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R·S·G·B· BULLETIN

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CURRENT COMMENT

Emergency

ELSEWHERE in this issue, we publish with pride the epic story of how the radio amateurs of Jamaica came to the aid of their community, during the period of chaos which followed the great hurricane. They themselves admit that they were unprepared and that this was a grave handicap, nevertheless they rendered a vital and efficient service to their fellow citizens in time of need and richly deserve commendation.

We now learn that Italian amateurs performed a similar service for their own countrymen during the disastrous floods in the Po Valley. Again, they admit the handicap of lack of previous organisation, but even so, they managed to maintain vital services for the Municipal and National authorities as well as for the Red Cross and fire brigades. Most of the messages were transmitted on frequencies between 7050 and 7190 kc/s. or on the 144 Mc/s. band. A Government station situated in Rome acted as central control and most of the traffic was handled on 'phone. We hope to publish the full story as soon as A.R.I., our counterpart Society in Italy, can furnish the details.

All very interesting and praiseworthy you may say, but how does it affect me? We are so apt to consider communications in this country as foolproof that we are inclined to regard any such emergency as beyond the realms of possibility. This is possibly quite true. No doubt the good citizens in the Po Valley thought so too. Still it does no harm at least to be trained in the technique of being prepared; by this we mean the construction and operation of equipment which is independent of the public supply mains and which is readily portable.

We can all benefit by smartening-up our method of operation, and some of us even the way we send the Morse code. Once a year, during National Field Day, is hardly enough practice in the erection and operation of a radio station under emergency conditions. Such a service to the community may never be required; for that matter neither were the millions of gas masks issued during and before the last war. Let us be sure, however, that we are prepared, if ever the call should come. Human lives may depend on what we do about it *now*.

Workmanship

VISITORS to the R.S.G.B. Amateur Radio Exhibition must have been impressed by the very high standard of workmanship in evidence on those stands showing home-constructed equipment. It is indeed pleasing to see that the general tendency, amongst present day amateurs, is towards a greatly enhanced standard in the appearance of the apparatus they make, as well as in its operation. The era of the untidy and often highly-dangerous "bread-board" layout has largely gone, we hope never to return. It may well be that at least one of the benefits which T.V.I. will confer on Amateur Radio in the long-run, is the necessity for more closely studying the design and layout of the apparatus we use, as well as having it properly screened. If these points are fully considered, we are more likely to produce gear which works well, does not cause interference and is safe to handle. Yes, let us ponder that final matter of safety. As a New Year resolution let every transmitting amateur look round his station and take note of the places where high voltages are a trap for the blasé as well as for the unwary. Let 1952 be a year in which no one has to regret the loss of fingers, or the acquisition of burn scars through carelessness. Electrocution is final, so make 1952 Safety Year and a very Happy and Prosperous one may it be for radio amateurs everywhere.

Recordings of Amateur Transmissions

THE Society has been advised, officially, that the G.P.O. raise no objection to the recording of amateur transmissions which fall within the scope of the P.M.G.'s licence. If, however, it is desired to retransmit the recordings, care should be taken to ensure that (a) no messages are sent that are not permitted under Condition 8 (i) of the Amateur Licence; (b) the call sign of the station from which any such message originated is not re-transmitted and (c) the retransmission is not sent for reception by anyone other than the person who transmitted the message.

It is hoped that publication of the above statement will remove any doubts which may have existed in the minds of those members who read elsewhere that the practice of playing back over the air recordings of amateur transmissions is contrary to the terms of the P.M.G.'s licence.

AN IMPROVED 75-WATT T.V.I.-PROOF TRANSMITTER

Part II

By LOUIS VARNEY, A.M.I.E.E. (G5RV)*

In this, the second and final part of G5RV's article describing his new V.F.O. controlled T.V.I.-proof transmitter, full details are given for the construction of the coil turret and the wideband couplers. The equipment is designed to provide an answer to the ever-increasing problem of T.V.I., and will be of special interest to amateurs operating in the service areas of the B.B.C. Television Service.

FOR the construction of the power amplifier coil turret, a pair of 2-pole 6-way *Wearite* ceramic wafers with click plates and shaft are required (or equivalent items may be obtained on the "surplus" market). It is a relatively simple matter to lengthen the switch shaft by the method described for the "Oak" type switch (*i.e.*—using a length of ¼ in. diameter brass rod, filed flat to match original shaft, connected by means of a shaft-coupler). Some 2-wafer ceramic assemblies are available, but the wafers are mounted only about 1 in. apart. These may easily be modified to increase the wafer spacing to 2½ in., providing a convenient mounting for the turret coils. A number of these switches are fitted with only four contacts on each half of each wafer, but extra contacts may be obtained from a spare wafer by carefully drilling off the heads of the copper rivets, the extra contacts then being fitted to the wafers in use by means of 10 B.A. nuts and bolts ½ in. in length.

Modified Coil Turret

A simplified arrangement of the coil turret is illustrated in the circuit diagram (Fig. 1 last month). This reduces the total number of switch contacts required, and has been found to work well in practice. One pole of a 2-pole, 6-way wafer is used to switch the "cold" end of each tank coil together with the "cold" end of its associated link coil, while the other pole of the same wafer selects the "hot" end of each link coil. The "hot" ends of the tank coils are selected by the single-pole, 6-way switch carried on the second wafer. Incidentally, the unused contacts on the lower half of this second wafer may be removed and used to build up the first wafer and the upper half of the second wafer to the required six positions, if necessary.

The turret coils are, of course, soldered directly on to the switch contact tags and will be found to be self-supporting. It should be noted that a common coil is used for both the 21 and 28 Mc/s. bands, consisting of six turns of No. 14 S.W.G. enamelled copper wire with an internal diameter of approximately ⅞ in. The coil is pulled out so as to occupy a winding length of about 1½ in. The final inductance value may be adjusted by squeezing in or opening out the coil until the 28 Mc/s. band is tuned with the tank condenser almost out of mesh (*i.e.*—with about 20 $\mu\mu$F. capacity) so as to achieve good efficiency on this band. When set for optimum efficiency on 28 Mc/s., the coil will tune the 21 Mc/s. band with the 150 $\mu\mu$F. (maximum) tank condenser about two-fifths meshed.

Omission of a separate 21 Mc/s. coil still permits efficient operation at that frequency, and enables a 1.7 Mc/s. coil to be added without overcrowding the turret assembly. Since there is no D.C. voltage on the tank coils, enamelled wire may, if desired, be used for the link coils, employing No. 20 S.W.G. for all bands except 21/28 Mc/s., where No. 16 S.W.G. should be used. All coils are treated with *Durofix* or similar coil dope before assembly. In order to facilitate winding on the link coils and to provide an additional measure of insulation, the lower end of each tank coil may be covered with two layers of adhesive plastic tape. P.A. coil data is given on page 298.

Construction of the Wideband Couplers

Complete winding data for the wideband coupling transformers appears in Table I. All windings consist of enamel-covered wire close-wound on *Ekco* type F804 formers fitted with iron-dust cores. These are currently available from dealers who supply components for several of the well-known home-built television receivers. The formers have a winding space of ⅞ in., and an outside diameter of ⅜ in.

Link coupling coils are wound over the "cold" ends of the primary and secondary coils using No. 22 S.W.G. enamelled copper wire. The coupler coils are mounted side by side, spaced ¼ in. between centres, the primary and secondary being wound identically on their respective formers.

The method of construction and mounting shown in Fig. 3 permits convenient adjustment of the slugs from the top of the chassis. When the final trimming has been completed, the slugs should be sealed in position with a spot of beeswax or similar

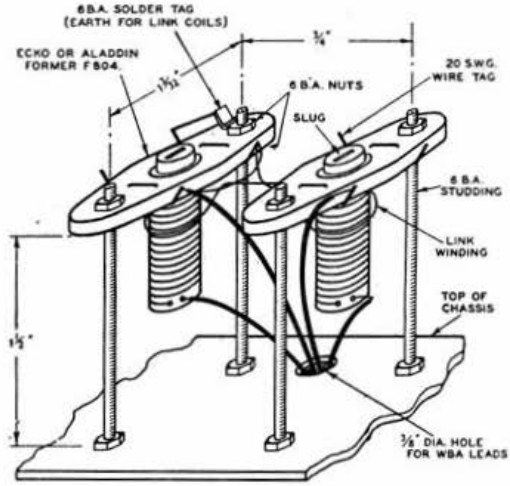


Fig. 3.

Wideband coupler detail diagram. Screen consists of standard 1⅝" square aluminium I.F. can cut down to 2" high (with ½" side flanges for fixing to chassis), fitted over coil assembly, with two ⅜" diameter holes in top of can for adjustment of slugs.

* *184 Galleywood Road, Chelmsford, Essex.*

substance (ordinary candle grease dropped on to the slug will do).

An alternative method of mounting the wideband coupler units is to drill suitable holes in the chassis to correspond with the 6 B.A. fixing holes in the coil former flanges (with a $\frac{5}{16}$ in. diameter hole to enable the iron-dust slug to be adjusted from the top of the chassis) so that the pairs of coils occupy approximately the positions indicated in Fig. 2 of Part I of this article. The individual coils of a pair are spaced $\frac{1}{4}$ in. between centres.

In mounting the coils, a 6 B.A. nut is first run on to each fixing bolt, and then the coil flange is slid on to the two $\frac{1}{2}$ in. long 6 B.A. bolts. It is secured by further 6 B.A. nuts.

Thus, the coil former flange is adjacent to the underside of the chassis top, the first pair of 6 B.A. nuts acting as spacers to avoid bringing the coil winding too close to the metal chassis and thus seriously reducing the "Q" of the coil. It is unnecessary to fit individual W.B.C. screening cans if this method is used.

An Improved Method of Coupling

Instead of employing separate link coils to couple the W.B.C. primary and secondary windings together, an improved arrangement may be used as follows. A short length of enamelled or P.V.C.-covered copper wire (No. 22 S.W.G.) may be connected to the H.T. positive end of each wideband coupler primary and taken round the "earthy" end of its associated secondary winding for the appropriate number of link turns, it being then soldered to a spare tag made by inserting a U-shaped piece of No. 22 S.W.G. tinned copper wire through the small holes provided for this purpose on the *Ekco* coil former base flanges. The H.T. by-pass condenser is also soldered to this point, H.T. for the valve being thus fed in through the link winding around the W.B.C. secondary. In this way, the link on the W.B.C. secondary is really a continuation of the tuned primary winding, and the tighter coupling thus achieved results in an improved "wideband" performance. The addition of the extra turns to the tuned primary may make it unnecessary to pad that winding with the ceramicon condensers mentioned in Table I.

Table I

Band Mc/s.	No. of turns		Wire S.W.G.	Link coil turns	Fixed trimmer capacity*	
	Pri.	Sec.			Pri.	Sec.
3.5	88	88	38	4	10	–
7.0	55	55	30	2	10	–
14.0	28	28	24	2	10	–
21.0	15	15	24	1	–	–
28.0	10	10	24	1	–	–

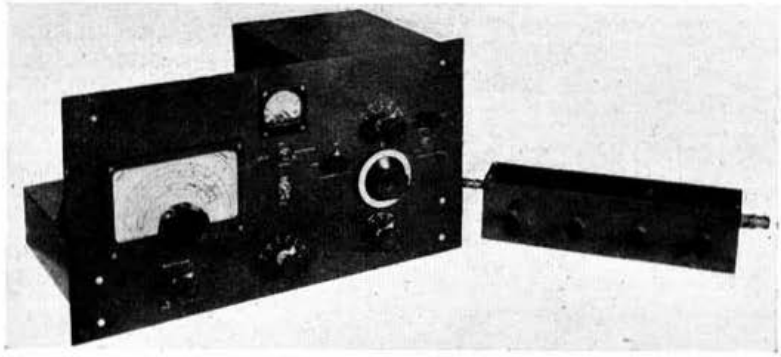
* In $\mu\mu$F., value to be determined by trial.

Adjustment of the Wideband Couplers

Adjustment of the wideband couplers is made in the manner described in the July, 1950, BULLETIN.† After initial adjustment has been made (starting with the 3.5 Mc/s. coupler and working through to the 28 Mc/s. coupler) an increase in available drive (807 grid current) may be obtained on the 21 and 28 Mc/s. bands by retrimming the 3.5, 7 and 14 Mc/s. couplers with the exciter range-switch in the 21 and 28 Mc/s. positions respectively. The final adjustment thus achieved will somewhat reduce the maximum drive previously obtained on the lower frequency bands, but ample will be available to drive the 807, since excessive drive may easily be obtained on 3.5, 7 and 14 Mc/s. by the original adjustment of these couplers.

On 21 Mc/s, the 6V6 feeding the 21 Mc/s. coupler functions as a frequency tripler, resulting in reduced output, with an average grid current of 1.8 mA. over the band. This has, however, been found to be adequate. If difficulty is experienced in obtaining sufficient drive on 21 or 28 Mc/s., the substitution of 6L6s for 6V6s in the appropriate valve-holders followed by retrimming of the appropriate wideband couplers will result in increased drive, but it is unlikely that this will be necessary.

† *Copies of this issue are available from Headquarters, price 1/3 post free.*



Front View of the Transmitter and Low-Pass Filter

Note on the Use of C43

For operation on 1.7 and 3.5 Mc/s., C43 is left in the short-circuit position (*i.e.*—fully meshed). On the remaining bands it may be adjusted to tune out the reactance of the P.A. link coils to achieve optimum coupling.

Preferably it should be mounted on a small perspex strip (2 x $\frac{3}{4}$ x $\frac{1}{4}$ in.) set back from the front panel by about $1\frac{1}{4}$ in., so that a small shaft-coupler (*Eddystone* Cat. No. 550) may be used, with an *insulated* extension shaft made of $\frac{1}{4}$ in. diameter Tufnol rod projecting through the panel. The metal shaft of C43 is, of course, "hot" with R.F., and although no trouble in this respect has been observed with the set described, it may be advantageous not to bring this shaft through the front panel.

Calibration of the V.F.O.

If the 1.7 Mc/s. band is included, the V.F.O. bandspread tuning condenser C1 should have a maximum capacity of 150 $\mu\mu$F. in order to cover the range 1.715 to 2 Mc/s. with the circuit constants given. The bandspread obtainable on the higher frequency bands will inevitably be considerably less than could be obtained if the 1.7 Mc/s. band were not a factor in the design. As already stated, however, an approximate visual frequency setting of the V.F.O. dial is all that is necessary, the exact change of frequency being achieved by reference to receiver calibration or by "netting" on a given station.

A practical point worth remembering is that most of the available variable condensers—with the exception of the straight-line capacity types

(*i.e.*—those having semi-circular moving vanes), are made to *increase* capacity with *clockwise* rotation, so that the V.F.O. frequency *decreases* as the control knob is turned *clockwise*. By using a straight-line capacity condenser capable of 360-degree rotation for C1 it may be set to a maximum capacity at 0° (or 0 divisions) on the V.F.O. dial, the V.F.O. frequency then *increasing* with *increasing* dial reading.

Transmitter Operation

For telegraphy operation, the transmitter is adjusted in the normal manner, the various voltages and currents being approximately as indicated in Table II. In order to obtain the best keying characteristic, it is recommended that the cathode of V3 (J2) should be keyed. On stand-by, switch SW3 may be used, or a remote-control switch or relay plugged into the oscillator control jack (J1).

Table II

Conditions.—14 Mc/s. band; switch (S.W.4) at QRO; Exciter H.T. 350 V.; P.A. H.T. 700 V.

Stage	Valve	Esg. V.	Isg. mA.	Ea. V.	Ia.** mA.	Output Mc/s.
E.C.O.	V1	100	1	100	2.2	1.7
B.A.	V2	100	1	200	4.0	1.7
F.D.	V3	20	–	350	3.0	3.5
F.D.	V4	220	–	350	26.0	7.0
F.D.	V5	220	–	350	32.0	14.0
F.D.	V6	220	–	350	21.0	–‡
P.A.	V7	300†	10†	700	110.0*	14.0

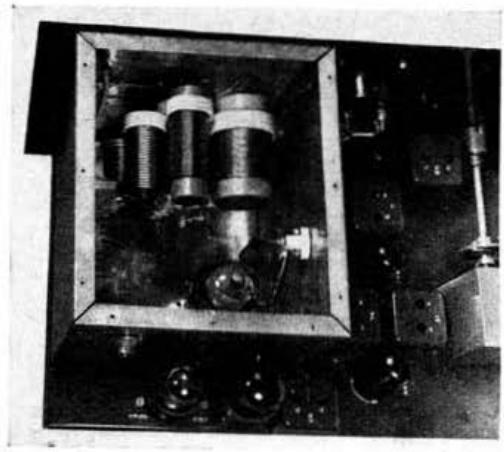
* Ik (measured across meter shunt) at Ig=2.5 mA.
† With key up: Esg=90 V.; Isg=0.6 mA.; Ia=50 mA.
‡ Undriven.
** Measured across 100-ohm metering resistors.

The usual tests should be made for the stability of the P.A., as described in the July, 1950, BULLETIN, using a dummy load comprising a combination of resistors or a lamp load having an effective total resistance of 80 ohms, and capable of dissipating some 30 watts of R.F. This is connected by short leads to the coaxial output socket. Providing the design has been faithfully followed, there should be no trace of parasitics on any band. The harmonic monitor plugged into the harmonic check position is a great help in this connection. If, for any reason, parasitics *are* observed, they must be suppressed before any T.V.I. tests are commenced.

H.T. may now be applied to the exciter portion of the transmitter; with 2 mA. 807 grid current on each band the P.A. should, with 500 to 750 volts H.T., load up to 110 mA. Approximately 10 per cent. of the cathode current read by the meter should be deducted in order to arrive at the actual 807 anode current. On 28 Mc/s. the harmonic trap circuit condenser should be set to the "S/C" or short-circuit position, since it is not required on that band (except in television areas where the second harmonic of 28 Mc/s. would be troublesome), thus providing a slight increase in output. On other bands, however, the use of the trap circuit causes no measurable reduction in P.A. output. The 807 cathode current should rise well over 120 mA. with the tank condenser off resonance.

After having set-up the transmitter on each band in turn for telegraphy operation and checked the keying characteristics, the transmitter may then be tested on telephony, using a suitable modulator unit. P.A. grid current may be adjusted to 2.5 mA. for 'phone operation.

The modulation transformer output impedance



Close-up view of the interior of the P.A. screening box.

has a nominal value of 6,500 ohms to suit the P.A. modulating impedance represented by Ea=650 V. and Ia=100 mA. for 3.5 to 28 Mc/s. operation, but for 1.7 Mc/s. operation Ea=350 V. and Ia=28 mA.—resulting in a modulating impedance of 11,700 ohms. Since there will be ample gain in the speech equipment to modulate fully the 10 watts input, even with a considerable mis-match, it is not necessary to re-adjust the modulation transformer impedance, but if desired the following simple refinement may be added to equalise the P.A. modulating impedance.

A suitable resistor may be connected between the 350 V. line and the 1.7 Mc/s. contact on the switch wafer SW1G. If this resistor has a value of approximately 2,500 ohms, and the 807 P.A. is adjusted to draw 40 mA. on 1.7 Mc/s., it will present a modulating impedance of 6,250 ohms (250 V. at 40 mA.). The voltage-dropping resistor should be by-passed to audio frequencies by connecting a 2 μF. condenser directly across it.

Table II shows the normal C.W. operating conditions for the transmitter on 14 Mc/s, and will serve as a guide for checking and maintenance. On 1.7 Mc/s., the 807 requires only about 1.5 mA. grid current, since it is working at 10 watts input. It should be remembered that the coupling to the aerial tuning unit should be reduced slightly from the optimum C.W. condition to ensure upward movement of the feeder ammeters on modulation (*i.e.*—incremental modulation). It is essential to check that the heater voltage measured at the base of the 807 is not less than 6.3 V.

P.A. Coil Data

Band Mc/s.	Turns	Wire S.W.G.	Former diam. in.	Winding length in.	Link coil turns
1.7	55*	20	1⅜	2⅛	8
3.5	40*	18	1½	2½	5
7.0	28*	14	⅞	2⅜	4
14.0	12*	14	⅞	1 1/16	2
21.0 / 28.0	6†	14	⅞	1½	2

* Close-wound. † Turns suitably spaced.

Conclusion

As in the case of the original model, the transmitter has been thoroughly tested for T.V.I. on all bands, and has been operated for a period of

several months with no trouble to the writer's or neighbours' television reception.

As for DX, many really outstanding contacts have been achieved and a number of "rare ones" worked on 14 Mc/s. during television hours. An example of what can be done on QRP 'phone, even in these days of overcrowded bands, was a solid QSO with a W6 using an input of 25 watts!

PRESIDENTIAL ADDRESS

by

FREDERICK CHARMAN, B.E.M., G6CJ,

Followed by

LONDON LECTURE MEETING

"OVERTONE MODE CRYSTALS"

(Standard Telephones & Cables, Ltd.)

Friday, January 25, 1952,

Institution of Electrical Engineers, Savoy Place, Victoria Embankment.

Tea 5.30 p.m. - Presidential Address 6.30 p.m.

The transmitter is specifically intended to be used with a suitable 80-ohm unbalanced low-pass filter and aerial tuning unit as indicated in the July, 1950, article, and the same remarks as to T.V.I. apply in this case. Wherever possible, the use of correctly matched aerial feeder systems is advised, preferably using 80-ohm twin-feeder. The aerial tuning unit serves as a useful additional harmonic suppression device, and as an unbalance-to-balance transformer.

Presidential Greetings

During this year your newly-elected Council has many important tasks ahead.

We shall do our best to fulfil these tasks for the benefit of the Society and the future of Amateur Radio.

I send you my personal greetings and best wishes for 1952. May your aerials radiate—as effectively as my models — the spirit of friendship and co-operation around the world.

F. Charman (G6CJ)—President.

Appreciation

THE General Secretary and Miss Gadsden wish to thank their many Society friends at home and abroad who sent them Christmas and New Year greetings.

The kindly expressions of remembrance were most warmly appreciated.

"Shining Morning Face . . ."

ONCE again a new Council comes into being. It is new in more than one sense; it includes several members who have not served before. In fact the major changes that have occurred in the composition of the new Council might almost be called "a palace revolution," were it not for the fact that "revolution" is by no means the right word to use in connection with free elections democratically conducted—the basis on which the governing body of this Society is returned every year.

One visualises the new Council "with shining morning face" ready to undertake whatever duties fall to it during its term of office—some of its members with years of experience behind them, others quite new, viewing their responsibilities not entirely without awe.

"Shining morning faces" now—and behind them no doubt the hope that they will still be that way when the term of office is run. For the foreknowledge of the burden that has fallen on past Councils and which, as one of the concomitants of office-holding, they know they must assume, is enough to take the shine away. May the remainder of the quotation, which goes on to say something about creeping unwillingly to school, not come true!

* * *

It is an old British custom to "have a go" at the people in power. No institution, from Parliament itself down to our own humble and modest Council, is spared the lively impact of public appraisal. That is as it should be. For one thing, it prevents the rise of the power which corrupts; and for another, it assures a constant injection of new ideas into the democratic blood stream. Yes, the higher formation —whatever it be—can always do with its bit of prodding (or praising) where called for. But because prods will always exceed praises since satisfied customers usually remain silent, it is useful to consider why any amateur ever allows his name to go forward for high office in the Society knowing that almost certainly he is in for a bed of thorns. He may do so from a sincere belief that he has something to offer; or from an irritation that prompts the feeling "I am sure I could do better than that"; perhaps even from self glorification and a desire for the limelight (to take only three factors in order of loftiness to lowness).

Whatever may be the reason, and whatever the position he holds, from Town Representative of quite a small group up to the President himself, he remains "just an amateur." He is as other men, and his brilliance in any particular sphere may be counterbalanced by shortcomings in another.

These considerations may comfort those who think that office-bearers are out of reach; at the same time it will encourage those who may never have taken office, and may not have considered themselves suitable for it, to remember the old saying about a field-marshal's baton. It is probably more true of the amateur radio fraternity than of any other.

J.H.

A DESIGN FOR "BREAK-IN" OPERATION

By W. H. SEGROTT (G8SI)*

One of the most desirable features of an amateur station is the facility for working "break-in." Most of the systems which have been devised require the use of relays for keying, receiver muting, aerial change-over, transmitter-receiver switching, etc. In this article G8SI describes a novel circuit, needing only one relay, which may be incorporated in transmitters up to a maximum of 25 watts input.

THE problems associated with the design of a satisfactory "break-in" system can be classified under three main headings: (i) transmitter keying; (ii) aerial change-over; (iii) receiver muting. Before considering a practical circuit, it is desirable that these factors should first be discussed in some detail.

Transmitter Keying

Assuming that a V.F.O. is used for frequency control of the transmitter, it is an essential requirement that:

(a) the V.F.O. is inoperative during reception periods, implying the use of some form of oscillator keying, or:

(b) the V.F.O. is operated at a very low power level, elaborate precautions being taken with regard to screening and R.F. filtering, in order to prevent harmonics of the oscillator being audible in the receiver during reception periods.

Whilst (b) is an attractive objective and provides the best keying characteristic, (a) is to be preferred since it facilitates a simpler approach to the problem of mechanical construction (*i.e.*: no elaborate screening is required).

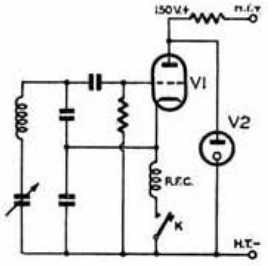


Fig. 1

Basic oscillator circuit. V1–6J5; V2–VR150/30

Direct keying of the V.F.O. inevitably results in a deterioration of the keying characteristic of the transmitter, because the breaking of any circuit associated with the valve used for the V.F.O. stage causes frequency variations under keyed conditions. This point is not always appreciated, it being often assumed that provided the H.T. line supplying the V.F.O. is stabilised no further effects due to voltage variation can result. Reference to Fig. 1 in conjunction with the following remarks should remove any doubts on this point. When the key (K) is open, no current flows in V1, and therefore the cathode is at H.T. line potential (150 volts). Closing the key returns the cathode to earth potential, from a D.C. point of view, and consequently the action of opening and closing the key varies the anode-to-cathode potential of V1 between the extremes of zero and 150 volts. It will be apparent from this that, so far as the D.C. voltage responsible for maintaining oscillation is concerned, the H.T. line to the V.F.O. is unstabilised.

* *30 Livingstone Road, Scarborough, Yorkshire.*

When direct keying is employed (*i.e.*: no delay circuits are used for smoothing the make and break), the time interval occupied by this change in anode-to-cathode potential is very small, so that the period during which the V.F.O. is subject to frequency variation is of short duration. The effect, when monitored on a receiver, manifests itself as a pronounced click, rather than an audible shift in frequency. This is an undesirable state of affairs, since such a signal, if radiated, can cause appreciable interference over a wide band of frequencies. Any attempt to eliminate these clicks by the inclusion of keying filters, only results in a slowing-up of the rate of change in anode-to-cathode potential, thus extending the period in which the V.F.O. is subject to frequency variation, resulting in the radiation of the familiar "chirpy" signal.

A system of keying which obviates all of the above difficulties has been described [1]. In this system, the V.F.O. is brought on quickly and taken off slowly, while the P.A. stage is brought on slowly (a few milliseconds after the V.F.O.) and taken off quickly (a few milliseconds before the V.F.O.). This ensures that any clicks or chirps originating in the V.F.O. are not radiated by the P.A. stage.

If a perfect keying characteristic is desired with full "break-in" facilities, this method seems to be the only practicable solution to the problem. All the circuits seen by the author, incorporating this system of keying, have included one or more keying valves and a high-speed keying relay. For the purposes of a small transmitter, a less complicated arrangement is preferable. A circuit devised to provide these same facilities, but requiring only the inclusion of a simple diode circuit, will be described later in this article.

Aerial Change-over

The use of an aerial common to both transmitter and receiver will be assumed, since the most elaborate and efficient equipment is no better than the aerial to which it is connected. Very few amateurs have facilities for the erection of two aerials of comparable performance on a given band. The use of separate aerials usually results in the delegation of the inferior one to the receiver.

Aerial change-over relays capable of being keyed are available, but expensive. At the present time there appears to be a scarcity of suitable types on the surplus market. A further disadvantage is that a separate power supply is needed in order to energise the relay. The solution seems to rest in the application of an electronic system of aerial switching.

Receiver Muting

In the case of a low power transmitter, receiver muting does not present any great difficulties,

(1) *Goodman—"Improved Break-In Keying," QST, March, 1948.*

the usual method being to bias-off the valves associated with the early stages of the receiver. This biasing voltage should be capable of adjustment so that the receiver may be used for monitoring purposes if so desired.

Design for "Break-In"

The system to be described has been designed to meet all of the requirements specified above. The circuits relating to the transmitter, keying and aerial switching represent, as far as the author is aware, a new approach to the problem. No claims to originality are made, however, since the circuits involved are only the result of applying well-known principles.

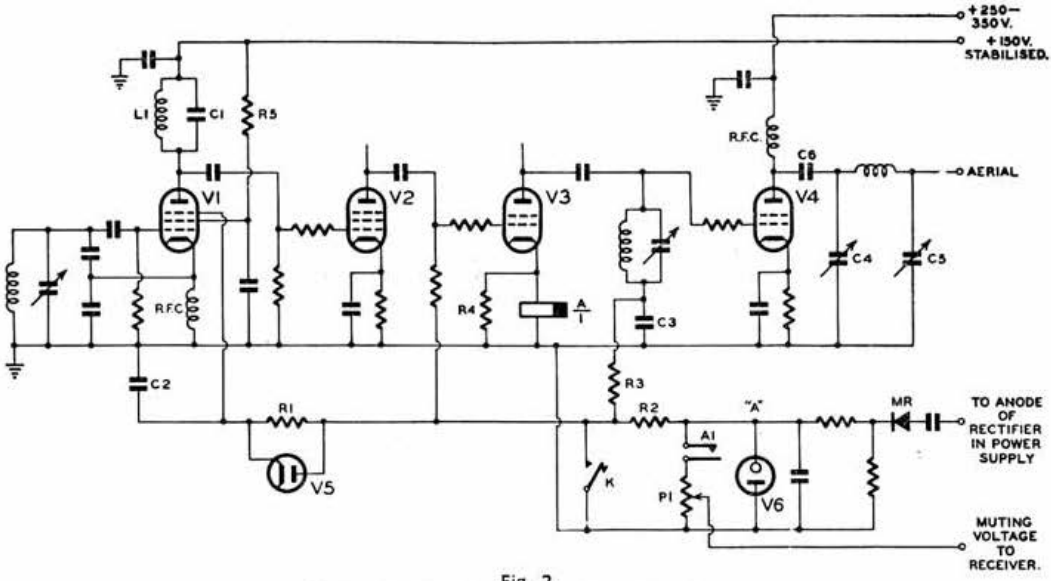


Fig. 2
Transmitter keying and receiver muting circuit.

R1, 2	1 megohm	A/1	Relay
R3	25,000 ohms	V1	6SJ7
R4	For relay adjustment (see text)	V4	807
R5	100,000 ohms.	V5	VR92 (EA50)
C2	0.25 μF.	V6	VR150/30
C3	0.02 μF.	P1	1 megohm.

(Only component values relating to keying circuits are shown.)

Fig. 2 shows a skeleton diagram of a 7-14 Mc/s. transmitter, the circuitry of which may be varied to suit individual requirements. The basic keying circuit, however, can be applied to practically any transmitter design. V1 is a conventional Colpitts oscillator with a fundamental frequency of 3.5 Mc/s., the output being taken from the anode circuit, L1.C1, which is tuned to 7 Mc/s. With this particular system of keying, the keying characteristic of the oscillator is relatively unimportant, and therefore the Colpitts circuit was chosen because of its simplicity (*e.g.:* the absence of separate feedback windings, cathode taps, or high "Q" coils, as in many other types of oscillator circuit).

Keying

The operation of the oscillator under keyed conditions can be followed by assuming that C2 has been charged *via* R1.R2. The suppressor grid of V1 is consequently negative to earth, and at approximately the same potential as point "A." In consequence, V1 anode current falls to zero, and the screen current increases. Due to the drop across R5, the screen potential now falls to a value insufficient to maintain oscillation.

On closing the key (K), the anode of V5 is earthed. Since initially, the cathode is held negative by the voltage across C2, V5 conducts, and the suppressor grid of V1 moves rapidly towards earth potential. At the same time, the potential on the screen rises, and oscillations in V1 build up almost instantaneously with the action of pressing the key.

On opening the key, C2 commences to charge *via* R1.R2, until, after a period dependent on the values of R1, R2, and C2, and the cut-off voltage of the screen and suppressor grid of V1, oscillations cease. It will be apparent that by so proportioning the values of R1 and C2, the oscillator can be arranged to remain on for a period ranging from milliseconds to several seconds. In fact, R1 can be made variable, if so desired, enabling the oscillator to be adjusted to suit individual requirements (*i.e.:* to go off between letters, or words, or to remain on continuously during each transmission period). R2 will normally be fixed in value in order to avoid short-circuiting the negative supply when the key is closed. In the key-up condition, some initial adjustment of R5 may be necessary to drop the screen potential to a value insufficient to maintain oscillation—or again, if desired, a variable resistor could be used to facilitate adjustment.

Assuming that the time constant of R1.C2 is arranged so that the oscillator goes off between words at a given transmission speed, then the leading edge of the first element in each word transmitted will almost certainly produce a pronounced click. This results from bringing on the oscillator abruptly. Similarly, due to the relatively slow decay of oscillations at the end of each word, the lagging edge of the last transmitted element will give rise to a chirp. If arrangements can now be made to delay the switching on and to accelerate the switching off (relative to the oscillator), of one or more subsequent stages, including the P.A., two objectives will be achieved at the same time: (i) undesirable clicks and chirps originating in the oscillator stage will be prevented from being radiated, and (ii) a satisfactory shaping

of the wave-form transmitted by the P.A. will be achieved. This shaping of the signal in the P.A. stage is of considerable importance, since it removes clicks, resulting from the clipping action inherent in Class "C" amplifiers, due to the high value of grid-bias used.

Grid-Block Keying

Since the oscillator comes on almost immediately, the necessary compensating delay in a subsequent stage (or stages) can be easily arranged by using grid-block keying. The delay is introduced by a time constant C.R. network in the grid circuit of the stage concerned. This is illustrated in Fig. 2 by R3.C3. It should be noted that these same C.R. networks will also introduce a slight delay when the stage is switched off, but, provided the oscillator output does not decay too rapidly, the subsequent stage will still close-down before the oscillator, thus satisfying the requirement that oscillator chirps must be prevented from radiating.

R3 (Fig. 2) is the normal grid resistor across which, when the key is closed, the required Class "C" bias resulting from grid current in V4 is developed. The charging time of C3 (*i.e.:* the delay in taking-off the P.A. stage) depends on the values of R2, R3 and C3, and, to a certain extent, on the grid current flowing in V4. This latter effect is due to C3 being charged to the potential developed across R3, so that the external blocking bias has to supply only the additional bias necessary to shut down V4 completely.

Circuit values are not critical in any way, and those given in Fig. 2 have been found satisfactory in practice. In the original transmitter to which this system of keying was applied, the blocking bias supply was not stabilised, and was derived by tapping-off a voltage from one side of the power transformer secondary winding (300-0-300 V.) *via* a 1 μF. condenser, this voltage being rectified by means of a small EA50 diode. Although this was satisfactory, the values of R3, C3 and grid current permissible were rather critical owing to poor voltage regulation, and the stabilised supply shown in Fig. 2 is to be preferred.

The grid current in V4 should not be more than that necessary to develop the requisite Class "C" bias across R3. When the key is raised, excessive drive may tend to overcome the blocking bias, because the oscillator is still operative for a fraction of a second and is in its most unstable condition.

The values given for R1, R2, and C2 provide a delay of about 250-500 milliseconds before the oscillator shuts down, which is suitable for listening-through between words. At normal keying speeds, the oscillator remains on continuously. Several valves were tried for the oscillator (V1), but the 6SJ7 seems to have the best characteristic for this particular application.

Receiver Muting Circuit

In order to provide monitoring facilities, it is desirable to reduce automatically the overall gain of the receiver during transmission periods. Various methods of achieving this are possible, some purely electronic, others involving the use of a relay. At G8SI, use is made of a relay "slugged" to give a small delay on the break. Referring to Fig. 2, it will be noticed that a constant negative voltage is available at point "A," which is connected *via* contacts A1 to potentiometer P1. The relay (A/1) is energised whenever current flows in V3 (*i.e.:* in the transmit condition). When the contacts close, an adjustable muting voltage is available by adjustment of the potentiometer P1. The value of R4 will be dependent on the operating current of relay A/1.

The method of applying this muting voltage to the receiver will, of course, depend on the receiver design, but most circuits will be adaptable with little modification. Fig. 3 shows a typical circuit for muting on a standard receiver. At all but the very slow keying speeds the relay A/1 remains energised and the receiver is muted. Any slight pause in transmission causes the relay contacts to open and the receiver reverts to normal gain, coincident with the switching of the aerial from transmitter to receiver.

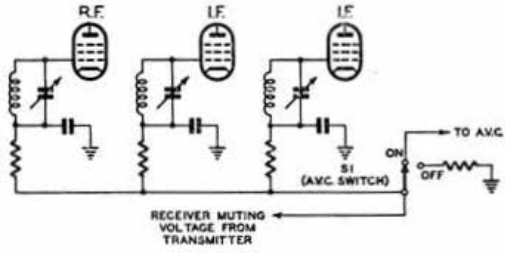


Fig. 3.
Application of muting voltage to a typical receiver.

Aerial Change-over Circuit

The problem here is to provide maximum transfer of R.F. energy from the P.A. tank circuit to the aerial, and likewise maximum signal from the aerial to the receiver. Fig. 4 illustrates how this has been achieved without the use of relays. The P.A. tank circuit consists of a pi-section coupler—a design which has found considerable favour in low power transmitters.

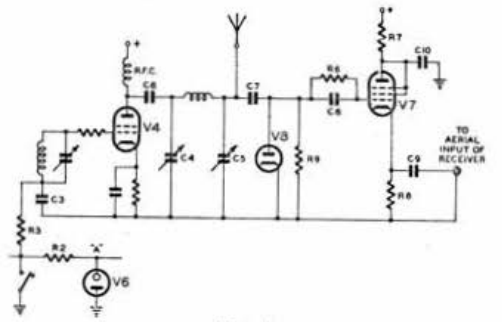


Fig. 4.
Aerial switching circuit.

C7, 8	100 μμF.	R8	1,000 ohms
C9, 10	0.01 μF.	R9	500,000 ohms
R6	1 megohm	V7	VR65 (SP61)
R7	100 ohms	V8	VR92 (EA50)

(Only component values relating to aerial switching are shown.)

Consider first of all the case of reception. When the key is open, the P.A. valve V4 is biased beyond cut-off, thus presenting a high-impedance to the pi-section coupler, the anode-to-earth capacity of the valve being tuned out in adjustment of C4 to resonance. The P.A. stage can therefore, from the point of view of the receiver, be regarded as non-existent, the aerial being coupled to V7 via C7 and C8. V7 is a cathode-follower which transforms the aerial impedance down to about 100 ohms—a convenient value for most receivers.

Under transmit conditions, the key is closed, and the P.A. stage supplies R.F. power to the aerial. The diode V8, which during reception is non-

conductive, now conducts, the resultant D.C. voltage developed across R9 being applied to the grid of V7 *via* R6. This voltage is negative to earth, and constitutes a cut-off bias rendering V7 inoperative. It should be noted that the rectified voltage cannot equal the peak value of the applied R.F., so that if R6 were omitted there would be appreciable grid current to V7 on each positive half-cycle of the applied R.F. voltage. R6 prevents this, and, being high in value, permits only a minute amount of grid current to flow while developing a large negative voltage which is applied to the grid of V7, causing the anode current to fall to zero. V7 and V8 now present a high impedance to the pi-section coupler, and very little power is absorbed from the transmitter, which functions as though the receiver were completely removed.

C8 is necessary in order to by-pass R6, as otherwise received signals would be attenuated due to the effect of R6 in conjunction with the input capacity of V7. During transmission, slight leakage will occur *via* the grid-to-cathode capacity of V7, so that, in the absence of a muting voltage to the receiver, severe overloading would result. This is of little consequence, however, since receiver muting is considered to be an essential requirement of "break-in" operation.

Results

Local trials with a transmitter running 10 watts input on 14 Mc/s., incorporating this system of "break-in," indicate that results are entirely satisfactory, and that the objectives with regard to keying and signal quality have been achieved. Tests with and without the aerial switching circuit connected produced the same "S"-meter readings, showing that the power loss due to this is negligibly small. Similarly, using a 0.5 A. R.F. meter and a 300-ohm load resistor, no change in the power supplied to the load could be detected either with or without the aerial switching circuit.

Conclusion

While it may seem that the above design is somewhat complicated in comparison with systems employing numerous relays and change-over switches, the operational advantage secured is well worth the slight complication involved, particularly when it is realised that complete change-over from receive to transmit is achieved by the simple action of pressing the key. This, coupled with the knowledge that the radiated signal is free from chirps and clicks, all adds to the enjoyment of operating.

Geneva Conference

IT is understood that the Extraordinary Administrative Radio Conference, sponsored by the International Telecommunications Union, which opened on August 16, 1951, has adopted a plan for the re-allocation of frequencies between 4 Mc/s. and 27.5 Mc/s.

Full details of the plan were not available when this issue closed for Press, but it is believed that the provisions regarding short-wave broadcasting will not be introduced until after the next I.T.U. Conference in 1955. This means, presumably, that amateurs in Region I will continue their occupancy of frequencies between 7 Mc/s. and 7.3 Mc/s.

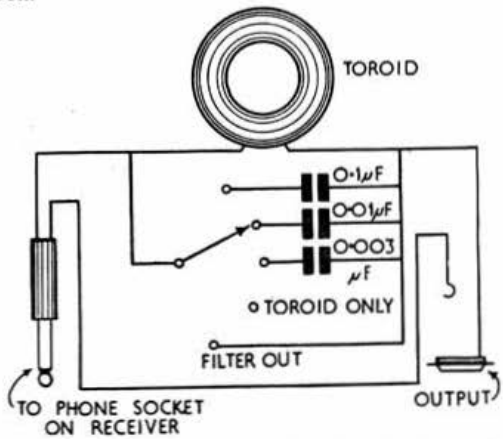
We hope to publish further information regarding the decisions reached at the Conference in our next issue.

A Simple Audio Filter

*By T. G. HULL (G3FIE)**

WHILE the design of audio filters is a complicated process involving mathematics, it is possible to construct a satisfactory and versatile unit from war-surplus equipment in an hour, or less. The writer has made an "add-on" unit of this type which plugs into the phone socket of the receiver, and is provided with several jacks to permit more than one set of phones to be used. A switching arrangement enables the tuning of the filter to be varied. In practice this unit was found to be a most useful accessory, particularly when receiving signals through a high level of interference.

The basis of the unit is a toroid inductance, frequently found in surplus stores, and code-marked with numbers in the series 4400, 4800, etc. Sometimes this may be obtained mounted on a handy tag panel. The toroid should be used as the basis of a compact unit, comprising a switch and any number of condensers of different values. The exact mode of construction is not important and will depend on the requirements of the constructor and the parts readily available in the junk box.



Circuit diagram of a simple "add-on" audio filter unit.

The circuit to be adopted is shown above. The unit should be wired in series with the phones, whilst the switching arrangement should include positions for using the toroid only (without a shunt condenser), and for short-circuiting the filter when it is not required. The values of the condensers may be chosen by trial and error to secure a useful degree of attenuation at various frequencies throughout the audio range. The values quoted in the diagram were found to be very convenient.

When in use, the filter will appreciably improve signal-to-noise ratio, and make a badly swamped signal readable even when the crystal filter has failed. This is largely because of the change produced in the tone of the signal due to attenuation of certain frequencies by the filter. Correct choice of switch position will often reduce interfering signals to a negligible level. The unit may be used on both C.W. and 'phone with equal advantage, though greater discrimination against unwanted signals can be obtained on C.W. by careful use of the B.F.O. The filter may be used with either a straight or superheterodyne receiver.

* *Heatherbrae, Heath End, Farnham, Surrey.*

A SIMPLE FREQUENCY STANDARD

By J. BANNER, M.B.E. (GW3ZV)*

THE unit to be described will provide what is, to all intents and purposes, an absolute frequency standard, without the use of crystals or other precision parts. The accuracy of calibration is better than one part in ten million. When in use the unit will provide modulated marker pips spaced at intervals of 200 kc/s. on all amateur bands from 1.5 to 30 Mc/s.

The principle involved is extremely simple, and will be self-evident from an inspection of the circuit diagram (Fig. 1). V1 (6F13) is an ordinary R.F. amplifier operating on 200 kc/s., receiving the B.B.C. long-wave Light Programme transmission from Droitwich. Owing to the large modulated signal received at GW3ZV from this source, the first stage of amplification provides sufficient output voltage to drive V2 (6F14) into grid current. At this stage, a certain amount of demodulation takes place. V3 (also a 6F14) is arranged to act as a squarer, so that the signal available at the output comprises harmonically-rich pulses at a frequency of 200 kc/s.

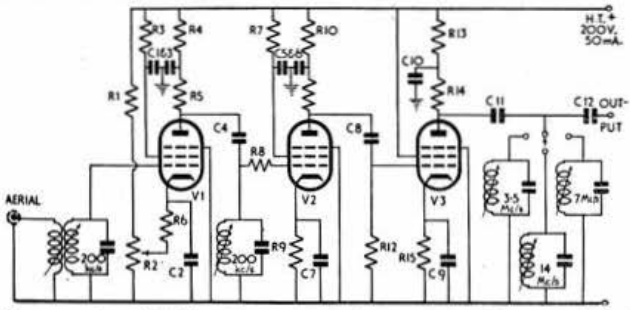


Fig. 1

Circuit diagram of a simple frequency standard designed to provide modulated marker pips at intervals of 200 kc/s. on the amateur bands. No crystal is required, the standard frequency being derived from the B.B.C. transmission from Droitwich on 200 kc/s.

The three switched tuned circuits shown in the output stage provide a degree of frequency selective boost, enabling a calibrated signal to be obtained at 200 kc/s. intervals on the bands indicated. Since the unit is designed to work on only one signal frequency, the tuned circuits in the R.F. amplifier stages may be pre-set. No coil data is given because any standard long-wave coil of commercial manufacture will be suitable.

Due to the fact that a large signal input is required from the aerial, the unit will only function in areas where the field strength from the B.B.C. transmitter at Droitwich is high, otherwise the squaring action in V3 will not take place due to inadequate amplitude of signal. The action of the circuit depends on the fact that the modulation depth of the Droitwich transmissions are held at a very low level (not normally exceeding 80 per cent.), so that V2 and V3 are able to clip off the greater part of the modulation envelope. The accuracy of the frequency standard depends entirely upon the accuracy of the B.B.C. transmitter, which is guaranteed to be better than 1 in 10^6 according to published information. In fact, the accuracy is almost always at least ten times better than this *(i.e.* one part in ten million—or, for the purpose of a frequency standard, one-tenth of a cycle per megacycle).

Layout

The layout and construction of the unit is not critical, and will depend upon the parts and materials available. It can be safely varied to suit individual requirements. The unit constructed by the author is shown in Fig. 2, and this has worked satisfactorily at GW3ZV from a simple aerial consisting of 10-15 ft. of wire.

COMPONENT LIST

R1	27,000 ohms.
R2	500 ohms variable.
R3	56,000 ohms.
R4, 10, 13	2,200 ohms.
R5	12,000 ohms.
R6	150 ohms.
R7	6,800 ohms.
R8	22,000 ohms.
R9, 15	100 ohms.
R11, 14	5,000 ohms.
R12	82,000 ohms.
C4, 8, 11, 12	100 $\mu\mu$F.
C1, 2, 3, 5, 6, 7, 9, 10	0.1 μF.
V1	*Mazda* 6F13.
V2, 3	*Mazda* 6F14.

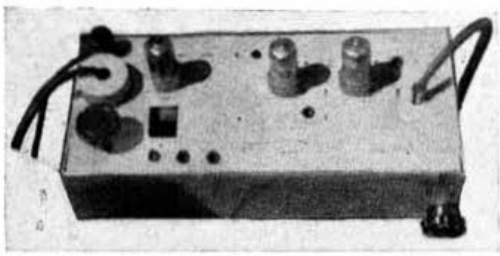


Fig. 2

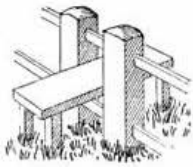
The frequency standard unit constructed by GW3ZV. Aerial input on the left, and coaxial output on the right of the chassis.

* "*Cartref*," *Neath Road, Rhigos, Nr. Aberdare, Wales.*

A Dry Battery Reactivator

SOMETHING new in "battery charging" is announced by *Amplion, Ltd.* Known as the "Activette," the device is claimed to extend the life of dry batteries by four to six times. The reactivation of dry batteries has hitherto been thought impossible, but tests carried out at the National Physical Laboratory have confirmed that this unit, which is contained in a small box measuring 4 x 1¾ x 2¾ in., does, in fact, do all that is claimed. The "Activette," which operates from A.C. mains, may be used to reactivate dry batteries in between periods of service, and is expected to reduce considerably the cost of running portable radio and deaf-aid equipment, where batteries are in frequent use.

THE HELPING HAND TO AMATEUR RADIO



Part VII. — Transmitter Oscillator Circuits

A BEGINNER, planning the oscillator stage of his transmitter, would be well advised to start with crystal control. This practically guarantees a T9 report, and a frequency safely fixed inside the permitted band, regardless of tuning adjustments. At the same time, the chassis layout should be such that a high-quality coil and tuning condenser may later be wired into the oscillator grid circuit (with provision for screening from anode components), so that variable frequency operation may be used once initial experience has been gained. The condenser should be so placed on the front panel that a slow-motion dial, about six inches in diameter, can be accommodated.

By

B. W. F. MAINPRISE

B.Sc. (Eng.), A.M.I.E.E. (G5MP)

Crystal Properties

A crystal consists of a thin disc or plate of quartz which, because of its inherent piezo-electric properties, can be made to behave as an oscillatory circuit of great stability and high "Q" (or *goodness factor).* The frequency of oscillation depends on the thickness of the plate and on the axis of the cut; generally speaking, the thinner the crystal, the higher is the frequency obtained.

Variations in the tuning or the voltages of a crystal controlled oscillator produce only small changes in frequency and, even when the regulation and smoothing of the power supply is poor, the transmitted note remains good. Temperature changes inevitably result in slight frequency drift, but in amateur stations this effect only becomes noticeable on higher harmonics.

If a surge of oscillations of appropriate frequency be applied to a crystal *(e.g.* by switching on a valve connected to a suitably tuned circuit), it will vibrate mechanically, due to the piezo-electric effect, and will maintain oscillation with great constancy. This vibration is far above the range of audio frequencies and, if allowed to attain excessive amplitude, may fracture the quartz. A crystal oscillator stage must, therefore, be run at a low input.

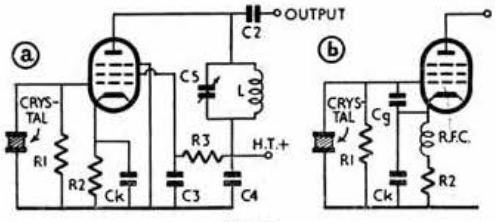


Fig. 1.

(a) Circuit of conventional oscillator using crystal of large pre-war type; (b) Modified design recommended for smaller present-day crystals. Component values are given in Tables I and II.

Crystal Oscillator Circuits

The standard circuit used for crystal control before the war is illustrated in Fig. 1a. The crystal was connected between the grid of a pentode oscillator stage and chassis, being mounted between two parallel metal plates in a holder, sometimes under light spring pressure, and sometimes with a small air gap. At that time, crystals were relatively large, being about ¼-inch across, and anode voltages up to 350 V. were permissible. The limiting value was a R.F. crystal current of approximately 60 mA., beyond which fracture was probable. A 60-mA. flash-lamp bulb was often wired in series with the crystal to act as a visual indicator of maximum crystal current, but not to serve as a protective fuse.

Table I

R1	25,000 ohms	C1, 2, 5	100 μμF.
R2	250 ohms.	C3, 4	0.002 μF.
R3	47,000 ohms.	R.F.C.	1.5 mH.

Cg, Ck.—See Table II.

The increased demand for, and high cost of, quartz during the war, together with improvements in manufacturing techniques, resulted in a great reduction in the physical size of crystals. Operating stresses on the crystal had to be correspondingly reduced, but this disadvantage was offset by refinements in production (such as plating the crystal surfaces) and by the increasing efficiency and gain of new valve types. The

Table II

Fundamental frequency of crystal	6AG7 or EF50		6V6	
	Cg	Ck	Cg	Ck
1.5–3 Mc/s.	75	250	50	250
3–6 Mc/s.	30	100	20	100
6–14 Mc/s.	15	100	10	100

Recommended valves: 6AG7—Va max.: 300 V.; EF50—Va max.: 250 V.; 6V6—Va max.: 250 V.
All condenser values in μμF.

present-day practice is to modify the original circuit by including a R.F. choke in the cathode lead (Fig. 1b), thus providing some degree of feedback *via* the voltage divider Cg and Ck. Incidentally, Ck is not chosen to resonate with the choke.

Tables I and II give circuit values recommended by British manufacturers.

Tuning

As the tuning condenser in the anode circuit of the crystal oscillator valve is slowly varied from its minimum value, a point will be reached where the anode current will suddenly decrease as the stage begins to oscillate, and R.F. output will appear in the anode coil. Anode current will continue to fall (with output still rising) until the tuned circuit is in resonance with the crystal. Immediately this point is passed, and the condenser tunes to the low-frequency side of resonance, oscillations will abruptly cease and the anode current will rise to its previous static value. This "dip" in anode current, when passing through the resonant point, exhibits a *slow* side and a *fast* side, and for stable operation and easy starting, the anode circuit should always be left slightly tuned to the high-frequency or *slow* side of resonance, with some small sacrifice of maximum output. An exception to this rule is an oscillator using a 6AG7 valve which, because of its good internal screening and freedom from interaction between anode and grid circuits, provides an oscillatory output that rises and falls smoothly as the anode circuit is tuned through resonance. Other valve types, with slightly inferior characteristics, are the EF50 and the 6V6.

The Tri-tet Circuit

Where the larger crystals are available and maximum harmonic output is required, the Tri-tet circuit gives the best performance. Referring to

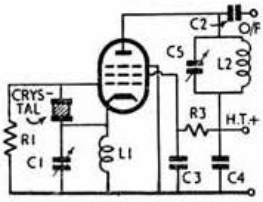


Fig. 2
The Tri-tet Crystal Oscillator circuit for use when maximum harmonic output is required. Component values are given in Table I.

Fig. 2, it will be seen that the tuned circuit is connected in the cathode lead of the valve. The tuning of L1.C1 is not critical, and may be left pre-set to a harmonic, or *well to the high-frequency side* of the crystal. It should be noted, however, that, if the tuning is allowed to approach the fundamental frequency, the crystal will probably be fractured through excessive excitation. The anode circuit is tuned to the desired harmonic, and the output rises and falls smoothly when tuning through the resonant point, with no abrupt cessation of oscillation. For fundamental operation. L1 should be removed and a jumper connection inserted. A 60-mA. bulb is desirable as a crystal current indicator, but this should be short-circuited if the stage is keyed, as the change in its resistance, with filament temperature, may cause a slight chirp. If a pentode with efficient inter-electrode screening is used (the anode voltage not exceeding 300 V.), and steps are taken to prevent the cathode-tuning approaching the fundamental crystal frequency, then the Tri-tet circuit is capable of excellent results, but is best avoided with modern small crystals.

Choice of Crystal Frequency

When selecting the frequency on which to operate, the beginner should avoid:

(a) the lowest 20 kc/s. of each band (this part of the DX bands is usually occupied by high-power stations looking for trans-oceanic contacts);

(b) the 50 kc/s. adjoining the telephony sub-bands (this part of the DX bands is often occupied by foreign stations using telephony);

(c) the section between 1715 and 1750 kc/s. (harmonics from this part of the band fall outside the higher frequency allocations).

Before ordering a crystal, it is wise to spend some time listening in order to ascertain as far as possible that the proposed frequency of operation is not already occupied by commercial stations or neighbouring amateurs.

Variable Frequency Oscillators

Once the beginner has gained experience in the operation of a crystal-controlled transmitter, and has eliminated any difficulties which may arise (such as parasitic oscillations in the amplifier stages), a variable frequency oscillator (V.F.O.) may be built, enabling transmission to be made on any frequency within the band limits.

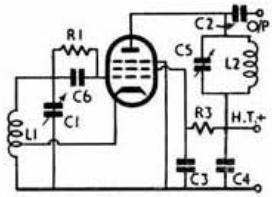
Triode oscillators are not generally satisfactory for transmitter control, since changes in tuning or loading of the anode circuit react excessively on the generated frequency. Pentode and tetrode valves are preferable, since the internal screen-grid (and suppressor-grid) electrode, being held at zero potential to R.F. by suitable by-pass condensers, effectively shields the anode from the grid circuit, resulting in improved frequency stability.

Electron-Coupled Oscillator (E.C.O.)

Generally speaking, any two adjacent electrodes in a valve can be used as oscillatory electrodes. Normal practice is to earth the cathode and connect the oscillatory tuned-circuit between grid and anode, but it is equally permissible to maintain the anode at zero potential to R.F. by means of a by-pass condenser to chassis, and connect the oscillatory circuit between grid and cathode. This type of connection is characteristic of the *electron-coupled oscillator*—one of the most widely used types of V.F.O.

A typical E.C.O. is illustrated in Fig. 3. The tuned circuit is connected between grid and chassis, a pentode valve (such as a 6AG7) being used. Feedback is obtained by taking the cathode to a tap

Fig. 3
The Electron-coupled Oscillator (E.C.O.) for variable frequency operation. Component values as in Table I, except that C1 should consist of a 25 $\mu\mu$F. variable condenser in parallel with a 200 $\mu\mu$F. silver-mica condenser.



on L1—roughly one-quarter of the way up the winding. Oscillation occurs between grid and cathode, the screen-grid being held at zero potential to R.F. by its by-pass condenser, and acting as the anode of the oscillator section. The anode current contains an oscillatory component, and R.F. output can be conveniently taken from the true anode of the valve, which is adequately shielded from the oscillatory electrodes by the screen and suppressor grids. Coupling, therefore, is almost entirely electronic, the anode circuit tuning and loading having very little effect on the generated frequency.

Practical Points

In any oscillator circuit, high-grade components are essential. The shaft of the variable condenser should have bearings at each end with no trace of "play" in the movement. The coils should be tightly wound on a former of ceramic or polystyrene, both of which have lower losses than the cheaper dielectrics. The wire used for the coil windings should be of as large a gauge as can be accommodated, since some heating will occur due to the circulating R.F. current, in addition to the heat developed by the valve and (if used) voltage-dropping resistors.

Rigid wiring and assembly are necessary, with protection from vibration, originating in power supply transformers and chokes, or from keying. A common practice is to enclose the grid coil and condenser in a screening box, leaving the valve and resistors exposed, to facilitate rapid dissemination of heat away from the tuned circuit.

Certain of the internal capacitances of the valve are in parallel with the tuned circuit. Due to heating effects and changes in output loading, these will vary slightly, causing frequency drift. In practice, this may be overcome to some extent by "swamping" the valve capacitances by connecting a silver-mica fixed condenser (value around 200 $\mu\mu$F.) across the coil. Since the value of the tuning condenser is normally about one-tenth of this figure, the requisite band-spread can also be obtained in this manner.

News in Morse

THE following schedule of London Press Service news transmissions is published for the information of Overseas members who may wish to improve their knowledge of the Morse Code. Sending speed is between 20-27 w.p.m. and all transmissions are beamed to reception areas abroad.

G.M.T.	*Call*	*kc/s.*	*Area*
0001-0230 *w*	GAC	6945	4
0001-0040 *w*	GAD6	7355	5
0030-0230 *m*	GAC	6945	4
	GAD6	7355	5
0130-0220 *w*	GAD6	7355	5
0130-0300 *w*	GDC	4125	6
	GBD2	5885	7
w & S	MIJ	7447	2
0945-1045 *w*	GEF	16190	3
1100-1200 *m & s*	GDZ	13910	3
1215-1315 *m & s*	GPA	20100	2
	GAC	17105	1
1600-1700 *w*	GCF	19005	2
1600-1800 *w*	MIJ	7447	1
1815-1930 *w & S*	GDB2	6795	1
	GDL	7345	3
1845-1945 *w*	GPP	5807	6
	GDG	6912	7
1945-2215 *w*	GDB2	6795	1
	GDL	7345	3
2000-2130 *m & f*	GAD6	7355	5
2045-2200 *S*	GDB2	6795	1
	GDL	7345	3
2100-2200 *w*	GCX	8920	2
2130-2215 *w*	GAD6	7355	5
2230-2400 *w*	GAD6	7355	5
2245-2400 *w*	GAC	6945	4
2330-0030 *S*	GCX	8920	2

Key to abbreviations: *w*—weekdays only; *m*—Mondays only; *f*—Fridays only; *s*—Saturdays only; *S*—Sundays only.
Key to Areas: 1—South-East Asia; 2—Africa; 3—North-East Asia; 4—North America; 5—South America; 6—Distant Europe; 7—Middle East.

It's Topical

SIMPLE equipment demonstrating the transmission of colours by television was one of the outstanding exhibits at the **Annual Exhibition of Television Equipment** organised by the *Television Society* at Century House, London, last month. Using a pair of synchronised rotating colour-discs, a monitor cathode-ray tube and photo-cells, coloured cards were placed in the "transmission" box for reproduction on the screen. Other items of interest were—an automatic television-aerial polar-diagram plotter *(Belling and Lee)* using miniature arrays to receive a signal from a small 450 Mc/s. transmitter, with a servo mechanism to produce an inked chart of the polar pattern; projection television for the home *(Decca)* with a screen size 4 ft. by 3 ft.; specimens of the old *Baird* 30-line scanning-disc transmitting and receiving equipment; a new viewing-filter of fabric mesh *(G.E.C.)*; modern outside-broadcast equipment and camera *(Pye)*; an electronic shutter for still photography from television screens *(E.M.I.)*; and a B.B.C. stand showing a new lightweight (60 lb.) studio camera in operation, televising visitors on to a monitor screen.

Training in radio for **Boy Scouts** is part of the programme of activities planned for this winter by members of the **Montreal Amateur Radio Club.** As a first step to developing interest, a picked group of Scouts will be taught how to build a small receiver which, in addition to illustrating "how it works," will also enable them to obtain code practice by listening in their own homes.

Readers of the national Press on New Year's Eve learned something of the practical utility of Amateur Radio in an emergency. "**'Ham' stays on alone in ship with cracked hull**" was one bold headline to the story of Captain Kurt Carlsen (W2ZXM/MM), who stayed on board his damaged 7,600-ton freighter *Flying Enterprise* in a fierce Atlantic storm after the rest of his crew and passengers had been taken off. Radio amateurs all over Britain listened-out for his signals, one of the last to hear him being G6UT of Bishops Stortford. Since then Captain Carlsen has been front-page news on both sides of the Atlantic, his battery-operated rig with its wire aerial dangling through a port-hole enabling him to maintain satisfactory communications with nearby ships.

Brig. General Sarnoff, Chairman of the Board of R.C.A., in a recent speech challenged scientists of the Corporation to produce **three important inventions** in the next five years: first—an electronic amplifier of light, enabling television pictures to be enlarged without loss of optical brilliance; second—a television picture recorder using entirely electronic methods, without the use of intermediate film as at present; and third—an electronic air-conditioner for the home, to function without moving parts, utilising the principle of induction heating.

Honours List

MEMBERS who hold—and display with pride—the Empire DX Certificate, will be pleased to hear that the person who produced their certificate by hand on vellum—Mr. J. W. Portway—was awarded the British Empire Medal in the recent New Year's Honours. Mr. Portway is a Leading Draughtsman in the Engineering Department of the G.P.O.

THE MONTH ON THE AIR

*By A. O. MILNE (G2MI)**

Zanzibar

THE Amateur Radio expedition to VQ1-land is now a matter of history and we await the full story with interest. From the British amateurs' viewpoint conditions were dead against us, and during the few periods when VQ1RF was audible at all, signals were very weak and noise level on the band very high. It is believed that some British Isles stations were fortunate enough to make a contact but it would appear that the Americans on 28 Mc/s. and the South Africans on 14 Mc/s. had most of the luck. Of the Europeans, the Italians appeared to do best. So far as the members of the VQ1 party are concerned, we should like to say "thanks chaps for a good show." Let's hope it can be repeated some time when the ionosphere is in a more friendly mood towards the G's.

"Top Band" to ZL

The series of tests carried out by GW3ZV, GW3FSP, G6GM and ZL1AH met with considerable success. From September 30 to November 4 both the Welsh stations were copied almost every day at an average of 449. From September 30 to October 7 the best time was around 1800 G.M.T. From then on the signals usually got through between 0620 and 0640 G.M.T. G6GM was heard on four occasions together with W1BB, W9NM and W9CVQ. Only two contacts resulted, both with GW3ZV on October 5 and 10. The report so far received gives no details of power or aerials used at either end.

Notes and News

G3HMC of Yeovil, who used to contribute to this column as B.R.S.16857, has been concentrating on 3.5 and 7 Mc/s. with 19 watts and so far has contacted 22 countries, including VE1EA. He has a complete list of HB stations divided into their respective Cantons. Anyone interested should send a S.A.E. to him at 27 Summerleaze Park, Yeovil. B.R.S.7594, also of Yeovil, adds a few to the list, CR4AD, 14197 at 2313, and EA0AC, 14172 at 2315. He says I5US is in Italian Somaliland, 14335 at 1830 G.M.T. Incidentally, W2CKD is Tex Beneke, the well-known band leader.

* *29 Kechill Gardens, Hayes, Bromley, Kent.*

TRIPOLI HAMFEST

During a recent visit to Tripoli, Reg. Knight (G2HKJ), was entertained by some of the local amateurs. In the photograph can be seen from left to right in the back row: MD2PI, G2HKJ, MD2AM, and a S.W.L.; and in the front row: MD2BC, MD2CC, MD2PM, MD2DW and a S.W.L. MT2EX was also present.

The new licence now in force in Cyrenaica has the same conditions as our own. Stations so far licensed include MD1BA (ex-MT1BA), MC1SD, MC1WN and MD1VK. MC calls are held by civilians and MD calls by Service personnel.

G5JL, who still sticks to 7 Mc/s., raised YI3ECU and TA3FAS, both of whom have now gone QRT. G5JL has heard many ZS stations, ZS5FY being the best. Others logged include CT3AB, SU1HY, TF3NA, ZB2F, ZC4XP, VK5FH, ZL3OX and ZL3JQ—all between 1800 and 1900 G.M.T. In the mornings, KV4AI, KG4AC (both on 7045), 4X4BX and LZ1RF are good signals.

G6XS has added PJ5RE, VK9XK and YV5BZ to his countries list and says it is understood that PJ amateurs are now officially recognised and that the authorities there have notified the F.C.C. to this effect. So it looks as if that is one more to work for DX C.C. He offers the following: PJ5RE, 14008 (1745), HZ1AR (14025), ZK1BC, 14005 (1700), CN2AA, 14016 (1750), VK9XK, 14008 (0815), PK4DA, 14080 (1540), MP4KAE, 14048 (1550), EA0AD, 14082 (1640), ZS7C, 14059 (1708) calling CQ LX and being called by everyone but!, PJ1UF, 14026 (1720), FM7WF, 14050 (1725), FY7YB, 14023 (1210), ZS3E, 14044 (1729). On December 9 UA9CC was heard working a PY, so the ban is not universal apparently.

From the *DXCC Bulletin*, edited by W5KUC, we learn that the following are active: FD8AB, T8, 14035, VP2AF, 14296 'phone, ZP7AW, 14120 'phone (QSL *via* the U.S. Embassy, Asuncion, Paraguay), KB6AQ, 14112 (c/o P.A.A., Canton Island), FO8AC, 14064, ZD2FFB, 14084, and FD8AA, 14022.

F9HE reports that VE8RH (14164 kc/s. at 1800 G.M.T.) wants to contact G stations in Lancashire.

Bob Pybus draws attention to VQ8AL, V.F.O. around 14360 kc/s. He has a sked with G2AMG between 1700 and 1730. FR7ZA puts in a good signal at the H.F. end of the band but seems to prefer working French stations. What about a once-a-week break for the G's O.M.? YI3ETQ is now home and has sent out all his cards.

Bob recommends EA9CI's beautiful QSL card worked in coloured silks. QTH Francisco Cabenas, Aragon. Hospital Cruz Roja, Ceuta.

Basutoland

G3CRK sends some details of the elusive ZS7C with whom so many of us would like a contact. The station began operations in June, 1949, with a simple 6L6 C.O. and an input of 3.2 watts. The receiver was an SX17 and the aerial a 66-ft. centre fed. In September, 1950, the present rig, which consists of VFO, 6V6, 6V6, 6V6, to a pair of 807's, came into use. A pair of 809's serve as modulators. The station now operates on all bands, a four-element beam being used on 28 Mc/s. He sends card for card *via* the South African Bureau or by direct surface mail if an I.R.C. is enclosed. No listener reports are acknowledged unless accompanied by an I.R.C. ZS7D is also very active on C.W. and by the time this is in print a new call, ZS7E, may be on the air. ZS7C's first G contact was with G3DLB on January 5, 1950.

News from Down Under

Eric Trebilcock, who has obtained his 200th country listener report QSL—one from I1AHR/

M1—says there are several FI's on the air including FI8KVA, Manoi, FI8YB, Saigon, and FI8WA, Tourane. All ask for QSLs *via* R.E.F., Paris. VR5GA is now back home from Tonga. Of the 16 authentic VK1 stations, Eric has QSL's from eight; these are 1ADS, PG, RA, RB, RD, RF and VU. He actually returned VK1VU's card to be properly made out, and got it back! Another pleasing piece of news is that there is a chance of a ZC2 coming on the air again. KX6ZA is on Majuro Island and VK9WK is at Port Moresby. VK9XK is ex-VK3XK and is at Samarai Island, Papua.

We were delighted to receive a visit from Bert Hay, VK2AGW, during his recent trip to this country. Although somewhat tied down by business commitments, he took time off to visit most of his more regular contacts. He is now on his way home and should be on the air fairly soon.

Falkland Islands

David Duke (ex-G3DDV, ex-VP8AP), now operating from Port Stanley under the call sign VP8AD, is using a small home-made transmitter with an input of 60 watts to a pair of 807s. He complains bitterly of those thoughtless people who make it impossible for him to complete a QSO unless the station he is working has an S9 plus signal. Ragchewing is out of the question on account of those who call him continuously throughout a QSO, on the assumption that sooner or later they will wear him down. David, whose black list grows longer and longer, suspects that some operators cannot read Morse as they take no notice of requests to answer "10 high" or "10 low." He is active on 14 Mc/s. in the evenings around 2215 G.M.T., and is on the look-out for G calls. He will be back in England sometime early in 1952.

Afghanistan

G2APM (Bordon, Hants), just back from Teheran, reports that EQ3UU will be operating on 14 Mc/s. C.W. from Kabul for two weeks as from January 19. G2APM offers to handle QSL cards for EQ stations.

Who's Who

W2YEJ, who was active as 4W1AC in Yemen, is now back in the States. SU1MR, now off the air due to the trouble in Egypt, sends 73 to all his British friends and hopes soon to be active again. G3ILS is ex-VK2DD. G2YY says TA3FAS has now returned to his home and may operate from Detroit after a spell of leave. At present he is W5HBQ with 1 kW. on 7 and 3.5 Mc/s. G3AYN is now in Iraq, so perhaps YI3AYN is a possibility soon! ZC4OR is back in the U.K. as is Frank Johnstone, the original MP4BAB, who is now active as G3HXZ.

MD2PJ explains the sudden disappearance of most of the British MD2's. They are now in Egypt but we don't expect that this will keep them quiet for long.

AC4YN now has a B2 as the result of our recent appeal. In a note of thanks to G3EXE he lets it be known that soon he may have an even rarer call.

Footnote

Apologies if this month's contribution is rather short but it had to be written and sent to press rather early in December.

("Month on the Air" was written by Mr. Milne whilst in hospital awaiting an operation. We are happy to report that he has made a good recovery.—Ed.)

International Short Wave League

A LONG-AWAITED ambition of the International Short Wave League has just been realised, by the publication, this month, of *Monitor*—an independent League periodical. Those responsible for this new venture record their appreciation to Amalgamated Short Wave Press, Ltd. (publishers of *Short Wave News*), for the help and guidance which the League has received from that organisation since its formation.

The current issue contains a number of features of special interest to the short-wave listener as well as a statement of policy, the gist of which is to the effect that the International Short Wave League backs the R.S.G.B., insofar as an independent listener's organisation is able to do so. The statement also recalls that from the time of the inauguration of the I.S.W.L., in 1946, up to the present time, the National Society has given every encouragement and help to the League.

Monitor, at present a duplicated 20 page production, is available, by subscription only, from I.S.W.L. Headquarters, 123 Sturla Road, Chatham, Kent (8s. per annum).

London Members' Luncheon Club

MAJOR KEN ELLIS, holder of G5KW, and a host of DX calls, of which HZ1KE is perhaps the best known—and Bob Thompson, W4GMP—on his way home to Decatur, Georgia, after a spell of duty with the U.S. Navy in European waters—were cordially welcomed at the Christmas luncheon on Friday, December 21; Stanley Vanstone, G2AYC (Chairman of the Club) presiding.

In a brief after-luncheon speech Major Ellis spoke of his pleasure at being in England again at Christmas time—his first spent at home for 14 years. Ken disclosed that during the past six years he had operated from 14 different countries and had despatched 10,000 QSLs to confirm contacts. He also gave some useful advice to those who strive to extract cards from elusive DX stations!

Later in the proceedings Mrs. Clarricoats, on behalf of the Ladies, thanked the members of the Club for their hospitality and for the seasonable gifts which they had received from the Chairman.

The next Club Luncheon will take place on Friday, January 18, at the Kingsley Hotel, Bloomsbury Way, W.C.1, opposite Headquarters (12.30 p.m. for 1 p.m.). All members are assured of a warm welcome. (Captain Kurt Carlsen of the *S.S. Flying Enterprise* has been invited to attend.—Ed.).

Diploma of the French Provinces (D.P.F.)

A NEW award, recently created by R.E.F. and known as the Diploma of the French Provinces (D.P.F.), is now available to licensed radio amateurs who can prove, by means of QSL cards, that they have worked sixteen different French Provinces. The award is in two sections—C.W.-D.P.F. for telegraphy, and Phone-D.P.F. for telephony, regardless of the amateur bands used. Only contacts made since January 1, 1951, are eligible. The form of call prescribed is CQ DPF DE G ... (or the equivalent in telephony), in reply to which the French station will indicate the serial number and name of the Province after its call sign.

Five international reply coupons should be enclosed with all applications, to cover the cost of forwarding the Diploma. Further details may be obtained from: Reseau des Emetteurs Francais (D.P.F.), 72 Rue Marceau, Montreuil (Seine), France.

JAMAICA STORY

*By GORDON H. FULLER (VP5FR)**

On August 17, 1951, Jamaica was devastated by one of the worst hurricanes in living memory. The following story—obtained exclusively for the "Bulletin" by Richard F. C. Crowther, G3DOG—tells how the radio amateurs of that island came to the aid of their community, thereby providing yet another example of public service, and of a job well done in the face of great odds.

AT half-hourly intervals throughout August 17, 1951, the Jamaican broadcasting station gave warnings of the approaching hurricane, but the news was received with little alarm, for in the past hurricanes had usually passed us by . . . only the old-timers recalled the disaster of 1903. So, beyond lashing their beams, there did not seem to be much for local Radio Amateurs to do, except lament the fact that, through shortage of power supplies, their plans for hurricane emergency equipment had not progressed very far.

The storm arrived—as predicted—at about 8.30 p.m. By dawn the next day it had left behind island-wide damage to property estimated at £20,000,000. Some 20,000 homes were completely wrecked, and another 30,000 damaged. Kingston, in which city all but one of the island's radio amateurs live, was cut-off from the outside world. Miles of high-voltage, telephone and telegraph cables were destroyed, no power was available, and water supplies were cut off in most parts of the city. More than 150 people were dead, and thousands more were homeless.

Emergency Rig

After checking up on the safety of their relatives and friends, the local amateurs began the task of endeavouring to establish communication with other parts of the island and the world at large, all commercial radio facilities being inoperative due to the destruction of equipment and lack of power.

Sometime during the morning of August 18, VP5DX, VP5FR and a Post Office official secured the use of a 3-kilowatt Diesel generator as a first step to placing the Jamaica Amateur Radio Association station (VP5RA) on the air. Meanwhile a 25-watt C.W. transmitter (borrowed from VP5AD) and a receiver (borrowed from VP5AK) were hurriedly installed in the top storey of *United Motors*. Through large gaps, where the roof had been blown off, a 20-metre dipole and a 66-ft. wire aerial were erected. At 5.30 p.m. that day, VP5AD and VP5AK brought the station into service and sent out a QRR call on 20 metres—the first signal from Jamaica since the hurricane. Replies were received from W9ROK and W5ZD, who were requested to listen-out for VP5AA at Montego Bay, 120 miles distant at the other end of the island.

Later in the evening VP5FR had his 200-watt 'phone/C.W. transmitter going with an SX43 receiver supplied by VP5DX. By that time (around 10 p.m.) the band was almost dead, but a CQ call on 'phone enabled a request to be passed, *via* HC1KW (Quito), to the U.S. Navy Base in Cuba for an aircraft to survey the damage, as communication outside Kingston was still not possible. The Association's station was closed down at 1 a.m. to enabled the operators to get some much needed rest.

Amateur Communications Network

At 7 a.m. the next day, VP5DX, 'AD, 'AK and 'FR opened up the station to a lively 20-metre band. The first contact was with HC1KW, who confirmed that, as a result of the previous night's request, a U.S. Navy flying boat was being despatched from Cuba to survey the island. Before 8 a.m. a satisfactory 'phone net had been set up between VP5RA (Kingston), VP5AA (Montego Bay), W4NTZ (Washington D.C.), KP4ES, who acted as net control, and several other stations. This net functioned at a fast rate with no breaks for meals—coffee being prepared at the Kingston station by VP5DX's wife. Traffic to and from Public Works, the Red Cross, airlines, weather stations and the Post Office flowed through VP5RA during the day. Many requests came for information about relatives, but most of them had to be ignored due to pressure of official traffic. By mid-day, however, the Post Office was able to establish its own radio contact with Montego Bay, which relieved VP5AA from a considerable amount of work.

One of the most successful phases of operation involved direct contact with W4AVS in Chicago, and *Southern Airlines*—information being relayed on airport conditions, and arrangements made for the supply of emergency equipment. CM9AA, of FG7XA fame, turned up at the right time with a direct line through to the Cuban Red Cross, from

* *Vice-President, Jamaica Amateur Radio Association.*

AFTER THE HURRICANE

The emergency station installed and operated by members of the Jamaica Amateur Radio Association immediately after the hurricane on August 17, 1951. In the picture (from left to right) are: VP5FR, VP5AK, VP5AD (with headphones), VP5DX and VP5AR.

[*Photo by courtesy of The Gleaner Co. Ltd.*

which organisation supplies in quantity were soon received. Many offers of help were now coming in. One stumbling block was the complete lack of local communications, there being no telephone service, but this was partly overcome by the use of messengers.

During the afternoon VP5AR left with his rig for Port Antonio, 70 miles away, to set up communications with the Kingston Post Office. At nightfall VP5AK and VP5AD left for Mandeville, 60 miles distant. Meanwhile VP5RA was kept open for traffic, watch being maintained by VP5RS and VP5AT. By now the real emergency was over, with everyone feeling much the worse for wear.

Aftermath

During the following week VP5RA stayed on the air most of the time, assisted by VP5AR at Port Antonio, and VP5AD and VP5AK at Mandeville.

Incidentally, many members of the Association were unable to take part in the hurricane operations. The President, VP5AO, for instance, was stranded in the country, while '5MU and '5EM sustained damage to their homes, and '5FR lost his 40-ft. steel tower and 3-element 20-metre beam.

Power was not restored to Kingston until many weeks afterwards, and the telephone service was not fully operational until November.

Credit is due to KP4ES, W4NTZ, HC1KW, HC2OL, CM9AA, to the management and staff of *United Motors*, and to a host of other amateurs who co-operated, without whose willing assistance little would have been accomplished. Unfortunately, owing to the unusual circumstances and pressure of work, log-keeping was rather lacking in detail, and it is possible that some stations who helped may have been overlooked.

The problem of providing rapid communications within the city itself was largely overcome by W4QS, who donated four mobile 15-watt 40/80-metre 12-volt 'phone rigs.

Finally, thanks are due to many good friends in the Mother Country for their sincere expressions of sympathy. Several VP5s are again in operation, and in the near future all should be back on the air. The J.A.R.A. is working hard to carry out pre-hurricane plans so that they may not be caught napping in any future emergency requiring their services.

* * *

Editorial Note: Members who would like to donate radio equipment to those Jamaican amateurs who lost their stations during the hurricane should contact Mr. R. F. C. Crowther (G3DOG), who will arrange for its shipment.

LONDON LECTURE MEETINGS, 1951/52

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

Friday, January 25, 1952: **Presidential Address**, followed by Lecture, **Standard Telephones and Cables, Ltd.**
"OVERTONE MODE CRYSTALS."

Friday, February 29, 1952: **Mullard, Ltd.**
"MODERN VALVES FOR V.H.F. WORK."

Friday, March 28, 1952: **Mr. H. A. M. Clark, G6OT**
MICROPHONE ACOUSTICS FOR THE RADIO AMATEUR.

Slow Morse Practice Transmissions

THE following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence.

G.M.T.	Call	kc/s.	Town
Sundays			
10.00	G6MH	1990	Southend-on-Sea
10.00	G5XB	1950	Reading
10.30	G3GIO	1915	Guildford
10.30 *	G3ESP	1990	Pontefract
	G3US		
	G3HCX		
	G3IDT		
11.00	G2FXA	1900	Stockton-on-Tees
21.00	G2FIX	1812	Nr. Salisbury
22.15	G3AEZ	1847	Dorking
Mondays			
19.00	G3NC	1825	Swindon
20.00	G3DSR	1750	Derby
21.00	G3BLN	1900	Bournemouth
21.00	G3BHS	1820	Eastleigh, Hants
22.00	G3AEZ	1847	Dorking
22.00	G3GIO	1915	Guildford
22.00 *	G3EJF	1810	Bury, Lancs
	G3DZU		
	G2AYG		
22.15	G8TL	1896	Ilford
Tuesdays			
18.00	G2FXA	1900	Stockton-on-Tees
19.00	G5XB	1905	Reading
19.30 *	G3HGY	1830	Coventry
	G5PP		
	G5SK		
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G3GIO	1915	Guildford
22.00	G2BND	1890	Dalston, E.
23.00	G2XG	1735	Chingford
Wednesdays			
14.00	G3ADZ	1910	Southsea
19.00	G3ADZ	1900	Southsea
19.30 *	G3HBX	1870	Warwick
	G6XA		
21.30	G3HKC	1770	Birmingham
22.00	G3DLC	1800	Grays, Essex
22.00	G3GIO	1915	Guildford
Thursdays			
18.00	G2FXA	1900	Stockton-on-Tees
19.00	G3NC	1825	Swindon
19.30 *	G2DOF	1830	S. Birmingham
	G3DTG		
	G3ENH		
	G6KI		
	G8JI		
20.00	G3FVH	1920	Hull, Yorks
21.30	G6DL	1760	Birmingham
22.00	G2NK	1730	St. Mary Cray
22.00	G3AEZ	1847	Dorking
22.00	G3GIO	1915	Guildford
22.30	G3OB	1803	Manchester
Fridays			
14.00	G3ADZ	1900	Southsea
19.00	G3BLN	1900	Bournemouth
20.00	G5AM	1900	Witnesham, Ipswich
20.00	G2AMV	1870	Wirral
21.00	G3BHS	1820	Eastleigh, Hants
22.00	G3GIO	1915	Guildford
22.00 *	G3AUT	1785	Rugby
	G3AUF		
	G3CBV		
	G3GTX		
Saturdays			
14.00	G3ADZ	1910	Southsea
22.00	G3GIO	1915	Guildford
23.00	G2FXA	1900	Stockton-on-Tees

* *Each station will operate in turn.*

AROUND THE STANDS

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

In addition to the comprehensive displays of amateur-built equipment described in last month's "Bulletin," the Exhibition was well supported by the Services and the Radio Industry, who showed many items of special interest to radio amateurs. This review surveys the outstanding features of those exhibits.

ALTHOUGH the demands of the defence programme, coupled with world shortage of raw materials, has tended to limit the production of components and equipment for the domestic market, many manufacturers are still maintaining an active interest in the requirements of the radio amateur. Three new exhibitors were *Cosmocord, Ltd., English Electric Co., Ltd.,* and *Panda Radio. The Television Society* displayed original drawings and models of studio sets used in television drama, together with an experimental version of the *Viewmaster* television receiver, having a chassis specially designed for accessibility and ease of working. The Admiralty and Air Ministry stands were centres of interest throughout the period of the exhibition.

Equipment for the Amateur

A 150-watt table-top transmitter, incorporating T.V.I.-suppression devices, was the main feature of the *Panda Radio* stand. This transmitter provides band-switched operation on all amateur bands from 3.5 to 28 Mc/s., using a high-stability V.F.O., and is completely self-contained with built-in power units and modulator. It may be used in conjunction with the four-section low-pass filter which was also on show.

The BRT.400 communications receiver exhibited on the *G.E.C.* stand provides complete coverage of all frequencies between 150 kc/s. and 30 Mc/s. (with the exception of 385-510 kc/s.), and incorporates facilities for frequency-shift keying, dial lock, and—if desired—a 500 kc/s. crystal calibrator.

The usual comprehensive range of specialised products for the amateur shown by *E.M.I. Sales and Service, Ltd.,* included a spot frequency marker (incorporating a crystal oscillator with a fundamental frequency of 1 Mc/s., generating harmonics at 1 Mc/s. intervals up to 146 Mc/s.); absorption wavemeters for H.F. and V.H.F. (with a calibration accuracy of ±2 per cent. obtained by use of a germanium crystal diode and a 0-500 microammeter); grid-dip oscillators for H.F. and V.H.F. (employing a tunable Colpitts oscillator, with a calibration accuracy of ±2 per cent.); and a modulation indicator (incorporating a cathode-ray tube for the direct viewing of modulation envelopes). The new V.H.F. Signal Strength Meter, Type QD.151, was also shown.

Automatic Coil Winder and Electrical Equipment Co., Ltd., showed a range of *AVO* instruments, including the new Model 8 Avometer, and a prototype of the *AVO* Power Factor and Wattage Unit; test equipment was also shown by *English Electric Co., Ltd.* (a 10 kV. insulation tester); *Salford Electrical Instruments, Ltd.* (a quartz crystal activity test set), and *G.E.C., Ltd.,* who, in addition to the *Selectest* multi-range test set, also exhibited two items of constructional interest to amateurs—a diode noise generator (for measuring the noise factor of sensitive receivers), and a low-noise broad-band pre-amplifier for improving the performance of older receivers. Pamphlets giving technical details of these were available.

Here and There

Valves of all kinds and sizes were to be seen on the *G.E.C* stand, while *English Electric* exhibited a number of specialised types, such as the water-cooled and air-cooled V.H.F. transmitting triodes as used in the driver and output stages of the Holme Moss television transmitter. An image-orthicon camera tube and the new 16-inch metal cathode-ray tube (T.901) were also featured. Crystals, generously represented by

An amateur station, including some of the special naval equipment issued to re-servists, was a feature of the Royal Naval Volunteer Wireless Reserve exhibit on the Admiralty stand. Communications equipment currently used by the Navy was also shown.

G.E.C. and *Salford Electrical Instruments, Ltd.*, are available for fundamental operation at any frequency between 400 c/s. and 16 Mc/s.

Woden Transformer Co., Ltd., displayed a full range of transformers (including compound - filled and hermetically-sealed C-core types) for audio, power and modulation circuits, together with a representative selection of chokes. C-core transformers were also on view at the *English Electric* stand.

Microphones were the main item of interest in the *Cosmocord* exhibit, a new production being the *MIC 30*—a lightweight hand microphone with press-to-talk switch (which will also make or break an external circuit) whose shape was "tailored to fit" by squeezing a lump of clay in the hand to determine the most comfortable and convenient pattern for the case and handle. Pick-ups and hearing aids were on show—all incorporating piezo-electric crystals.

Amateur interest in recording was catered for by *E.M.I.*, who exhibited high-quality tape and disc equipment, whose policy of making cabinets to measure, to suit individual requirements, has proved highly successful.

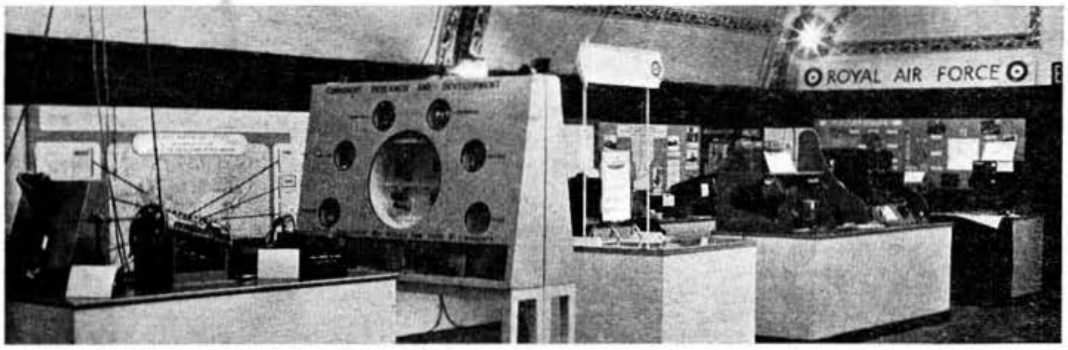
Many questions were asked—and answered—at the Single-Sideband and Audio Equipment stand, where one of the newest amateur techniques was displayed and demonstrated. Pictured in the group above are H. F. Knott (G3CU), G. C. Bagley (G3FHL), R. Morris (G3FDG).

Part of the comprehensive display of amateur-built Low-Frequency equipment. On the stand are P. W. Winsford (G4DC), and F. Lawrence (G2LW).

mainly intended for professional use. A popular stand was that of *E. J. Philpotts Metalworks, Ltd.*, a company specialising in the production of chassis, cabinets, and rack and panel assemblies,

Iliffe and Sons—in addition to displaying a comprehensive range of technical books and, of course, *Wireless World*—exhibited the prototype *Wireless World* F.M. Receiver with a tuning range of 86.5-96 Mc/s. Books and periodicals for the radio amateur were shown by *The Short-Wave Magazine, Ltd.* For those with large collections of magazines and journals, *Easibind, Ltd.*, exhibited a selection of *Easibinders*—a simple self-binding device for converting volumes of periodical publications into bound books.

In general, the trade stands demonstrated that there is a more than adequate supply of equipment and parts to satisfy the needs of the average amateur, although there is no discernible trend at present to produce items specifically intended for U.H.F. operation, probably because microwave practice is not yet sufficiently widespread to make the production of specialised plumbing for the



Outstanding features to be seen at the Royal Air Force stand (pictured above) were a demonstration of Rebecca and Gee radar equipment (left), a display of new developments in component research (centre), and a demonstration of quartz crystal reprocessing techniques (extreme right).

domestic market a commercial proposition. The great majority of amateurs, however, are mainly interested in H.F. operation, and it is in this field that the radio industry appears to concentrate its productive capacity.

The Services

The Royal Naval Volunteer Wireless Reserve was the main theme of the Admiralty stand, which featured a Reserve station using Naval equipment of the type available on loan through the R.N.V.W.R. scheme. A section of the stand was devoted to standard wireless equipment currently used on Naval vessels, including receivers for M.F., H.F., M.F.-D/F and H.F.-D/F. Although one of the communications receivers was connected for demonstration purposes, lack of adequate aerial facilities and considerable local interference made reception extremely difficult.

At the Air Ministry stand the accent was on technical developments. An impressive demonstration of quartz crystal reprocessing illustrated the high degree of accuracy and mechanisation to which this art has been developed, examples of the latest lapping machines and activity test

This display of Historical Equipment—which included a coherer, a crystal set, a spark transmitter and a range of valves dating back to 1908—was filmed by the B.B.C. and screened on *Television Newsreel*.

apparatus being shown in operation. Component research and development was the subject of a special display which featured recent progress in the miniaturisation of components and in resin-moulding techniques. Here one could indeed glimpse the shape of things to come in radio, radar and electronics. Button-sized large-capacity tantalum electrolytic condensers, printed metal-film resistors, high-permittivity ceramic capacitors, and crystal triodes are a few of the newer items that will eventually revolutionise the design and appearance of radio apparatus. Moulded blocks of specially prepared resin, in which are embedded groups of associated components, typify the application of new methods to the problems of combating the effects of heat, cold and moisture on critical circuits. The trend seems to be towards compact miniature equipment of robust unit construction, each unit an integral whole capable of withstanding extremes of ambient temperature, humidity (or even complete immersion in water), and vibration.

Radar was, of course, adequately represented—

IN THE BEGINNING . . .

Mr. Horace Freeman (Exhibition Manager) photographed against a poster advertising the First All-British Wireless Exhibition which he organised in 1922. The poster was displayed on the Historical Equipment Stand.

by the latest Rebecca and Gee navigational aids. Business was brisk at this section of the Royal Air Force stand, where demonstrations were almost continuous. Standard airborne communications equipment with a comprehensive system of remote control was also on show.

For the Shack

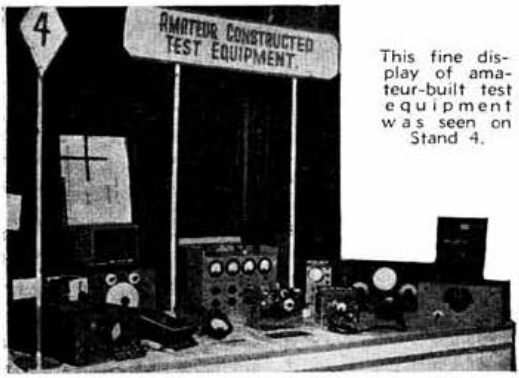
Two items of outstanding interest to radio amateurs, developed by personnel at No. 1 Radio Equipment Calibration Centre, were demonstrated. The first was a Frequency Standard and Comparator for Amateur Radio stations, in which a locally generated oscillation is compared with the received signal of the B.B.C. 200 kc/s. transmission from Droitwich, the frequency difference between the two being shown visually on the screen of a cathode-ray tube. A frequency divergence of even a fraction of a cycle is immediately discernible. A point of interest is that the local oscillator employed in this apparatus is based on and is virtually the same as that appearing on page 127 of the 2nd Edition of the R.S.G.B. *Amateur Radio Handbook*.

The other item was a Valve Keyer for amateur transmitters, connected in a special installation

HEADQUARTERS' STAND

From left to right: P. J. Naish (G3EIX), P. Bond (G3BEG), Miss May Gadsden and C. T. Wakeman (G4FN).

comprising a crystal oscillator, receiver and oscilloscope, designed to demonstrate the ill-effects of incorrect keying-circuit adjustment. The actual keying waveform was monitored on the screen of the oscilloscope, and could be varied from almost square-wave shape (producing hard clicks in the receiver) to a rounded "pear" shape, having a clickless woolly sound. The correct keying waveform, with rounded edges and a slight slope on the make and break, lay between the two extremes, and could be easily obtained by correct adjustment of the keying circuit. A description of the Valve Keyer is planned to appear in an



This fine display of amateur-built test equipment was seen on Stand 4.

early issue of the BULLETIN, but for those who attended the exhibition, printed leaflets providing full circuit details of both the Valve Keyer and the Frequency Standard were distributed gratis.

A wall display featured the R.A.F. Amateur Radio Society, with a selection of QSL cards illustrating contacts made by R.A.F. amateurs.

Front view of the new BRT.400 communications receiver, manufactured by the *General Electric Co., Ltd.*, and shown at the Exhibition.

Appreciation

Credit is due to Mr. H. Freeman, Exhibition Manager, for the efficient organisation of the exhibition, to the management and staff of the Royal Hotel for their willing assistance, and to the many Society members who volunteered to man the R.S.G.B. stands. The construction of the stands and display work was again carried out by *Display and Exhibitions, Ltd.*

Amateur Constructors' Section

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

Stand duty: J. Bramhill (G2BMI), F. Ruth (G2BRH), T. Osborne (G2CVO), C. Newton (G2FKZ), T. Delvin (G2FLK), F. Simmons (G2FWJ), E. Fish (G2HCZ), Mrs. E. E. Fish, F. Lawrence (G2LW), N. Woodhead (G2NX), C. Reddick (G2RK), E. Digman (G3BVA), N. Priest (G3BYB), S. Sharpe (G3CKX), H. Knott (G3CU), R. Ellory (G3CUI), E. Lark (G3CWC), Dr. A. Koster (G3ECA), R. Harris (G3EGT), R. Halls (G3EIW), R. Morris (G3FDG), S. Ledbrooke (G3FDV), G. Bagley (G3FHL), L. Pennelegion (G3FIO), R. Bowler (G3GKN), B. LeGrys (G3GOT), E. Yeomanson (G3IIR), H. Cooper (G3IRR), P. W. Winsford (G4DC), J. Hollington (G4GA), E. Rayner (G6IO), W. N. Craig (G6JJ), J. Driscoll (G8RC), C. H. L. Edwards (G8TL), P. Morris (B.R.S.15509), M. Wallace (B.R.S.18241), L. Hickinbotham (B.R.S.18104), J. Allen, E. Green, J. Miles (Associates), and Messrs. Williamson, Sage, Showell and Largen (Ilford Radio Society).

Equipment: R. H. Hammans (G2IG), W. T. Larbey (G2DWV), C. Newton (G2FKZ), F. Rutter (G2FMF), H. Woodhead (G2NX), M. J. Hicks (G3ASI), J. Plowman (G3AST), G. Fox (G3AEX), J. Bramhill (G3BMI), C. Gillman (G3BPN), R. Rivers-Young (G3BTP), E. Digman (G3BVA), N. Priest (G3BYB), S. Sharpe (G3CKX), A. Watkins (G3CRK), H. Knott (G3CU), R. Ellory (G3CUI), E. Lark (G3CWC), Dr. A. Koster (G3ECA), R. Morris (G3FDG), G. Bagley (G3FHL), A. Brookman (G3FLP), G. Stone (G3FZL), M. Perry (G3GKP), R. Cutts (G3HRC), E. Yeomanson (G3IIR), P. W. Winsford (G4DC), S. Brown (G4LU), W. N. Craig (G6JJ), C. H. L. Edwards (G8TL), R. G. Godfrey (B.R.S.18540), T. D. Cheesman (B.R.S.15776), W. F. Holdaway (B.R.S.15028), J. Flint (B.R.S.17824), L. Hickinbotham (B.R.S.18104), and F. T. Taylor (B.R.S.4249).

EXHIBITION PHOTOGRAPHS

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

10" × 8" — 2/10 plus 3d. postage;
8" × 6" — 2/3 plus 3d. postage;
6" × 4" — 1/10 plus 3d. postage.

QRP Research Group Contest Award

THE QRP Research Group closed its second year of activity with a most interesting little ceremony from the platform of the R.S.G.B. Amateur Radio Exhibition during the afternoon of Saturday, December 1, 1951. Mr. A. O. Milne, G2MI (newly-appointed President of the Group) gave a brief review of its aims and achievements, and explained that the purpose of the function was the presentation of the Kaleveld Cup—a trophy donated by the Group's Continental representative (Evert Kaleveld, PA0XE, of Rotterdam) and awarded to the member making the three best low-power contacts during a selected week.

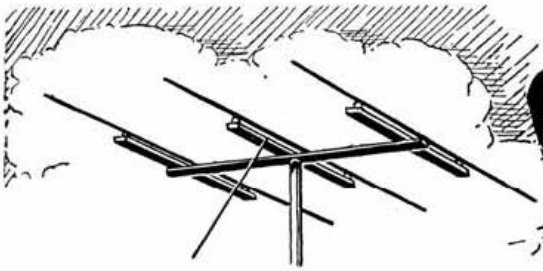
Mr. E. Kaleveld then presented the Cup to the winner of the contest—Mr. E. Banks, GC2CNC, of Jersey, whose entry showed solid QSOs with OK1AJB, OK1HX and SM7OY, all on 3.5 Mc/s., using 0.1-watt input to his single 3Q5 C.O. In his reply, Mr. Banks mentioned that this was the first Amateur Radio trophy ever to be won by a Channel Islands amateur. Unfortunately Mr. W. S. Carter, G5QI, who gained second place in the contest, was not present to receive his certificate, but a certificate was presented to Mr. M. Delaney for the most comprehensive listener report.

Information concerning the Group can be obtained on request from the Hon. Secretary, John Whitehead, B.R.S.18755, "The Retreat," Ryden's Avenue, Walton-on-Thames, Surrey.

Silent Key

With sorrow we record the passing, at the age of 53, of Harold Gregory, G2FBP, of Walsall, Staffs. Mr. Gregory obtained his A.A. licence in 1938 and his full licence immediately after the war. His death, after a short illness, came as a great shock to his many friends in the Walsall and District Amateur Radio Society, in which Society he was a keen and well-liked member.

Our sympathies are extended to his widow, sister, relatives and close friends.



AROUND THE V.H.F.'s

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

THE month of December was not very prolific in reports, due, perhaps, to distractions in other directions at that time of the year. Two metre activity has been at a far lower level than it was a few months ago in the north of England, but the same criticism can hardly be applied to the eastern part of the country. Nor can the lack of activity be laid at the door of V.H.F. conditions, for not only was a good Continental opening enjoyed by East Anglian stations in the middle of the month, but 70 cm. is still yielding ranges in excess of 100 miles to those enterprising enough to try their luck on that band. The report of certain tests carried out in America on a frequency of 412 Mc/s. and dealt with later in this article, may evoke interest, and perhaps correspondence, from 70 cm. enthusiasts.

Two Metre News

On December 12, G3VM (Nr. Norwich), contacted G3AUS (Torquay). He also heard signals from Dutch, Belgian and German stations who were working one another. All failed to answer his repeated calls. One solitary French station was also audible, so the area of good conditions was evidently of considerable extent. On hearing about this, G3WW (Wimblington, Cambs.), called eastwards and raised PA0AD and PA0OP at strengths of S6 and S7 on 'phone, and later had a QSO with ON4BZ, who was an S7 'phone signal and gave 'WW S8. At about the same time—2030 G.M.T.—G3VM succeeded in raising DL3VJ (145.8 Mc/s.).

From 2200 G.M.T. onwards G3WW worked, among others, G2AOK/A (Stow-in-the-Wold, Glos.), 2HCG and 3DUP (Northampton), 3EHY (Banwell, Som.), and 3GHI (Purley, Sy.). Signals between 3WW and 2HCG are normally S9 both ways, but on this occasion each of them found it difficult to read the other owing to severe fading which continued until about 2340 when conditions reverted to normal. On turning the beam eastwards after this QSO, 'WW heard two stations on 'phone at S7 on approximately 144.15 and 145.1 Mc/s. speaking German, but no call signs were given. PA0FB, who came in shortly afterwards, said that he had heard a number of Belgian and German stations working amongst themselves earlier in the evening and stated that DL9LO had been on 144.18 Mc/s. (It is understood that a Dutch station is now transmitting three times each week on 146.0 Mc/s., to collect reports regarding V.H.F. conditions. Further details would be appreciated. —Ed.).

G3WW reports that on the following evening when conditions were fair, contacts were obtained with seven stations between 1830 and 2015 G.M.T., including G3FAN (Ryde, I.O.W.). A new station in Northampton, G3IAI, put in an appearance and a good signal. The 14th was marked by an almost complete lack of activity, but on the evening of the 15th, between 1900 G.M.T. and 0045 G.M.T. the next morning, eleven contacts were made and a number of other stations heard. Because many 2 m. operators have been complaining of a dead band recently a list of these stations may be of interest. G2FQP, HCG, MV, XV, 3BLP, BNC, DUP, EDD, EHY, FAN, FSG, GVC, 4HT, 5YV, 6NB, 8HK and 8VZ.

From the other side of the country comes word from G3EHY who found conditions during December almost consistently good, but with few stations operating regularly. He found several new arrivals on the band, mostly using low power, but asks "what has become of the fine weather boys?"

Two Metre Converters

Further to our remarks on Noise Measurements last month, here are some details sent by SM5VL (Stockholm) concerning three converters in his possession. (1) Wallman Cascode (6AK5-6J4), 6.0 db. (2) Earthed-grid triode (6J4-6AK5 and one section of a 6J6 as mixer), 7.5 db. (3) Push-pull neutralised triode (6J6 and 6J6 p.p. mixer) 4.7 db.

These converters were tested "as built," and no attempt was made to redesign them for a better noise factor, although the input matching was in all cases adjusted for the best results in this respect. SM5VL suggests that in (1) the trouble was probably due to unsuitable components, as the circuit should yield a noise factor of the order of 4.5 db. The 6J4 in (2) gave insufficient gain to over-ride the noise produced by the 6AK5 pentode second r.f. stage. It would be interesting to know whether the employment of the e.g.t. circuit described in the April, 1951, BULLETIN would effect an improvement, as the writer—admittedly using *two Mullard* EC91 valves, which are very similar to the 6J4—obtained a noise factor better than 5 db. with that arrangement.

SM5VL, who will be remembered as one of the pioneers of V.H.F. operation in Scandinavia, was married recently (congratulations O.M.). He hopes to be active again in the Spring from a better V.H.F. location than he had in the past.

The Seventy Centimetre Band

A complete rebuild of the 70 cm. equipment is nearing completion at G3EHY, and already tests have shown good promise. An e.g.t. pre-amplifier, with a type 446 B "Lighthouse" triode in a tuned cavity, has been added to the receiver, and several low powered stations in Bristol and South Wales have been received regularly at S7/9, while GW2ADZ has been heard on several occasions. On December 12, when a warm front was approaching from the west (compare Continental opening on 2 m., reported earlier in these notes), this station was worked for 45 minutes on C.W. with a report of RST 599 in both directions.

* *32 Earls Road, Tunbridge Wells, Kent.*

The distance is 105 miles, and the path quite difficult from the 70 cm. standpoint. Both stations have 32-element stacked arrays—that at 3EHY being indoors—and the transmitter output at the Somerset end approximately 4 watts. A new P.A., incorporating a *Mullard* QQE06/40 double-tetrode is nearing completion. In a recent test with G5TP (Henley-on-Thames), G3EHY was received at RST 559.

It is understood that GW2ADZ and G2FKZ/3FZL are continuing to enjoy regular contacts on Monday evenings on 70 cm., and it is hoped to record some of their experiences at a later date.

American Tests on 412 Mc/s.

G8DM sends details of some experiments conducted in America on a frequency of 412 Mc/s. and published in the November, 1951, issue of the *Proceedings of the I.R.E.* which have considerable bearing upon results to be expected on our 420 Mc/s. band.

Observations were made at four receiving sites approximately 100 miles distant from a transmitter and covered a total period of 2340 hours during all seasons. The estimated power radiated by the half-wave dipole was 1 kW. at an effective height of 40 ft. above flat, rolling country in central U.S.A. The receiving dipoles were only 10 ft. high. The median level of signal strength was plus 5 db. with respect to 1 μV/m., and never fell below plus 3 db. For 10 per cent. of the time signals were 20 db. or so above the reference level with short-time peaks up to 55 db. One of the most arresting things about these tests was the high average level of signal noted between 0400 and 0700 local time, with a secondary, but lesser peak between 2000 and 2300 hours.

G8DM has interpreted these results in the light of modern 70 cm. practice to indicate that communication should be possible *at all times* over a similar path with a signal-to-noise ratio of 10.4 db. at the receiver assuming the following conditions:

(i) Transmitter aerial 40 ft. above ground and with a gain of 13 db. over a dipole.
(ii) Transmitter radiated power 10 watts.
(iii) Receiver aerial similar to transmitter aerial, but 10 ft. high.
(iv) Receiver noise factor 10 db.
(v) Receiver bandwidth 5 kc/s.

Should the receiver aerial be raised above the specified 10 feet, even better results could be expected, likewise a considerable improvement should follow if either or both the transmitter and receiving aerials were sited appreciably higher than the surrounding countryside.

Signal levels on 420 Mc/s. fluctuate (scintillate) very rapidly at times, with the result that speech is chopped up and C.W. difficult to read. Provided the average signal level permits, it would seem that the use of n.b.f.m., combined with adequate limiting, and the employment of a discriminator at the receiver, would remove most of the fluctuations, a fact which has been proved by comparing the a.m. and f.m. transmissions from the B.B.C. V.H.F. transmitter at Wrotham in Shrivenham, using a purposely poor aerial for the purpose.

Comments upon the foregoing would be welcomed either by the writer or by G8DM whose address is now Danes House, Great Coxwell, Faringdon, Berks.

The closing date for reports for the February issue will be Monday, January 21.

Circular Letters

IN order to avoid any misunderstanding which may arise in interpreting the recommendation which was passed at the last R.R.'s Conference and subsequently accepted by the Council, the Council has drawn up the following regulations governing the issue of Circular Letters to local members:

(a) Not more often than twice in any calendar year a Town Representative may, at the Society's expense, issue a circular to local members on matters of local interest.
(b) In such cases the Town Representative will be permitted to make an "en bloc" entry on his Expenses Sheet for circulars sent at the cheap rate.
(c) When reimbursement is claimed a copy of each such circular must be appended to the Expenses Sheet.

Claims for Expenses

REPRESENTATIVES are reminded that expenses should be claimed quarterly or half-yearly and that all Expenses Sheets should reach Headquarters within one month of the following dates: September 30, December 31, March 31, June 30. Claims totalling less than £1 should be held over until that figure is reached or until the end of the Society's financial year—June 30.

Claims cannot be accepted if received later than one month after the end of a particular financial year.

IS YOUR CALL IN THE R.S.G.B. AMATEUR RADIO CALL-BOOK? IF NOT, SEND A CARD TO G2QI VIA THE QSL BUREAU.

Region 6

THE Council has decided, after very careful consideration, not to acceed to the wishes of Hampshire members that a new Region should be formed comprising Dorset, Hampshire and Wiltshire. In reaching that decision the Council were made aware that members in Dorset wish to remain in association with Region 9.

The new Region 6 will comprise the following counties:

Berks (outside Region 7)
Bucks (outside Region 7)
Gloucestershire (excluding the City and County of Bristol)
Hampshire
Oxfordshire
Wiltshire.

In the ballot for the office of Region 6 Representative Mr. H. G. Hunt, G3ECV, of Southampton, was successful by 14 votes to 12 over his opponent, Mr. F. A. Jefferies, G8PX, of Oxford, who had been R.R. during 1951. Mr. Jefferies has agreed to resume office as C.R. for Oxfordshire.

Contests Diary

January 26-27	"Top Band" (No. 1)
March 29-30	B.E.R.U. (Telegraphy)
April 5-6	B.E.R.U. (Telephony)
May 10-11	144 Mc/s. Field Day (No. 1)
June 7-8	National Field Day
June 22	420 Mc/s. Tests
July 6	European V.H.F.
July 26-27	144 Mc/s. Open Event
September 7	Lower Power Field Day
September 21	144 Mc/s. Field Day (No. 2)
October 4-5	Low Power
November 8-9	"Top Band" (No. 2)

I.A.R.U. (Region I) Two Metre Contest

*Data compiled by JAN ADAMA (PA0FB)**

THE European and North African two-metre contest—organised on behalf of the I.A.R.U. Societies in Region I by V.E.R.O.N.—was highly successful. More than 120 competitors, representing eight countries, took advantage of the favourable conditions prevailing throughout both week-ends, and comments received with entries indicate that the event was popular. The chief criticism concerned the long duration of the operating periods. The object of the Committee in fixing the times was to enable contestants to find at least one good spell of two-metre conditions during the contest. The duration of the event undoubtedly proved a double strain on Swiss amateurs, who were obliged to pack up their portable equipment between the two week-ends, and carry it four times up and down the mountains—a point to be considered when the next contest is planned.

Table I.—Contest Winners

Psn.	Call	Pts.	Psn.	Call	Pts.
1	G3BLP	519	11	PA0PN	308
2	G3WW	436	12	G5DS	295
3	G2NH	406	13	G2XC	293
4	G2ANT	393	14	ON4HC	290
5	GW5MQ	372	15	DL3NQ	278
6	G5YV	362	16	G5DF	273
7	GW2ADZ	349	17	DL3FM	268
8	HB1IV	338	18	PA0WO	248
9	DL4XS/3KE	331	19	PA0AD	240
10	PA0FC	322	20	G5MR	221

Leading Stations

The winner of the contest is J. Haydon, G3BLP, of Selsdon, Surrey, who scored 519 points, using an input of 120 watts to a pair of 826s, feeding a 16-element stacked array 450 ft. above sea level. His receiver consisted of a 6AK5, EC91 (R.F.s), 6AK5 (mixer) followed by double conversion.

Second place is taken by R. F. G. Thurlow, G3WW, of Wimblington, Cambridgeshire, who scored 436 points. His equipment included a pair of 24Gs in the final running at 140 watts input and feeding a 5-over-5 Yagi. His receiver employed a 6J6 R.F. and a 6J6 mixer working into a superhet.

Third place also went to a British amateur—E. A. Dedman, G2NH, of New Malden, Surrey, who scored 406 points, using a 4-over-4 Yagi array, with an input of 100 watts on C.W. and 50 watts on 'phone.

Table I lists the first twenty contestants in order of scoring. It is interesting to note that the top seven places are held by G stations, of which all but one used Yagi aerials, with input powers ranging from 26 to 140 watts. Table II lists the contestants in alphabetic order of country, showing score and position, while Table III records some of the outstanding long-distance contacts acheived during the period of the contest.

A careful study of the entries seems to indicate that in Western Europe optimum conditions for propagation existed around midnight on September 22/23.

The effect of height on range is illustrated by

* *V.H.F. Manager—V.E.R.O.N.*

J. Haydon (G3BLP), winner of the I.A.R.U. (Region I) 2-metre Contest, at the operating position. Equipment pictured above from left to right (on shelf)—P.A. unit with 826, exciter with 832 on top of power supply unit; (on table)—2-metre converter, and main receiver (tuning 26–28 Mc/s.). At the extreme left can be seen the ¼-wave matching bars (70/300 ohms).

Table II.—Classified Results

Psn.	Call	Pts.
Belgium:		
1	ON4HC	290
2	ON4HN	166
3	ON4UV	136
4	ON4EI	26
5	ON4IW	10
Denmark:		
1	OZ2FR	175
2	OZ2IZ	163
3	OZ2WP	117
4	OZ6PX	74
5	OZ2LX	44
6	OZ7WA	6
France:		
1	F9DI	187
2	F3CT	169
3a	F8LO	103
3b	F8OL	103
4a	F8NW	100
4b	F8YZ	100
5	F8CH	92
6	F9MX	79
7	F9ZF	41
8	F8KY	36
9	F8AA	30
10	F8SI	25
11	F3WE	23
12a	F9AQ	18
12b	F8NH	18
Germany:		
1	DL4XS/3KE	331
2	3NQ	278
3	3FM	268
4	6RL/P	196
5	6BU	192
6	3JI	185
7	3MH	183
8	2MW	165
9	4CK	161
10	1LS	148
11	6EF	122
12	1LH	113
13	6EP	107
14a	6EZ/P	99
14b	6MH	99
15	6FX	96
16a	1JH	95
16b	3TO	95
17	6SV	83
18	1FL	66
Germany—Cntd.		
19	1LB	61
20a	1DA	59
20b	9EV	59
21	1CK	55
22	1HC	53
23	1CS	44
24	6TT	40
25	3HG	32
26	6KP	27
27	1EX	26
28	1DH/P	25
29	6SW/P	22
30a	9HD	21
30b	6XZ/P	21
30c	6ZB	21
31	3IY/P	18
32a	1KV	17
32b	3WA	17
33	1FG	12
34a	1DY	10
34b	1YC/P	10
35	6DZ	8
Great Britain:		
1	G3BLP	519
2	G3WW	436
3	G2NH	406
4	G2ANT	393
5	GW5MQ	372
6	G5YV	362
7	GW2ADZ	349
8	G5DS	295
9	G2XC	293
10	G5DF	273
11	G5MR	221
12	G3CCQ	203
13	G5UF	186
14	G3CWW	176
15	G2DSW	147
16	GC2CNC	95
17	G3ASG	60
18	GM3EGW	45
19	G2AOL	37
Non-Competitors: G4MR, G3CCH, G3BPM/P, G3HBW		
Netherlands:		
1	PA0FC	322
2	PN	308
3	WO	248
4	AD	240
Netherlands—Cntd.		
5	WI	180
6a	HA	176
6b	NL	176
7	BAL	167
8a	BN	165
8b	IK	165
9	LDG	135
10	IKS	133
11	DV	128
12	FB	124
13	UP	121
14a	JW	118
14b	MU	118
15	VU	117
16	RA	115
17	FP	112
18	TG	107
19	LF	96
20	YA	95
21	BP	88
22	PR	81
23	PAX	64
24	HRO	59
25	RK	57
26	JM	35
27	AV	21
28	LU	20
29	CJP	6
30	DSW	3
Non-Competitors: PA0AJA, PA0JHK, PA0SW, PA0ZU, PA0WL (152 pts.), PE1PL.		
Sweden:		
1	SM7BE	179
2	SM7BB	33
Switzerland:		
1	HB1IV	338
2	HB9CB (ex-PK4AZ)	81
3	HB1IO (HB1 = Portable HB9 Station).	41
More HB Stations than those listed are known to have taken part, but logs were not received.		

the excellent performance of DL4XS/3KE (see Table III), who used a 16-element phased array situated 614 ft. above sea-level. Characteristic peculiarities of the two-metre band were also noted—for instance, the way good conditions would fade-out rapidly in the course of an hour, followed by complete restoration during the following hour.

Around the Countries

Belgium: ON4HC (Antwerp) contacted several Dutch stations. During the week-end September 29/30 many ON's worked stations in the Paris area. *Denmark:* Several Danish stations contacted SM7BE (Lund). *France:* Good contacts occurred between FA3GZ (Algiers) and F8SI, F9DI and F8KY in South France. PA0PN was the only Dutch station worked. *Germany:* OZ, SM, PA, ON, F, G, GW, OE and HB were worked from Germany. *Great Britain:* GC2CNC (Jersey) worked Gs up to a distance of 206 miles. GW5MQ worked GM3BDA, GM3FOW and GM3DAP. European countries worked by Gs included F, ON, DL and PA, while HB1IV was reported heard by G3DIV/A (Eastbourne) on September 22. *Netherlands:* ON, F, G, GW and DL were worked. A duct must have been responsible for several Dutch stations contacting GW5MQ on September 22, since intermediate stations were inaudible. *Sweden:* Reports indicate several contacts with Danish stations. SM7BE (Lund) worked a number of DLs. *Switzerland:* HB1IV, operating from Mt. Pilatus (September 22/23) and Mt. Stanserhorn (September 29/30) had QSOs with DL, ON, F and OE stations. HB1IO contacted stations in South France, as did HB9CB, whose entry recorded a QSO with F3WC, a 4-watt portable station on Mt. Semnoz, South France.

Table III.—Outstanding Long-Distance Contacts

Stations	Location	Distance (Miles)	Date (Sept.)	G.M.T.
GW2ADZ–DL4XS/3KE	Llanymynech–Wiesbaden	550	22	0001
GW5MQ–DL4XS/3KE	Mold–Wiesbaden	525	22	1855
G3AUS–DL4XS/3KE	Torquay–Wiesbaden	520	22	0023
G5YV–DL4XS/3KE	Leeds–Wiesbaden	500	22	2156
GW2ADZ–DL3FM	Mold–Mülheim	500	22	0010
F8KY–FA3GZ	Marseille–Algiers	470	23	2030
F9DI–FA3GZ	Toulon–Algiers	470	23	2130
F8SI–FA3GZ	Marseille–Algiers	470	23	2045
G5BD–DL4XS/3KE	Grimsby–Wiesbaden	411	22	0057
G2NH–DL4XS/3KE	New Malden–Wiesbaden	390	22	0003
GW5MQ–PA0AD	Mold–Hilversum	375	22	2305
GW2ADZ–ON4BZ	Llanymynech–Brussels	360	22	0002
GW5MQ–PA0WI	Mold–Schagen	350	23	0100
HB1IV–ON4HC	Pilatuskulm–Antwerp	340	22	2041
GW5MQ–PA0TG	Mold–Rotterdam	335	22	2235

The Future

The V.E.R.O.N. Contest Committee thank all amateurs who participated in this contest. V.E.R.O.N. is in favour of making it an annual event, and endorses the view that information about V.H.F. propagation can best be determined on an international scale. In handing over the organisation of the Region I V.H.F. Contest for 1952 to another European Society, V.E.R.O.N. hope that it will be possible to hold the event earlier—in May or June, if possible.

Top Band Contest Results

At least 400 stations were involved in the busy struggle for points during the night of November 10-11, 1951. Logs were received from 116 stations, of which no less than 108 were entrants. A gratifying feature of this event was the number of entries received from relatively newly-licensed amateurs. Although competing against many old-timers in a contest requiring great operating skill, speed and endurance, many of these new-comers put up fine scores, and even those who were aware that their efforts would place them towards the foot of the list seem to have obtained a maximum of enjoyment out of the event with promises of "another try next time."

The Leading Stations

Mr. D. E. Davies, GW3FSP, of Skewen, Glam., won the event with a record score of 696 points—a clear lead of 57 points over the next competitor. His scoring rate, too, is a record—183 stations worked in the 11 hours, including 31 in the first hour. It was only in January last that he first appeared as an entrant in a "Top Band" Contest, being then placed fifth. The transmitter in use was an E.C.O.-B.A.-P.A. with 6V6 valves in the first two stages and an 807 in the final. No doubt his aerial system contributed largely to his score—a choice of two half-waves in phase or one of two 270 ft. Zepps. North/South or East/West. His best DX contact was HB9CM.

Runner-up was Mr. J. C. Foster, G2JF, of Ashford, Kent, the leading entrant in the January event. Mr. Foster was able to increase his earlier score by 76 points, obtaining 639 points from 168 contacts. He was, however, badly handicapped in the early hours of the 11th by a supply-mains failure of 75 minutes' duration, but he made up for lost time by a rapid rate of scoring during the last few hours when most other leading stations were experiencing difficulty in discovering fresh fields to conquer. G2JF's transmitter consisted of a V.F.O.-B.A./F.D.-B.A.-P.A. feeding a half-wave Zepp.

Third place was taken by Mr. J. N. Walker, G5JU, of Birmingham, with 624 points from 160 contacts, including OK1AJB. His transmitter line-up was EL32 (C.O./V.F.O.)-6L6-4033A P.A. and the aerial consisted of two 135 ft. wires in parallel, series-tuned with a loading-coil. Mr. H. J. M. Box, G6BQ, of Gravesend, who won both events last year, was fourth with 593 points from 160 contacts.

Mention should be made of G6ZN's fine score of 581 points obtained by working 150 stations with a single stage Hartley oscillator running on dry batteries and an input of 3½ watts. Surely this performance is an answer to the critics who believe that high scores can only be achieved with a multi-stage transmitter using the maximum licensed power.

Conditions

Conditions appeared to be fairly good, but only two Continental stations (HB9CM and OK1AJB) were reported and worked by a few entrants. Although QRM was bad, due to the number of stations operating and "bunching" on certain frequencies (which always occurs), the general noise level was low. Apart from a few ship-shore stations and one or two isolated amateur 'phone signals heard during the early part

Top Band Contest Results
November, 1951

Posn.	Callsign	Reg.	Pts.	Posn.	Callsign	Reg.	Pts.
1	GW3FSP	10	696	55	G2CV	07	338
2	G2JF	08	639	56	GM3BL	14	336
3	G5JU	03	624	57	G6WH	03	333
4	G6BQ	07	593	58	G2BOF	07	328
5	G2YY	13	588	59	G2XV	05	320
6	G5WP	07	583	60	G2AFV	02	318
7	G6HD	07	582	61	G3FNY	07	312
8	G6ZN	02	581	62	G3GNY	06	311
9	G2LC	05	571	63	G2HCZ	07	309
10	GM8FM	13	569	64	G2ZZ	07	306
11	G4DC	07	560	65	G3BF	08	306
12	G3COJ/A	06	558	66	G4BU	04	299
13	G5HB	06	552	67	G3GDW	09	296
14	G6ZY	07	547		G3GHC	03	296
15	G3AAQ	03	542	69	GW3GYY	11	291
16	G8NF	02	539	70	G2CLL	07	290
17	G4JS	01	536		G3NT	02	290
18	G2DLJ	04	535	72	G3EOC	01	288
19	G5JL	07	534	73	G3GGN	08	284
20	GI3GTR	15	520		G4CM	07	284
21	G3AGQ	06	518	75	G3DCQ	07	275
22	G2AOL	07	512	76	G2AVK	02	272
23	GM6RI	12	488	77	G3LA	07	271
24	G3AUT	03	473	*	G3HRW	05	269
25	G5ZX	03	467	78	GW3HJR	10	258
26	G3BJD	01	464	79	G3GWT	02	253
27	G3AKY	02	463	80	G3IIR	07	247
28	GW3QN	11	461	81	G3HQQ	08	241
29	G3DTG	03	445	82	G4XC	04	235
30	G6VC	07	431	83	G2HNF/A	05	231
31	G3BKE	02	429	84	G6JJ	07	224
32	G2FMF	07	427	85	GI3HFT	15	220
	G3DDM	06	427	86	G2HBG	04	217
34	G3IAS	07	413	87	G2CVV	04	205
35	G3BDQ	08	403	88	G3EVL	07	194
36	G3BGP	08	399	89	G3HKC	03	183
37	G3DBF	04	393	90	G3HKX/A	07	182
38	G3HBU	06	388	91	G6WN	07	172
39	G3CPA	07	387	92	GI5HV	15	166
40	G3FXA	08	386	93	G3GLV	01	162
41	G5XB	06	385	94	G3AFL	13	150
42	G3GGK	04	382		G6NK	07	150
43	G3ASI	07	379	*	G3FAS	06	148
44	G3IMW	07	375	96	G3FBA	09	146
45	G3BJU	05	372	97	GM2CHN	12	138
	G8MD	01	372	98	G3ELZ	04	122
47	G3CWW	07	365	99	GM3OM	14	118
48	G5MR	08	361	100	GI6YW	15	115
49	G3FZC	07	357	101	G2QX	06	110
50	G2BTO	01	356	102	G3CWL	07	106
	G6UT	05	356	103	G3GNL	07	98
52	G3CAZ	08	352	104	G3NA	03	82
	GM8MJ	14	352	105	G3HTP	07	61
54	G2FGD	06	341	106	G3IDG	07	36

** Disqualified under Rule 4 (no declaration).*

of the event, the band appeared to be given up to contest operation. However, this is a shared band, and some contestants were reminded of this fact when DAC requested them to keep his channel clear.

"TOP BAND" CONTESTS

The Contests Committee has prepared a memorandum that analyses the results of the last "Top Band" Contest under a number of different scoring systems.

A copy may be obtained by sending a stamped addressed envelope to Headquarters.

Once again activity was centred mainly between 1800 and 1900 kc/s., and hardly any stations were heard above 1950 kc/s. No doubt Loran is responsible for the lack of activity in the H.F. region but there is no excuse for neglecting the L.F. end.

Comments

Those who commented upon the event were unanimous in their praise for the high standard of operating and gentlemanly conduct observed throughout. The logs themselves were an example of neatness and accuracy and undoubtedly much care had been taken in the preparation of many of them. One or two contestants appeared to be unaware of their correct region number and this led to an amendment to the scores of a number of entrants who had claimed three points when working these stations believing them to be in their own region, or, on the other hand, had unwittingly over-estimated their points. This did not, however, affect the scores to a great extent. One or two stations with bad notes were reported, but these were of a temporary nature, the trouble being cleared up soon after it became apparent. Once again G6BQ has furnished the Contests Committee with a comprehensive argument in favour of a modified scoring procedure and suggestions contained therein will be perused carefully by the Committee.

The following are thanked for sending in most helpful check logs:

G2HKU, 2HW, 2MI, 3AED, 3EZZ, 6ZT, GM3EHI and GW3YR.

The First "Top Band" Contest, 1952

THE first individual contest of the New Year will be held on "Top Band" during the week-end January 26-27, 1952.

There are no major changes in the rules for this popular event, although it has been decided to alter the scoring system slightly. This will now be one point per contact without bonus for region or country, and competitors are asked for their comments on the relative scoring systems, to help the Contests Committee to decide if any changes are required for the second event.

In order to facilitate the checking and analysis of entries, an exchange of report and region number will still be necessary before points can be claimed.

Competitors are asked to note a change in the detail at the top of the entry form. The Committee will be assisted in their task of checking entries if the Call Sign and Claimed Score are written in bold characters as near to the top right-hand corner of the form as possible.

Rules

The rules for this contest are identical with those published on page 170 of the October, 1951, issue, with the following exceptions: *Rule 2.*—The contest will run from 2100 G.M.T. on Saturday, January 26, to 0800 G.M.T. on Sunday, January 27, 1952. *Rule 5.*—No entry will be accepted bearing a postmark later than Monday, February 4, 1952. *Rule 13.*—One point will be scored for every contact.

Entries will only be accepted if submitted on foolscap or quarto paper and set out in the form below:—

Top Band Contest

January 26-27, 1952 *Call Sign* .....

Claimed Score .....

Name .....

Address ..... *Region* .....

Transmitter .....

Aerial System .....

Receiver .....

Contact No.	*Time G.M.T.*	*Call Sign of station worked*	*My Report on His Signals*	*His Report on My Signals*	*Region No.*	*Leave Blank*
1		*G2*——	*599*	*599*	*06*	
2		*G3*——	*599*	*599*	*07*	

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

Signed .....

Annual General Meeting

Minutes of the Twenty-Fifth Annual General Meeting of the Incorporated Radio Society of Great Britain held at the Institution of Electrical Engineers, London, W.C.2, on Tuesday, December 18, 1951, at 6.30 p.m.

Present :

The President (Mr. W. A. Scarr, M.A., in the Chair), Messrs. W. H. Allen, M.B.E., A. P. G. Amos, F. Charman, B.E.M., L. Cooper, W. N. Craig, B.Sc., C. H. L. Edwards, A.M.I.E.E., P. A. Thorogood, A. J. H. Watson, F.S.A.A. and P. W. Winsford (Members of the Council), Messrs. S. K. Lewer and A. E. Watts (Past Presidents), Messrs. H. A. M. Clark, B.Sc.(Eng.), M.I.E.E., D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., J. W. Mathews, Assoc.Brit.I.R.E., and H. V. Wilkins (Vice Presidents), Mr. John Clarricoats, (General Secretary), Miss May Gadsden (Assistant Secretary) and about 170 members.

Notice Convening the Meeting

The Honorary Secretary (Mr. L. Cooper) read the Notice convening the Meeting.

Apologies for Absence

Apologies for absence were submitted on behalf of Messrs. V. M. Desmond (Immediate Past President), A. O. Milne (Honorary Editor) and T. L. Herdman, B.A. (Member of Council).

Minutes of the Twenty-Fourth Annual General Meeting

It was moved by Mr. Cooper, seconded by Col. Nepean and resolved that the Minutes of the Twenty-Fourth Annual General Meeting, as published in the February, 1951, issue of the R.S.G.B. BULLETIN, be received, approved and confirmed.

Annual Report of the Council

It was moved by the President and resolved that the Annual Report of the Council, as circulated to the Members and published in the November, 1951, issue of the R.S.G.B. BULLETIN, be received, approved and adopted.

Report of the Honorary Treasurer and the Audited Accounts

The Honorary Treasurer (Mr. A. J. H. Watson), made a statement on aspects of the Society's financial affairs.

It was then moved by Mr. Watson, seconded by Mr. Watts and resolved that the Audited Annual Accounts for the year ended June 30th, 1951, be received, approved and adopted.

Mr. Watson explained to the meeting his reasons for not seeking re-election to the Council.

It was then moved by Mr. Watts, seconded by Mr. Wardman and resolved that a cordial vote of thanks be recorded to Mr. Watson for the valuable services which he has rendered to the Society over a period of eleven years as a Member of the Council and, for the last nine years, as Honorary Treasurer.

The resolution was adopted with acclamation.

Election of the Council for 1952

The President reported that he had received a letter (of which the following is a copy) from the Scrutineers setting out the result of the Baliot for the election of Officers and other Council Members for the year 1952.

"We the undersigned have scrutinised the Council Ballot and report as follows :

President :	F. Charman, G6CJ Returned unopposed
Acting Vice-President :	L. Cooper, G5LC Returned unopposed
Hon. Secretary :	A. O. Milne, G2MI Returned unopposed
Hon. Treasurer :	D. Findlay, G3BZG 1,150 votes. Elected A. P. G. Amos, G3AGM 1,101 votes.
Hon. Editor :	J. Hum, G5UM 1,143 votes. Elected. W. H. Allen, G2UJ 1,119 votes.

Members :

C. H. L. Edwards	G8TL	2,125 votes. Elected
H. A. Bartlett	G5QA	2,016 votes. Elected
T. L. Herdman	G6HD	2,009 votes. Elected
P. W. Winsford	G4DC	1,922 votes. Elected
H. McConnell	GM2ACQ	1,775 votes. Elected
F. G. Lambeth	G2AIW	1,608 votes. Elected
R. Walker	G6QI	1,528 votes. Elected
G. Webster	G5GK	1,509 votes.
J. D. Heys	G3BDQ	1,368 votes.

Total Number of Ballot Papers Wholly Accepted	2,233
Total Number of Ballot Papers Partially Accepted	41
Total Number of Ballot Papers Rejected	18

F. Barnard, G4FB, F. Ruth, G2BRH, E. Green, Associate."

The President further reported that, because of the small number of votes which separated Messrs. Findlay and Amos, Messrs. Hum and Allen and Messrs. Walker and Webster, the General Secretary had asked for those portions of the Ballot affecting the six candidates concerned, to be re-scrutinised. This had been carried out in the presence of Messrs. Ruth, Green, Barnard, Rayner, Solder, Lawrence, Yeomanson and Stone on Sunday, December 16th, 1951.

The President thanked the scrutineers for their help and congratulated Messrs. Findlay, Hum, Bartlett, Lambeth, McConnell and Walker on their election to the Council for the year 1952.

Auditors

It was moved by Mr. Watson, seconded by Mr. Varney and resolved to confirm the appointment of Edward Moore and Sons as Auditors for the year ending June 30th, 1952, at a fee of seventy-five guineas.

Institution of Electrical Engineers

The President moved and it was resolved that a cordial vote of thanks be recorded to the President and Council of the Institution of Electrical Engineers for allowing the Society to continue to use the Institution's building for the holding of meetings.

This concluded the formal business of the Annual General Meeting.

(A Report of the Annual General Meeting begins on Page 322).

Report of Twenty-fifth Annual General Meeting

THIS Report of the Twenty-fifth Annual General Meeting of the Society, held on December 18th, 1951, should be read in conjunction with the Minutes of the Meeting as published on page 321 of this issue of the BULLETIN.

Annual Report of the Council

Following the adoption of the Minutes of the Twenty-fourth Annual General Meeting, the President moved that the Annual Report of the Council for the year ending June 30th, 1951, be adopted.

Mr. Basil Wardman, G5GQ, commented on the falling-off of trade support for the Fourth Annual R.S.G.B. Amateur Radio Exhibition held in November, 1950, and the serious fall in membership recorded during the year under review. Mr. Wardman suggested that the Society should organise the Radio Amateurs' Examination in collaboration with the G.P.O. On licence matters he agreed that it is necessary for one body to speak with a common voice. There would be no hobby, if there were no licences. The Society had always spoken on behalf of all U.K. amateurs.

Mr. Wardman asked, what is the policy of the Society? What is it that the Council plan to do? Reading the Report reminded him of a sparrow darting about looking for crumbs. He had analysed the percentage of revenue spent on certain specific items of expenditure. His analysis showed that 16 per cent. is spent on secretarial and general offices expenses, 14 per cent. on regional expenses, five per cent. on the QSL Bureau and 61 per cent. on the BULLETIN. He wondered whether the Society was justified in spending approximately 2s. 10d. in every £1 on regional expenses. He asked, "Can we operate such a scheme successfully from London?" A possible solution would be to open-up branch offices in the provinces. Of the QSL Bureau, Mr. Wardman asked, "What percentage of our 12,000 members use the service?" Speaking of the Society's Journal, Mr. Wardman said, "We must face the fact that the BULLETIN is the master, instead of the servant of the Society." He referred to it as "an inflated tail wagging the dog." He considered there was no reason why the BULLETIN should not become a paying concern. This, he suggested, could be done either by making it a commercial publication controlled direct by the Council or by forming a separate publishing organisation. He agreed that, as now produced, the BULLETIN must include many items which are of interest only to members. The BULLETIN cannot, at present, afford to operate a technical laboratory, but if its scope were changed to that of a commercial publication, much development would be possible. Mr. Wardman ended his speech by again asking, "What is the policy of the R.S.G.B. and what are its future plans?"

A member drew attention to the statement made in the Report that, although some 500 licences were not renewed during the year, there had been a net increase over the previous year of 190. In view of that fact he suggested that the membership of the Society should have increased rather than decreased.

Mr. Newton, G2FKZ, enquired what progress had been made in regard to the revision of the Articles of Association.

The Report was then adopted.

Report of the Hon. Treasurer and Audited Annual Accounts

The Hon. Treasurer (Mr. Watson), began his speech by explaining that the revenue received from subscriptions during the first five months of the present financial year was only £68 less than in the corresponding period of 1950. He suggested that this may mean that the membership was becoming more stabilised. Mr. Watson explained how the "Subscriptions in Advance" reserve operated and also why he had recommended the Council to write-down the stock of certain technical publications. He mentioned—particularly for the information of new members—that during the period from 1940 to 1951, the Society made a total profit of £12,832 on the sale of technical publications. In that connection he felt that the membership at large should be made aware of the great debt of gratitude the Society owes to those who were associated with the General Secretary in preparing the *Amateur Radio Handbook*. He mentioned in particular Messrs. H. A. M. Clark, G6OT, D. N. Corfield, G5CD, F. Charman, G6CJ, E. L. Gardiner, G6GR, S. K. Lewer, G6LJ and J. W. Mathews, G6LL.

Mr. Watson then gave details of the expenditure incurred under the headings of "Furniture and Fittings" and "Legal Fees." With regard to the loss of £260 on Convention he said that the decision to organise a Festival of Britain Year Convention was taken early in 1950, shortly after a highly successful Convention (supported by about 600 members and friends) had taken place in Manchester. The 1950 Council had assumed that at least 600 persons would support a London Convention during the summer of 1951. Unfortunately the support, particularly from London and the Home Counties, was much below expectations. The film which it was planned to show later in the evening had cost £47 to produce and was included in the loss of £260.

Mr. Watson reminded the meeting that in 1939 the Society's assets were under £2,000—today they were in excess of £20,000.

Mr. Watson stated that the Finance and Staff Committee had budgeted for a substantial loss on the current year as it was realised that any benefit which might arise from an increase in subscription rates would not take effect until the following year.

Mr. Watson suggested that it was the duty of every member to retain a proper sense of perspective and to bear in mind that the Society is in being to promote a hobby interest, and that the Council was a voluntary body. He believed that, over the years, the Council had always taken the view, in financial matters, that it was the duty of the governing body to see that any proposed expenditure was in the best interests of the Society as a whole and that the best possible value was obtained when spending the members' money. The fact that a group of members wanted some particular service was no justification for granting that request unless the Council felt that the service fell within the limits of the principles outlined.

Mr. Watson then made a reference to the action of those members who, at the previous Annual General Meeting, rejected the Audited Accounts.

TROPHY WINNERS

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

(1) Mr. D N. Corfield (G5CD), winner of the handsome Wortley-Talbot Trophy. (2) Mr. P. R. Golledge (G3EDW), winner of the Low Power Contest, was awarded the 1930 Committee Cup. (3) Mr. H. A. Bartlett (G5QA), Region 9 Representative and newly-elected Council Member, winner of the Society's Premier Trophy—the Rotab Cup. (4) Mr. G. T. Peck (B.R.S. 15402) winner of the D/F Contest, receives the 1950 Council Trophy. (5) Past-President Stanley Karl Lewer (G6LJ), receiving his Honorary Member's Certificate and Badge from the President (Mr. W. A. Scarr). (6) Mr. R. H. Hammans (G2IG), winner of the Norman Keith Adams Prize for 1951 and the Courteney-Price Trophy. (7) The Colonel Thomas (B.E.R.U.) Trophy, the B.E.R.U. Senior Telephony Contest Miniature, and the Braaten and Mitchell Milling Cups were won by Raymond Joss (G2AJ), seen here in company with G2WS and G5LC. (8) Frank Hicks-Arnold (G6MB) receives the Edgware Trophy awarded to Thames Valley Amateur Radio Transmitters' Society, winners of the 1951 Affiliated Societies' Contest. Leslie Cooper (G5LC), (Executive Vice-President), seen in the centre of the group, is President of T.V.A.R.T.S.

Prints of the above photographs may be obtained from Mr. Eric Yeomanson, G3IIR, at prices announced on page 315.

He believed that this action and the subsequent action of those members who had issued a circular letter entitled "Freedom of Speech," had done much harm to the Society and had been directly responsible for the suggestion made recently in a contemporary magazine that the Society had "cracks and gaps in its structure and rebellion and dissension in its ranks." Mr. Watson pointed out that the rejection of audited accounts had been construed by some as a suggestion that the officers of the Society had been dishonest. He urged those present to bear his words in mind if they, at any future time, contemplated any similar action and to consider it carefully in the light of the principle, "Is it in the best interests of the Society as a whole?"

Mr. Watson assured the meeting that his decision not to allow his name to go forward as a candidate for Honorary Treasurer had been taken solely for business reasons, and that it had no relation to the events of the previous year. He pointed out, however, that to a professional accountant, nothing could be more damaging than the rejection of the Audited Accounts of an organisation of which he was Honorary Treasurer. After expressing the hope that the members would be kinder to his successor, Mr. Watson then formally moved the adoption of the Accounts and Report.

Mr. Watson's speech was warmly applauded.

Mr. Arthur Watts (Past President) in seconding the adoption of the Accounts and the Report, expressed regret that Mr. Watson had decided to step down from office and, judging by the applause just given, he felt sure the members present were also sorry that the Society was to lose Mr. Watson's services. Mr. Watts emphasised that the rejection, last year, of the Audited Accounts was in no sense a reflection on Mr. Watson. Mr. Watts said he realised—as had other members—that the rejection of the Accounts was, for Mr. Watson—in view of his professional position—a very serious matter. Mr. Watts stated that he believed the Accounts were rejected because certain members felt, at that meeting, a sense of frustration, over matters which had nothing to do with the accounts. Mr. Watts said he had been privileged to hear Mr. Watson, on many occasions, give advice on financial and other matters to the Council. Members should realise that the Council, as a whole, is responsible for the presentation of the Accounts. Mr. Watts concluded his speech by suggesting that the Council should husband the resources of the Society during the year 1952.

Mr. Watts then asked permission to move that a cordial vote of thanks be recorded to Mr. Watson for his past services to the Society as Honorary Treasurer. Mr. Wardman seconded the motion which was carried with acclamation.

Mr. Newton enquired whether any expenditure had taken place in connection with the Region I Bureau. Mr. Watson stated that although the Council had agreed to an expenditure of up to £500 for the year 1951, the expenditure had, in fact, only amounted to a few pounds.

Mr. Castle enquired why, in his previous Report, Mr. Watson had predicted a loss of £100 on the Fourth Amateur Radio Exhibition. Mr. Watson stated that at the time the Report was prepared, which was some time before the date of the Exhibition, the Council were anticipating a loss, because support from the radio industry was expected to be less than in 1949. The support, however, was greater than anticipated, and by effecting economies, particularly in regard to printing, the expected loss had been turned into a useful profit.

Mr. Castle felt that the Honorary Treasurer had been unduly pessimistic in predicting a loss on the current year of £2,500. He agreed the Council should be cautious, but he thought it bad salesmanship to suggest to the membership, as well as to candidates for membership, that the Society is running at a loss. Mr. Watson explained that the Finance and Staff Committee had examined the proposed income and expenditure with great care, and had reached the conclusion that a deficit of £2,500 appeared to be likely. Mr. Watson agreed that the estimate may prove unduly pessimistic, but on the other hand it was his duty, and that of the Finance and Staff Committee, to present facts, as they saw them, to the members.

An Australian member resident in England commented that the Wireless Institute of Australia and Australian amateurs generally, look with envy and admiration on the work of the R.S.G.B.

The motion to adopt the Audited Accounts and the Honorary Treasurer's Report was then put to the meeting and carried unanimously.

Council Ballot, 1952

The President then announced the result of the Ballot for the election of the Council for the year 1952.

The President afterwards moved and it was resolved that a vote of thanks be recorded to the members who had acted as scrutineers.

Mr. Scarr congratulated those who had been elected to the Council for the first time.

Auditors

Mr. Watson moved, Mr. Varney seconded and it was resolved that Edward Moore and Sons be re-appointed Auditors for the current year at a fee of seventy-five guineas.

Vote of Thanks to I.E.E.

The President moved and it was resolved that a vote of thanks be recorded to the President and Council of the Institution of Electrical Engineers for permitting the Society to continue to meet in the Institution building.

Informal Discussion

Replying to Mr. Wardman's comments made at the beginning of the meeting the President reminded the members present that one of the first decisions of the 1951 Council had been to draw-up and issue a statement of policy. No previous Council had declared its policy to the membership in this way. Mr. Scarr suggested that many of the matters referred to in the Annual Report represented the fulfilment of that policy. The Council had not felt it necessary, when preparing the Report, to repeat its statement of policy.

Replying to Mr. Newton, Mr. Cooper explained that the 1951 Council had devoted many hours to a study of the Articles of Association and that about three-quarters of the Articles had already been dealt with. Mr. Cooper outlined the steps which were now necessary in order to complete the task. As soon as the examination of the Articles had been completed a draft would be sent to the Society's legal advisers and then to the Regional Representatives for their comments. He anticipated that the Regional Representatives would be invited to meet the Council, after which the draft would be issued to the membership for their comments. After a stated period a final draft would be sent to the Board of Trade for approval. When this had been obtained a Special General Meeting would be held to ratify or amend the new Articles.

Mr. Hollington, G4GA, asked why no information appeared in the Report regarding the number of members who had resigned.

The General Secretary explained that only a very small number of members actually resign. Under present arrangements, a member continues to receive the Society's journal for a period of three months after his subscription has become due. The names of overdue members are reported to the Regional Representatives. It frequently happens that within a few weeks of a member becoming more than three months overdue, he renews and again receives the BULLETIN. In other cases members do not renew until many months later and then expect to receive the issues of the BULLETIN they have missed. Mr. Clarricoats agreed with Mr. Walker, G6QI, that a member is entitled to nominate candidates for the Council provided his subscription is less than 12 months overdue. Mr. Clarricoats expressed the view that the appropriate Articles bearing on these points would require to be very carefully considered by the Council and the membership.

Mr. H. Wilkins, G6WN, commented that the practice of sending the BULLETIN to overdue members was costing the Society a great deal of money each year. Mr. Hollington considered that the present position is lax.

Referring to the remarks made by Mr. Cooper concerning the Articles of Association, Mr. Watts considered that some of the Society's present difficulties may be due to the fact that the Council has lost the advice of many of its past Presidents. Mr. Watts considered that Council's position would be strengthened if provision was made in the Articles, for past Presidents to serve for a period of, say, four years after vacating the Presidential Chair.

Mr. Cooper assured Mr. Watts that the points he had made had already been carefully considered by the retiring Council.

Mr. Deaman, G2NH, then read to the meeting the following statement:

"I would like to take the opportunity of congratulating the Council on their editorial comments in the November issue of the BULLETIN, *entitled 'Unbalance.'*

"I have been a reader of, and subscriber to, 'The Short Wave Magazine' since its inception, and I fully appreciate that it has a place, and in my opinion, a very important place in the pattern of amateur radio in this country. However, I do NOT think that it has the slightest mandate from its readers to take this destructive critical attitude against our national society.

"It can easily be confirmed by anyone wishing to take the trouble to do so, that any form of divided control of a hobby or movement, is a fatal policy, and as we have in the R.S.G.B. an old-established national society which already represents the vast majority of amateur transmitters in this country, what, in heaven's name, makes the editor of 'The Short Wave Magazine' think that we require a rival organisation?

"That our society has faults, none of us will deny, but surely such faults are inevitable in any society that has to cater for the widely divergent aims and views that are inseparable from our hobby, and which, in addition, has to rely on voluntary workers for the major portion of its detailed administration. We have seen during the last year that constructive criticism is welcomed by the Council, and they have not hesitated to act on such criticism, where it was shown that the majority of the membership wished it.

"In any case I am sure the general body of members will agree with me when I say that we prefer to manage our affairs through our democratically elected officers, and that we do not require gratuitous criticism of a purely destructive nature from a commercial publishing organisation.

"I note from the current issue of S.W.M. that Austin Forsyth says that he has not said his last word in this matter, but in all sincerity, I do ask him to pause and reconsider, before he launches out on any new mud-slinging campaign that can only result in harm to the amateur radio movement."

Mr. Dedman's statement was received with sustained applause.

Mr. Ewen expressed the view that the BULLETIN might go out and beat its competitors in the commercial field.

Mr. Cooper, speaking on behalf of the retiring Council, thanked Mr. Dedman for his statement. He assured the meeting that it was with reluctance that the Council decided to issue a rejoinder to the editorial published in the October, 1951, issue of *The Short Wave Magazine*. Had they not done so, however, the membership could have claimed that the Council was weak.

Mr. Cooper informed the meeting that during the year 1951, the Council had met on no less than 23 occasions and had been in session for a total of 90 hours—equivalent to more than two normal working weeks. In addition, Council members had attended Committee Meetings and various official functions. He, personally, had attended 60 Society functions and meetings during the year.

Mr. Newton asked when it was expected that GB1RS would be functioning again. Mr. Charman stated that the Technical Committee is still investigating the possibility of moving the station from Headquarters. He hoped to be able to report a satisfactory arrangement early in the New Year.

Mr. Delvin complained that Council members and Regional Representatives receive their copy of the BULLETIN four to six days earlier than the general membership. Mr. Clarricoats stated that, on the instructions of the Council, an advance copy of each issue is sent to the Members of the Governing Body and to Regional Representatives, but he disagreed that the distribution was four to six days in advance of the general distribution. Normally the advance copies are despatched 24 to 48 hours prior to the general distribution. It could happen that, if the BULLETIN was printed on a Thursday, the advance copies would reach their destinations on Friday, whilst the bulk distribution (of 12,000 copies) would not be despatched until Monday. He had given strict instructions to the Society's printers that the distribution was not, under any circumstance, to be made piece-meal. This had occurred, accidentally, some years ago with the result that certain members, interested in the Small Advertisements section, felt aggrieved because other members who received the BULLETIN a day earlier, had already taken advantage of a particular bargain offered for sale.

Mr. Varney queried whether the Society would make money if the subscriptions were reduced and members were allowed to purchase the BULLETIN from booksellers. Mr. Watson reminded the meeting that 2,900 of the 3,200 members who replied to the appropriate question in the questionnaire were satisfied with present arrangements in so far as the BULLETIN is concerned.

A member enquired why the BULLETIN is not offered for sale on bookstalls. Mr. Charman considered that such a step would lead to a marked falling off in paid-up membership. Members would, no doubt, buy the BULLETIN, but many would not renew their subscription. The A.R.R.L. had, he believed, lost many members since it was decided to place *QST* on sale at bookstalls. Mr. Charman also referred to the heavy wastage which has been found to occur with publications offered through the bookstalls.

Mr. Mott enquired why the Council had not agreed to allow candidates for the 1952 Council to issue election addresses. He and many other members were not conversant with the qualifications of all the candidates. The recent questionnaire had shown a majority to be in favour of election addresses.

Mr. Clarricoats agreed that the questionnaire returns showed a slight majority (54 per cent.) in favour of election addresses, but the retiring Council, after carefully considering the matter, had decided not to authorise the issue of such addresses. The Council felt that the step would be undignified and not in keeping with the status of the Society.

Mr. Matthews, G2CD, commented that it would be useless to issue election addresses so long as the membership were denied the right to know the names of those who voted for or against a particular motion at Council meetings.

Mr. Wardman wound up the discussion by reminding the meeting that it is a feature of the British way of life that there should be cut and thrust in debate. During the past year the Council had done a tremendous amount of work. They were live people doing their best for the membership and on behalf of all present he proposed that a hearty vote of thanks be recorded to the President, Council and Officers for their valued help.

The motion was seconded by Mr. W. H. Matthews and carried with acclamation.

The meeting terminated at 8.20 p.m., after which presentations were made to Mr. A. J. H. Watson, Mr. S. K. Lewer, Mr. H. A. M. Clark and those Trophy winners who were present. The 1951 Convention film was then screened for the first time.

Presentation of Prizes and Trophies

THE undermentioned trophies were presented at the Annual General Meeting, held at the Institution of Electrical Engineers, on Tuesday, December 18, 1951:

Rotab to Mr. H. A. Bartlett, G5QA.
Wortley Talbot to Mr. D. N. Corfield, G5CD.
Courtenay Price to Mr. R. H. Hammans, G2IG.
Founder's to Mr. J. P. P. Tyndall, G2QI.
B.E.R.U. Senior Telephony Contest Miniature to Mr. W. R. Joss, G2AJ.
Colonel Thomas to Mr. W. R. Joss, G2AJ.
N.F.D. Shield Replica to Chelmsford Group (accepted by Mr. R. L. Varney, G5RV).
1930 Committee to Mr. P. R. Golledge, G3EDW.
Somerset to Mr. J. C. Foster, G2JF.
Desmond to Mr. D. Davies, GW3FSP (winner of second Top Band Contest, 1951).
Mitchell Milling to Mr. W. R. Joss, G2AJ.
1950 Council to Mr. G. T. Peck, B.R.S. 15402.
1951 Council to Mr. F. H. Watts, G5BM.
Edgware to Thames Valley Amateur Radio Transmitters' Society (accepted by Mr. F. Hicks Arnold, G6MB).
Fergus to Messrs. C. J. Spackman, G3GYQ and P. J. Naish, G3EIX.
Braaten to Mr. W. R. Joss, G2AJ.

Upon the invitation of the President, newly-elected Council Member Hugh McConnell, GM2ACQ, accepted the N.F.D. Shield on behalf of the Falkirk Group for subsequent presentation to that Group.

The **Norman Keith Adams Prize** was presented to Mr. R. H. Hammans, G2IG.

The winners of the undermentioned trophies were not present:

B.E.R.U. Senior Rose Bowl.—Mr. F. J. North, VP6CDI.
B.E.R.U. Junior Rose Bowl.—Mr. J. Van Wyk, ZS6QF.
B.E.R.U. Receiving Rose Bowl.—Messrs. W. L. Ely, B.R.S. 1535, and B. Kendall, B.R.S. 14261.
Watts.—Messrs. S. F. Brown, G4LU, and J. Spragg, G3APY.
Milne.—Mr. J. Banner, GW3ZV.

Presentation to Mr. A. J. H. Watson

AS a mark of esteem and in appreciation of his valuable services to the Society, members of past Councils, together with the two senior members of the Headquarters' Staff, were responsible for the presentation of a silver cigarette case to Mr. Alec Watson, G2YD, at the recent Annual General Meeting.

Mr. W. A. Scarr (G2WS) making the presentation to Mr. Watson.

Mr. Watson was elected to the Council in 1941 and became Honorary Treasurer two years later, an office he held for nine years until his retirement last month. During that time the assets of the Society increased from £2,000 to £20,000, a reflection on his wise direction of the financial affairs of the Society. Mr. Watson is a Fellow of the Society of Accountants and Auditors and senior partner of a well known North London firm of accountants.

Presentation to Mr. S. K. Lewer

AT the same Meeting, Mr. Stanley Karl Lewer, B.Sc., G6LJ, was presented with a certificate on vellum to mark his election to Honorary Membership of the Society. Mr. Lewer was President in 1947 and represented the I.A.R.U. and R.S.G.B. at the I.T.U. Conference held that year in Atlantic City, U.S.A. Mr. Lewer is a Member of the G.P.O. Liaison, Region I Bureau and Technical Committees of the Society.

15th B.E.R.U. CONTESTS 1952

THIS year the contests will occupy one weekend period of 24 hours duration for each of the Telegraphy and Telephony events. As usual, the Telegraphy event will have full-power and low-power sections, whilst receiving sections will operate in connection with both the Telegraphy and Telephony events, making five sections in all. The reduction in time period follows the modern trend, and will undoubtedly be welcomed.

The dates have been moved back to March/April because of the congestion in earlier months, and should suit those who wish to participate in other contests. Under present-day ionospheric conditions the new dates are expected to result in somewhat better performance on 7 and 14 Mc/s. and a weaker performance on 3.5 Mc/s. The 28 Mc/s. band will probably not be useful either at the new times or earlier, except for a few north-south contacts. The rules make provision for the use of 21 Mc/s. in all sections should that band become generally available. It is doubtful, but if it *does* happen we shall surely have a most interesting time!

In order to encourage participation by VE2 and ZS stations, VE2 has been made a zone in itself, and ZS has been made into three zones, making 30 in all. Much study was given to the problem of reducing "G-congestion" by zoning or other means, but no simple solution could be found. Again, to be uniform with other contests, the serial number must now start between 0 and 100. With these modifications the rules stand as before.

Entrants are again asked to note carefully the posting dates (Rule 8) and to try and send in tidy and uniform logs (Rule 7). It will be found helpful to prepare a scoring chart in advance showing zones and zone totals against entries. If this is filled in during the contest, duplicate contacts can be avoided, the score can quickly be found at any time, and log and analysis totals can easily be made to agree.

As usual a trophy or miniature cup will be awarded to the fully paid-up member of the R.S.G.B. gaining the highest number of points in each section. Certificates will also be awarded to the first three entrants in each section and also to the leading entrant in each zone, provided three entries have been received from that zone. A second certificate will be awarded for each zone yielding ten or more logs.

Competitors should conform, as far as their licences permit, with the *R.S.G.B. Band Plan*, which is as follows:

Telegraphy only:	3,500-3,600 kc/s.; 7,000-7,050 kc/s.; 14,000-14,150 kc/s.; 28,000-28,200 kc/s.
Telephony only:	3,600-3,635 kc/s.; 3,685-3,800 kc/s.
Telegraphy or Telephony:	7,050-7,300 kc/s.; 14,150-14,400 kc/s.; 28,200-30,000 kc/s.

Remember a hundred well-chosen contacts will bring a leading score. Good hunting!

Rules: Transmitting Contests

1. The event will be divided into three sections, namely:—
   (a) Senior telegraphy (max. licensed power).
   (b) Junior telegraphy (25 watts maximum input).
   (c) Telephony (max. licensed power).

2. The contest periods will be as follows:—
   Telegraphy (Senior and Junior): From 1200 G.M.T., March 29, to 1200 G.M.T., March 30, 1952.
   Telephony: From 1200 G.M.T., April 5, to 1200 G.M.T., April 6, 1952.

3. The contests are open to all British subjects living within the British Empire and British Mandated Territories and to members of British Forces of Occupation operating properly authorised stations, who are fully paid-up members of either the R.S.G.B. or one or the British Empire Societies listed overleaf. All entrants agree to be bound by the Rules of the Contests.

4. An entrant who is not a member of the R.S.G.B. must certify in the declaration overleaf that he was a fully paid-up member of one of the listed British Empire Societies and that he was resident in that country at the time of the contest.

5. An entrant not located in one of the prescribed Prefix Zones shall be considered as being in the Prefix Zone nearest to his station.

6. Only the entrant will be permitted to operate his apparatus for the duration of the contest.

7. Entries must be legibly written or typed on one side of quarto or foolscap paper (8 x 10 in. or 8 x 13 in.) as set out overleaf. Sheet 1 will bear the name, address, etc., and declaration; Sheet 2 the analysis. Continuation sheets will continue the log in time order.

8. All entries must be posted within 14 days of the close of the relevant section—postmarked not later than April 14, 1952, in the case of the Telegraphy Contest, and April 21, 1952, in the case of the Telephony Contest. Entries must be addressed to the R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, London, W.C.1. **The closing date for the acceptance of entries is July 3, 1952.**

9. The judging of entries will be carried out by the R.S.G.B. Contests Committee. The decision of the R.S.G.B. Council will be final in all cases of dispute. No correspondence will be entered into regarding any decision made by the Council or the Contests Committee.

10. Operation is restricted to the following bands: *Telegraphy*: 3.5, 7, 14 and 28 Mc/s. *Telephony*: 14 and 28 Mc/s. The 21 Mc/s. band may be used in both cases if it is generally available at the time of the contest. Telegraphy must be type A.1 (pure C.W.) only, and frequent tone reports of T8 or less may result in disqualification. Telephony may be A.3 (amplitude modulation) or narrow band frequency modulation where permitted, but reports of excessive frequency spread may result in disqualification.

11. The conditions laid down in the entrant's licence must be observed. The input to the valve or valves delivering power to the aerial must not exceed 25 watts in the Junior section.

12. Contacts may be made with any station using a British Empire call sign in any of the Territories indicated in Rule 3, except that contacts with stations in the entrant's own zone, or with mobile or unlicensed stations in places where licences are obtainable, will not count for points. Only one contact per band with each station will count for points, but duplicate contacts should be logged. The decision as to whether or not a station is valid will rest with the R.S.G.B. Contests Committee.

13. For each zone (outside the entrant's own zone) the first contact on a specific band will count 15 points, the second contact 14 points, and so on till after the 14th contact they count 1 point each. This system will be repeated on each band. (Thus four contacts with ZL on 7 Mc/s. would count 54 points and another five with ZL on 14 Mc/s. would score a further 65 points.)

14. Serial numbers must be exchanged and acknowledged before a contact can count for points. The serial number of 5 figures (or 6 in the case of telegraphy) is made up of the RS (or RST) report plus three figures which may start with any number between 000 and 100 for the first contact and will increase in value by one with each successive contact: *e.g.* 087 for the first and 088 for the second contact, etc.

Receiving Contests

1. Receiving entries may be made for the Telegraphy or Telephony events, or both, as given above. There are two events.

2. To count for points the log must show, in columns, *(a)* date; *(b)* time, G.M.T.; *(c)* band; *(d)* station heard; *(e)* serial number sent; *(f)* station worked; *(g)* when possible, serial number returned; *(h)* points claimed. If col. *(g)* can be completed two *loggings* may be claimed. CQ or Test calls will not count for points.

3. Each logging will score points in the same way as contacts in the Transmitting Contests (see Rule 13 earlier).

4. The same station may be logged only once in col. (*d*) and once in col. (*g*) to count for points.

ENTRY FORM

SHEET 1 **Call Sign**.....

B.E.R.U. Contest, 1952.....**Section**

Name (Block Letters).....

Address .....

Input Power to Final Stage.....

Aerials Used.....

(Other station details may be included.)

DECLARATION:—

I hereby certify that my station was operated strictly in accordance with the rules and spirit of this Contest, and I agree that the decision of the Council of the R.S.G.B. shall be final in all cases of dispute.

Date..... *Signed*.....

If an entrant is a non-member of the R.S.G.B., he must sign the following additional Declaration:—

I hereby certify that at the time of the Contest I was a fully paid-up member of.....

Date..... *Signed*.....

Date	G.M.T. Contact Established	Band Used Mc/s.	Call Sign of Station Worked	Serial Nos. Sent	Serial Nos. Rcvd.	Points Claimed	(Leave Blank)

TOTAL .. ..

ENTRY FORM

SHEET 2 **Prefix Zone Analysis**

	Prefix Zone	Mc/s. Contacts	Mc/s. Points	Mc/s. Contacts	Mc/s. Points	Mc/s. Contacts	Mc/s. Points
1	AP, VU2, 4, 5, VS7 ..						
2	G, GC, GD, GI, GM, GW						
3	DL2, MB9						
4	MD, MF, MT, ZB, ZC4						
5	(VQ6), MI3, ST ..						
6	VE1						
7	VE2						
8	VE3						
9	VE4, 5, 6						
10	VE7, 8						
11	VK2, 3						
12	VK4, 7						
13	VK5, 6						
14	VK9, VR4						
15	VO						
16	VP1, 3, 5, 7, 9						
17	VP2, 4, 6						
18	VP8, VK1						
19	VQ1, 3, 4, 5, ZD6 ..						
20	VQ2, ZE						
21	VQ8, 9, ZC2						
22	VR1, 2, 3, 5, 6, ZK, ZM						
23	VS1, 2, 4, 5						
24	VS6						
25	VS9, VT, VU7, MP4 ..						
26	ZD1, 2, 3, 4, 7, 8, 9 ..						
27	ZL						
28	ZS1, 2						
29	ZS5, 6						
30	ZS3, 4, 7, 8, 9						
	TOTALS						

British Empire Societies

Amateur Radio Club of India.
Canadian Amateur Radio Operators' Association.
Canadian Section A.R.R.L.
Ceylon Amateur Radio Society.
Hong Kong Amateur Radio Transmitters' Society.
Jamaica Amateur Radio Club.
Malta Amateur Radio Society.
Montreal Amateur Radio Club.
Newfoundland Amateur Radio Association.
New Zealand Association of Radio Transmitters.
Northern Rhodesia Amateur Radio Society.
Pakistan Amateur Radio Society.
Radio Society of East Africa.
South African Radio League.
Wireless Institute of Australia.

MAKE SURE YOU UNDERSTAND THE RULES AND DON'T FORGET TO SIGN THE DECLARATION. In case of mistakes or uncertainties a note on the log will help. Suggestions for future contests are invited.
Note.—In case of doubt see Rules 3, 5, 12.

A.R.R.L. International DX Contest

THE rules for the 1952 A.R.R.L. International DX Contest are, apart from three minor changes, the same as last year. In order to take advantage of possible 28 Mc/s. openings, both telephony periods have been brought forward to February. A special listing is available for entrants who work exclusively in the 28 Mc/s. band. A new award category will recognise multiple-operator stations in those sections or countries from which three or more valid multiple-operator entries are received.

U.K. amateurs should work as many stations as possible in the 19 American call areas (W0-W9, VE1-VE8 and VO), counting 3 points for each completed contact (*i.e.*, 2 points upon receiving acknowledgment of a number sent and 1 point upon acknowledgment of a number received). In the C.W. section, contestants will exchange a six-figure number consisting of an RST report plus the power input used; in the 'phone section a five-figure number (RS plus power) will be exchanged. If the input power varies considerably on different bands, the "power number" should be changed accordingly. The final score is obtained by multiplying the total number of points earned, by the sum of the number of W (K) and VE/VO licensing areas worked on one band plus the number worked on each other band.

The Contest periods are: *Telephony*—0001 G.M.T., February 2, to 2400 G.M.T., February 3; and 0001 G.M.T., February 16, to 2400 G.M.T., February 17. *Telegraphy*—0001 G.M.T., March 1, to 2400 G.M.T., March 2; and 0001 G.M.T., March 15, to 2400 G.M.T., March 16.

A certificate will be awarded to the C.W. and 'phone winners in each country. Full details of the Contest, together with specimen logs and report forms, are published in the January, 1952, issue of *QST*.

New Books

THE OXIDE-COATED CATHODE. Vol. I—Manufacture; Vol. II—Physics. By G. Herrman & S. Wagener. Published by Chapman & Hall. Price, Vol. I 21/-, Vol. II 42/-.

An English edition of a highly specialised German work, first published in 1944. All phases of the technology and theoretical physics of the subject are covered in what is probably the most comprehensive work yet published in this field.

RADIO TECHNOLOGY (3rd Edition). By B. F. Weller. Published by Chapman & Hall. 30/-.

This book, which was first published in 1943, has already run into its third edition. It has been improved by the extension of the chapter on Aerials, and by a new chapter on V.H.F. Technique. The latter briefly surveys the field of frequencies above 30 Mc/s., including the use of F.M. Although the subjects are too briefly considered to be of value to the specialist worker, the book maintains its position as an excellent all-round work and one of the very few in which an adequate proportion is allotted to the subject of transmission.

THEORY AND DESIGN OF VALVE OSCILLATORS. By H. A. Thomas. Published by Chapman & Hall. 36/-.

This new edition of what has come to be regarded as a standard work has been re-arranged by the condensation of the material forming the bulk of the first edition (*i.e.*, that dealing with frequency stability), and by the addition of new chapters on R.C. oscillators, crystal oscillators and V.H.F. oscillators, including magnetrons and velocity-modulated valves.

NEWS FROM HEADQUARTERS

COUNCIL, 1952

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FREDERICK J. CHARMAN, B.E.M., G6CJ
Acting Vice-President : Leslie Cooper, G5LC
Hon. Secretary : Arthur O. Milne, G2MI
Hon. Treasurer: Douglas A. Findlay, D.F.C., A.S.A.A., G3BZG
Hon. Editor : J. H. Hum, G5UM
Immediate Past-President : William A. Scarr, M.A., G2WS

* * *

Members: H. A. Bartlett, G5QA; C. H. L. Edwards, A.M.I.E.E., G8TL; T. L. Herdman, B.A., A.M.I.R.E., G6HD; F. C. Lambeth, G2AIW; H. McConnell, GM2ACQ; R. Walker, G6QI; P. W. Winsford, G4DC.

General Secretary: John Clarricoats, G6CL

November Council Meetings

Résumé of the Minutes of the Proceedings at the Meeting of the Council of the Incorporated Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Tuesday, November 13, 1951.

Present.—The President (Mr. W. A. Scarr) in the Chair, Messrs. W. H. Allen, A. P. G. Amos, F. Charman, L. Cooper, W. N. Craig, C. H. L. Edwards, T. L. Herdman, A. O. Milne, P. A. Thorogood, A. J. H. Watson, P. W. Winsford and John Clarricoats (General Secretary).

Apology.—An apology was submitted for the absence of Mr. V. M. Desmond.

* * *

Cash Account.

The Council resolved to accept and adopt the Cash Account for the month ending October 31, 1951, as prepared by the Honorary Treasurer.

Membership.

The Council resolved:—
(a) to elect 53 Corporate Members and 18 Associates;
(b) to grant Corporate Membership to 9 Associates who had applied for transfer;
(c) to grant Life Membership to Mr. F. C. Robertson, GM3GIV.

Application for Affiliation.

The Council resolved to grant affiliation to the Faculty of Technology Amateur Radio Society (Manchester University).

"CQ Local."

The Council noted comments published in the October, 1951 issue of "CQ Local," monthly publication of the South London Group, referring to the Editorial published in the October, 1951, issue of "The Short Wave Magazine."

Region 7 Circular.

The President submitted a copy of a Circular issued by the London Regional Representative in regard to the forthcoming Council Election. The Council noted the contents.

Representation.

The following resolution was submitted from the Southampton T.R.:—

"That Council be requested to ensure that where nominations are required to be submitted for the office of R.R., C.R., and T.R., four weeks clear notice be made available as from the date of publication of official notification in the BULLETIN."

The Council resolved to accept the suggestion put forward by the Southampton Town Representative, and to advise the membership that nominations will, in future, be accepted up to one month from the date of publication of the official notification of a vacancy.

A.G.M. Procedure.

Annual General Meeting arrangements were discussed and a procedure approved.

Technical Committee.

The Secretary reported upon the undermentioned matters discussed at a Meeting of the Committee held on November 8, 1951:—

(a) The Radio and Television Retailers' Association had been asked to appoint representatives to meet representatives of the Society to discuss Television Interference problems.
(b) The Rules governing the award of the Bevan Swift Premium had been approved for publication. (The Rules were published in the December, 1951, issue of the BULLETIN).
(c) Further enquiries were being made in regard to the re-establishment of GB1RS elsewhere than at Headquarters.
(d) The G.P.O. had been asked to receive representatives of the G.P.O. Liaison and Technical Committees to discuss the proposals for issuing a licence to operate an Amateur Wireless Station on board ship.
(e) Region I Bureau had been asked to write to Societies in Region I for information regarding Maritime Mobile operation

Historic Photographs.

It was suggested that the Society should consider the formation of a collection of photographs of outstanding radio personalities and items of historic equipment. The Council resolved to bring the suggestion to the notice of the 1952 Council, together with an earlier suggestion that the Society should establish a museum of historic radio equipment.

Finance and Staff Committee.

The Chairman of the Committee (Mr. A. J. H. Watson) submitted the Minutes of a Meeting of the Committee held on October 11, 1951.

Subscription Rates.

The Chairman confirmed that the Committee held the view that subscription rates should be increased, but the decision as to the amount of the increases would be a matter for the Council to decide and then to submit to the membership at a Special General Meeting. Mr. Watson pointed out that July 1, 1952, would probably be the earliest date from which new rates could operate.

Staff Emoluments.

Increases in salary for certain members of the staff with long service were approved on the recommendation of the Finance and Staff Committee.

Staff Pensions Scheme.

After considering a detailed Report from the Finance and Staff Committee on the present staff pensions scheme as it applies to the General Secretary and Miss Gadsden, the Council resolved that the Society shall make arrangements for retirement pensions for Mr. Clarricoats and Miss Gadsden, equal to one half of their present salaries less their National Insurance Retirement Pension and that they shall each contribute towards the cost of the additional premium required to produce the additional amount of pension now deemed to be necessary.

The Chairman drew attention to the fact that the Committee had given consideration to the question of providing a Group Pensions Scheme, on a contributory basis, for other members of the staff.

Résumé of the Minutes of the Proceedings at a Special Meeting of the Council held on Thursday, November 15, 1951, at 6 p.m.

Present.—The President (Mr. W. A. Scarr) in the Chair, Messrs. F. Charman, L. Cooper, W. N. Craig, C. H. L. Edwards, T. L. Herdman, A. O. Milne, P. W. Winsford and John Clarricoats (General Secretary).

Apologies for absence were submitted from Messrs. W. H. Allen, A. P. G. Amos, V. M. Desmond, P. A. Thorogood and A. J. H. Watson.

* * *

Purpose of Meeting.

The President explained that the primary purpose of the Meeting was to give further consideration to the revision of the Articles of Association.

Television Interference.

As a matter of urgency, and with the approval of the Council, the Secretary submitted a letter received that day from Mr. E. L. Harris, in which he commented on the reply from the Society in connection with a Memorandum he had prepared on Television Interference (see Résumé of Minutes of Meeting held on October 16, 1951).

The Council resolved to invite Mr. Harris and two or three of his colleagues to meet Members of the Television Sub-Committee of the Technical Committee and Members of the G.P.O. Liaison Committee to discuss matters of mutual interest.

Articles of Association.

The Council then proceeded to examine a draft revision of the Articles. Articles 29-45 were dealt with.

The Meeting terminated at 9.30 p.m.

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AMERICAN PUBLICATIONS

Orders for the following American publications can only be accepted from residents in the United Kingdom and British Empire. Delivery requires approximately 4-6 weeks. Prices quoted include cost of postage and packing.

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RADIO AMATEURS' HANDBOOK, 1952 Edition *(A.R.R.L.)* **30/-**
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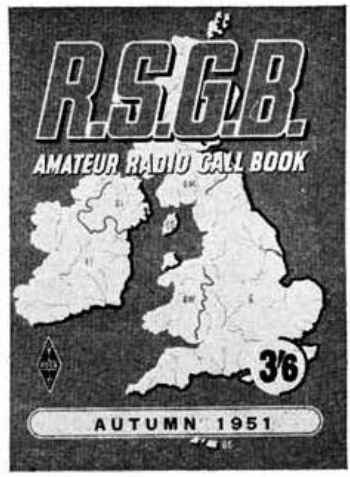

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