R·S·G·B AMATEUR RADIO BULLETIN

February 1949

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TOWARDS CLEANER DX OPERATING

THE months of February and March have long been marked by a sudden increase in activity on the long-distance amateur bands. The excellent propagation conditions which normally prevail at this season of the year are not the only reason for this outburst of activity. The annual B.E.R.U. and A.R.R.L. DX Contests have acquired a flavour and popularity all their own. Amateurs, who for ten months out of every twelve are quite happy pursuing their particular interests in V.H.F. propagation, high-fidelity speech transmission and reproduction, or just pottering around the shack with a soldering iron, suddenly feel the urge to widen their horizons, to reach for their Great Circle Maps and M.U.F. charts, and to talk knowingly of Tonga, South Georgia and Bahrein Island. For a time even our higher mathematicians forsake their beloved formulæ and apply calculus, abacs, and other tools of their trade to such matters as multipliers, serial numbers and final points.

To the critics of amateur contests—and there are a few—we would remind them that in every field of applied science—from bicycles to aviation—races and trials of all types have proved again and again to be one of the most powerful stimulants to progress and the development of mechanical reliability. The experience gained during periods of intense competition engendered by the Schneider Trophy, the Grand Prix and other international events was of enormous benefit to designers. So it is with Amateur Radio. To keep abreast of his friendly rivals, the amateur must be prepared to incorporate into his station every modern technique; band-switching, directive aerial arrays, Q-5er selectivity, break-in facilities to mention only a few. And the amateur who cannot afford to expend large sums on his equipment is forced to seek some new means of obtaining equal benefits at low cost. The new devices that result from his efforts will become standard commercial practice five or so years from the date of the B.E.R.U. or A.R.R.L. contest which first proved their value.

But there is one charge to which, in recent years, certain contestants have laid themselves open. In their eagerness to obtain high scores they have ignored or flouted the traditional ethics of operating procedure and transmitter adjustment. Unfortunately this is not true only of contest periods, but nevertheless it is at such times that the ill-manners of the few become more than usually conspicuous. The two major "crimes" are to call a DX operator known to be in contact with another station, and to radiate transmissions of poor quality characterised by excessive chirp, key-clicks and ripple.

The Society, by insisting that every contest entrant must sign a declaration that his station has been operated in accordance with the "rules and spirit of the contest" and by laying down, both for contests and proficiency certificates, a minimum acceptable tone report, has consistently led the way towards a general adoption of clean notes and a high standard of operating ethics. All supporters of this campaign will therefore welcome the news that our sister-society, the American Radio Relay League, has recently prepared a "DX Operating Code" which lists a number of important recommendations designed to encourage courteous and systematic DX operating throughout the amateur world. These suggestions, published in the February, 1949, issue of *QST*, are being reprinted in the form of a postcard (Operating Aid No. 5) which the A.R.R.L. will supply on request. A copy should find a place in every amateur station. The League feels—and in our opinion rightly so—that the real solution to the present problems lies in the hands of the "rare DX" operators. If all the more eagerly-sought-after stations made it clear that they had no intention of contacting operators guilty of deliberate breaches of amateur etiquette, reformation of our bands would take place overnight.

The new Code also advises DX stations not to answer calls exactly on their own frequency but, instead, to indicate in their CQ calls how many kilocycles *up* (U) or *down* (D) from their own frequency they intend to listen for replies; to answer calls from American and Canadian (and may we add British) stations only when their signals are of good quality; to refuse to answer calls from other stations when they are already in contact with someone; not to acknowledge calls from amateurs who indicate they wish to be "next"; and, in order to give everyone an equal chance, to refuse to comply with requests to "listen for a friend."

Continued on page 201.

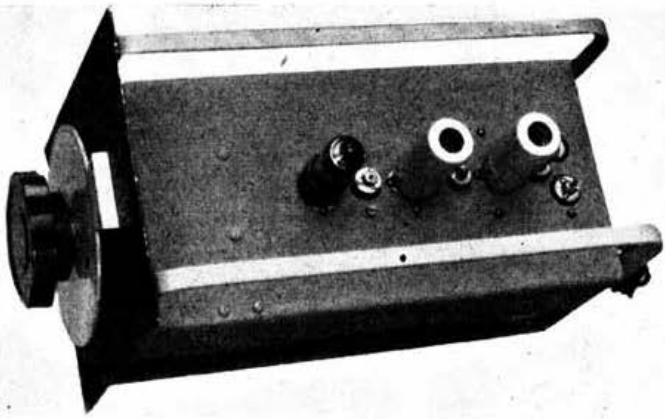
In this issue

A CONVERTER FOR THE TWO METRE BAND

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

V.H.F. converters may be considered as falling into two main categories: one where coverage of the desired band is accomplished by tuning the converter itself, while the R.F. section of the main receiver acts as a fixed-tuned I.F. amplifier, and the other where the tuning of the converter is fixed and the I.F. amplifier is tuned over a frequency range corresponding in width to the required V.H.F. coverage. The piece of apparatus to be described is suitable for either mode of operation, subject to certain conditions which will be discussed later.

It is generally assumed that the "main receiver" referred to when considering converter operation, is a communications type superhet., when the whole receiving equipment becomes a double-conversion circuit, but this is by no means essential, and those whose station receiver is of the "straight" variety should not be discouraged on this account from trying their hand — or should one say their ear?—at reception on the higher frequencies.



A top view of the converter showing the pre-set controls. The frequency changer valve screen was removed for the purpose of the photograph.

The ratio of signal-to-noise determines the ultimate performance of a receiver, and this is, or should be, established before the first frequency change takes place. Subsequent I.F. and A.F. amplification will increase the strength of the received signals, but will not alter the ratio between them and the various sources of receiver noise.

Circuit Details

The first two stages are R.F. amplifiers, and are followed by a diode-triode frequency changer, the new *Mullard* EAC91, which is recommended by the makers for such service up to at least 300 Mc/s. The two metre amateur band extends from 144 to 146 Mc/s. and although this is considerable in terms of frequency, it represents a percentage change of less than 1·4. This being so there is little to be gained in varying the tuning of the signal frequency circuits which are, therefore, resonated to the centre of the band. This leaves the oscillator tuning as the only variable control, and thus doing away with ganging difficulties, simplifies both construction and preliminary adjustments.

The *Muirhead* slow motion dial may be read to 1/10th. degree, and has a ratio of 9 : 1. This might at first sight appear to be on the low side for V.H.F. work, but in view of the smooth movement and entire absence of backlash, combined with the fact the band covers 50°, this component has been found perfectly satisfactory, both for rapid searching and for resetting accuracy.

V1 and V2 are both R.F. pentodes with B7G bases, the former being a *Mullard* EF91, and the latter a 6AK5 of American manufacture. This mixture of types was arrived at after considerable experiment, and it was found that although the EF91 worked quite well in the second stage, the substitution of a 6AK5 made a small, but worth-while, improvement in the overall performance. The employment of a similar type of valve in the first stage, however, did not show any advantage over the EF91.

Aerial coupling is effected by means of a pair of 30 pF. *Philips* air-spaced trimmer condensers in series across the grid coil of V1, the centre lead of the co-axial feeder being connected to their mid-point†. This forms a capacity potentiometer, and by increasing the value of C1 and at the same time decreasing the capacity of C2, the coupling between feeder and tuned circuit becomes tighter, while reversing this procedure results in looser coupling.

L1 and L2 are wound on *Denco* "Maxi-Q" polystyrene formers with variable iron cores, and in both circuits the grid is tapped down a short distance from the high potential end of the coil to lessen the effect of valve damping. Parallel H.T. feed is adopted for V2, RFC1 consisting of 20 in. of 24 S.W.G. enamelled wire close wound on a ¼ in. diameter former, being mounted on the chassis close to the holder of V2. L3 and C14 comprise the tuned circuit between the second R.F. and the mixer stages. The coil may be seen in the under-side chassis photograph behind the oscillator tuning condenser with C14 above it and adjustable from the top of the chassis.

The oscillator section of the frequency changer operates on-half the required frequency, and although there is a theoretical disadvantage to harmonic mixing inasmuch as the conversion efficiency is thereby lowered, the diode does not appear to be critical in this respect, and careful measurements made with both modes of operation failed to disclose any serious falling-off in gain or increase in noise. The advantages to be gained by harmonic mixing are, however, considerable, there being almost complete absence of "pulling" between the tuning of L3 and L4, while oscillator stability is excellent, largely on account of the high-C condition of the circuit brought about by the inclusion of C23.

Turning now to the cathode circuit of the mixer,

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

† As described on several occasions in "QST".

RFC2 and C15 form a filter to prevent both signal and oscillator frequencies from reaching the I.F. amplifier, the connection to which is *via* C17 and the screened cable shown in the diagram. RFC3 is a *Stratton* type 1022 choke, which can be seen in the photograph of the underside of the unit on a group board on the right hand side of the chassis. This simple form of output circuit is perfectly suitable for I.F.'s up to about 3 Mc/s., but if higher frequencies are to be employed a tuned circuit, provided with a link winding for connection to low capacity cable, should be substituted. A very suitable component now on the market is the Type 728 Converter Coupling Transformer introduced by *Stratton*, and shown alongside the unit in one of the photographs. This transformer is designed for an I.F. of approximately 10 Mc/s., but may be adjusted over a limited range by means of its moveable iron core. If it is intended to incorporate this component in the converter, it is suggested that it be mounted immediately behind the panel, with its connecting lugs projecting through clearance holes in the chassis on either side of the reduction gear of the *Muirhead* dial. In order that the top of it shall not be higher than the panel it would be as well, on the score of appearance, to increase the height of the panel as suggested later.

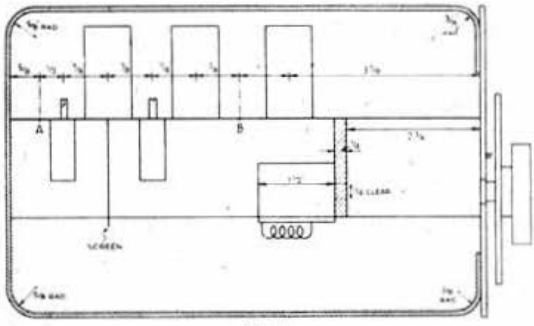


Fig. 1.
Side elevation of the converter. Two holes $\frac{3}{8}$ in. diameter and 1 in. centre to centre are drilled at "A" for the adjustment of C1 and C2, and a single $\frac{3}{8}$ in. hole at "B" for C14.

Constructional Details

The chassis is constructed of 16 S.W.G. aluminium, and is $9\frac{1}{2}$ in. long by $4\frac{1}{2}$ in. wide by 2 in. deep; it may be obtained ready made, if desired, from *Premier Radio*. The panel is cut from aluminium sheet of the same gauge, to the dimensions shown in Fig. 2. Should the constructor intend to incorporate the *Stratton* Converter Output Transformer previously mentioned, it would be as well to increase the height of the panel by 1 in. in order that the top of the transformer shall not protrude above it. All drilling details would remain as before with the exception that the hole for the dial single hole fixing bush would be $4\frac{1}{4}$ in. from the top of the panel instead of $3\frac{1}{4}$ in.

The pair of side rails are bolted to the panel and to the rear of the chassis, and serve to make a very robust and light assembly, with the advantage that the unit may be placed in any position while adjustments are being carried out. Suitable material for these side members will be found in the brass pelmet rail sold at *Woolworth's* stores. Rather less than 5 ft. will be ample, and it is suggested that it be heated in a fire, or over a gas burner, before forming to the shape shown in Fig. 1, as an attempt to bend the material cold is likely to result in fracture. There is no need to make the brass very hot, as at a point well short of red heat it will bend easily. Slight corrections to its shape may safely be made after cooling, provided no sharp bends are attempted.

If the height of the panel is increased as mentioned in a previous paragraph, the overall length of each rail will be increased accordingly.

Nothing need be said regarding the drilling of the chassis and panel, as all relevant dimensions are shown in the diagrams, apart from the fact that 4 B.A. bolts are employed to fasten the various parts together. A *Pye* co-axial socket is mounted on the right hand side of the rear apron of the chassis as viewed from the rear, and is balanced on the left by a hole, protected by a rubber grommet, through which pass the I.F. output and supply leads.

C1 and C2 are mounted on a strip of polystyrene 1 in. between centres and $\frac{1}{2}$ in. below the top deck of the chassis, and immediately to the rear of the former for L1. This strip is $\frac{1}{4}$ in. thick, and drilled in accordance with Fig. 3. Attachment to the chassis is by means of two short lengths of polystyrene rod $\frac{1}{4}$ in. in diameter which are inserted into the $\frac{1}{4}$ in. holes in the strip, and secured by a trace of "*Denfix*" cement obtainable from *Denco Ltd.* They are secured to the chassis by two 6 B.A. bolts tapped into their upper ends. The bracket for C14 is of similar construction, but as only one condenser has to be accommodated—in the centre—its length is $1\frac{3}{4}$ in.

A further piece of polystyrene $\frac{1}{4}$ in. thick, $1\frac{7}{8}$ in. wide and $2\frac{1}{4}$ in. in height, serves as a mounting for the oscillator tuning condenser C22. Fixing to the chassis is by means of a length of $\frac{1}{2}$in. brass angle. No instructions for drilling are given, as they will depend upon the fixing arrangements of the condenser employed. That shown in the photograph is a surplus item, and when bought had one fixed and two moving vanes in each of the two sections, giving a capacity of 6 plus 6 pF. One of the moving plates was removed from each section, and the resultant capacity enables the band to be spread over some 50° on the dial. The overall length of the condenser is slightly more than $1\frac{1}{2}$ in., and should it be desired to use a larger component care must be taken to ensure that it does not foul C14. It will be seen that C22 is immediately above the holder for V3, and although this insures the shortest possible leads from one to the other, some care and not a little patience must be exercised in making the necessary connections. L4 mounts directly on to the stator lugs on the condenser, with C23 wired in parallel, and at a slight angle to facilitate adjustment. As this condenser is only adjusted at rare intervals it was not thought necessary to complicate the construction by allowing for its adjustment from the top of the chassis. It should be noted that there is *no* "earthy" connection from either the coil or the condenser in the oscillator circuit.

The screen between L1 and L2 is made from thin tinplate or copper, $2\frac{3}{4}$ in. wide and $2\frac{1}{4}$ in. high, with the sides turned over for $\frac{1}{8}$ in. for added rigidity. A slot is cut out to clear the holder of V1, across which it is mounted, and two tabs each $\frac{3}{4}$ in. long and $\frac{3}{8}$ in.

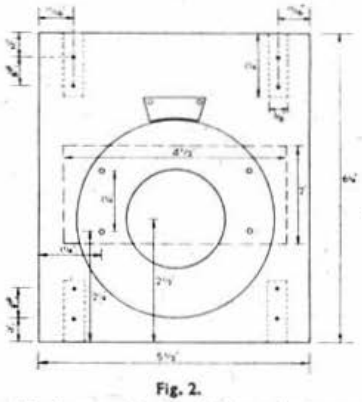


Fig. 2.
Drilling detail for front panel. The height may be increased by 1 in. if an output transformer is incorporated.

wide are provided for bolting to the chassis. Most B7G valve holders have a split metal tube at their centre, and the screen should be inserted in this slit and, after bolting down, soldered to the tube.

Two tag boards will be seen in the photographs, the one nearer the front panel carries RFC3, C16, C17 and R8, while the other serves as a connecting point for the supply leads.

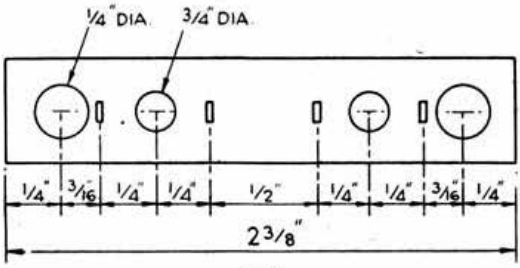


Fig. 3.

Polystyrene bracket for mounting the aerial coupling condensers C1 and C2.

In Fig. 4 neither side of the heater wiring is shown connected to the chassis. This was to suit the supply arrangements at the author's station, but there is no reason why one side should not be joined to the chassis in the normal way. This will lead to the elimination of C4 and C18, with consequently more room for other components round the somewhat crowded valve holders. It is as well to mention here that really efficient bypassing in heater circuits is essential to satisfactory performance, and that although the actual value of the capacity employed does not appear to be in any way critical, the condensers must be of the flat mica dielectric type—preferably silvered mica—and the leads to them, in common with all leads carrying R.F., kept as short as possible.

Oscillator Adjustment

For the purpose of this description it is assumed that an I.F. amplifier tuned to 2 Mc/s. is in use, although any frequency between 1 and 3 Mc/s. may be employed without adjustment with the type of output coupling shown in Fig. 4.

The frequency of the oscillator must now be adjusted to $\frac{145}{2} + 2$ or 74·5 Mc/s., and this is best done with the aid of an absorption frequency meter fitted with a sensitive indicator, or with a grid-dip oscillator. Should neither of these instruments be available, then a non-indicating type of absorption meter must be used, and that described in the May, 1948 issue of the BULLETIN would be very suitable. The procedure is as follows :—Set C23 to rather more than half capacity, and C22 to mid scale. Switch on the B.F.O. in the associated receiver, and locate a signal from a signal generator, V.F.O. or other oscillator which need not be operating on the frequency concerned, but which is situated close to the converter. If reasonable output is being given by the signal generator etc., whistles should be heard at various settings of the latter. Choose one, couple the meter fairly closely to L4, and rotate its tuning

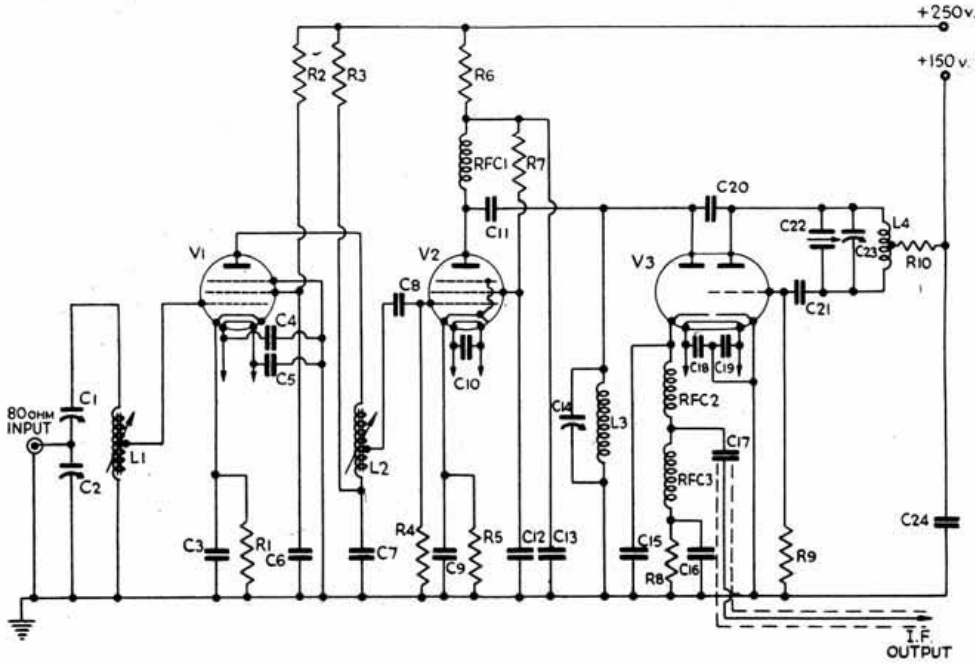


Fig. 4.

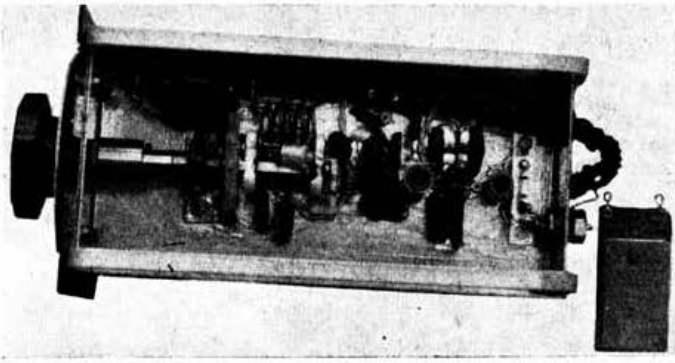
Circuit of the two metre converter. The 150 volt supply for the oscillator should be obtained from a stabilised source.

C1, 2, 23	30 pF.	Philips trimmers	
C3	.002 μF.	mica	Hunt
C4, 5, 18, 19 ...	.001 ,,	,,	T.C.C. & Hunt
C6, 24	.001 ,,	silvered mica	T.C.C.
C7, 9, 10, 12 ...	.0006 ,,	,, ,,	
C8	.0001 ,,	ceramic cup	T.C.C.
C11	5 pF.	ceramic disc	T.C.C.
C13, 16	.0005μF.	silvered mica	T.C.C.
C14	8 pF.	Philips trimmer	
C15	10 ,,	ceramic disc	T.C.C.
C17	.0002μF.	mica	Dubilier
C20	2 pF.	ceramic disc	T.C.C.
C21	15 ,,	,, ,,	T.C.C.
C22	4 + 4 ,,	see text	

RFC 1, 2	20 in. 24 enam. wire close wound on ¼ in. former				
RFC 3	Type 1022. Stratton.				
L1	1½ turns 18 SWG, ½ in. diam. Centre tapped.				
L2	2 turns 18 SWG, ½ in. diam. Tapped ⅓ turn.				
L3	4 turns 18 SWG, ½ in. diam. Length ⅝ in.				
L4	5 turns 14 SWG, ½ in. diam. Length 1 in. Centre tapped				
V1	EF91 Mullard.				
V2	6AK5				
V3	EAC91 Mullard.				
R1, 5	200 ohms	R7	27,000 ohms Erie.		
R2	1,500 ohms Erie.	R8	4,700 ohms Erie.		
R3	1,000 ohms Erie.	R9	20,000 ohms Erie.		
R4	1 megohm	R10	10,000 ohms Erie.		
R6	8,000 ohms				

condenser until the signal "jumps." Now loosen the couplings between the two coils until this "jump" is just detectable, and the reading on the meter will be the frequency to which L4 is tuned. It is now a matter of juggling with C23, the setting of which is rather critical, until oscillations are obtained at the desired frequency.

C14 should now be varied slowly over its range, and at a point near its minimum capacity a rise in background noise will be noticed. Adjust the iron core of L2 for a similar effect and connect the aerial feeder to the *Pye* socket. At this point a low-power oscillator operating in the centre of the band, or better still a signal from another station, becomes a necessity, and having made sure that such signal is being picked up *via* the aerial, adjustment of L1, C1 and C2 may be carried out. The core of L1 should be almost unscrewed, *i.e.* at the end of the former nearest the chassis, and C1 and C2 at about half-capacity. The two condensers should now be adjusted a step at a time in opposite directions, keeping the circuit resonant with the core of L1 until the optimum signal-to-noise ratio is achieved, aiming to keep the iron core as far from the coil as possible while still retaining some scope for adjustment.



The underside of the chassis. C23 and L4, together with the majority of the other components, are clearly visible in this view. The Stratton Type 728 Output Transformer is shown to the right of the unit.

The final setting of the input circuit having been arrived at—and it is much easier to do than to describe—L2 and C14 should again be checked for best signal strength. Now return to the oscillator circuit and arrange, by adjustment of C23, that the high frequency end of the band comes at approximately 90° on the 100° dial, and that the oscillator is actually operating on the high frequency side of the signal, as this setting produces better conversion.

The Use of Higher I.F.'s.

Setting up the oscillator for I.F.'s other than 2 Mc/s. follows the same lines as indicated in the last paragraph, with the exception that the oscillator frequency must be altered accordingly. If an I.F. much higher than 3 Mc/s. is to be employed regularly then it would be advisable to replace RFC3 and C17 by a tuned circuit and link winding, and to use low capacity cable for connection to the aerial and earth terminals of the main receiver. At any I.F., tuning may be carried out on the receiver, the convertor oscillator being left set at a convenient frequency.

Results

This converter has been measured with the aid of a diode noise generator, and a figure of 6db. obtained at the middle of the band, rising to slightly over that reading at the band edges. As such information is not necessarily absolute, by virtue of possible inaccuracies in the measuring equipment, it should be mentioned that a 5 metre receiver having an earthed grid triode R.F. and EF54's in both second R.F. and mixer stages, gave a reading on the same noise generator of 5·5 db.

Oscillator stability—aided by a voltage regulated supply—is adequate for giving T9 reports to those stations meriting them, while the extremely small amount of drift encountered could only be improved upon by the employment of a crystal controlled oscillator.

A SIMPLE MODULATION METER

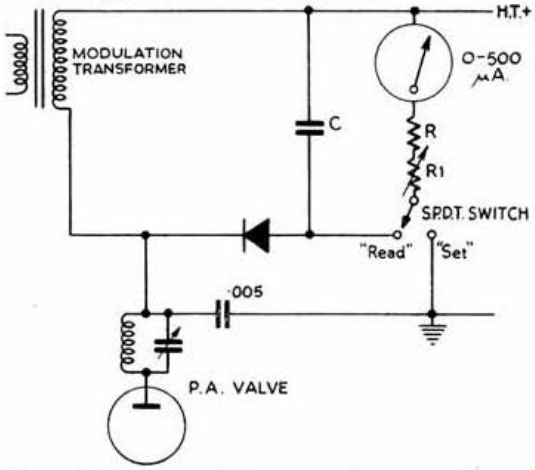
By LORIN KNIGHT, Grad. I.E.E., (G2DXK)*

WHEN using anode-modulation in a transmitter, it is possible to obtain a very good indication of modulation depth by merely measuring the peak A.F. voltage superimposed on the H.T. supply to the P.A. The diagram shows a simple modulation meter using this principle. It has proved very successful, and, in fact, it is now an indispensible part of the transmitter at the writer's station.

C and R + R1 have a time constant of about ½ sec. With the switch at "Read," the meter measures the peak negative A.F. voltage across the secondary of the modulation transformer. When this voltage is equal to the H.T. voltage, it means that on modulation peaks the carrier is being reduced to zero, *i.e.* the modulation depth is 100 per cent. Thus if, with the switch at "Set," R1 is adjusted so that the meter (with R and R1) gives a full scale deflection for the H.T. voltage, when the switch is at "Read," full scale deflection will correspond to 100 per cent. modulation.

In the case of a transmitter with 350 volts H.T. applied to the P.A., R is 500,000 ohms, R1 is 500,000 ohms and C is 0·5 μF, 450 volts working. For different H.T. voltages the values and ratings of the components will need modifying accordingly.

The rectifier is a low-current H.T. metal rectifier. A valve, such as a 5Z4, could be used, but an isolated heater supply would then be required.



The modulation meter, which compares the negative A.F. peak voltage with the H.T. voltage applied to the P.A. valve. 100 per cent. modulation occurs when the two are equal.

* *Capra, Norton Road, Stotfold, Beds.*

A STABILIZED POWER UNIT FOR THE BC221

By MARTYN BOOTY (BRS11547)*

- Mains Driven.
- Supplies 6·3 volts for heaters.
- H.T. controllable from 120 to 150 volts.
- H.T. stabilized at pre-determined voltage for all currents between 0 and 30 mA.
- Fits into the battery compartment of the BC221.

THE BC221, of which there are numerous models, was manufactured by several well-known American radio concerns, and is a portable, crystal-checked heterodyne frequency meter, using the "6" series of valves, and normally operated entirely from dry batteries. It is capable of measuring, with considerably greater accuracy than the G.P.O. Amateur Transmitting Licence requires, frequencies from 125 kc/s. to 20 Mc/s. (or higher under certain conditions), and it can also be used to check the calibration of receivers fitted with a B.F.O.

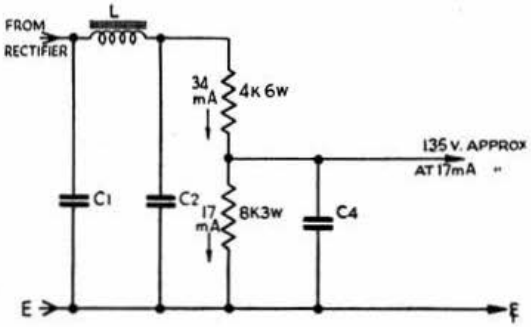


Fig. 1.
Because the current consumption of the BC221 varies between 16 and 19 mA at different positions of its "Check/Operate/Crystal Only" switch, this type of potentiometer network was found to be unsuitable for dropping the power unit output from 270 volts to 135 volts.

The 6SJ7 calibrated oscillator in the BC221 operates in two switched wavebands, known as "Low" and "High," the former running at fundamentals of 125 kc/s. to 250 kc/s. (giving outputs covering 125 kc/s. to 2 Mc/s.) and the latter at fundamentals of 2 to 4 Mc/s. (giving outputs covering from 2 to 20 Mc/s.). The worm-driven slow-motion dial is fitted with a vernier and lock, reference being made to a calibration book to obtain the desired setting for any particular frequency. The calibrated oscillator can be checked at numerous points by means of the 1 Mc/s. crystal oscillator formed by the triode section of a 6K8 converter valve. The unknown signal, together with the output from the calibrated oscillator, is applied to the other section of the 6K8 which functions as a screen grid detector. The latter is choke capacity coupled to a 6SJ7 audio amplifier, and thence the beat notes are applied to the headphones. (In older models, the mixer is a 6A7, and these models are just as useful to the average amateur).

The unknown signal is picked up by means of a small length of stiff wire attached vertically to the aerial terminal on top of the instrument, and this also serves as a radiator when receiver calibrations are being checked. The coupling should be kept as loose as possible, and no direct connections made between transmitter and meter.

For N.F.D. and similar occasions, the BC221 can be run from dry batteries, but under normal circumstances it is best operated from a mains-driven power unit.

A Suitable Circuit

The meter requires 135 volts H.T., at approximately 18 mA., and 6 volts at 1 amp. for the heater supply. Many amateurs will possess an odd mains transformer or two, but they are not so likely to have one with an H.T. secondary giving around 135 volts. The writer was no exception, consequently it was decided to make use of a small transformer which had windings rated at 270–0–270V., 30 mA., and 6·3V., 1 A. twice. Those who have transformers wound for 250–0–250 volts will no doubt find them satisfactory, provided the capacity of the reservoir condenser (C1) is increased to 8 or 16 μF. If the available transformer has a 5 volt heater winding, this can be modified to 6·3 volts by rewinding with 1·26 times as many turns as were used on the 5 volt winding.

A fuse and mains switch may be included in the circuit if desired, but the BC221 has internal switching to cut off both heater and H.T. supplies.

The first circuit tried was a simple potentiometer network following the usual smoothing circuit to obtain the required 135 volts (see Fig. 1). This did not prove satisfactory, because it was impossible, without employing large resistors in the potentiometer network (and allowing them to dissipate an unduly large amount of heat), to obtain a constant supply at 135 volts in all three switch positions, "Check," "Operate" and "Crystal Only." Although the BC221 will retain its accuracy over a small variation of H.T. potential—as indeed it must do when running from dry batteries—it is desirable that the power unit should provide as near 135 volts as possible if the best results are to be obtained.

Experiment with a simple stabilized power unit, using a neon and dropping resistor, was impracticable because of the scarcity of neons working at 135 volts, hence the stabilizing had to be done indirectly by means of valves. Finally, since the plans for the power unit were now quite complicated, it was thought that its output might as well serve purposes other than for the BC221. It was decided therefore to make up a stabilized power unit to produce an output variable from 120 to 150 volts, at 0 to 30 mA., thus covering the functions of all normal H.T. batteries.

Circuit Design

As the EL32 output pentode can pass up to 35 mA. without strain, it was chosen as the "dropper" valve. It is also small physically. An EF36 R.F.

* *117A South Street, Eastbourne, Sussex.*

pentode proved suitable as the control valve, and a CV188 (or its civilian equivalent) was chosen as the neon which "ties" the EF36 cathode to a fixed potential and thus stops the compensating action of a normal cathode-biasing system.

the EF36 and the EL32 0·2 Amp. each, so a tota current of 1 Amp. will be suitable for the 6·3 volt heater winding on the transformer. This winding must, of course, be left "floating."

With the unit supplying an output of 130 volts,

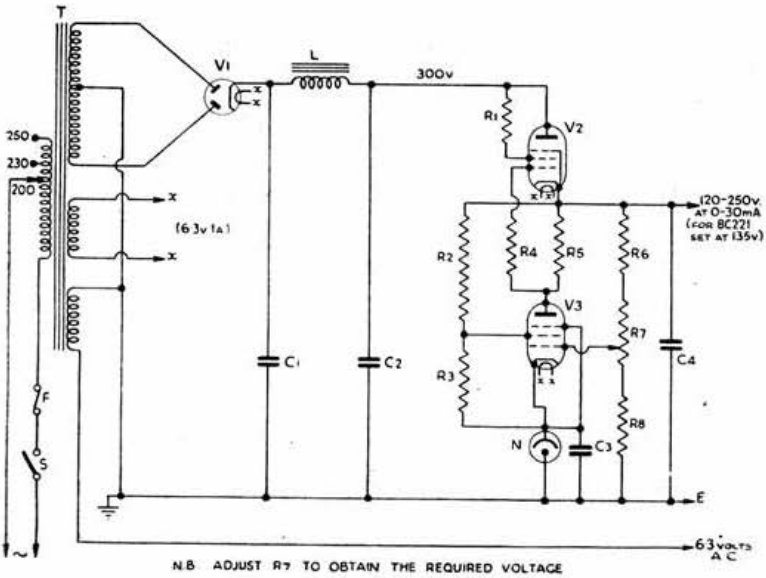


Fig. 2.

The stabilized power unit, which supplies any output between 120 and 150 volts by alteration of R7. Once R7 is set, the output voltage remains constant over a variation in current from zero to 30 mA.

C1, 2	4 μF 350 V. working electrolytic, vertical can type.	V1	6X5GT/G.
C3	·02 μF 200 V. working tubular type.	V2	EL32.
C4	4 μF 200 V. working electrolytic, tubular with wire ends.	V3	EF36.
R1	47 ohms ½ watt.	N	CV188 or civilian equivalent.
R2	15,000 ohms ½ watt.	F	½ ampere cartridge type.
R3	4,700 ohms ½ watt.	S	S.P.S.T. Q.M.B. toggle switch.
R4	1,000 ohms ½ watt.	T	270–0–270V., 30–35 mA. H.T. secondary. 6·3 V. 1 A : 6·3 V. 1 A L.T. secondaries. Primary tapped or to suit available mains input.
R5	120,000 ohms ½ watt.	L	20 H at 30 mA.
R6	12,000 ohms ½ watt.		
R7	10,000 ohms wire-wound potentiometer (½ watt upwards).		
R8	27,000 ohms ½ watt.		

Provided that a 6X5 is used as the rectifier, the heaters of the EL32, EF36 and 6X5 can all be fed from the one heater winding on the transformer, thus leaving the other winding entirely free for the BC221 heater system. The 6X5 takes 0·6 Amp., and

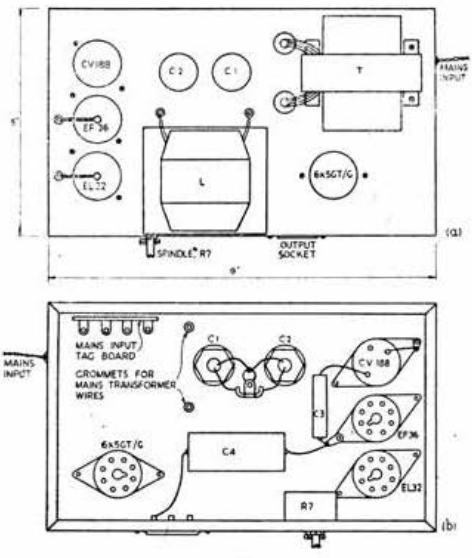


Fig. 3.

Above and below-chassis layout for the power unit. The base-connections for the CV188 can be seen from the lower diagram.

the EL32 has to drop 170 volts because the smoothed output of the rectifier, with the stabilizing circuit connected, is 300 volts. The CV188 stabilizes at 90 to 100 volts, leaving only 30 volts H.T. for the control valve. The EF36, however, functions quite satisfactorily at this figure, as exhaustive tests have proved. Resistor values should be adhered to as closely as possible, and to within 10 per cent. for R2, R3, R5, R6 and R8.

A 10,000 ohm wire-wound potentiometer, R7, varies the bias on the EF36, thus altering the voltage applied to the grid of the EL32, and thereby controlling its resistance and varying the output from 120 to 150 volts as required. C4 provides the final smoothing for the stabilized output; C3 absorbs transients across the neon.

As one side of the heaters in the BC221 is earthed, so must one side of the heater winding in the power unit also be connected to earth.

Chassis and Layout

A suitable chassis can be constructed from No. 18 or 20 S.W.G. aluminium. A size of 9 in. × 5 in. × 1 in. takes the components without cramping, and also allows ample room for the completed power unit to be housed in the battery compartment of the BC221. In some models there is a battery cage, and this should be removed to allow the power unit to be inserted. Fig. 3 shows the layout underneath and on top of the chassis, but this need not be followed exactly.

Constructional Pointers

The 6·3 volts filament lead, the earth lead and

the 120/150 volts H.T. lead may be taken to a four-pin British type valve-holder on the chassis, and the BC221 may then be connected by a plug made from an old four-pin valve base wired to the battery cable. The mains input lead can be fed through a convenient flap-covered hole to be found in the case of the BC221.

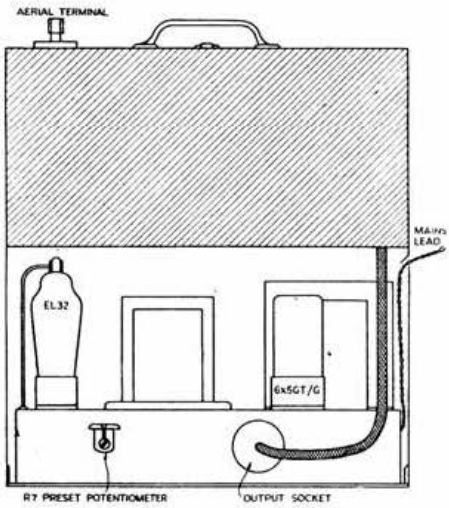


Fig. 4.
The completed power unit fits into the battery compartment of the BC221.

Testing on Completion

Using a high wattage variable resistor of suitable value as an artificial load, steady outputs of 120 to 150 volts were obtained at load currents between zero and 30 mA. Little heat is given off by the power unit, but in order to afford ventilation, it may be considered desirable to leave the door of the BC221 battery compartment open when in use.

When using the power unit, the output should be set at 135 volts (by means of R7) before switching on the BC221, and then the procedure outlined in the instruction book should be followed.

Low-power Transmitter for 420 Mc/s.

The author of this article (Mr. W. A. Scarr, M.A., G2WS) which appeared in the January, 1949, issue, points out that the caption which was added to the first photograph of the apparatus, hardly represents the facts.

Actually results from Mr. Scarr's home in Shortlands, Kent, which is situated in a hollow, have, as expected, been poor. The transmitter has, however, been tested in a good location and reports from stations over ten miles distant indicate that, as stated, considerable distances can be covered under favourable conditions.

In the opinion of G2WS, results on the 70 cm. band depend on four main factors in the following order of importance :—

(i) Location.
(ii) Aerials.
(iii) Receiver.
(iv) Transmitter.

At the present time, the limiting factor is undoubtedly the receiver and much careful work is needed on the design of superheterodyne receivers for this band.

Bevan Swift Memorial Fund

Members are reminded that the Council has decided to perpetuate in some suitable form the name of the late Mr. H. Bevan Swift, G2TI—a tribute to whose memory appeared in the December, 1948 issue.

Among the suggestions already considered is one that a Bevan Swift Memorial Lecture should be delivered annually at the Institution of Electrical Engineers.

Donations should be forwarded to the General Secretary and the envelope marked "Bevan Swift Memorial Fund." Remittances should be made payable to the Society and kept separate from those which are intended to cover Society subscriptions, etc.

Braatten Trophy

The Rules governing the award of this Trophy, donated to the Society in April, 1937, by Mr. Arthur Braaten, W2BSR, of Riverhead, Long Island, New York, have been modified by the Council so that in future the Trophy will be competed for only by members resident in England.

The new Rules are as follows :—

(1) The Braaten Trophy will, at the discretion of the Council, be awarded each year to the fully paid-up licensed member of the Society resident in England scoring the highest number of points (as recorded in *QST*) in the Annual DX Telegraphy Contest organised by the American Radio Relay League.
(2) The Trophy will be held for one year and will be awarded at the Annual General Meeting or such other function as the Council may decide.
(3) The Council reserves the right to award the Trophy for any purpose other than that mentioned in Rule 1.

Arthur Milne Trophy

The Council has been pleased to accept from Mr. Arthur Milne, G2MI, a new Trophy to be competed for annually by members resident within the United Kingdom, but not in England.

The Rules governing the award of the Trophy are as follows :—

(1) The Arthur Milne Trophy will, at the discretion of the Council, be awarded each year to the fully paid-up licensed member of the Society resident within the United Kingdom, but not in England, scoring the highest number of points (as recorded in *QST*) in the Annual DX Telegraphy Contest organised by the American Radio Relay League.
(2) The Trophy will be held for one year and will be awarded at the Annual General Meeting or such other function as the Council may decide.
(3) The Council reserves the right to award the Trophy for any purpose other than that mentioned in Rule 1.

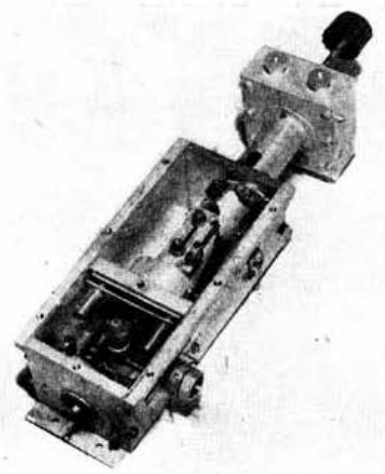
Suppression of Ignition Interference

Tests carried out in the United States on car ignition interference show that correctly fitted standard suppressors reduce the limiting distance between a vehicle and a television receiving aerial for intolerable interference from 200 feet to approximately 70 feet. There are now 30 television stations in regular operation in the U.S.A., and an average *weekly* production of 12,500 receivers.

SIMPLE CRYSTAL CONTROL ON 420 Mc/s.

By G. MICHAEL KING, B.Sc., M.B., Ch.B., D.M.R.T. (G3MY)*

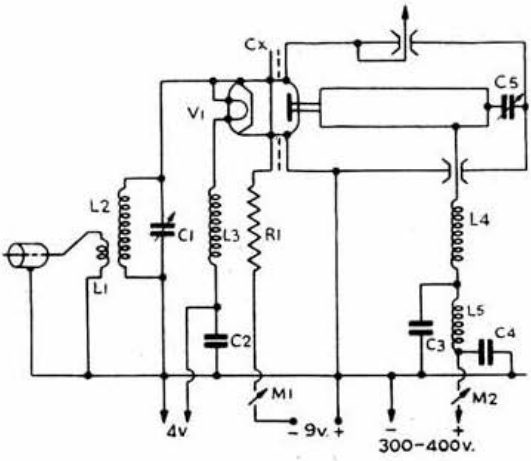
INITIAL experiments on the 420 Mc/s. band were made with a Government Surplus Type 105 self-excited oscillator, using a CV82 (disc-seal triode) as a grounded-grid oscillator. Running with 350 volts on the anode to give an input of 8–9 watts this little unit produced an output in the region of 2¼ watts, tunable over the whole range of the new band, and extremely useful for lining-up the many different types of beams which have been tried. However, when the question of communication arose it was discovered that the self-excited oscillator left very much to be desired, due to its lack of stability (rendering it impracticable to work straight C.W.) and the ease with which the frequency shifted when attempts were made to anode modulate the oscillator. It was therefore decided to try out the unit as a driven frequency-tripler, using the normal 144 Mc/s. transmitter for the purpose. It was soon seen that very few changes would be necessary in order to convert the unit to its new function.



Type 105 Oscillator modified to work as a driven frequency tripler to 420 Mc/s.

Modifications Required

The grid leak must be increased from its original value of 1,500 ohms to 27,000 ohms in order to provide the high negative bias necessary for efficient multiplication. The two cathode chokes must be removed and replaced by a 144 Mc/s. choke in the positive filament lead, and a suitable coil and variable condenser fitted in the common negative filament-cathode lead of the CV82. A co-axial plug should be mounted through the side of the unit to take the input coupling link. This completes the modifications. As the photograph and circuit diagram make the changes quite clear no further description seems necessary.



Circuit diagram of modified Type 105 unit to provide crystal control on 420 Mc/s.

L1	1 turn 20 S.W.G. copper ¾ in. inside diameter.
L2	4 turns 20 S.W.G. copper ¾ in. inside diameter ¾in. long.
L3	30 turns 28 S.W.G. enamel copper wire ¼ in. diameter.
L4, 5	Parts of the original Type 105 unit.
C1	1 to 5 pF concentric type air trimmer (*Phillips*).
C2, 3, 4, 5	Parts of the original Type 105 unit.
R1	27,000 ohms 1 watt carbon.
M1	0–10 mA. meter.
M2	0–50 mA. meter.
V1	CV82/3A/147J. (CV16 or CV53 also work satisfactorily.)

The grid condenser (Cx) is part of the original unit and is formed by a thin sheet of mica separating the grid seal of the valve from the earthed metal chassis.

Results Achieved

A length of co-axial cable was used to connect the unit to the 144 Mc/s. exciter (a pair of EC52's tripling from 48 to 144 Mc/s. and giving about 6 watts of R.F. for 15 watts input), and this amount of drive on 144 Mc/s. produced exactly 5 mA. of grid current through the 27,000 ohm grid leak, when the cathode circuit was tuned to resonance. A 300 volt supply was then connected to the anode circuit of the unit and a quick check revealed that the anode current of the CV82 was in the region of 40 mA (dropping to about 25 mA when the drive was removed). The tuning condenser vane at the end of the coaxial line anode circuit was then adjusted towards maximum capacity, and a sharp dip in anode current was observed, the dip being from 40 to 18 mA. A check with Lecher wires showed that the unit was giving output on 430 Mc/s. With 7½ watts input (300 volts at 25 mA), the measured output on 430 Mc/s. is a little over 2½ watts, and by running the input up to 10 watts (400 volts at 25 mA.) the output can be increased to nearly 4 watts, which should be ample for good communication when used to excite a high-gain beam aerial.

Increasing the drive to the tripler does not appreciably improve the output, and quite useful output can be obtained with as little as 3 watts of drive on 144 Mc/s. The CV82 is rated at 6 watts anode dissipation, and will handle the 10 watts input without any strain.

The high efficiency obtained is no doubt partly due to the fact that the CV82 stage is slightly regenerative, this being due to the rather high anode-to-cathode capacity of the valve, and to the appreciable reactance of the cathode circuit at 420 Mc/s. The tripler is quite stable with drive, however, and does not produce any spurious emissions. By using a small amount of fixed bias as shown, the driver stage can be keyed quite safely, since the CV82 is biased to cut-off when the key is up.

* *51 Springfield Road, Sheffield, 7*

TRUE S-METERING

By K. E. MARCUS, BRS10494*

ELSEWHERE in this issue, there appears a letter drawing attention to the difficulties in obtaining a true indication of signal-strength on an S-meter. This article describes an arrangement which gives such an indication, using a double-diode-triode as a valve voltmeter plus A.G.C. producer.

The appended circuit shows the arrangement, and the following table gives the interpretation of the various S-readings in decibels above the average noise level of the receiver at the frequency in use. The figures in the right hand column refer to the meter readings, as described later.

S-reading	db above Noise	Micro-amps.
S 0	0	500
S 1	10	460
S 2	20	300
S 3	30	150
S 4	40	125
S 5	50	105
S 6	60	87
S 7	70	70
S 8	80	55
S 9	90	40

Modus Operandi

R.F. appearing across the primary of the last I.F. transformer is rectified in the left-hand diode (see circuit diagram), and part of the D.C. potential across its load is applied to the triode. Since the diode load resistor is returned to the cathode, the diode and triode combination acts as a valve voltmeter measuring the signal voltage produced across the primary of the I.F. transformer. In the no-signal condition, the triode passes about 12 mA, and its cathode will therefore be about 60 volts positive to the point C. Due to the battery, however, the point C is 25 volts below chassis potential, so that the cathode, with no signal applied, is at about 35 volts positive to the chassis.

The right-hand diode is at chassis potential by virtue of its connection through the A.G.C. load resistor, and is non-conductive as long as the cathode is positive to the chassis. But, as soon as the voltage drop in the 4700 ohm cathode resistor becomes less than 25 volts (this occurs when the triode cathode current sinks below 5 mA), the A.G.C. diode becomes conductive, and a voltage appears on the line marked "A.G.C. control." This voltage is applied, in the normal way, as delayed A.G.C. and S-readings can be taken continuously even on C.W.

The R107

The writer used this circuit in experiments with an ex-Army R.107. The modifications were as follows :—

(1) The A.G.C. diode feed condenser (C14A 100pF†) was removed.

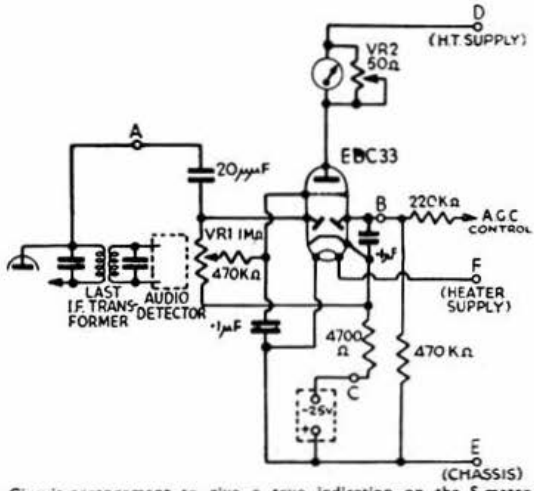
(2) Both the diode load resistor (R12B, 470,000 ohms) and the A.G.C. decoupling resistor (R2E, 220,000 ohms) were taken off their diode and connected to point B.

(3) Point A was connected to the anode of the last I.F. valve.

(4) The supply points D, E and F were connected to the appropriate points on the R.107.

Meter Readings

The values given in the table above were the readings in micro-amps obtained with VR1 pre-set at about 300,000 ohms from the cathode end. As expected, these readings were not equally spread over the scale, but signals of less than 6 db above noise level could be detected visually, while they



Circuit arrangement to give a true indication on the S-meter, and at the same time make available a source of delayed amplified A.G.C. VR2 is chosen so that, with the meter in use, it can be adjusted to give a full scale deflection on noise only.
Meter :- 500 μA f.s.d. 500 ohms.

were barely audible above the background noise. It should be noted that the audio detection system of the R.107 has not been tampered with in any way, and there is nothing to suggest that any other set would, if modified similarly, resent the treatment.

On weak-signal contacts, where S-reporting is really most useful, this device works excellently, and gives a clear indication of the true S-reading.

† *Bracketed descriptions refer to the official diagrams of the R107*

* *35 Merton Avenue, North Hillingdon, Uxbridge, Middlesex.*

INSURANCE POLICIES AND THE RADIO AMATEUR

By R. F. ARMSTRONG (GW2HDX)*

AS some Insurance Companies have recently been offering what are termed "Wireless Installation" policies, a few words of advice regarding Wireless Insurance policies in general may help some members to avoid pitfalls.

Normal Cover

The usual "Wireless Installation" policy covers the following sections :—

(1) Damage to or loss of gear whilst in the shack or temporarily removed to any occupied dwelling house in the United Kingdom. This includes fire, lightning, burglary, housebreaking and theft, as well as accidental damage, and covers up to the amount for which the gear has been insured.

(2) Damage to your other property (house, shed, chicken-run, etc.) caused by the collapse of aerial or mast, up to £500.

(3) Your legal liability to the public (excluding a person in your employment at the time, or a member of your household) for death, injury, or damage to property, caused by collapse of aerial or mast, up to £500 any one occurrence.

(*a*) Your legal liability for costs of such claimant.

(*b*) Your legal costs for defence of such claim.

Exclusions

The *Exclusions* printed on the usual policy are :—

(*a*) War, civil war, rebellion, revolution, etc.

(*b*) Earthquake, riot, civil commotion.

(*c*) Depreciation, wearing away or wearing out of any part of the installation, or loss or damage caused by rain, mist or normal atmospheric conditions.

(*d*) Loss, damage and/or liability arising during the fixing up, adjustment, repair or dismantling of any part of the installation or caused by or naturally resulting from the handling, using or working of the installation or any part thereof.

(*e*) Loss of or damage to any valve and/or other apparatus arising whilst such valve, etc., is not a component of the installation.

(*f*) Damage or destruction occurring to any working dynamo, motor, transformer or rotary converter, or in the wires, mains or electrical apparatus, through short-circuiting, over-running or excessive pressure originating in such dynamo, motor, transformer or rotary converter or in the circuit of which such wires, mains, or electrical apparatus form part.

(*g*) Liability at law for damage to property directly or indirectly due to fire.

The usual annual premium for the above is 7s. 6d. per cent. (minimum premium 7s. 6d.) on the value of the gear insured.

This type of policy was not, however, designed for the radio amateur and the protection afforded, when in its usual form, is totally inadequate. Most Insurance Companies, however, are always prepared to meet the requirements of their individual policy-holders as far as possible, and will suitably amend their standard form of policy, but such amendments should be requested as and when they are required, and not on discovering that the damage due to the accident which happened yesterday is not covered!

* *22 Park Wern Road, Skelly, Swansea, Glams., S. Wales.*

Alterations Necessary

The standard form of policy, extracts from which are briefly set out above, can easily be modified to meet the general needs of the radio amateur.

It will be seen from Section (3) above, which should be examined in conjunction with Exclusion (*d*), that only liability in connection with aerial and mast is covered, and even this is inoperative if you are working on the aerial system at the time of an accident. Exclusion (*d*) should therefore be completely deleted from the Policy and Section (3) reworded as follows :—

"(3) Liability at law (not arising under any contract) for compensation for death of or bodily injury to any person (not being a person in the service of the insured nor a member of his household) or for accidental damage to the property of any such person in connection with the installation or its operation or maintenance, but limited in respect of any one claim or number of claims arising out of one cause to the sum of £5,000."

This section is now not only applicable in respect of the aerial system, but gives a general cover and would operate in such cases as a visitor coming into contact with the power supply and alleging that you had not taken proper precautions for safety; dropping your pliers from the top of the mast on to a neighbour's head; a mast running amok whilst being erected, etc. Also the indemnity is now £5,000 per accident, the previous limit of £500 being quite insufficient in view of present-day awards for injury.

At the end of Exclusion (*c*), the words "other than by storm or tempest" should be inserted. This then provides indemnity for damage to gear by rain if directly caused by a storm—such as part of the shack roof being blown away overnight—in addition to actual storm damage which is itself covered under Section (1).

Exclusion (*e*) should be entirely deleted. Otherwise the Policy will only cover the gear on the racks.

Exclusion (*g*) should be amended to read :—"Liability at law for damage caused by fire to any building in which the installation is contained." Fire insurance on the building of the shack is, of course, a separate subject, but such a fire may spread to other property, and with this Exclusion in its original form you would not be indemnified under Section (3).

The deletion of Exclusion (*e*) quoted above will affect the description of "The Installation" shown on your Policy, and this should generally be covered under four headings, viz. :—

	Total Value
(*a*) Transmitter	£
(*b*) Receivers	£
(*c*) Aerial equipment	£
(*d*) Test gear & spares (including valves)	£

Insurance Companies generally require such a list, but it should be pointed out that you will be making alterations from time to time and that so long as the total sum insured is adequate to cover the whole of your gear, you are not obliged to advise alterations under the four separate headings.

Premium

The very much wider protection afforded by the alterations suggested above will, of course, warrant

(*Continued on page* 201)

A Compact Dual Purpose Power-pack

AN attractive little power pack weighing only 10¼lb. and contained in a black crackle box measuring 4½" × 9½" × 6" high has been produced by *Messrs. Rainbow Radio Ltd.* of Blackburn.

It is designed to work off either A.C. mains or a 6-volt accumulator, the changeover being made merely by plugging in the D.C. supply instead of the A.C. The necessary wiring changes are made automatically when the plugs are changed.

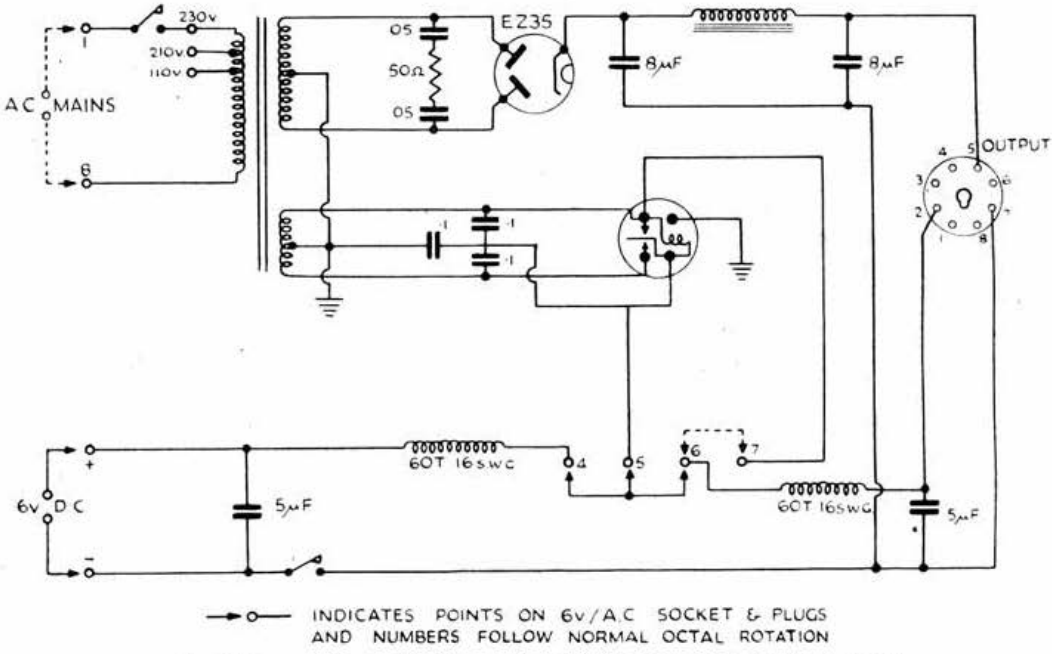
Circuit Features

The circuit is shown in the accompanying diagram, together with the various condenser values. An EZ35 valve is employed as a rectifier for both A.C. and D.C. inputs, a 6-volt non-synchronous vibrator being used. The makers' ratings are, for A.C. input, 180V. at 70 mA. and 6·3V. 3·5 A., and for D.C. input 135V. at 45 mA.

Test Results

On test, using A.C. input, the output was found to vary from 165V. at 100 mA. to 190V. at 32 mA. With a fully charged 6V. accumulator on the input the output varied from 189V. at 23mA. to 115V. at 60 mA. The input current varied from 2·8 A. to 3·5 A. with these loads. The amount of hum produced in a receiver by the vibrator is very small and is scarcely noticeable even when reading weak C.W. signals, while from an A.C. input there is no noticeable hum whatsoever.

The whole unit is extremely neat and compact and, as will be seen from the figures quoted, very efficient. It is ideal for use with portable gear, the small size and light weight permitting it to be packed away in an odd corner. Consequently, it should prove very popular on field days, or with portable-mobile gear. The price is £5 19s. 6d.



Circuit Diagram of Compact Dual Purpose Power Pack manufactured by Rainbow Radio Ltd.

Amateur Radio in Germany

Mr. R. G. Shears advises that the Ordinance concerning the issue of amateur transmitting licences for German nationals in the British and U.S. Areas of Control in Germany, was passed by the German Economic Council on January 19, 1949. This Ordinance has now been referred to the Landerrat (Land Government). The German Post Office is ready to issue licences as soon as instructed to do so by the Bipartrite Control Office.

Technical and Morse examinations have already been held and a list of some 500 successful applicants with allocated callsigns is available. It is anticipated that licences will be issued at the end of February.

Call signs will be allocated in sequence from DL1AA to DL1ZZ and then DL3, 6, 7, 8, 9 and 0. Prefixes for Allied call signs in Germany will remain as at present, *i.e.* DL2, 4 and 5 for the British, U.S. and French Zones respectively.

Re-union at Pinoli's

Twenty-two years ago this summer—June 29, 1927, to be precise—the first of the famous Pinoli Hamfests took place. The General Secretary would be glad to hear from members who were present at those gatherings with a view to staging a reunion.

Slow Morse Transmissions

Slow Morse transmissions are being radiated daily between 20.30 and 21.00 G.M.T. on a frequency of 3515 kc/s. by the Belgium National Society U.B.A. Stations taking part include ON4BZ, FT, UF and VE. Incidentally, we hope U.B.A. will transfer this service to some other frequency as the transmissions tend to interfere with DX work on this band.

EDITORIAL—(*Continued from page* 189.)

While final judgment on certain of these and other recommendations must be reserved, the formulation of the Code does, at least, indicate that an ever-growing body of amateurs throughout the world are determined to put their house in order and to bring to an end the post-war craze of DX contacts at any price.

* * *

The widespread desire to improve the orderliness and effectiveness of both long and medium-distance amateur communication was clearly shown in the answers given to the recent Questionnaire on Band-Planning. Thanks to the co-operation of the Society's Town Representatives, an invaluable poll of the considered opinion of almost two thousand members has been secured, and is now being carefully studied by the Codes of Practice Committee. But whatever may be the final outcome of the poll, and of the many interesting suggestions put forward both by individuals and groups, it is clear that the answer—to a certain extent at least—must always be governed by the willingness of the amateur fraternity as a whole to submit *voluntarily* to a code of operating ethics. How simple the intricate problem of Band-Planning would become if every amateur were to decide—*today*—never again to use telephony near the low-frequency end of each band. And, incidentally, how much this gesture would be appreciated by every amateur taking part in this year's Contests.

J. P. H.

INSURANCE POLICIES AND THE RADIO AMATEUR

—(*Continued from page* 199.)

an extra premium, but the loading on the original annual rate should not be more than 2s. 6d. per cent. —making the total annual premium for the entire cover 10s. 0d. per cent. (minimum premium 10s. 0d.) on the value of your gear.

Earthing the Aerial

In conclusion, there is one Condition on this type of Policy which should be carefully noted, viz. :—"The Insured shall take all reasonable precautions for the safety of the property insured, and where an outside aerial is fitted shall at all times when the Installation is not in use see that the aerial is connected direct to 'earth.'"

If there is any doubt as to what your Insurance Company mean by "direct to 'earth,'" you should obtain a note of their interpretation. The writer had queried this with one well-known company who are satisfied with such a connection being made to the nearest water pipe, etc., and do not interpret their wording as meaning direct to earth outside the shack.

One Minute Quiz

Can you say which is the correct Answer?

1. *G2KF made the first England–America amateur contact in:* (*a*) 1920; (*b*) 1923; (*c*) 1925.
2. *The callsign of the first British broadcasting station was:* (*a*) *2LO*; (*b*) *5XX*; (*c*) *2ET*.
3. *The number of amateur licences issued in the United Kingdom is approximately:* (*a*) 2,500; (*b*) 6,500; (*c*) 10,000.
4. *During December,* 1901, *Marconi received signals in Newfoundland from:* (*a*) *Daventry*; (*b*) *Clifden;* (*c*) *Poldhu.*
5. *The first European QSL card was sent by G2UV in:* (*a*) 1921; (*b*) 1926; (*c*) 1931.

(Answers on page 207)

Old Timers' Dinner

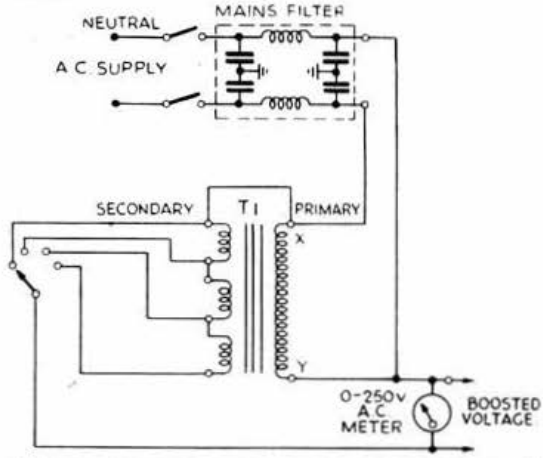
Eligibility for attendance at the Old Timers' Dinner to be held at The Horse Shoe Hotel, Tottenham Court Road, London, W.C.1, on Friday, May 20, 1949, will be the holding of a radiating licence issued by any British authority at a date not later than *December* 31, 1928, with possession of a transmitting licence (but not necessarily issued by the same authority) current on *December* 31, 1948, or inclusion in British Old Timer Club membership lists as published in *Short Wave Magazine*.

Reservations including remittance (10s.) must reach R.S.G.B. Headquarters by not later than May 14, 1949.

Economical Mains Boosting

It is regretted that the circuit reproduced on page 171 of the January issue of the BULLETIN was incorrect. As drawn, the primary of the transformer carries the whole of the transmitter current; this it is incapable of doing. The basis of the scheme is that the primary only carries the necessary "boost" power. A corrected version of the circuit is reproduced herewith.

The author (Mr. C. B. Raithby) expresses his thanks to those members who pointed out the circuit error.



ANNUAL GENERAL MEETING

Minutes of the Twenty-second Annual General Meeting of the Incorporated Radio Society of Great Britain, held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2 on Friday, January 28th, 1949, at 6.30 p.m.

Present.—The President (Mr. V. M. Desmond in the Chair), Messrs. W. A. Scarr (Executive Vice President), A. J. H. Watson (Hon. Treasurer), A. O. Milne (Hon. Editor), G. Marcuse and E. D. Ostermeyer (Past Presidents), F. Charman, C. H. L. Edwards and J. W. Mathews (Members of Council), John Clarricoats (General Secretary), Miss A. M. Gadsden (Assistant Secretary), Mr. J. P. Hawker (Assistant to the General Secretary) and about 100 Members.

Notice Convening the Meeting

The General Secretary read the notice convening the meeting.

Previous Minutes

It was moved by Mr. Parry, seconded by Mr. Thorogood and Resolved that the Minutes of the Twenty-First Annual General Meeting as published in the January, 1948 issue of the R.S.G.B. BULLETIN be taken as read, confirmed and signed as a correct record.

Annual Report of the Council

It was moved by the President and Resolved that the Annual Report of the Council for the year ended 30th September, 1948, as published in the December, 1948 issue of the R.S.G.B. BULLETIN be approved and adopted.

Report of the Honorary Treasurer and Audited Annual Accounts

In presenting the Audited Annual Accounts for the year ended 30th September, 1948, the Honorary Treasurer (Mr. A. J. H. Watson) pointed out that the total Assets of £21,000 represented an increase of some £19,000 since 1939. This improvement in the Society's financial position had been brought about largely as the result of the sale (during the war years) of the *Amateur Radio Handbook* and *Radio Handbook Supplement*. He paid tribute to the members of the Technical Committee who had produced the *Handbook* and *Supplement* and in more recent years the new technical booklets.

Mr. Watson referred to a circular letter sent to T.R.'s by Mr. F. H. Osborne, G2CVO, of Chingford, Essex, wherein he had attempted to build-up opposition to the suggestion which he (Mr. Watson) had put forward at the last London Official Regional Meeting that it may ultimately become necessary to increase subscription rates. Mr. Watson explained that although Mr. Osborne was present at the O.R.M. he did not ask a single question on financial or other matters. The Council strongly deprecated the action taken by Mr. Osborne especially in view of the fact that it had been made clear at the meeting that no increase could take place without the approval of the members at a General Meeting. Mr. Watson stated that it will almost certainly become necessary to increase subscription rates when the size of the BULLETIN is substantially increased.

At the conclusion of his speech, which was greeted with applause, Mr. Watson moved and Mr. Clark seconded, that the Report of the Honorary Treasurer, together with the Audited Accounts for the year ended 30th September, 1948, as circulated among the members be and are hereby approved.

During the subsequent discussion Mr. Hollington stated that he would convey to Mr. Osborne the views put forward by the Hon. Treasurer.

In reply to questions raised by Mr. Williams, the Hon. Treasurer explained that the fee of £105 paid to Edward Moore and Sons represented an audit fee of 75 Guineas (as approved at the previous A.G.M.) and an accountancy fee of 25 guineas. Mr. Watson thought it was not desirable to bring into account overdue subscriptions at the end of the financial year, as a provisional bad debts reserve would also have to be made in respect of most of them. Publications in stock are valued at cost and represent only those books which the Society expects to sell. Mr. Watson thanked Mr. Williams for a suggested improvement in the layout of the Balance Sheet.

There being no further questions the Motion for adoption as set out above was put to the meeting and carried unanimously. A motion was proposed by Mr. Newton and seconded by several members, that this meeting records its confidence in the Council and its handling of the financial affairs of the Society.

Election of Council for the Year 1949

The President announced that the following Corporate Members had been duly elected to serve on the Council for the year 1949 :—

Officers

President : Mr. V. M. Desmond, G5VM
Acting Vice President : Mr. W. A. Scarr, M.A., G2WS
Hon. Treasurer : Mr. A. J. H. Watson, F.S.A.A., G2YD
Hon. Secretary : Mr. J. W. Mathews, G6LL
Hon. Editor : Mr. A. O. Milne, G2MI

Members

Mr. I. D. Auchterlonie, G6OM	... ...	1,961 votes
Mr. D. N. Corfield, G5CD	... ...	1,904 ,,
Mr. F. Charman, G6CJ	... ...	1 886 ,,
Mr. W. H. Allen, G2UJ	... ...	1,698 ,,
Mr. P. Thorogood, G4KD	... ...	1,620 ,,
Mr. A. P. G. Amos, G3AGM	... ...	1,456 ,,
Mr. D. A. G. Edwards, G3DO	... ...	1,348 ,,

The President announced that the following Members had been unsuccessful in the Ballot :—

Mr. W. N. Craig, G6JJ	... ...	1,221 votes
Mr. W. H. Matthews, G2CD	... ...	1,166 ,,
Mr. F. Hamer, GW8BW	... ...	1,061 ,,
Mr. G. Webster, G5GK	... ...	971 ,,
Mr. J. J. Hollington, G4GA	... ...	958 ,,

The President thanked the unsuccessful candidates for allowing themselves to be nominated, congratulated the new members of Council on their success, and thanked the Scrutineers (Group Captain H. W. Evens, G6CH, Messrs. H. D. Cullen, G5KH, W. G. Irwin, G5DI, F. W. Tyler, G3CGQ and R. L. Glaisher, G6LX) for their services.

The President announced that 2,670 Ballot forms had been accepted, compared with 2,914 in 1947 and 3,286 in 1946. Thirty-two forms had been rejected.

Re-appointment of Auditors

Mr. Watson moved, Mr. Edwards seconded and it was Resolved to re-appoint Edward Moore and Sons, Auditors for the period ending 30th June, 1949, at a fee of seventy-five guineas.

Vote of Thanks to the I.E.E.

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

There being no other business the meeting terminated at 7 p.m.

Presentation of Trophies and Awards

At the conclusion of the Annual General Meeting Mr. Gerald Marcuse, G2NM (Past President) presented the ROTAB Cup (donated by him in 1927) to Mr. Arthur Milne, G2MI, after which the President presented trophies, miniatures and awards to the following members :—

Wortley Talbot...	... ...	Mr. H. A. M. Clark, G6OT
Courtenay Price	... ...	Mr. R. L. Varney, G5RV
Col. Thomas	... ...	Mr. W. E. Russell, G5WP
Braaten	... ...	Mr. F. A. Robb, G16TK
Somerset	... ...	Mr. J. A. Hunt, G2FSR
Mitchell-Milling	... ...	Mr. J. Haydon, G3BLP
B.E.R.U. Receiving	... ...	Mr. W. S. Hall, BRS15024
N.F.D. Shield	... ...	Hendon-Edgware Groups
N.F.D. Miniature	... ...	Slough Group
Miniature	... ...	Mr. E. J. Greenwood, G4OS

Mr. C. J. Peach, G5JP, was not present to receive the 1930 Committee Cup. Messrs. E. J. Williams, G2XC and P. R. Burridge, G3CQR, were not present to receive Miniatures.

Certificates of Merit for success in Contests were presented to Messrs. J. Haydon, G3BLP, N. H. R. Munday, G5MA, and F. Charman, G6CJ.

Norman's Hamfest

Another of the popular Hamfests organised by Norman Turner (G4NT) was held at Chiltern Works, High Wycombe, on December 19, 1948, when the 130 guests present enjoyed an event which in every way maintained the high standard set by earlier gatherings. Apart from an interesting series of short lectures, an improvised Ham Band helped keep alive the social spirit.

During the proceedings old timer Kenneth Alford (G2DX) presented G4NT with an illuminated address bearing the call-signs of all present, after which prizes donated by the Dayton (Ohio) Amateur Radio Society were handed to the winners of the local contests organised last year. In addition more than 100 valves—mostly HK24's—also donated by the Dayton Society, were distributed to winners in a Lucky Draw.

Radiolympia, 1949

The Radio Industry Council announces that the 16th National Radio Exhibition ("Radiolympia") will be held at Olympia, London, from Wednesday, September 28, to Saturday, October 8, 1949.

THE MONTH ON THE AIR

By A. O. MILNE (G2MI)*

FORTHCOMING R.S.G.B. CONTESTS

March	5– 6	B.E.R.U.
April	2– 3	144 Mc/s.
June	11–12	National Field Day.
July	3	144 Mc/s. Field Day.
August	20–21	420 Mc/s.
September	25	Direction Finding.
October	1– 2	Low Power (3·5 Mc/s.).
November	26–27	" Top Band " (1·8 Mc/s.).

Date to be announced. Affiliated Societies.

" DX " on 80

THERE is a big disappointment in store for many of those who have worked so hard making unnecessary CQ calls on 3510 ± 10 kc/s. recently as most of the apparent DX has proved to be spurious. ZS1M, VS2BC, VK7YL, KH6IJ and KL7GH were all the work of someone with a distorted sense of humour. VS6AJ is also thought to be a bad-'un. The signals using these calls were extraordinarily convincing however and certainly sounded like DX. VK5KO and ZC8PM are O.K. A complete list of QSO's made by VK5KO is being sent to the writer and will be available for check shortly. It is not yet known for certain whether *all* the transmissions made with this call were genuine. Tests have been made between VK3CI and G2MI and the latter has been heard in Australia each time both on C.W. and 'phone.

Much as we deprecate the malevolence of the individual responsible for the " phoney " calls we do not feel as sorry for certain of the victims as we might have done. For sheer stupidity some of the behaviour recently heard on this band would be hard to beat. Certain people not newcomers, but dyed-in-the-wool old timers who ought to have more sense, have bedevilled the first 10 kc/s. of the band with useless CQ calls, causing QRM to those actually in QSO with the two DX stations active, and doing nothing better for themselves than hook a phoney reply.

A particular case in point was when VK5KO tried to work ZC8PM for his 3·5 Mc/s. W. A. C. He had figuratively speaking to go on his bended knees to the CQ merchants and those even worse who persisted in calling him when he was in QSO, and beg them to give him a break.

This chap has been getting up at 5 a.m. every morning for nearly two months to give the Europeans a DX contact on 80, yet they could not let him alone for five minutes to achieve his heart's desire.

A QSO between ZC8PM and G2MI took 25 minutes when it could have been completed in three. It was obvious that certain operators did their best to break it up. V.F.O.'s were wobbled back and forth, one station indulged in a series of V's and someone else switched on a modulated oscillator. The keynote seemed to be " If I can't raise him, I will darned well see you don't ! "

This is not good enough, chaps and we appeal to you to adopt the following rules in an effort to bring some sort of order out of chaos.

(1) No CQ calls on 3505 kc/s. ± 5 kc/s. between 1900 and 2100 G.M.T.
(2) Listen for the DX station to call CQ and when someone hooks him, keep silent and wait for the QSO to be completed.
(3) Don't call DX stations if you cannot hear them.
(4) Remember that your V.F.O. may radiate.
(5) Don't indulge in local contacts in the first 20 kc/s. of the band.
(6) Spread out a bit, and encourage your DX contacts to do the same. The present state of affairs between 3500 and 3510 is plain idiotic.

ZD9AA

In order to speed the delivery of QSL's to G contacts, the operator of ZD9AA has authorised G2MI to make out the cards on his behalf from details to be given over the air on a weekly sked. The only cards to be sent out will be for stations listed by ZD9AA at 1915 G.M.T. each Monday, so if you want your cards, keep 14050 clear once a week. A specimen card has already arrived by courtesy of ZS6BT. The first batch, together with a batch of blank ones will leave Tristan da Cunha early in February. We hope shortly to publish a photograph and description of this station—a real outpost of Empire.

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

Notes and News

GW5SL has worked KP6AA, Palmyra Is., KX6AF Kwajalein (QSL *via* AACS Navy 824 c/o F.P.O. San Francisco) YK1AB (Box 35 Damascus, Syria) and VP2AA, all on 14 Mc/s. G2RX states that VQ2DH may soon be heard with a ZD6 call between 1800 and 2200 G.M.T. on either 14030 or 28060. MP4BAB has now been posted to Malta and has QSL'd all his contacts. A1018 reports D4AZU/Airmobile and D4A1M/Airbourne both on 14 Mc/s. and has heard FL8AE who claims to be in French Somaliland. We seem to remember this one before and that he was a " phoney." HZ1A is O.K. and QSL's.

BRS 16304 reports ZP2AE, ZP3AD, ZP3CM and ZP7AD all on 14 Mc/s. Wonderful what you can hear if you don't transmit ! says FF8AA is now signing FF8MM (Box 207 Dakar). G6RH says ZS2MI has now left Marion Island and offers the following — KX6AF, (14040) KP6AB, (14050) AR1AL (14180 phone), C3EA/Formosa (14220 phone), YK1AF, QSL *via* R.S.G.B. (14015), ZS9D (14010).

G3BCK has worked US1KAA on 7 Mc/s. who gave QTH as Leipzig and asked for QSL *via* Box 88, Moscow. How's this for a countries list, either heard or worked on 7 Mc/s.? CM, CN8,. CR7, CT2/3, EK1, EP, FA, FT4, HC, J2/9, KB6, KG6, KJ6, KL7, KP4, KZ5, LU, OQ, OX, MP4, HZ, PX, PY, TF, All U.S.S.R. districts except UX1, VE1–8, VK, VO, VP3/4/6, VQ2/4, W1–0, ZB1/2, ZD2/4, ZD9, ZL, ZS. If you want the DX, 7 has it !

He also wonders if G3D—ever works anyone. The other evening he sent CQ 98 times, signed once and got through another 51 CQ's before 'BCK decided life was too short to see if he ever sent a " K." Any candidates for a CQ Century Club ? An American visitor recently remarked, " We can always tell a G by the length of his CQ call ! " *Verb sap.* G5MR draws attention to KH6VP/VR4 on 14080. EP3D is now FA9UO QSL *via* R.S.G.B. G8QX mentions VU7AF who claims to be the only licenced amateur in Nepal. Heard at lunchtime on either 14180, 14270 or 14305. He asks ; " Why not a bit more publicity for the Society's certificates ? How many E.DX certificates have been issued ? " The answer appears on this page.

I1RC states there will be a contest between Trieste stations during March and that all contacts will be confirmed. TA3VO is PY7GB aboard the Panamanian ship " Pamela " operating off Istanbul on 7015 kc/s. Thanks G3BEG. G5WI has got tired of making out W6AY's cards for him and leaves shortly for California. Good luck O.M. Will ZD3B please write to G2MI, giving his present address ?

Ex-Council member G2NR is now VS2CQ. He says VS1CQ has been operating in VS2 territory with his VS1 call and forsees some confusion in EDX and DXCC claims.

G2BUV who has just returned from 18 months in Belgium declines responsibility for the G2BUV who has been active on 7 and 3·5 Mc/s. C.W.

Bugdad Morse

GM2CID makes some ' canny ' comments on individuals who send 15 w.p.m. Morse with the left foot on a " bug " key adjusted for 25 w.p.m. He quotes from his log a station alternately signing himself G2—and D2—. " QTH is Strawbgrg Tmi Strarbgrgush " (Apparently meant to be Scarborough). The gentlemen went on to say the band was " vy husy " and signed off by wishing him lots of " duck." Almost as bad is the long dot short dash gibberish beloved of several well known operators in the south of England.

DL4 Calls

To simplify DL4 callsigns, it has been decided to drop the first letter following the figure (*e.g.* DL4AKW now becomes DL4KW). These calls are being used by American personnel in the U.S. Zone of Germany.

EMPIRE DX CERTIFICATES

1 . G6RH	9 . G6KS	17 . ZL1HY
2 . G2PL	10 . PA0GN	18 . G8TD
3 . G6ZO	11 . G8IL	19 . G6QB
4 . G2MI	12 . G3DO	20 . G6CL
5 . G8IG	13 . G6YR	21 . G3BI
6 . GI6TK	14 . G6WY	22 . G2FSR
7 . G6RB	15 . G4JZ	23 . G8KP
8 . G2AJ	16 . G5BJ	24 . G8II

Telephony Endorsement

1 ... GM2UU 2 ... VQ4ERR

AROUND THE V.H.F.'s

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

V.H.F. Aerial Systems

IN the course of an informative letter, Mr. Hopkinson, G8QX (Malvern), raises many topics of interest to the V.H.F. worker, including the question of improving the vertical directivity of an aerial system in an endeavour to obtain the maximum radiation at the low angles necessary for successful medium and long distance communication with the small input powers at present permitted to U.K. amateurs. Beams of the familiar Yagi pattern do something in this respect, but a multi-element array tends to produce so sharp a pattern in the horizontal plane that searching for active stations on a sparsely populated band becomes rather like looking for the proverbial needle in the haystack. The well-known W8JK beam is a step in the right direction, as the inter-reaction of the two close-spaced elements on one another does much to cancel the unwanted vertical radiation, but the system which would appear most likely to combine sharp vertical directivity at low angles with a reasonably wide horizontal coverage is one employing half-wave elements stacked one above the other at half-wave intervals, and fed in-phase by means of an open line. In its simplest form such an array would, of course, be bi-directional, but the addition of a wire mesh reflector would overcome this, and at the same time give additional forward gain. The early C.H.L. radar stations employed a four-bay array of this type with great success on frequencies not far removed from 144 Mc/s.

So far very little information has been published regarding the "Cubic Quad," but from the results obtained by some DX workers using this type of aerial it would appear that one of its virtues is the concentration of the bulk of the radiation at small angles to the horizontal.

The Two-Metre Band

Presumably there is a great deal of rebuilding and bench-testing going on amongst the fraternity, for not only has the 144 Mc/s. band been practically deserted for evenings on end, but the activity reports reaching us this month have been few and far between.

G2ADZ (Oswestry) asks yet again for more activity from London and Southern England stations, particularly in the early evening. Although there have been several occasions when conditions have been suitable for ranges of 150 miles or more, little advantage has been taken of them. On December 23 he worked G2NH (New Malden) and G6YP (S.E. London), and on January 15 made contact with G6VX (Hayes, Kent). 6YP was also heard on the following day. He has no difficulty in maintaining his skeds. with Cheltenham, and finds this path consistently reliable under all weather conditions. A curious fact is that G4LU, 5 miles south of 2ADZ, and situated 250 ft. higher, receives the Cheltenham stations far less strongly despite his apparently superior site, and the possession of a receiver of proved sensitivity. On those occasions when both 2ADZ and 4LU have been received by the writer 4LU has almost invariably been the stronger signal.

G2JU (Harrow) now has his transmitter and receiver working to his satisfaction, and is operating most evenings on 145·2 Mc/s. No interference whatever is caused in the T.V. receiver belonging to his next door neighbour. A 3 element indoor rotary beam is employed, and although this is only 15 ft. above ground, he has experienced no difficulty in working those stations he has heard. The receiver is a converted Type 27 with broad band R.F. and mixer stages, and an oscillator on 66 Mc/s. doubling to 132 Mc/s. with an I.F. of 12 Mc/s. 2JU finds little activity, however, and would welcome contacts. He does not operate after 22.00 GMT.

G6UH (Hayes, Middlesex), a well known call on 60 Mc/s., is now on 145·46 Mc/s., also with an indoor 3 element beam, and is active most evenings after 19.00 GMT.

G8QX, situated on the eastern slope of the Malvern hills, finds that signals on 30, 60 and 144 Mc/s., together with the T.V. signal on 45 Mc/s., exhibit remarkably similar characteristics. The latter signal is, under normal conditions, S5 on the S-meter of his *Hallicrafters* S27 receiver, and the 144 Mc/s. band then has a range of around 50 miles. When, however, Alexandra Palace produces an S9 signal, the 144 Mc/s band is open for contacts with London and beyond, while similar results are obtained on the other amateur bands mentioned.

Before leaving 144 Mc/s. we should like to mention a phenomenon which has been noticed by the writer not only on this band, but on 60 Mc/s. also; we refer to the number of 'phone stations heard whose modulation level is so low as to make it quite impossible to read more than a word here and there, although their carriers are S5/6. It seems unreasonable that operators should adopt this practice from preference and thereby minimise their chances of raising stations which they presumably wish to work, and the question therefore arises as to whether this is a V.H.F. "effect" of some sort. Further point is added to these remarks from recent experiences of the writer when operating 'phone on the five metre band, when two contacts immediately following one another yielded reports of 90 per cent and 20 per cent. modulation although the modulation level had not been altered in between. The carrier was said to be S8/9 in each case. Unfortunately an oscilloscope was not available at the time for measuring the actual depth of modulation, but from observations on a field-strength meter, modulation was certainly nearer 90 per cent. than 20 per cent.

The Aurora

During the last week of January displays of the Aurora were observed in several parts of the British Isles, and some disorganisation caused to radio communication on the lower frequencies by exceptional sunspot activity. No reports have yet been received as to whether the V.H.F.'s were affected by these disturbances, and it would be of considerable interest to learn whether this was, in fact, the case. The "Aurora Effect" is well known to workers on the 60 Mc/s. band, and when it is present, all signals, irrespective of their true bearing, appear to originate from a northerly direction, while normally T9 carriers exhibit a marked low frequency modulation, going rapidly down the "T" scale as the disturbance increases in intensity. The last, and very intense manifestation of such conditions occurred in August, 1948, when the present G–DX record of 363 miles was set up between G5MA in Ashtead, Surrey, and GM2DAU in Cupar, Fife.

So far, no observations of this effect have been made on 144 Mc/s., and it has been stated in American publications that it does not extend so high in frequency. This would seem to indicate that although a 60 Mc/s. wave is reflected from the area of disturbance with little loss, waves of around half that length penetrate the area without undergoing reflection. However, with the small amount of data at present available it cannot be assumed that this is invariably the case. Information regarding the behaviour of signals on the aircraft frequencies between 100 and 130 Mc/s would also be of value, as these occupy a position intermediate in the frequency spectrum between our 60 and 144 Mc/s. bands.

Seventy Centimetres

Our remarks last month regarding suitable aerials for this band have evoked comment from G8QX, whose letter on the subject has already been mentioned, and from G2CWY (Golders Green). The latter suggests the Franklin Uniform Array as fulfilling the requirements of good vertical directivity combined with a circular horizontal polar diagram.

Considerable interest in 70 cm. operation is being shown in the Midlands. Five stations are now active on the band in South Birmingham—G3APU, EMY, LN, 5JU and 8JI. At the moment the transmitters are all self-excited modulated oscillators, but G5JU is rebuilding for crystal control. Apart from purely local contacts both 3LN and 8JI have been heard at New Oscott with reports of R5 S8 and R5 S7 over distances of 10 and 11 miles respectively.

Mr. T. F. Higgins, G8JI, the South Birmingham Area Representative, would like to hear from anyone interested in forming a V.H.F. Group similar to that already in existance in South London. His address is 391, Rednal Road, Northfield, Birmingham 31.

G6HD (Beckenham, Kent) is now active on the band and takes part whenever possible in the Wednesday evening skeds.

Two Walking Suitcases

What is probably the first instance of 420 Mc/s. (70 cm) portable operation took place during the evening of January 22, when G2WS/P, working from a site 3 miles north of Oxted, Surrey, 800 ft. up on the North Downs, effected two-way contact with G2FKZ (Dulwich), at a distance of 12 miles and heard G3AHB/A, situated on the roof of the E.M.I. building at Hayes, Middlesex, 22 miles away. It is unfortunate that signals from G2WS were not received by 3AHB, but the report—R5 and S7 on M.C.W.—was passed *via* 2FKZ, who relayed it to Hayes. G2WS was using the small "copperplate" transmitter, employing a *Mullard* ECC91 valve, which he described in the BULLETIN last month, together with a two valve super-regen. receiver and a broadside array consisting of 8 driven elements backed by 8 reflectors. Besides 2FKZ (who was a good S9 at Oxted and received the portable station at R5, S6) G3CU (Dulwich) and G4CG (Wimbledon), were also heard at R5 S6 in each case.

G3AHB/A is now able to put an S9 signal over to G2FKZ (15 miles) and an S8 to G5PY (Wandsworth), as a result of improvements to his aerial array. The parabolic reflector type previously in use and mentioned in these notes last month, was cut for a somewhat lower frequency, and suffered some inefficiency thereby, but the new array which consists of four half-wave elements end-fed, with four reflectors spaced ¼ wave behind, gives about 15 db. gain and a back-to-front ratio of 28 db. The previous difficulty of feeding a balanced aerial from an unbalanced co-axial line has been overcome by the addition of a balance-to-unbalance transformer in the shape of a parallel-connected ¼ wave length of co-axial feeder at the aerial end. Experiments are at present being conducted into the use of 829 and 832 type valves as oscillators on 70 cm., and with the considerable increase in power output which it is hoped to obtain thereby 3AHB is looking forward to even better results.

* * *

The closing date for these notes for the March issue is Wednesday, February 23.

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

The Five Band Club

London Meeting

ON Saturday, January 29th the Five Band Club held a "Meet Your Neighbour" dinner, and as a result an almost complete silence must have fallen over the V.H.F. bands while 64 of their usual disturbers enjoyed an excellent meal at the Euston Tavern, near St. Pancras Station in London.

This magnificent response to the Club's invitation to anyone interested in V.H.F. work would almost certainly have been surpassed had it not been for the fog which, with its severe disorganisation of all transport services, prevented some from making the journey from the more distant parts of the country. As it was there were representatives from Birmingham, Weston-super-Mare and Portsmouth, while the best G-DX was undoubtedly Mr. Frank Robb, GI6TK, who came all the way from Belfast.

Maurice Mason, G6VX, who was responsible for the organisation of the meeting, and Ted Williams, G2XC, the Secretary, welcomed those present and explained the objects of the Five Band Club, which came into being following a similar dinner held in London last year. Although sponsored by the *Short Wave Magazine*, Mr. Williams pointed out that membership was in no way limited to readers of our contemporary, the only qualification being a genuine interest in, and activity on the V.H.F. bands. G6VX, in conjunction with Ernie Dedman, G2NH, of the *Quartz Crystal Company*, who was present, had constructed two very neat and compact frequency standards comprising a 500 kc/s. crystal, and a 6AK5 oscillator driving a similar valve as a harmonic generator, to produce reference frequencies at ·5 Mc/s. intervals throughout the V.H.F. bands at least as high as 146 Mc/s. Commenting upon the importance of accurate frequency measurement as an aid to keeping skeds. and in finding weak signals, the frequencies which were known, Mr. Mason announced that these two useful instruments would be disposed of among those present; one to a member living at least 100 miles from London, and the other by raffle. The only proviso made with this offer was that the successful participants should supply the Club at intervals with a list of the frequencies of stations which they had heard and checked, such lists to be correlated and distributed to members of the Club.

A number of pieces of V.H.F. apparatus were displayed, the ingenuity in design and general high standard of craftsmanship of which aroused much interest, and emphasised the care and experience being brought to bear at the present time upon the many and varied problems entailed in communication on the V.H.F. amateur bands.

This function certainly attained the success it deserved in providing an opportunity for V.H.F. workers to get together and discuss their views and problems under pleasant conditions, and it is to be hoped that it will be the forerunner of many more in the future.

Australian Antarctic Expedition

A relief party recently left Melbourne for Heard Island in the South Indian Ocean (53° South, 73° East). The party, which includes VK4FE and VK3VU, intends to set up two amateur stations which should become active towards the end of February under the calls VK1FE and VK1VU. The equipment at VK1FE will include an 80 watt band-switched transmitter for 7, 14 and 28 Mc/s. and an *Eddystone* 640 receiver. V.H.F. equipment for operation on 50 and 144 Mc/s. is also included, as it is planned to maintain a constant listening watch on both of these bands.

The stations will operate on 14 and 28 Mc/s. at the following hours (G.M.T. plus 5):—1000–1200, 1600–1700 and 0800–1000, 1800–2000 respectively. Neither of the operators will answer calls exactly on their own frequencies. QSL cards should go *via* W.I.A. The party will remain on Heard Island until March 1950. The only other VK1 call so far allotted (VK1AA) will be cancelled in the near future.

British Schools Exploring Society

Applications are invited for the post of Officer in Charge of Wireless Telegraphy for the Northern Norway Expedition, 1949, leaving on August 3 and returning about the middle of September.

The entire cost to each member will be £110 plus about £10 for equipment.

The Expedition, led by Major G. F. Spooner, Parachute Regt. and Assistant Leaders (all Commissioned Officers) is for boys of 16 to 18 years of age and will include those from Public and Secondary Schools and Cadets from the Services.

The following scientific objects will be incorporated in the Expedition: survey, short-wave wireless experiments, collections of scientific specimens and notes of birds, mammals, insects, plants and minerals for the British Museum; photography and cinematography are included.

Applicants should apply as soon as possible to the Hon. Secretary, White Barn, Old Oxted, Surrey, if possible suggesting a date they could come up to London for an interview.

Old Timers' Dinner

to be held at

THE HORSE SHOE HOTEL,

TOTTENHAM COURT ROAD,

LONDON, W.C.1,

on

FRIDAY, MAY 20th., 1949.

6.30 p.m. for 7 p.m.

(Lounge Suits)

Tickets 10/– each. Reservations, with remittance, must reach R.S.G.B. Headquarters by May 14th, 1949, latest.

AROUND THE TRADE

Oliver Pell Control Ltd. Cambridge Row, Burrage Road, Woolwich, S.E.18 have recently placed on the market an ingenious device known as the Varley Door Light. Powered by a pair of U2 dry cells the device operates when a plunger is released by the action of opening a door or cupboard.

The Varley Door Light should prove a boon in every home and in those shacks where equipment is assembled in a dark compartment.

The price is 9s. 9d. plus 2s. 1d. purchase tax.

* * *

Taylor Electrical Instruments Ltd. have produced an alternative to the Model 30A Oscilloscope incorporating a cathode ray tube with a blue trace and having a yellow-green after-glow. The list price of this instrument, known as the "30A with Persistent Trace," is £33 10s. 0d. and delivery can be effected in about three weeks.

* * *

Apropos the article, "Rotating the Beam by Remote Control," published last month, *Wireless Supplies Unlimited*, of Bournemouth, state that the BTH type SM1406 Selsyn Motor (available as ex-Government surplus) operates from 230/250 volt 50 cycle mains and requires no torque amplifier. As only five connecting leads are required, a single 5-cored rubber-covered flexible cable is all that is needed between the beam and shack.

* * *

Members are cordially invited to visit "Radio Centre," the new retail premises of *Mail Order Supply Co.*, to be opened at 33 Tottenham Court Road, London, W.1, on March 15 next.

Current Amateur Bands

The footnote (†) which appeared below the table published on Page 177 of the January, 1949, issue, inferred that holders of first year licences were permitted to use A1 and A2 (M.C.W.). In actual fact holders of such licences are restricted to the use of A1 (C.W.) on all bands.

A Society Affair

Society members were present in force when Mr. H. M. Tainton, G2BCI, of Old Coulsdon, Surrey, was married recently to Miss B. Pearsall. Best man was Mr. K. B. E. Denton, G3BEF. Other guests included Messrs. Montague, G2ANR, Hatch, 2CBB, Wilson, 2CGD, Herbert, 2KU, Wynn, 8TB, and BRS members, Phillips and McGowan.

Thanks

The newly elected members of the Council thank all those who voted for them in the recent elections.

On the Up and Up

There were 92,800 television licences in force on December 31, 1948, compared with 82,400 a month earlier.

Quiz Answers

See page 201.

1. 1923. 2. 2ET. 3. 6,500. 4. Poldhu. 5. 1921.

HIC ET UBIQUE

COUNCIL, 1949

President:
VICTOR M. DESMOND, G5VM.

Executive Vice-President: W. A. Scarr, M.A., G2WS.
Hon. Treasurer: A. J. H. Watson, F.S.A.A., G2YD.
Hon. Secretary: J. W. Mathews, G6LL.
Hon. Editor: Arthur O. Milne, G2MI.
Immediate Past President: S. K. Lewer, B.Sc., G6LJ.

Members: W. H. Allen, M.B.E., G2UJ, A. P. G. Amos, G3AGM, I. D. Auchterlonie, G6OM, F. Charman, B.E.M., G6CJ, D. N. Corfield, D.L.C.(Hons.), A.M.I.E.E., G5CD, D. A. G. Edwards, G3DO, P. A. Thorogood, G4KD.

General Secretary: John Clarricoats, G6CL

G.P.O. Liaison Officer: Arthur E. Watts, G6UN.

December Council Meeting

Resume of the Minutes of a Meeting of the Council of the Incorporated Radio Society of Great Britain held at New Ruskin House, Little Russell Street, London, W.C.1, on December 14, 1948, at 6 p.m.

Present.—The President (Mr. V. M. Desmond in the Chair), Messrs. Charman, Corfield, Edwards, Lewer, Mathews, Milne, Scarr, Watson, Watts and John Clarricoats (General Secretary).

Apologies.—Apologies were presented for the absence of Messrs. Auchterlonie and Evans.

Membership.
Resolved—
(*a*) to elect: 74 Corporate Members,
20 Associates and
7 Junior Associates.
(Total elected: 101).
(*b*) to grant Corporate Membership to 7 Associates.
(*c*) to grant Life Membership to Mr. F. G. Bail, VK3YS.
(*d*) to grant Affiliation to the Catterick Amateur Radio Club.

Members' Small Advertisements.
A suggestion that the minimum rate for Members' Small Advertisements should be increased from 3s. 0d. to 5s. 0d. was not accepted. The view was expressed that the present rate is of special assistance to members who have only isolated items of gear to sell.

QSL Bureau.
Resolved to award honoraria totalling £108 to 13 members who acted as Sub-Managers during the last financial year.

Band Planning.
It was reported that completed band planning questionnaires had been received from 97 town groups. An analysis showed that 1,112 licenced Members and 679 B.R.S. and Associate Members had recorded their views. It was announced that the Codes of Practice Committee would shortly submit recommendations to the Council.

Headquarters' Station.
Mr. Charman reported upon various technical matters concerning the operation of GB1RS.

Finance.
Resolved to accept and adopt the Cash Accounts for the months of October and November. It was reported that subscriptions received during the first two months of the current financial year amounted to £1,862 compared with £1,932 in the corresponding period last year.

Staff.
Staff increases amounting in all to £2 10s. 0d. a week were approved.

Exhibition.
The Secretary reported that a net profit of about £150 had been realised; catalogue sales amounted to £102 compared with £50 last year; revenue from advertising produced £146 compared with £112 last year; sales of publications realised a profit of approximately £50.
It was recorded that about 50 per cent. of those who signed the visitors' book on the R.S.G.B. stand came from outside the London Region.
Resolved—
(*a*) that the Society shall pay the annual subscriptions, when due, of six members who performed outstanding voluntary service on the R.S.G.B. stand.
(*b*) to thank Mr. H. Freeman for the efficient manner in which he managed the exhibition.

Contests.
Messrs. W. H. Matthews and T. L. Herdman (Chairman and Hon. Secretary respectively of the Contests Committee) attended the meeting when the Reports of that Committee were considered.
Numerous recommendations made by the Committee were approved.
The meeting terminated at 9.45 p.m.

Representation

The following are additions or alterations to the list of Representatives published in the February, 1948, and subsequent issues:

Town Representatives

Region 1.
Lancashire West—
Southport ... ... F. H. P. Cawson, G2ART, 113 Waterloo Road

Region 2.
East Yorkshire—
Hull ... ... G. Tompkins, BRS.11966, 18 Hawthorn Avenue, Anlaby Road.

Region 3.
Warwickshire—
Coventry ... ... H. J. Chater, G2LU, 10 Middlemarch Road, Radford
Rugby ... ... M. Johnston, G3BLB, 16 Walford Place, Elms Estate.

Region 6.
Buckinghamshire—
High Wycombe ... M. Tapson, G6IF, 5 Squirrel Lane, Booker.

Region 7.
East London—
Wanstead and Woodford ... F. Judd, G2BCX, 111 Maybank Road, S. Woodford, E.18.
South London—
Lewisham, Lee and Catford ... ... G. V. Haylock, G2DHV, 63 Lewisham Hill, S.E.13.

Region 9.
Somerset—
Yeovil ... ... F. W. Parkhurst, BRS10663, 56 Cromwell Road
Wiltshire—
West Wilts. Area E. A. Parsons, G2PS, 9 Fore Street, Westbury.

Vacancies

Messrs. L. Green, G3AOW, R. J. Donald, G3DJD, and J. Brindle, G3PQ, have resigned as Town Representatives for Bolton, Brighton and Hove, and Preston respectively. Nominations for their successors should be made on the prescribed form and sent to reach the General Secretary by February 28, 1949.

Slow Morse Transmissions

Day	*G.M.T.*	*kc/s.*	*Call*	*Town*
Daily ...	22.00	1840	G6NA	Guildford
Sundays	11.00	1800	G2LC	South Ruislip
Sundays	20.30	1802	G2DLJ	Derby
Mondays	20.00	1900	G2AJU	Stutton, Ipswich
Mondays	20.00	1800	G2DJS	Bradford
Mondays	20.00	1750	G3DSR	Derby
Mondays	20.00	1900	G3DDM	Petersfield
Mondays	21.00	1900	G3BLN	Bournemouth
Mondays	21.00	1850	G8VR	London, S.E.2
Tuesdays	22.00	1896	G8TL	Ilford
Tuesdays	22.30	1896	G4GA	Ilford
Tuesdays	22.30	1820	G6JB	Salcombe, Devon
Tuesdays	23.00	1820	GM4AN	Kirkcaldy
Wednesdays	20.00	1783	G3AFD	Southampton
Wednesdays	20.00	3625	PA0AA	Hilversum
Wednesdays	21.00	1800	GM2HIK	Forfar, Angus
Wednesdays	22.00	1800	G3DLC	Grays
Thursdays	22.00	1873	G2BCX	South Woodford
Thursdays	22.30	1873	G3ARU	South Woodford
Thursdays	22.30	1803	G3OB	Manchester
Fridays	19.00	1900	G3BLN	Bournemouth
Fridays	20.00	1900	G2AJU	Stutton, Ipswich
Fridays	20.00	1860	G3AKW	Wirral
Fridays	20.00	1900	G3DDM	Petersfield
Fridays	20.30	1868	G8LZ	Gravesend
Fridays	22.30	1820	G6JB	Salcombe, Devon
Fridays	23.00	1820	GM4AN	Kirkcaldy
Saturdays	23.00	1800	G3CHY	Ashton-u-Lyne

Regular practice under actual operating conditions ensures success for members taking the G.P.O. 12 w.p.m. Morse Test.
Further volunteers for this service are still required. Details to Mr. C. H. L. Edwards, G8TL, 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

"V.H.F. Technique"

Mr. H. C. Spencer, G6NA, has drawn attention to the fact that the base connection diagram for DET19, 4074A and RK34 valves, illustrated on Page 26 of "*V.H.F. Technique*" is incorrect, in that the connection between Pin 4 and the mid-point of the cathode has been omitted. The correct diagram is given on Page 571 of the 1948 Edition of the *A.R.R.L. Handbook* where it is type T-7DC.

FORTHCOMING EVENTS

REGION 1

Accrington.—March 9, 7.30 p.m., Cambridge Street Schools.
Ashton-under-Lyne.—March 6, 3 p.m., New Jerusalem Schools, Katherine Street.
Bolton.—March 1, 8 p.m., Y.M.C.A.
Burnley.—March 2, 7.30 p.m., Mechanics Institute, Manchester Road.
Bury.—February 24, March 3, 17, 7.30 p.m., Club Rooms, Spring Mill, Tottington. March 10, 7.30 p.m., Atheneum, Market Street.
Darwen and Blackburn.—February 18, March 4, 18, 7.30 p.m., Weavers Institute.
Manchester and District Radio Society.—March 7, 7.30 p.m., Reynolds Hall, School of Technology, Sackville Street. Lecture "Construction of V.H.F. Valves" by G.E.C.
Oldham.—February 23, March 9, 7.30 p.m., Civic Centre, Clegg Street.
Rochdale.—March 6, 3 p.m., Drill Hall, Baron Street.
Wirral Amateur Radio Club.—March 2, 16, 30. Y.M.C.A., Birkenhead.

REGION 2

Barnsley.—February 25, March 11, 7.30 p.m., King George Hotel, Peel Street.
Bradford.—February 22, March 8, 7.30 p.m., Cambridge House, 65, Little Horton Lane.
Catterick.—Tuesdays, 7 p.m., Loos Lines, Catterick Camp.
Doncaster.—Wednesdays, 7.30 p.m., 73, Hexthorpe Road.
Harrogate.—Wednesdays, 7.30 p.m., rear of 31 Park Parade.
Hull.—February 23, 7.30 p.m., Imperial Hotel, Paragon Street.
Middlesbrough.—February 28, March 14, 7.30 p.m., 400 Linthorpe Road.
Newcastle-upon-Tyne.—February 28, 8 p.m., British Legion Rooms, 1 Jesmond Road.
Sheffield.—February 23, 8 p.m., Dog and Partridge, Trippet Lane. March 9, 8 p.m., Albreda Works, Lydgate Lane.
South Shields.—Thursdays, 7.30 p.m., Trinity House, Laygate.
Spenborough.—March 2, 16, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Wednesdays, 8 p.m., 29 Victor Street.

REGION 3

South Birmingham.—March 6, 20, 10.30 a.m., Stirchley Institute.

REGION 5

Cambridge.—February 18, 7.30 p.m., Jolly Waterman.
Southend-Westcliff.—February 23, 7.45 p.m., G2BBI, 6 Trinity Avenue, Westcliff. March 23, 7.45 p.m., G2GU, 8A Northumberland Crescent, Southend.

REGION 6

High Wycombe.—February 23, 7.30 p.m., G3DQC.
Luton.—Mondays, 7.30 p.m., Surrey Street Schools.
Stotfold.—Mondays, 8 p.m., A.C.F. Hut.

REGION 7

Barnet.—March 12, April 16, 7.30 p.m., Bunny's Restaurant, 15 Station Road, New Barnet.
Barnes and Putney.—March 8, 7.30 p.m., 28 Nassau Road, S.W.13.
Croydon (Surrey R.C.C.).—March 8, 7.30 p.m., Blacksmith's Arms, South End.
Chingford.—February 17, 7.45 p.m., Bull and Crown. Aerials demonstration by G2BCX and G2FLG. March 3, 7.45 p.m., G4GA, 1 Templeton Avenue.
Edgware and District R.S.—February 16, 23, March 2, 9, 16, St. Michael's School, Flower Lane, Mill Hill.
Enfield.—February 20, March 20, 3 p.m., George Spicer School, Southbury Road.
East London.—February 13, 2.30 p.m., Lambourne Room, Ilford Town Hall, "Exciting," by G3ECA. March 13, "Have you tried this?" by G2UJ.
Hampstead.—February 25, 8 p.m., G2RX, 14(B) Belsize Lane. (Nearest station, Belsize Park, Northern Line).
Hayes.—March 4, 7.30 p.m., The Vine, Uxbridge Road, Hillingdon.
Hoddesdon.—March 4, 8 p.m., Salisbury Arms Hotel.
Holloway (Grafton R.S.).—Mondays, Wednesdays and Fridays, 7.30 p.m., Grafton School, Eburne Road, N.7.
Peckham.—March 7, 7.30 p.m., The Kentish Drover, Rye Lane.
Slough.—February 17, 7.30 p.m., Labour Memorial Hall, Chandos Street.
Southgate.—March 4, 7.30 p.m., The Merry Hills Hotel (Oakwood Station).
St. Albans.—March 9, 8 p.m., The Beehive, London Road.
Welwyn Garden City.—March 1, 8 p.m., Council Offices.

REGION 8

Brighton.—February 17, 24, March 3, 10, 17, 7.30 p.m., St. Mary Magdalene Hall, Bread Street, North Road.
Eastbourne.—March 4, 7.30 p.m., Friends Meeting House, Old Wish Road.
Guildford.—February 27, 3 p.m., The Cinema Cafe, Woodbridge Road. P.C. to the T.R. if attending.
Southampton.—March 5, 7.30 p.m., 22 Anglesea Road, Shirley.
Worthing.—March 14, 7.30 p.m., Adult Education Centre, Union Place.

REGION 9

Exeter.—March 4, 7 p.m., Y.M.C.A., 41 St. Davids Hill.
Plymouth.—February 19, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Judes.
Torquay.—February 19, 7.30 p.m., Y.M.C.A., Castle Road.

REGION 13

Edinburgh.—February 24, 7.30 p.m., Chamber of Commerce, 25 Charlotte Square.

REGION 14

Glasgow—February 23, 7 p.m., 39 Elmbank Cresent.
Ayr—February 23, 7.30 p.m., Royal Hotel, Prestwick.

Barnet Amateur Radio Society

The monthly meetings at Bunny's Restaurant, Barnet, continue to be well attended and a series of technical lectures has been arranged. Further details can be obtained from the Secretary: Mr. M. R. Jenkins, G3EIM, 1193A High Road, N.20.

Brentwood and District Amateur Radio Society

Meetings of this newly formed society are held on the first Thursday of every month at 27 Mount Crescent, Brentwood. Prospective members are invited to contact the Secretary, Mr. J.F. Moseley, G2CIW, 23 Tower Hill.

Cheltenham and District Amateur Radio Society

At the recent A.G.M. the following Officers were elected: *President* and *Hon. Secretary*, Mr. S. Kelly (G3COZ); *Chairman*, Mr. N. Baker (G8LB); *Treasurer*, Mr. N. O'Brien (G3LP). A programme of lectures is being prepared for the coming year, details of which can be obtained from the Secretary, 10 London Road, Cheltenham (Cheltenham 2779).

Derby Meeting

A meeting to discuss plans for the 1949 N.F.D. will be held at the Derby Post Office Telephones Social Club (50 Sadler Gate, Derby) on Thursday, March 10, at 7 p.m. All local R.S.G.B. members are invited to attend.

Hampstead Hamfest

Ron Read, G2RX, reports that fourteen Hampstead members, with G5CW from South London, attended a dinner party at De Hams Restaurant, London, W.C.1, on January 7. The event proved such a success that arrangements are being made to repeat the experiment later in the year.

Oxford and District Amateur Radio Society

Oxford and District Amateur Radio Society is holding its first Hamfest on Sunday, March 27 at 2.30 p.m. in the Carfax Assembly Rooms, Oxford. Tickets price 3/6 each, may be obtained from the Secretary, Mr. R. H. Clifton, 86 Victoria Road, Oxford, or from the T.R., Mr. H. R. Webb, 61 Crotch Crescent, Marston, Oxford. Those who wish to attend are asked to make early reservation in order to assist catering arrangements.

Silent Keys

We record with regret the death, following an accident, of Ian A. Bates, GM3BZP, of Perth. Mr. Bates will be remembered by those who knew him as a keen short-wave listener rather than as a transmitting amateur. From the age of 16 he gave ample evidence of his ability, in true amateur fashion, to get the best results from improvised equipment. Although handicapped by indifferent health and also by D.C. mains he made his contribution to the Art. G4QK.

* * *

We also record with sorrow the passing of Mr. J. F. Fish, of Blackpool, Lancs. Known familiarly as "Pop," Mr. Fish had been interested in Amateur Radio for more than 30 years, in fact it is believed that he obtained his original licence prior to the first World War. In more recent years he had operated under the call G4MH.

Mr. Fish leaves a widow, four sons and three daughters to whom heartfelt sympathies are extended. One of his sons, Mr. D. A. Fish, is applying for a licence and hopes to retain his late father's call-sign.

* * *

Members in North Wales mourn the passing of Mr. Leslie Wilson Seager, GW2BLW. A native of London, Mr. Seager had lived in Colwyn Bay since 1910. He became interested in Amateur Radio before the last war and his enthusiasm for that hobby was only second to his great love for music in which sphere he was an extremely accomplished artist. Mr. Wilson was the leader of a well-known dance band which has broadcast on many occasions.

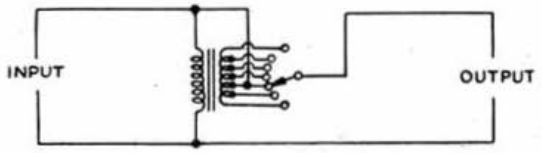
To his wife, two sons and many friends we offer sincere condolences.

LETTERS TO THE EDITOR

Mains Voltage Regulation

DEAR SIR,—The article by Mr. L. Bergna (BRS14342) in the October issue described an excellent home-constructed auto-transformer for controlling a fluctuating mains stage. I would however like to draw attention to another method, which is not so widely known, but which employs a much smaller and more easily wound transformer.

Using Mr. Bergna's figures we will suppose the input voltage of 240 varies between 205 and 255. A range of 50 volts is therefore required—say from minus 15 to plus 35. Consider the circuit given herewith. The secondary is a low-voltage winding of 50 volts overall and rated to carry the maximum current the station is likely to draw from the mains. This winding is connected in series with the mains and by moving the contactor either side of the zero-tap the " make-up " volts can be added to or subtracted from the incoming supply voltage.



An auto-transformer must be of suitable size to handle a wattage of 255 × 5 = 1,275 watts, for a maximum current of 5 amperes. The series-connected transformer just described would handle only 50 × 5 = 250 watts, and thus would only be approximately one-fifth the size.

Further, a " disposals " mains transformer having an odd-voltage secondary can be obtained very cheaply, and requires very little re-winding to produce an excellent home-made " Variac."

Yours faithfully,
A. H. S. BRIDGMAN, B.Sc. (G3BAA).

[*Editorial Note.*—The use of a 250v./6·3V. × 3 mains transformer as an auto-transformer, on lines similar to those suggested above was featured in an article by C. B. Raithby, in the January, 1949, issue.]

Signal Strength Measurements

DEAR SIR,—In connection with Mr. Walker's article published in the June, 1948 issue I should like to suggest that the Society takes up the establishment of proper standards on " S " reporting with other interested bodies and the relevant authorities.

The intelligibility of a signal depends not only on the carrier strength of the incoming signal, but on its ratio to the inherent noise of the receiver and to the average noise level at the frequency used.

In industrial communication engineering a " signal-to-noise " ratio of 20 db is considered as just satisfactory, whilst 10 db is described as the absolute minimum of intelligibility.

May I therefore propose to interpret as follows:

S 0 as the noise level
S 1 as a signal 10 db above noise level
S 2 " " 20 db " " "
S 3 " " 30 db " " "

and so on to—

S 9 " " 90 db " " "

As efficient communication receivers can be expected to show a carrier-to-noise ratio of 20 db with a generator signal of 5 μV into the aerial socket, S 9 would roughly correspond to the signal strength of a local broadcast station.

To meter signal strength to any such standard it is, in my opinion, inopportune to measure A.G.C. or its effect on controlled valves. Only if non-delayed A.G.C. is employed—and that does not happen very often—a valve voltmeter across the A.G.C. load will give a logarithmic indication which would enable us to calibrate the meter in S-units of equal scale length.

Any metering across a valve controlled by a non-delayed A.G.C. will give a distortion of the indication. Finally, if delayed A.G.C. is employed there will be no indication until the delay voltage is overcome.

Many modern communication receivers use high-level detection, *i.e.* a diode kept by A.G.C. at about 5V. R.F. for all worth-while signals. There is thus a delay voltage which is overcome only by signals of, say, 30 to 40 db above noise level. Consequently nearly half the S-scale could not be metered at all with devices as described by G5JU.

Yours faithfully,
K. E. MARCUS.

Class AB2 Modulators

DEAR SIR,—I note that in the article by Mr. C. H. Ranft (G5RF) on " Interference to Television by Speech Equipment " in the November BULLETIN, the Class AB2 modulator is described and shown as having 10,000 ohm resistances in the grid circuits of the KT2C class AB2 modulators.

Surely the introduction of such resistances would cause a severe loss of output if not very considerable distortion.

The resistance of the grid circuit in a Class AB2 or Class B amplifier should be made as small as possible in order to minimise alteration in grid voltage when the amplifier is driven into grid current.

Yours faithfully,
J. B. PARKE, D.Sc. (GI8PA).

The Unexpected

DEAR SIR,—Last year you mentioned in an Editorial (June issue) the practice of badge-wearing as an aid to introductions with other hams met by chance in everyday life. No-one has so far come forward with any incidents although I am sure they are legion, but I would like to recall two memorable personal contacts in which badges took no part.

The first was in Copenhagen during a summer trip, when a bank messenger came up to the side of the small tramp steamer on which I was about to sail, and started *whistling* my call sign for all he was worth. I dashed down the gangway to be told that he was Danish Receiving Station No. — and that he had heard me say—on 80 metres—that I hoped to catch this boat home! I was glad of that send-off as I was otherwise alone.

The second time *I* did the whistling, although softly as it was in a main line train, just about the time our new licences were to be issued. I was idly trying a " CQ " to see what it would sound like again—when a fellow passenger lent across the compartment and answered my " call "—with GW5KJ! From that moment the journey was not long enough.

These, and many other similar experiences, have made me place on my QSL a note:

" Amateur Radio makes the world a little village."

Yours faithfully,
JOHN PIGGOTT (G2PT.)
Northwood, Middlesex.

OUR FRONT COVER

THE photograph shows a Model 7 Universal AvoMeter being used to measure the anode voltage to the first R.F. stage of an AR88 receiver which has been adjusted to work at 235 volts. This photograph won a prize for Mr. John R. Ramshall of Cheam, Surrey, in the " Avo " competition for R.S.G.B. members announced in our pages by the makers of " Avo " Instruments, The Automatic Coil Winder & Electrical Equipment Co., Ltd., Winder House, Douglas Street, London, S.W.1.

Accommodation Required

Miss Joan Martin who has recently relinquished the Headquarters' Secretaryship of the South African Radio League is shortly to visit England *en route* to her home in Australia. During her stay Miss Martin would like to live-in with a private family as a paying guest. Offers of accommodation should be sent to her, c/o R.S.G.B. Headquarters.

No. 7 Radio School Reunion

A reunion of those who served during the war at No. 7 Radio School, R.A.F., or at any of its subsidiary units, is to be held in London during March or April.

Members who wish to receive further details are asked to write to S/Ldr. C. Keith Street, G3DKS, 115 Norwood Road, London, S.E.24. The reunion will be of a low-brow nature!

EXCHANGE AND MART SECTION

Due to paper restrictions advertisements are only accepted "for insertion when space is available." No advertisement must exceed 50 words. Rates: Members Private Advertisements 2d. per word, minimum charge 3/-. (*Write clearly. No responsibility accepted for errors*). Trade, 6d. per word, minimum charge 9/-. Use of Box number 1/6 extra. Send copy and payment to Parrs Advertising Ltd., 121 Kingsway, London, W.C.2.

A BARGAIN.—145 Mc/s. 9 valve Superhet type 1359: 130/560 Mc/s. £12 or with twin A.C. mains power pack £15. 90 watt modulator (type T1131) without valves and power pack £5 10s.—Box 575, PARRS, 121 Kingsway, London, W.C.2.

AMATEUR must sell.—H.R.O. power pack, crystal filter, S-Meter, etc. Perfect working order, Avo-7 as new, home built signal generator, Megger, 100 watt modulator, over 120 almost new valves. Electric gramophone with amplifier and 10" speaker. Lots of components. Offers for lot or separate.—BRS11175, 30 Dollis Park, London, N.3. Fin. 4582. [*586*

ARRL Handbook 1947 6s. Type 26 convertor with valves 12s. 6d. HRO "S" Meter 15s. Two 10" morse records 10s.—G2BVN, 51 Pettits Lane, Romford, Essex. [*565*

AR77E with instructions £20; 300W C.W. transmitter 6J5–807–RK47–PP HK54 complete in louvered cabinet £25; Hawey CW/RT transmitter 200W C.W. 60W Ph bandswitched complete in rack £30. Lot £60 or offers to G6JA, 46 Bellevue Road, West Cross, Swansea. [*579*

AVOMETER model 7, new, with case, £15 or offers.—BRS12000, 17 Morton Street, Old Trafford, Manchester, 16.

CAPACITORS 4 μF 500V Mansbridge type 2s. 6d.; New valves VP2, SP2. 6K7G, 6V6G, 5Z4G, 7s. 6d.—WILLETTS, Bungalow, Bishopsutton, Nr. Bristol. [*583*

COMPLETE A.C. powered T1154–R1155 assembly in rack. Over £50 secures.—Details, photograph from BRETHERICK, 37 Hillcrest Road, Romford. [*558*

COSSOR double beam oscilloscope with special Camera. Marconi CR100/3 CB287 receiver. Eddystone 358X receiver complete. A.V.O. all wave oscillator. CNY1 transceiver. R1132A. All in very good condition £105 delivered, or offers.—JOYCE, Newhall, Nr. Burton-on-Trent. [*569*

EA50 (VR92) Valves, new, guaranteed perfect, three for 3s. 9d. post paid. Ideal for noise limiters, field-strength meters, etc.—EDWARDS, Clontinaglare, Saintfield, Belfast. [*589*

EXCHANGE.—R107, speaker, "S" Meter and MCR.1 complete, A.C./D.C. power unit, etc., for A.C. mains BC342, 348 or offers.—BRS16957, 33 Milner Street, Burnley, Lancs. [*561*

FERRANTI Universal testmeter, genuine bargain £5.—11 Rockhampton Road, West Norwood, S.E.27. Phone: GIP 1206.

FOR SALE.—BC375 TX150/100 watt CW/ICW/Phone, with dynamotor, spare set valves 3 tuning units instruction book £25 or offer. Also Cossor D Beam 5" oscilloscope £18 or offer. Weston analiser 20,000 ohms/volt £15. Also 25 μF 750V condenser approximately 300; What offers?—D. V. R. RAO, Wireless College, Colwyn Bay. [*595*

FOR SALE.—Two BC375 transmitters. One brand new, one slightly used. Both in perfect working condition. What offers?—Box 571, PARRS, 121 Kingsway, London, W.C.2. [*571*

FOR SALE.—SCR522; RT7–APN–1 altimeter; Indicator 1D–68–APN4. Wanted R1155: Valves, phones, mike, power pack and instructions for 19 set.—J. SMITH, BRS16215, 62 Maple Gardens, Methil, Fife. [*560*

FULLY modified BC312. Built in Q5ER and noise limiter 17 valves 230 A.C. £15 10s.; Model 7 Avometer new in leather case £15 or exchange Avo Taylor valve tester: No. 58 transeiver new £10 10s. or exchange MCR1; Hallicrafters S27 £20; Class D wavemeter 6V AC/DC £5.—Details, offers, GW3ECH, 28 Rectory Road, Trecwn, Pembrokeshire. [*588*

G6QA Personal service by post. Crystals. Active types in holders for re-grinding, 5 to 7 Mc/s. 3s. 6d.; Others for 144 Mc/s. by 27, 9s. 6d.; 100 micro amp movements, new, ideal for field strength meters 7s. 6d.; Vacuum Capacitors 50pf 5Kv 7s. 6d. See Dec. *QST* for curing TVI. All items post free.—82 Molyneux Street, Rochdale, Lancs. *547*

HAM emigrating, offers.—AR–88, lab aligned £40. Following new items: Valves—CV73, CV85, 10s.; 6V6G, 807, VU133, CV54, 6Q7G, KT63, 7s. 6d.; 7193, L63, 3s.; Condensers—·5+·5 μF 2200V, 8s. 6d.; ·05 μF 3300V, 5s.; 1 and 2 μF, 9d. Pots, relays, 1s. Junk box parcels, 5s. five lbs. Also used serviceable items. S.A.E. list. C.W.O.—EDWARDS, 12 Coledale Drive, Stanmore, Middlesex. [*559*

HRO Senior with 8 coil set and instruction book. Good condition, but requires line-up and overhaul. Bandspread on coil set. A.B.C.D.—Offers to BM/CXND, London, W.1. [*590*

HRO's 5 coils (4 bandspread) loudspeaker, power pack, excellent condition, 100 per cent. efficiency £31 each. AR88–D loudspeaker, completely new at £45. NC 200 loudspeaker, excellent condition. £30.—P.C.A. WIRELESS WORKSHOP, The Arches, Cambridge Grove, W.6. [*593*

METAL valves, British and American. Rectifiers, receiving types, 1T4, etc., 7s. 6d.; High voltage transformers 20s. to 40s.; VCR 97's 50s.: all guaranteed.—Box 563, PARRS, 121 Kingsway, London, W.C.2. [*563*

NAVY receiver type P.58 covers 280–680 Mc/s. 18 valves £8: Ceramic switches 2 bank 6 positions 1s. 10d.; M.E.S. panel lamps, bakelite 10d.; Plugs and sockets 10-way 2s. 4d. pr.; All carriage paid.—ANGLIN, G4GZ, 233 Welholme Road, Grimsby.

QSL Cards.—Distinctive and attractive designs. Samples and prices from G5KT, 35 Hillside Avenue, Kingswood, Bristol. [*587*

QSL Cards G, BRS, SWL, from 7s. 6d. 100. Send for free samples.—G2DJA, 137 Randall Avenue, London, N.W.2.

QSL's and log books (P.M.G. approved); samples free; state whether G or BRS.—ATKINSON BROS., Printers, Elland. [*483*

Q5R9 Beams, 2½ to 20 metres. Masts, lashings, bearings, rotators, indicators and rigging. S.A.E. for list. The Countries leading specialists.—EMDO, Ace Works, Staines. [*562*

RM.E. 69 crystal filter, noise suppressor, requires re-alignment. Best offer over £25.—G3ZI, Cedar House, Philpot Lane, Chobham, Surrey. [*550*

ROTARY converter for sale.—Ex-Admiralty 110V D.C. 8 amps in 230V, 500V, A 50 cycles out. £18 10s.—R. TAMS, 55 Lambert Avenue, Richmond, Surrey. [*592*

R1116 communication receiver, 142 kc/s.–20 Mc/s., 8 valves, 2 accumulators. Charger and eliminator. £10.—Phone: P. KILBY, Tunbridge Wells 912. [*551*

R208, 10 to 60 Mc/s., 100–250V A.C., or 6V D.C. Good condition £12.—BRS7202, 23 Bridgewater Road, Ruislip, Middlesex. [*555*

R208 Receiver, 10 to 60 Mc/s., built-in A.C. mains pack and 6" speaker. Good condition. £9 or offer. Spare set valves £1. —WM. HAMILTON, 99 Clydesdale Street, New Stevenston, Motherwell. [*597*

R5/ARN7 receiver £4; 5-way push buttons 2s.; 50–Erie resistors 5s.; ·1 μF condensers 3s. 6d. doz. Lists.—BRS8224, 28 Lancaster Gardens, Clacton-on-Sea. [*567*

SALE.—Transmitter 150/200 watt C.W. and phone, rack mounted, relay operated, black crackle panels, price £55, plus carriage. S.A.E. please.—Box 554, PARRS, 121 Kingsway, London, W.C.2. [*554*

SALE.—BULLETINS 1934 to 1941, 1946–7–8 complete 1932–33–42, almost complete. All good condition. Offers, lot or separate.—JEBBETT, 70 Bond Street, Hinckley, Leicester.

SALE.—Phillips P.C.R.I. modified B.F.O. bandspread with Muirhead drive "S" Meter complete power pack speaker £25 offers also; 25 watt C.W. transmitter EL32 6V6 6L6 complete coils (less crystal power pack) fitted 8" panel 4 meters airtested FBDX £12 offers.—G3BOZ, 2/32 Greyhound Lane, S.W.16. [*545*

TROPHY 8 communications receiver for sale.—New condition, £17 10s. or near offer. Also various test instruments.—Box 552, PARRS, 121 Kingsway, London, W.C.2. [*552*

TR9 transmitter/receivers, these were formerly sold at £6 each, the remaining few to be cleared at 25s. carriage paid.—THE STAMFORD RADIO CO., 199 Stamford Street, Ashton-u-Lyne, Lancs.

TU9B; TU8B; TU6B new, 10s. each (carriage 2s. 6d.). Three 36s. carriage paid. Outer cases for above 3s. each. TU5B: TU26B: 20s. each.—KNIGHT, 82 Fairfield Road, Widnes. [*576*

TWO Hallicrafters power supplies 700 volts, 400 mills, as new. "P–E–110B." £4 10s. each.—G3BTW, Herbert Avenue, Parkstone, Dorset. [*556*

VALVES unused. 83—6s. 6d., 803—43s., RCA807—15s., 813—48s., 814—45s., 829—28s., 866/866a—19s., 872a—36s., 956—10s. 6d., OZ4, 1T4—6s., 2A3, 5Z3, 5Z4, 6L6, 6K8—7s. 6d., 6B7, 6J5, 6SC7—6s. 6d., and many others. Send P.O. or C.O.D.—P. & B. SUPPLY CENTRE LTD., 56 Draycott Place, S.W.3. [*594*

VALVES for sale.—All new, 813 25s.; 805 10s.; TZ40 10s.; 6AC7 5s.; 6J7 6s.; 6J5 5s.; 6SH7 5s.; 6H6 2s.; Plus carriage.—Box 584, PARRS, 121 Kingsway, London, W.C.2. [*584*

V.F.O. totally enclosed in steel box with A.C. power supply, 80 meter band covers whole dial; as new £8; also R1116 and R208 receivers. Best offer secures.—G3EIW, 48 Raglan Road, London, S.E.18. [*577*

WANTED.—BC375 transmitter less power supply, also HRO receiver. State condition and price.—Box 596, PARRS, 121 Kingsway, London, W.C.2. [*596*

WANTED.—144 Mc/s. and Television equipment. For disposal B2 Minor transmitter less coils and 38 transreceiver.—Box 564, PARRS, 121 Kingsway, London, W.C.2. [*564*

WANTED.—Manual for BC348J, RFU24 converted or 20–30 Mc/s. converter. Sale: R103 MkIIa no power pack. D.C. Avominor.—Offers to Box 566, PARRS, 121 Kingsway, London, W.C.2. [*566*

WANTED.—R.1155 receiver, modified or unmodified, cheap. For sale ASB 4 indicator.—M. J. HOLLIDAY, Sticklepath, Okehampton, Devon. [*549*

WANTED.—AR–88, HRO Senior or CR–150. State condition and price. S.A.E. For sale AR–77, excellent condition £20. —Box 546, PARRS, 121 Kingsway, London, W.C.2. [*546*

WANTED.—Coil packs A, B, C, D, or nearest for Eddystone 358X Receiver.—Price and particulars to J. HOLLAND, Bk 64 High Street, Cleethorpes, Lincs. [*553*

WANTED.—Vibroplex Bug Key. Or any good make. State price.—CPL. NUTTALL, Signals HQ 3 Group, R.A.F., Mildenhall, Suffolk. [*591*

WANTED.—Set of coils for B2 transmitter.—Particulars and price to SLANEY, 32 Highland Grove, Worksop. [*572*

WANTED.—2" C.R.T. R.C.A. 902 or Dumont 24XH, also 2 of Sylvania 1N34 crystal diodes. Wire ends.—HODGETTS, 43 Regis Road, Blackheath, Birmingham. [*582*

WESTON Analyser for sale.—Model E772 new, £12.—Box 585, PARRS, 121 Kingsway, London, W.C.2. [*585*

WHAT Offers?—112 BULLETINS 1926–1943, 44 *QST's* 1941–1945, 19 *Wireless World's* 1944–1945, would swop for gear. —BM/STR, London, W.C.1. [*573*

WHEATSTONE Creed morse tape transmitter with A.C. motor. High speed relay and galvo, mounted ready for use, transmits any speed. Three key punching machines, reel box and tape, circuit diagram. Morse ink recorder mechanism only, actuation easily fitted, £12 10s. lot.—G5ZI, 65 Balmoral Drive, Southport. [*568*

8-WAY high voltage "Jones" type plugs and sockets, with crackle covers 1s. 6d. pair complete, 12s. dozen pairs, £3 10s. per 100 pairs, carriage paid.—JACK PORTER LTD., College Street, Worcester. [*570*