

R.S.G.B.

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

Bulletin

Vol. 32 No. 6

DECEMBER, 1956

Price 2/6 Monthly

Attention is drawn

to the EDDYSTONE '888'
Amateur Band Communications Receiver



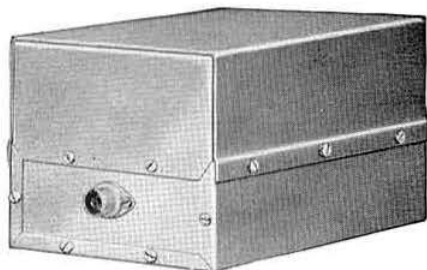
for highest grade equipment

Please write for full specification to the makers—

STRATTON & Co. Ltd. BIRMINGHAM, 31

Accessories expressly
designed for use with
transmitters having co-ax
output connections

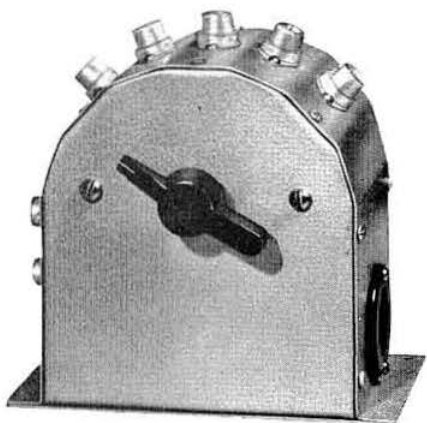
Low Pass Filter Type E5034



Handles 1,000 watts up to 30 Mc/s with
only 0.25dB insertion loss. Attenuation
40-220 Mc/s over 80dB.

PRICE (in U.K.) £6 nett (ex-stock.)

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Allows instant selection of up to 5 aerials
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relay for transmit/receive change-over.

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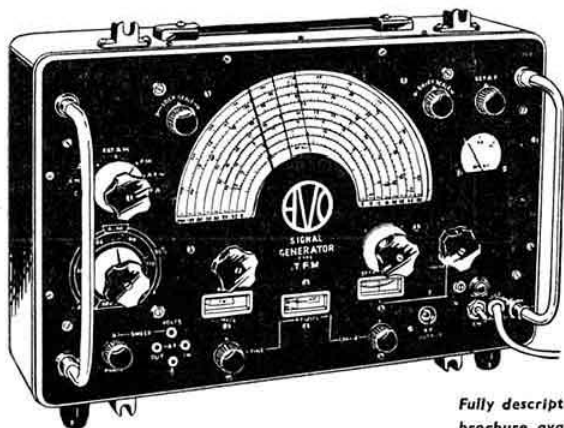


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WIDE BAND SIGNAL GENERATOR

Type T.F.M.

The design of this new Wide Band Signal Generator, operating throughout on fundamentals, is the outcome of considerable research and development work to meet the stringent requirements imposed by new frequency modulation and commercial television stations.



Fully descriptive
brochure available
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A M

COVERAGE

5-220 Mc/s in 8 ranges, CW or 400 c/s sine/square wave modulation. Accuracy $\pm 1\%$. Provision for spot frequency calibration.

F M

COVERAGE

65-120 Mc/s. Accuracy $\pm 1\%$. Maximum deviation ± 150 Kc/s.

OUTPUT

Minimum (about $2\mu\text{V}$) to 100 mV continuously variable with decade multiplier. Force output 250 mV.

OUTPUT IMPEDANCE:

80 Ω , 200 Ω , balanced 80 Ω and 300 Ω , isolated unbalanced 80 Ω .

OPERATING VOLTAGES:

100-120, 200-260V, 50-60 c/s A.C. mains.

LIST PRICE: £89

The frequency bands have been chosen in such a manner as to ensure maximum convenience when servicing and aligning T.V. and F.M. receivers.

Provision has been made for spot R.F. frequency calibration.

Facilities are provided to ensure adequate discrimination throughout the very wide frequency band covered by the instrument.

Sine and square wave audio frequency modulation provided.

The instrument is fitted with an R.F. carrier level meter.

A double-ratio slow-motion mechanism, together with interpolation dial, enables the instrument to be set with a high degree of accuracy. On the F.M. range an internal phasing control enables the modulating signal to be applied to the X-plates of an oscillograph to produce a picture of a discriminator response curve.

DIMENSIONS:

15 $\frac{1}{2}$ x 10 $\frac{1}{2}$ x 10 ins. approx. with lid closed.

WEIGHT: 16 lbs. approx.

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Eddystone 680X, £80.0.0; BRT400,
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£30.0.0

Also, in clean condition, AR88LF,
£42.10.0

Brand new Varley Dry Accumulators type VPT 9/17, 8/- each.

VALVES

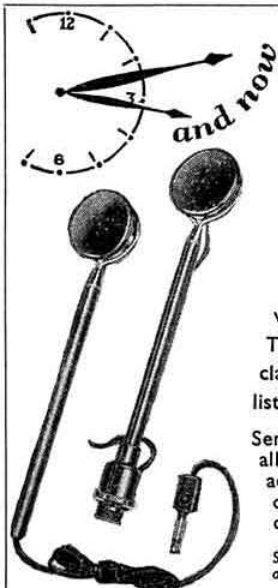
6H6, PT15, NR70, CV72, 836, 2A3, HR77, 6N79, all at 3/6. 6L6, 6K8, 6SG7, VR150, KTW61, 6R7, 6SJ7, 6J6, 6AK5, 6CH6, EL84, PL81, PY81, EF80, ECL80, PCL83, PL32, all at 7/-, 807, 866, all at 7/6. 35T, 811, 805, TZ40, 810 all at 12/6.

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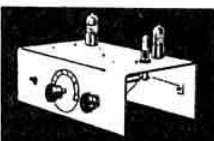
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Power requirements: Standard 120 V. H.T. and 2V . L.T.

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TYPE FT243 fundamental frequencies. 2 pin $\frac{1}{4}$ in. spacing. 120 TYPES. 5675 kc/s. to 8650 (in steps of 25 kc/s.) 80 TYPES. 5706 kc/s. to 8340 kc/s. (in steps of 33.333 kc/s.)

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UP41	11/-	6X4	8/-	EPF80	11/6	ECC84	12/6
UCH42	12/6	PY82	10/-	EPF85	10/6	6AQ5	10/-
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DK40	10/-	PCP82	12/6	ECPF82	15/-	ECH42	12/6
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1A7GT, 1N56GT, 1H5GT, 1A5GT (or 1Q5GT or 3Q5GT).....	37/6 Set
10 EP50 (Ex-Brand New Units) 5/- each.....	45/-
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(Tested and complete with Data and Circuits)

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Please note that these Red Spot Transistors are ideal for most circuits including "W.W." Pocket Transistor Receiver and Transistor Amplifier. All Transistors are British Manufactured and Guaranteed. Send for circuits and Data.

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Set of six Transistors including one R.F. Transistor **60/-**

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Complete Kit with 2 Transistors, Components and Circuit..... **25/-**

U.S.A. INDICATOR UNIT BC929A

Complete with 3BP1 C/R tube and screen. 7 valves—2-68N7GT, 2-6H6GT, 6G6, 2X2, 6X56, volume controls, condensers, etc. Ideal for portable 'scope. In black crackle case size 15 $\frac{1}{2}$ in. x 9 in. x 9 in. BRAND NEW. 65/- carr. FREE.

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Containing VCR97 with Mu-Metal Screen. 21 Valves: 12-EP50, 4-8P41, 3-EA50, 2-EB34. Plus Pots, Switches, H.V. Cond., Resistors, Muirhead S/M Dial. Double Deck Chassis and Crystal. BRAND NEW ORIGINAL CASES 67/6. CARR. FREE.

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R.F.24 10/-. R.F.25 12/6. R.F. 26 25/-. BRAND NEW WITH VALVES. Carr. 2/6.

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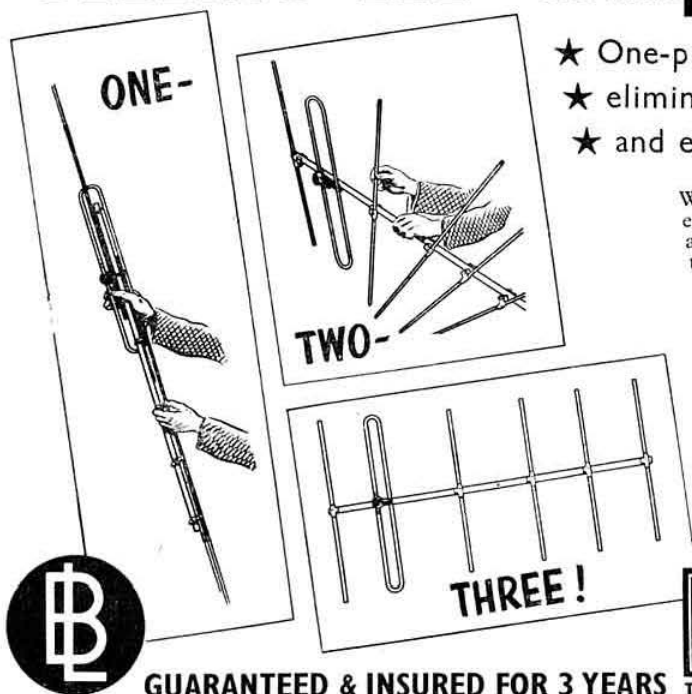
MINIATURE TRANSMITTING STRIP "TYPE 81"

Size 7 $\frac{1}{2}$ in. x 6 in. x 3 in. Complete with Valves Type CV415, CV509, 2-6A6G, 9-7D9 and Quartz Crystal, 4,560 kc/s. Fully wired with circuit. £4/10/- complete.

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(Bendix manufacture)
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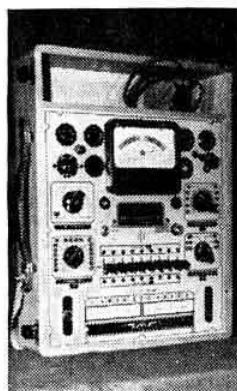
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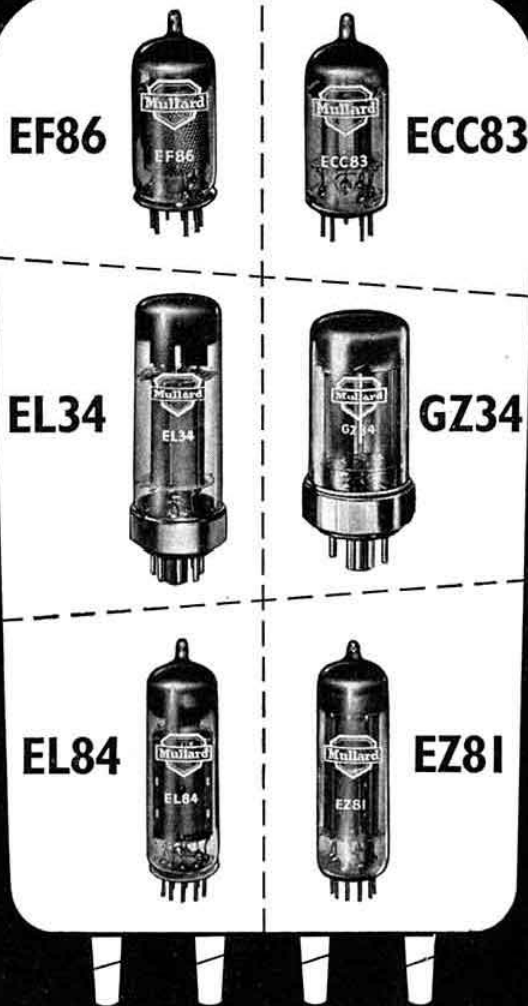
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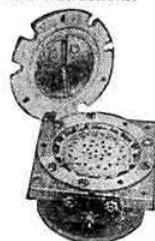


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This comprises a transmitter unit and Indicator which will operate on 12 or 24 volts D.C. and will indicate with instantaneous and smooth pointer movement. The Transmitter is a specially designed potentiometer and will operate the Receiver on a simple three-wire system and the receiver in this instance is calibrated in Gallons but dial could be easily altered to indicate a 360 Deg. sweep. Transmitter and Receiver with full instructions. Price 12/6, plus 2/- p.p.



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This unit consists of Magnet, and Coil which is attached to an aluminium diaphragm suspended freely and perforated to prevent air damping. Mounted on a Ceramic cover which sits over the diaphragm is a form of 2-Gang capacitor which has a swing from 10-50 pF.

The above unit is used as part of the Wobbulator described on page 252 of the June "Wireless World."

PRICE 7/6 p.p.

A.P.Q.2 RADAR JAMMING UNIT. Containing 931A Photo Multiplier Cell complete with resistance network and lightproof box. Wide band Amplifier (2) 6AC7, (2) 6AG7, (2) 388A. This unit is similar to the A.P.Q.9 Jamming Unit shown in the October issue of *Wireless World*. Brand New. £5.0.0 plus 10/- carr.

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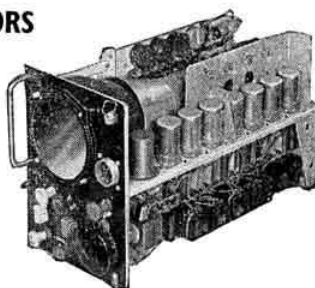
2 yards of cab type twin cable and 2 large croc. clips, new and boxed, 3/- p.p.

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Cowl Gill Motors. These motors have a 4 stage (600 to 1) reduction gear. Tapped field giving 2 speeds in either direction. Size 12in. x 3 1/2in., drive end 1/2in. splined. Price: 25/- each p.p.

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Ideal for conversion to oscilloscopes, T.V. units, etc. Containing V.C.R.97, 12 VR.91 (EF.50), 2 VR.54 (EB.34), 3 VR.92 (EA.50), 4 CV.118 (SP.61). Slow-motion dial, 13 Pots and scores of useful components. Size 8 1/2in. x 11 1/2in. x 1 1/2in. In wooden packing case. PRICE: £3.0.0. Carriage 7/6.



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6.3 volt, 1 1/2 amp.; brand new, 6/6 plus 1/- p.p.

NICKEL IRON CELLS

1.2 volt, size 3 1/2 x 3 1/2 x 1 1/2 in.; unfilled 5/- plus 1/- p.p.

MAINS POWER UNIT Type "234"

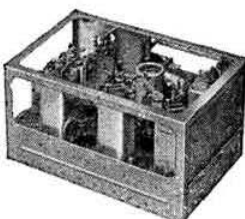
Double Smoothed 200-250V 50 c/s input. 240V 100mA 6.3 at 6 amps. with Volt Meter reading Input and Output Voltages. Size: 19in. x 10in. x 6 1/2in. Standard Rack Mounting. Price £4.10.0 each, plus 7/6 carriage.

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2in. Maglips 50V 50 Cycle A.C. transmitter and receiver units. Accurate to 1/10th of 1°. Guaranteed in good working order. Price 30/- pair, plus 3/- p.p.

RECEIVER UNIT Ex 1143A

Suitable for conversion to 2 metres or F.M. Wrotham transmission. Valve line-up: (4) EF50, (1) EL32, (2) EF39, (1) EBC33, (1) EA50. Supplied with circuit diagrams. Fully valued 25/- each, Plus 3/- p.p.



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Bulgin bakelite type, 2/6 each p.p.

E.M.I. TEST EQUIPMENT FOR AMATEURS

SPOT FREQUENCY MARKER. Type AD/U405. Operating on a frequency of 1 Mc/s and generating harmonics at 1 Mc/s intervals up into the V.H.F. range.

V.H.F. GRID DIP OSCILLATOR. Type AD/U406. Frequency may be varied over the range 65-150 Mc/s and accuracy is within $\pm 2\%$ at all frequencies within this range. Consumption 0.3 Amp. at 6.3V and 3mA at 150-250V. A stabilised power supply is not essential.

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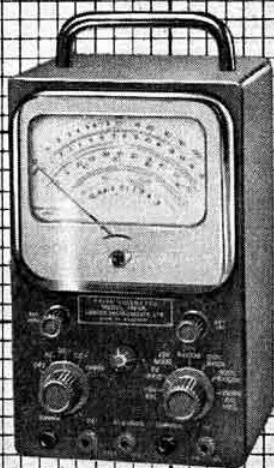
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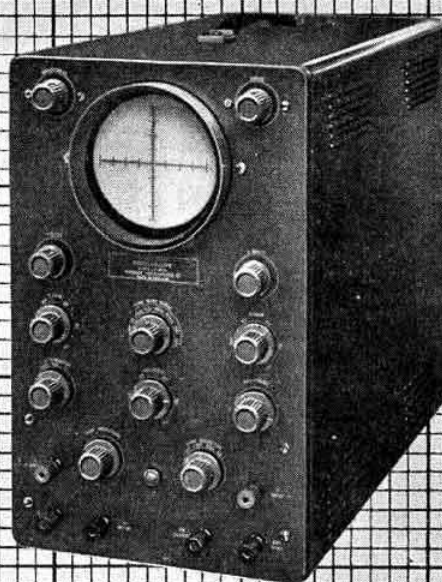
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Current Comment

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New Horizons

WHEN the first 70 centimetre tests were organized by the Society seven years ago, many v.h.f. enthusiasts probably took one look at the problems involved in getting on this then new band and decided that two metres was about as far as they would ever get, frequency-wise.

"Learning by doing"—which plays such an important part in the hobby of Amateur Radio—taught the lesson that it wasn't so difficult after all. Plenty of regular operators on 70 centimetres declare that not so long ago they would have written it off as being beyond the bounds of practical application except for amateurs enjoying special facilities or aptitudes. Now it is "all in the day's work."

Probably the same sequence of events will be experienced in connection with the 23 centimetre band on which a few months ago the first R.S.G.B. official tests took place. These tests went some way towards canalizing the pioneer work being done—often in isolated groups, unheralded and unsung—in different parts of the country.

It was a good idea on the part of the Contests Committee to categorize this first collective 23 centimetre effort as "Tests" and not as a full-dress contest on conventional lines. It helped impart the

feeling that everyone started on an equal basis, however great or small his technical knowledge and equipment may have been. This was the practice in the early days of 70 centimetres, where development has been so rapid that it is now possible to lay on two 70 centimetre contests a year and find them well supported.

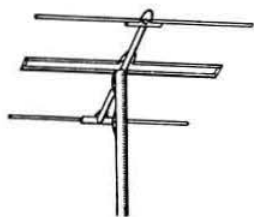
All that is needed now is more occupancy on "23."
—J.H.

Code Mode

WRITING the above "Comment" about 23 centimetre operations calls to mind the useful concession granted by the Post Office in extending the band to allow direct tripling into it from 70 centimetres. The occasion represents a copy-book example of how a reasonable technical requirement stated by members can be taken up by the Society, and a case put to the licensing authority with satisfactory results all round. (That 27/6d. *does* buy something else besides the BULLETIN and the use of the QSL Bureau!)

Quite recently an extraordinary thing has happened: a concession has been granted from on high that wasn't asked for! This was the abolition of the "telegraphy twelvemonth" stipulation which new licensees had to observe. Many c.w. enthusiasts regret that the newly licensed transmitting amateur can now go straight on to telephony without doing his year's initiation on the key, yet there are good arguments on either side. Less log checking by the Post Office saves time and money, and to that degree helps hold the licence fee at its present level. There is the further thought that communication by speech has been superseding communication by Morse at a rapid rate ever since the war.

However, the one service where Morse will often effect a contact when telephony will not, is the Amateur Service, whose "fringe operation" and interference levels would frighten many a professional setter-up of communication circuits into thinking them impossibly hazardous. Telegraphy has an important future in Amateur Radio operation for so far ahead as can be seen. Only the amateur who is prepared, deliberately, to limit the scope of his activities can afford to neglect it, even though he is no longer compelled to serve an apprenticeship.—J.H.



The

V.H.F.

THREE-BAND

MINIBEAM

A 'ZU Special' for 4, 5 and 6 Metres

By G. A. BIRD (G4ZU)*

AFTER the initial excitement of learning that a four-metre band has been made available to U.K. licence holders, the average amateur is likely to find himself faced with three fundamental equipment problems: the transmitter, the receiver and last but by no means least, the aerial system.

The design of suitable transmitting and receiving equipment has already been covered in these pages, but the special aerial problems involved have not so far received detailed attention.

So far as is known, only two other countries, France and Russia, have allocations in the 70 Mc/s region. It is clear, therefore, that British amateurs on 4 metres will have to give serious consideration to *cross band* working with stations in other parts of the world using 5 or 6 metres, if the possibilities of this new band are to be fully exploited. Any attempt to use a conventional

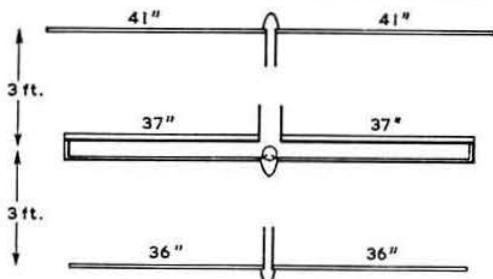


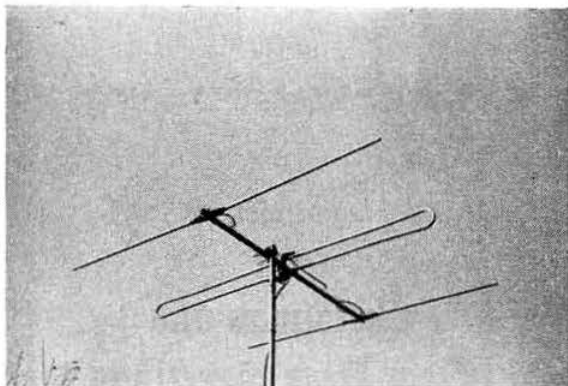
Fig. 1. Practical details of the v.h.f. Minibeam. The drawing is not to scale.

70 Mc/s Yagi array for cross band work is likely to prove disappointing as the efficiency of such a system at 50 or 60 Mc/s would be too low to be worth considering. On the other hand, the construction of three separate beams for 4, 5 and 6 metres would be an undertaking calculated to dampen the enthusiasm of even the keenest v.h.f. operator.

If some means could be found of providing a high gain directional aerial which would work at full efficiency on all three bands, the situation would begin to look very much more hopeful. With such a beam, there is no reason why a number of intercontinental v.h.f. records should not be achieved during the coming sunspot maxima.

A good directional system can readily provide an improvement in signal to noise ratio of 20db or more at the receiver, particularly in a noisy location, while the gain on the transmitting side will permit good results to be obtained with simple equipment, and enable a low power installation to compete effectively with stations running very much higher power. The benefit to be obtained in practice will be appreciated most by those who have done some work on improving the noise factor of v.h.f. receivers. An improvement of even a couple

*94 Shirley Way, Croydon, Surrey.



An experimental model of the beam using equal diameter conductors for the folded radiator. The feed impedance was brought to 75 ohms by moving the director in to 0.15 wavelength spacing.

of db can often entail hours of patient endeavour and careful laboratory measurements. The chance of increasing the signal to noise ratio by 20db or so at little extra cost is a gift which cannot lightly be rejected.

A Single Three Band Array

Readers will remember that the allocation of the 21 Mc/s band for amateur operation a few years ago created a need which led to the conception of the original three-band Minibeam for 14, 21 and 28 Mc/s, details

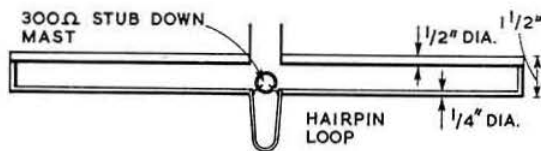


Fig. 2. Construction of the radiator.

of which were first published in the BULLETIN in February, 1956. Since that time the writer has successfully applied the principles of stub switching to commercial multi-channel networks, and in particular, multi-band television aerials, with the result that a three band v.h.f. beam can now be offered with *direct coax feed*, capable of operating in an efficient manner on 4, 5 and 6 metres.

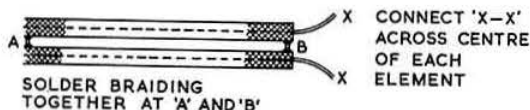


Fig. 3. The shorting stub for the director and reflector.

From Fig. 1 it will be seen that the overall dimensions are those of any normal 70 Mc/s Yagi. The quarter wave open circuit stubs at the centre of each element provide a straight through path on this frequency so that the performance is, in fact, identical with that of a normal 70 Mc/s beam.

On the two lower bands, however (5 and 6 metres), the stubs no longer behave as a short circuit, and the loading inductors, in this case hairpin loops, come into action and provide the necessary conditions for resonance. As a result of the inductive loading, the elements are some two feet shorter than a conventional 5 or 6 metre beam; as the saving in space and material, compared with three separate beams, is so marked, it was felt that the term v.h.f. three band Minibeam could properly be applied in describing an aerial of this pattern.

The Driven Element

The design of the driven element (Fig. 2) is rather unusual. It is a pattern which has been developed only recently, and so far as is known, no previous information has been published on a radiator of this type. It is fundamentally a folded dipole, but with the addition of the now accepted principle of stub switching plus inductive loading, it becomes a multi-band radiator, with a resistive impedance on more than one frequency. The aerial can therefore be fed with coaxial cable or 75 ohm twin feeder with the assurance that a low s.w.r. will be obtained.

If the radiator for 70 Mc/s had been a plain dipole the presence of the parasitic elements would reduce the feed impedance to about 35 ohms. A normal folded dipole would give an impedance step up of four times to 150 ohms, which is not a convenient figure. The lower limb of the folded dipole is therefore made by tubing about twice the diameter of the upper limb. This provides an impedance step up of between two and three according to the spacing. By varying the spacing it is possible to obtain a perfect match to any feeder between 50 and 100 ohms.

The band width in the 4 metre region is sufficient to cover the French and Russian 72 Mc/s band as well as the British 70 Mc/s allocation.

Parasitic Elements

The reflector is arranged to have a second resonance at 50 Mc/s and the director a second resonance at 58 Mc/s, the radiator being resonant at a mid-frequency of 54 Mc/s. This is in accordance with accepted theory for a broad band parasitic array, where the director and reflector are normally made 8 per cent shorter and 8 per cent longer as compared with the driven element. The beam will therefore maintain its performance over the full extent of these two lower bands without reversal of pattern.

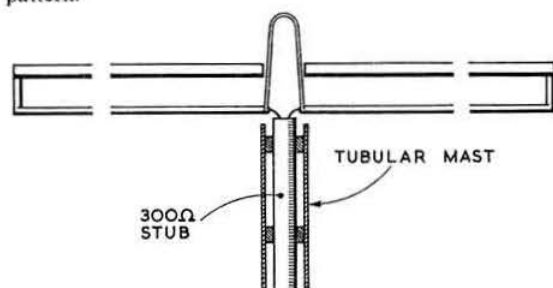
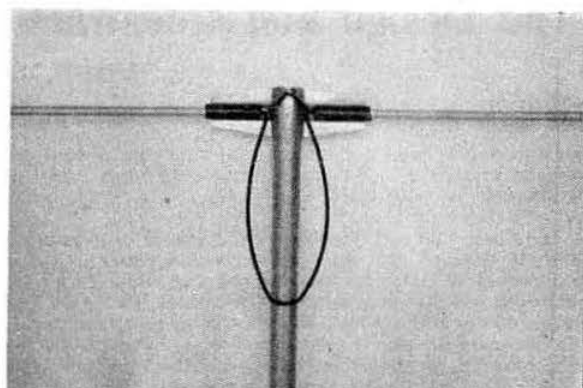


Fig. 4. Arrangement of the shorting stub for the radiator.



A close-up of the hairpin loop on the director. The shorting stub can be seen emerging from the end of the tubular boom.

It will be seen from Table I that two pieces of coaxial cable, connected back to back, are specified for the shorting stubs on the director and reflector. This is to maintain balance to ground, and to obviate any change in velocity factor which might occur when they are pushed down inside the tubular boom. The stub on the radiator is made of 300 ohm ribbon, as this provides a more accurate impedance match with a folded element.

TABLE I
Dimensions for the v.h.f. Minibeam

	Director	Reflector	Radiator
Element length each side of centre ...	36 in.	41 in.	37 in.
Length of $\frac{1}{4}$ wave open circuit stubs ...	26 in.	29 in.	32 in.
Approx. length of hairpin loops*	6-9 in.	7-10 in.	12-15 in.

* Total length of wire in the loops will be about twice these figures, e.g. a 6 in. loop would require about 12 to 13 in. of wire.

The director and reflector stubs are made of two pieces of coax. cable connected back to back as in Fig. 3. The lengths specified are based on a velocity factor of 0.66 which is the normal figure for most types of coax.

The radiator stub is made of 300 ohm ribbon or tubular feeder. A velocity factor of 0.82 has been used as a basis for calculation. The radiator stub should be pushed down inside the tubular supporting mast and should be centrally disposed by means of corks threaded along its length (Fig. 4) or some similar method.

The beam, if constructed according to the figures in Table I will cover four bands.

- (1) The French and Russian allocation 72 -72.8 Mc/s.
- (2) The new U.K. allocation 70.2-70.4 Mc/s.
- (3) The five metre band 56 -60 Mc/s.
- (4) The six metre band 50 -54 Mc/s.

Readers in countries where the normal allocation is 50-54 Mc/s (e.g., the U.S.A. and Canada) may prefer to tune the beam sharply at the lower end of its coverage so as to obtain the maximum possible gain on their normal transmitting frequency. The only alteration necessary in such a case will be in the length of the hairpin loop on the director. This should be resonant at 54 Mc/s. It might also be an advantage to increase the length of the hairpin loop on the driven element by an inch or so until the s.w.r. is as low as possible. All other dimensions can remain unchanged.

(Continued on page 261)

The Design and Construction of Modulating Equipment

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

THE design of modulating equipment is a process which must be started from both ends. The output of the microphone and the maximum audio output required to modulate fully the transmitter must both be known, hence the intermediate stages must be designed to give the required gain.

The first step in the design is the choice of a suitable output stage to give the required audio power. In this connection it must be remembered that, due to the inefficiency of the modulation transformer, about 10 per cent. of the audio power will be lost in this component. In the case of anode modulation of a triode amplifier, the amount of audio power required for 100 per cent. modulation on peaks is one half of the d.c. input to the r.f. amplifier. In the case of anode and screen modulation of pentodes or tetrodes an extra 10-20 per cent. power is required. To give an example, assuming a d.c. input of 150 watts to a triode r.f. amplifier, then for 100 per cent. modulation 75 watts of audio power are required. Assuming now that the efficiency of the modulation transformer is 90 per cent., the modulator output stage must supply 83 watts. If anode and screen modulation is required, a further 10-20 per cent. audio power is necessary. The modulator must therefore be capable of supplying about 100 watts. It would be reasonable to design the modulator to have about 20 per cent. more audio output than is estimated to be required, thus a modulator for a 150 watt telephony transmitter should be designed to give 100-120 watts of audio power.

The choice of a suitable modulation transformer should also receive careful attention. Two conditions must be fulfilled: the ratio must be correct and there must be adequate iron in the core for the power involved. A multi-ratio modulation transformer, of which several types are obtainable, is the best answer as these enable many combinations of audio and r.f. stages to be satisfactorily matched. The use of mains transformers as modulation transformers, even if designed for use on a high frequency supply, is not recommended, save perhaps for low power work, as they rarely permit the correct ratio to be obtained and generally saturate at quite low values of direct current.

Having decided on the output stage, the next step is the choice of a suitable driver stage. If the output valves are running into grid current, i.e., in class AB2 or class B, then the driver stage must be a power amplifier which is usually transformer coupled to the following grids. The regulation of the driver stage must also be good. The ideal driver stage is therefore seen to be either one or two medium power triodes, used singly or in push pull, operating in class A. Alternatively triode connected tetrodes may be used; such valves as the 6V6 or KT61 when triode connected are capable of driving fully any class B stage likely to be used under British licensing conditions.

If the output valves are operating in class A or AB1, then the driver stage need only be a voltage amplifier, and either transformer or r.c. coupling to the output stage may be used. If a centre-tapped transformer is not available, one of the r.c. coupled phase splitters, discussed in R.S.G.B. BULLETIN, May 1956, pp. 458-461, must be used when a push-pull drive voltage is required. For stability reasons it is not advisable to use a high gain driver stage, therefore a single or double triode, which has a low or medium amplification factor,

is suitable. The driver stage, irrespective of whether it delivers power or voltage, should be capable of some 50 per cent. more output than is required to drive the output valves.

Once the type of driver stage to be used has been decided, the input voltage it will require may be found. The ratio of this voltage and the anticipated output of the microphone to be used is the gain which must be provided in the earlier stages. This gain should be obtained by the use of a high gain r.f. pentode for the first stage, followed by one or possibly two fairly low gain triode stages. Two high gain stages in cascade would require careful design and construction to avoid the possibility of feedback between them and self-oscillation and are therefore not recommended. For the majority of applications a single pentode will provide sufficient gain.

Constructional Practice

No matter how good the theoretical design of a modulator may be, it will be wasted unless the construction receives the same attention. In addition to the usual practical points of good workmanship, correct choice of components, etc., it is particularly important that full consideration be given to the layout of the components and supply leads in order to avoid feedback between stages and hum pick-up. These are two of the most difficult things to avoid in a.f. amplifier construction.

General Layout

The general layout of a modulator is usually determined to a large extent by its power rating. For example, consider a modulator suitable for a 25 watt transmitter. This would have a maximum output of 15 watts or so and would most likely use two small tetrodes operating in class AB1. All the components, including the modulation transformer and power supply, would be quite small in size, and so such a modulator could be very easily accommodated on a standard relay rack chassis measuring 17 in. by 10 in. A suggested layout is shown in Fig. 1 (a). The main requirement in such a scheme is that both the modulation transformer and the low level input stages should be as far as possible from the mains transformer. Interaction between the two transformers can be reduced to a minimum by placing them so that their cores are at right angles to each other.

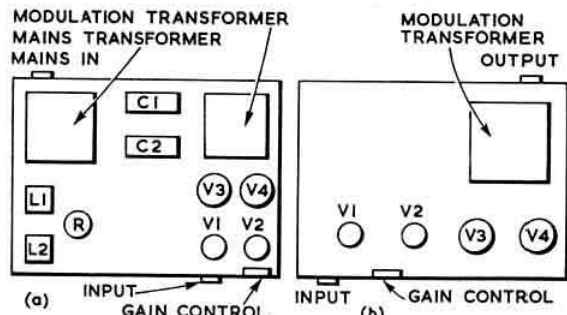


Fig. 1. Suggested layouts for 15 watt modulator. (a) Incorporating power supply, on standard 17 in. x 12 in. chassis. (b) Without power supply on a smaller chassis. (C1, C2 smoothing condensers; L1, L2, smoothing chokes; V1, V2, speech amplifier; V3, V4, output valves; R, rectifier.)

*81 Anglesmede Crescent, Pinner, Middlesex.

The alternative shown in Fig. 1 (b) allows a much smaller chassis to be used, as the power supply is not included.

Turning now to the other extreme and considering a modulator with an output of up to 120 watts, the modulation and h.t. transformers, smoothing chokes and condensers are large and heavy and so it becomes necessary to separate modulator and power supply to avoid an unduly heavy unit. Generally the most convenient way of doing this is to build the modulator and power supply for the speech amplifier stages on one chassis and the power supply for the output stages on another chassis. A typical layout for such a scheme is shown in Fig. 2 (a). The power supply for the speech amplifier stages need only use a small transformer (a 250 volt 60 mA. type being sufficient), a small choke and a two section electrolytic condenser. If a separate heater transformer for the output stage is required it is advisable to place it on the modulator chassis, as it then reduces to a minimum the number of interconnecting wires required. This is advantageous both from the point of view of general convenience and also it is a reduction in the number of possible sources of hum. A suitable layout for a high power class B modulator is shown in Fig. 2 (b). It is often desirable, either to keep the microphone lead short or as part of a remote control system, to have the first stage or stages of the speech amplifier separate from the remainder of the modulator. Such a "head amplifier," with gain control, may be combined with the control unit and placed at some convenient place on the operating desk.

The actual form of construction is not very important, the most convenient being the familiar inverted tray type chassis. The expensive cadmium plated chassis complete with panel, handles and side brackets to match, which are available from several sources, are very nice from the appearance point of view, but they are by no means essential, and equally successful amplifiers may be made on simple chassis consisting of a flat sheet of metal supported on wooden runners. An alternative form of construction which has a lot to recommend it for large output stages and power units is to mount the heavy components, such as transformers and chokes, directly on the panel, smaller components such as valves being supported on brackets mounted on the transformers. In this way the use of a chassis is avoided.

General Constructional Points

Without doubt the most important stage in any a.f. amplifier is the first voltage amplifying stage. The grid circuit is very prone to pick up hum, as the voltage level at this point is generally very low. It is advisable to screen the microphone input jack and all wiring, in-

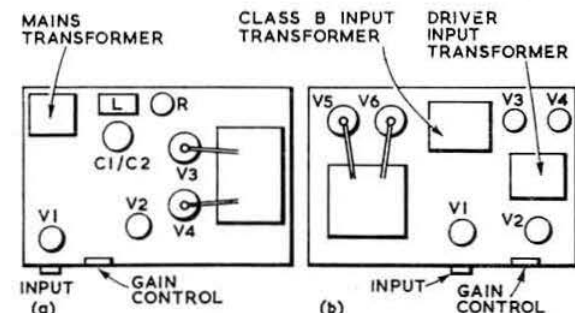
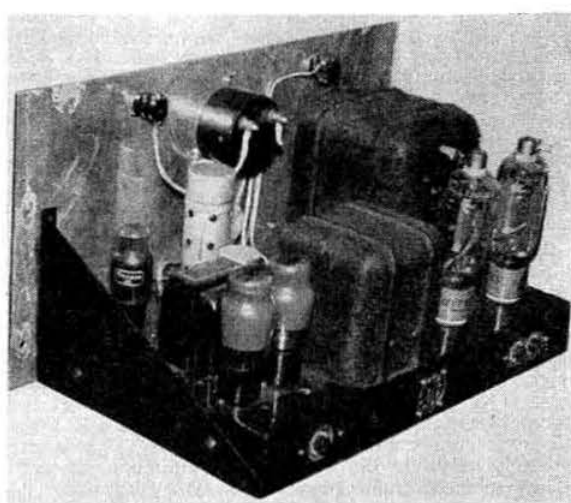


Fig. 2. Suggested layouts for high power modulators. (a) On standard 17 in. x 12 in. chassis incorporating small power supply for speech amplifier. (b) Arrangement for high power class B modulator.



High power modulator (175w. push pull TZ40's—Class B) with standard chassis and panel construction.

(Photo by courtesy of G6TH)

cluding microphone transformer, if used, and grid leak, right up to the grid of the valve. This valve should have a screened top cap at least, and preferably a complete screening can. A double ended valve, i.e., one with a grid top cap, is often preferable in this position, as a single ended valve, unless designed for this particular application, is liable to hum pick-up between the grid and heater pins in the base. For similar reasons, the gain control should be after the first valve where the voltage level is much higher.

Another troublesome fault which can occur in the input stage is microphony. This is apparent as a hollow ringing sound when the valve is tapped and is due to the valve electrodes vibrating. It is not a common fault in modern valves, although some of the earlier miniature pentodes tended to be quite microphonic. Special valves, for example, the G.E.C. type Z719, Mullard EF86 (B9A base), and Mullard EF37A (octal base) are now available with a very high degree of internal bracing so that it is virtually impossible for one electrode to move with respect to another.

By comparison with the input stage, the remainder of the amplifier is relatively straight forward. With a logical layout and providing that an adequate amount of decoupling is used, the other bugbear of amplifier construction—undesired feedback between stages—can be avoided. Any layout which brings the input of the amplifier near to the output, or which brings the wiring of the anode circuit near to the grid circuit, must be avoided at all costs.

The Output Stage

If the popular medium power single ended valves, such as the KT66, EL38, or 6L6 are used in the output stage, it is advisable to mount them in good quality valveholders, as the high voltage appearing at the anode pin has been known to break down the insulation of ordinary bakelite valveholders. Grid and/or anode and screen stoppers, if used, should be placed as near as possible to the appropriate pins.

Earthing

Solid earthing is of great importance in avoiding hum pick-up and instability. If the heater winding has a centre tap it may be earthed and the heaters wired up

with tightly twisted flex to reduce the field produced by the heater current. The heater wiring should be kept well away from grid and anode leads and it is a good plan to place the heater wires in the corners formed by the bent down ends and sides of the chassis. If hum is still present after all efforts to remove it, it is well worth disconnecting the centre tap, which may not necessarily be the true electrical centre, and earthing by means of a small potentiometer or "hum dinger." Very often it is possible to "tune out" the last traces of hum by this method.

The actual earthing of the various points of the circuit should be carefully thought out. The indiscriminate earthing of components to various points on the chassis is liable to set up circulating currents in the chassis. It is better to take all earth connections to one point for each stage, as in r.f. technique. An alternative method, which is particularly applicable to a.f. amplifiers, is to run a busbar of thick tinned copper wire, say 10 or 12 s.w.g., the whole length of the chassis to which all earth connections may then be made. This is particularly useful in the case of an aluminium chassis to which soldered connections cannot easily be made.

It is usually more convenient to mount the power unit with an output of more than 500-600 volts at 250 mA on a separate chassis on account of the size and weight of the components involved. Layout and length of wiring are generally not very critical, but it is advisable to mount the mains transformer so that its core is at right angles to that of the smoothing choke.

Points to which attention must be paid are insulation, which includes the all-too-often overlooked points of safety, and ventilation. All high voltage wiring must be adequately insulated and should whenever possible be run under the chassis. High voltage terminals and the top caps of valves should be covered with either insulated connectors or specially made bakelite cover plates. Where it is necessary to run a high voltage lead through the chassis, the hole should be fitted with a rubber grommet if the voltage is below 500 volts. Above this figure a ceramic feed-through insulator should be used.

It must be remembered that rectifier valves produce a considerable amount of heat and so they should be mounted at the rear of the chassis and at least 2 in. from any other component. For this reason also the bleeder resistor should be mounted away from anything else. Although it is often inconvenient to arrange in low voltage supplies, it is a good plan to feed all heaters from a separate transformer from the h.t. as this permits a somewhat easier on/off switching system. This, of course, is essential if mercury vapour or other rectifiers requiring delay switching of h.t. voltage are used. Fuses should be fitted on the primary side of all mains transformers and also in all h.t. supplies. A ceramic valve-holder mounted at the rear of the chassis makes a cheap and convenient outlet point for the h.t. and l.t. supplies. If an l.t. current of more than 2 or 3 amperes is taken, it is as well to parallel two pins for each lead. If the h.t. voltage is higher than about 600 volts it is better to take it from a separate stand-off or feed through insulator.

Choice of Components

As in any other electronic device, the use of components of adequate rating is essential for reliable operation and long life. While a rating of $\frac{1}{4}$ or $\frac{1}{2}$ watt is adequate for the majority of resistors, the actual dissipation should be checked in each case. This is important for the cathode bias and screen voltage potentiometer resistors as quite high dissipations are sometimes

called for. Condensers with a reasonable safety factor on working voltage must be used. This point is of particular importance in the case of the grid coupling condenser where even a very slight leak may have disastrous effects on the following valve. The use of 1,000 volt working oil-filled condensers in this position is not so ridiculous as, at first sight, it seems.

Metering

It is convenient to be able to measure the anode or cathode current of each valve in the modulator and this then provides an immediate check on the operating conditions of each stage. Whilst it is not suggested that a separate meter be fitted to each stage, a low resistance can be wired in series with each valve and a single low reading milliammeter may be switched across each in turn. Alternatively a single meter may be plugged into a closed-circuit jack in each stage. The minimum requirement is the measurement of the anode current of each valve in a push-pull output stage. This enables a check to be kept on the balance of the two valves both during setting up and operation. Normally the two should agree to within 10-20 per cent.

Connections to and from the Modulator

As a general rule, all interconnections should be as short and direct as possible, with emphasis on adequate bonding together of the chassis of the modulator, its power unit and the transmitter with thick copper wire. A.f. energy is normally distributed at an impedance of 600 ohms, but for the short runs generally encountered in amateur practice, good quality flex, screened or un-screened, or alternatively ordinary r.f. coaxial cable is quite satisfactory.

(a) Microphone-to-modulator Connection

Either screened twin flex or coaxial cable is suitable for the microphone lead or connection between head amplifier and modulator. A recommended scheme for crystal microphones is the use of twin screened wire with the screening connected only to the microphone case at one end; at the other end, the screening is connected to earth together with the earthy microphone lead, the other lead going straight to the grid of the valve. As far as possible, screening should be continuous from the microphone to the grid of the first valve. In this respect, the use, where possible, of coaxial cable is advantageous, as the appropriate screened plugs and sockets may be employed.

In the case of a low impedance microphone, such as the moving coil type, the use of coaxial cable can lead to bad hum pick-up and a screened, twisted pair cable is much to be preferred.

(b) Modulator-to-transmitter Connection

Bearing in mind the high voltages which may exist across the secondary of the modulation transformer, it is seen that good quality insulated wire must be used. The interconnection should be as short as possible and placed clear of metal work and other leads.

A point often overlooked is that in a transmitter which is also used for telegraphy, the secondary winding of the modulation transformer should either be short circuited or removed from the h.t. lead during telegraphy operation. If the modulation transformer is left in circuit, the high voltage which may be induced in the primary as a result of the keying of the secondary current, is liable to cause the insulation to break down and to cause severe key-clicks.

(Continued on page 261)

A Combined Dynamotor Vibrator Power Unit

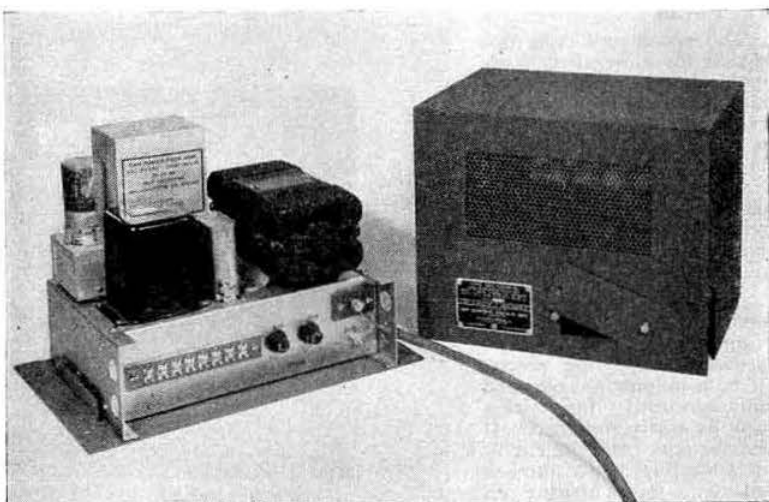
By
A. COCKLE, Grad.I.E.E. (G3IEE)*

IN amateur circles a low voltage power supply embodying a motor-generator or dynamotor and a vibrator power unit is often required. In addition to describing a specific power supply unit, this article contains some general information on emergency or mobile power supplies of this type.

The Hallicrafters HT11 power supply unit has recently become available in this country at a low price and is probably the answer to many field day power supply problems. The unit, which operates from a 12 volt supply, forms part of the Hallicrafters Marine Radio-telephone, types HT11B and HT11E. The U.S. Navy designation for the power unit is CHL20181 and for the complete equipment MT2 Radio-telephone. The power supply unit provides two outputs, one being 244

volts at 44 mA from a synchronous vibrator pack and the other 350 volts at 165 mA from a motor generator unit.

The photograph reproduced above shows the steel case on the right with the fuse access plate partially open. The motor generator is on the right and the vibrator pack at the left rear of the chassis on the left of the picture. The whole power supply weighs 33 lb. and is strong enough to stand up to the rigours of field days and mobile operation.



The Hallicrafters HT11 Dynamotor Vibrator Unit.

*96 Latchmere Road, Kingston-on-Thames.

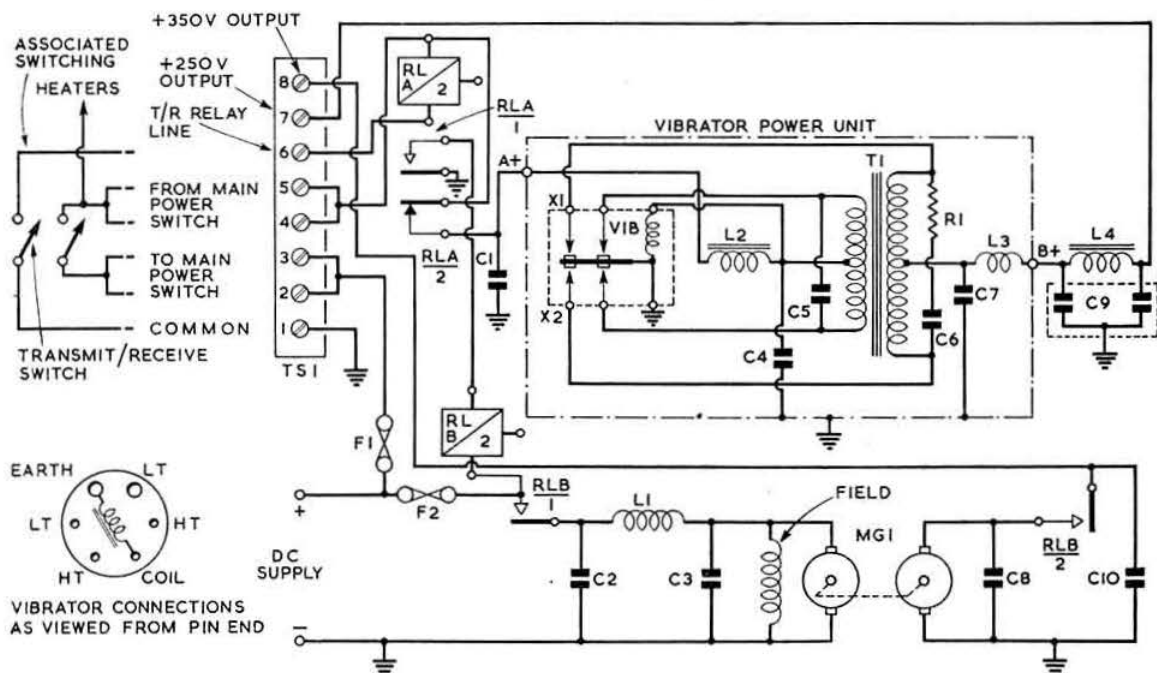


Fig. 1. Circuit diagram of the Hallicrafters HT11 power supply unit. C1, 2, 3, 4, 0.5 μ F; C5, 1 μ F; C6, 0.008 μ F 2kV; C7, 0.1 μ F; C8, 0.03 μ F; C9, 8 μ F + 8 μ F; C10, 2 μ F; F1, 10 amp fuse; F2, 20 amp fuse. L4, 5.5H; R1, 5K ohms.

The Circuit

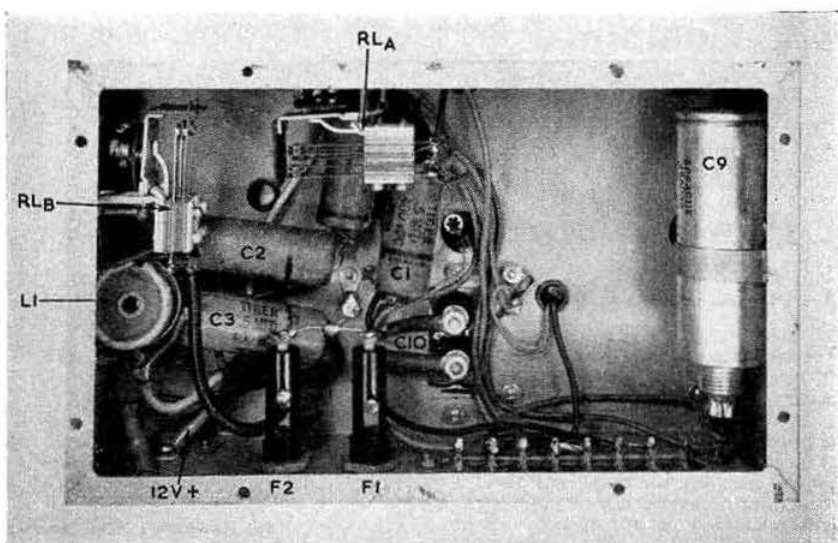
The power unit was designed for a negative earth input; however, this can be modified for a positive earth as described later. The input is connected to the two nut terminals at the right hand side of the front of the chassis; the outputs and relay control lines are brought out to the tag strip on the left.

The unit is intended to operate with either the vibrator pack or the motor generator supplying power. If both outputs are required simultaneously, the wiring can be easily modified. It can be seen from the circuit diagram, Fig. 1, that there is adequate hash filtering on both the input and output sides of each supply. Further filtering on the vibrator pack output, consisting of C9 and L4, attenuates any low frequency ripple present on the 250 volt output line.

Both relays RL/A and RL/B have double wound coils; this permits them to be operated on 6 or 12 volts and, in the 12 volt power supply unit, a flying lead is taken back onto the coil bobbin.

Initial Servicing

Most vibrators and motor-generators require some attention before they are used if they have been stored for a considerable length of time. In the case of the HT11 power supply, the units were manufactured eleven or twelve years ago and packed in sealed cartons containing silica-gel dessicators. They appear to be in "mint" condition and even the electrolytic condensers seem to suffer no deterioration. However, it is probably wise before operating the power supply to disconnect the h.t. output line from the vibrator supply and to feed a voltage increasing gradually up to 350 volts into the filter C9 and L4.



Under-chassis arrangement of the complete power supply.

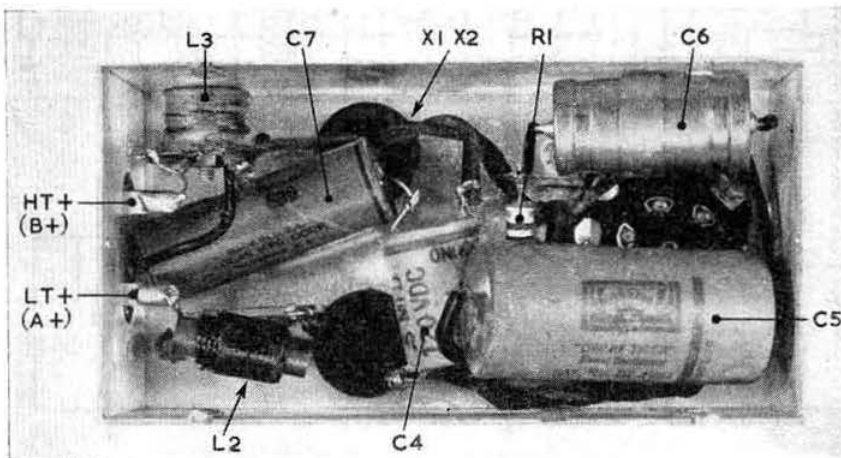
After a long storage period a vibrator unit is liable to have its vibrating reed stuck to one contact. Therefore the vibrator unit should be removed from the vibrator pack and held in one hand and then slapped several times into the other hand; this should clear any sticky reed trouble. In the case of the writer's unit, the 20 amp. fuse F2 (in the motor-generator circuit) "blew" because the brushes had stuck to the commutator. It is, therefore, advisable to rotate the rotor manually before applying power for the first time. Care must be taken to avoid damaging the windings when doing this.

There is also a chance that arcing can occur inside the casting at the high voltage end between the soldered connection on the brush housings and the windings on the armature. This is due to the small clearance when a large soldered joint has been made (on manufacture) and is most likely to occur when the motor-generator has been modified for a positive earth. The remedy is to disassemble the unit and resolder the high voltage connections to the brush housings making a neat joint.

Desirable Modifications

Fuses

It is very unlikely that many owners of the HT11 power supply will have a stock of the American 10 and 20 amp. "Littelfuses," type 4AG, which are larger in diameter than the British fuses. It is, therefore, a good plan to remove the original fuseholders and replace them with Belling-Lee type L356 holders and to use type L1055 10 amp. and 20 amp. fuses.



An underside view of the vibrator pack showing the location of the various components.

Use of Positive Earth

If the power supply is to be used with a positive earthed supply (e.g., as on most post-war cars), the following modifications can be carried out:

1. The leads to the vibrator transformer secondary windings, X1, X2, have to be changed over on the vibrator socket; these leads are indicated in one of the photographs. After this modification, 12 volts negative may be fed to the A+ terminal and 240 volts positive will still appear at the B+ terminal.
2. To change the polarity of the motor-generator output so that a positive earthed supply can be used requires the reversal of the high voltage output leads which may be identified with an ohmmeter.

The red lead is then earthed and the black lead soldered to the tag point previously occupied by the red lead.

Output Characteristics

The amount of hash and ripple on the two high voltage output lines, under normal load conditions, was measured with an oscillograph and the results were as given below:

Vibrator Supply

Input—12 volts 0.3 amp. off load
12 volts 1.2 amp. on load
Output—250 volts at 41mA
Hash—less than 1 volt peak-to-peak.

Motor-Generator Supply

Input—12 volts 4.3 amp. off load
12 volts 9.2 amp. on load
Output—350 volts at 150mA
Hash and ripple—5 volts peak-to-peak.

A ripple frequency of 100 c/s with a small amount of 1200 c/s was observed.

Summary

Although the foregoing information has been based on the HT11 power supply it is hoped that it will be of use to all users of vibrator packs and motor-generators, since units like this are in general use today. The HT11 is probably one of the most useable items of surplus equipment and is eminently suitable for emergency and mobile operation. It is always a pleasure to reduce the number of interconnections between pieces of gear. To have two power supplies with relay switching in the same "box" will reduce those mysterious power failures which always seem to happen on field days and other special occasions.

Design and Construction of Modulating Equipment

Continued from page 258

Prevention of Instability due to R.f. Pick-up

Instability in the modulator can often be caused, particularly in a transmitter working on the higher frequency bands, by the existence of r.f. fields or currents in or around a high gain a.f. amplifier, the first voltage amplifying stage being usually the most susceptible. Rectification takes place and the resulting voltage is fed into the transmitter via the modulator. This form of instability can only be cured by confining the r.f. fields to the transmitter, so the problem is similar to that of the suppression of T.V.I. Short, direct and screened wiring between modulator, transmitter and power units in conjunction with liberal use of r.f. chokes and by-pass condensers of 0.001 μ F to 0.01 μ F at each end of the power supply leads is generally sufficient to effect a cure.

V.H.F. Minibeam

Continued from page 255

Adjustment

The hairpin loops on the director, reflector and radiator should be adjusted in length until resonance is obtained at the frequencies specified. This can easily be checked by coupling a grid dip oscillator to each loop in turn. These adjustments should preferably be made with the beam well in the clear and at least half wave above ground, a condition not difficult to satisfy at these frequencies where a half wave is only about nine feet!

Although the beam as described is a three-element array, there is no reason why additional directors should not be added to make it a four, five or six element array where additional gain is required, or two beams could be stacked in phase at spacings between half and one wavelength. This, however, would be departing somewhat from the main objective, which was to keep the system as simple and as compact as possible!

Editor's Note

The principle embodied in the design of this aerial forms the subject of a Patent Application in Great Britain, the United States of America, Canada, Australia, etc., but there is no objection to radio amateurs using the design in connection with their own private experiments.

A licence to manufacture aerials of this pattern has been granted to the Panda Radio Co., Ltd., of Rochdale, who are the sole licensees.



Matilda Comes to Town

G3KKD/T's "roving eye" in Queen Square, Holborn, during the B.A.T.C. Convention last October. The equipment included a station camera built by Pye Radio Club (G8PY), a rotatable corner reflector aerial and a modified G8SK-type transmitter built by G3KKD. A 2kW petrol electric generator lashed to the luggage grid provided the power. "Matilda," a former London taxi (vintage 1936), was bought for £5!

A Modified Electronic Keyer

By W. I. G. REID, M.I.E.E. (G3CPA)*

MOST electronic keyers used in this country are probably based on the design by Brondum-Nielsen described in the R.S.G.B. BULLETIN for February 1950. An improved, but considerably more complicated, version of the same circuit was given by Brann in *QST* for February 1951.

Whereas it is only too easy to produce poor Morse on a manual key, and easier still on a semi-automatic key, the problem with the modern electronic key is different—it either produces perfect Morse or it completely garbles it. In the writer's opinion it is more difficult to produce 100 per cent. intelligibility with the simple electronic keyer than with a manual key. With the latter, spacing may be poor and the relative lengths of dots and dashes may be incorrect but the result will probably be readable. On the other hand, errors in operation of the electronic key may lead to the complete loss of one or more dots, rendering the transmission unreadable.



Fig. 1. Diagrammatic representation of the Morse letter C.

To explain this difficulty more clearly, Fig. 1 shows the formation of the letter C in diagrammatic form. The lever of the keyer has been pushed to the "dash" side at the instant "a" and the dash "a b" and the space "b c," then follow automatically. Somewhere

about the instant "c" the lever is moved to the "dot" position, and dot "c d" and space "d e" follow automatically. The remaining dash and dot are of course formed similarly. Now let us assume point "e" has been reached, i.e. the second dash has started. The operator can either move the lever immediately to the dot position, and hold it there until he hears the second dot start, or he can hold the lever in the dash position, and transfer it to the dot position only when point "g" has been reached. This requires considerable accuracy of timing, for if the lever is moved to the dot position too late then the space "f g" is incorrectly prolonged, but if the lever is moved too soon, and not held over, the second dot is never formed. Normally no difficulty occurs in practice sessions on a keying monitor, but in the stress of competitions and the like it is only too easy to lose an occasional final dot, and, less often, an intermediate dot like the first dot in the letter C.

What is required, therefore, is a "memory" circuit which will "hold" a dot which has been attempted during the time the circuit is occupied in making a dash or space, and to bring it in after the circuit becomes free.

Brann in *QST* (July 1953) described such a circuit added to his original scheme. The ultimate in such circuits was described by Kaye in *QST* (April 1955). The latter, however, uses 17 valves and is unlikely to appeal to the more modestly equipped British amateur.

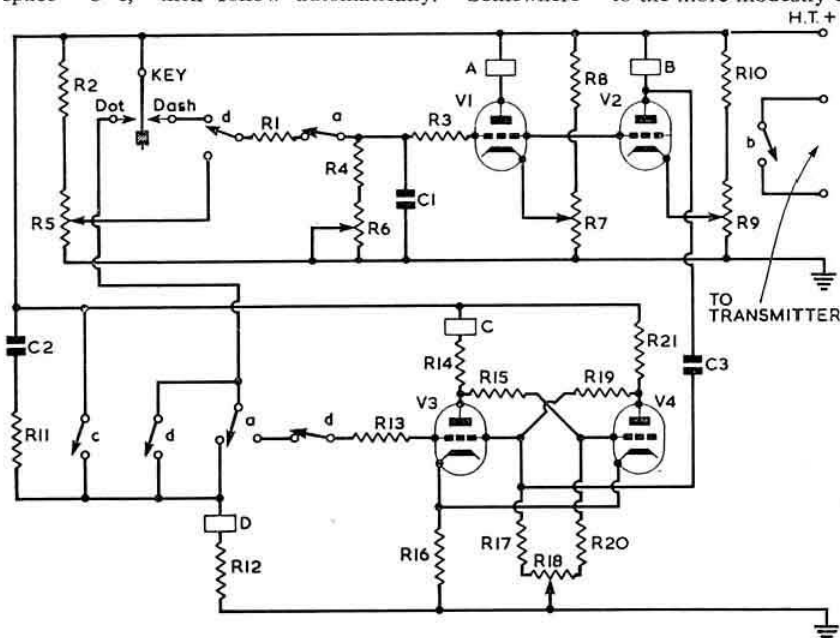


Fig. 2. Circuit diagram of the modified electronic keyer.

C1, 2, 0.2 μ F	R7, 9 20K ohms wire wound	R16, 12K ohms 1 watt
C3, 0.002 μ F	R8, 35K ohms wire wound	R17, 20, 270K ohms $\frac{1}{2}$ watt
R1, 470 ohms $\frac{1}{2}$ watt	R10, 35K ohms 5 watts	R18, 500K ohms $\frac{1}{2}$ watt
R2, 15K ohms 5 watts	R11, 220 ohms $\frac{1}{2}$ watt	R19, 1 Megohm $\frac{1}{2}$ watt
R3, 2 Megohms $\frac{1}{2}$ watt	R12, 15K ohms 1 watt	Relays A, B, C, D, Post Office type
R4, 200K ohms $\frac{1}{2}$ watt	R13, 100K ohms $\frac{1}{2}$ watt	V1, 2, 6SN7
R5, 10K ohms wire wound	R14, 21, 22K ohms 1 watt	V3, 4, 6SN7
R6, 1 Megohm	R15, 1 Megohm $\frac{1}{2}$ watt	

Practical Circuit

The circuit described below and shown in Fig. 2 makes use of readily available components and comprises basically a second double triode valve V3/V4 and two more relays. While it is theoretically possible to achieve the desired results with only one additional relay, the second relay isolates V3/V4 effectively from the remainder of the circuit and obviates a tendency to instability in the simpler circuit.

The diagram shows the basic keyer circuit at the top. V1 and V2 are biased to cut-off by means of R7 and R9. On operation of the key, voltage is impressed on C1 which is charged to full h.t. voltage by "dash" operation and to the voltage of the tapping on R5 by "dot" operation, the latter being applied via the change-over contact of relay D. Both valves then conduct until C1 has discharged sufficiently through R4 and R6. The bias on V2 is adjusted

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so that this valve ceases to conduct a little before V1, and this time-difference is the "space" interval between individual dots or dashes. It will be understood, therefore, that R7 sets up the correct conditions for operation, R9 sets up the space intervals, R5 determines the length of dot and R6 is the speed control. A few minutes' experiment with these various controls will enable correctly spaced keying to be set up without difficulty.

It will be realized that the normally open contact of relay A isolates the key lever from the timing circuit as soon as the operation of a dot or dash begins, and control by the key is not regained until the operation is complete. This ensures perfect formation of dots and dashes whatever the operator may do, but may lead to the loss of a dot incorrectly sent, as discussed above.

Referring now to the lower part of the diagram, if the key lever is moved to the dot position while the timing circuit is still "busy" with a dash, h.t. positive voltage is applied, through the changeover contact of relay A, to the grid of V3. V3 and V4 constitute a "flip-flop" arrangement which is stable in either one of two conditions:

- (1) V4 conducting and biasing off V3 to prevent conduction;
- or
- (2) V3 conducting and biasing off V4.

The application of positive voltage to the grid of V3, therefore, makes this valve conduct, closes relay C and hence D. Thus as soon as relay A returns to normal, D being closed, "dot" voltage is impressed on the timing circuit by the changeover contacts of D, which also open the circuit to the key lever to prevent a dash over-riding the "stored" dot. The flip-flop is reset by a pulse from relay "B", through the 0.002 μ F condenser, on its next make, and returns the circuit to normal.

Some adjustment is available in the grid leak circuit of V3 to set up the correct conditions. The 500K ohm potentiometer should be adjusted to the resistance value which gives the correct "dot hold" operation. This is checked by setting the speed control (R6) to about 12 words per minute and sending the letter N at about 20 w.p.m. when, if all is in order, a correctly formed N at the speed of setting of R6 should result.

There is nothing critical about the two relays C and D, and Post Office types of 3,000 to 6,000 ohms will be satisfactory up to 25 w.p.m. A less sensitive relay could no doubt be used for D if a corresponding reduction is made in the 15K ohm dropping resistor in series with this coil.

Improving the RF 26 and 27 Units

THE performance of RF26 and 27 units, the use of which for the new 4 metre band was described by Dr. Koster (G3ECA) in the November 1956 BULLETIN, can, according to Mr. R. Palmer (G5PP), be greatly improved by a few simple modifications. The following procedure is suggested:—

1. Remove the aerial input circuit from the co-ax connector (including the small coil trap circuit).
 2. Wind a two turn link on to the aerial coil for balanced twin feeder input. If one end of this coil is connected to earth, co-ax input can be used.
 3. Connect a 250K ohms resistor across the r.f. stage padder.
 4. Replace the resistor across the mixer padder with one of 250K ohms.
 5. Replace the resistor across the oscillator padder with one of 250K ohms.
- (The padders are mounted on the vertical screen between the tuning condensers. The padders are num-

bered C3, 16 and 31 in the circuit on page 202 of the November 1956 BULLETIN.)

6. Replace the mixer bias resistor with one of 5K ohms.
7. Replace the r.f. stage bias resistor with one of 5K ohms.
8. Replace the r.f. stage anode resistor with a v.h.f. choke. (The choke should be wound on a $\frac{1}{2}$ -in. diameter former $2\frac{1}{2}$ in. long with 30 s.w.g. enamelled wire, the winding length being 2 in.)
9. Increase the value of mixer screen resistor to 250K ohms.
10. Remove the resistor across the i.f. output coil.
11. Wind an 8 turn link winding of 30 s.w.g. enamelled wire on to the "cold" end of the i.f. output coil and earth one end. Use co-ax for the connection to the main receiver.
12. Remove the condenser output from the mixer anode circuit.
13. Remove the 2pF coupling condenser from the oscillator to the mixer. Take a lead direct from the oscillator and push the other end of it into one of the holes in the mixer grid coil former. *Do not connect directly to the grid coil.* (This modification will provide ample oscillator injection and reduce the noise considerably.)
14. Fit an 8 μ F condenser in parallel with the oscillator decoupling condenser to improve the c.w. beat note.
15. If there is any trouble with i.f. break-through, insert a series-tuned 7.5 Mc/s wave-trap in one leg of the feeder to the aerial input.

After these modifications have been made it will be found that the i.f. output hiss tunes sharply and that gain and selectivity will be better.

"Made for Life"

Mullard Film Show in North London

AT the Manor House Hotel, Finsbury Park, London, on November 22, 1956, Mullard Ltd., with the co-operation of the Grafton Radio Society and the Finsbury Park Centre of the Radio and Television Retailers' Association, screened their new film "Made for Life". The film tells the story of Mullard Radiant Screen television tubes from drawing board to final testing.

The film was introduced by Mr. Colin Gardner, a member of the Mullard Technical Executive, who later in the evening spoke about common faults in television tubes and recent developments.

Among the 200 people present at the meeting were Council Members C. H. L. Edwards (G8TL), F. Hicks-Arnold (G6MB) and W. H. Matthews (G2CD), R.S.G.B. Vice-president H. A. M. Clark (G6OT) and the General Secretary were also in attendance.

The chair was taken by Mr. A. H. Pounds, chairman of the Finsbury Park R.T.R.A. Centre, who had the support of Mr. L. A. Kippin (G8LP), Chairman, and Mr. A. W. Wennell (G2CJN), Hon. Secretary, Grafton Radio Society.

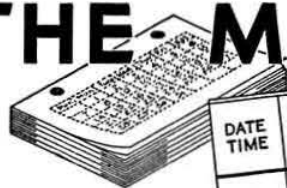
A vote of thanks to Mr. Gardner and the Mullard Company was proposed by Mr. Clarricoats who referred to the pioneer work on cathode rays done, nearly 50 years ago, by the late Mr. A. A. Campbell Swinton, first President of the Wireless Society of London, who, in 1908, predicted the use of such rays in what he then called "distant electric vision."

Refreshments were served during the evening.

Henry's (Radio) Ltd.

IN the advertisement for Henry's (Radio) Ltd., on page 237 of the November BULLETIN, the price of the set of six transistors under the heading "Special Offer" was inadvertently omitted. The price for the set is 60/-.

THE MONTH



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

ON THE AIR

BY S. A. HERBERT (G3ATU)*

INTERNATIONAL happenings during recent weeks have inevitably had their effect on the world of Amateur Radio. One result has been the temporary cancellation of transmitting licences in the Cyprus area, while the events in Central Europe have had consequences of which we are all aware. Let us hope that it will not be long before the tension eases, both in the world of radio no less than in other and wider spheres.

Conditions during this troubled period have been poor in comparison with those of the previous three months. True, there have been times when the high frequency bands have been full of DX, but solar storms now begin to enter the picture and a couple of really good specimens during the period disrupted communications for days on end. Still, we should hardly grumble at such concrete evidence of solar activity; let 'em all come and the bigger the better!

Ten Metres

The above-mentioned solar outbursts always upset things most on the high frequencies and so ten has emerged rather poorly from the fray, having been dead or almost so for days on end. The lucky people were those who caught the band just before a storm or just after it had finished. Those are the times when things start happening and all sorts of DX is liable to appear, some of it seemingly at quite the "wrong" time, before the curtain drops and everything goes dead. So with fewer reports than usual, to business.

B.R.S.20317 (Bromley) found things down a bit, but his BC348/RF26 combination still pulled in phones CR5AC (17.00), CR5SP (St. Tome), CR7DS, CR9AK, 9AL, DU1AP, FB8BZ, FQ8AF, OQ0DZ and YS2AG, while he logged HK3PC, ST2NG, UL7KAA (heard often on Wednesdays around 15.00), VK9XX and VS6 on c.w.

B.R.S.20135 (Newport, I.O.W.) found mornings good, but evenings poor (even without the occasional power cut!) and mentions CR9AH, ZD3BFC, ZD4BR, VP3HAG, VP7RV (G5RV), ST2DB, SV0WE (Rhodes), VK and ZL, all on phone. **B.R.S.6327** (London, S.W.18) lists CP2AA, VU2EJ, VQ2AS, FA, LZ1, YO, ZE, ZS and KP4 on phone, heard with a 67ft wire in his loft, while **B.R.S.20249** (Sutton) heard G5RV talking from CM9AA, just before he left for Nassau.

B.R.S.20106 (Petts Wood) has his receiver peaked on ten to help in the search for new countries—he already has the formidable total of 151 on the band—but found things down. When he hears local DX chasers talking to each other on a Sunday morning instead of working the Far East, it shows something or other! However, he still managed to dig out c.w. such as FK8AO (08.00 and 09.45—he gave E19N RST569), JA1CO, 3AH, VE8OW, KG4AN, UJ8KAA and UA9s 'CM, 'CR and 'DA, while on phone he heard VE5, '6, '7, KL7BCS (19.00), KR6RB (12.00), OA4EE, HR2HO, FB8BZ (15.30), ZD6, ZP and T.F. A UM8 is on c.w. from time to time and a CN8 was calling KS6 (which may not mean a thing).

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

B.R.S.18017 (Warwick) is one of those who has been caught up in events and is now "Somewhere in England"! At least though, he was lucky enough to strike a camp which boasts a shack complete with AR88 and two aerials—a vertical and a 100ft wire—and his off-duty time was spent listening to HP11Z and W7s 'VER, 'NHI, 'ZTG on c.w. and OA4EE, VO6AD and CX on phone. **B.R.S.3129** (Norwich) tells of his attempt during the phone section of the CQ DX Contest to log 100 countries. He nearly succeeded, too, with a total of 93 in an actual listening time around a third of the 48 hours. On ten, 46 countries were logged and CN2BL, CR6AI, FB8BP, VK9DB, VP2KB, VS6AE, ZC4IP and 4S7YL are some not previously mentioned.

G3JCS (Reading) sends his first report, having deserted eighty metres for the DX bands. Two 807s at 80 watts and a dipole delighted him with ZD4BR on phone for a new one, but he prefers fifteen metres, as will be seen later. **G6CJ** (Stoke Poges) fulfilled his promise to check 50 Mc/s with a view to possible cross-band 28 Mc/s QSOs and dug his converter from the attic where it had been since 1947. No means were handy to check if it was still tuned to the band, so Dud had to wait for a signal and at 16.15 G.M.T. on November 18 all doubts were dispelled when up came WIHDQ at RST569 calling "CQ cross-band 50-28 Mc/s." Unfortunately, the ten metre path was poor and no contact was made, but it is now only a question of time, Dud suggests that 50-70 Mc/s cross-band work will be possible when the m.u.f. gets up to 70. Probably not this year but maybe next November.

G3ATU talked to G5RV, operating CM9AA's station and Louis wants it known that he now has VP5RV and VP7RV available for use in addition to calls already granted him. He is now on a trip which will take him to all the capital cities of Central America and to Lima and he will doubtless appear from friendly shacks in the various countries he visits. Other A3 QSOs were with VE2ASY (ex-ZB1GKU) and VE3AYE (ex-G3AAU), now happily settled near Toronto and using a rig kindly given him by VE3BWY who is, of course, Ham Whyte, ex-G6WY. Both send 73 to their friends over here. CR9AH was worked while under the able management of VS6AE and VS6BE, who had been let loose in Macau to enjoy a few days' holiday! VP5ML (Turks Is.) completes the ten metre picture.

Fifteen Metres

Fifteen was affected less than ten by the unstable conditions, but it too had its ups and downs. **B.R.S.21008** (Abingdon) sends us his first report. He needs one more country for his century after listening on the band since July last and his latest phone DX is CR9AH, KA3KB, KH6AGO and KR6RB, all midday, plus ZD8SC, VQ5EK, CR6 and OQ5. **B.R.S.20317** lists BV1US, CE8AG, ET2PA on phone and CR7BS, ET3AH, UA0KOA, UL7CB, VP2LU on the key. **B.R.S.20135** listened to XZ2RN, JZ0PC, VU2HF, VS2UW, VP8BT, VK7PM, YN1PM and other luscious items on phone

while **B.R.S.20249** overhead G2MI and other fortunate Gs in converse with VP8BP (Vahsel Bay), CE8AG (P.O. Box 479, Punta Arenas, Chile), sundry VP6s on phone and VE6KJ on c.w.

B.R.S.20106 mentions VE5, '6, UA9 and ZD2DCP on c.w. and BV1US (14.20), VP7NS, ZP5JP, UB5KBA and TI2DL on phone, while **B.R.S.18017** used his borrowed AR88 to pull in KR6SF, JA1CR, VK7MD, EL1L, HH4MV and ZD1FG on the key and then found KL7MZ (21360), XZ2OM (21250-13.40), TG9US and OY9ML on phone. **B.R.S.3129**'s century chase landed him EA6AR, FF8AP, HZ1AB, VP8BU and ZS9G to mention only a few. **G3JCS** battled with the multi-vibrating jammers and worked JZ0ACK (07.40) and ZS3BC (18.25) for two good new ones; he enjoyed a three-way with ZL3AB and a PY, over the long path one morning. Your commentator has heard VP8BU occasionally around 18.00-18.30 at good strength on c.w. and was talking to BV1US when up came a jammer and that was quite definitely that.

Twenty Metres

Once more twenty has been full of DX and also full of Europeans for most of the time; although this combination is guaranteed to raise certain people's blood pressure, the band still remains a good bet for chasers of far away places. An example of the world-wide nature of the DX available comes from **B.R.S.20104** (South Harrow) who turns in a c.w. listing of VR2BA (18.20), ZS9O (Box 23, Francistown), ZC5JM (18.30; R.A.F.

Labuan), UA1KTO/FJ (Franz Josef Land, QSL to UA1-8808), XW8AB, ZA1AB(!), ZD9AE and ZS7H. He also heard scores of hopefuls calling on FL8 smack on his frequency, then someone with a nice sense of humour came up with a recording of *Blaze Away*!

A.1328 (London, W.1) using his 6SA7 converter heard YS1MS for an uncommon one on phone. **B.R.S.20317** heard the suspect ZA1AB, BV1US (20.20), FE8AE, HR1AT, VK9TC (New Guinea, 19.20), VP8BK, 'BR, 'BS, ZD9AE, ZS7C and 3W8AA, all on the key. **B.R.S.20249** heard UD6BM for a new one and PY8MO gave him his last PY call-area, VP8BW and VQ5GJ were also logged, the latter being jammed by out-of-turn callers. **B.R.S.20106** has been hearing ZL, JA and KH6 in the evenings together with FK8AO (19.15), AP2AD, FG7XD, FP8AP, VP8BK (20.30), UA1KAE and VK6DJ (22.30, calling FK8AA/MM). On phone, he heard VP2DN and VP7NS around 02.50 G.M.T.! He still finds twenty best, but says that may be because he is at work when ten and fifteen are open.

DL2ZO (G3KMQ) has done well since getting his DL call last July and he now has over 100C. Activity is mostly on 7 and 14 Mc/s; his latest on this band are FL8AB, UA1KAE, FB8ZZ, AP2AD, VS5BS, UH8BA, UL7CB and VK9TW. **G3ATU** worked VK9AJ (23.45) who is on Direction Is, in the Cocos-Keeling Group and is ex-VK1RW. The VK9 call is now official for the Group and replaced VK1 on October 1, 1956. Ron of ZD6RM also worked him and is thanked for passing on the same news. Other DX of the c.w. variety

Frequency Predictions for January 1957

PREPARED BY J. DOUGLAS KAY (G3AAE)

Short skip on the higher frequency bands is expected during the summer months, and is due to Sporadic E reflection, which is normally unpredictable and of short duration. However, throughout the past autumn, and continuing through the present winter, signals normally within the skip zone have continued to be well received on 14 Mc/s and to a lesser extent on 21 and 28 Mc/s. The reason for this is that the m.u.f. figures have increased so considerably that normal E and F layer propagation over short haul circuits is now a daily occurrence. To quote two examples for the month under consideration, the January m.u.f. on the Rugby-Rome circuit is due to reach 29 Mc/s while that on the Rugby-Stockholm circuit will approach 24 Mc/s. The approach of the period of sunspot maximum is not therefore without its disadvantages to the DX worker.

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA
M.U.F.	39 Mc/s 1500	42 Mc/s 1300	38.5 Mc/s 1600	38.5 Mc/s 1400	48 Mc/s 1000	46 Mc/s 1000	43 Mc/s 1030	32 Mc/s 0800
28 Mc/s	1230—1830	1030—1930	0930—1930	0830—1900	0730—1700	0800—1530	0800—1500	0730—1500
21 Mc/s	1130—2100	0930—2100	0900—2100	0730—2000	0630—1830	0700—1700	0700—1700	0700—1630
14 Mc/s	1030—2200	0845—0200	ALL DAY	ALL DAY	0600—0000	0630—2000	0630—1830	0600—1730
7 Mc/s	2000—0800	2200—0700	2200—0800	2000—0700	2000—0200	2200—0200	1800—0000	1600—2000
3.5 Mc/s	2200—0630	2300—0400	2200—0400	2000—2300	2100—0200	2300	2300	1630—1800

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

to be heard includes UPOL6, who sounds as if he may be near UA1KAE (but that is just a guess), CR4AH, ET3RH, FL8AC (very difficult, this one!), ZS3DP, UGYA (who should be elsewhere, surely, with that call, but who was engaging in semi-commercial chatter with amateurs) and a gentleman signing SU1JD and giving his QTH as Port Said—of all places! Those wanting the Faroes on phone should listen for OY2Z, who has recently been putting out a well-modulated signal from those islands. **G2DHV** (London, S.E.13) heard FQ8AX, VK3KX, LU5CH, OA5CP, VO2U and a CN2 within a few minutes recently. He has just received picturesque QSLs from FS7RT, EL9A (who is now EL12G), W6YI and W7VMP.

Forty Metres

Past rude remarks about the band prompt **G3LEQ** (Tunbridge Wells) to leap to its defence. He says if you really like to do things the hard way, try a late night session on eighty c.w., jammed as it is with more and more non-amateur traffic in what passes for Morse. (To which we can only say, "Here, here.") **G3LEQ** finds the only really troublesome member of the *Tin Pan Alley* gang still on forty is Radio Paris on 7050 kc/s. He got his licence last August, at the age of eighteen, and finds 25 watts A3 and 50 watts A1 ample for DX such as CE3ZO. **B.R.S.20317** did well to hear XE1A, 'IKZ, CE3AG, YI2DX, HH3DL, UL, UA0AA, W5, '6, '7, VP6RG and ZL4GA, while **B.R.S.20106** logged ZS5PM (18.00), KZ5BE, UA9 and ZL4GA. **G5FA** (London) has always been a keen and successful user of the band and with only 30 watts he raised XW8AB. In fact, '5FA finds 30 watts adequate for all bands and for months now he has used no more.

W2GZZ strongly advises Europeans to move above 7050 kc/s where there are clear channels for DX working. Below that frequency, American QRM is colossal. **G3ATU** worked AP2RH (01.00), who is genuine and heard PK5CR (00.30)—one of those doubtfuls that may possibly turn out to be good.

Eighty and One-Sixty Metres

There seems little interest here yet, though some DX may start creeping through on Top Band about now, despite the solar cycle. **B.R.S.20106** heard DL2UY and OKs up there around 18.30 G.M.T. **B.R.S.20317** logged HB9T and the DL at 15.40, while on eighty, he got UQ2, UR2, CT1, 4X4CK and II for new ones, then heard W1, '3, '4, '8 and W0MSK (23.50).

Other Home Items

G3AAE (Barnet) says he worked no DX of consequence but passes the news that W4EMF/KS4 returns home in January. Send all QSLs for him to the W4 Bureau and not to Swan Is. Having remarked on the lack of HH QSLs, '3AAE promptly received one—from HH2Y. **G3KZR** (Cambridge) is home after a spell as ZB1ZR and is on from G6UW until his own rig arrives from Malta. He remarks on the queues waiting for him on 14 Mc/s c.w. Low power or no, he often worked Ws non-stop until dawn! Anyone wanting a ZB1ZR QSL (subject to a log check!), should write to the QTH given in the New Members' List in the October BULLETIN.

G3LHO (London, S.W.20) is another returned wanderer, being ex-MI3TM and VQ4EG. From Kenya, he worked 110C and, as he has 99 confirmed, he would be delighted to see just one QSL from MF2AG, MP4QAL, CR9AH, '9AL, KP4TA, while anyone short of his card should write to 108 Cannon Hill Lane, Merton Park.

News from Overseas

A note from **B.E.R.S.928** (G3III), now in Cyprus, confirms that all ZC4 licences have been withdrawn, pending the cessation of the emergency. **VS6CO** (R.A.F. Sek Kong, Hong Kong) is an R.A.F. Club station (with some five operators) which is active on 14 c.w. and 21 c.w. and phone. The noise-level on 14 Mc/s is terrific, so they appeal for Gs to look for them on 21 Mc/s phone. The motto at VS6CO is "The longer the QSO the better we like it" and they are always happy to talk back home. **G3JFF** should by now be settled in Singapore and will doubtless appear with a VS1 call at an early moment and add a second DXCC to the one he earned from 'JFF. With 108C worked, it should be there all right.

W6ITH of FS7 and PJ2 fame has some pointed comments to make on the activities of rumour-mongers. There are those amongst us who have only to hear the mere possibility of a new country being active and they pass on all sorts of fancy "details" which are nothing but wishful thinking. **ITH** himself was caught up in such a situation when he asked a VK6 over the air what transport was available from Australia to Christmas Is. (ZC3). The next thing he knew, someone put it in print that he was going there; then it was reported he was on his way: stations were heard talking about his having arrived and one character said he had heard the mythical ZC3. **ITH** by then fully expected to be snowed under with requests for QSLs! As, in fact, nothing further was ever done about any such trip, he is somewhat naturally peeved. He has been granted permission to operate from "Freedomland," Spratley Is., in the China Sea, and holds the call DUORT, but, at the moment, no decision has been made as to any further plans. Rumour-mongers, please copy.

So ends another month. With Christmas looming, early posting of reports would be appreciated, so good luck, good hunting, a very Merry Christmas to you all and 73.

Wireless World Diary 1957

THE *Wireless World* Diary for 1957 contains 80 pages of reference material in addition to the usual diary pages of a week to an opening.

The Diary is available from Headquarters price 4s. 6d. (post free) in rexine and 6s. 3d. (post free) in cloth.

DX Television Predictions for January, 1957

Prepared by J. Douglas Kay (G3AAE)

Barbados	1300-1500	Colombo	0800-1400
Trinidad	1300-1430	Karachi	0800-1330
Rio	1100-1130	Singapore	0900-1200
Aden	0800-1600	Hong Kong	0930-1030
Baghdad	0800-1500	Accra	0900-1600
Bahrein	0800-1430	Dakar	1000-1600
Tel Aviv	0800-1500	Nairobi	0800-1600
Bombay	0800-1400	Cyprus	0800-1600

G.M.T. throughout

The above predictions are given for the Band I transmissions of the B.B.C. on a sound frequency of 41.5 Mc/s. The vision frequency of these transmissions is 45 Mc/s.

A report has been received from New South Wales, Australia, that, during November, strong signals were received on 41.5 Mc/s, but as the transmission consisted entirely of music, positive identification of the signal was not possible.

A Simple Receiver for the Beginner

Easily-built Basic Design

By C. H. L. EDWARDS (G8TL)* and PETER SMITH (A.1372)†

The receiver described in this article was designed for the beginner. The superhet arrangement was chosen because it was thought that a tuned radio frequency circuit would not cope adequately with the conditions prevailing on the amateur bands at the present time.

The prototype, built by Peter Smith, a 15-year-old schoolboy, was exhibited at the 1956 National Radio Show and is now at the Science Museum Amateur Radio station GB2SM. A set which he built at the National Radio Show in August will be on the Society's stand at the forthcoming National Schoolboys' Own Exhibition later this month.

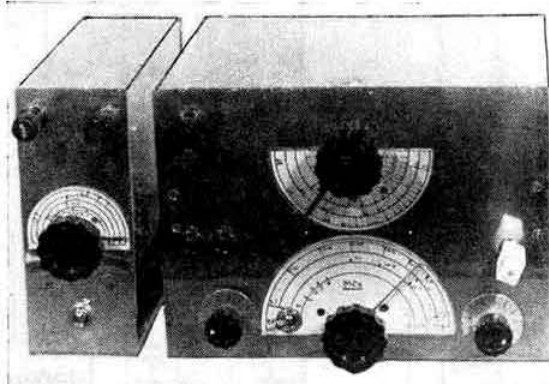
FOR the newcomer with but little knowledge of Amateur Radio a few remarks about short-wave receivers in general may give a clearer picture of their method of operation. A receiver extracts its energy from passing radio waves, separates the desired signal from a host of others and then reproduces the modulation of the original signal. The latter function of the receiver entails amplification, since the power output must be considerably greater than the energy extracted from the original wave. When selecting the type of receiver to construct several important points have to be considered. First, selectivity, which is its ability to discriminate between signals of different frequencies; second, sensitivity, which is its response to weak radio signal voltages and third, the accuracy with which it will reproduce the intelligence contained in the original modulated wave.

In considering a design for the newcomer, the problems looked formidable when costs, circuitry, complication, inexperience in layout and constructional work were considered. However, the circuit shown in Fig. 1 was eventually evolved. Basically, this is a three-valve superheterodyne, not too complicated or difficult to construct, yet covering most of the points enumerated above.

As a rough guide the set can be built for less than £4 using surplus components and for about £9 using all new parts.

In a superhet, the incoming signal is changed to a lower radio frequency (called the intermediate frequency) then amplified and finally demodulated. The first valve, V1 (a 6K8), is called the mixer. Its function is to accept the selected radio signal and mix it with a steady signal generated in the receiver oscillator section, the resultant being a signal bearing all the modulation of the original but of a frequency equal to the difference between the local oscillator and the incoming frequency. This appears in the output of the mixer circuit and is applied to the second valve V2 (a 6SK7) which is the intermediate frequency (i.f.) amplifier. It is there amplified and passed on to the germanium crystal rectifier (CR) which rectifies the signal before feeding it to the grid of V3, which is the audio amplifier.

In order to receive Morse c.w. signals, regeneration is obtained by looping a turn or so of wire (L7 in Fig. 1) around the lead connecting the first i.f. transformer (IFT1) to the grid of the 6SK7, and connecting this wire

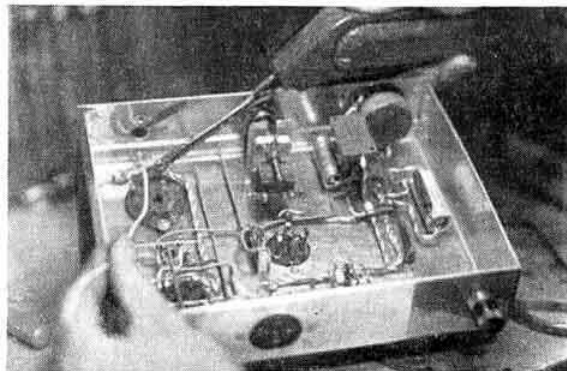


The simple receiver with the r.f. unit.

to the anode pin. Often, however, the close proximity of the anode and grid wires will provide sufficient coupling. By varying the bias on V2, using the potentiometer R11, the valve can be made to oscillate as required.

To improve further the selectivity and sensitivity, an r.f. stage was constructed as a separate unit. This is plugged in between the receiver and the aerial. For the newcomer this can be added at a later date when experience in handling the receiver has been gained, and sufficient cash has become available! The circuit of the r.f. stage is shown at the left of Fig. 1.

When using the r.f. unit care should be taken not to tune to the second channel or image frequency. The h.f. oscillator frequency will cause i.f. response at two signal frequencies, one which will be higher than the oscillator frequency and one which will be lower. For example, if the oscillator is set at 7465 kc/s to tune to a 7000 kc/s signal, the receiver will also respond to a signal on 7930 kc/s to give a 465 kc/s i.f. The latter signal is called the image frequency and can cause repeat points on the tuning dial. If difficulty is experienced, it is advisable to ask a local radio dealer to align the unit as he will have the use of a signal generator to do the job.



Wiring up the receiver.

*28 Morgan Crescent, Theydon Bois, Essex.

†5 Heath Drive, Theydon Bois, Essex.

To forestall the criticisms of the "old-timer" it should be remembered that this set is designed for the newcomer to build, hence a much larger chassis is used than would normally be required. This allows the constructor plenty of room to operate with a hot soldering

iron and also permits the use of the physically larger and older types of components which can be purchased cheaply on the second-hand market. Efficiency on the h.f. bands naturally suffers, due to the long leads, but most newcomers build their first receiver to listen to

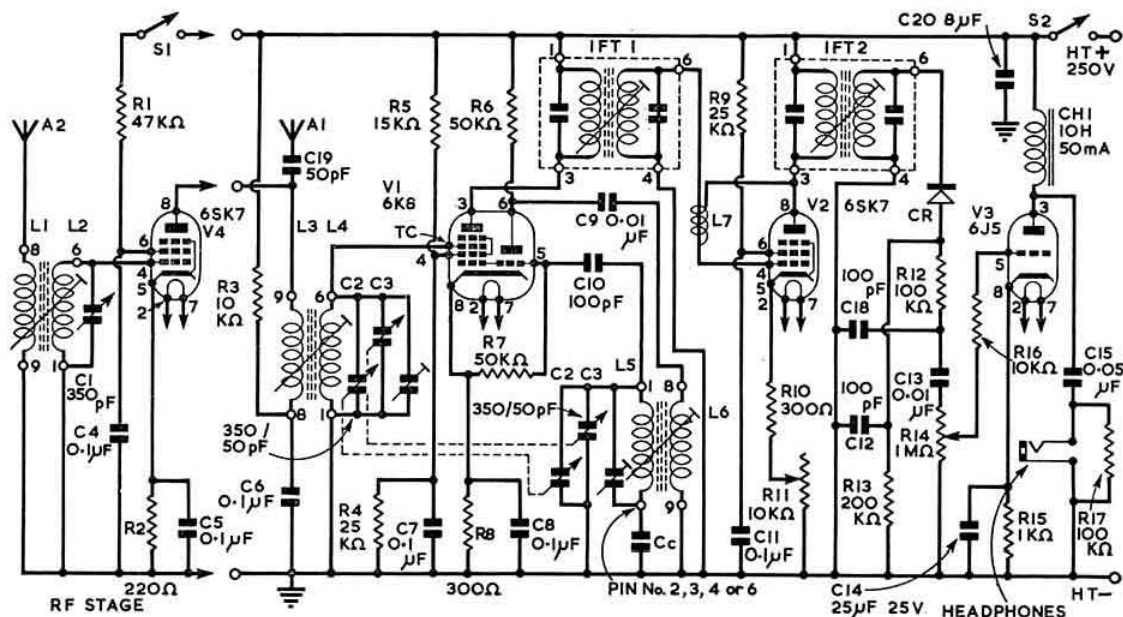


Fig. 1. The circuit diagram of the simple receiver with the optional r.f. stage at the left.

LIST OF COMPONENTS FOR THE SIMPLE RECEIVER

Cc, part of Maxi Q coil.
C2, 350pF variable condenser, twin-gang (Jackson Bros. type O, Cat. 5250).
C3, 25pF variable condenser, twin-gang (Jackson Bros. type O).
C6, 7, 8, 11, 0.1μF 350 volt working condenser (Dubilier).
C9, 13, 0.01μF 350 volt working mica condenser (Dubilier).
C10, 12, 18, 100pF silver mica condenser (Dubilier).
C14, 25μF 12 volt working condenser (Dubilier).
C15, 0.05μF 350 volt working condenser (Dubilier).
C19, 50pF silver mica condenser (Dubilier).
C20, 8μF 350 volt working condenser (Dubilier).
CR, Germanium crystal rectifier (Brimar type GD5/3).

IFT1, 2, 465 i.f. transformers (Maxi-Q type IFT11/465).
L3, 4, Maxi-Q miniature dual purpose coils R2, 3, 4, and 5 (Yellow).
L5, 6, Maxi-Q miniature dual purpose coils R2, 3, 4, and 5 (Red).
L7, see text.
R6, 7, 47K ohms ½ watt resistor (Dubilier).
R3, 16, 10K ohms ½ watt resistor (Dubilier).
R4, 27K ohms ½ watt resistor (Dubilier).
R5, 15K ohms ½ watt resistor (Dubilier).
R8, 16, 330 ohms ½ watt resistor (Dubilier).
R9, 27K ohms ½ watt resistor (Dubilier).
R11, 10K potentiometer (Bulgin type IVC19).
R12, 17, 100K ½ watt resistor (Dubilier).
R13, 220K ½ watt resistor (Dubilier).
R14, 1 Megohm potentiometer (Dubilier).

R15, 1000 ohms ½ watt resistor (Dubilier).
CH1, 10H 50mA choke (Ellison).
S2, Single pole on/off switch (Bulgin type S259).
V1, 6K8 (Brimar).
V2, 6SK7.
V3, 6J5 (Brimar).
Chassis and panel (Denco (Clacton) Ltd.).
3 Octal valveholders (Bulgin type VH85).
2 Four-pin valveholders (Bulgin type VH76).
2 B9A (novel) valveholders (for coils).
1 Headphone jack (Bulgin type J2).
1 Headphone jack plug (Bulgin type P38).
1 Dial light (Bulgin type D170/red).
2 Terminals (Bulgin type TL3).
3 Tagstrips (Bulgin type T17).
2 Knobs (Bulgin type K94).
2 Knobs (Bulgin type K294).
1 Epicyclic drive (Jackson Bros. Cat. 4511).

LIST OF COMPONENTS FOR R.F. STAGE

C1, 350pF variable condenser (Jackson Bros.).
C4, 5, 0.1μF 350 volt working condensers (Dubilier).
L1, 2, Maxi-Q miniature dual purpose coils R2, 3, 4 and 5 (Blue).

R1, 47K ohms ½ watt resistor (Dubilier).
R2, 220 ohms ½ watt resistor (Dubilier).
S1, Single pole on/off switch (Bulgin type S259).
V4, 6SK7.

LIST OF COMPONENTS FOR POWER SUPPLY

CH2 10H 60mA smoothing choke (Ellison).
C16, 17, 8μF 500 volts working electrolytic condenser (Dubilier).
T1, 250-0-250 volts 60mA, 6.3 volts 3 amps, 5 volts 2 amps.

V5, 5Z4 (Brimar).
1 three-pin plug and socket (Bulgin type P73).
1 Octal valveholder (Bulgin type VH85).
1 Four-pin valveholder (Bulgin type VH76).

2 Fuse carriers (Bulgin type F27/1).
2 Fuses, 1½ in., long, 250mA (Bulgin type S123).
1 Dial light (Bulgin type D170/red).

British and foreign broadcasting stations and later to amateur stations working on the 160 and 80 metre bands.

In order to keep down the cost as much as possible, octal valves are used. Valves of this type can be purchased on the second-hand or surplus market for a few shillings each. If Maxi-Q coils are too expensive suitable substitutes can be wound on bakelite or cardboard formers. Data on former sizes, wire sizes, and the number of turns required are given in most handbooks. All coils should be screened to stop any interaction between them.

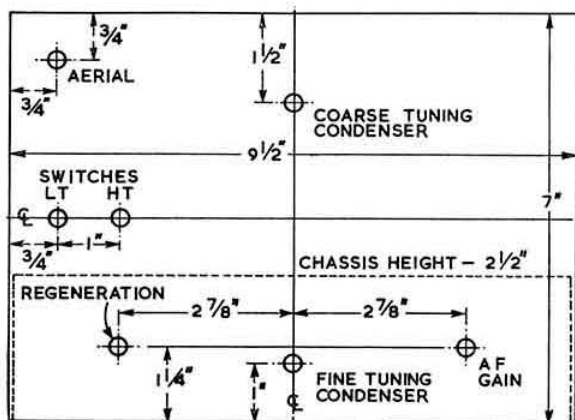


Fig. 2. Front panel layout of the receiver.

If coils are too large or no cans are available metal screens should be fitted between the stages. To avoid buying plugs and sockets, valveholders can be used as outputs from the power supply and receiver, the bases of dud valves filled with wax being used as connectors. Dials can be made from stiff pieces of card covered by a thin piece of celluloid or perspex secured to the panel by countersunk 6 BA screws. Pointers are made by using No. 12 aluminium knitting needles or cycle spokes, filed to an edge, threaded 10 BA and screwed to the slow-motion drive.

To make sure that a young person could build this receiver it was decided that Peter Smith should construct the prototype himself. Assistance and advice were freely available and the writer allowed him to use his workshop. Only simple tools were used such as screw-drivers, pliers, cutters, files, metal hand saws, handbrake, drills and taps,

etc., but no power drills or saws. The writer buffed the aluminium and made up the perspex boxes for show purposes, whilst Peter Smith made the oak boxes in the woodwork department at his school. He now tells in his own words how he got on with the job of construction.—G8TL.

Construction

I was fortunate in having the assistance of G8TL and the use of his workshop in building this little receiver, but it could have been constructed equally well on a kitchen table with a selection of simple tools.

The front panel and chassis were measured out and cut from 18 gauge aluminium, the latter being bent in the vice to size, using pieces of angle iron between the jaws to protect the surface from becoming marked. All the holes were then drilled in the chassis and front panel, those larger than a conventional twist drill bit being made by drilling a series of small holes around the circumference of the hole to be cut, these holes being joined by a pair of tinsnips, the centre being pushed out. The rough hole was then smoothed by a half-round file. Care was taken to see that the holes for the pins of the i.f. transformers were drilled in accordance with the maker's instructions in order to prevent them from shorting to the aluminium chassis. The corners of the chassis were strengthened with small right-angle brackets which were fixed with 6 BA nuts and bolts and screwed to the front panel.

The chassis and front panel layouts are shown in Figs. 2 and 3.

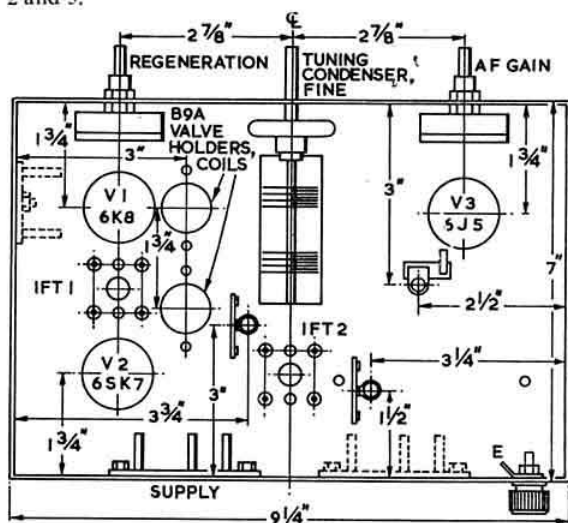


Fig. 3. Layout of the chassis for the receiver section.

Assembly

First the valveholders were mounted. These were of the paxolin type for the sake of economy although the solid plastic type or ceramic variety would have been suitable. The i.f. transformers were next placed into position. In order to avoid incorrect wiring great care was taken to get the numbers of the pins marked on the chassis before screwing the latter down. Although the transformers used were of the Maxi-Q miniature type, any 465 kc/s transformers would be suitable. The two potentiometers were next fixed at each end of the chassis, their spindles protruding through the front panel.

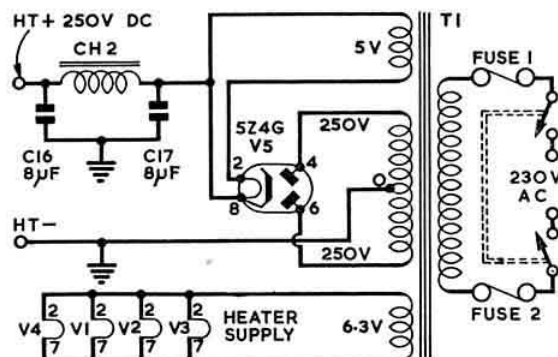


Fig. 4. The power supply. Note the use of a double pole on/off switch in the primary circuit of T1 to completely remove the connection to the mains when the set is not in use.

Between these two components a two-gang condenser (25pF capacity) was mounted. This was set back $\frac{1}{2}$ in. to accommodate an epicyclic slow-motion drive for the fine tuning. The coarse tuning condenser (350pF) was assembled above the chassis $1\frac{1}{2}$ in. from the top of the panel. The fitting of the choke offered no special difficulty. The two sockets for the coils were then screwed into position. (If Maxi-Q coils are used, these will be Noval valveholders. If home-made coils are used, 4-pin or any other type of valveholder is suitable.) The remaining components were then assembled into position.

Wiring

The valve heaters were first wired with 18 s.w.g. insulated wire, twisted in order to eliminate hum. The grid circuits were next coupled up keeping the leads as short as possible. Finally the h.t. supplies to each valve were wired in. When soldering in the diode (CR), care should be taken to avoid heat reaching the crystal. This will be



Peter Smith plugs in the last valve before testing the Simple Receiver.

avoided if pliers are used to hold the wire between the crystal and the point to which it is to be soldered. The decoupling condensers should be soldered in the right way round, i.e., earthing the end with the black ring; the bias electrolytic condenser (C14) must also be connected correctly.

Testing and Operation

Before applying voltages the circuit should be checked thoroughly. If the results are satisfactory, i.t. can then be switched on. Make sure that the fuses in the power supply unit are correct (250 mA). Now connect the h.t. circuit and after affixing an aerial to the set, rotate the coarse tuning knob towards the all-in position of the condenser. Look for the B.B.C. Third Programme on 464 metres (No. 2 Maxi-Q coils). The slugs in the i.f. transformers should then be rotated carefully until maximum signal strength is reached (these are roughly correct when dispatched by the makers). If the Third Programme is received with the tuning condenser half-way out, rotate the slug in the red coil until the signal is received with the condenser nearly all in. This gives a very rough

calibration. Sharpen the tuning by rotating the slug in the blue coil (aerial). Swing the condenser through the scale and the Third Programme should again be heard on 194 metres. Leaving everything as before, adjust the trimmer on the coarse condenser (blue coil) until maximum signal is obtained. The most effective way to align any receiver is to use a signal generator. Your nearest amateur would no doubt be pleased to help in this task. If not, a local radio shop will undertake the job. I found the set worked well on the medium wave broadcast, 160, 80, and 40 metres; but the addition of the r.f. stage greatly improved results.

R.F. Unit

This is a very desirable addition to the receiver, and can be made quite cheaply. The chassis is $2\frac{1}{2}$ in. by 7 in. by 2 in. deep. The front panel is 7 in. by $2\frac{1}{2}$ in. The main components consist of a variable condenser 350pF (C1), valve (6SK7) and holder, toggle switch (S1), resistors and condensers. The unit is connected to the receiver by banana plugs mounted on the underside of the chassis on a piece of $\frac{1}{4}$ in. paxolin. The toggle switch opens the screen circuit. The unit is tuned by a variable condenser fitted with an epicyclic drive.

Operation

First tune in the wanted signal on the receiver and then connect the r.f. stage. Set the pointer of the variable condenser approximately in line with the coarse tuning condenser of the receiver. Rotate the slug in the blue coil until maximum signal is obtained. When the unit is in use the blue coil is used as L1, L2, and the yellow coil takes its place in the receiver.

Power Supply Unit

This is a very simple and compact unit. The front panel measures 7 in. by 3 in. and the chassis 7 in. by $2\frac{1}{2}$ in. by 2 in. deep. It contains a mains transformer which delivers 250-0-250 volts h.t. at 60 mA, 5 volts 2 amps and 6.3 volts 3 amps. This is used in conjunction with a 5Z4 rectifier (V5) and smoothing choke (CH2), which has an 8 μ F condenser (C16, 17) from each side to earth. In the unit are also two 250 mA fuses in the main leads and a 3-pin mains socket and indicator lamp. The h.t. consumption is 45 mA for the set alone; with the r.f. unit connected it requires 55 mA total current.

The circuit is shown in Fig. 4.



Marking out the dials as described in the text.

A Two-Band Amplifier for V.H.F./U.H.F. Operation

By W. A. SCARR, M.A. (G2WS)*

THIS single valve amplifier which utilises a Mullard QOV03/20A valve, is designed to provide r.f. energy in the 144 and 420 Mc/s bands, the band-change being effected by a simple plug and socket device in the anode circuit of the valve.

The valve acts as a straight power amplifier on 144 Mc/s and as a power tripler on 420 Mc/s. The chief advantages of the method are:—

(a) Efficient operation on the two bands, necessitating the purchase of only one power valve.

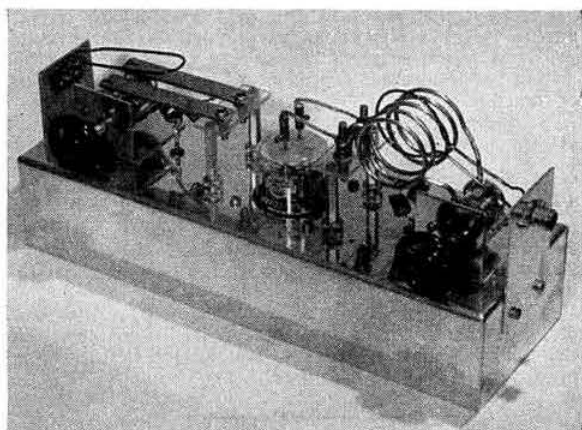
(b) Band change effected in a matter of seconds. No changes of power supply are necessary and aerials for both bands may be left permanently connected to the amplifier.

(c) Two band operation is secured with a minimum of components and an economy of weight and space, particularly useful for portable operation.

Construction

The unit may be built on a chassis 12in. x 4in. x 2½in. —just long enough to accommodate the two tank circuits. The valveholder is mounted about one inch below the top of the chassis by means of brass stand-offs. The centre of the circular cut-out through which the valve envelope protrudes is 5½in. from the nearer end of the chassis. This is the end which bears the 144 Mc/s tank circuit.

The circuit, apart from the band-switching arrangement, is conventional. The grid coil, consisting of two turns of 16 s.w.g. wire, ¾in. diameter and spaced ⅞in. apart, is tuned by a Philips concentric trimmer soldered as near as possible to the ends of the coil which terminate at the grid tags of the valve socket. Input is via a co-axial cable, the socket for which is fixed at the back of the chassis opposite the grid coil. A single-turn coil of insu-



In this picture of the two band amplifier, the 420 Mc/s p.a. circuit is to the left and 144 Mc/s circuit on the right.

lated wire from the input socket is pushed between the turns of the grid coil and adjusted to give maximum grid current.

Terminals are provided at the back of the chassis for including battery bias in the grid circuit. Although not essential for telephony operation, fixed bias is desirable for c.w. operation and in case excitation fails, when abnormal anode current might flow. Between 20 and 30 volts may be used according to the anode voltage employed.

The anode connectors were made from brass fittings taken from a 5 amp. electric lighting socket. Short lengths of stout wire braid were soldered to the open ends of the connectors and transmitter-type plugs were soldered to the other ends of the braid. The braid links should not be longer than 1½ in. The two pairs of sockets, one on either side of the valve anodes, are supported by small polystyrene "bridges," as shown in the photograph.

The 420 Mc/s anode lines consist of twin strips of 16 s.w.g. copper, ½ in. in width and 3½ in. long, separated by a ⅞ in. gap. The strips are soldered directly to the tags of the split-stator tuning condenser. A suitable "hair-pin" of 16 s.w.g. enamelled wire forms the aerial coupling and is adjusted for maximum output with the aerial connected.

The 144 Mc/s anode coil is also series tuned, each half consisting of 2½ turns of 8 s.w.g. silvered copper wire, the turns being 1½ in. in diameter and spaced approximately ⅞ in. between turns. A loop of 16 s.w.g. enamelled copper wire be-

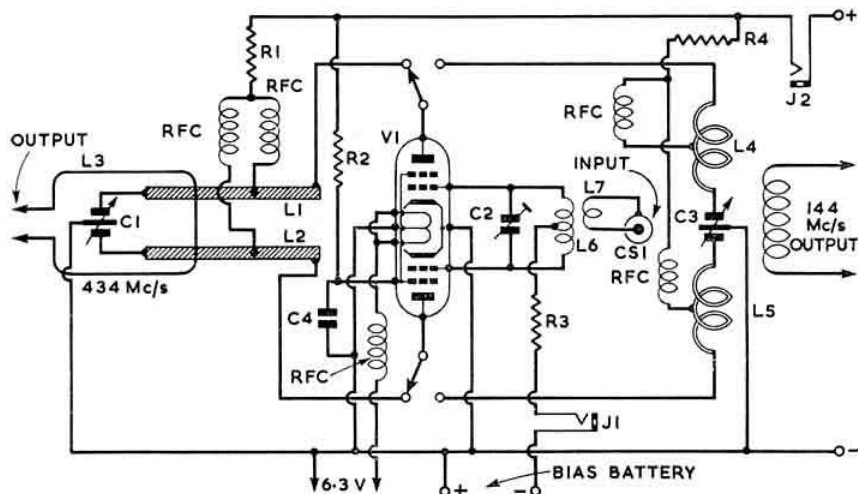


Fig. 1. Circuit diagram of the two band v.h.f./u.h.f. amplifier

C1, 5 + 5 pF (approx.) split-stator condenser.

C2, Concentric trimmer, 8 pF (Philips).

C3, 10 + 10 pF split-stator condenser.

C4, 0.0003 μF.

CS1, Co-axial socket (Belling-Lee).

R1, 4 1000 ohms

R2, 27K ohms.

R3, 47K ohms.

J1, 2, closed-circuit jacks.

L1, 2, 4, 5, 6, 7, see text.

L3, loop 2 in. long, ⅞ in. wide (approx.).

V1, QOV03/20A (Mullard).

tween the two halves of the coil provides coupling to the aerial feeder. Care must of course be taken to wind the two halves of the coil in the same direction, otherwise output will be greatly reduced.

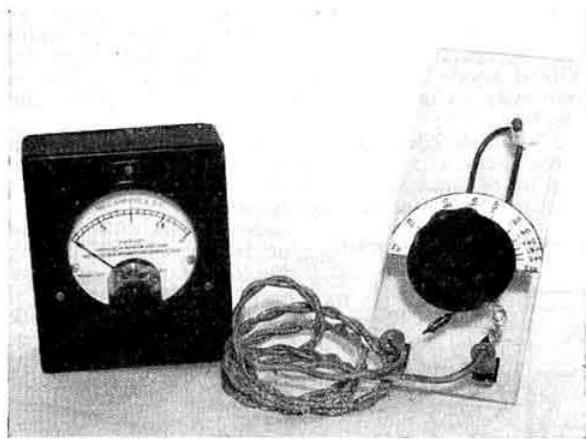
Closed-circuit jacks in the grid and anode circuits enable suitable meters to be plugged in for checking grid and anode current. These and a 5 pin Belling-Lee socket for the power supplies, are mounted at the back of the chassis.

At the writer's station, the amplifier is driven by a crystal-controlled exciter unit, the final stage of which has a 5763 valve functioning as a doubler to 144 Mc/s. With anode voltage at 300, the combined anode and screen-grid current is about 56 mA when 12 volts battery bias is used. The current falls below 50 mA if excitation is removed. With 400 volts on the anode, 24 volts battery bias may be used, the current consumption then being about 75 mA.

It should be remembered that during operation high d.c. voltage is continuously present in both tank circuits. Power should always be switched off before changing from one band to the other.

Simple V.H.F. Absorption Wavemeter

By J. Greenwell (G3AEZ)*



FINDING the band is perhaps the biggest problem the newcomer to v.h.f. work has to overcome in getting started. The simple absorption wavemeter described here is an easily built unit covering 65 to 230 Mc/s and can therefore be used to check the oscillator frequencies of f.m. tuners and Band III converters in addition to the 70 and 144 Mc/s stages in v.h.f. transmitters. The circuit is shown in Fig. 1.

Construction and Calibration

Construction is perfectly straight forward and all the components, apart from the meter, are mounted on a perspex plate $7\frac{1}{2}$ in. by 3 in. by $\frac{1}{8}$ in. Details of the tuned circuit are shown in Fig. 2 and should be closely followed. The layout of the other components is not critical provided they are kept away from the inductance loop.

*Wigmore Lodge, Beare Green, near Dorking, Surrey.

To prevent damage to the crystal when soldering, a heat shunt should be used.

For accurate calibration a signal generator would be required but provided the inductance loop is carefully

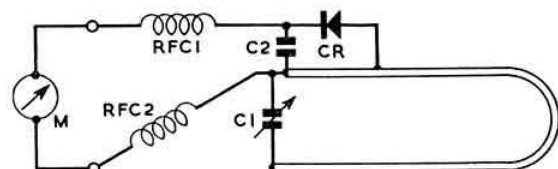


Fig. 1. Circuit diagram of the simple v.h.f. absorption wavemeter. C1, 4–50 pF (Jackson Bros. Type C.804); C2, 500 pF; CR, germanium diode (type CG1C or similar); M, 1–2 mA m.c. meter; RFC1, 2, v.h.f. chokes (80 turns 40 s.w.g. enamelled wire close wound on $\frac{1}{2}$ watt resistor of 1K or more and wax dipped).

constructed and the knob and scale are non-metallic, dial markings can be determined from Fig. 3. These should be accurate enough for most purposes.

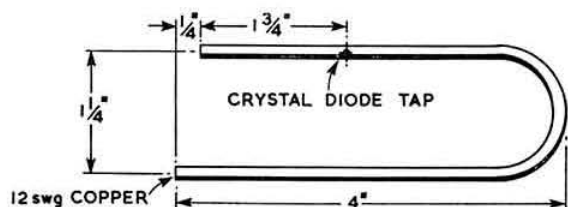


Fig. 2. Details of the inductance loop made of 12 s.w.g. copper wire. The dimensions should be closely followed if the calibration of Fig. 3 is to be used.

Operation

The unit should be loosely coupled to the tuned circuit under test, and the condenser then tuned until the meter indicates resonance. For low power oscillators a more sensitive meter should be used if available.

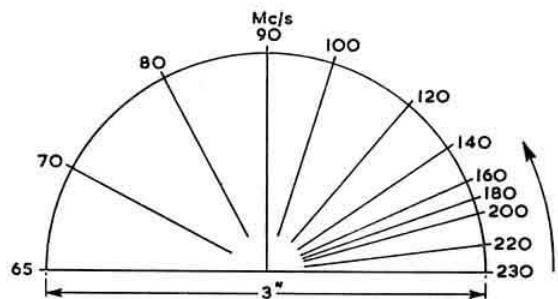


Fig. 3. Dial calibration. The calibration points relative to the base line (anti-clockwise) are: 230 Mc/s—0°; 220 Mc/s—8°; 200 Mc/s—16°; 180 Mc/s—20°; 160 Mc/s—25°; 140 Mc/s—35°; 120 Mc/s—50°; 100 Mc/s—73°; 90 Mc/s—90°; 80 Mc/s—118°; 70 Mc/s—152°; 65 Mc/s—180°.

The wavemeter can also be used to make adjustments to v.h.f. aerial arrays.

A single turn coil should be loosely coupled to the wavemeter loop and connected via a low impedance feeder to a dipole pointing towards the aerial under test.

R.S.G.B. News Bulletin Service			
GB2RS		3600 kc/s	
10.00 G.M.T.	Sundays	12.00 G.M.T.	

TWO METRES AND DOWN

New Activity Period Inaugurated—Four and Six Metre News

By F. G. LAMBETH (G2AIW)*

A SITUATION of some gravity has lately revealed itself and the adverse results will soon be apparent unless some energetic steps are taken to redress the balance. We (the British v.h.f. population) appear to have no real voice in Region I I.A.R.U. v.h.f. deliberations. As we are the largest single National Group within the Region, our participation at a high level is not only desirable, but in many ways essential, and we accordingly call for the strongest representations, at the earliest possible moment, to this end. There is a growing feeling that v.h.f. operators are being neglected, and it is urgently necessary to refute this claim. The liaison with the Region I International V.H.F. Committee must also be improved in advance of the closer co-operation called for above. We are not happy at being virtually disenfranchised; the only remedy is to take action with the least possible delay.

Two Metre Activity Night Inaugurated

Before the November BULLETIN appeared with its trenchant calls by G6LI and G8RW for more activity on the 2m band, there had been some earnest discussion on this point over the air between G5KG (Chelmsford) and G5UM (Hertfordshire). The upshot was a meeting "on the air" on November 17, in which six Home Counties v.h.f. operators took part. The object of the meeting was to inaugurate a weekly activity night that will really "stick", in contrast with the abortive efforts made in the past.

"You people in Hertfordshire already have a Monday night net running regularly", observed G5KG to G5UM, "how about developing this nucleus into something much larger?" And so the snowball started to grow, with an encouraging turnout of the Home Counties 2m operators on November 19 and promises from members in many other populated centres to stimulate similar activity.

A beginning has been made, and if the sustained level warrants it, it might even be possible to initiate a second weekly activity night. Here are the reasons which motivated the choice of Monday:—

1. A nucleus of activity already existed (at least in the Home Counties region).
2. For many people Monday evening is a "dead" evening and the compulsion of television is not so often exerted.
3. There is no clash with weekend contests.
4. It is important to promote activity during television hours, and not expect people to wait until a late hour when they should be in bed if they are going to work next day.
5. Heating arrangements in shacks often have to be fixed up in advance during the winter months. It would be worth members' while to know that they can always have the shack warmth turned on every

Monday with the assurance that their time and fuel will not be wasted.

It is hoped that all 2m operators will come on to the band between 8 and 10 p.m. every Monday evening irrespective of conditions. If this happens, one outstanding complaint—"that you seem to be talking to the same people all the time"—will be disposed of; there will be so many on that you won't have time to talk to all of them, even if conditions are at their worst!

Four Metre Band Activity

The advent of the new 4m band makes the heading to this feature a trifle misleading, but this, being somewhat hallowed by time, will be retained for the time being. Pride of place is given, however, to 4m reports this month.

Up to the time of reporting G5KW (Chelmsford) has had 10 contacts, the best distance worked being Coventry. G6NB (Brill) has also been active and is believed to have exceeded G5KW's tally so far. At the end of November about 20 stations were on the band, with more coming on all the time. G5MR (Hythe, Kent) is listening with a dipole in the roof space, and hopes to have a transmitter and more efficient aerial shortly.

G8LN (Plumstead), who will be on this month, reports that G3BTC is already equipped, which should help London operators desiring reports. '8LN suggests that output on 4m can be obtained from a simple 3 stage transmitter using a 5-6 Mc/s crystal, viz., c.o. to 23.4 Mc/s, tripling to 70.3 Mc/s and thence to the final. T111 valves can easily be employed for all stages if desired. Much can be obtained from cheap simple apparatus working efficiently, and miniaturisation is not essential.

B.R.S.6327 (Earlsfield) is listening with an unmodified RF27 unit working into an Eddystone 740. The 2m aerial is being used. '20162 (Selsdon) is also active. G3BFP/A has worked G5KW.

G3HRH (Welwyn Garden City) finds little activity so far, but hastens to say that the Welwyn Garden City v.h.f. group is already on the 4m map. His transmitter is running 40 watts to a QQV06/40 and a crystal controlled R.S.G.B. type converter into a BC348. The aerial is a 5-over-5 2m array, but he hopes to have a 5-element Yagi in use soon. So far, G3JMS has been worked (crossband to 160m), G5KW and '8KW direct on 4m, with G3EYV heard. The QSO with G3JMS was achieved with the aid of a 2m aerial at '3HRH and a Band III aerial at '3JMS! The latter now has a dipole at 30 ft.

B.R.S.16075 reports that stations active on 4m in the Southampton area are G3FAN, '3ARL, '3GOP, '3BHS and '3KMI, plus several listeners. G3GOP and '3BHS have worked G2HCG.

G3BHS (Eastleigh) reports that he and G3GOP set about getting on 4m as soon as the news was received over GB2RS. '3BHS was ready on November 2 but no

*21 Bridge Way, Whitton, Twickenham, Middlesex.

replies to CQs were received until November 4, when G3GOP was raised; this has been followed by nightly QSOs. November 12 brought the first contact outside the area—with G6NB (Brill, Bucks.)—reports being S8 to 9 both ways. QSOs with G3ARL (Lake, I.O.W.), G3FAN (Ryde) and G2HCG soon followed. The aerials at both '3BHS and '3GOP are temporary dipoles in the roof space. The receiver in use at G3BHS comprises a 6BZ7 cascode r.f., 6AK5 triode mixer, 88 Mc/s tuneable oscillator and BC348 (i.f. 18 Mc/s). The transmitter is an s.e.o. on 11.72 Mc/s, doubler, tripler to 70.32 Mc/s with an 832 final running 25 watts input. G3GOP's equipment is similar.

G3KMI (Southampton University) and G3AFD are listening on the band and will be transmitting shortly, as will G3ION.

G3HHY (Bristol) is operative on 70.26 Mc/s. The aerial will soon be either a 2 or 3 element Yagi (a folded dipole is at present in use). The converter is a modified r.f. unit into the 23 valve 14 Mc/s—455 kc/s—85 kc/s main receiver.

F80L (Paris) is equipped to receive 70 Mc/s and transmit on 72. **PEIPL** has a 70 Mc/s receiver for cross-band 70/144 Mc/s QSOs.

Station Reports 2m

Band conditions on 2m have been patchy this last month. One or two periods of fair conditions have been reported, but little or no fresh Continental traffic. After the October opening things have, in fact, returned very much to "normal" which this year means little activity by reason of (or in spite of) conditions.

G8LN (Plumstead) has not been very active apart from skeds, but found conditions on the whole reasonably good. '8LN greatly approves of the Monday evening activity period, and will be there whenever possible "as activity is appalling during the evenings." **G5MR** (Hythe, Kent) is to be congratulated on working G13GXP on October 21. Conditions were good, and fading was only slight. The distance (362 miles) is only part of the story; '5MR is surrounded by hills, which usually screen the north-west completely. **B.R.S.20133** (Melton Mowbray) heard G6XM (Tollerton, Notts) probably for the first time locally, on the key on November 19. We hope this presages Bill's return to the fray. Most of '20133's log was compiled on November 18.

G3KHA (Bristol 4), in spite of falling off in conditions and activity after October 21, still worked the "occasional" station, including G3HKT who said it was the first QSO outside his area (Southampton). November 4 was quite an active day, but things were generally dull until November 16 when Northern and Midlands stations came through. Phone QSOs were made with G3JWQ and '3DKF and two Leicester stations (G3GVK and '3GXN) were heard for the first time. **G5MR** (Hythe, Kent) was heard on November 18 and was called without success. '3KHA has been running a sked with G3IOO (Oswestry) for about a fortnight, with a view to possible QSOs on 70 cm. He has had no luck yet, although sometimes the 2m signals have been excellent, especially on November 17.

G3WW (Wimblington) reports a QSO with G5BQ which was the first on any band for five years. Welcome back to 2m OM. Conditions generally (says '3WW) were good on November 17-18, but not abnormally so. '3WW has not heard much from the south lately.

B.R.S.16075 (Shirley, Southampton) has found activity on 2m less as many people are either going on, or preparing for 4m. November 16-18 was a good period,

with signals to the north excellent, G3WW, '2ATK and '3JWQ being S9+ signals.

G3HHY (Bristol) worked (in this order) DJ1DC, G2BVW, F3XY, G3JWQ, G3IEK and GC2FZC, '3EBK for first contacts, during the October opening. '3HHY would never have thought that ON4BK could have been such a strong signal. On November 15-16 conditions were good to the north but '3HHY is hampered by a 1-in-6 hill rising 100ft to his north; nevertheless three Midlands stations were raised. **G3HKV** (Beaminster) is on 144.45 Mc/s looking for contacts. At present his operating time is between 18.30-19.30 G.M.T. Mobile operation can also sometimes be arranged from nearby hilltops. The rig is an REE Communicator used in the car with a $\frac{1}{4}$ vertical whip.

B.R.S.19162 (Dewsbury) says that the recently opened ITA station is causing "birdie" troubles to G5YV and G3GFD, both on hill-top locations. The television transmitter is only five miles from Dewsbury, but in one of '19162's bad directions and nothing can be heard on the R.S.G.B. converter "so being down in the hole seems to have its advantages."

G2XV (Cambridge) says local activity has reached a new "high" with several new stations on the band including G5BQ. **G2JF** (Wye, Ashford, Kent) reports for the first time with quite a good list of stations worked. '2JF hopes that the new 4m band does not distract too much attention from 2m.

G3JGJ (Plympton) heard EI4E at last on November 5 at 539 but no QSO has yet resulted. GC3EBK was worked on October 21, the first time ever heard by '3JGJ. The sked with GC2FZC continues. Parallel lines have been fitted to the 2m converter and also to the 832A p.a. The improvement to both is very pleasing. Experiments are being made with f.m. on 2m.

G6LI (Grimsby) suggests that anyone who wants to know the times of PEIPL's 2m skeds should apply to G5BD, '5YV or '5KW. Times already known are G6LI (09.00) and G2NY (09.15). During the first London activity night (November 19), '6LI made no contacts whatever, the only stations heard being on telephony and within 75 miles.

Two Metre News from Scotland

Activity has been generally low, according to **GM6WL**, only a few stalwarts like GM3NG, '6KH and '3GUO holding the fort. GM4PW (Prestwick) has again been heard in QSO with '3DIQ (Edinburgh). '8MN (Crieff) has worked '3NG and '6KH.

Seventy Centimetre Reports

G2XV is still looking for fresh contacts on the band, and would like to hear from any operators who are "ready to go". **G3HHY** (Bristol) is fully operative on 70 cm, running an 832 with about 4 watts output to an eight-element bi-directional stack. It is hoped to make this into a QV03/20 with 8 watts shortly. The receiver comprises a crystal mixer and head amplifier into 14 Mc/s on the main receiver. '3HHY has two other 70 cm "generators". One is a 6J6 in a trough as an s.e.o./super-regen for portable work on the Vespa scooter, while the other gives 100 watts output from a pair of RD12TF Lorentz tubes. QSOs on 434.1 Mc/s or cross-band 2m or 4m or straight 70 cm will be welcomed. Tests are proceeding with G3KHA (Knowle).

GM2CQI (Glasgow) is receiving on 70 cm, and as he has now acquired a QV06/40 it is hoped he will soon be transmitting. GM3INK, '3NG, '3GUO, '6KH and '6WL are generally to be found on 70 cm every Sunday forenoon.

Twenty-three Centimetres

A successful crossband QSO took place on November 18 between **G3BVU/P** (2 miles west-north-west of Hook Norton on the Warwick/Oxford border) and **G3FUL/P** at Dunstable Downs, a distance of 43 miles. '3BVU transmitted on 23 cm from Hook Norton and the return circuit employed Top Band and 3.5 Mc/s. The 23 cm signal was S9+. There was thick fog at both ends. A further attempt will be made at Christmas to improve the distance, weather and other circumstances permitting. A previous, but unsuccessful, attempt was made between Hook Norton and Galley Hill on October 13. Dunstable Downs has a height advantage over Galley Hill of approximately 180ft and is 3 miles nearer. The points used, however, were on the roadside, and not the actual hill tops. Congratulations to both stations for their sustained efforts. We look forward to news of further progress.

Three Centimetres

G3BAK (Havant) states that quite a lot of apparatus suitable for 3 cm has appeared recently on the London market. Many excellent pieces have been obtained, including a couple of 18 in. reflectors. '3BAK is in course of checking an "easy method" of predicting when 723A/B klystrons are "in the band". It is hoped to have further information when the tests are completed. **G3LBA**, who is very interested in 3cm work, visited '3BAK recently.

Predicting Conditions by the Stars

An interesting suggestion comes from **G3IPV**, who is serving in *H.M.S. Coruma*. He advises metre wave enthusiasts to examine the stars on a clear night. If the stars do not twinkle it should be a good guide of stability of the atmosphere and to the possibility of propagation by ducts. If, contrariwise, there was considerable twinkling, there would be a chance of propagation by forward scatter through the troposphere. The idea is feasible—what do other members think?

The 50 Mc/s Band

W4NWB (near Greenville, South Carolina) would appreciate co-operation from listeners over here and, of course, 28 Mc/s crossband contacts. The best times to listen are from 13.00 to 16.00 G.M.T. between 50 and 51 Mc/s.

From **WIHDQ**, v.h.f. editor of *QST*, news has been received of activities on 50 Mc/s, a band which is assigned to amateurs in North America and various other countries. With the m.u.f. steadily rising there is a good chance of crossband contacts with British stations on 28 Mc/s. Those interested should note that **WIHDQ** calls CQ on 50 Mc/s and listens on 28 Mc/s for replies.

Writing to **G3IGK** (Wolverhampton), on November 23, 1956, **WIHDQ** (V.h.f. Editor, *QST*) said, "November has turned out to be the best month for F2 layer DX across the Atlantic that we've ever experienced. The 50 Mc/s band was open almost every day (every day that 28 Mc/s was open in fact) but we have yet to make

LONDON U.H.F. GROUP ANNUAL DINNER

Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

Friday, January 11, 1957, at 7 p.m.

All v.h.f. and u.h.f. enthusiasts welcome

Tickets, price 12/6 each, may be obtained from P. A. Thorogood (G4KD), 35 Gibbs Green, Edgware, Middlesex.

FLASH!

50 Mc/s Opens Across the Atlantic

On December 1, 1956, between 15.37 and 16.27 G.M.T., **E12W** (Dublin) on 28 Mc/s worked **W1FOS**, **W1HOY**, **W1HDQ**, **W2UTH** and **W8CMS** on 50 Mc/s. All the contacts were on phone, reports ranging from RS55 to RS59+.

On the same day, **G5BD** worked three U.S. stations and **G5MR** heard one American station. **G6DH** (Clacton) worked **W1HDQ** at 13.20 G.M.T. on December 1 and **W1AEP** shortly afterwards. During the latter QSO **W1HDQ** relayed **G6DH**'s signals on 50 Mc/s as **W1AEP** had no receiver for 28 Mc/s. **G6CJ** heard **W5VY** on December 1 and on the following day **W1FTX** was heard working **E12T**. **W1DEI** was calling **DL4ME**. **G3COJ** (Maidenhead) has logged stations in VE1, W1, 2, 3, 4, 5 and 8 and worked several. Conditions on December 5 were still improving.

American stations on 50 Mc/s wishing to work cross-band generally tune from 28 to 28.25 Mc/s.

a single contact, cross-band or otherwise. I have received numerous 'heard' reports from England, Ireland and France, but still no takers on our daily calls for cross-band contacts. We're still hoping, however, that we will yet come across someone who has a 10 metre transmitter and a 6 metre receiver!"

A very happy Christmas and New Year to v.h.f. operators everywhere. Reports for January as early as possible after this issue of the *BULLETIN* is published, please. Be sure to come on to the 2m band every Monday from 8-10 p.m.

★ ★ ★

Worked and Heard on Two

GC2FZC (Guernsey) October 13-14.
Worked: **D1DC**, **E12W**, **G2NY**, **2ADZ**, **2AHP**, **2AIQ**, **2ANS**, **2BVW**, **2CIW**, **2DCI**, **2DVO**, **2HGR**, **3JR**, **3AUS**, **3DKF**, **3EGG**, **3FAN**, **3FGT**, **3FIH**, **3FQS**, **3GDR**, **3GHO**, **3GOP**, **3GPT**, **3HAZ**, **3HBE**, **3HGI/P**, **3HHD**, **3HHY**, **3HTY**, **3IER**, **3IEX**, **3IWI**, **3IUL**, **3JFR**, **3JGJ**, **3JWQ**, **3JZG**, **3KEF**, **3KEQ/P**, **3KHA**, **3KSR/P**, **3LHA**, **3LIM**, **5BD**, **5BM**, **5DW**, **5KG**, **5KW**, **5MA**, **5MR**, **5PP**, **5SK**, **5US**, **6AG**, **6LL**, **6YU**, **8DA**, **ON4BZ**, **PA0NO**.

G18DV/P (Limavady, Co. Londonderry) September 23, 25, 29, October 9-10, 12.

Worked: **E12W**, **G2OI**, **3GPT**, **3KFD**, **5MA**, **G13GXP**, **3DIQ**, **3NG**, **6WL**. Heard: **G3CCH**, **GM6XW**.

GW3GWA (Wrexham) October 14.
Worked: **G2DCI**, **2DVD**, **2FNW**, **3ABA**, **3CKQ**, **3DOV**, **3DKF**, **3LHA**, **4MK**, **5KG**, **5MA**, **ON4BZ**, **4HN**. Heard: **PA0FB**.

G3KSR (Farley Mount) October 14.
Worked: **F3XY**, **8RK**, **9DQ**, **G2ADZ**, **2AHL/P**, **2BRR**, **2DSW/M**, **3EPW**, **3GPT**, **3HAZ**, **3HHD**, **3IWI**, **3JGJ**, **3JWQ**, **3KEF**, **3LAY**, **5AU**, **5PP**, **5SK**, **6NF**, **GC2FZC**, **3EBK**, **GW8UH**.

G3JGJ (Plymouth) October 13-14.
Worked: **F8GX**, **8XT**, **9AJ**, **8XY**, **G3FZL**, **3GAO**, **3HBW**, **3KSR/P** (Winchester), **GC2FZC**. Heard: **F3MJ**, **8GV**, **8MW**, **8NS**, **G2ADZ**, **3AUS**, **3FCQ**, **3FIH**, **5KW**, **5US**.

G5BM (Highnam) October 14.
Worked: **F8GH**, **8LO**, **8MW**, **G3AUS**, **3EPW**, **3HWS**, **3IER**, **3IEX**, **3KEQ/P**, **3YH**, **5AU**, **GC2FZC**, **3EBK**. Heard: **ON4BZ**.

PA0FB (The Hague) October 9-16.
Worked: **D1DC**, **1XX**, **DL0MR**, **1SE**, **3QH**, **3VJ**, **3YBA**, **6SV**, **F3XY**, **8NS**, **8GH**, **G2YB**, **2FJR**, **2FNW**, **3ANB**, **3CLW**, **3DOV**, **3EMU**, **3FFV**, **3GFD**, **3HAZ**, **3JWQ**, **3KEQ/P**, **3KHA**, **3LIM**, **5DW**, **5KG**, **5KW**, **5PP**, **5SK**, **6AG**, **6NB**, **6SN**, **GC3EBK**, **GW55A/P**, **8UH**, **PA0CMH**, **OCO**, **0GER**, **0HA**, **0JMS**, **0NO**, **0SK**, **0RK**, **0WAR**.

Heard: **DJ2DF**, **F8XT**, **G2HOP**, **3AUS**, **3FZL**, **3GHO**, **3HTY**, **3IEX**, **3KUH**, **5YV**, **6LI**, **6OX**, **ON4BZ**, **4HN**, **4LN**, **PA0BL**, **0BN**, **0CA**, **0DT**, **0DEF**, **0ES**, **0IKS**, **0LAM**, **0PFW**, **0WO**, **0WU**, **0XW**, **PE1PL**.

Worked and Heard on Four Metres

B.R.S.6327 (Earlsfield)
Heard: **G3EYV**, **5KW**, **6NB**.

G3FPA/A (Selsdon, Surrey) November 3-18.
Worked: **G5KW**. Heard: **G2DD**, **3DKF**, **3EVV**, **3EYV**, **3HAZ**, **3HRH**, **5KW**, **6NB**, **8KW**.

The Z-Match Aerial Matching Unit

VIC SCOTT (GD3UB) has sent details of a simple aerial matching unit which is in use at six stations in the Isle of Man. The unit will match a nominal 80 ohm output from a transmitter to any aerial of 40 to 2,500 ohms impedance using co-axial or twin wire feeders.

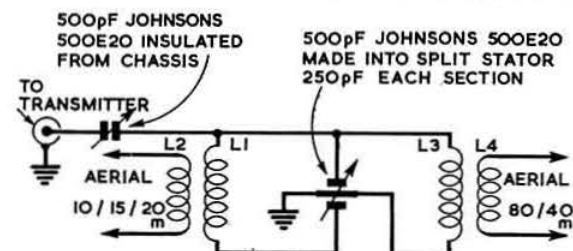


Fig. 1. Circuit diagram of the Z-Match aerial tuning unit.

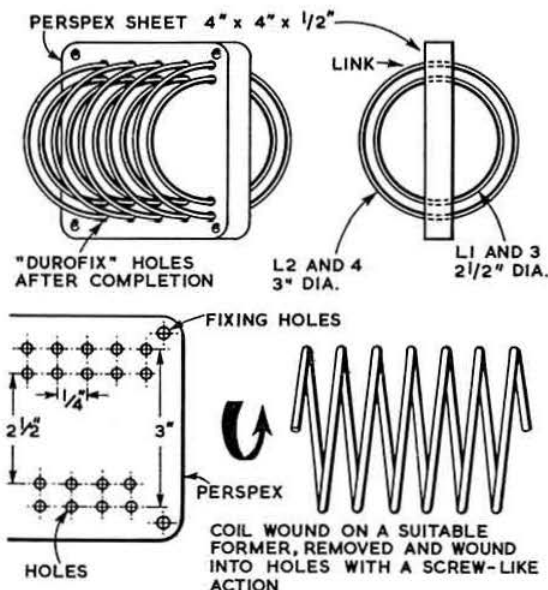


Fig. 2. The construction of the coils used in the aerial tuning unit. L1, 2, 5 turns 14 s.w.g. copper wire; L3, 8 turns 14 s.w.g.; L4, 6 turns 14 s.w.g. The windings are spaced twice wire diameter between turns.

The circuit arrangement is shown in Fig. 1, while the other diagrams illustrate the winding of the coils, suggested layout and modifications to the Johnson 500E20 condenser which is available at the present time on the surplus market.

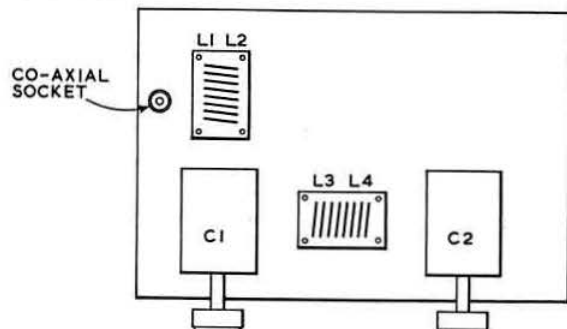


Fig. 3. Suggested layout of the aerial tuning unit. C1 is the series condenser and C2 the split stator condenser in the circuit of Fig. 1.

The tuning procedure is quite straightforward. First, the transmitter should be loaded up with an 80 ohm dummy aerial and the anode current noted. The dummy load is then replaced by the tuning unit and aerial and C1 and C2 tuned for the same reading on the anode meter.

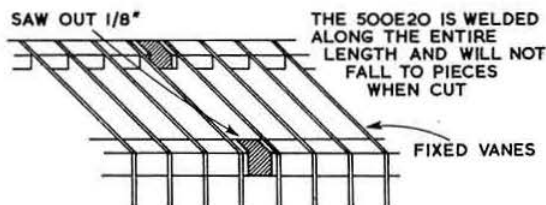


Fig. 4. Modification of the Johnson 500E20 condenser for use in the aerial matching unit.

When a standing wave ratio meter is used it should be connected in the co-ax lead from the transmitter to the tuning unit. C1 and C2 are then tuned for zero reflected power on the s.w.r. meter.

Members interested in constructing a combined s.w.r. bridge and aerial tuning unit will find an article entitled "The Z-Match Antenna Coupler" by Allen W. King (W1CJL) in *QST* for May 1955 of considerable interest.

Zanzibar Activity

WITH reference to the article "East to Zanzibar," published last month, several readers have drawn attention to the fact that VQ1RF, VQ1HJP, and VQ1CUR all operated from Zanzibar prior to 1950. VQ4VL is believed to have operated from there recently as VQ1VL.

Radio Amateur Dies During Budapest Fighting

IT is learnt from the national Press that one of the Free Hungarian stations in the recent fighting in Budapest was operated by Ferenc Kaldor (HA19KF). During the fighting, he was wounded and left for dead. Despite his injuries, HA19KF continued to operate his station until he died.

Measuring Instruments Lecture

MEASURING Instruments (Pullin) Ltd. offer to provide a speaker for a lecture on the design and manufacture of measuring instruments, providing the lecturer's immediate expenses can be recovered. Enquiries should be addressed to the Sales Manager (Mr. P. J. Lovegrove) of the Company at Electrion Works, Winchester Street, Acton, London, W.3.

R.C.E.E.A. Secretary

MR. H. E. F. Taylor has been appointed Executive Secretary of the Radio Communication and Electronic Engineering Association.

Mr. Taylor recently returned from India where he had been in business for many years. He has been an active radio amateur for over 35 years and currently holds the call-signs VU2AT and G6HT.

Amateur Television

By M. BARLOW (G3CVO/T)*

THE 1956 Amateur Television Convention on October 27 broke all records. Over 140 amateur TV enthusiasts came along to see five cameras, two film scanners, four transmitters, an "Outside Broadcasting Unit" (sic) and a host of other exhibits. Undoubtedly the most original feature was the OB Unit, consisting of an ancient London taxi, with a very noisy petrol generator on the luggage platform, and a TV camera tripod and 70 cm V-beam mounted on the roof! The camera control unit, monitor and camera were in the passenger compartment, and the whole affair was liberally decorated. First-class pictures were transmitted by the taxi back to a monitor in the exhibition hall whilst the "Roving Eye" cruised slowly around the nearest square. The equipment was built by Cambridge members, using the G8PY camera and G3KKD/T r.f. equipment.

G2WJ/T brought along the photicon camera seen at other exhibitions, now resplendent with a new coat of paint, "G2WJ/T" lettering and new cue lights. A small studio was shared with G3KOK/T, who had built a complete image orthicon camera chain in a little over three months, with the assistance of G3KWD. This camera has a fantastic sensitivity; pictures have been televised using the light from an ailing cycle lamp at twenty yards from the subject on a pitch dark night! G2DUS/T had a comprehensive exhibit of monoscope, test patterns, studio camera and 16 mm film scanner, and as ever the quality of the results was a source of wonder to many of the visitors. M. Cox (Chelmsford) showed his monoscope and slide scanner, although this had suffered somewhat in transit from Chelmsford. Amongst the static exhibits were the camera chain of the High Wycombe group, some of C. G. Dixon's colour equipment, and a comprehensive display of r.f. equipment—airials, converters, microwave links and transmitters. G3AST showed some of his flying spot scanner, and the Television Society exhibited parts of G3CTS/T, their transmitter located at Norwood which has recently been testing on the air.

Messrs. Pye, Telequipment, Solartron, Mullard, S.T.C., Proops, Iliffe and Norman Price also exhibited, and there were exhibitions of photos from overseas members.

Excerpts from lecture tapes and microfilms were demonstrated, and in the afternoon the "B.A.T.C. Television Newsreel" (complete with the proper "advertisements") was screened. The usual raffles and auctions added to the enjoyment of this most successful meeting.

Here and There

G2WJ at Dunmow and G3CVO continue to exchange pictures without difficulty. PA0LQ/T, from Leiden, remarked that the signal/noise ratio on the 70 cm link using standard domestic TV sets without flywheel sync was much the same as the Dutch 2m stations get over a longer path. In Dublin, W. Stapleton is hoping to take out the first EI/T licence to make tests with G13FWF/T and also with stations in England. G3GDR/T (Abbots Langley) now has G2WJ's old sync generator, and if 25 cm activity permits, is to originate his own pictures. At Chelmsford, the conversion of G3CVO's garage into a TV studio is now complete. Video and sound lines connect the studio with the "transmitting hall" in the house, with a most extensive sound and vision mixing and talk-back system in operation, B.B.C., I.T.A., and local slide scanner, test patterns or image orthicon camera

can be mixed in any proportions with any source of sound. Current construction involves a new sync generator (G3KOK), peak programme metering (G3KWD), a new slide scanner (J. Terry) and a mobile receiving station (M. Cox). G3CVO is completing his oscilloscope and modifying the sync generator.

New Standard

As a result of operational experience, a new standard has been proposed for British Amateur Television: this is that all sync generators should be fitted with a Belling-Lee socket for accepting mixed sync information at



This photo shows the picture received from the amateur "roving eye" on a 14 in. receiver in the Convention hall.

standard 1 volt level for the purpose of "genlocking" the generator to any other source of synchronizing pulses, e.g., the B.B.C. This makes for easier operation at exhibitions, and for better results over the air when both transmitter and receiver are locked to the B.B.C. or I.T.A.

Late News

On November 17, the above-mentioned taxi paid a visit to Birmingham, where it was enthusiastically welcomed by amateur TV enthusiasts. Prior to this, G3KBA/T had radiated his first pictures through a built-up area to the local clubroom. George is now going ahead to order a vidicon camera tube to "see if we can't beat you lads down there"! Peterborough has sprouted members recently, and a group is being formed. They aim to start with simple scanning equipment, but eventually to relay pictures across country to Birmingham.

R.S.G.B. Frequency Measuring Tests

12 noon Transmission from GB2RS (Nominal Frequency 3600 kc/s).

December 30, 1956

Reports to R.S.G.B. Headquarters by Tuesday, following tests.

*10 Baddow Place Avenue, Gt. Baddow, nr. Chelmsford, Essex.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, October 15, 1956, at 6 p.m.

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

Apology for Absence

An apology for absence was submitted on behalf of Mr. R. G. Lane.

Absent

Mr. H. W. Mitchell.

Membership

(a) *Resolved* (i) to elect 81 Corporate Members and 16 Associates; (ii) to grant Corporate Membership to 4 Associates who had applied for transfer.

(b) The Secretary reported that of the 623 members whose subscription became due on July 1, 1956, 80 became overdue on September 30, 1956. Of this number 12 were London, 42 were Country, 21 were Overseas Corporate Members and 5 were Associates. Of those overdue 6 London, 21 Country and 16 Overseas members held Amateur Radio Licences.

(c) The Secretary reported that 17 of the 80 members referred to in (b) above had written to resign. Of this number 1 had given no reason for resigning, 3 had resigned for personal reasons, 1 had resigned for financial reasons, 8 had lost interest, and 4 had given various reasons.

(d) The Secretary reported that he had written to the G.P.O. to enquire whether the P.M.G. would be willing to waive the licence fee for blind radio operators. No reply had yet been received. (See page 279—Ed.)

Applications for Affiliation

Resolved to grant affiliation to the Royal Air Force Debdon Radio Society and to the Science Museum Radio Society.

Scheme of Representation

Resolved to request the Membership and Representation Committee to give consideration to the present Scheme of Representation.

Schoolboy's Exhibition

Resolved to advise the organizers that the Society is prepared to take space at the forthcoming Schoolboy's Exhibition to be held at the Royal Horticultural Halls, London, from December 31, 1956, to January 12, 1957.

The Morse Code for Radio Amateurs

Resolved to increase the initial printing order of *The Morse Code for Radio Amateurs* from 3,000 to 5,000 copies.

The Band 70.2-70.4 Mc/s

The Secretary reported that the Post Office had agreed to allow U.K. amateurs to use the band 70.2-70.4 Mc/s on a basis of non-interference with other services, until December 31, 1958, provided no operation takes place

within a radius of 50 miles of the Jodrell Bank Observatory. Power would be limited to an input of 50 watts.

Resolved to give maximum publicity to the fact that the new facility had been obtained as the result of discussions between the Post Office and the Society.

Operating Certificates

Resolved that the Hon. Certificates Manager (Mr. R. Perks) be given discretion to deal with the financial aspects of claims from non-members and to reject any claim which he believes to be faked.

BULLETIN Advertising Rates

The Secretary submitted a letter from the Society's Advertisement Managers dealing with a proposal that BULLETIN advertisement rates should be increased.

Resolved (a) to adopt the revised scale of charges; (b) that the new rates shall apply as from January 1, 1957, except that existing contracts shall be completed at the old rates.

Mr. E. Brown, G3CSP

Consideration was given to a letter from the Honorary Secretary, Sheffield Amateur Radio Club, in which it was suggested that the Society had adopted a "remarkable complacency" in connection with the case of Mr. E. Brown (G3CSP). The letter contained a suggestion "that Counsel's opinion should be sought to explore the possibility of obtaining some type of judicial declaration to the effect that a local Housing Manager has no lawful right to interfere in the private legal relationship of his Council's tenants."

The Secretary reported that he had discussed the letter with a representative of the G.P.O. who had expressed the opinion that Mr. Brown, right up to the time he ceased to transmit, had been causing interference to two or three television sets which could not be cleared by any normal method. In view of that fact his case fell outside the arrangements which had been agreed by the Post Office and the Society.

The Secretary was instructed to inform the Sheffield Amateur Radio Club that the Society's representatives are still in touch with the Post Office regarding the case of Mr. Brown.

Cash Account

Resolved to receive and adopt the Cash Account for September, 1956, as prepared and submitted by the General Secretary.

Annual Report

Resolved to approve for publication the draft annual Report of the Council as prepared and submitted by the General Secretary.

Resolved to place on record the thanks of the Council to the General Secretary for preparing the Annual Report of the Council.

Annual Accounts

The Secretary reported that a copy of the written Report of the Auditors had been circulated to each Member of the Council.

Resolved to approve for publication the Annual Accounts of the Society for the year ended June 30, 1956.

The Balance Sheets were then signed by the appropriate Officers of the Society.

Reports of Committees

Ad hoc (Handbook) Committee

The Minutes of a Meeting held on September 20, 1956, to discuss the question of producing a new edition of the *Amateur Radio Handbook* were submitted. After a lengthy discussion it was

Resolved (by 9 votes to 4) to accept an offer made by Mr. S. K. Lewer, B.Sc. (G6LJ), to act as General Editor of the Third Edition of the *Amateur Radio Handbook*.

The Secretary was instructed to inform the Technical Committee that the Council had decided to go ahead with the preparation of a new edition of the *Handbook* and to solicit the assistance and co-operation of the members of that Committee in producing suitable material.

The Secretary read to the meeting the text of a letter which he had sent to all Regional Representatives soliciting their assistance in connection with the preparation of material for the new edition of the *Handbook*. The

Regional Representatives had been asked to obtain from their C.R.s and T.R.s the names of members who may be able to submit descriptions and photographs of modern equipment.

Contests Committee

The Minutes of a Meeting held on September 20, 1956, were submitted as a Report.

Resolved to receive the Report and the two recommendations contained therein.

The recommendations related to 1957 National Field Day rules and the results of the D/F Final.

R.A.E.N. Committee

The Minutes of a Meeting held on September 15, 1956, were submitted as a Report.

Resolved to receive the Report.

There were no recommendations.

Recorded Lectures

Resolved to authorize the purchase of six further tapes for use in connection with the Recorded Lecture Library.

The meeting terminated at 9.20 p.m.

Society News

The 420-460 Mc/s Band

MEMBERS interested in u.h.f. work will recollect that it was reported in the R.S.G.B. BULLETIN for January 1955 that the Post Office expected to replan the 420-460 Mc/s band at a future date so that the channel 425-440 Mc/s would become an exclusive amateur allocation while the channels 420-425 Mc/s and 440-450 Mc/s would be shared by amateurs with Government services on a basis of non-interference to such services. The channel 450-460 Mc/s would be taken over by the fixed and mobile civilian services.

Because of cuts in Government expenditure some of the services cannot now be moved out of the 420-460 Mc/s band for some years. Again, because of economy cuts and other factors which could not be foreseen two years ago, additional aeronautical radio navigational services (distance measuring equipments) will have to move into the band, probably in two or three years' time. For these reasons the Post Office cannot proceed with the re-allocation of the band in the way they had planned.

Radio amateurs will, therefore, still have the use of the whole of the band on a basis of non-interference to other services, as at present.

Blind Radio Amateurs—Licence Fees

BEARING in mind that the Council of the Society has been empowered by the Board of Trade to waive the subscription for blind Corporate Members, the General Secretary recently wrote to the Post Office to enquire whether the Postmaster-General would be willing to waive the licence fee for blind radio amateurs in the same way as he waives the fee for blind broadcast listeners.

In their reply the Post Office pointed out that under the terms of Section 2(2) of the Wireless Telegraphy Act the Postmaster-General has no power to dispense with the fees for transmitting licences for any class of person. Regrettably, therefore, he is unable to waive licence fees for blind radio amateurs.

Reciprocal Arrangements

ON several occasions in recent years the General Secretary, on behalf of the Society, has made representations to the Post Office with a view to short-term licences being issued on a reciprocal basis to foreign amateurs visiting the United Kingdom.

The G.P.O. have now examined the Society's proposals and those submitted by two Foreign Administrations, to see whether reciprocal arrangements could be entered into with those and other Administrations, whereby an amateur resident abroad for a period, or taking a holiday abroad, could apply for a temporary amateur licence under the conditions applicable in the country in which he wishes to operate.

After very careful consideration the Post Office have advised the Society that they are unable at present to modify, in any way, the requirement that an applicant for any kind of amateur licence issued by the P.M.G. must be a British subject.

Radio Amateurs' Examination

MEMBERS studying for the Radio Amateurs' Examination may like to know that the City and Guilds of London Institute can supply copies of the question papers set at recent C. & G. Examinations. The Institute generally carry a stock of the last three papers, which can be obtained, price 6d. per copy, from Gresham College, Basinghall Street, London, E.C.2.

The reference number for the R.A.E. paper is 55/1.

Somerset County Meeting

A SOMERSET County Meeting will be held at the Angel Hotel, Westgate Street, Bath, on Saturday, January 12, 1957, from 3.30 p.m. to 8.30 p.m. The programme will include a film show and competitions. Tea will be served at about 5 p.m. Tickets, price 5s. 6d. for adults and 3s. for children, can be obtained from the T.R., Mr. J. W. Russell (G2ZR), 45 Shakespeare Avenue, Bath.

Society Trophies

IN addition to those listed in the September 1956 issue of the BULLETIN the following Trophies have been awarded for the current year:—

Braaten: Mr. F. J. U. Ritson (G5RI), leading English R.S.G.B. member-station in 1956 A.R.R.L. DX Telegraphy Contest.

Edware: Stourbridge and District Amateur Radio Society, winners of Affiliated Societies' Contest.

Houston Fergus: Mr. J. J. Yeend (G3CGD/P), winner of Low Power Field Day.

Milne: Mr. C. J. Oliver (GW5SL), leading U.K. R.S.G.B. Member-station, other than English, in 1956 A.R.R.L. DX Telegraphy Contest.

Mitchell-Milling: Mr. H. Beaumont (G5YV), winner of 144 Mc/s Contest.

Somerset: Mr. W. A. Higgins (G8GF), winner of First 1956 Top Band Contest Short Section.

Watts: Mr. A. L. Mynett (G3HBW), in connection with 1250 Mc/s Tests.

1950 Council: Mr. T. C. Reynolds (B.R.S.21019), winner of D/F National Final.

Miniatures: Mr. W. R. Stevenson (G3JEQ), winner of Short Section First Top Band Contest, 1956. Mr. R. G. Goulding (GW3GWA/P), winner of First 1956 144 Mc/s Field Day. Mr. H. Boakes (G8SB), winner of Second 144 Mc/s Field Day. Mr. D. N. Biltcliffe (G6NB), winner of First and Second 420 Mc/s Contests.

The **Desmond** and the **1930 Committee** Trophies are to be awarded to the winners of the Second 1956 Top Band and Low Power Contests respectively.

Colour Transparencies

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

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

A.R.R.L. Handbook

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

Voting Cards

HEADQUARTERS now carry a stock of voting cards for use when a ballot is called for in a Region, County, District, Town or Area.

Cards can be obtained on application to Headquarters, free of charge.

Frequency Measuring Test, November 25, 1956

THE frequency in use at G3DQ (operating as GB2RS) during the period of the test was 3605.425 kc/s.

Measurements within 25 parts per million of the correct value were submitted by G. W. Alderman (G3JXA) and C. W. Cragg (G2HDU). The measurement of K. Procter (G3EPO) was within 50 parts per million.

The final test of the present series will take place on Sunday, December 30.

Morse Gramophone Records

FROM time to time enquiries are received at Headquarters for details of Morse records. The Columbia records which were available in the past have now been withdrawn and all stocks are exhausted. Members who know of any discs which are currently obtainable in the United Kingdom are asked to send details to the General Secretary.

Jodrell Bank Observatory

FOR the benefit of members who wish to determine whether or not they are within 50 miles radius of Jodrell Bank Observatory, the National Grid Reference of the Observatory is 33/800705.

The 70.3 Mc/s Band

THE 70.3 Mc/s allocation will be available for use until December 31, 1958, not 1956, as stated on page 228 of the November issue.

London Meeting

THERE was an attendance of nearly 40 at the meeting of the Society held at the Institution of Electrical Engineers on November 30, 1956, when members of the London U.H.F. Group gave talks on the latest advances in 1250 Mc/s techniques. The President-elect, Mr. D. A. Findlay (G3BZG), was in the chair. A vote of thanks to the speakers was proposed by Council Member W. H. Matthews (G2CD).

The National Radio Show

THE Twenty-fourth National Radio Show will be held at Earls Court, London, from August 28 to September 7, 1957. There will be a pre-view on August 27.

JUST PUBLISHED

The Morse Code for Radio Amateurs

A New R.S.G.B. Publication

Written by MARGARET MILLS, G3ACC

The Author draws on many years of experience in teaching the Morse Code to produce a series of unique exercises. Each of the nine lessons includes a set of special words to be sent in a specified time.

Price 1/- (By Post 1/3)

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

Liverpool O.R.M. an Outstanding Success

INCLUDING guests, 105 members and some of their ladies attended the Region 1 O.R.M. held in the Bradford Hotel, Liverpool, on November 11, 1956. Arrivals commenced at noon and within a very short time it would have been apparent to an eavesdropper that ancillary equipment, aerials, etc., were being "designed" in all parts of the hotel.

Business began in earnest with the serving of lunch at 1 p.m. This was followed by the R.R.'s address of welcome to the guests and visitors—replied to by the President, Mr. Reg. Hammans (G2IG). Trophies were then presented to representatives of the Bury Group, winners of Region 1's own special Field day, and to the Wirral Group for the highest placed Region 1 entry in National Field Day.

The Business Meeting—always a popular item—opened with a report from the General Secretary bringing the

"pirates", TVI, and the new 4 metre band, which unfortunately is not available to the majority of members in Region 1.

After tea a cleverly edited film describing the activities of the Liverpool and Wirral groups during N.F.D., and in D/F contests, etc., was shown. The film caused much amusement in its 20 minutes' duration. A highly successful (for some) draw followed! Consternation was rife when the ticket drum was rotated minus its lid, thereby providing an excellent demonstration of the effect of gravity on small pieces of paper.

The final, and most attractive, feature was Mr. Hicks-Arnold's now famous lecture on The Antennamatch. This was accompanied by a sound film on standing waves and by appropriate lantern slides. Members were left in no doubt whatever of the efficacy and benefits of this invaluable piece of apparatus.

Thus ended a full and happy day. Thanks are due to



In this picture, taken outside the Bradford Hotel, Liverpool, on the occasion of the North Western Official Regional Meeting, the President (Reg. Hammans, G2IG) is in the centre with Frank Hicks-Arnold, G6MB, on his left and the General Secretary and the Region 1 Representative (Basil O'Brien, G2AMV) on his right. Zonal Representative Cliffe Metcalfe, G3DQ, is next to John Hodgekins, G3EJF (T.R. for Bury) shown holding the Region 1 Field Day Trophy.

members up-to-date with matters of interest. At this stage there was some external opposition in the form of a Brass Band followed, after a short interval, by a steam roller. The visiting delegation were eventually persuaded that neither of these items had been arranged by the organizing Committee! Amongst the matters discussed in the open forum that followed were, Liverpool

the President, to the other members of the Council (G3DQ and G6MB) and to the General Secretary for their attendance; also to the visitors who came a long way—these included G4JW (R.R. Region 2), OH2TZ and an old friend of Region 1 in the person of G2YS. Thanks are also recorded to the large body of willing helpers, to whose efforts the success of the meeting was largely due. G2AMV.

London Members' Luncheon Club

MESSRS. V. T. Dickins (XE1FE), Rauno Alander (OH2TZ) and Harry Wilson (E12W), were among the 25 present at the luncheon held at the Bedford Corner Hotel, Tottenham Court Road, on November 16, 1956. The Chairman (Mr. Stanley Vanstone, G2AYC) extended a warm welcome to the overseas visitors and also to Messrs. G. A. Bird (G4ZU) and J. B. Duncan (G6JB) who were making their first visit to the Club.

After lunch the overseas visitors spoke of Amateur Radio in their respective countries. Mr. Dickins mentioned that the Government of Mexico is prepared to issue licences to qualified foreigners. Mr. Dickins, who is, of course, an Englishman, has been resident in Mexico for many years.

A special Christmas Luncheon, to which ladies are invited, will be held on Friday, December 21. Reservations should be made to the Hon. Secretary (Frank Fletcher, Ruislip 2763), or to R.S.G.B. Headquarters (HOL. 7373), by not later than 12 noon, December 20, 1956.



The President (Reg Hammans) presenting the Region 1 Field Day Trophy to Bury Group representatives Tom Platt, G2GA, and John Hodgekins, G3EJF.

Dorset County Hamfest

SIXTY members, with their ladies, attended the Dorset County Hamfest at Sandacres Hotel, Sandbanks, on November 4, 1956. Those present included the Region 9 Representative, Herb. Bartlett (G5QA) and Mrs. Bartlett, the Somerset County Representative Bill Green (G3FBA) and the Bristol C.R., Roy Poeton (G3CTN). A highlight of the programme was the showing of the French film *Race for Life* which features Amateur Radio.

The organizing committee records its thanks to those manufacturers who donated prizes for the draw, to J. N. ("Jerry") Walker (G5JU) of Stratton & Co., Ltd., who demonstrated the Eddystone 888 receiver, to Peter Blanchard who acted as auctioneer and to Mrs. Blanchard for helping with the raffle. The committee particularly appreciates the unstinted support and co-operation given by Mr. Bartlett who was making his farewell appearance as Region 9 Representative.

Radio Interference Complaints

DURING the six months ended July 19, 1956, the Post Office Engineering Dept. investigated 84 complaints to broadcasting and 226 complaints to Band I television, attributable to amateur transmitters. There were only three complaints of interference to Band III television attributable to amateurs.

During the same period the Post Office investigated 3,115 complaints to broadcasting and 269 complaints to Band I television attributable to radiation from television receiver time-base circuits. This was by far the highest identifiable source of interference to broadcast reception. Sewing machines (5777), motors (4767), vacuum cleaners (3767), hairdryers (3147), power lines (2607), and other "contact" devices (2466) were the chief causes of interference to Band I television.

During the same period the P.O. staff fitted 23,015 suppressors while the radio and electrical trade fitted a further 9342.



Group photograph taken outside Sandacres Hotel, Sandbanks, on the occasion of the Dorset County Hamfest on November 4, 1956.

E.M.I. Electronics Exhibition

THE Royal Hotel, Woburn Place, London, W.C.1, venue from 1947 to 1955 of the annual R.S.G.B. Amateur Radio Exhibition, recently provided the setting for an Exhibition of Electronics organized by E.M.I. Electronics, Ltd. More than one hundred products, many of them new, were seen in both static and operating displays in a variety of applications.

By a coincidence the Exhibition took place during the last week in November, the week set aside in past years for the R.S.G.B. Exhibition.

Radio and Electronic Components Show

THE Fourteenth Annual Show organized by the Radio and Electronic Component Manufacturers' Federation will be held at Grosvenor House and Park Lane House, Park Lane, London, W.1, from April 8 to 11, 1957. Admission will be by ticket only, obtainable from the Secretary, R.E.C.M.F., 21 Tothill Street, Westminster, London, S.W.1.

Forthcoming Mobile Rallies

June 1957 Bournemouth Amateur Radio Society

In order to avoid clashes of dates, organisers of rallies are invited to submit details for inclusion in this space as far in advance as possible.

High Pass Filters

V. COLLINS (G2HOF) draws the attention of readers to the effectiveness of the high pass filter described on page 21 (Fig. 22) of the R.S.G.B. booklet *Television Interference* in preventing breakthrough from 28 Mc/s transmissions. The filter is simple and cheap to construct using only three fixed condensers. It is not so effective on 21 Mc/s.

The Editor will be pleased to hear from any member who is willing to contribute a short article on the construction of similar filters with maximum attenuations at 14 and 21 Mc/s.

British Interplanetary Society

AT the meeting of the British Interplanetary Society on January 5, 1957, at 6 p.m., Dr. M. W. Ovenden will lecture on "Astronomy and Earth Satellites."

One Sunday at Barnett Hill

The Red Cross meets the Radio Amateurs

By L. E. NEWNHAM, B.Sc. (G6NZ)*

IT was on Sunday, November 4, 1956, that the British Red Cross Society invited the Committee responsible for the organization of the Radio Amateur Emergency Network to attend a day conference with Red Cross officers drawn from all over the country at their Training Centre at Barnett Hill, Guildford. The party was made most welcome by Major-General Hawes, and then work started at 10 a.m. The General in a vigorous talk outlined the plan of action and procedure in a hypothetical rail smash which was illustrated by a large scale detailed floor model. It was obvious, already, that rapid communication would play a vital part in all the rescue work that would need to be done.

Next Col. Wilson, of the Eastern Counties, spoke of the 1953 floods and emphasized the lack of communications at that time. Warning systems could have helped much in saving life and property. He told us that his own warning in Essex came from London as a result of a rise in the Thames level, hours after flooding had already occurred on the East Coast.

At this stage of the Conference it was now overwhelmingly plain to us that Amateur Radio could be useful in such emergencies. Indeed, the radio amateurs present were thinking that it was their bounden duty to help in every way possible.

After a short interval Lt.-Col. Dunn (G2ACD), Chairman of the R.A.E.N. Committee, spoke about Amateur Radio and the R.A.E.N., giving a forthright account of the activities and limitations of the average amateur. He referred to the recently-granted concession which allows Red Cross messages to be handled in an emergency, and he thanked General Hawes for his invaluable help in this connection. The scope of the R.A.E.N. organization was explained, and a large map pinpointing all R.A.E.N. members was placed on display. Col. Dunn told how and when amateurs could help; he spoke of the growing use of mobile stations, and he produced call-books for inspection to show how amateurs were spread throughout the community.

After Col. Dunn had finished his talk, G3ABB/A, who was installed in the lecture room, made immediate contact with G3ELZ/M and G3FZW/M who were touring with Red Cross passengers in the locality. This demonstration was most impressive to the Red Cross assembly and started a host of conversations.

"Are there any amateurs in my area?" "How can I get in touch with them?" "Will they be willing to help in my district?"

Such questions assailed us on all sides. Enthusiasm was at its highest; our usefulness was made plain indeed; we were more than welcome. If all amateurs had been present they would then and there have unanimously declared their willingness and eagerness to help this most enthusiastic public spirited body of workers that constitutes the Red Cross Society.

Many of those present took their turn as passengers with the mobiles, while just outside the building G2AHL/P (operated by the Deputy General Secretary) was busy working G3FCQ at Crowborough on 2 metres, attended by a large audience who were amazed at the clarity and ease of communication.

At lunch, communication and the radio amateur were lively topics of conversation and the R.A.E.N. Committee were all kept busy answering questions. How pleased

and surprised one lady was to find that an amateur lived in her very road! This discovery prompted much call-book searching, and not a few addresses were noted by enthusiastic Red Cross helpers.

After lunch, the party broke up into discussion groups with topics provided by General Hawes, R.A.E.N. members being attached to each group. The discussions were lively, informative and valuable to all concerned. Each group presented its findings at the final session which took place prior to tea.

In his summing up General Hawes paid a tribute to all R.A.E.N. members, praising their willingness to help and welcoming their co-operation with the utmost enthusiasm—sentiments which brought the applause of the assembly. It was indeed a most heartening experience to be present at a gathering where the amateur was so welcome and made to feel that he and his hobby could be so valuable to the community.

One thing stands out clearly, however. The R.A.E.N. NEEDS MORE MEMBERS. It has grown rapidly to its present size of just over 1,000 strong, but this provides an uneven spread over the country. R.A.E.N. must multiply its membership. It must have active members in every part of the land. There must be more mobiles. The Network needs in every area active volunteers who can organize and co-operate in this necessary and worthwhile effort.

Let the British Red Cross Society know that we amateurs, both individually and as a body, are able and willing to help whenever we are needed! Let us be public spirited and show that our combined technical skill, equipment and experience in our self-training in radio communication may be rated as community assets!

In that way Amateur Radio will take its rightful place in the eyes of an appreciative public.

"Yasme"

FROM the November 1956 issue of *Amateur Radio* (official publication of the Wireless Institute of Australia) we learn that prompt action taken by VS6AE, VK9FN and a number of Australian amateurs was, without doubt, responsible for averting a possible tragedy when the yacht, *Yasme*, with Danny Weil aboard, ran into difficulties early in September.

Since then the yacht has become a total wreck, having foundered on an uncharted reef about 150 miles off the coast line of New Guinea. The radio and navigation equipment was lost. The sole occupant of the yacht was rescued by a Catalina aircraft which made an emergency landing in heavy seas.

London Meeting
Friday, January 25, 1957
Presidential Address
by D. A. Findlay, D.F.C. (G3BZG)
followed by a lecture-demonstration
of Miniature Aerials by F. Charman, B.E.M. (G6CJ)
at the
Institution of Electrical Engineers,
Savoy Place, Victoria Embankment
Buffet Tea 6 p.m. Lecture 6.30 p.m.

*Council Member: 17 Washington Road, Emsworth, Hants.

For Your Bookshelf and Shack . . .

R.S.G.B. PUBLICATIONS

R.S.G.B. Amateur Radio Call Book	Price 2/6 (by post 2/10)
Certificates and Awards -	Price 2/6 (by post 2/10)
Valve Technique -	Price 3/6
Simple Transmitting Equipment -	Price 2/-
Transmitter Interference -	Price 1/3
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Special Offer. Members may purchase the set of four booklets for 4/6 (post paid)	

AMERICAN PUBLICATIONS

Orders for the following American publications can only be accepted from residents in the United Kingdom and British Empire. Prices quoted include cost of postage and packing.

*Radio Amateur's Handbook 1957 Edition (available February) -	34/-
(A.R.R.L.)	
*Radio Amateur's Handbook 1956 Edition -	32/-
(A.R.R.L.)	
*Mobile Manual for Radio Amateurs -	24/6
(A.R.R.L.)	
*CQ Mobile Handbook -	24/-
(Cowan Publishing Corp.)	
*Antenna Book 7th Edition -	19/-
(A.R.R.L.)	
*Radio Amateurs' Mobile Handbook -	18/-
(Cowan Publishing Corp.)	
*Single Sideband for the Amateur -	14/-
(A.R.R.L.)	
*Single Sideband Techniques -	13/-
(Cowan Publishing Corp.)	
*Hints and Kinks (Volume V) -	10/-
(A.R.R.L.)	
*Course in Radio Fundamentals -	10/-
(A.R.R.L.)	
*How to become a Radio Amateur -	4/6
(A.R.R.L.)	
*Learning the Radiotelegraph Code -	4/6
(A.R.R.L.)	
QST (A.R.R.L.) Yearly Subscription -	36/-
CQ (Cowan Publishing Corp.) Yearly Subscription -	44/-

*Usually available from stock. All prices for American publications are subject to alteration without notice.

R.S.G.B. MEMBERS ONLY

Society Tie (all silk) -	16/6
Blazer Badge -	7/-
Car Badge (R.S.G.B. Emblem) -	5/-
Car Badge (R.S.G.B. Emblem with Call-sign) (5 characters)† -	6/6
Car Badge (De Luxe Type)† -	17/6
Call-sign Lapel Badges (5 characters)† -	6/-
Rubber Stamp (R.S.G.B. Emblem) -	7/6
Stereo Block (R.S.G.B. Emblem) -	5/6
Miniature Pennants (R.S.G.B.)	
10" long for bicycle -	5/9
12" long for car -	7/9
Headed Notepaper (R.S.G.B.) per 100 sheets -	6/6

†Delivery 3-5 weeks.

MISCELLANEOUS ITEMS

Two Metre Zone Map -	6d.
R.A.E.N. Message Pads -	2/-
Log Books (Webbs') -	4/-

All prices include postage unless otherwise stated.

R.S.G.B. Sales Dept., New Ruskin House,
Little Russell Street, London, W.C.1

Radio Amateur Emergency Network

By C. L. FENTON (G3ABB)*

DURING the past year, R.A.E.N. has made great progress. From an organization whose members were prepared, in emergency, to give help where needed, and, in so doing, risk the possibility of official action for breach of licence conditions, the Network has become officially recognized, and can now give such assistance through their co-operation with the British Red Cross Society. In the coming year there are four immediate aims to be achieved: to appoint a Controller for each county in the British Isles; to set up active groups throughout each county; to achieve efficiency in procedure, with adequate mobiles in the field; to co-operate fully with the British Red Cross Society.

County Controllers have so far been appointed for Staffordshire, Yorkshire, Lincolnshire, Sussex, and Norfolk, but many more are required. Individual members are invited to make suggestions in writing to the Hon. Secretary, R.A.E.N. Committee, giving the names of persons whom they think are suitable to fill the vacancies. Volunteers will always be considered.

It has been suggested that too much publicity is being given to the East Coast groups to the detriment of other areas. In defence, we would point out that this column depends for its news on reports from the E.C.O.s and County Controllers. Unfortunately such reports are very sparse; if there is no news of a particular group, then it obviously cannot be published.

Visit to Barnett Hill

Members of the R.A.E.N. Committee visited the National Training Centre of the British Red Cross Society at Barnett Hill, Guildford, on November 4, 1956, for discussions with Red Cross officials from all over the country. G3FZW/M and G3ELZ/M demonstrated mobile equipment on Top band, G3ABB/A acting as Control. At the same time, G2AHL/P was operating on 144 Mc/s. Thanks are due to G3FCQ and G2AHP who co-operated so ably on this band.

The discussions were most valuable, and a joint report on the meeting is in course of preparation. When completed, copies will be distributed to E.C.O.s and B.R.C.S. officials, and will be available, on request, to interested members. Present thinking suggests that, in an emergency, links between the scene of the emergency and the local B.R.C.S. Headquarters will be required, with a possible further link from the Headquarters to a telephone ten miles or so away from the congested area, so as to clear the immediate congestion.

News in Brief

A flood-warning system is being worked out to cover the East Coast area. This will give full scope to B.R.S. members. It is hoped to publish full details next month.

Norfolk members recently demonstrated R.A.E.N. facilities to local B.R.C.S. officials, with a Control Station installed at Red Cross Headquarters in Norwich. About 12 stations took part in the demonstration which was most successful. Worcester members, assisted by those in neighbouring counties, gave a demonstration to B.R.C.S. officials on December 1. Chelmsford members have arranged three exercises in conjunction with Red Cross officials. The first of these was held on November 25; the other two will follow as soon as practicable.

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

Tests and Contests

Affiliated Societies' Contest, 1957

Rules

1. The contest is open to all Societies in fully paid-up affiliation with the R.S.G.B. Each competing Society must submit an entry signed by an officer of the Society, stating the call-sign to be used. Entries must be addressed to the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1, postmarked not later than December 31, 1956. No alteration of call-signs will be permitted after the closing date for entries. A full list of all competing stations will be circulated direct to each Society by post during January 1957.
2. The contest will be confined to two-way telegraphy (A1) contacts only, in the 1.8 Mc/s band, and will be in two sections. The first section will be held between 18.00 and 23.00 G.M.T. on Saturday, February 9, 1957, and the second section between 18.00 and 23.00 G.M.T. on Sunday, February 10, 1957.
3. Only one transmitter—which may be either the Society transmitter or that of one of the members—and not more than two receivers may be used.
4. The input to the anode circuit of the valve or valves delivering power to the aerial, or to any previous stage, must not exceed 10 watts.
5. Ten points will be scored for contact with another Affiliated Society station, as listed in the official list, and one point for contact with any other British Isles station. The final score will be the sum of the scores for the two sections.
6. Only contacts with stations in the British Isles (prefixes G, GC, GD, GI, GM and GW) will be permitted to count for points. Proof of contact may be required.
7. Competitors will call "CQ R5GB". An exchange of RST reports and a rising serial number starting between 001 and 100, and increasing by one with each successive contact, will be required before points may be claimed.
8. Only one contact with a specific station, whether fixed, portable or mobile, will be permitted to count for points in each section of the contest.
9. Transmitter operators may be changed as often as is desired, provided the terms of the licence are observed.
10. Logs (preferably on foolscap or quarto paper, and on one side only) must be set out as shown below:—

Affiliated Societies' Contest, February, 1957

Name of Society..... Claimed Score.....
 Address of Station..... Call-sign.....
 Transmitter.....
 Receiver(s).....
 Aerial(s).....

Date	Time	Call-sign of station worked	Report and Serial No. SENT	Report and Serial No. RECEIVED	Signature of Operator	Points Claimed
		G2—	589001	579005		
		G3—	599002	599016		
		G3—	569003	559025		
Total...						

Declaration: I declare that the station for which I was responsible was operated strictly in accordance with the rules and spirit of the contest, and I agree that the entry shall become the property of the Council of the R.S.G.B., whose decision shall be final in all cases of dispute.

Date..... Signed..... Office.....

11. The entry form must be completed and signed by an officer of the Society, who will be held responsible for the conduct of the station.

12. The terms of the Amateur (Sound) Licence must be strictly observed.

13. Any station frequently receiving tone reports lower than T9 will be disqualified.

14. The Edgeware Trophy will be awarded to the Affiliated Society with the highest total score.

15. Entries must be postmarked not later than February 18, 1957, and must be addressed to the Hon. Secretary, Contests Committee, R.S.G.B., New Ruskin House, Little Russell Street, London, W.C.1.

Contests Diary

1957

- January 26-27 - B.E.R.U.¹
- February 9-10 - Affiliated Societies'
- March 2-3 - First Top Band
- May 5 - D/F Qualifying Event (organizers to be announced later).
- May 5 - First 144 Mc/s Field Day
- May 26 - D/F Qualifying Event (Rugby).
- June 1-2 - National Field Day²
- June 16 - 420 Mc/s
- June 23 - D/F Qualifying Event (South Manchester).
- July 6-7 - 144 Mc/s
- July 14 - D/F Qualifying Event (Peterborough).
- August 18 - Second 144 Mc/s Field Day
- September 1 - Low Power Field Day
- September 8 - D/F National Final
- October 5-6 - Low Power
- November 9-10 - Second Top Band
- November 23-24 - 21-28 Mc/s Telephony

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

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

Annual Direction Finding Meeting

THE annual direction finding meeting, to which the Contests Committee invites representatives of organising groups and competitors, was held on October 7, 1956 at the Bonnington Hotel, Southampton Row, London, W.C.1.

A lengthy discussion took place concerning the rules for the National Final and the qualifying events, and it was decided to recommend that: (a) a parenthesis should be added to the rule referring to gates, expressly excluding "clearly marked 'gated roads'" from the restriction; and (b) in the Final, two transmitters should operate, as at present, from 13.30 to 16.00. They may be found in either order, and the time of reaching his second transmitter should decide the winner. The finishing point should be at the tea rendezvous, or otherwise at the discretion of the organizer, and must be reached by 16.30. These recommendations have now been accepted by the Contests Committee, and the necessary alterations have been made in the rules for the 1957 contests.

As the changes made in the rules are not great, it has again been decided not to publish them in the BULLETIN, but a copy may be obtained on request by anyone interested from Headquarters.

Copies of the report of the meeting have been circulated to the groups to which invitations to attend had been sent.

CHRISTMAS HOLIDAYS

Members are asked to note that Headquarters will be closed from 5.15 p.m. Friday, December 21, until 9.15 a.m. Thursday, December 27. Copy for the January issue will be accepted up to Thursday, December 27.

Regional & Club News

Bristol.—At the November meeting more than 50 members heard a lecture on "Germanium Semiconductors" by A. H. Hooke (G3CMT) and J. D. O'Toole. A miniature transistor telephony transmitter for 3.5 Mc/s and a transistor receiver were demonstrated. At the meeting on January 18, A. F. Collins, F.R.A.S., F.B.I.S., will talk on "Radio Astronomy." *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

British Amateur Television Club (Chelmsford Group).—"70 Receivers" (G3V1), "A Home-made Image Orthicon Camera" (G3KOK) and "Oscilloscopes for Amateur Television" (G3CVO) were subjects for recent lectures. At the meeting on January 10 there will be a talk on "Sync Generation." *Hon. Secretary:* D. Reid, 4 Bishop Road, Chelmsford.

Affiliated Societies' Contest, 1957

The attention of all Affiliated Societies is drawn to Rule I, which requires that entries must be submitted by December 31, 1956. See page 285.

Bury Radio Society.—The A.G.M. and a Supper Party were held on December 8. On January 8 at the George Hotel, Kay Gardens, commencing at 8 p.m. G2BTO will talk on "Television Interference." The clubroom at the A.T.C. Headquarters, Hill Street, is open every Wednesday evening from 7.30 p.m. *Hon. Secretary:* C. L. Robinson, 56 Avondale Avenue, Bury.

Crystal Palace & District Radio Club.—A junk sale has been arranged for December 15 at 7.30 p.m. at Windermere House, Westow Street, Crystal Palace, S.E.19. *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, Forest Hill, London, S.E.23.

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, at 12.30 p.m. on Friday, December 21, 1956
SPECIAL CHRISTMAS LUNCH
Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

Leicester Radio Society.—Meetings will be held at 140 Highcross Street, Leicester, on December 17 ("Frequency Measurement and Absorption Wavemeters," by R. Parry, G3HDG, of the G.P.O.), December 31 ("Interference," by S. D. Hoff, G3AWM, of the G.P.O.), and January 14 ("A Symposium on Mobile Operation"). *Hon. Secretary:* J. Tranmer, 4 Grocott Road, Evington, Leicester.

Norwich & District Radio Club.—The Annual Christmas Party and Dinner will be held on December 28. R.S.G.B. Recorded Lectures are being arranged for the New Year. *Hon. Secretary:* D. C. Youngs (G3JIE), 53 Salisbury Road, Thorpe Road, Norwich.

Nottingham & District Amateur Radio Society.—G3APY gave a talk on "Getting Going on Two Metres" at the November meeting. On December 21, there will be an R.S.G.B. Recorded Lecture by Louis Varney (G5RV) on "Transmitter TVI-proofing." Meetings are held at Basford Hall Miners' Welfare, Nuthall Road, Cinderhill. *Hon. Secretary:* R. I. Sills (G3IQM), 38 Montford Crescent, Sherwood, Nottingham.

Prestatyn & District.—There was an attendance of 12 at the meeting on November 5 at the Railway Hotel, when Peter F. Jones (GW3FDF) opened a discussion on "Broad Band Couplers." Details of future meetings will be found in *Forthcoming Events*.

Radio Society of Harrow.—The society operated GB3HAR on 14 Mc/s at the Second Wembley Exhibition in October. Many DX contacts were made and all have been acknow-

ledged by a special QSL card. The exhibits included v.h.f. gear made by G3HBW and a Braille test meter by G3HAO. The annual Constructors' Contest took place on December 7. Meetings are held on Fridays in the Science Laboratory, Roxeth Manor Secondary Modern School, Eastcote Lane, South Harrow, commencing at 8 p.m. *Hon. Secretary:* S. C. J. Phillips, 131 Belmont Road, Harrow Weald, Middlesex.

Science Museum Radio Society.—The Society has arranged a series of lectures for its monthly meetings at the Science Museum, South Kensington, which commence at 6 p.m. Membership is open to all Civil Servants. Visitors are welcome but should contact the *Hon. Secretary:* G. C. Voller (G3JUL) on KENSINGTON 6371, Extension 237 beforehand. On December 11 there was a lecture on "The Art and Science of Sound Reproduction" by Mr. Hawes of the General Electric Co.

South Manchester Radio Club.—At the recent A.G.M. the following were elected: *Chairman:* N. Potter (G3GNC); *Vice-Chairman:* M. Denny (G6DN); *Hon. Secretary:* M. Barnsley (G3HZM), "Greenways," 11 Cemetery Road, Denton; *Hon. Treasurer:* N. Ashton (G3DQU). Classes for the R.A.E. are held on Mondays at 8 p.m. at Ladybarn House, Mauldeth Road, Fallowfield, Manchester 20. Anyone who wishes to attend should communicate with the *Hon. Secretary* or apply in person on Monday evenings to Mr. Ashton (G3DQU). All those who took the course last winter and sat the examination this year were successful.

Thames Valley Amateur Radio Transmitters' Society.—A full programme has been arranged for 1957. The A.G.M. will take place in January and the second part of a talk on "Frequency Measurement" by E. Dedman (G2NH) will be given on February 6. New Members of the R.S.G.B. living in the Molesey and Hampton Court areas are invited to attend meetings at the Carnarvon Castle Hotel, Hampton Court. The dates can be found in *Forthcoming Events*.

Torbay Amateur Radio Society.—"Radio through the Years" was the title of the recorded lecture at the November meeting. On December 19, there will be another recorded talk—"Receivers," by R. H. Hammans (G2IG)—at the Y.M.C.A. *Hon. Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

Worthing & District Amateur Radio Club.—At the recent A.G.M. the following were elected: *Chairman:* P. Robinson (G3KFH/T); *Hon. Treasurer:* R. B. Forge (G3FRG); *Hon. Secretary:* J. Tootill (B.R.S.20543), 113 Kings Road, Lancing, Sussex.

Worked Liverpool Award (W.L.A.)

TO mark the 750th anniversary next year of the granting of the Charter of Incorporation to Liverpool, the Liverpool and District Amateur Radio Society has recently instituted the "Worked Liverpool Award." Full details of the award, which is available to amateurs all over the world, may be obtained by sending a stamped addressed envelope to G3BHT, Hove To, Sandy Lane, Hightown, near Liverpool, to whom claims should be submitted.

LONDON MEETINGS

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

- January 25, 1957: Presidential Address followed by Lecture and Demonstration of MINIATURE AERIALS by F. Charman, B.E.M. (G6CJ).
- March 1, 1957: "MODERN AMATEUR COMMUNICATION RECEIVER DESIGN," by R. G. Lane (G2BYA).
- March 29, 1957: "MOBILE OPERATION." Discussion opened by F. W. Crabtree (G3BK) and R. G. Shears (G8KW). Meetings commence at 6.30 p.m. preceded by buffet tea from 6 p.m.

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—No meeting in December.
Bury (B.R.S.).—January 8, 8 p.m., George Hotel, Kay Gardens.
Chester (C. & D.A.R.S.).—Tuesdays, 7.45 p.m., Tarran Hut, Y.M.C.A.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Lancaster (L. & D.A.R.S.).—January 2, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Room "G", Wavertree Community Centre, Penny Lane, Liverpool, 18.
Manchester (M. & D.R.S.).—January 7, 7.30 p.m., Brunswick Hotel, Piccadilly. (S.M.R.C.).
—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 20.
Preston (P.A.R.S.).—Wednesdays, 7.45 p.m., 48 High Street, off Lancaster Road.
Southport.—Thursdays, 8 p.m., Sea Cadets' Camp, Esplanade.
Stockport (S.R.S.).—December 19, January 2, 16, 8 p.m., Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.R.S.).—December 20, January 3, 17, Royal Oak Hotel, Bridge Street.
Wirral (W.A.R.S.).—December 19, January 2, 16, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street.

REGION 3

Birmingham (South).—January 4, 7.30 p.m., "A" Committee Room, Cadbury Bros., Bournville. (M.A.R.S.).
—December 18, 7 p.m., Midland Institute. (Slade).—December 21 (Social Evening), January 4, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—December 21, 7.30 p.m., Priory High School, Wheatley Street. (Courtalds).
—Wednesdays, 5-8.30 p.m., Courtalds, Ltd., Foteshill Road.
Malvern.—January 7, 8 p.m., "Foley Arms." (S.M.R.C.).
Solihull.—December 24, 7.30 p.m., Civil Defence H.Q., Sutton Lodge, Blossomfield Road.
Stourbridge & District.—December 21, 8 p.m., "White Horse", Ambicote (Christmas Party), January 1, 8 p.m., King Edward VI School.

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m.; Sundays, 10.30 a.m., Boulton Lane, Alvaston, Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Room 4, 119 Green Lane, Derby.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Room 5, College of Further Education, Field Road.
Leicester (L.R.S.).—December 17, 31, January 14, 7.30 p.m., 140 High Cross Street, Leicester.
Lincoln (L.S.W.C.).—January 2, 7.30 p.m., Technical College, Cathedral Street.
Newark (N. & D.A.R.S.).—January 6, 7 p.m., Northgate House, Northgate, Newark.
Northampton (N.S.W.C.).—Fridays, 7 p.m., Clubroom, 8 Duke Street.
Nottingham.—December 21, January 18, 7.30 p.m., Basford Hall Miners Welfare, Nuthall Road, Cinderhill.
Peterborough.—January 2, 7.30 p.m., 21 Hankey Street.
Retford and Workop.—December 17, 7.45 p.m., Whitehall Youth Centre, Retford.
—January 14, 7.30 p.m., King Edward VII Hotel, Workop.
Scunthorpe (S.A.R.S.).—December 18, 7.30 p.m., Talbot Hotel, Earl Street.
Workop.—January 3, 7 p.m., King Edward Hotel.

REGION 5

Chelmsford.—January 1, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Norwich.—Fridays, 7.30 p.m., The Golden Lion, St. John's, Maddermarket.

REGION 7

Acton, Brentford and Chiswick.—December 18, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick, W.4.
Bexleyheath (N.K.R.S.).—December 27, January 10, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East London.—December 16, 2.30 p.m., Town Hall, Ilford.
East Molesey (T.V.A.R.T.S.).—January 2, 8 p.m. (A.G.M.), February 6, 8 p.m. (Frequency Measurements, G2NH), Carnarvon Castle Hotel.
Guildford & Woking.—December 23, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.

Norwood & South London.—December 15, 8 p.m. (Junk Sale); January 19, 8 p.m. (Simple VHF Equipment, by G3EOH), Windermere House, Westow Street, Crystal Palace.
Slough.—January 8, QTH from G2HOX, 13 Quaves Road, or G3GYD, 5 Parklands Avenue, Slough.
Welwyn Garden City.—January 1, Service Training School, Murphy Radio, Ltd., Bessemer Road, ("How and How not to operate an amateur station.")
London (L.M.L.C.).—December 21, January 18, 12.30 p.m., Bedford Corner Hotel, W.C.1.
London (U.H.F. Group).—January 3, 7.30 p.m., Bedford Corner Hotel.

REGION 8

Worthing (W.D.A.R.C.).—January 14, February 11, 8 p.m., Adult Education Centre, Union Place.

REGION 9

Bath.—December 17, January 28, 7.30 p.m., R.N.V.W.R. H.Q., 12 Pierpoint Street (top floor).
Bristol.—January 18, 7.15 p.m., Carwardine's Restaurant, Baldwin Street.
Exeter.—January 4, 7 p.m., Y.M.C.A., St. David's Hill.
Falmouth (W.C.R.C.).—Alternate Tuesdays, 7 p.m., Technical Institute, Falmouth.
Plymouth.—Alternate Tuesdays, 7.30 p.m., Virginia House Settlement, Barbican.
Torquay.—December 15, January 19, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare.—January 10, 7.30 p.m., Sea Cadets Hall, Alfred Street.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—January 14, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath & Port Talbot.—January 1, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 11

Prestatyn.—January 7, Railway Hotel.

REGION 13

Edinburgh (L.R.S.).—December 20, January 10, 7.30 p.m., 25 Charlotte Square.

REGION 14

Falkirk & Stirling.—December 21, 7.30 p.m., The Temperance Café, High Street, Falkirk.
Glasgow.—December 21, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2.

REGION 15

Belfast.—January 14, 7.30 p.m., Y.M.C.A., Wellington Place.

Slow Morse Practice Transmissions

G.M.T.	Call	kc/s	Town
Sundays			
09.00	G3GYV	1900	Hartford, near Northwich
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
10.30†	G3DGN	1930	North London
	G3GZB		
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	G3KAN	1850	Northampton
12.00	G1SUR	1860	Belfast
21.00	G2FIX	1812	Nr. Salisbury
22.00	G3ARM	1919	Guildford
Mondays			
18.30	G3NC	1825	Swindon
21.00	G3BLN	1900	Bournemouth
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G2HDR	1860	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
21.45†	G3ETP	1875	Lowestoft
	G3JMX	1860	
22.30†	G3IIR	1915	Norwood
	G3GQK		

G.M.T.	Call	kc/s	Town
Wednesdays			
18.30	G3GCY	1830	R.A.F., Dishforth
19.00	G3HUB/A	1902	Chelmsford
22.30	G3FBA	1910	Bath
Thursdays			
18.30	G3NC	1825	Swindon
	G2ABR	1919	Hull, Yorks
20.00†	G3FCY		
21.00	G3GWT		
	G3KTO		
20.30	G3JQM	1878	Barwick, Yeovil
Fridays			
19.00	G3BLN	1900	Bournemouth
	G2FNI	1875	Wirral
20.00†	G3EGX		
	G3ERB		
20.30	G3ICX	1915	Sutton Coldfield
	G3KLZ	1860	Bradford
21.30†	G3INW (or G3KSS)		Bradford
	G3KEP		Bingley
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
21.00	G3HWI	1987	Blackburn, Lancs
23.00	GM3HBY	1900	Glasgow

† Alternately.

Representation

THE following is a list of Corporate Members who have been duly nominated to serve as County (or District) Representatives for two years as from January 1, 1957.

REGION 1 (NORTH WESTERN)

Cheshire.—L. N. Goldsbrough (G3ERB), 54 King's Lane, Bebington, Wirral.

Lancashire East.—M. Barnsley (G3HZM), 11 Cemetery Road, Denton, Lancs.

Lancashire West.—F. H. P. Cawson (G2ART), 113 Waterloo Road, Southport.

REGION 2 (NORTH EASTERN)

Durham.—J. R. Tyack (G3ELP), 101 Birchington Avenue, South Shields.

Yorkshire (West).—R. M. Strickland (G8KB), 733 Worrall Road, Worrall, near Sheffield.

REGION 3 (EAST MIDLANDS)

Birmingham.—G. A. Swinnerton (G6AS), 120 Grange Road, Olton, Solihull, Warwicks.

Staffordshire.—E. Arnold Matthews (G3FZW), 1 Shortbatts Lane, Lichfield.

Worcestershire.—N. C. Heathcock (B.R.S.6319), Lynburn, Forge Lane, Blakedown, near Kidderminster.

REGION 4 (WEST MIDLANDS)

Leicestershire & Rutland.—W. A. Mead (G5YY), 82 Edward Avenue, Leicester.

Lincolnshire.—J. Stace (G3CCH), 38 Skippingdale Road, Scunthorpe.

Nottinghamshire.—A. Walmsley (G2HIO), Park House, Cinderhill Road, Cinderhill, Nottingham.

REGION 6 (SOUTH CENTRAL)

Hampshire.—D. Metcalf (G3GHQ), 80 King's Road, Southsea, Hants.

REGION 7 (LONDON)

London (North).—S. H. Iles (G3BWQ), 29 River Bank, Winchmore Hill, N.21.

London (East).—P. W. Winsford (G4DC), 137 Hall Lane, Upminster, Essex.

London (South).—W. D. Gilmour (G2VB), 35 Grangecliffe Gardens, S.E.25.

REGION 9 (SOUTH WESTERN)

Bristol.—D. V. Newport (G3CHW), 145 Ilchester Crescent, Bedminster Down, Bristol, 3.

REGION 10 (SOUTH WALES)

Cardiganshire, Carmarthenshire & Pembrokeshire.—Captain G. C. Price, T.D. (GW2OP), Bangeston Hall, Pembroke Dock, Pems.

Glamorganshire.—V. J. Bartlett (GW5BI), 171 City Road, Cardiff.

Monmouthshire.—G. A. James (GW8CT), 1 Hillside, Cefn Road, Blackwood.

REGION 13 (SCOTLAND—SOUTH EASTERN)

East, Mid and West Lothian.—Rev. Walter M. Ferrier (GM3BDA), Manse of St. Andrew, North Berwick, East Lothian.

Ballot

THE following is the result of the Ballot for the election of a London (South) District Representative:

W. D. Gilmour	..	..	..	..	..	27 votes
R. L. Glaisher	..	..	..	..	..	8 votes

Mr. Gilmour is accordingly elected.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the October 1955 issue of the BULLETIN.

Ashington and District Radio Club, c/o T. G. Musgrove, Millbank Farm, Bedlington, Northumberland.

Hartlepool Amateur Radio Club, c/o J. Thompson, 27 Chester Road, West Hartlepool, co. Durham.

R.A.F. Ayios Nikolaos Amateur Radio Club, c/o A. M. Ernest, R.A.F. Station, B.F.P.O. 53.

Science Museum Radio Society (GB2SM), c/o G. C. Voller, The Science Museum, South Kensington, London, S.W.7.

Stoke-on-Trent Amateur Radio Society, c/o A. Rowley, 37 Leveson Road, Hanford, Stoke-on-Trent, Staffs.

Representation

THE following is an amendment to the list of Regional Representatives published in the December, 1955, issue:—

Region 9

W. J. Green (G3FBA), 82 Bloomfield Avenue, Bath, Somerset.

with effect from January 1, 1957.

The following are additions to the list of Town Representatives published in the December, 1955, issue:—

Region 5—Norfolk

Great Yarmouth

H. Lawley (G6ZG), Summerholme, Ormesby Road, Caister-on-Sea.

Region 7—London, East

Brentwood (Essex)

H. Fronius (B.R.S.15083), 14 Costead Manor Road.

Change of Address

The address of Mr. G. R. Cobb (G3IXG), Town Representative for Shefford (Beds), is now 75 Amphill Road.

A Useful Valve Data Handbook

ELECTROTHERMAL ENGINEERING have recently published the second edition of their Valve Retainer and Valve Data handbook.

This book has been brought right up-to-date and considerably enlarged to include the majority of CV Valves and their commercial equivalents with the appropriate data on retainers and top cap connectors.

Copies are available from the publishers Electrothermal Engineering Limited, 270 Neville Road, London, E.7.

Silent Keys

W. H. LAMB (G5MB)

The death is announced of Mr. W. H. Lamb (G5MB) of Heaton Mersey, Stockport, at the age of 60 years. Mr. Lamb—Billy to his friends—did much useful experimental work at the famous Baguley Station of the Manchester Wireless Society where he and Mr. Y. W. P. Evans (G2YO) were among the first, if not the first, amateurs to hear signals from the U.S.A. during the Transatlantic Tests in 1922. Mr. Lamb had been a member of the R.S.G.B. since the early days and for a long time was Hon. Treasurer of the old Manchester Wireless Society.

Sympathies are extended to his family in their bereavement.

CECIL EDWARD AUSTIN (B.E.R.S.860)

It is with regret that we record the death of Mr. C. E. Austin (B.E.R.S.860) on November 6, 1956, as a result of an accident in Cyprus. He had only recently been promoted to the rank of Chief Technician in the Royal Air Force in which service he had been for 19 years. A most likeable and popular person, he will be greatly missed.

Sympathies are extended to his widow and her family.

G3IRK

J. H. BARRANCE, M.B.E., F.I.L. (G3BUJ)

Amateur Radio suffered a sad loss by the death on November 24, 1956, of James Hawkins Barrance, M.B.E., F.I.L. (G3BUJ), of Southend-on-Sea, Essex, at the age of 69 years. "Barry," who was a keen listener for many years pre-war, obtained his transmitting licence in 1946, the year he retired after service at the Admiralty and Foreign Office. He was an interpreter in three European languages and Arabic. A keen churchman, quiet and unpretentious, he was always ready to help anyone. He kept in repair the receivers of many blind people in his district, and was the local representative of the "Talking Book" scheme. For five years he was Honorary Secretary of the Southend Radio Society, and had also held the post of C.R. for Essex. His wife predeceased him by two years. His son is in Indonesia. "Barry" succeeded the late J. E. Nickless (Nick) (G2KT) as Chairman of the Shaving Club, and his death is mourned by the operators of the many transmitting and listening stations who are members of that Club. Mr. C. T. Wakeman (G4FN) represented the Society at the funeral which was attended by other members of the R.S.G.B. and the local society.

H.W.E.

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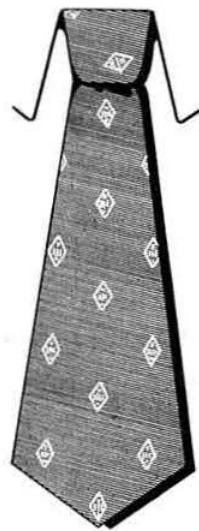
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Type R.107 receiver, as new	£16
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Avo All Wave Oscillator (Signal Generator) 95 kc/s-80 Mc/s	
400 c/s internal Modulation, mains operated	£7/5
Ditto, battery operated	£5/5
Ditto, battery operated with kit to convert to mains	£6/15
Precision Apparatus Co., Model 834-S Multirange meter, with voltage ranges up to 6,000V., current up to 600mA., and resistance up to 5 Megohms	£4/10
Evershed & Vignoles circuit Testing Ohmmeter (0-3 ohms and 0-30 ohms), complete in leather case	£3/10
Evershed & Vignoles 500 Volt Wee Megger in leather case	£13

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PJ2AA "MANY THANKS FOR MAKING DX SO EASY."

G8KS "Highest Score on 21 Mc/s in B.E.R.U. Contest — MANY THANKS."

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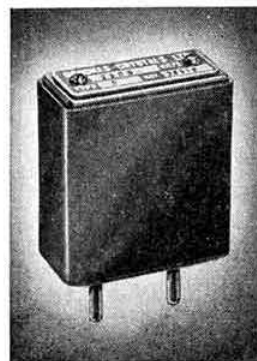
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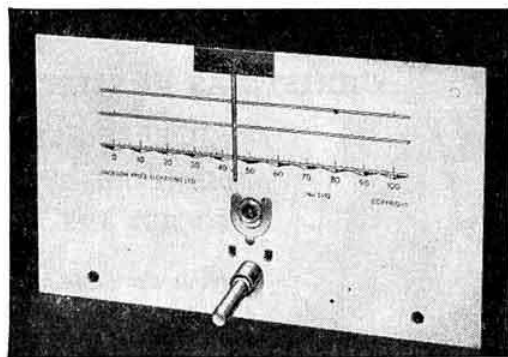
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JERSEY Holiday—Visit "The Lincoln," 3 Saviour's Road, S.a.e., please, for brochure—GC3KPO. Book early! (191)

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(Continued on page 292)

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R.S.G.B. Bulletin

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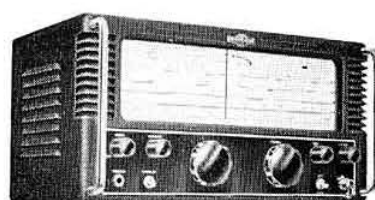
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