ruislip)

Heard: **G2AJ5**, **2BDP**, **2DVD**, **2JF**, **2TP**, **3ABA**, **3BII**, **3COJ**, **3FCQ**, **3FIB/P**, **3FM**, **3FP**, **3FQS**, **3GDR**, **3GHI**, **3GNR/P**, **3JON**, **3KEQ**, **3WW**, **5KW**, **5MA**, **6AG**, **6NK**, **6OX**, **8KW**.

Heard on 70 cm

G3KHA (Bristol).
Heard: **G3HHY**.

Side Slips

ON page 280 of the December, 1956, issue of the R.S.G.B. BULLETIN it was incorrectly stated that Mr. W. A. Higgins (G8GF) had been awarded the Somerset Trophy in recognition of winning the Short Section of the First 1956 Top Band Contest. Mr. Higgins was, in fact, the winner of the Long Section of the Contest.

On page 288 of the same issue under "Representation," Region 3 was described as "East Midlands" and Region 4 as "West Midlands." These descriptions should have been reversed.

THE MONTH

THE MONTH										REMARKS
DATE TIME	FREQ.	STATION CALLED	CALLED BY	STATION HEARD OR WORKED			IF QSO RESULTED			
				R	S	T	KC/S OR DIAL	MY SIGS. R S T	TIME OF ENDING QSO	

ON THE AIR

By S. A. HERBERT (G3ATU)*

THE happiest news this month comes from the Middle

East, which is once more back to radio normality. After what turned out to be only a short close-down, activity was resumed from Israel and, shortly afterwards, from Cyprus, a state of affairs which delighted not only the ZC4 and 4X4 boys, but the entire Amateur Radio world as well. About the same time, the bands were electrified by the unexpected appearance of MD5 stations, who somewhat naturally found themselves in great demand; however, more of them anon. As to conditions during the last month, compared with the state of affairs during September and October they have been plain, downright bad for the most part, with just one or two sparkling openings scattered around to prove that things are never as poor as they seem. In any case, December is regarded by ionospheric experts as a mediocre month for long distance work in comparison with the months before and after, so that things should start to get really interesting again early in the New Year; judging by the manner in which the sun-spot numbers are rocketing still, interesting they surely will be!

So much then for things as they are. Add to that the distractions of the Christmas period and we are left with the usual much smaller December mail. On with it, then, starting with twenty metres.

The Twenty Metre Band

Whatever else can be said about the behaviour of the band these days, there is no doubt as to its liveli-

ness. Activity of one kind or another goes on virtually round the clock—a fact of some significance—for only a high level of ionisation is able to support communication after dark at this time of year on these frequencies; even one year ago, the band was usually quite dead for DX shortly after darkness fell. Short skip continues to blanket the DX for much of the time and some of the notes from across the North Sea have to be heard to be believed. If it's T1 they're after, some of them are obviously on the brink of success!

B.R.S.20317 (Bromley) achieved his target for the year by logging 40 Z, and 200 C, a feat which he accomplished by late November. A fact for budding DX chasers to note is that of the total, '20317 logged all 40 Z and 185 C on c.w. Recent catches were FG7XC, KM6AX (19.20), OQ0VN, ST2NG, ZD9AE, ZS3DP, ZS7C, VP8BK and PJ2ME (St. Martin Is., 14005, 21.35 G.M.T.). QSLs arrived from VR2BZ, UA0KJA, VP6RG, OX3UD and YV0AA. **B.R.S.20106** (Petts Wood) found the band good in the evenings and accumulated FK8AO, '8AY, 3W8AA, VP2LU, ZL4CK, VP8BO, '8BP, '8BR, UP0L4, MD5DNQ, VK, KL7 and KH6 on c.w., all between 18.00 and 20.30, while one day between 13.30 and 14.08 he logged UA9, UH, UL, UM, UJ and KR6US. **B.R.S.20135** (Newport, I.O.W.) was able to listen for only a short time before sending his SX28 away for overhaul. He remarks on the number of VKs using s.s.b.—VK2VA, '2VH and '3SSK were among those heard, while XW8AC, KA2NY, ST2DB and VK2, '4 and '5 were heard on A3. The best on phone logged by **B.R.S.21049** (Shrewsbury) were KL7AG, VS2BN and VK1AB, while **B.R.S.20249** (Sutton) heard ZS2MI (Marion Is.) and EA6AZ on the key, but missed VP8BK (South Georgia), who was successfully worked by his friend G3IRU.

G3LEQ (Tunbridge Wells) still gets out with 25 watts to a 100 ft Hertz and has worked ZL2GX, CT2AC, ZB2U, HC5PW, EA8CC and OX3PW on A3, getting good reports. He told the OX how cold it was, but back came the reply that in Greenland it was two degrees below zero, which probably made him feel warmer! **B.R.S.21230** (St. Leonards) sends a welcome first report. Using an R107, in some three hours he picked up phone from TF2WBJ, HC1FG, plus a goodly score of Ws. Your commentator happened on XE1RM (14005—01.00), was pleased to be his first G and



This neat and efficient looking station is VS2DQ, at Kedah, about 370 miles north of Singapore and 45 miles from Penang. The aerials available include a home-made G4ZU Minibeam, and three element arrays for 21 and 50 Mc/s.

talked also to HS1VR (18.30). QSL him via Signals Corps, Royal Thai Army, Bangkok. ZL4CK comes through most evenings on c.w. and ZS2MI can often be heard plodding slowly along around 19.00. AC5PN was heard one morning (01.00, RST229) working strings of Ws—very frustrating unless you happen to be a W! UPOL4 is around and so is UGCA, who uses m.c.w., works lots of Us and whose whereabouts is a mystery as far as this column is concerned.

The Ten Metre DX.

Nothing very exotic has appeared recently on the band, although from midday onward it remains the happy hunting ground of masses of loud Ws and VEs. Early morning conditions to the Pacific should be getting better by now, so don't forget to check the band above 28500 kc/s for KG6, KH6 and the like.

B.R.S.20487 (N. Finchley) lists KA2WK and some W5s while **B.R.S.20135** pulled in VP2JC (St. Kitts), VP6WR, '7NS, ST2DB, MP4KAC, ZD4BR and M1B. **B.R.S.20106** heard OY7ML, an unusual one on c.w., with HK5ER, CR9AK, VS6CL, '6CY, VE5CU, '5HB and '7HB on phone. **B.R.S.20249** logged OA4EP for a new one and listened to CR9AL working SM5FA with constant interruptions from a bunch of CTs, one of whom was heard to ask a GW to QSY. (To avoid QRM'ing the QRM, so to speak!). QSL CR9AL via Box 114, Macau. YS2AG is frequently to be found during the early evenings and XE1GE is there shortly after midday. Incidentally, the Mexican is also looking for cross-band QSOs and transmits on 50,010 kc/s. **G8KS** (Petts Wood) worked the XE and called G3ATU to confirm this information.

Fifteen Metres

On fifteen also, a state of comparative quiet has prevailed (apart from the jammers, which are anything but that) and reports are fewer than usual. **A.1328**

(London, W.1) now has a modified RF24 Unit ahead of his 6SA7 converter and finds things much livelier as a result. Between 18.00 and 19.30 he has been hearing ZS4GK, OQ5AJ, SP, UA4 (all new for him), ET2PA, KP4 and the usual Ws and VEs. **B.R.S.20487** mentions VP2JC and ZP5ET on A3, while **B.R.S.20135** pulled in JZ0PC, ZD8SC, VK and VS6. **B.R.S.20317** has lost patience with ten and fifteen after fruitless hunting for Nevada for his H.A.S., but he did log CO2GR, CR6AI, UJ8AF and XE1PJ on the key.

B.R.S.20106 looked over both parts of the band and emerged with ZD1DR, ZB2I, ZS3F, KH6AYG (18.58), EL1I, VP2JC and ZLs on phone and on c.w., UA0OM, VK4ZB, KR6GT, JA3FT, KL7 and ZD1FG (08.30, calling "CQ ZL"). **B.R.S.20249** heard HC1ES (a new one), KA3WG, HH4MV and VP6WR, the last-named very active indeed and working every available G! **G3IRU** worked ZS6AJ0 and thus passed the half-century mark. **B.R.S.21049** dug out a rare one when he heard VR2BZ on phone. During a recent I.S.W.L. contest, he logged 62 countries on 15, 20 and 40 metres in only seven and a half hours, which seems good going.

Forty Metres

At this time of the year and at this period of the sun-spot cycle, forty could well provide world wide DX for much of the day and all the night. Eight years ago or less, the evening air was full of VK, ZS, VSI and VU signals, with DX of one kind or another workable through the night until morning brought the ZLs and often other Pacific stations. The picture could be similar at this very time, but the sad fact is that the band has been so cluttered up in recent years by broadcast stations that many amateurs have gone elsewhere. Certainly the situation in Europe is better, but there must be scores of low power broadcasters doing their worst in distant parts. We don't hear them, but the VKs, VSs and ZLs do and act accordingly. At the moment,

Frequency Predictions for February, 1957

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
M.U.F.	40.5 Mc/s 1645	46 Mc/s 1345	41 Mc/s 1400	43 Mc/s 1400	48.5 Mc/s 0900	50 Mc/s 0930	46.5 Mc/s 0930	36 Mc/s 0830
28 Mc/s	1200—2000	1030—2000	1000—1930	0800—1900	0800—1800	0730—1700	0730—1700	0700—1430
21 Mc/s	1130—2100	0930—2230	0800—2300	0730—2200	0700—2000	0700—1900	0700—1830	0645—0700 1900—2330
14 Mc/s	1000—0200	0900—0400	ALL DAY	0700—0000	ALL DAY	0700—0000	0700—2000	0400—2200
7 Mc/s	2000—0800	2000—0400	2300—0200	2200—0200	2000—0400	2030—0400	2000—0200	1600—1930
3.5 Mc/s	2200—0200	0000	0200	0000	2200—0200	0030	2200	1800

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

the going is tough. Even so, there is DX around for the delving. **B.R.S.20317**, for instance, got a brand new one when he heard CR10AA working GW5ZC at 00.20. The CR said he is ex-WIABB and indications are that he is quite genuine. Apart from this, '20317 also pulled in 3W8AA, VP2LU, HC1LM, HH2JB, KZ5BE, ZS4FK (21.30), VE8OP (23.30), W5ALZ and W5BSL, while **B.R.S.20106** came up with XW8AB, JA8AT, OX3MD and an HH (all around 22.00), UA9, UG6, UF6, OY1R and some LUS, so there is life in the old band yet!

Eighty Metres

The trouble on eighty is not broadcast, but the odd assortment of rasps, squelchings and buzzings which infest the low end. How anyone can read it—presumably it is meant to be Morse—is something of a mystery. Only two reports this time, the first, from **B.R.S.20317** details CT3AB (01.20), WIGHJ, K2OAA and Us and **B.R.S.20106** reports TF3CM, 9S4DF, W3HZS, W9WJB and UB5s.

One Sixty Metres

Here the story is happier. A single report from **B.R.S.20106** gives news that the band has opened for transatlantic DX. Late in November he heard W1BB with a test "CQ" call around 07.00 and during December there were more openings, which produced W2EQS (07.32), W2UWB (or possibly W2UWD), W2GGL, DL1FF, DL2ZO, '2UY and ELIC, whose African location will put him high in the "wanted" list. ZB1HKO is thought to be on also and W1BB says W7VS is active on 1901 kc/s.

The MD5 Story

G3ADZ sent via G6CL official information on the situation in the Port Said area, where he found himself in company with G3DNQ, '3AMO and '3FQN. They applied immediately for temporary licences and these came through on December 11. (G3ATU worked **MD5DNQ** the next day and was given the news). '3ADZ commented that QRN was troublesome below 21 Mc/s (although 7 Mc/s was excellent in the Central Mediterranean) and most listening—while awaiting those licences—was on 28 Mc/s. G3HCU was the first G heard, and it was a great strain not to use the TA12 which was ready to go. By now of course they have left for homelier parts and with no regrets, despite the rare prefix!

Antarctica

Ex-G3KKC is now settled in Antarctica, where he is W/T operator of a party who are opening Base "J". For the first year, operation will be from batteries, with some 14 watts input, but the spirit is there and he will really be trying to work Europe, with crystals for eighty and forty and eventually with a v.f.o. for the h.f. bands. In 1958, he should be QRO with 350 watts—meantime, listen for the 14 watts from VP8.

W6ITH reports that Japanese scientists have left for Prince Harald Land, Antarctica. Via JA1CR—the call letters JA1JG have been assigned to Toshio Sakuma (ex-JA3VO), a member of the Harald Is. group. A kilowatt rig and beams will be used on frequencies of 7020, '60, '90, 14040, '120, '180, 21060, '180, '270 kc/s, phone and c.w. QSL via the J.A.R.L. only, as JA1JG is a re-issued call.

Rare States Activity

Art Bean (**W7AMX**) sends via G2MI a further list of stations active from the rarer States on 14 Mc/s c.w. All calls are W7 and are as follows: *Arizona*: 'DKG, 'HYQ, 'LVG, 'MAE, 'PUV, 'RFE, 'RUK, 'UNM,



While British troops were in Port Said recently, MD5 stations were active again. In this picture are, l. to r., Capt. Donald MacLean (**G3DNQ**) and Major Dennis Haylock (**G3ADZ**) with Foreman of Signals John Houghton (**G3AMO**) behind. Within 90 minutes of coming on the air they worked all continents on 14 Mc/s c.w., the first stations contacted being YU2HO, W6VE and VK4NL. The transmitter comprised a 6AG7 and 807 running 36 watts input and an AR88 receiver. The aerial was a long wire made from assault cable.

(Photo by courtesy of British Paramount News)

'UVR, 'YWF, K7WBC, K7PVO. *Idaho*: 'FBD, 'PVO, 'Montana': 'CRC, 'DZF, 'HTB, 'LER, 'NBB, 'NJW, 'PXR, 'WLM, *Nevada*: 'PGD, 'RQI. *Utah*: 'BAJ, 'NAU, 'PKB, 'STC. *Wyoming*: 'AXD, 'FTE, 'HRM, 'ORM, 'PMA, 'TPS, 'TQP, 'WNI, 'ZOS.

Other News from Overseas

From John Knight (**W6YY**) comes news that UP2AS and UA1KAI are going under official auspices to Tanna Tuva for a month this Spring (Zone 23). UPOL6 at the North Pole is on 14040 kc/s. VQ8AB, 'AD, 'AP active on c.w. and VQ8AR is on phone from Mauritius. W0AIW worked VU4AB on 20 c.w.—said he was on the Laccadives. CO2BL says EA9EE is available from Rio de Oro on 20 metres A3 on Saturdays. FK8AS now participates in DX from New Caledonia. The N.Z. I.G.Y. Antarctic station is due to start up early in 1957. The call may be LZ5. Congratulatory to '6YY on being awarded the second Empire DX Certificate to go to a U.S. amateur for phone only.

VK5QL (Elizabeth, S.A.) is also G3KQL. He and G3KFA/VK5YL are on a three year tour with the R.A.F. out there and are looking for Gs on 7, 14 and 28 Mc/s. Ex-G3LCS now **VSIHO** is chasing DX on 28, 21 and 14 Mc/s. He remarks that 1.8 and 3.5 Mc/s are almost unheard of in VS1 while 7 Mc/s is used largely for a Sunday morning phone net!

Finally, news from *The DX'er*, excellent organ of the Northern California DX Club. K6ENX worked FB8BR, who said he would leave for Paris in March 1958, but plans a little Comoro operation ere then. Something very new is that there will soon be two permanent stations in the Comoros, one on Moroni Is. and one on Anjuan Is. The boy on Anjuan has passed his examination and hopes to be on in the New Year as FB8CB, but this has yet to be confirmed. ZC3AC has his receiver at Singapore for repair.

And that is all for the first month of 1957. Thanks to all of you who have continued to support this column during the past twelve months and have kept the news flowing. A very happy New Year, full of good hunting. 73.

The Treatment of Electric Shock

By ARTHUR C. GEE, M.R.C.S., L.R.C.P., D.P.H. (G2UK)*

ONE cannot repeat too often the warning that "one slip in dealing with electrical equipment may mean death." Timely reminders of the dangers have been given from time to time in this journal. The writer has been asked to contribute this article so that those who, by accident or carelessness, do "get a packet" may be assisted by other people in the house and thus help avert death or severe injury.

*East Keal, Romany Road, Oulton Broad, Suffolk.

It is difficult to specify a minimum lethal or dangerous voltage—circumstances will affect the issue—but quite low voltages may produce injury. Normally the tissues of the body offer considerable resistance to an electric current; particularly is this so of the skin. Once this resistance has been broken down and current begins to flow, a rise of temperature of the tissues takes place, causing a fall in resistance, so that further passage of current is facilitated. The conductivity of the tissues depends on their water content; the greater the latter

the lower the resistance. Thus a moist, clammy palm of the hand will conduct at a lower voltage than one which has hard, horny, dry skin.

It is generally accepted that below 500 volts alternating current is more lethal than direct current, but above this voltage direct current is the more dangerous. This would rather suggest that once the resistance of the tissues has been broken down by a sufficiently high voltage it is the amount of current flowing which does the damage. It is very unwise, therefore, to adopt an attitude of complacency and lull oneself into a state of false security by assuming that because the voltage is not "particularly high" or that the current is "only d.c." there is no danger.

The results of a severe electric shock may lead to death

or to injury. Death may result from interference with the action of the heart or from the muscles of the chest-wall going into a spasm, preventing normal respiratory movements and thus causing asphyxiation. In milder cases injury only may result, either from burns at the site of contact or from falls sustained as a result of involuntary muscular movements at the time of the shock. As a rule electrical burns heal slowly and, if extensive, may scar badly, thus inflicting disfigurement or disability.

Action to take

When one comes to consider treatment the first and obvious point to make is that the electrical source must be stopped immediately. It is here that one sees so well

Safety Recommendations for the Guidance of Radio Amateurs

1. Orderliness in the layout of an amateur station is the keynote of safety. To this end all apparatus and wiring should be so placed that it is impossible to receive a high-voltage shock under normal operating conditions. When tests and experiments are being carried out on the apparatus it is not always possible to evolve a perfectly safe layout, and in such cases special care should be taken. The circuit and the apparatus should be studied beforehand with a view to discovering all conceivable sources of danger, including such hazards as faulty insulation in condensers and transformers.

2. All high-voltage equipment, including filter condensers and valves, should be enclosed wherever possible, preferably in an earthed metal case.

3. All high-voltage wires should be suitably insulated and kept as short and as stiff as possible. It is also helpful to colour them distinctively.

4. Anode tank coils and aerial coupling coils should be mounted on porcelain or other rugged insulators. Clip connections when used should be of the positive-grip type and preferably fitted with insulated sleeves. The h.t. should always be switched off when making adjustments; or still better an automatic safety switch should be provided which switches off the h.t. supply when the metal covers are removed. Interlock switches should not, however, be regarded as first line safety measures but as additional.

5. When the transmitter is operated from public supply mains the aerial must not be

directly connected to the anode coil of the output valve (see note in G.P.O. Licence).

6. A double-pole switch-fuse of the iron-clad type should be fitted on the mains side of the rectifying or high-voltage equipment. This switch should be clearly marked with ON-OFF positions and should be mounted in a position which will permit it to be operated without difficulty before adjustments are made to the transmitter. The switch should be connected so that when in the OFF position the fuses are "dead," thus permitting their safe replacement whenever necessary.

7. A red pilot lamp should be fitted across the primary circuit close to the output side of the double-pole mains-switch. The lamp should be so mounted as to be clearly visible to the operator at all times. Small neon lamps may also be inserted across the primaries of all h.t. transformers. All lamps, however, are liable to fail and the absence of a light should not be taken to indicate that the circuit is safe. To avoid this danger, the mains ON-OFF switch should be of the change-over type so connected that when the h.t. is OFF a green or blue safety light is ON.

8. Transformer cases and cores, lead-sheathed cable and other metal-work should be connected together by means of copper wire of a size not less than 7/22 s.w.g. or copper strip and then connected to a reliable earth. Gas pipes should never be used for this purpose, but most cold-water pipes are satisfactory.

9. Bleeder resistances for draining away accumulated charges should be connected across the terminals of all fixed condensers used in smoothing circuits working at voltages in excess of 200 volts. These should be of a reliable wire-wound type and of such a value that the voltage falls to a low value in less than a second.

10. Morse keys should not be connected in h.t. circuits over 250 volts. Where this is unavoidable, the key should be of the enclosed insulated type or a keying relay should be used.

11. Insulated extension spindles should be fitted to transmitting tuning condensers unless they are already connected to earth.

12. Common earthing connections should not be bunched under one terminal unless a number of terminal nuts are provided. A bus-strip fitted with terminals or connecting screws is advocated in order that each wire may be terminated separately. Bunched wires have a tendency to work loose.

13. Some other person in the house should know how to switch off at the main switch in the event of an emergency. Provision should, however, be made to prevent the operation of the main switch by unauthorized persons or by children in the absence of the operator. A pair of rubber gloves kept in an obvious position might save a would-be helper in the event of the operator falling on to the h.t. circuit.

14. Telephones and microphones should be isolated from h.t. circuits by isolating transformers, the cores of which should be

earthed. Earthed shields between primary and secondary windings are recommended. Microphone stands should also be earthed.

15. Where the floor is likely to be damp, a rubber mat, not less than 1/16 in. thick, should be placed in every position from which the h.t. parts of the apparatus could be touched.

16. If it is necessary to touch any part of the transmitter while the power is ON, the operator should use only one hand, keeping the other hand in his pocket or behind his back. Whenever two hands are used to adjust the transmitter, there is a grave risk of receiving a shock which might paralyse the heart muscles.

17. It is not only the transmitter that can be dangerous. Receiving equipment and television receivers can also produce fatal shocks and should be treated with the same caution as a transmitter.

18. The greatest care is necessary when servicing a.c./d.c. equipment in which the whole chassis may be "alive." It is unsafe to operate such apparatus in the vicinity of hot-water radiators and other exposed earthed bodies which might be touched by the operator. Rubber gloves and a rubber mat are the only safeguards against accidents with such equipment.

19. Don't take chances, even when the voltage is relatively low. Although the voltage may not be high enough to cause death, the muscular reaction can often be so violent as to result in serious physical injury.

the truth of the statement that the "medium voltages" may, in fact, prove to be the most fatal, because a really high voltage may produce such an instantaneous and widespread muscular convulsion that the patient is thrown clear and thus automatically severed from further contact with the source.

A less severe shock may produce only local muscle spasm, thus making it impossible for the patient to let go of the contact. A would-be rescuer must be careful not to lay himself open to receiving a shock. If the appropriate switch cannot be located, try to pull the body clear, either with some insulating material, such as a broom or catch hold of the patient's clothing and drag him free with that.

The next step is to treat the state of collapse, or "shock" as it is called. If the patient is unconscious wrap him in blankets and leave him on the floor where he is until he begins to recover. Hot water bottles should be placed under the blankets to restore body heat. A warm drink of sweet black coffee is useful. *Do not give any alcohol.* In the meantime, medical aid should be summoned.

If the patient is unconscious, ascertain whether he is breathing; if he is not, artificial respiration should be applied. Even if, as is possible, you are not expert, some attempt should be made until more expert assistance arrives, as it may mean saving the patient's life. The easiest method for the layman to adopt is to place the patient flat on the ground face downwards; draw the arms forward and then, kneeling at the patient's side, press down on his chest wall, counting four slowly. Then relax the pressure slowly, again counting four, and repeat until more expert help arrives.

After-effects

Those who have had the misfortune to experience a severe electrical shock—and the writer has to admit to being one—will say that one of the most distressing after-effects is the phobia which occurs from time to time during the weeks that follow. Depending on the victim's mental make-up, this may amount to little more than a very healthy respect for the piece of equipment which caused the shock. On the other hand it could produce a state bordering on terror at even entering the room in which the incident took place.

The usual symptoms of terror, viz., sweating, palpitations and so forth can be seen and, in these cases, reassurance and sedatives should be given until the patient has regained his confidence and the episode has sunk to its proper level in his subconscious mind.

R.S.G.B. News Bulletin Service

GB2RS	3600 kc/s
10.00 G.M.T. Sundays	12.00 G.M.T.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the October 1955 issue of the R.S.G.B. BULLETIN:—

Grimsby Amateur Radio Society, c/o J. Browne, 245 Yarrow Road, Grimsby, Lincs.

Manchester & District Radio Society, c/o J. A. Elliott (G3KIQ), 2 Pennine Close, Higher Blackley, Manchester 9.

Radio Club, Student's Union, Queen's University, Belfast, Northern Ireland.

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Written by MARGARET MILLS, G3ACC

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New Ruskin House, Little Russell Street,
London W.C.1

CQ Single Sideband

BY H. F. KNOTT (G3CU)*

MUCH pleasure will be derived from the recent announcement made by the Society that single sideband is one of the forms of emission which may be used on the new 70.2-70.4 Mc/s band. Hitherto some concern had been felt that the opportunity to exploit this new band, with its great technical potentialities, was to be denied the sideband enthusiasts, but this point has now been cleared up and a go-ahead authorized.

S.S.B. V.h.f. DX Possibilities

With the gradual rise in m.u.f. over the next year or two the use of s.s.b. is certain to mean an early start to DX communication at these frequencies, and in particular cross-band operation with stations operating on 72 Mc/s as well as on the 50 Mc/s band. It is hoped that during the next two years as many stations as possible will become operational at these frequencies, and so add substantially to the contribution to be made by amateurs during the coming International Geophysical Year.

DX Bands

The highlight of this bi-monthly report is undoubtedly the news of the first s.s.b. W.A.C. during a multiway QSO. On October 28 at 08.00 G.M.T., PY2JU, VK3AE, ZL3PJ, KA2FC, DL4SV, CN8GD, W5SVP and G3HRO made contact, all stations being received 100 per cent.

There are now more than seventy countries with s.s.b. stations in all parts of the world, the increase in activity having greatly accelerated over the past twelve months. The list includes some of the more elusive countries; they are to be found, however, as may be confirmed by the more regular operators on the DX bands. Countries heard to date are AP, CT1, CE, CO, CP, CX, CN8, DL1, DL4, DJ1, EI, EL, EA, F, FS7, G, GM, GI, GC, GW, HR, HP, HH5, HB, I, JA, KZ5, KV4, KX6, KL6, KL7, KH6, HR6, KT1, KP5, KP4, KC4, KG6, KG1, LA, LU6, ON, OZ, OH, OE, OA, OQ, PJ, PA0, PY, SM, SP, SV0, TG, TF, UA0, UA2, VU2, VU4, VS6, VP2, VR2, VK, VP7, VP9, W, XE, YV, ZD4, ZS3, ZS6, ZB1, 9S4, 4X4, 4S7 and 5A2.

OH2OJ is to be heard regularly on 14 Mc/s putting out a very potent signal from his phasing-type transmitter. He has a new final under construction using a 4-65A tetrode, while CP5EK, operating on 14 and 28 Mc/s runs a 4-250A. Rumour has it that a UA0 is now operating with s.s.b. on 14 Mc/s, although no details are yet available concerning his equipment. If confirmed, this will make two U.S.S.R. stations using the system.

AP2BP Back Home Soon

AP2BP is due back in England where he hopes to visit old friends. Whether or not Bob will be returning to Pakistan is not yet certain—maybe he will turn up with another rare call!

From the American continent a whole host of new countries are making their appearance. PY2JU is running a 500 watt linear amplifier driven by a Multiphase 20A exciter. Other interesting calls heard recently include YV5FL, CX5AF, LU6DHR, CE2HV, CP5EK, HR2WC, KV4AA, CO5LF, OA4CL and VP9HH. VS6BE owns a Collins KWS1 and a 75A4 receiver and is very satisfied with their operating capabilities.

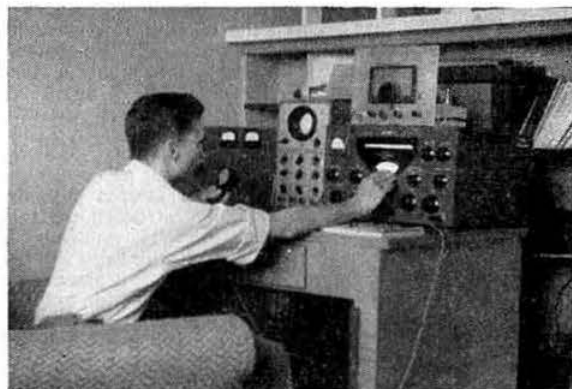
A Fine Record

ZS6KD and W9EWC have now completed 536 successful two-way contacts spread out over the past two years,

which is a fair indication of the consistency of s.s.b. Those interested in low power working will be pleased to hear that VK3AHR is working regularly into the U.S.A. with less than one watt input. ZBICZ says it took him a year to build his phasing exciter and get going on sideband; however he is now making up for lost time, for in less than three months he has worked over 40 countries.

VE3EGO (ex-G3IXL) has just returned to Canada after a Christmas holiday in the U.K. He asks that it be made known that his recent period off the air has been due to an enforced rebuild. His new rig for 14, 21 and 28 Mc/s is to contain one mixer only, selecting a suitable crystal for each band to beat against a 2 Mc/s v.f.o. Appropriate phase-shift networks for each band will be switched in. The final will consist of a pair of 4X150As running 300 watts.

Each week new stations are heard on 14 Mc/s and the top end of this band is now becoming highly congested. May the appeal be again made, as was for 3.7 Mc/s, that stations spread out a little more and make full use of the band that is available to us.



VE3EGO (ex-G3IXL), Kitchener, Ontario, is mainly active on 14 Mc/s, running 100 watts s.s.b. In this picture, the linear amplifier is on the left and the Collins 75A4 receiver to the right, with the phasing exciter on top.

New stations on single sideband on the DX bands include JA1AEA, TG9AO, ZL1BL, DJ1XD, GM3CIX, XE2JK, HH5DR, TF2WBI, TI4JG, VP7NQ, KC1FR and I1LOV. On 28 Mc/s there is quite a spate of activity, including several Gs, all W call areas, KZ5, KH6 and CP5, while several others have equipment under construction.

The 3.5 Mc/s Band

Quite a number of VO and VE stations are again manifesting themselves around 3.8 Mc/s. At the high end of the 75 metre band several QSOs have been heard taking place between Ws, all with good signal strengths. It is hoped that they will soon become aware that they are being heard in this country and begin looking for Europeans.

G3FHL, who has been somewhat inactive recently made a welcome return over the Christmas period. He has been devoting some time to finishing off his single sideband receiver. He says that during tests on the demodulator circuit he found that the product detector was inclined to be noisy. He has therefore reverted to a germanium diode for the present, but hopes later to try an infinite impedance detector with strong b.f.o. injection. The performance of the latter is comparable with a diode

*15 Hampden Road, Wantage, Berks

detector, but has the advantage that its input impedance is very high, and presents very little damping to the r.f. circuit from which it is fed, and so is an aid to better selectivity. Very little news has been received in connection with the l.f. bands this month, apart from the fact that G8DM, G8PX, G3HNY and G3GFY are at present building transmitters.

Topical Topics

No longer is an oscilloscope necessary for the alignment of a phasing type exciter. At last someone has come forward with a really simple yet effective "gimmick" consisting of a germanium diode in series with a pair of phones and a two turn link. There is nothing spectacular in this suggestion put forward by G3CWB except that it has not apparently occurred to anyone before.

The mode of operation is not at all difficult and is carried out by slipping the link over the exciter output coil (not the p.a. coil of course). A sine wave, say 1.5 kc/s is fed to the microphone socket. A 1.5 kc/s tone will be heard in the phones, but then by carefully adjusting the carrier balancing potentiometers the 1.5 kc/s tone should become almost inaudible, leaving a 3 kc/s tone (the beat between the upper and lower sidebands). By adjusting the r.f. and audio phasing controls this tone too can be reduced to a minimum (a very pronounced minimum). The points to watch are (i) to keep the audio down so that no overloading can take place and the tone can be heard just comfortably in the phones; (ii) throughout the entire adjustment the carrier balance must be fairly well on the nose, otherwise the fundamental tone will mask the beat between the sidebands. The two tones can actually be heard together and easily distinguished as the carrier is reduced. It may be advisable to balance the carrier first by the use of a receiver and S meter, so as to be somewhere near the correct point of adjustment, however, a little practice will enable an accurate adjustment to be made. As with an oscilloscope this method of alignment will not indicate which sideband has been phased-out; this must be checked in the usual manner on a receiver, and depends of course on which way the balanced modulators have been wired. If a switchable sideband facility is included in the exciter, adjustment for optimum sideband attenuation, in either position of the sideband switch, must be allowed for.

The writer would like to thank all those who sent Christmas Greetings, and to wish all readers a very prosperous New Year.

New Flat Picture Tube

SPEAKING to the Television Society recently on the design of his new flat television tube, Dr. Denis Gabor, F.R.S., said that the idea came to him four years ago. Since then it had been worked out with the aid of the National Research Development Corporation in the Electronics Laboratory at Imperial College.

By 1952 it appeared certain that tube manufacturers would soon be faced with the problem of a reliable and inexpensive colour television tube and the flat tube seemed to be the solution of the colour tube problem. The tube itself has the shape of a rectangular glass box having a total depth of only 4½ in. for a 21 in. screen. It is divided into two halves by a metal tray which carries the whole electron optical system and which also acts as a magnetic screen for the beam. By an ingenious system of electron lenses the beam is curved to run parallel with the glass faces of the tube and is finally deflected towards the screen by a series of conductors which run parallel to the screen itself.

The flat tube can be made safer than the conventional television tube because the glass is specially toughened, as in car windscreens. These tubes might therefore dispense with the safety screen in front. They would not be damaged by accidental scratching.

The tube has several novel features of construction including the use of silicones as insulation in the electrode system. This, as far as is known, is the first time that they have been used in a sealed off vacuum device. For colour television, the separate phosphors are deposited on the glass face through a shadow mask by a method which will prove far more economical than the present method of depositing a colour screen by printing a phosphor in register.

In conclusion, Dr. Gabor stressed the fact that the tube was still in the development stage, but the main problem of making a satisfactory flat tube for colour television has been solved. He thought that the time was now ripe for the tube to be produced on a commercial basis. The tube is protected by British Patent No. 739496, 1953 (U.S. Serial No. 309677) and others.

London Meeting Friday, March 1, 1957 "MODERN AMATEUR COMMUNICATION RECEIVER DESIGN" by R. G. Lane (G2BYA)

at the
Institution of Electrical Engineers,
Savoy Place, Victoria Embankment
Buffet Tea 6 p.m. Lecture 6.30 p.m.

G3CTS/T

THE Television Society's station G3CTS/T at South Norwood, London, is on the air on Mondays, Wednesdays and Thursdays from 7 to 9 p.m., when test card C from a monoscope and a test pattern are radiated on 427 Mc/s. The sound transmission is on 423.5 Mc/s. Reports on the reception of signals from G3CTS/T will be welcome. They can be sent via the R.S.G.B. QSL Bureau or direct to the Television Society, 164 Shaftesbury Avenue, London W.C.2.

Band III TV Film Strip Lecture

BELLING & Lee, Ltd., have produced a colour film strip telling the story of Band III reception, primarily for Scottish dealers participating in the exhibition organized by Scottish Television, Ltd., the I.T.A. programme contractors for Scotland. The lecture will be given in Edinburgh, Stirling, Glasgow and Dundee. Admission will be by ticket obtainable from Belling & Lee, Ltd., Great Cambridge Road, Enfield, Middlesex.

Colour Transparencies

THE Council proposes to build up a collection of colour transparencies of modern Amateur Radio stations. Members willing to assist in furthering this project by donating transparencies to the Society, are asked to communicate with Mr. Arthur Milne (G2MI), 29 Kechill Gardens, Hayes, Bromley, Kent, who has agreed to organize the collection.

Brief details should be given of the equipment illustrated in each frequency.

Can You Help?

● J. H. Jones (B.R.S.20740), 62 Grangefields Estate, Guildford, Surrey, who urgently requires the circuit diagram, handbook or any other information on the "Hambander" receiver?

Supplementary Report of the Council*

DURING the six months that have elapsed since the Society's last financial year ended a number of interesting developments have taken place. The purpose of this Supplementary Report is to refer briefly to some of those developments.

The new 70 Mc/s Band

The announcement made in November that U.K. amateurs, except those living within a radius of 50 miles of Jodrell Bank Observatory, were to be allowed to use 200 kc/s between 70.2 and 70.4 Mc/s came after many months of negotiation between the G.P.O. Liaison Committee and representatives of the Post Office. The Council is confident that good use will be made of this important concession.

TVI Policy

The announcement, also made in November, that the Post Office had modified its policy in respect to TVI will have been warmly received by those members who in the past have been compelled to restrict their transmitting activities because of TVI brought about by "blocking" of a neighbouring receiver. The decision of the Post Office to allow an amateur, after a period of one month has elapsed from the time the complaint was investigated, to carry on his activities during television hours if it can be shown that the interference is capable of being cleared by means of a simple high pass filter, should pave the way for greater activity on the DX bands. The Council has continued to assist those members who have been faced with TVI problems.

R.A.E.N. and the Red Cross

It was announced in August that the Postmaster General had agreed to allow R.A.E.N. volunteers to handle third-party messages on behalf of the British Red Cross Society in conditions of emergency. This important concession has been warmly welcomed.

National Radio Show

The Society's participation in the National Radio Show at Earl's Court, London, last August, focused attention on the Amateur Radio movement. Emphasis was placed on showing the interested layman how to become a radio amateur. Mr. F. F. Ruth (G2BRH) again carried out his duties as Stand Manager with great zeal and efficiency.

Schoolboy's Own Exhibition

The decision to apply for space at the Schoolboy's Own Exhibition (held in London from December 31, 1956, to January 12, 1957—Ed.) was made as the result of a suggestion put forward by Mr. R. F. G. Thurlow (G3WW). The Council is of the opinion that the publicity given to Amateur Radio at the Exhibition will greatly benefit the Society.

Meetings

Official Regional Meetings were held in York (July 1), Aberdeen (September 28), Torquay (October 7), and Liverpool (November 11). Excellent attendances were recorded at the York and Liverpool meetings but attendances at Aberdeen and Torquay fell short of expectations.

The Council records its thanks to those who were responsible for organizing the meetings.

The Scheme of Representation

The Council is concerned at the apparent lack of interest in the present Scheme of Representation.

Fourteen members only had been nominated as County Representatives up to the closing date for nominations, while the office of Region 8 Representative has been vacant for several months. Many towns are without a local representative.

Within the last few weeks the Membership and Representation Committee have given consideration to the Scheme of Representation and have put forward certain recommendations to the Council which, if adopted, may lead to increased interest in the Scheme.

Membership Drive

During the past six months an intense membership drive has been taking place. First fruits of the drive will have become apparent to those who have scanned the New Members' lists in recent issues of the R.S.G.B. BULLETIN.

The decision to insert an application form in each copy of the August issue produced immediate results, more than 150 forms being returned to Headquarters within two months.

A drive for new members on the R.S.G.B. stand at Earl's Court also proved effective, as has the effort of an individual member (Mr. J. D. Kay, G3AAE) who has sent letters of invitation to join the Society to more than 200 overseas amateurs he has contacted during recent months.

Publication in *QST* of a letter from Capt. Jordan (W3FIU) (now stationed in London with the U.S. Navy) in which he wrote enthusiastically about the R.S.G.B., resulted in requests for details of the Society's work from more than 100 U.S. amateurs, a number of whom have now joined the Society.

The Council accepted, with thanks, an offer by Mr. Hicks-Arnold (G6MB) to provide the Society with a quantity of stickers for use on QSL cards, inviting recipients to write for details of R.S.G.B. membership. Mr. J. J. Maling (G5JL) is thanked for his suggestion in this connection.

New Publications

A new Society publication *Amateur Radio Certificates and Awards* was published in August. The thanks of the Council are recorded to Mr. Ron Perks (G4CP) for compiling the information contained in the booklet.

Another new Society publication *The Morse Code for Radio Amateurs* was published in December. The manuscript of this booklet was donated to the Society by Margaret Mills (G3ACC) who is thanked for her generosity.

When it became known that the Society's application to take space at the Schoolboy's Own Exhibition had been accepted, steps were taken to reprint the Sixth Edition of *A Guide to Amateur Radio*, stocks of the first printing having become exhausted.

The Amateur Radio Handbook

Of great moment was the decision taken by the Council in October to proceed with the preparation of a new edition of *The Amateur Radio Handbook*. The Council

Continued on page 326

* This Supplementary Report was read by the President to the members present at the Annual General Meeting held on December 14, 1956. It is reproduced here for the information of all members.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, November 19, 1956, at 6 p.m.

Present.—The President (Mr. R. H. Hammans in the Chair), Messrs. W. H. Allen, H. A. Bartlett, C. H. L. Edwards, K. E. S. Ellis, D. A. Findlay, F. Hicks-Arnold, J. H. Hum, R. G. Lane, W. H. Matthews, W. R. Metcalfe, A. O. Milne, L. E. Newnham, J. Taylor, John Clarricoats (General Secretary) and John A. Rouse (Deputy General Secretary).

Apology for Absence

An apology for absence was submitted on behalf of Mr. W. A. Scarr.

Absent: Mr. H. W. Mitchell.

Membership

(a) **Resolved** (i) to elect 121 Corporate Members and 3 Associates; (ii) to grant Corporate Membership to 2 Associates who had applied for transfer.

(b) The Secretary reported that of the 546 members whose subscription became due on August 1, 1956, 58 became overdue on October 31, 1956. Of this number 7 were London, 35 were Country, 15 were Overseas Corporate Members and 1 was an Associate. Of those overdue 2 London, 17 Country and 12 Overseas members held an Amateur Radio licence.

(c) The Secretary reported that 16 of the 58 members referred to in (b) above had written to resign. Of this number 3 had given no reason for resigning, 1 had resigned for personal reasons, 2 had resigned for financial reasons and 10 had lost interest in Amateur Radio.

(d) The Secretary reported that the Wireless Telegraphy Act did not permit the P.M.G. to waive the licence fee for blind radio amateurs.

Applications for Affiliation

Resolved to grant affiliation to the Ashington & District Amateur Radio Club; Grimsby Amateur Radio Society; Hartlepool Amateur Radio Club; Radio Club of Queen's University, Belfast; R.A.F. Ayios Nikolaos Amateur Radio Club; and the Stoke-on-Trent Radio Society.

Film History

Resolved (i) to authorize the Honorary Film Curator to produce a composite 16 mm. film (made up from numerous old Society films of historic interest) to give a running time of approximately one hour; (ii) to carry out the project in easy stages; (iii) to authorize the expenditure of £25 during the current financial year.

It was estimated that the total cost of producing the completed film would be about £75.

V.H.F. Contests

A motion that V.H.F. Contests should be handled by the V.H.F. Committee was rejected. An amendment to the foregoing motion to the effect that V.H.F. Contests should continue to be handled by the Contests Committee was adopted.

European V.H.F. Contest, 1957

The Secretary was instructed to write and request the Hon. Secretary, Region I Division, to obtain official information regarding the 1957 European V.H.F. Contest which it had been stated was to be organized by the R.S.G.B.

Consideration was given to a Report prepared by the Contests Committee dealing with the rules for European V.H.F. Contests as approved at the Stresa I.A.R.U. Conference.

A Guide to Amateur Radio

Resolved to accept an estimate submitted by South London Press, Ltd., for reprinting 5,000 copies of *A Guide to Amateur Radio*.

R.S.G.B. Amateur Radio Call Book

It was reported that Mr. John Tyndall, G2QI, would be unable to continue his duties as Honorary Call Book Editor.

Resolved to place on record the thanks of the Council to Mr. Tyndall for his services to the Society in connection with the *Call Book*.

Mr. E. Brown (G3CSP)

It was reported that the opinion of Learned Counsel was being sought in connection with certain aspects of the case of Mr. E. Brown (G3CSP) of Sheffield. (Mr. Brown was recently compelled to close down his station under a threat from the Housing Manager of the Sheffield City Council that if he did not do so his mother-in-law, with whom he lived, would be deprived of the tenancy of her Council house. Mr. Brown had been accused by certain neighbours of causing interference to the reception of television.)

Visit to B.R.C.S. Headquarters

Mr. Newnham reported on the recent visit of members of the R.A.E.N. Committee to British Red Cross Society Training Headquarters at Guildford. Mr. Newnham stated that General Hawes and his staff had accorded a most cordial welcome to the members of the Committee.

Rating and Valuation

After considering advice given by the Society's legal advisers it was decided not to appeal for exemption from the payment of local rates under the terms of the Scientific Societies' Act, 1843. The Secretary informed the Council that he and the Society's legal advisers had considered a number of precedents, from which it appeared that the Society would be unlikely to succeed in an appeal.

Cash Account

Resolved to accept and adopt the Cash Account for October 1956 as prepared and submitted by the Secretary.

Reports of Committees

Contests

Resolved to receive, and adopt as Reports, the Minutes of Meetings of the Contests Committee held on October 18 and November 15, 1956, and to adopt the recommendations contained therein.

The recommendations dealt with the award of trophies and certificates to winners and runners-up in contests.

Consideration was given to a letter from the Gloucestershire C.R. (Mr. Perkins) regarding the decision of the Contests Committee to permit the 21 and 28 Mc/s bands to be used during N.F.D. 1957. A letter from the Contests Committee outlining the gist of the reply which it was proposed to send to Mr. Perkins was also submitted.

Resolved to receive the correspondence.

The Scottish Zonal Representative reported that he had visited Glasgow recently to discuss with Mr. Maitland the arrangements for awarding the trophy which Mr. Maitland had presented to the Society.

It was resolved to request the Contests Committee to consider the suggestions put forward by Mr. Maitland and to report upon them to the Council.

Exhibition

Resolved to receive, and adopt as Reports, the Minutes of Meetings of the Exhibition Committee held on October 22 and November 9, 1956, and to adopt the recommendations contained therein.

The recommendations concerned the forthcoming Schoolboy's Own Exhibition and a proposal to drop the words "Home Constructor's Section" from the title of the Committee.

R.A.E.N.

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the R.A.E.N. Committee held on November 3, 1956.

A recommendation dealing with the action to be taken by the Committee when approached for help by organisations other than the British Red Cross Society, was adopted in modified form.

Technical

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the Technical Committee held on November 8, 1956. The Report contained no recommendations.

The Secretary reported that a Sub-committee had been set-up to advise and assist the General Editor of *The Amateur Radio Handbook* (Mr. S. K. Lewer). The Sub-Committee had prepared a specification for submission to firms of printers who would be invited to tender for printing the handbook.

Mr. W. R. Metcalfe

The Honorary Treasurer Elect (Mr. W. R. Metcalfe) intimated that he would be prepared to continue in office as Zone A Representative.

The Council accepted Mr. Metcalfe's offer. The meeting terminated at 8.45 p.m.

Annual General Meeting

Minutes of the 30th Annual General Meeting of the Radio Society of Great Britain, held in the Lecture Theatre, Electric Lamp Manufacturers' Association, Savoy Hill, London, W.C.2, on Friday, December 14, 1956, at 6.30 p.m.

Present

The President (Mr. R. H. Hammans in the Chair), Messrs. W. H. Allen, M.B.E., H. A. Bartlett, C. H. L. Edwards, A.M.I.E.E., K. E. S. Ellis, D. A. Findlay, D.F.C., A.S.A.A., F. Hicks-Arnold, J. H. Hum, W. H. Matthews, W. R. Metcalfe, A. O. Milne, L. E. Newnham, B.Sc., W. A. Scarr, M.A., J. Taylor (Members of the Council), Messrs. D. N. Corfield, D.L.C. (Hons.), J. W. Matthews and T. A. St. Johnston (Vice-Presidents); Mr. John Clarricoats, O.B.E. (General Secretary), Mr. John A. Rouse (Deputy General Secretary), Miss May Gadsden (Assistant Secretary) and about 70 members.

Apologies for absence

Apologies for absence were received from Messrs. R. G. Lane and H. W. Mitchell (Members of Council).

Notice Convening the Meeting

The General Secretary read the Notice convening the Meeting.

Minutes

It was moved by Mr. Edwards, seconded by Mr. Milne, and resolved that the Minutes of the 29th Annual General Meeting, held on December 16, 1955, as published in the January 1956 issue of the R.S.G.B. BULLETIN, be approved and confirmed.

Annual Report of the Council

It was moved by the President, seconded by Mr. Kempton, and resolved that the Annual Report of the Council as published in the November 1956 issue of the R.S.G.B. BULLETIN be approved and adopted.

The President read to the meeting a short Supplementary Report covering developments which had taken place since the end of the last financial year. (The Supplementary Report is published on page 321 of this issue. EDITOR.)

Messrs. Newton and Deacon spoke on the reception of the Report.

Report of the Honorary Treasurer and the Audited Accounts

It was moved by the Honorary Treasurer (Mr. D. A. Findlay), seconded by Mr. Green, and resolved that the Report of the Honorary Treasurer and the Audited Accounts of the Society for the year ended June 30, 1956, be approved and adopted.

Election of Council 1957

The President declared that the following Corporate Members had been duly elected to serve on the Council:—

Officers			
<i>President</i>			
Mr. D. A. Findlay ..	..	..	Unopposed
<i>Executive Vice-president</i>			
Mr. L. E. Newnham ..	..	..	Unopposed
<i>Honorary Treasurer</i>			
Mr. W. R. Metcalfe ..	..	..	Unopposed
<i>Ordinary Members</i>			
Mr. A. O. Milne ..	..	..	1090 Votes
Mr. C. H. L. Edwards ..	..	..	935 Votes
Mr. W. A. Scarr ..	..	..	654 Votes
Mr. J. H. Hum ..	..	..	604 Votes

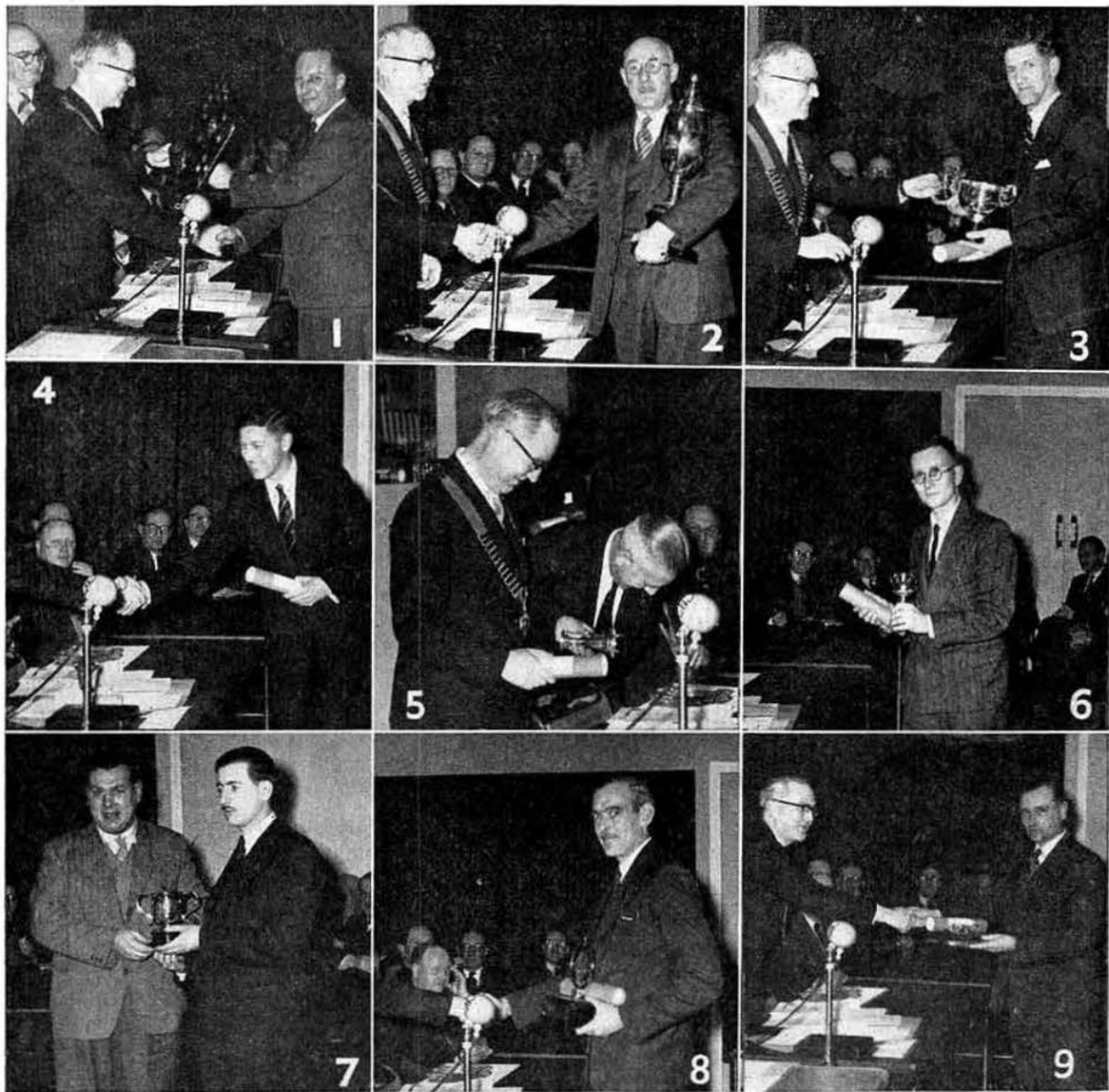
Zonal Representative			
Mr. H. W. Mitchell ..	..	..	Unopposed

The President announced that the following Corporate Members had not been successful in the Ballot to fill the four vacancies among the Ordinary Members of the Council which would occur on December 31, 1956:

Mr. L. Cooper ..	..	..	572 Votes
Mr. J. D. Kay ..	..	..	474 Votes
Lt.-Col. A. C. Dunn ..	..	..	407 Votes
Mr. E. G. Ingram ..	..	..	406 Votes
Mr. E. W. Yeomanson ..	..	..	399 Votes
Mr. S. L. Jacobs ..	..	..	287 Votes

Trophy Winners

It has become a tradition at each Annual General Meeting for the President to present trophies and prizes won by members during the year. At the Annual General Meeting held last month in the Lecture Theatre of the Electric-Lamp Manufacturers' Association, London, a photographic record was made of the presentations, some of the highlights of which are depicted below.



(1) Mr. Roy Poeton (G3CTN) received the N.F.D. Trophy on behalf of Bristol Group. (2) Mr. G. A. Jeapes (G2XY) was awarded the Wortley Talbot Trophy. (3) Mr. A. W. Timme (G3CWV) received the Founder's Cup for his services to the Society as Hon. Secretary of the Contests Committee. (4) Mr. G. A. Bird (G4ZU), designer of the Three Band Minibeam, received the Norman Keith Adams Prize. (5) The President, Mr. R. H. Hammans (G2IG), was the first recipient of the Varney Cup which he received from the Immediate Past President, Mr. H. A. Bartlett (G5QA). (6) The Bevan Swift Memorial Premium was awarded to Mr. A. L. Mynett (G3HBW), author of "Transmission Line Tuned Tank Circuits." (7) Messrs. I. Howard (G2DUS) and I. Waters (G-KKD/T) received the Courtenay Price Trophy for outstanding work in the Amateur Television field. (8) Mr. T. C. Reynolds (B.R.S.21019), winner of the D/F National Final, was awarded the 1950 Council Trophy. (9) Dr. A. C. Gee (G2UK) received the Calcutta Key for his services to the cause of international friendship through the medium of Amateur Radio. Mr. Mynett also received the Arthur Watts Cup.

Copies of the above photographs may be obtained from Mr. F. W. Lawrence (G2LW).

The President thanked those who had assisted with the scrutiny of the Ballot.

The President stated that Messrs. Allen, Ellis, Hicks-Arnold, Lane, Matthews and Taylor had not been required to stand for election this year.

Auditors

It was moved by Mr. Findlay, seconded by Mr. Herdman and resolved to confirm the appointment of Edward Moore & Sons as Auditors for the year ending June 30, 1957, at a fee of 100 Guineas.

Other Business

The President stated that the Secretary had not received notification of any other business.

The meeting terminated at 7 p.m.

Informal Discussion

A short informal discussion then took place.

Presentation of Trophies

At the conclusion of the Annual General Meeting on December 14, 1956, the President (Mr. R. H. Hamman) presented trophies and awards as follows:—

Mr. G. A. Jeapes, G2XV	Wortley Talbot
Messrs. J. Waters, G3KKD/T and I.	
Howard, G2DUS	Courtenay Price
Mr. A. W. W. Timme, G3CWW ..	Founder's
Dr. A. C. Gee, G2UK	Calcutta Key
Mr. A. L. Mynett, G3HBW	Arthur Watts
Mr. T. C. Reynolds, B.R.S.21019 ..	1950 Council
Mr. W. R. Steversen, G3JEQ	Miniature
Bristol Group	N.F.D. Shield and Replica
Croydon Group	N.F.D. Replica
Boston Group	Bristol

The Norman Keith Adams Prize was presented to Mr. G. A. Bird, G4ZU, and the Bevan Swift Memorial Premium to Mr. A. L. Mynett, G3HBW.

The Immediate Past-President presented the Louis Varney Trophy to Mr. R. H. Hamman, G2IG.

Trophy and Prize Winners who were unable to attend the meeting included:—

Mr. P. J. Broom, G5DQ	R.O.T.A.B. Trophy
Mr. G. J. Dent, VQ4AQ	B.E.R.U. Senior Rose Bowl
Mr. J. C. van Wyk, ZS6R	B.E.R.U. Junior Rose Bowl
Mr. A. R. Smith, B.R.S.20206	B.E.R.U. Receiving Rose Bowl
Mr. F. J. U. Ritson, G5RI	Col. Thomas Rose Bowl and Braaten Trophy
Coventry Group	N.F.D. Replica
Edinburgh & Lothians Group	Scottish N.F.D. Trophy
Mr. C. J. Oliver, GW5SL	Arthur Milne Trophy
Mr. H. Beaumont, G5YV	Mitchell-Milling Trophy
Mr. J. J. Yeend, G3CGD	Houston Fergus Trophy
Mr. W. A. Higgins, G8GF	Somerset Trophy
Mr. A. G. Goulding, GW3GWA	Miniature
Mr. H. Boakes, G8SB	Miniature
Mr. D. N. Biltcliffe, G6NB	Miniature
Stourbridge and District Amateur Radio Society	Edgware Trophy

Society News

International Boy Scout Jamboree

THE 50th Anniversary of the foundation of the Boy Scout Movement in 1907, and the 100th Anniversary of the birth of the founder of the Movement (Lord Baden Powell) in 1857, are to be celebrated by the holding of an International Boy Scout Jamboree in Sutton Coldfield, Warwickshire, next August.

Present plans are for an Amateur Radio station to be operated from the camp site using a special call. The organisation of the station will be in the hands of a small committee consisting of members of the Midland Amateur Radio Society, Slade Radio Society and the Birmingham Amateur Television Club.

Members who would like to assist in any way should contact Mr. Allen F. Dennis (G3CNV), 47 Hemlingford Road, Walmley, Sutton Coldfield, Warwickshire.

It is anticipated that R.S.G.B. participation will take the form of a stand situated in the same marquee as the Amateur Radio station.

Maitland Trophy

ACTING on the advice of the Contests Committee, the Council have decided that the Maitland Trophy (generously donated to the Society by Mr. J. C. Maitland, B.R.S.16925, of Glasgow) shall be awarded to the Corporate Member resident in Scotland scoring the highest aggregate number of points in the Second 1956 and First 1957 1.8 Mc/s Contests, and in corresponding contests in future years.

To remove any doubts on the point the Committee expressed the opinion that this ruling shall not prevent a high-scoring station entering for only one of the two Contests from being eligible for the award of the Trophy.

Low Power Contest

THE Council has awarded the 1930 Committee Trophy for the year 1956 to Mr. I. T. Cashmore (G3BMY) in recognition of his success in winning the Low Power Contest.

A Certificate of Merit has been sent to Mr. R. Ashman (G3HXI) who was runner-up in the Contest.

V.H.F. Manager

ACTING on a recommendation of the V.H.F. Committee the Council has decided to recognize the office of V.H.F. Manager to the Society.

Mr. F. G. Lambeth (G2A1W) has accepted an invitation from the Council to undertake the duties of that office.

The 70.3 Mc/s Band

THE Society has been advised by the Post Office that the single sideband system of transmission (A3a) may be used on the 70.3 Mc/s band.

London Meeting

Friday, January 25, 1957

Presidential Address

by D. A. Findlay, D.F.C. (G3BZG)

followed by a lecture-demonstration of Miniature Aerials by F. Charman, B.E.M. (G6CJ) at the

Institution of Electrical Engineers, Savoy Place, Victoria Embankment

Buffet Tea 6 p.m.

Lecture 6.30 p.m.

Schoolboy's Own Exhibition

THE R.S.G.B. stand at the Schoolboy's Own Exhibition held at the Horticultural Halls, Westminster, London, from December 31, 1956, to January 12, 1957, attracted great attention every hour of the day the Exhibition was open.

An Amateur Radio station was operated under the call-sign GB3RS/A. Hundreds of contacts were made with stations in the United Kingdom and on the Continent on Top Band and 80 metres. The equipment was provided by E. W. Yeomanson (G3IIR), C. H. L. Edwards (G8TL) and Peter Smith (A.1372). Other features of the stand included "the lamps which light without wires", a modulated light beam (loaned by C. E. Newton, G2FKZ) and simple equipment for the schoolboy specially built by members of the Exhibition Committee.

The Society was fortunate in being able to call upon the services of several schoolmasters who were on holiday at the time to assist on the stand. The stand was managed by Fred Ruth (G2BRH) who had the help of several London and near London members.

Aerials on the roof of the New Horticultural Hall were erected by members of the Norwood and South London Group led by G3IIR.

The organization of the stand was undertaken by the Exhibition Committee whose Chairman is C. H. L. Edwards (G8TL).

"The Morse Code for Radio Amateurs"

THIS new R.S.G.B. publication, written by Margaret Mills (G3ACC), is intended for the newcomer to Amateur Radio. It contains a series of unique exercises designed to help the student in mastering the Morse Code. Individual copies are available from Headquarters price 1s. (1s. 3d. by post).

Club Secretaries and Town Representatives will be helping local members by placing bulk orders for by so doing the cost of individual postage will be saved.

Headquarters will be pleased to send a specimen copy of this new publication to any college or organisation giving Morse instruction in preparation for the G.P.O. Morse test.

"A Guide to Amateur Radio"

TO meet an ever-growing demand for this popular R.S.G.B. publication, a large revised reprinting of the Sixth Edition has just become available. For the newcomer to Amateur Radio *The Guide* is a "must".

Descriptions of simple equipment, licence regulations, abbreviations, international prefixes, the Morse code, are among the many subjects dealt with in its 40 pages.

Individual copies are available from Headquarters price 2s. 6d. (by post 2s. 10d.). Club Secretaries and T.R.s are urged to order in bulk to save the cost of postage for local members.

Frequency Measuring Test, December 30, 1956

THE frequency in use at G3DQ (operating as GB2RS) during the period of the test was 3604.65 kc/s.

Measurements within 25 parts per million of the correct value were submitted by G. W. Alderman (G3JXA) and H. O. Sills (G8QZ), and within 50 parts per million by D. Willies (G3HRK) and G. B. Horsfall (G3GKG).

This test concludes the present series.

Morse Records

APPROPOS the query raised last month, Mr. K. F. Moss states that Morse training records (78 r.p.m.) are available from the Linguaphone Institute, 207/209 Regent Street, London, W.1.

The Course is in two parts, Part I working up to 8 words per minute and Part II from 8 to 12 w.p.m. Each part comprises five double-sided records and a text book and costs £2 1s. 11d., plus 3s. 6d. packing and postage.

New Year Honour's List

COL. SIR STANLEY ANGIN, K.B.E., D.S.O., M.C., T.D., one time Engineer-in-Chief of the Post Office and now Chairman of the Commonwealth Communications Board, becomes a K.C.M.G. and Squadron Leader P. M. S. Hedgeland, M.B.E. (G2DBA) is promoted to O.B.E.

A.R.R.L. Handbook

COPIES of the 1957 edition of the *Radio Amateur's Handbook* are expected to reach Headquarters early in February. Orders can now be accepted at the rate of 34s. per copy, post free.

Broadcast Receiving Licences

AT the end of November 1956, 14,424,236 broadcast licences were current in Great Britain and Northern Ireland. Of this number, 6,433,417 were for television, and 310,690 for sets fitted in cars. The number of television licences increased by 142,345 during the month.

Talking Book Service

MR. J. C. COLLIGAN, O.B.E., Secretary, Nuffield Talking Book Library for the Blind in a letter to the General Secretary, asks that his thanks be conveyed to all who answered the recent appeal for volunteers to help with the talking book service.

Supplementary Report of the Council

Continued from page 321

are aware of the magnitude of the task facing the Handbook Sub-committee which has been set up to assist Mr. S. K. Lewer, B.Sc. (G6LJ), whose generous offer to act as General Editor has been warmly appreciated.

The Council plan to publish the Handbook towards the end of 1957 and hope to offer it for sale at a price between 15s. and 21s.

Contests

During the period from July 1, 1956, until the end of December 1956, a number of fixed station and field day events were arranged by the Contests Committee, the most important in the former category being the World Wide 21-28 Mc/s Telephony Contest held in November under good radio conditions.

N.F.D. 1957

Acting on the advice of the Contests Committee the Council has agreed that for the year 1957 the maximum input power which may be used by N.F.D. stations shall be increased to 10 watts. The Council has also agreed to permit operation on two additional bands, viz., 21 Mc/s and 28 Mc/s, and to approve the use of the rising serial number system of scoring.

FOR AND ON BEHALF OF THE COUNCIL,
R. H. HAMMANS,
President.

The Social Side

Thames Valley Annual Dinner-Dance

THE Annual Dinner-Dance of the Thames Valley Amateur Radio Transmitters' Society was held at the Carnarvon Castle, Hampton Court, on Saturday, December 8, 1956. The President of the Society, Mr. Leslie Cooper (GSLC) and Mrs. Cooper, welcomed more than 70 members and their ladies, including representatives from neighbouring Societies and Clubs. Mr. W. E. Russell (G5WP), in proposing a toast to the R.S.G.B., recalled how, during the war years, the R.S.G.B. Council had planned for the early return of licences. The fact that United Kingdom amateurs were back on the air only a few months after "VJ Day" was due entirely to the excellent liaison which existed between the Society and the Post Office. Mr. Russell spoke of other war-time activities of the Society and referred to the successful effort made since the war to obtain more liberal licensing regulations.

In reply to the toast, the General Secretary of the R.S.G.B. (who is also a Vice-President of the Thames Valley Society), spoke of recent developments, mentioning in particular the release of frequencies in the 70 Mc/s band and the decision of the Council to proceed with plans for the publication of a new edition of the *Handbook*. Mr. Clarricoots recalled that nearly 200,000 copies of the Second Edition were sold during, and just after, the war, the effect of which was to increase the assets of the Society from £1,000 in 1939 to nearly £15,000 in 1947.

Mr. Stanley Vanstone (G2AYC), President of the Sutton and Cheam Radio Society, proposed a toast to the Thames Valley Society and Mr. Cooper replied.

Council Member Frank Hicks-Arnold (G6MB) welcomed the ladies and male guests, and Mrs. Graham Leicester replied.

Bouquets were presented to the wives of the members of the Committee in appreciation of their assistance to the Society in offering hospitality at Committee meetings.

The rest of the evening was given over to dancing, entertainment and a draw for prizes donated by members and friends of the Thames Valley Society. Mr. Alan Mears (G8SM) acted as Toastmaster.

Ham-Hop Club

ARE you interested in Ham Holidays abroad? Would you be willing to extend hospitality to visiting amateurs for periods not exceeding 24 hours at a time? If so, write to Mr. George Partridge (G3CED), 17 Ethel Road, Broadstairs, Kent, for details of his Ham-Hop Club enclosing a stamped addressed envelope.

Last June Mr. Partridge carried out an interesting experiment. Using a 49c.c. Moped for transport he enjoyed a most pleasant 16 days holiday abroad, thanks to the kindness of a dozen or so German amateurs each of whom offered him overnight hospitality.

Having returned from the trip G3CED conceived the idea of the Ham-Hop Club (no fees, no rules), the object of which will be to compile a register of radio amateurs who would be prepared to offer overnight hospitality to visiting radio amateurs.

Those who join the Club would not be expected to provide hospitality more than twice in any one year.

Mr. Partridge hopes the Club will eventually become an international body with an organizer in each country.

PLEASE PAY YOUR SUBSCRIPTION PROMPTLY WHEN DUE

London Members' Luncheon Club

THIRTY-THREE members and their ladies were present at the Christmas-tide luncheon held at the Bedford Corner Hotel, Tottenham Court Road, on December 21, 1956. Mr. Stanley Vanstone (G2AYC), Chairman of the Club, presided. The only visitor from abroad, Evald Strobele (in London to study English), brought greetings from German amateurs. Other speakers were G6CL and G6MB.

The Club will meet again for lunch on January 18, 1957, at 12.30 p.m. for 1 p.m. Reservations should be sent to G2FUX (Ruislip 2763) or to R.S.G.B. Headquarters (Holborn 7373) before 12 noon the previous day.

The Club will hold its Second Annual Ladies' Night at the Bedford Corner Hotel on February 22, 1957. All members are cordially invited to support this event which promises to be an even greater success than the 1956 Ladies' Night. Full details can be obtained from G2FUX, 11a Ickenham Road, Ruislip, Middlesex.

A Word of Thanks

THE General Secretary wishes to thank the many members at home and abroad who were kind enough to send Christmas and New Year greetings to himself and to the other members of Headquarters' staff. The expressions of good will were much appreciated.

LONDON MEETINGS

The following programme of meetings at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, has been arranged.

January 25, 1957: Presidential Address followed by Lecture and Demonstration of MINIATURE AERIALS by F. Charman, B.E.M. (G6CJ).

March 1, 1957: "MODERN AMATEUR COMMUNICATION RECEIVER DESIGN," by R. G. Lane (G2BYA).

March 29, 1957: "MOBILE OPERATION," Discussion opened by F. W. Crabtree (G3BK) and R. G. Shears (G8KW).

Meetings commence at 6.30 p.m. preceded by buffet tea from 6 p.m.

Can You Help?

Mr. C. A. Sharp (G6KU), 56 Moore Avenue, Wibsey, Bradford, Yorks, who would like to hear from any member who has successfully converted an Admiralty Responder Unit (a 10 valve 1.5 metre superhet) Type 4790B, for B.B.C. F.M. reception?

An AVO Service for Blind Amateurs

WE illustrate an example of the special QSL card which the Automatic Coil Winder and Electrical Co. Ltd., supply free of charge to sightless radio amateurs. This free service is available to any blind radio amateur who cares to make application to the Company for a supply of cards.

Tests and Contests

Low Power Contest 1956

CONDITIONS throughout the period of the 1956 Low Power Contest were fairly good, although most contestants found scoring considerably slower in competition with higher powered stations during daylight hours. The change back to the old scoring system, with the maximum rate for inputs of 0.5 watt and less, was well received and resulted in a higher average number of contacts and considerably higher scores due to the larger number of code areas worked.

Repeating his win in the 1955 contest, I. T. Cashmore (G3BMY), of Blackheath, near Birmingham, was very closely followed by R. Ashman (G3HXI), of Cradley Heath, Staffs. In third place, expressing himself well satisfied with the performance of his aerials for a change, is J. J. Yeend (G3CGD/P), who operated from a portable location two miles south-west of Cheltenham.

Equipment

The gear used by the leading stations was:—

G3BMY: Transmitter: SP61 (e.c.o.)—half-6J6 (p.a.) fed from a.c. power unit with h.t. stabilized by a CV45 regulator. Receiver: CR100. Aerial: half-wave Zepp.

G3HXI: Transmitter: EF91 (e.c.o.)—half-6J6 (b.a.)—half-6J6 (grounded grid p.a.) fed from a.c. power unit with h.t. stabilized at 150 volts. Receiver: CR100. Aerial: half-wave dipole.

G3CGD/P: Transmitter: 3S4 (Hartley osc.)—3S4 (b.a.)—3S4 (p.a.) with all power from batteries, h.t. 90 volts. Receiver: bandset t.r.f. (1T4-1T4-3S4). Aerial: two half-wave dipoles.

Of the transmitters used by the other entrants, 1 was a single-stage, 7 were two-stage, 4 were three-stage and 2 were four-stage. Rather more competitors appeared to be using sections of higher power transmitters than those using specially constructed gear.

Comments

A number of competitors wrote in favour or against the introduction of rising serial numbers. This innovation was made in order to bring the contest into line with other R.S.G.B. contests, and to conform with the I.A.R.U. recommendation to standardize report exchanges. The code area number must continue to be sent as an addition if a bonus on this basis is to be included in the scoring. While some competitors expressed a preference for all to start with a serial number of 001, to enable them to follow the progress of other stations, the view was also expressed that quick progress by a few stations noted by their high serial numbers might discourage others, particularly late starters, from sending in entries. The Contests Committee's answer is that the present system, which accords with the letter of the I.A.R.U. recommendation, allows all competitors to start where they choose between 001 and 100 and means that their serial number at any given time is not a positive indication of their progress, so that late starters should not be discouraged. Other competitors who wish to do so can easily gauge the progress of their rivals by noting their serial numbers at intervals during the contest.

A number of suggestions were made for changes in the scoring system, for the use of 7 Mc/s as an additional or alternative band, and for two low power contests to be held in each year; these will all be discussed later.

Finally, a word of appreciation from those responsible for the checking for the well-written logs received, and for the check logs submitted by non-competitors.

Results of Low Power Contest 1956

Position	Call-sign	Power in watts	Scoring contacts	Points
1	G3BMY	0.48	82	2260
2	G3HXI	0.494	78	2220
3	G3CGD/P	0.4-0.5	62	1920
*	G3AZY	0.48	54	1640
4	G2DC	0.7	79	1470
5	G3RD	0.4	48	1400
6	G5LQ	0.45	50	1370
7	GW3IHL	0.5	43	1340
8	G6VC	0.5-2.0	74	1295
9	G4JW	0.48-2.75	35	950
10	G3EUE	0.5-2.0	47	920
11	G2BLA	0.47-0.48	28	880
12	G3DOP	0.5-1.0	40	870
13	G3BRL	0.47-0.96	30	740
14	G3GDW	0.5	13	420
15	G3BAK	0.35	7	260
16	G3JMT	4.8	12	190

*Late entry

Check logs from G3BWQ, '3JHX, '5SX, and '6AH are acknowledged with thanks.

Surplus Radio Gear

MR. L. E. Profaze, 28 The Vale, Southgate, London, N.14 (PAL. 7406), has for disposal a quantity of useful components and valves which he would like to give to a group or club who may be able to make good use of them. He would prefer to give them to a school club or organisation associated with schoolboys who cannot otherwise afford to purchase the type of material retail.

Contests Diary

1957	
January 26-27	- B.E.R.U. ¹
February 9-10	- Affiliated Societies ²
February 9-10	- A.R.R.L. DX Contest (Phone Section) ³
February 23-24	- A.R.R.L. DX Contest (C.W. Section) ⁴
March 2-3	- First Top Band
March 9-10	- A.R.R.L. DX Contest (Phone Section) ³
March 23-24	- A.R.R.L. DX Contest (C.W. Section) ⁴
May 5	- D/F Qualifying Event (organizers to be announced later).
May 5	- First 144 Mc/s Field Day
May 26	- D/F Qualifying Event (Rugby).
June 1-2	- National Field Day ³
June 16	- 420 Mc/s
June 23	- D/F Qualifying Event (South Manchester).
July 6-7	- 144 Mc/s
July 14	- D/F Qualifying Event (Peterborough).
August 18	- Second 144 Mc/s Field Day
September 1	- Low Power Field Day
September 7-8	- European V.H.F. Contest ³
September 7-8	- National V.H.F. Contest ³
September 8	- D/F National Final
October 5-6	- Low Power
November 9-10	- Second Top Band
November 23-24	- 21-28 Mc/s Telephony

¹ For rules, see page 479, R.S.G.B. Bulletin, May, 1956.

² For rules, see page 230, R.S.G.B. Bulletin, November, 1956.

³ Both under Region 1 I.A.R.U. rules.

⁴ For details, see page 329.

R.A.E.N. Rally, 1956

ABOUT 80 operators took part in the R.A.E.N. Rally on October 21, 1956, and 41 logs were submitted. Some R.A.E.N. members operated as non-R.A.E.N. stations, presumably because they had no test phrase allocated.

The majority of points deducted from claimed scores were due to faults in logging, or errors in copying logs; this lost points, not only for the entrant making the error but also for the other station concerned where it was not possible to place the responsibility without doubt. Test phrases were correctly and accurately passed in almost all cases. The errors which did occur could possibly have been avoided if a confirmation had been asked for when there was some doubt. The standard of timekeeping and synchronising was good on the whole but in some cases it left a lot to be desired. Two logs had the times completely mixed up.

G3JOH deserves special mention. He is a blind operator and his log does him great credit.

Twenty outstations took part in the Rally and logs were submitted by thirteen. G4IV/P took his equipment to the /P site in a wheelbarrow.

The average power used on 80m was 35 watts, with only four stations using 100 watts or more. If the average is taken without these stations it stands at 17 watts. However, it is quite clear that Top Band is the most reliable for R.A.E.N. usage, whether it be on phone or c.w.

Results—R.A.E.N. Rally 1956

Leading Fixed Station G4XC
Leading Outstation G3DWQ/P
Leading Receiving Station Mrs. M. Jackson

Position	Station	Score	Position	Station	Score
1	G4XC	84	13	G13BHX	32
2	G3ELZ	79	14	G3AWM	31
3	G3ABG	73	15	G5LL	28
3	G2AT5	62	16	G3JXF/M/P	27
4	G3FJV	61	17	G3AWM/F	26
4	G3UD	61	18	G3DZT	24
5	G3JOH	56	19	G3IHH	22
5	G2ABK	56	20	G3ATI/M	21
5	G3KTO	56	21	G3GXZ/M	20
6	G3ELZ/P	52	22	G3DDI	18
6	G3BMY	51	23	G3IOU	16
6	G3DWQ	51	24	G3GGY	15
7	G3FVW	48	25	G3HWM/M	14
7	G3GZE	48	25	G3AXS	14
8	G3DWQ/P	45	26	G3ARX/P	12
9	G3HTI	40	27	G3GYJ/M	11
9	G3GYV	40	28	G8ML/M	10
9	G3HRK	39	29	G3FRT	8
10	G3ERB	38	29	G3MC	8
11	G3AAQ	35	30	G4IV/P	7
12	G3CGD	34	31	G3ELP/M	4
12	G3FZW	33			

† Member of R.A.E.N. Committee

Receiving Section

The receiving section logs were very accurate and in all cases well compiled. The leader (Mrs. M. Jackson) must be congratulated on an excellent score. There is no doubt that she is a first-class listener and logger. A point of note is that Mrs. Jackson was possibly the newest member in the Rally as she and her husband (who was not present) joined R.A.E.N. only a couple of days earlier. Her total number of contacts logged was 149, all in periods 1 and 2, thus averaging 25 contacts per hour. The receiver is a modified R1155, and the aerial a 6ft rod!

The receiving logs proved very helpful in checking the transmitting section where a doubt existed, and once again it is plain that listeners do not miss very much.

R.A.E.N. Rally 1956—Receiving Section

Operator's Name	Location	Score
Mrs. M. Jackson	Grimsby	447
K. L. B. Dalby	Woodhall Spa	294
D. L. Jones	Romford	84
E. Dean	Harrogate	60
D. Smith	Grimsby	51
K. Sketheway	Newcastle-on-Tyne	36
L. G. Hutton	Birmingham	33

A.R.R.L. International DX Contest

AMATEURS all over the world are cordially invited to take part in the 23rd A.R.R.L. International DX Contest to be held during four week-ends in February and March this year. The phone section will take place during the week-ends of February 9 to 10 and March 9 to 10, and the telegraphy section during the week-ends of February 23 to 24 and March 23 to 24. In all cases, the starting time is 00.01 G.M.T. on the first date and the finishing time 24.00 G.M.T.

As in the past, certificate awards are offered to the top single-operator phone and c.w. scorers in each country. A special category recognizes multiple-operator stations in those countries from which three or more valid multiple-operator entries are received.

The rules of the contest are the same as for last year except for minor rewordings. Stations other than Ws and VEs will call "CQ W/VE" and attempt to make contest exchanges with U.S. and Canadian participants. Overseas stations will transmit 5 or 6 digit numbers, the first digits indicating the signal report and the last three the power input. For example, a station running 100 watts input might send "569100" on c.w. or "56100" on phone. U.S. and Canadian amateurs will transmit the RS or RST plus their State or province or some abbreviation of it. For example, a W4 in Virginia might send "579VA" on c.w. or say "57 Virginia" on phone.

Entries should be sent to the American Radio Relay League as soon as possible after the contest. Contest log forms are available on request from the A.R.R.L. Communications Department, 38 La Salle Road, West Hartford, Connecticut, U.S.A.

Full details and all the rules appear in the January, 1957, issue of QST.

U.B.A. Contest, 1957

R.S.G.B. members are again invited to take part in the Annual U.B.A. (Belgium) contest. The Telegraphy Section will commence at 12.00 G.M.T. on March 2 and end 36 hours later at 24.00 G.M.T. on March 3. The Telephony Section will take place between the same times on April 13 and 14. All bands from 3.5 to 28 Mc/s may be used.

Overseas amateurs will gain 2 points for each contact with a Belgian station on each band. The final score will be the total number of points multiplied by the number of Belgian provinces worked on each band.

Logs should be sent to Andre Maigre (ON4MC), U.B.A. Traffic Manager, 32 rue Joseph Wauters, Charleroi, Belgium, from whom further information may be obtained.

Can You Help?

W. B. Mansell (GW2CPM), Franklin House, Upper Frog Street, Tenby, Pembrokeshire, who urgently requires details of the plug connections and any other data for the Aircraft Radio Transmitter Model ATB Type CRV52233 and circuit information on the Signal Corps U.S. Army Modulation Unit BC-1203-A?

C. U. I. N. B. E. R. U. ?

Radio Amateur Emergency Network

By C. L. FENTON (G3ABB)*

WITH the start of a New Year, R.A.E.N. members in all parts of the country are preparing for any calls that may be made upon them during the next few months. Many counties now have organised groups ready. Worcestershire is the latest county to start, while there are signs of preparation in the North of Scotland. Many more still require such organisation. Yet another call is made to members to nominate County Controllers, so that some organisation may be set up. The Hon. Secretary would appreciate all offers of help.

Following a highly successful demonstration to Worcestershire Red Cross Officials, G3BDS figured in the Midland News programme of the B.B.C. recently.

The British Red Cross Society recently made an appeal for assistance in setting up a temporary communications network between refugee camps and B.R.C.S. Headquarters in the south of England. The nearest R.A.E.N. group was almost 50 miles away, and whilst the requirement was eventually called off, considerable time and effort were expended in attempting to meet the requirement. Members in inland areas sometimes feel there is little need for their services, but this is not so. Tomorrow a similar situation may arise in your own area. Are you ready to set up a communications network from mobiles to fixed stations, at short notice? All members are urged to have their equipment ready to meet any calls which may be made on the Amateur Radio movement.

Regular Reports

No one realizes more than the writer the effort which is needed to submit reports on activities. Nevertheless, unless regular news is received from E.C.O.s and County Controllers, it is impossible for the R.A.E.N. Committee to be aware of what is happening and to assist in solving any difficulties which may be experienced. Problems should be reported to the Committee who will do all possible to help solve them. Whether there are problems or not regular reports of activities are important to the working of R.A.E.N. as a whole.

Details of the Flood Warning Scheme (not yet completed) will be published as soon as possible.

Emergency Communications Officers

J. B. Harding has resigned as E.C.O. for Norton-on-Tees, Co. Durham, and O. M. Derrick as E.C.O. for Larbert, Stirlingshire.

The following have been appointed E.C.O.s: T. Griffin (G3GUV), 22 Albert Terrace, Middlesborough.

R. A. M. Crust (G3MC), 9 Sedge Crescent, Weeds Wood Estate, Walderslade, Nr. Chatham, Kent.

In the list of E.C.O.s published recently the call GI3HXM should read GI3HXH.

County Controllers

The following have been appointed County Controllers: J. Simpson (GM4QV), 10 Falkirk Road, Bonnybridge, Stirlingshire for Stirlingshire and Clackmannan.

K. T. Whithorn (G3BDS), 34 Tybridge Street, Worcester for Worcestershire.

Items for inclusion in the next R.A.E.N. column should reach the writer not later than January 20, 1957.

* "Narbyl," Gay Bowers Road, Gay Bowers, Danbury, Essex.

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*CQ Mobile Handbook - - - - 24/-

(Cowan Publishing Corp.)

*Antenna Book 7th Edition - - - - 19/-

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*Radio Amateurs' Mobile Handbook - - - - 18/-

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Little Russell Street, London, W.C.1

Regional & Club News

Baileul Radio Society (Arboretfield).—This society has for the past 10 years provided facilities for National Service and Regular personnel of R.E.M.E. stationed at Arboretfield, Berkshire, to carry on their hobby during off-duty hours. The club station (G3IHH) is active on Top Band, 40, 20, 15 and 10 metres. Meetings are held on the first Monday in each month and the club room is open every evening. Test equipment and essential hand tools are available.

Bristol.—"Mobile Equipment" was the title of a talk by A. G. Blackmore (G3FKO) in December. During the meeting a contact with G3HSD/M demonstrated the equipment which was described. On January 18 A. F. Collins, F.R.A.S., F.B.I.S., will lecture on "Radio Astronomy." Zonal Representative R. G. Lane (G2BYA) is arranging a film show for February 1. The following members have been elected to serve on the local committee during 1957: C. N. Chapman (G2HDR), W. J. Dear (B.R.S.19985), G. V. Farrance (G3KPT), H. J. Gratton (G6GN), E. C. Halliday (G3JMY), R. G. Lane (G2BYA), G. C. Manning (G2IK) and R. T. Poeten (G3CTN). A. E. Siddons-Wilson (B.R.S.14627) and D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, have been re-elected *Hon. Auditor* and *Hon. Secretary/Treasurer* respectively. Any local member who has not had a copy of the 1957 programme may obtain one from G3RQ on request.

Bury Radio Society.—Lectures have been arranged for February 12 ("All Transistor Broadcast Receiver," G6QT) and March 12 ("Receivers," G8VF). Meetings, which commence at 8 p.m., are held at the George Hotel, Kay Gardens. *Hon. Secretary:* L. Robinson, 56 Avondale Avenue, Bury.

Cambridge.—A Social Evening took place on December 13 at which Mrs. Sassoon presented the "Granfield Trophy" to Ivan Howard (G2DUS/T) who, as a result of his work on Amateur Television, was considered to have made the greatest contribution to Amateur Radio in Region 5 during 1956.

Crystal Palace & District Radio Club.—Meetings are now held at Windmere House, Westow Street, Crystal Palace, S.E.19, at 7.30 p.m. on the first Tuesday and third Saturday in each month. At the Tuesday meetings talks are given to supplement regular courses of instruction for the R.A.E. On January 19 Dennis Furby (G3EOH) will talk about "Simple V.H.F. Equipment." *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, Forest Hill, London, S.E.26.

Grafton Radio Society.—Recent events have included a lecture on "Headphones" by a representative of S. G. Brown Ltd. and the Christmas Junk Sale. Meetings are held on Mondays (R.A.E.) and Fridays at the Grafton School, Eburne Road, Holloway, N.7. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Kingston & District Radio Society.—A Morse class is now being held regularly and it is hoped to start a Radio Theory class soon. Details of the programme for 1957 may be obtained from the *Hon. Secretary:* S. Babbs, 28 Grove Lane, Kingston-upon-Thames. The dates of meetings will be found in *Forthcoming Events*.

Prestatyn & District.—Members from both ends of Flintshire attended the meeting on December 3 at the Railway Hotel, Prestatyn, when John Lawrence (GW3JGA) gave a talk and practical demonstration on "Using an Oscilloscope." The call-sign of Peter Jones, mentioned in the December BULLETIN, should have read GW3FPF.

Radio Society of Harrow.—Meetings have been arranged for January 18 and 25 (A.G.M.), February 1 and 8 (Junk Sale). *Hon. Secretary:* S. C. J. Phillips, 131 Belmont Road, Harrow Weald, Middlesex.

Slade Radio Society.—At the meeting on January 18, Dr. D. G. Marshall will lecture on "Industrial Uses of Atomic Energy." On February 1, there will be a talk on "Operating on the DX Bands" by G. A. Swinnerton (G6AS) and on the 15th a demonstration of high quality sound reproduction by a representative of Whitely Electrical & Radio Ltd. "Circuit Applications of Transistors" will be the subject of the lecture by J. Chandler and A. Wates of the B.T.H. Co. Ltd. on March 1. All meetings are held at the Church House, High Street, Erdington, commencing at 7.45 p.m. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

South Manchester Radio Club.—On January 25, there will be an R.S.G.B. Recorded Lecture on "Aerials" by F. J. H. Charman, B.E.M. (G6CJ). A "Hot Pot Supper" will be held at the Wellington Hotel, Nicholas Croft, High Street, Manchester, at 8 p.m. on February 8. Tickets, price 6s. each, may be obtained not later than January 31 from the *Hon. Secretary:* M. Barnsley (G3HJM), "Greenways," 11 Cemetery Road, Denton, Lancs.

Surrey Radio Contact Club.—The Annual Dinner will be held at the Greyhound Hotel, Croydon, on February 1. Tickets and full information can be obtained from the *Hon. Secretary:* S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, South Croydon.

Torbay Amateur Radio Society.—At the meeting on January 19 at the Y.M.C.A., Torquay (7.30 p.m.) there will be an R.S.G.B. Recorded Lecture entitled "Radio in the Antarctic" by Roth Jones. The Annual Social and Dinner will be held at the Oswalds Hotel, Babbacombe, on February 23, commencing at 7.30 p.m. Tickets may be obtained from G2GM, 36 Shipway Lane, Torquay. *Hon. Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

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Forthcoming Events

REGION 1

Bury (B.R.S.).—February 12, 8 p.m., George Hotel, Kay Gardens.
Chester (C. & D.A.R.S.).—Tuesdays, 7.45 p.m., Tarran Hut, Y.M.C.A.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Lancaster (L. & D.A.R.S.).—February 6, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Room "G," Waverley Community Centre, Penny Lane, Liverpool, 18.
Manchester (M. & D.R.S.).—February 4, 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.
Manchester (S.M.R.C.).—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 20.
Preston (P.A.R.S.).—Wednesdays, 7.45 p.m., 48 High Street, off Lancaster Road.
Southport.—Thursdays, 8 p.m., Sea Cadets Camp, Esplanade.
Stockport (S.R.S.).—January 16, 30, February 13, 27, 8 p.m., Blossoms Hotel, Buxton Road.
Warrington (W. & D.R.S.).—January 17, February 7, 21, 7.30 p.m., Royal Oak Hotel, Bridge Street.
Warral (W.A.R.S.).—January 16, February 6, 20, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Bradford.—January 26 (Annual Dinner), January 29, February 12, 7.30 p.m., 66 Little Horton Lane.
Doncaster.—February 5, 7.30 p.m., Lord Nelson Hotel, Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—January 29, February 12, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., 4 Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract.—January 31, February 14, 7.30 p.m., Queens Hotel, Tanshelf.
Rotherham.—Wednesdays, 7 p.m., "Cutler's Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., Chapman's Yard, North Street.
Sheffield (S.A.R.C.).—January 23, 8 p.m., "Dog and Partridge," Trippet Lane.
Slaitwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
South Shields (S.S. & D.R.C.).—January 30, 7 p.m., Trinity House Social Centre.
Spenn Valley.—January 23, February 6, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South, & Bournville).—Tuesdays, 7.30 p.m., No. 4 Committee Room, Cadbury Bros., Bournville, (Slade).—January 18, February 1, February 15, 7.45 p.m., Church House, High Street, Erdington.

Representation

THE following are additions to the list of County Representatives published in the December, 1956, issue:—

Region 4—Northamptonshire

L. Critchley (G3EEL), 36 Waterloo Road, Peterborough.

Region 9—Somerset

W. Holley (G5TN), "Waverley," Worleberry Hill Road, Weston-super-Mare.

Cornwall

J. Watson (G3AET), 24 St. John's Terrace, Devon, nr. Truro.

The following is an alteration to the list of Town Representatives published in the December, 1955, issue:—

Region 5—Essex

Danbury Area

E. J. O. Cole (G3IIS), 320 Springfield Road, Springfield, Chelmsford.

Coventry (C.A.R.S.).—January 28, February 11, 7.30 p.m., 9 Queens Road, Coventry, (Courtauld).—Wednesdays, Courtaulds, Ltd., Foleshill Road, Coventry.
Stourbridge & District.—January 18, 8 p.m. (Informal) "White Horse," Ambleside, February 5, 8 p.m., King Edward VI School, Stourbridge.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Boulton Lane, Alvaston, Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Room 4, 119 Green Lane, Derby.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Room 5, Ilkeston College of Further Education, Field Road.
Leicester (L.R.S.).—January 14, 28, February 11, 7.30 p.m., 140 High Cross Street, Leicester.
Lincoln (L.S.W.C.).—February 6, 7.30 p.m., Technical College, Cathedral Street.
Newark (N. & D.A.R.S.).—February 3, 7 p.m., Northgate House, Northgate, Newark.
Northampton (N.S.W.C.).—Fridays, 7 p.m., Clubroom, 8 Duke Street.
Nottingham.—January 18, February 15, 7.30 p.m., Basford Hall Miners' Welfare, Nuthall Road, Cinderhill.
Peterborough.—February 6, 7.30 p.m., 21 Hankey Street.
Scunthorpe (S.A.R.S.).—January 15, 29, 7.30 p.m., Talbot Hotel, Earl Street.
Retford & Workop.—February 11, 7.45 p.m., Whitehall Youth Centre, Retford.

REGION 5

Chelmsford.—February 5, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Norwich.—Fridays, 7.30 p.m., The Golden Lion, St. John's, Maddermarket.

REGION 7

Acton, Brentford and Chiswick.—January 15, February 19, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, London, W.4.
Bexleyheath (N.K.R.S.).—January 24, February 14, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Croydon (S.R.C.C.).—February 1, 7.30 p.m., "Greyhounds," Croydon (Annual Dinner).
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East Molesey (T.V.A.R.T.S.).—February 6, 8 p.m., Carnarvon Castle Hotel ("Frequency Measurements," G2NH).
Guildford and Woking.—January 27, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Holloway (G.R.S.).—Mondays (RAE), Fridays, 7 p.m., January 18, 8 p.m. ("Past, Present and Future of Amateur Radio," G6CL).
Grafton School, Eburne Road, Holloway, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.

Kingston-on-Thames (K. & D.A.R.S.).—January 24 (H.I.), by E.M.I., February 7, 21, 7.45 p.m., Penrhyn House, 5 Penrhyn Road, Kingston.
London (L.M.L.C.).—January 18, 12.30 p.m., Bedford Corner Hotel, W.C.1 (no meeting in February). Ladies' Night, February 22 (same venue).
London (U.H.F. Group).—February 7, 7.30 p.m., Bedford Corner Hotel, W.C.1.
London Meeting.—January 25, 6.30 p.m., I.E.E., Savoy Place (Presidential Address by D. A. Findlay, D.F.C., G3BZG, followed by lecture and demonstration of Miniature Aerials by F. Charman, B.E.M., G6CJ).
Norwood & South London.—January 19, 8 p.m., Windemere House, Westow Street, Crystal Palace ("Simple V.H.F. Equipment," G3EOH).
Slough.—January 8, OTH from G2HOX, 13 Quaves Road, or G3GYD, 5 Parklands Avenue, Slough.
Welwyn Garden City.—February 5, Service Training School, Murphy Radio, Ltd., Bessemer Road (Bring-and-Buy Sale).

REGION 9

Bath.—January 28, 7.30 p.m., R.N.V.W.R. H.O., 12 Pierpoint Street (top floor).
Bristol.—January 18, February 1, 7.15 p.m., Carwardine's Restaurant, Baldwin Street.
Exeter.—February 1, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth (W.C.R.C.).—Alternate Tuesdays, 7 p.m., Technical Institute, Falmouth.
Plymouth.—Alternate Tuesdays, 7.30 p.m., Virginia House Settlement, Barbican.
Torquay.—January 19, February 16, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—February 14, 7.30 p.m., Sea Cadets' Hall, Alfred Street.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—February 11, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
North & Port Talbot.—February 5, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 11

Prestatyn.—February 4, 7.30 p.m., Railway Hotel.

REGION 13

Edinburgh (L.R.S.).—January 24, February 7, 7.30 p.m., 25 Charlotte Square.

REGION 14

Falkirk & Stirling.—January 18, February 15, 7.30 p.m., The Temperance Café, High Street, Falkirk.
Glasgow.—January 25, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2.

Items for inclusion in this feature should be sent to the appropriate Regional Representatives by the 20th of the month preceding publication.

Vacancy

Mr. R. M. Morris (GW3HJR) has resigned as T.R. for Cardiff. Nominations for his successor should be made in the prescribed form and sent to reach the General Secretary by not later than February 28, 1957.

Membership Drive
 Have you enrolled a new
 member this month?

Letters to the Editor . . .

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents.

Thanks Chaps

DEAR SIR,—On relinquishing the office of Region 9 Representative I feel I must ask your indulgence for a little space to express my thanks to the C.R.s, T.R.s and members generally in the south-west for all their help over the past many years. It has been a pleasure to be their representative and I know they will give their full support to my successor Bill Green.

In passing, may I say a rather special "thank you" to the Torquay and Cornish boys—they will know the little matter to which I refer.

December 31, 1956.
Exeter, Devon.

Yours sincerely,
HERB. BARTLETT (G5QA).

East of Zanzibar

DEAR SIR,—It appears from various letters received by you that I have made a mistake regarding the number of amateurs that have, at one time or another, operated from Zanzibar. Mr. Thomas states that he operated under the call VQICUR twice during the year 1949, and that Mr. Powell also operated from the island in either 1946 or 1947.

Whilst I was on the Island I had a chat with the Chief Customs Officer who gave me the information that I was the third amateur to operate from there, the first being VQIRF, and the second VQIRO. I must therefore apologise to G2CUR and to anyone else, apart from the above who might have operated with the VQI prefix. I might add that since I first became interested in Amateur Radio in early 1933, I certainly cannot remember a Zanzibar call prior to Frank Featherstone's effort in 1951.

Yours faithfully,
MAL. GEDDES
Salisbury, Southern Rhodesia. (ZE3JO, ex-VQ1JO).

Erecting a Tower

DEAR SIR,—We are interested to learn from the article "How to Erect a 32ft Tower", the method used by Mr. G. G. Gibbs to erect a tower of our manufacture.

We would like to make it clear, however, that this is not by any means the only method of erecting our towers. In fact the more conventional way is to build it vertically, straight on to the foundation. The method used by Mr. Gibbs would not be possible if the tower was of a greater height, erected on a roof, or in a confined space.

Yours faithfully,
Francis & Lewis, Limited,
Cheltenham. W. G. FRANCIS,
Director.

National Field Day—Bristol Throw Down the Gauntlet

DEAR SIR,—N.F.D. will soon be with us again, on June 1 to be exact; just 5 months away as I write, or 21 weeks. Not a great deal of time left to prepare everything for the great day and it is noted—to the sorrow of the R.S.G.B. Group here in Bristol—that interest is waning, resulting in a smaller number of entries each year.

N.F.D. is, without any doubt, the highlight of the R.S.G.B. year and has been for a long time. Each year old friendships are renewed on the air for a brief moment and new ones started, some hundreds of operators all over the country pit their skill against each other in an endeavour to prove that their station is just that little something better and to win the trophy.

An N.F.D. entry does not call for supernatural cunning, great expense or complicated equipment: the gear that we use in Bristol is quite straightforward. We get such an enormous amount of enjoyment out of N.F.D. that we should be sorry, extremely sorry, to see the event die out. For at the present time the number of entries is falling year by year and it does look as though interest may eventually be insuffi-

cient to warrant continuation. Could we make this a revival year? Those groups who have participated in the past know the fun to be had; to those who have not yet "had a go," what about it—THIS YEAR?

The Trophy is at present here in Bristol. You're welcome to come and get it—but we shall be having a jolly good try to keep it!

January 1, 1957. Yours faithfully,
Bristol. F. H. CHAMBERS (G2FYT),
T.R. for Bristol.

N.F.D. Rules

DEAR SIR,—If, repeat, IF the majority of groups entering for N.F.D. favour an increase in power then let us have it, but please may we be spared any more feeble excuses like the one tendered by J.H. in the November editorial?

IF it is difficult to run an 807 at a legitimate 5 watts, why has the Contests Committee done nothing about the many N.F.D. stations, including winners and other high scoring stations, who have used them in the past?

IF it was difficult to obtain suitable valves which will run efficiently at 5 watts input without any of the difficulties mentioned, it might be sufficient reason for changing the rule, but suitable valves are available, and the explanation offered looks suspiciously like "changing the law to suit the law-breaker!"

Shall we, in a few years time, have a further increase in the power allowed on N.F.D. because of the difficulty in keeping an 813 down to 10 watts input? Or rather (as applies to the 807 and the 5 watts limit) the difficulty of resisting the temptation to run such a large bottle at an input more in keeping with its potentialities.

Yours faithfully,
H. WATSON (G3HTI), F. R. PETERSON (G3ELZ),
J. BROWNE (G4XC), S. R. WALKER (G3IYT),
Grimsby, Lincs.

"Yasme"

DEAR SIR,—No doubt many of us already know that Danny Weil—in his attempt to be the first Englishman to sail round the world single-handed in a 40ft. yacht (*Yasme*) had the misfortune to strike an uncharted reef some 150 miles off the coastline of New Guinea. As a result of this, *Yasme* foundered and all possessions, including radio and navigation equipment, were lost.

Fortunately a rescue service was quickly inaugurated following Danny's radio call for assistance combined with the observance of amateurs in Australia and Port Moresby. Unfortunately the Catalina rescue aircraft was unable to make a landing owing to heavy seas. This necessitated the rescue dinghy being dropped and a swim of some 200 yards through shark-infested waters from the sinking *Yasme*. Approximately seven hours later the Catalina made another run-in and despite the heavy seas prevailing, carried out an emergency landing. Danny was soon in Port Moresby Hospital recovering from the shock and exposure of his ordeal.

News of this unfortunate accident to *Yasme* was soon known throughout the amateur world and he was subsequently invited to Sydney by the Australian amateurs who offered to assist in the search for *Yasme II* to enable Danny to continue his world trip via the exotic DX locations.

American amateurs have also indicated a desire to assist in the replacement of *Yasme*, and already an invitation has been extended to him to visit the U.S.A.

This is a venture with which the U.K. manufacturers and radio amateurs may wish to associate themselves, and if any further support is proposed I should be glad if they would communicate with me.

Incidentally, in a recent letter which I have received from Danny he states that, circumstances and conditions permitting communication with U.K. may be more successful on the "ascent from VK" compared with the "descent through the Pacific"—and daily communication from those rare DX spots is a possibility.

Yours faithfully,
A. SWINDON (G3ANK, ex-VS9AS).
135, Station Road, Sidcup, Kent.

Defective Components

DEAR SIR,—The following experience may serve as a warning to others to test components before putting them into use.

I recently purchased, brand new, three 50 k Ω wire-wound potentiometers of well-known make, for use in an oscilloscope I am building. I tested these components on reaching home, having been caught before with queer faults in apparatus after it has been built.

One potentiometer proved O.K. Of the other two, one had an open-circuit track. Testing between slider and one end of the track, the disconnection was found at 36 k Ω from the end. The third potentiometer had a "hop-off" along the track, which itself was of correct resistance. Between points 4 k Ω and 5 k Ω from one end, however, the slider appeared to leave the track, but either side of this 1 k Ω gap there was no fault. Had I not found these defects at once, no doubt I would now be the loser of 13s. 0d.

This incident brings to mind a earlier experience with a new valve. This was tested on a commercial valve tester, reference being made to the valve manufacturer's data to ascertain the pin connections in order to set up the test conditions. On switching on, the valve went a vivid blue, and died. Later, it was found there was a mis-print in the valve-maker's data, the wrong base connections being shown. Due to this, control-grid and screen-grid connections were reversed in the test, a condition to which valves do not like being subjected!

Yours faithfully,

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

Licensing Arrangements in Canada

DEAR SIR,—I would like to advise you that I am now resident in Montreal and that my G licence has been surrendered to the G.P.O. I now hold the call-sign VE2AKQ.

For the information of Gs who may be coming to live in Quebec Province, the following may be of use. The Dept. of Transport insist that any one wishing to obtain a VE licence must sit an exam (10 w.p.m. Morse, Procedure and Regulations, draw some simple circuit diagrams, i.e. 2 stage transmitter, superhet receiver, wavemeter, key-click filter, mains filter, full-wave power supply plus smoothing, and answer questions on the circuits). The charge for the exam is about \$3.00. If one is the holder of a 1st class P.M.G. Marine Licence the authorities will exchange it for a full 1st Class Canadian Commercial licence, and the holder of that is automatically entitled to an Amateur Licence. Although I have held an internationally-recognised 1st class M.T.C.A. Flight Radio Operators' Licence for 6 years, the Canadian authorities would not accept it as a qualification for an Amateur Licence as there is no similar licence issued in Canada. Because of this I had to take the full amateur examination. As a point of interest both M.T.C.A. and P.M.G. have the same standard. Eventually I was granted my VE licence, but only for c.w. below 50 Mc/s, with permission for phone above 50 Mc/s. After 6 months, a restricted phone licence is issued which allows phone on 28 Mc/s and up. Six months later one can obtain full unrestricted phone privileges provided one can pass a simple oral exam on modulation and a Morse test at 15 w.p.m.

On receiving my initial licence I noticed it stated that the holder is entitled to use restricted phone "after six months of operating an Amateur Radio Station." The word "Canadian" was not mentioned although the local D.O.T. office held that this meant that the operating must have been done in Canada. So I wrote to the Head Office in Ottawa detailing my experience, both amateur and professional, indicating the point about the six months' period, etc., and they replied that on passing another, more advanced exam, I could have the full unrestricted licence immediately!

At the initial issue of a Canadian Licence one is entitled to use "an input to the antenna of not more than 500 watts" i.e. about 630 watts input at 80 per cent. efficiency. Also, one is entitled to work "mobile" immediately, as well as "portable" in any State or Province of the U.S.A. and Canada, provided the right authorities are informed.

All gear is very expensive compared to English standards. Although 115 volts mains are universal over here, most houses/apartments have 220/230 volt junction boxes for heavy-duty appliances, so English voltage equipment is OK.

Yours faithfully,

Montreal, Canada.

R. H. T. RYLANDS—VE2AKQ.
(ex-G3DHF, ZB1DHF, VS9AR).

Code Proficiency Transmissions

DEAR SIR,—I am writing to suggest that the Society issues Code Proficiency Certificates similar to those of the A.R.R.L. A weekly or monthly transmission at speeds of from 10 to 35 w.p.m. would be quite sufficient for c.w. enthusiasts to prove their copying ability.

I consider there is room for such a certificate and would be interested to hear the views of other members on the subject.

Yours faithfully,

M/V Pinemore,

FRED PILKINGTON (R/O)
(G3IAG).

Silent Keys

CAPTAIN A. M. HOUSTON FERGUS, G2ZC

Old Timers, and many not so old, will be grieved to learn of the death, at the age of 63 years, on Christmas Eve, 1956, of Captain A. M. H. Fergus, G2ZC—"Fergie" to all his friends. More than 30 years ago the name Houston Fergus and the call 2ZC came into prominence in Amateur Radio circles chiefly because of the success of his QRP experiments from his then home in Jersey, C.I. At about that time, too, Captain Fergus took an active part in the development of Army wireless communications in the Channel Islands.

After a family bereavement "Fergie" moved to Hindhead, Surrey, from where he set up a new amateur station which became as well known as the one he had established earlier in Jersey. In 1938 he succeeded Cecil Page, G6PA, as Manager of the R.S.G.B. Experimental Section. Always keenly interested in research and experimental work G2ZC carried out his new duties with great zeal and efficiency. During the Second World War he was engaged in radio work of a confidential nature which brought him into close contact with many other radio amateurs similarly engaged.

In 1946 "Fergie," who had by then moved to Farnham, Surrey, was largely instrumental in reviving the First Class Operators' Club in the face of considerable opposition. He shouldered the heavy responsibilities of the secretaryship alone for almost three years and then continued for a like period, as joint secretary with the late James E. ("Hamish") Catt, G5PS.

A year or two ago Captain Fergus offered to donate a perpetual trophy to the Society for annual award in connection with low power activities. The handsome—and unique—Houston Fergus Trophy was the outcome of that offer.

A man of great personal charm, widely read and with forceful views on many subjects, "Fergie" will be much missed, but his name, like those of other pioneers of the Amateur Radio movement, will always be remembered.

To his widow and to his daughter Joy we extend our heartfelt sympathies in their great loss.

J. C.

THOMAS MYERS (VP5AD)

With regret we have to report the passing of Mr. Thomas Myers (VP5AD) of Jamaica. In recent years he had carried out with great diligence the duties of Honorary Secretary and OSL Manager to the Jamaica Amateur Radio Association of which he was a Founder Member. He was in his 21st year of Amateur Radio when he passed on.

Prior to the last war Mr. Myers was B.E.R.U. Representative for Jamaica in which capacity he rendered valuable service to the R.S.G.B.

Sympathies are extended to his relatives and colleagues in the J.A.R.A.

J. C.

J. E. SHAW (B.R.S.20794)

The death occurred on December 18, 1956, of Mr. J. E. Shaw (B.R.S.20794), of Highcross Street, Leicester. Although an unlicensed member of the R.S.G.B. he was a tireless worker for the Leicester Radio Society of which Society he was an Honorary Member. His premises were used by the L.R.S. as a club-room. Mr. Shaw's untimely death at the early age of 48, after a short illness, has dealt a great blow to Amateur Radio circles in Leicester. He was unmarried. Condolences are extended to his mother.

G3GXZ

New Members

THE following were elected to Membership at the November, 1956, Meeting of the Council:—

Corporate Members, Home (Licensed)

- G2BCX 1F. C. JUDD, Flat 2, 7 The Shrubberies, George Lane, South Woodford, London, E.18.
G2FFY 1W. EVANS, 10 Normanhurst Avenue, Bexleyheath, Kent.
G2FWM 1J. T. WOODHOUSE, 35 Lammack Road, Blackburn, Lancs.
G3CAZ 1J. J. SPRINGATE, A.M.I.E.E., Haslemere House, Plot 64, Chandag Road, Keynsham, Bristol.
G3ATM 1D. NASEY, 8 Greenway, Botham Hall, Longwood, Huddersfield, Yorks.
G3CUN 1J. LEONARD, 148 Duncroft Road, South Yardley, Birmingham, 26.
G3FEQ 1K. G. STOREY, 11 Brambletyne Avenue, Saltdean, Sussex.
G3HDM 1S. G. CAMPBELL, 6 Little Spenders, Basildon, Essex.
G3JFH 1T. A. RUSSELL, 201 Gloucester Road, Cheltenham, Glos.
G3JFS 1P. C. COLE, 146 Cambridge Road, Hounslow, Middlesex.
G3JPB 1C. H. NODEN, Brownhills Manor, Market Drayton, Shropshire.
G3KNT 1F. W. PICKARD, 55 Downlands Close, Bexhill-on-Sea, Sussex.
G3KQI 1J. L. HOWARD, 78 Northcote Road, Leicester, Leics.
G3KTW 1R. THYER, 12 Spotland Tops, Cutgate, Rochdale, Lancs.
G3KVI 1S. TOMLINSON, 50 Kingsford Street, Weaste, Salford, 5, Manchester.
G3KWP 1D. KITCHEN, 27 Masefield Crescent, Balderton, Newark, Notts.
G3KXL 1C. V. KEMPTER, 1 Sack Street, Dukinfield, Cheshire.
G3LFB 1P. H. COSBY, 93 New Road, Grays, Essex.
G3LFU 1E. D. GREEBE, 62 Clabon Road, Norwich, Norfolk.
G3LGZ 1A. BATE, 13 Bamford Street, Glasgow, Tamworth, Staffs.
G3LHJ 1D. WEBBER, 9B Pinewood Road, Milber, Newton Abbot, Devon.
G3LHZ 1M. J. UNDERHILL, The Rectory, Rusper, near Horsham, Sussex.
G3LID 1B. R. J. WHITE, 97 Richmond Road, Gillingham, Kent.
G3LIF 1F. A. JACKSON, 21 Lavender Road, Farnworth, Lancs.
G3LIG 1J. W. SOLE, 8 Herons Close, Chilham, nr. Canterbury, Kent.
G6JF 1G. R. WIGG, Yabbacombe Farm, Loddiswell, Devon.
G6NM 1E. G. HOULDSWORTH, 52 Worsley Crescent, Stockport, Ches.
G6PJ 1B. PASILEY, 124 Nicholson Road, Hecley, Sheffield, 8.
GM3LHV 1J. ELLERBY, 38 Well Court, Dean Village, Edinburgh, 4.
GW2BUF 1J. G. PRICE, 23 Powell Street, Aberlilly, Mon., South Wales.

Corporate Members, Overseas (Licensed)

- DL22T 1M. ALLENDEN, c/o Sgts. Mess, R.A.F. Oldenburg, B.A.O.R. 25, Germany.
DL4SV (W9NTV) J. C. MILLER, American Consulate General, Munich, Germany.
HK3PC Rio de los Casares, Airmail Box 3418, Bogota, Columbia.
K0EXD CARL W. THORSELL, 1195 E. 77th Street, Kansas City, Missouri.
K2AMK W. F. HARMAN, Box 184, Glenside, Pennsylvania.
K2BKX R. B. CHAMPLIN, Jr., 131 Bryant Avenue, Springfield, New Jersey.
K2GQA L. E. GITTINGS, 117-26, 239th Street, Elmont, New York.
K2HSY J. A. LOGAN, 4811 Avenue L, Brooklyn 34, New York.

- KN9CRD C. KUNDE, R.F.D. No. 1, Roselle, Illinois.
K9CSI HAROLD HABERKAMP, R.F.D. No. 1, Addison, Illinois.
KN9DNR R. J. TLAPA, Box 183, Cicero, Illinois.
KP4WD L. GARCIA DE LA TORRE, P.O. 4956, San Juan, Puerto Rico.
KP4YT J. GONZALEZ, P.O. Box 1447, San Juan, Puerto Rico.
SM5ANV H. WAHLBERG, Smedsbacksgatan 4/5tr, Stockholm O, Sweden.
SM5WV OLLE H. ERIKSSON, PB 1001, Tjilberga, Sweden.
SM6AHN O. G. LINDOW, Brogatan, Oskarstrom, Sweden.
SM6KA KARL H. R. KAHLEFELDT, Eriksgatan 21, Falkoping, Sweden.
VE3IT H. R. GLOSTER, London Aeradio Station, Box 156, London, Ontario.
VK3GB G. P. BUTLER, 70 May Street, North Fitzroy, N.7, Victoria, Australia.
VR2BZ B. J. HOGG, P.O. Box 183, Nadi Airport, Fiji Islands.
W00AQ K. DOLSBERRY, 315 South Fifth, Leavenworth, Kansas.
W05JR ELWIN D. NEWELL, 1125-4 Street, North Fargo, North Dakota.
W1ARA J. L. SPATES, 106 Meadowbrook Avenue, West Springfield, Massachusetts.
W1FEO A. W. GARDNER, Wood River Junction, Rhode Island.
W2GT 1A. E. HOPPER, 103 Whitman Street, Rocelle Park, New Jersey.
WN3GLZ G. O. BAKER, North 4th Street, City RT.5, New Brighton, Pa., U.S.A.
W3RFA M. W. RANDALL, 8301 Oakleigh Road, Baltimore 14, Maryland.
W4ADN VERNON J. CHEEK, 3019 North Druid Hills Road, N.E., Atlanta 19, Georgia.
W5CWP J. L. REIFFIN, 4622 McKinney Avenue, Dallas, Texas.
W7SCU J. J. DIEBOLD, 1944-8th Avenue West, Seattle 99, Washington.
W8GHE J. J. FALKENHOF, 293 Hawthorne Street, Elyria, Ohio.
W8NSI ALBERT E. ALDRICH, Concorn, Michigan.
W8QXW G. F. MCKAY, 2135 Arthur Avenue, Lakewood 7, Ohio.
W8SWZ W. D. THOMPSON, RFD No. 4, Springfield, Ohio.
W8VLK RICHARD J. JUSTY, 1110 Elm Street, Grafton, Ohio.
W8YKC V. T. BARTLE, 28231 Groveland Avenue, Roseville, Michigan.
W9DSO J. F. OBERG, 2601 Gordon Drive, Flossmoor, Illinois.
W9LOF G. J. NESBED, 2429 So. Harvey Avenue, Berwyn, Illinois.
W9NGV L. WARSHAWSKY, 1900 S. State Street, Chicago, Illinois.
W9OZX A. P. WARSNUIS, RFD. 1, Mascoutah, Illinois.
YU2CF Z. VERNIC, Lenjinovtr, 7, Zagreb, Yugoslavia.
ZD4BR W. A. H. ASHLANT, P.O. Box 101, Takoradi, Gold Coast.
ZE5JU P. J. LIEBENBERG, c/o Electricity Supply Commission, P.O. Umniati, Southern Rhodesia.
ZL1FS F. J. MARTIN, 60 McFarlane Street, Hamilton E., New Zealand.
ZS1FR C. J. VAN DER WESTHUYZEN, No. 8 Querida Flats, Hope Road, Rosebank, Cape Town, South Africa.
5A5TP 22562704 SGT. W. E. INGRAM, Tripolitania District, Signal Troop, B.F.P.O.57.

Corporate Members (British Receiving Stations)

- 464 1R. A. BALDWIN, 9 Rosebery Road, Gillingham, Kent.
21226 J. P. MILLER, 4 Burstow Road, Wimbledon, London, S.W.20.
21227 F. DOWERS, 59 Clovelly Road, Offerton, Stockport, Cheshire.
21228 J. B. SHEARLAW, 290 Frimley Road, Camberley, Surrey.
21229 J. D. F. FRANCIS, 1 Married Quarters, Woodhouse, near Loughborough, Leics.

- 21230 D. V. PAYNE, 26 Magdalen Road, St. Leonards-on-Sea, Sussex.
21231 R. R. RAVEN, 2A Russell Parade, Purley, Surrey.
21232 A. D. M. KELLY, The Cottage, Couchmore House, Littleworth Road, Esher, Surrey.
21233 J. W. PENDLEBURY, 22 Gibwood Road, Northenden, Manchester, 22.
21234 W. G. H. CHAMBERS, 7 Vezey Street, Rhyll, Flint, North Wales.
21235 A. J. MOUNCEY, 113 Warren Avenue, Shirley, Southampton.
21236 J. HATCH, Widbrook Cottage, Cookham-on-Thames, near Maidenhead, Berks.
21237 A. F. HUNTER, 88 Sunnymead Road, Kingsbury, London, N.W.9.
21238 V. H. LLOYD, 80 Broadway Crescent, Binstead, near Ryde, I.O.W.
21239 E. G. TESTER, 14 Woolbrough Road, Crawley, Sussex.
21240 R. ALLERTON-AUSTIN, 7 Albany Mansions, Marina, Bexhill-on-Sea, Sussex.
21241 J. R. BARKER, 50 Bolckow Street, Guisborough, Yorkshire.
21242 J. G. WILKES, 8 Grove Road, Leytonstone, London, E.11.
21243 S. FORREST, 395 Bolsover Terrace, Pegwood, Morpeth, Northumberland.
21244 E. L. HITCHCOCK, 46 Westrow Gardens, Seven Kings, Ilford, Essex.
21245 G. G. MCINTOSH, 200 Dundas Street, Grangemouth, Stirlingshire.
21246 N. S. BECKETT, 67 Sebastian Avenue, Shenfield, Essex.
21247 J. C. PELLATT, 4 Shaftesbury Lane, Temple Hill, Darford, Kent.
21248 J. T. HAMER, 52 Seagrave Road, Coventry, Warwick.
21249 P. G. DAMS, "Samaria", North Street, Uppingham, Rutland.
21250 K. KEELING, 37 Ridge Road, Kingswinford, Staffs.
21251 R. F. JONES, M.B.Camb., Manor House, Tamworth, Staffs.
21252 J. MCFARLANE, 75 Redcliffe Gardens, Kensington, London, S.W.10.
21253 B. LOVEDAY, The Bungalow, Little Weldon, near Corby, Northants.
21254 W. H. BROWN, 4 Moorhey Drive (off Cop Lane), Penwortham, Preston, Lancs.
21255 V. M. ROWLANDS, Post Office, Melton, Mont. South Wales.
21256 H. A. RICHARDS, 89 Belmont Road, Uxbridge, Middlesex.
21257 A. J. HOOPER, 56 Central Road, Gloucester, Glos.
21258 P. G. TURTON, 38 Avebury Road, Birmingham, 30.
21259 V. A. J. COLE, 26 Springfield Road, East Ham, London, E.6.
21260 J. A. WILLIAMS, Cornerwood, Callow Hill, Virginia Water, Surrey.
21261 F. G. DRAGO, 4 Lansdown View, Twerton, Bath, Somerset.
21262 A. N. MACKAY, 23 Ellesmere Avenue, Mill Hill, London, N.W.7.
21263 T. SPENCER, 66 Empire Road, Greenford, Middlesex.
21264 R. A. RATCLIFFE, 31 Shortlands Road, Kingston-on-Thames, Surrey.
21265 E. W. WRIGHT, 70 Jarrow Road, Chadwell Heath, Romford, Essex.
21266 *D. B. LLOYD, 7 Aldbourne Avenue, Earley, Reading, Berks.
21267 *I. F. GRANT, 31 Winchester Drive, Glasgow, W.2.

Corporate Members (Foreign Receiving Stations)

- 264 N. UGURLU, Denizyollari Teknik Buro, Istanbul-Sirkeci, Turkey.
265 A. E. ZELUBOWSKI, 2615 Gosnold Avenue, Norfolk 8, Virginia, U.S.A.
266 W. F. WACKER, III, 1224 Salem Avenue, Hillside 5, New Jersey, U.S.A.

*Denotes transfer to Corporate Grade.

†Denotes re-elected.

THE following were elected to Membership at the December, 1956, Meeting of the Council:

Corporate Members, Home (Licensed)

- G2FPY J. HARRIS, 50 Brightwell Crescent, Tooting, London, S.W.17.
 G3ANV H. D. McDERMID, 453 Woodham Lane, West Byfleet, Surrey.
 G3AQF H. F. WESTON, 29 Fellows Road, Hampstead, London, N.W.3.
 G3DXJ T. H. HOLBERT, 25b Valon Road, Arborfield, nr. Reading, Berks.
 G3FIU W. B. GRAY, 31 Watts Lane, Hillmorton, Rugby, Warwicks.
 G3HIQ B. A. CANNING, 78 Botley Road, Oxford.
 G3IBH D. G. K. GUY, 439 Broadwater Crescent, Longmeadow, Stevenage, Herts.
 G3IYX G. J. LEASK, 32 Queen Anne Street, Bradwell, Wolverton, Bucks.
 G3KLP J. R. YOUNG, 37 Priestlands Road, Hexham-on-Tyne, Northumberland.
 G3KMG D. H. PLUMBRIDGE, 3 Rowley Bank, Castleside, Consett, Co. Durham.
 G3KOF J. J. ANTHONY, 56 Sherwood Street, Derby.
 G3LCB R. E. WOLPERS, 19 Cedar Avenue, Sidecup, Kent.
 G3LDX H. CLARE WALLIS, 9A Bird Hill Road, Woodhouse Eaves, nr. Loughborough, Leics.
 G3LEB B. R. JOHNSON, 82 Kent House Road, Beckenham, Kent.
 G3LGG E. A. LEBAGUE, 1 Farnborough Road, R.A.F. Watton, Thetford, Norfolk.
 G3LJG B. W. SMITH, 45 Hazelhurst Road, Castle Bromwich, Birmingham, Warwicks.
 G3LJA M. J. HEATHCOTE, 16 Stonehall Avenue, Ilford, Essex.
 G3LJR T. E. SEXTON, 104b Warwick Road, Kenilworth, Warwicks.
 G3KVO S. K. ORR, School Residence, Union Place, Dungannon, Co. Tyrone, N. Ireland.
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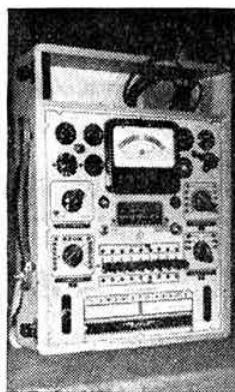
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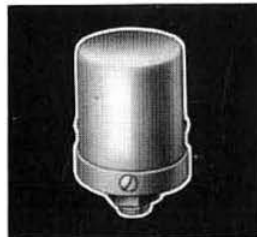
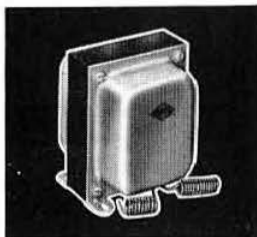
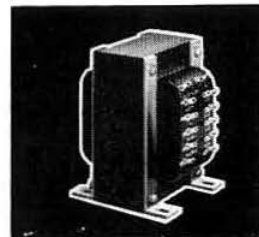
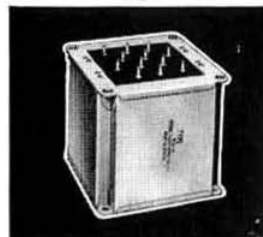
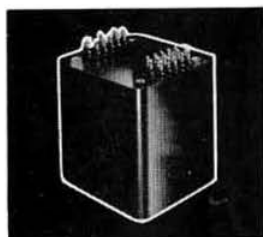
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