RSGB

AUGUST, 1957

BULLETIN

2/6 Monthly

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOL. 33, NO. 2

DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

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R.S.G.B. BULLETIN

Devoted to the Science and Advancement of Amateur Radio

Vol. 33 No. 2 AUGUST 1957

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RADIO SOCIETY OF GREAT BRITAIN
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Tel.: HOLborn 7373

Advertising Office:
NATIONAL PUBLICITY CO. LTD.
36-37 UPPER THAMES STREET, LONDON, E.C.4
Tel. CENtral 0473-6

Published on or about the 15th of each month as its official journal by the Radio Society of Great Britain and issued free to members. *Closing date for copy is the 22nd of the month preceding publication.*

Current Comment

BERU for VE

LAST month's report, printed here, of the results of the 1957 BERU Contest, will have brought a good deal of satisfaction to DX enthusiasts on a number of counts.

First of all, there was the feeling that this year's contest was perhaps the best of any. Secondly, it was gratifying to note such a considerable turnout of prefixes rare and not-so-rare that denote " red on the map." And thirdly, on a personal plane, congratulations were especially in order to Mr. Vic Williams (VE3KE) for his success in achieving top place after a consistent effort made over the years. His achievement may be a presage of still more formidable Canadian participation in the years to come: it would be pleasant to think so.

It is now more than 26 years since the BERU contest was instituted as a special challenge to the skill of operators within the British Empire—and particularly to their patience in explaining to non-Empire amateurs what it meant! As a point of interest that first contest ran for a whole week!

Now, when the " Empire " as such has metamorphosed into the Commonwealth, the initials "BERU," if literally less meaningful, retain in practice as much significance for contestants as ever they did—and their rhythm, pounded out in Morse characters, is as much a part of the tradition of British Amateur Radio as that other code group "NFD," born, as it happens, at much the same time in the early thirties.

In the rules for the 1958 BERU Contest a small departure from tradition will be observed by the abolition of the expressions " Senior " and " Junior," which dated back to the days when to possess even a 25 watt transmitting licence was a privilege (most of them being for 10 watts), while 100-watters were a positive rarity. Henceforth the designations are to be " High Power " and " Low Power."

Two further thoughts that suggest themselves are, first, that a greater participation by listening stations might be well worth encouraging (transmitting members should mention the forthcoming BERU contest on QSL cards they send to BRS and BERS members who happen to report during the next few months); and second, who would like an argument on the thesis that " Success in BERU is governed by the size of your pocket book "? Commercially built transmitters, receivers and aerials help towards ease of operating but they cost money. Cheaper, personally built equipment *can* be made to give " commercial " results but frequently doesn't; yet it would be a sad day for Amateur Radio if the practice of handicraft were to become as outmoded as building your own car or television set have, in fact, already done.—J. H.

Frequency Shift Keying

ELSEWHERE in this issue we publish for the first time in the BULLETIN constructional details of a drive unit which provides for the employment of frequency shift keying (f.s.k.). This system, while widely used in the commercial communications field and also by a certain number of amateur stations, mainly in the United States, is certainly not in anything like general use among amateurs.

F.s.k. is frequency modulation applied to telegraph operation and in common with frequency modulated telephony is said to be less liable to cause television interference. We shall be interested to learn, in due course, whether stubborn cases of TVI from c.w. transmitters are alleviated by its use. Many of the advantages claimed for this system in commercial practice are, however, not of interest to amateurs, being concerned with high speed or teleprinter operation and diversity reception.

As in the case with most things in this life, an advantage from one point of view has to be paid for by a disadvantage in another, and in this case the snag is that the signal is broader than a normal c.w. transmission by reason of the fact that both a mark and a space wave is radiated. These two transmissions are, however, only 500 to 850 cycles apart so that the signal does not take up as much space on the band as would even a single sideband signal, the occupation being more akin to that of a modulated c.w. transmission.

Whether the slight increase in interference to other users of the band during, say, a busy contest session would lead to some unpopularity for the f.s.k. operator will only be ascertained when a few stations become active with the system.—W. H. A.

Your Questions Answered

TWO questions which were raised verbally by members during the past month can be conveniently answered here, as coming under matters of policy:

" *Why is the Résumé of Council Proceedings published two months late?* " This is one of those seemingly intractable anomalies which most aspirants to Council membership are determined to rectify but find, when they are elected, that they cannot. One example will serve to illustrate why. The Council meeting for the present month takes place in about a week's time. One of the first things the governing body will do when it meets will be to consider the draft résumé of the minutes of its meeting of the previous month and approve it for publication after any required amendments have been made. But this cannot happen until the minutes of the

(*Continued on page 68*)

The Interceptor

A Simple Communications Receiver for the Amateur

By C. W. CRAGG, A.M.I.E.E. (G2HDU, ex-ZD6DU)*

IN designing and building the Interceptor receiver four years ago, the author's object was to produce a receiver covering the h.f. bands from 1·8 to 30 Mc/s, which had an acceptable standard of performance, and yet was both simple and economical to construct.

Features

The over-riding requirement on the amateur bands for some years past has been selectivity. With the accent on economy (i.e. value for money) the choice of a double superhet circuit, with intermediate frequencies of 1620 kc/s and 100 kc/s, gives a degree of adjacent and second channel selectivity which is normally only found in much more elaborate receivers. On c.w. a simple method of giving a peaked a.f. response is used in order to improve selectivity further still. The selectivity figures obtained are as follows:

Telephony: 6db down at 1·2 kc/s off tune
20db down at 2 kc/s off tune.
Telegraphy: 6db down at 0·75 kc/s off tune.
20db down at 1 kc/s off tune.

As originally built no r.f. stage was included, though space was left on the chassis for its later addition. The Interceptor gave a very good account of itself, even on 28 Mc/s, without this stage, and usually had to be operated with either the r.f. or a.f. gain control turned well down.

A medium-waveband was added later, giving four bands with the following coverage:

0·48 — 1·45 Mc/s, 1·7 — 5 Mc/s,
5 — 15 Mc/s, 15 — 30 Mc/s.

Electrical bandspread is used to avoid the need for an expensive slow-motion drive and to give ease of tuning.

Other features include a simple noise limiter, aerial trimmer, and temperature compensation of the first oscillator.

Loctal valves are used as they were cheap and easy to obtain at the time. The modern equivalents may of course be employed, but it is doubtful if any improvement in performance will be obtained at the frequencies involved.

Other components, including coils, are readily obtainable. If required, 85 kc/s instead of 100 kc/s may be used for the second i.f. with little change in performance.

Originally, T3 was a normal double tuned i.f. transformer similar to T2, but the selectivity obtained was too great for telephony reception, with excessive sideband cutting. As it was desired to keep the receiver simple, without selectivity control, the single tuned circuit was used. In a receiver mainly intended for c.w. a normal i.f.t. would be a considerable advantage.

The Circuit

The circuit diagram of the receiver is shown in Fig. 1 with the associated power supply in Fig. 2. V1 is a conventional r.f. stage, and V2 the first frequency changer. The coils used are miniature "Maxi-Q" types. The ranges quoted by the manufacturers for the two highest frequency bands are 5 to 15 Mc/s and 10·5 to 31·5 Mc/s. It will be seen that this gives an unduly large frequency overlap between these two ranges. The padder on the highest band was therefore reduced to give a more restricted coverage, and consequently slightly greater ease of tuning. This necessitated adding padders to the r.f. and aerial coils to achieve good tracking.

A parallel tuned wavetrap in the grid circuit of both V1 and V2 serves to prevent i.f. breakthrough on 1620 kc/s. V3 is the second frequency changer. Its oscillator circuit is

* *24 Lansdown Place, Cheltenham, Glos.*

COMPONENTS LIST

C1, 50pF variable aerial trimmer (Jackson Bros.)
C2, 10, 270pF silvered mica (Hunts).
C3, 20pF ceramic (Erie).
C4, 24, 36, 41, 44, 50, 100pF ceramic (Erie).
C5, 17, 40pF ceramic (Erie).
C6, 22, 23, 3-gang main tuning 310pF (Jackson Bros. type E with L/M fixing feet).
C7, 8, 14, 16, 18, 45, 0·01μF paper (Hunts).
C9, 11, 12, 13, 26, 28, 30, 32, 3-30pF Philips trimmers.
C15, 34, 35, 39, 40, 43, 0·1μF paper (Hunts).
C19, 4·7pF neg. temp. coeff. ceramic 750 parts per million per degree Centigrade (Erie).
C20, 21, 2-gang 10pF bandspread tuning (Jackson Bros. type U.101/S-S).
C25, 42, 48, 51, 52, 0·002μF mica (Hunts).
C27, 375pF silvered mica (Hunts).
C29, 1000pF silvered mica (Hunts).
C31, 340pF silvered mica (Hunts).
C33, 110 pF silvered mica (Hunts).
C37, 47pF silvered mica (Hunts).
C38, 49, 200pF silvered mica (Hunts).
C46, 750pF silvered mica (Hunts).
C47, 100pF variable, b.f.o. pitch control (Jackson Bros.).
C53, 25μF 25V electrolytic (Hunts).
C54, 55, 8μF 500V electrolytic (Hunts).
C56, 16μF 500V electrolytic (Hunts).
C57, 0·01μF 250V a.c. working, paper (Hunts).

L1, Maxi-Q range 5, blue.
L2, Maxi-Q range 4, blue.
L3, Maxi-Q range 3, blue.
L4, Maxi-Q range 2, blue.
L5, 10, Maxi-Q range 1, white (1620 kc/s rejectors).
L6, Maxi-Q range 5, yellow.
L7, Maxi-Q range 4, yellow.
L8, Maxi-Q range 3, yellow.
L9, Maxi-Q range 2, yellow.
L11, Maxi-Q range 5, white.
L12, Maxi-Q range 4, white.
L13, Maxi-Q range 3, white.
L14, Maxi-Q range 2, white.
L15, Maxi-Q range 1, white
L16, Maxi-Q range 1, yellow.
All coils manufactured by Denco (Clacton) Ltd.

R1, 17, 18, 26, 470K ohms (Erie).
R2, 5, 6, 9, 12, 14, 15, 20, 32, 47K ohms (Erie).
R3, 8, 13, 16, 220 ohms (Erie).
R4, 3·3K ohms (Erie).
R7, 21, 220K ohms (Erie).
R10, 22 ohms (Erie).
R11 19, 25, 4·7K ohms (Erie).
R22, 24, 1 Megohm (Erie).
R23, 1K ohms (Erie).
R27, 270 ohms 1 watt (Erie).
R28, 2·7 ohms (Erie) or 5 ohm variable (see text).
R29, 3 ohms 1 watt (Erie).
R30, 2·2K 5 watt wire wound (Welwyn).
R31, 680 ohms 10 watt wire wound (Welwyn).
All resistors are ½ watt unless otherwise stated.

S1, 3-wafer band change, each wafer 2 pole 4 way; total length behind panel 8 in.; wafers spaced 3 in. (N.S.F. "Oak" type).
S2, single pole toggle switch; a.v.c. on/off (Bulgin).
S3, double pole toggle switch; b.f.o. on/off (Bulgin).
S4, single pole toggle switch; noise limiter on/off (Bulgin).
S5, single pole toggle switch; stand-by (Bulgin).
S6, mains on/off switch (part of VR2).

T1, 1600 kc/s i.f. transformer (Maxi-Q type IFT.6A).
T2, 100 kc/s i.f. transformer (Alpha Radio Supply Co.).
T3, Maxi-Q range 1, yellow, with 1000pF condenser added to primary side.
T4, loudspeaker output transformer; pentode to 3 ohms.
T5, 300-0-300V 80mA, 5V 2A, 6·3V 2·5A (Douglas type MT2A).

V1, 4, 7H7.
V2, 3, 7S7.
V5, 7R7.
V6, 7C5.
V7, 5Z4.
VR1, 10K ohms wire wound; r.f. gain control (Reliance).
VR2, 500K ohms with switch; a.f. gain and mains on/off (Egen).

Dial escutcheon (Jackson Bros. type 4555).
Drive drum, 3¾ in. diameter (Jackson Bros. type 4736).
Output jack, with single change-over contact (Bulgin type J13).
Slow motion drive, 8-to-1 (Jackson Bros. type 2155).

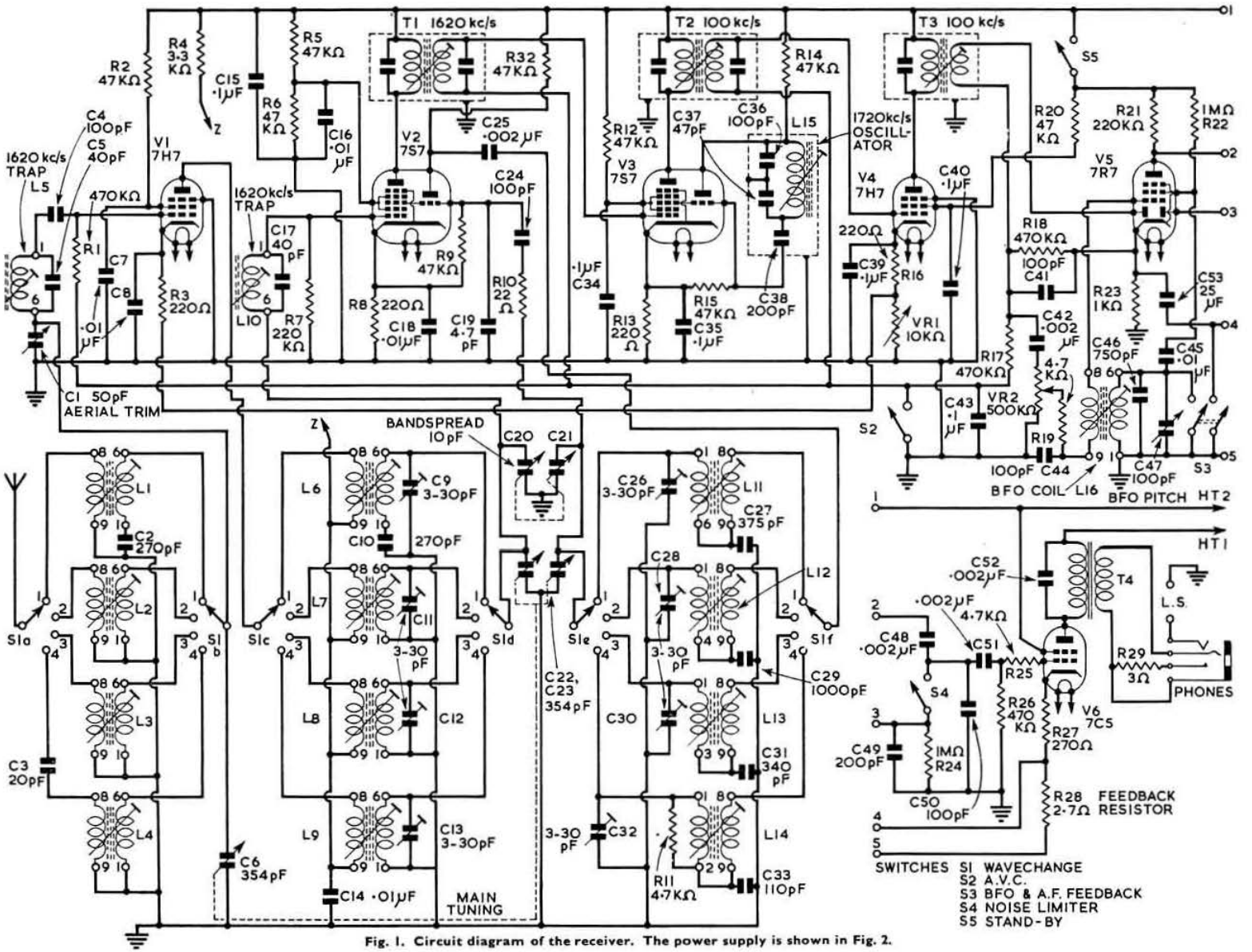


Fig. 1. Circuit diagram of the receiver. The power supply is shown in Fig. 2.

designed to have a low harmonic output to prevent interfering signals from finding their way into the front-end of the receiver. By screening the oscillator coil in a can and placing it as far as possible from the input circuit, whistles have been cut down to an almost inaudible level. They do not appear in any amateur band.

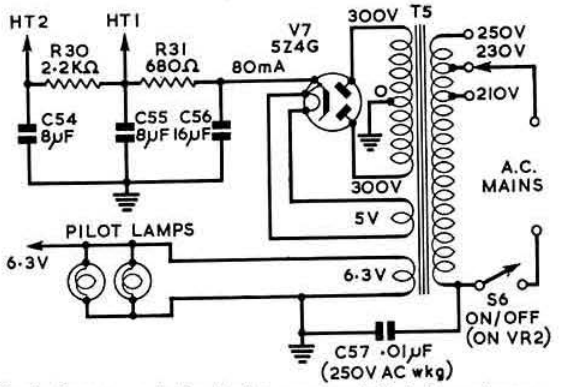


Fig. 2. Power supply for the Interceptor. It is built on the same chassis as the receiver.

V4 is a conventional i.f. amplifier on 100 kc/s, and with its grid and anode i.f. transformers is responsible for most of the selectivity. V5 performs several functions: signal and a.v.c. detector, a.f. amplifier, noise limiter, and b.f.o. The detector diode circuit is quite normal, and after rectification the signal is fed via the a.f. gain control to the pentode grid. The second diode is used as a simple noise limiter across the anode load of V5, and will conduct when the signal voltage exceeds the bias developed across V5 cathode resistor.

The screen grid of V5 is decoupled to earth, as far as the audio signal is concerned, by a 0·01μF condenser in series with the tuned winding of the 100 kc/s b.f.o. coil. The b.f.o. feedback coil is connected to the grid circuit, so that oscillations take place between the signal and screen grids of the valve. This method does away with the need for a separate b.f.o. valve, and is quite satisfactory in practice. No trouble at all has been experienced with this arrangement. Adequate decoupling is provided to separate the 100 kc/s and the a.f. signals present in this stage.

To disable the b.f.o. for telephony reception the tuned oscillator coil is merely shorted to earth. Another set of contacts on the same switch is provided for increasing a.f. selectivity during c.w. reception. It will be seen from Fig. 1 that during c.w. operation positive feedback is applied from the cathode of V6 (the output valve) to the cathode of V5. The effect is to increase the gain of the audio stages until they are near oscillation at a frequency determined by their associated resistors and capacitors. With the values of components shown this frequency is about 800 c/s. The amount of feedback is controlled by the 2·7 ohm resistor in the cathode circuit of V6. If desired this may with advantage be made a 5 ohm variable resistor, so that the feedback may be adjusted rather more critically, and the a.f. selectivity increased a little further still. If this resistor is increased too much the circuit will, of course, oscillate at 800 c/s.

Provision is made for headphone or loudspeaker connection to the output stage, the action of plugging headphones into the jack socket automatically disconnecting the loudspeaker and connecting a 3 ohm resistor in its place to put a proper load on the valve. Low impedance phones will give the greatest sensitivity in this arrangement.

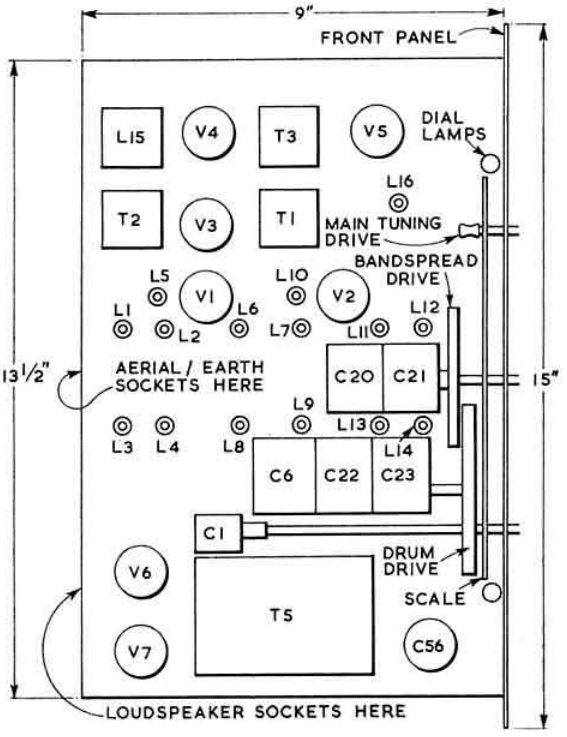


Fig. 3. The chassis layout.

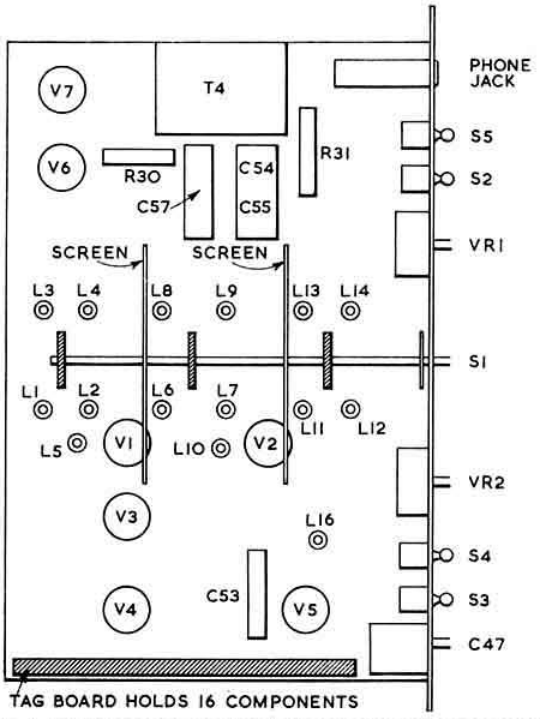


Fig. 4. Underneath chassis layout showing the main components. The sixteen components mounted on the tagboard are (commencing at the end nearest to C47): C42, R17, R18, C41, R23, R22, R21, C48, C50, R24, C49, C51, R26, R16, R20 and C39.

During stand-by periods both the oscillators are left running to minimize frequency drift. The stand-by switch removes h.t. voltage from the i.f. amplifier screen-grid and from the anode and screen of V5.

The power supply uses resistance capacity smoothing, which is perfectly adequate and considerably cheaper than using a choke. An indirectly heated rectifier is used, as this is kinder to the other valves and the electrolytic condensers during warming up periods.

Construction

The rigid chassis is made of 16 s.w.g. mild steel, bright cadmium plated. The layout of the main components is shown in Fig. 3 and is quite straightforward, except for the mounting of the main tuning and bandspread condensers. The latter is centrally mounted, behind its 8-1 slow-motion

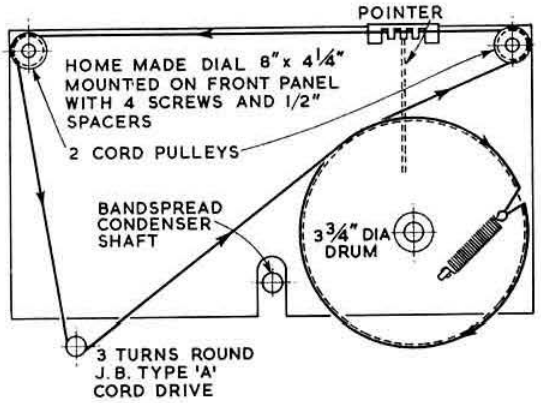


Fig. 5. Method of fitting the dial cord, viewed from the rear.

drive (J.B. type No. 2155), on 1¼ in. long pillars. The main tuning condenser is mounted alongside the bandspread condenser, on a small 1½ in. high sub-chassis. This allows plenty of clearance from the main chassis for fitting a 3¾ in. drum drive. The method of fitting the dial cord is shown in Fig. 5.

Aerial, earth and loudspeaker sockets are fitted on the chassis rear apron.

An underneath view of the chassis layout appears in Fig. 4, showing the main components. The bandswitch and coils are placed centrally beneath the bandspread tuning condensers. Two screens support the bandswitch and isolate the coils in the different stages. The trimmers are mounted close to their respective coils on small pillars. The large number of small components associated with the detector/a.f. stage are mounted on a tagboard at one end of the chassis. The anode and grid leads of each valve should be kept as short and as far apart from one another as possible, to ensure stability. Otherwise no particular precautions are necessary with the wiring of the receiver.

The Interceptor is housed in a black crackle cabinet 15 in. long, 9 in. high, and 9⅛ in. deep. A strip of black perspex, with the engravings filled in white, serves to identify the various controls and enhance the appearance. The dial escutcheon is a J.B. type No. 4555. The front panel layout is shown in Fig. 6.

Alignment

The following table gives the approximate voltages to be expected in the receiver with 230 volts applied to the 230 volt mains tap.

V7 anodes	320V 50 c/s
V7 cathode	340V
V6 anode	280V
V6 screen-grid	210V
V6 cathode	10·5V
V5 anode	88V
V5 screen-grid	30V
V5 cathode	0·88V
V4 anode	210V
V4 screen-grid	103V
V4 cathode	2·45V
V3 hexode anode	210V
V3 osc. anode	102V
V3 screen-grid	76V
V3 cathode	1·75V
V2 hexode anode	210V
V2 osc. anode	100-130V (varies with
V2 screen-grid	70V frequency)
V2 cathode	1·6V
V1 anode	185V
V1 screen-grid	100V
V1 cathode	2·5V

These voltages were taken with the r.f. gain control at maximum, using a 20,000 ohm per volt meter (Avo Model 8).

Having ascertained that the voltages are approximately correct, a 100 kc/s modulated signal should be fed to the grid of V4, and the i.f. transformer in the anode of this valve tuned for maximum output. The input signal is next transferred to the grid of V3 and the first 100 kc/s i.f.t. tuned. Throughout the alignment the input signal should be kept as small as possible to prevent overloading; the a.v.c. should be switched off.

With the input still connected to V3 grid, change the signal generator frequency to 1620 kc/s, and tune the oscillator coil L15 for maximum output. Next, transfer the input to the grid of V2 and peak up the 1620 kc/s transformer.

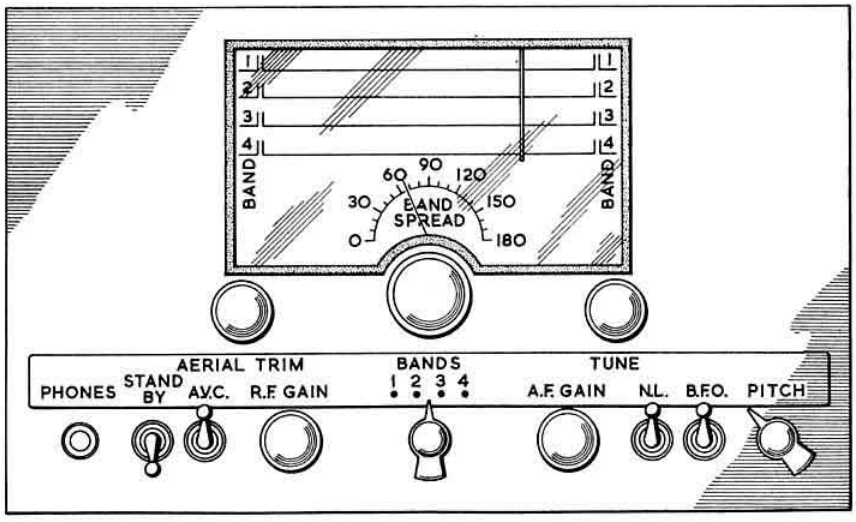


Fig. 6. Layout of the front panel.

The oscillator and r.f. coils for the four bands may now be aligned to cover the correct frequency ranges. The iron cores are adjusted at the l.f. end of each band and the trimmers at the h.f. end. The r.f. coils for the four bands should be aligned at the following frequencies:

16·5 and 28 Mc/s, 5·5 and 13·5 Mc/s,
1·85 and 4 Mc/s, 0·53 and 1·3 Mc/s.

The test signal may now be connected to the aerial input, and with the aerial trimmer set mid-way, the four aerial coils may be aligned at the lower frequency in each band as given above.

The b.f.o. is aligned by feeding in a signal of 1620 kc/s. The pitch control should be central, and the b.f.o. switch set to " On ". The iron core is then tuned for zero-beat.

Finally, with an input signal of 1620 kc/s the two i.f. wavetraps should be tuned for minimum output.

As shown in the circuit, a 4·7pF negative temperature coefficient ceramic condenser is connected from the oscillator grid of V2 to earth. This value was found to give best temperature compensation in the author's case, but the value may need to be slightly different with other associated components.

Operation

Little need be said concerning the operation of the Interceptor, since this is straightforward. For telephony, the r.f. gain control is usually set to maximum (except on very strong signals) as this gives the best a.v.c. action, whilst for c.w. it is usual to set the a.f. gain near maximum, and use the r.f. control.

The receiver has given a good account of itself for the last four years, and compares more than favourably with many receivers of greater complexity. Although inexpensive, the bandspread drive used gives an acceptable rate of tuning, even at the highest frequencies.

A Turnstile Slot Aerial for 145 Mc/s

By M. J. HEAVYSIDE, B.Sc.(Hons.), M.Ed., Ph.D. (G2QM)*

SOME amateurs who wish to work a local net on 145 Mc/s as well as other stations on that band, find that a vertical aerial does not suffice and want all-round radiation with horizontal polarisation. The turnstile aerial will supply this need, but, as with other combinations of centre-fed dipoles, matching becomes difficult. It seemed to the writer that this difficulty would be overcome by using the skeleton-slot principle.

Two skeleton slots, each a rectangle with rounded corners, 45 in. by 15 in., of ½ in. material, were secured together by nuts and bolts through holes drilled at the centre of each short end, at right angles to each other (Fig. 1). It should be noted that one slot must be linked into the other before being finally screwed (or soldered) together, and that it does not matter that one slot is half an inch higher than the other when secured.

As the slots must be fed at the centres of the long sides 90° out of phase, two lengths of the same material as the slot are drilled with holes 20½ in. apart (a quarter of a wavelength) and these lengths are bent non-inductively, as in the diagram, until the holes are 10·6 in. apart. These act as feeders for the slot fed 90° out of phase, and also help to hold both slots securely in their relative positions at right angles, making quite a rigid assembly. The whole is fed by a delta match with 11 in. sides in the plane of the slot being fed, secured one inch apart at the ends where the 80 ohm co-axial feeder is attached. The arms of this delta match are also of the same material as the slot, bolted securely to a centre of the long side of the slot and secured to a piece of perspex at the co-axial feed end.

For mounting, though the centre of the bottom of the slots should be at zero potential, it was found better to mount

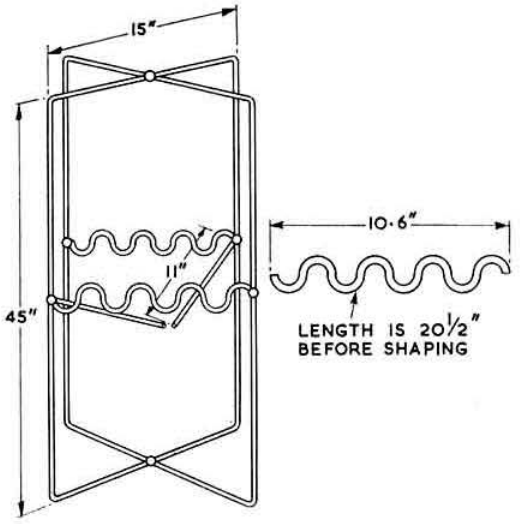


Fig. 1. Turnstile slot aerial for 145 Mc/s.

the system on a 4 in. square of keramot screwed to the top of the supporting post. Two pieces of ¼ in. perspex were put under each side of the higher slot for secure bolting.

For testing purposes, the aerial was first mounted so that it could be turned through a complete circle. No difference

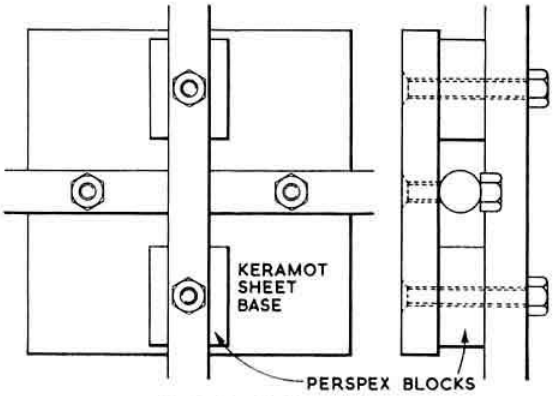


Fig. 2. Detail of base fixing.

could be detected in the strength of received signals as it was turned. The strength was about the same as that from a reference dipole turned to give maximum reception but less than that from a single slot so turned. This was expected, and it is the price paid for the all-round reception.

* *23 Bowling Hall Road, Bradford 4, Yorks.*

Radio Teletype

MR. H. HARRIS (B.R.S.12959), " The Huon," Branksome Hill Road, Bournemouth, will be pleased to hear from other members in the U.K. interested in radio teletype.

The Design and Construction of a Drive Unit for Amateur Use

By N. SHIRES (G3BTM)*

THE reason for developing the unit to be described was the need for a drive source capable of providing any type of emission permitted by the Amateur (Sound) Licence. One result from using such a unit would be the ability to compare the degree of interference to other services, for instance television, from the various types of radiation.

The design has been carefully tested, and while it is appreciated that the whole circuit may be unnecessary for average use, the final results are sufficiently rewarding to warrant a copy for the operator who requires facilities in addition to the usual A1 and A3 at the flick of a switch. Sections of the unit can of course be used individually without following the original arrangement as there should be no change of characteristic if the rule of short wiring and mechanical rigidity is adhered to.

Requirements

The design required a constant output level between 3·5 and 3·8 Mc/s on any chosen system. Unfortunately the provision of single sideband outputs required frequency changing and complicated switching that would have been difficult to provide in a unit of this size. However, the audio and r.f. outputs can be used as a base for this type of transmission if required. With this exception the following facilities have been provided:

(1) A constant output over the range 3·5 to 3·8 Mc/s.
(2) Sufficient power to drive any frequency multiplier of reasonable efficiency.
(3) " Netting " to a sending station's frequency.
(4) " Break-in " working is possible.
(5) Changing systems is simple.
(6) The frequency stability is adequate for all amateur purposes.
(7) All methods of transmission are possible with the exception stated above, i.e. A1, F1, A2, A3 and F3.

A modulator is required for A3 but the output from the filter unit will drive a 6V6 to full output.

Circuit Details

The circuit (Fig. 1) may appear at first sight to be complicated, but if it is studied as a number of sections it will be seen to be quite simple. For the purpose of description this technique will be used and the unit as a whole will not be considered electrically.

The r.f. section is composed of V1a, V1b, V2 and V3, the oscillator, cathode follower, limiter-buffer and output stages respectively. The oscillator is a Hartley which was chosen because it is possible to adjust the feedback point to close limits. The value of feedback is more important than is generally accepted in preventing unwanted components in the output circuit. The correct level is the minimum required to maintain a steady state with as near unity coupling between windings as possible. The coupling to subsequent stages should be the minimum commensurate with the required output power being realized. The reason for these conditions is that if the losses in the external circuit are small (high Q) with the harmonic voltages small enough to allow the anode and grid impedances to be resistive, the frequency is less dependant on valve parameters and the output is more nearly a sine wave in character. Failure to ensure this condition will result in a distorted oscillator output and a reduction in stability coupled with harmonic outputs of high level. Despite the attenuation of following tuned circuits, these unwanted frequencies or the resultant intermodulation products may have their level maintained up to the aerial *whether or not they are within the normally accepted passband of the subsequent stages in the transmitter*. TVI, therefore, can start in the oscillator; the fact that interference is absent with the final stage switched off is no guarantee of the innocence of the first stage.

The component values shown gave a stability of 2 parts in 10^5 over a period of 30 minutes after a warming up period of 15 minutes. The drift was negative throughout the test indicating that the final operating temperature was not reached and the use of a controlled temperature or longer

COMPONENT INFORMATION

C1, 2·7pF ceramicon.
C2, 100pF variable (Eddystone).
C3, see text.
C4, 9, 10, 4·7pF ceramicon.
C5, 20, 21, 0·002μF, T.C.C. type M3N.
C6, 8, 16, 40, 0·005μF, T.C.C. type M3N.
C7, 39, 10pF ceramicon.
C11, 17, 10/100pF, T.C.C. type TCK1010.
C12, 14, 15, 22, 23, 0·001μF, T.C.C. type M3N.
C13, 100pF, T.C.C. type M3N.
C18, 19, 37, 0·01μF, T.C.C. type M3N.
C24, 0·003μF, T.C.C. paper.
C25, 26, 30, 0·015μF, T.C.C. paper.
C27, 0·06μF, T.C.C. paper.
C28, 0·05μF, T.C.C. paper.
C29, 0·03μF, T.C.C. paper.
C31, 33, 34, 36, 0·002μF, T.C.C. type M3N.
C32, 38, 12μF, T.C.C. type CE32D.
C35, 2μF, T.C.C. type CE17L.
L1, 45 turns 28 s.w.g., $\frac{3}{4}$in. diam., close wound, tapped 10 turns from earthy end.
L2, 50 turns 36 s.w.g., $\frac{3}{4}$in. diam., close wound.
L3, 60 turns 36 s.w.g., $\frac{3}{4}$in. diam., close wound.
L4, 5, 6, Maxi-Q type AFC/125 (Denco (Clacton) Ltd.)
R1, 7, 22K ohms, Erie type 9.
R2, 11, 220 ohms, Erie type 9.
R3, 100 ohms, Erie type 9.
R4, 8, 330 ohms, Erie type 9.
R5, 22, 25, 26, 30, 35, 100K ohms, Erie type 9.
R6, 10, 34, 37, 10K ohms, Erie type 9.
R9, 15, 23, 23, 31, 33, 1000 ohms, Erie type 9.
R24, 560K ohms, Erie type 9.
R12, 14, 33 ohms, Erie type 9.
R13, 33K ohms, Erie type 9.
R16, 27, 100K ohms, 5 per cent tol., Erie type 2.
R17, 38, 47K ohms, Erie type 2.
R18, 4·7K ohms, 5 per cent tol., Erie type 2.
R19, 68K ohms, Erie type 2.
R20, 220K ohms, Erie type 2.
R21, 4·7K ohms, Erie type 2.
R28, 29, 1000 ohms, 5 per cent tol., Erie type 2.
R32, 470K ohms, Erie type 9.
R36, 2 Megohms, Erie type 8.
R39, 10K ohms, Erie type 2.
Rx, see text.
Unless otherwise stated all resistors are 20 per cent tolerance.

RFC1, 2, 3, 2·5mH (Eddystone).
T1, see text.
V1, 4, 5, 6, 12AU7 (Brimar).
V2, 3, 8, 6AM6 (Brimar).
V7, 6AL5 (Brimar).
V9, 11, 12, OA3 or VR75/30 (Brimar).
V10, OD3 or VR150/30 (Brimar).
V13, rectifier to suit T1.
VR1, 2, 20K ohms potentiometer.
VR3, 2K ohms potentiometer.
VR4, 250K ohms potentiometer.

* *8 Marconi Bungalows, North Weald, Epping, Essex.*

warming up period would improve the results. Measurements were accurate to one part in 10^6 or better.

V1b is arranged as a cathode follower to isolate the oscillator from the following stages and is designed to present an extremely high input impedance to the driving stage so that it is almost unaffected by any load presented by a subsequent stage. The action of this arrangement is good and the frequency of the oscillator is unaffected when the grid of V2 is earthed.

The buffer V2 has no cathode decoupling to provide a small amount of negative feedback. Improvement in the bandwidth is given by the damping resistance Rx which can be adjusted to give a satisfactory compromise between frequency coverage and gain.

V3, the output stage is perfectly straightforward and with the suggested component values should deliver 500 mW into an 80 ohm coaxial line. This is in excess of the requirements of any modern high-gain valve used either as an amplifier or frequency doubler. Any excessive power should be dissipated in an attenuator of 80 ohms impedance with the required loss, or if preferred, the output can be reduced by increasing the value of R7 or reducing Rx; in extreme cases where less than 200 mW is required the former is preferable as the limiting action of the stage is improved. The need for this is to prevent amplitude variations resulting from the frequency modulation circuit appearing at the output. Some amplitude variation will occur on the oscillator and as it may not be proportional to either the frequency or amplitude of

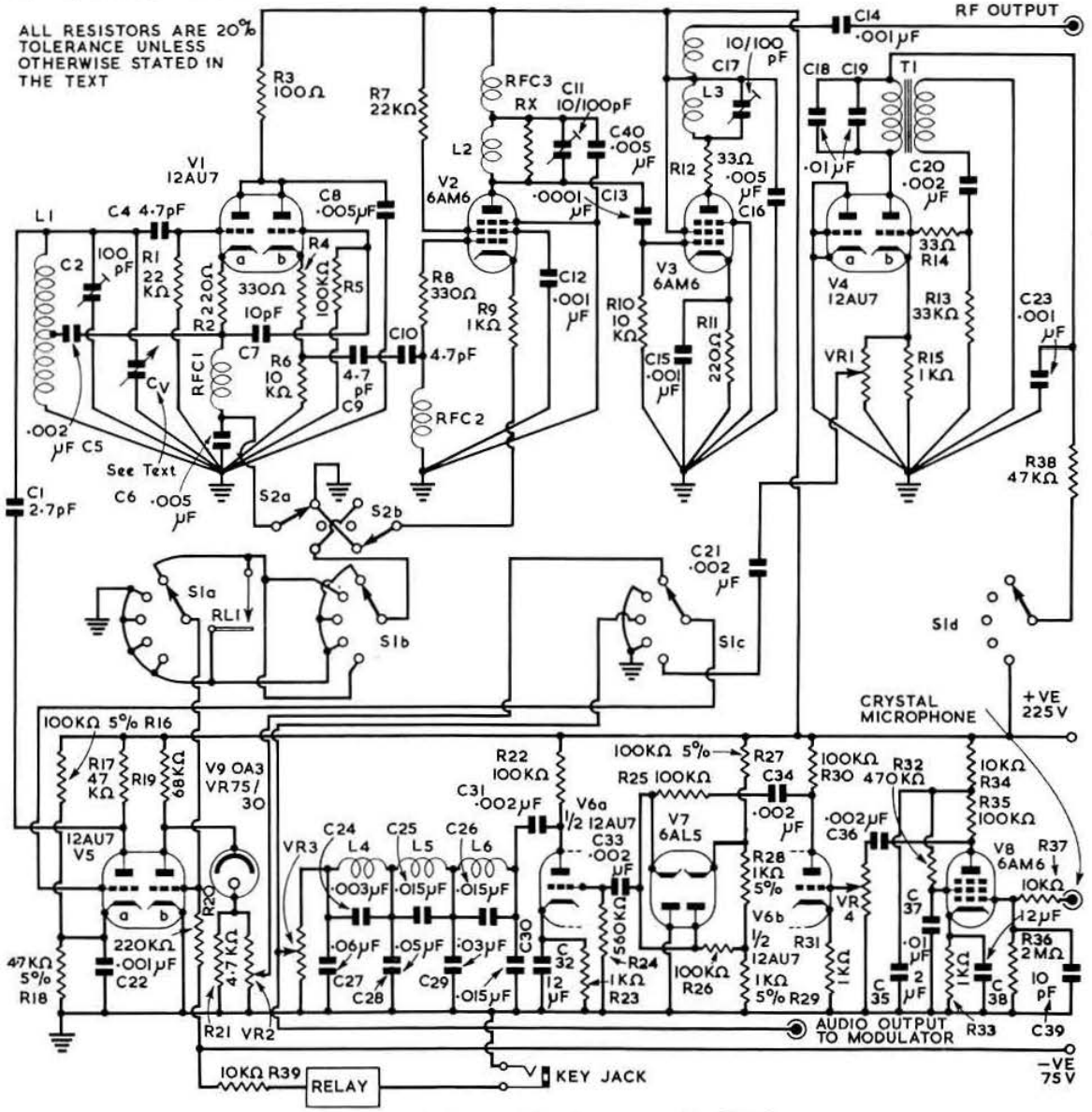


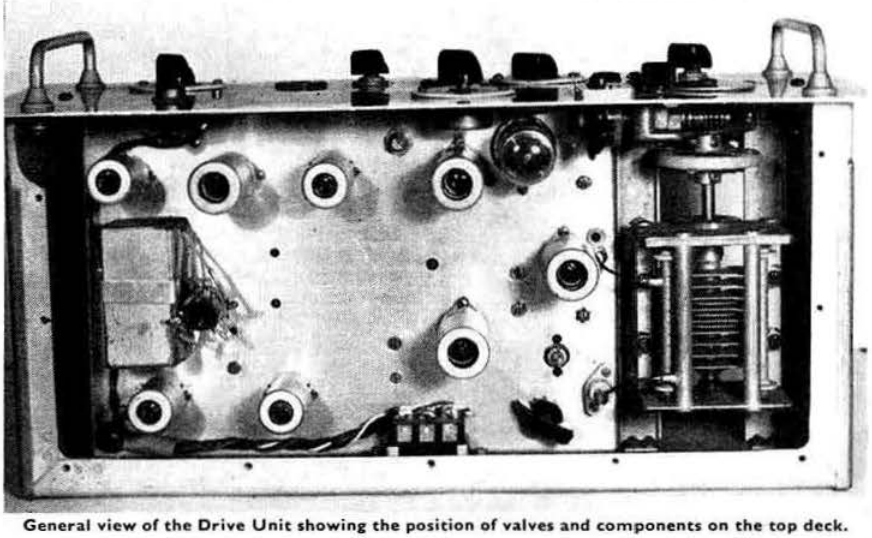
Fig. 1. Circuit diagram of the unit constructed by G3BTM.

the intelligence, it is essential that it should be as low as practicable in relation to the output power.

As F1 and F3 require some method of varying the frequency a reactance valve V5a is included in the circuit. Unfortunately this device must degrade the stability of the oscillator but care in design can reduce this effect to a minimum as shown by the performance figures of this unit. The principle used is to arrange a change of reactance and feed it to the oscillator LC circuit. A simple way of achieving this is to use the change of *Ra* and consequent effective reactance of a valve when operated on the curved portion of the characteristic in the region of cut-off. R16 and R18 are arranged to hold V5a almost cut off when its grid is earthed; in this condition a slight change of grid voltage will result in a considerable change of reactance. R17 is the load, and coupling to the oscillator LC circuit is via C1. As the potential on the grid of V5a is varied the oscillator frequency varies in sympathy. Sufficient change of frequency is provided with the stated values of components to permit a first sideband of minus 4db relative to the carrier to be generated at the fundamental without a shift in the mean or centre frequency. This ensures that with a first sideband of minus 6db the circuit is operating well within its capabilities.

giving the space condition. The total shift is adjusted by VR2 and should normally be within the limits of 500 to 800 c/s. R21 is included to arrange an 800 c/s shift on 3·5 Mc/s with VR2 at maximum, thus permitting adequate control on the higher frequency bands. The grid of V5b is earthed when other facilities are in use making the circuit inoperative.

A2 is generally associated with amplitude modulation which entails the use of a high power audio amplifier, making the set-up a little clumsy. In addition the use of this system for local working is a waste of effort. When conditions of selective fading are troublesome on DX however, the use of this system will increase the readability of a signal. To overcome the need for high power audio equipment, frequency modulation can be used to obtain the necessary bandwidth. The sideband spectrum as with F3 will be inferior to equivalent amplitude modulation as the second and higher order sidebands will appear at greater strength relative to the carrier. If the audio oscillator is delivering perfectly sine output and there is no distortion in the reactance network the sideband levels should be as follows: first, 6db; second, 18db; third, 35db. This means that for a given power developed less will be of real use. This reduction is



General view of the Drive Unit showing the position of valves and components on the top deck.

The provision of F1 is unusual for amateur purposes and its use is not advised by the majority of amateur authorities. Technically there is no reason to shun the system as it has advantages on some occasions for the serious operator. There are several methods of generating a frequency shift signal and the one to be described was chosen for the following reasons: (a) The keying circuit has no effect on the frequency stability; (b) The use of a "gating" valve, V9, ensures a positive mark and space frequency; (c) The total shift is easily adjustable and the operation is simple.

When the grid of V5b is earthed the valve is fed through R19 and the residual voltage at its anode is below the maintaining voltage of V9 which is extinguished, thus no voltage appears across VR2 and R21. In this condition V5a is in the cut-off condition and a mark frequency is radiated, it being conventional that the mark frequency is the higher of the two. With the keying relay open a negative voltage is applied to the grid of V5b via the resistor R20. This cuts off the valve causing the potential at the anode to rise and V9 to conduct. Due to the current flowing a small voltage appears across VR2 and R21; part of this is applied to the grid of V5a, an increase in the effective reactance across the tuned circuit of the oscillator occurs and the frequency is reduced very small being less than 0·04 of the total power, and is more than compensated for by the simplicity of the system. As has been indicated it is necessary to generate a pure audio tone for modulation and in the circuit shown V4 is used for this purpose. An oscilloscope should be used to observe the output even if it means borrowing one. The transformer used in the original is one believed to have been designed to match a carbon microphone into a valve grid circuit and with the added capacity generates a frequency of about 500 c/s. Any audio transformer can be used, provided the frequency generated is between 500 and 800 c/s. R38 should be increased in value until oscillations are just maintained as the amount of audio voltage required is quite small; if the output is distorted adjustments should be made to R13, R14, and/or C20. If the output cannot be made pure the transformer must be replaced with another type.

Both frequency and amplitude modulated telephony cause objectionable and unnecessary adjacent channel interference if the level of modulation applied to the carrier is too high. To obtain the maximum signal to noise ratio at the receiver it is necessary to maintain a high average level of modulation at the transmitter.

To enable these opposing requirements to be satisfied

some form of constant output circuit is required in which the amplitude variations of speech waveforms are reduced. Most circuits for this purpose rely on one of two methods, either a limiter to control the maximum amplitude of signals passing or a valve circuit whose gain can be varied inversely with the signal level. The former method is used in the present case as it is the easiest to adjust, and if followed by a good low-pass filter, quite free of any distortion. The speech input feeds into V8 which is a high gain amplifier capable of providing sufficient output from any crystal microphone. V6b, fed via the potentiometer VR4, is a further amplifier in which a small amount of degeneration is included for the correction of frequency response. V7 is the limiter and the action is best explained by reference to the simplified diagram, Fig. 2. The diodes are in series, each being biased +2 volts on their respective cathodes. If the audio voltage at point

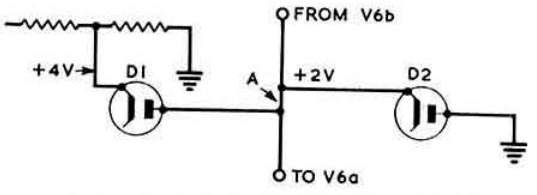


Fig. 2. Simplified circuit of the limiter arrangement.

" A " swings ±2 volts there is no action. Now consider the point " A " going 3 volts negative: it will then be 1 volt negative to earth and the diode D1 will conduct until the point " A " is restored to negative 2 volts. Similarly, when the point " A " goes above 4 volts positive the diode D2 will conduct and restore the potential to positive 2 volts. Returning to Fig. 1 it will be seen that if the potentiometer VR4 is adjusted to give more than ±2 volt swing at the point " A " for all normal speech levels the clipping action will be continuous.

The output from this stage, which is very square, is amplified by V6a and then passed to the low-pass filter, which is similar to that used by L. Varney (G5RV) in the

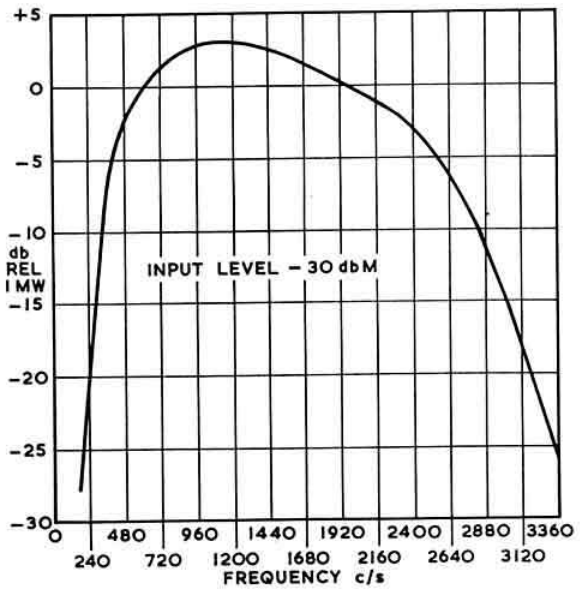


Fig. 3. Graph showing the frequency response of the audio stages.

Elizabethan speech clipper. If the values shown in Fig. 1 are adhered to, this part of the circuit will prevent any of the high frequency components generated in the clipper and the microphone from passing into the output. In addition, the operating conditions of the valves V6 and V8 have been arranged to reduce the level of low frequencies passed. Fig. 3 shows a graph of the frequency response of the complete circuit, the 6db points appearing at about 400 c/s and 2500 c/s with frequencies outside the range 200-3500 c/s 30 db down or better. This gives a good crisp quality to the speech as the greatest gain is centred around that part of the spectrum containing the majority of intelligence. The output from this section is via the potentiometer VR3 and can be used to drive a high-power modulator for A3 or via S1c for F3.

Switching

The switching of the unit is simple and is accomplished by S1 and S2. S1, the system switch, provides, in the following order, F1, A1, F3, A3, and A2. The wafer S1a connects the grid of V5b on position one to the keying relay; on all other positions the grid is earthed. S1b connects the cathode of either V1a or V2 to the keying relay on positions 2 and 5 and to earth on positions 1, 3 and 4. S1c connects the grid of V5a as required for F1, A2, and F3. S1d applies h.t. to the audio oscillator on A2 transmission. This valve is switched off when the output is not required as due to strays, probably across the switch, a sideband of about − 30db relative to the carrier appears if it is left running when not required.

Setting Up

Adjustment and setting up of the unit should be carried out in the following manner. The oscillator should first be arranged to cover the frequency range required and the anode circuits of V2 and V3 tuned to give a constant output over the range. The measurement of level can be made by using the instrument described in the article *A Modern Transmitter for the Amateur*, in the R.S.G.B. BULLETIN for September, 1956. The level should not vary greatly from the performance figures at the end of this article.

Next, the F1 shift is adjusted to be 800 c/s with VR2 set to maximum; if at this setting the shift is greater than 800 c/s the value of R21 should be reduced. It is advisable to err on the side of having the shift a little below rather than above this figure. The adjustment will be easier in this case on the upper frequencies, and the method of obtaining these settings is to divide the scale of VR2 into eight sections marked in an anti-clockwise fashion for the remaining bands. The voltage division should be equal to the frequency multiplication for correct shift on all bands. A check with the transmitter on will confirm these adjustments and permit a final correction if required.

The levels for F3 and for the modulation on A2 should now be confirmed. First set up the audio level into the clipper filter unit by adjusting VR4 to the point of maximum gain without distortion, as monitored at the output from VR3. This is best ascertained by setting the potentiometer to maximum and slowly reducing the gain until the speech appears clean and crisp. Next ascertain the d.c. voltage required to shift the frequency 2·5 kc/s in the following manner: Arrange a potentiometer across any convenient d.c. supply and connect negative to chassis and the slider to the grid of V5a. Measure the frequency with zero voltage and then increase the voltage in a positive direction until the frequency has moved 2·5 kc/s. Apply this voltage to the oscilloscope and mark off on the screen the deflection obtained. With the output from VR3 in place of the d.c. voltage adjust the gain to give a deflection equal to that originally obtained whilst using normal speech input to the microphone. If the limiter is working correctly quite large variations in input level will produce no change in output

voltage which is what the oscilloscope will be measuring. This potentiometer setting should be near the maximum and is the correct level for 80 metres. Half of this level will be required for 40 metres, one quarter for 20 metres, etc. To set up the A2 level repeat the above instructions using the output from the audio oscillator in place of the filter output. The resultant sideband levels on both systems will approximate to a 100 per cent modulated signal on A3.

Construction

The author's unit was constructed using a TU box as a base, owing to the suitable size and excellent shielding provided by the double skin. The original front panel, internal screens and all components with the exception of the " M.O." tuning condenser were removed. All but three of the moving plates were removed from the rotor of this condenser to give the required bandspread. A new aluminium panel was drilled and fitted as shown in the photograph, after which the condenser drive and supporting angles were replaced. The chassis has a $\frac{1}{2}$ in. lip turned down on all four sides to make a neat fit into the space between the condenser supports and the end of the inner box. The original handles are fitted and the top and bottom edges of the outer case reinforced with $\frac{1}{4}$ in. angle secured with 6BA screws. The front panel is secured to these and to the original side fixing angles with self-threading screws which makes a rigid assembly. The author's opinion is against laying down hard and fast laws for the layout and wiring of any unit as the type and size of components may vary. In addition, a certain amount of improvisation is a good thing for all concerned. Power supplies are connected via a Jones plug and a socket fitted to the inner structure. Access is obtained through a clearance hole in the outer case. The accompanying photograph shows the chassis and front panel layout. Most of the wiring can be completed before the chassis is put into position in the unit if sufficient lengths of wire are left for the remaining wiring.

The keying relay is a small " surplus " type which works quite well on about 10 volts; the inclusion of a relay is to ensure that the frequency when keying the oscillator is not affected by stray coupling. With the 70 volts available any suitable relay may be used with an adjustment of R39.

Power Supplies

A transformer with 350-0-350V at 125 mA and 6·3V at 3 amps secondaries is used to drive the unit. The output voltage is obtained by connecting two 75 volt stabilizer valves and one 150 volt type arranged as shown in Fig. 4. The smoothing resistance Ra is adjusted to prevent the current flowing through the valves exceeding the makers' ratings when the unit is working. A current of 15 mA through the valves has been found sufficient to maintain a steady voltage in operation. This is of course well within the valve limits.

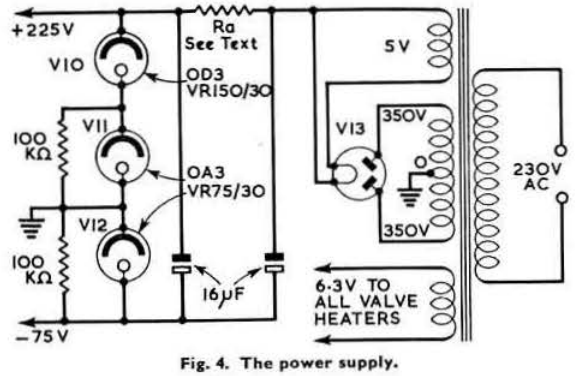


Fig. 4. The power supply.

Performance

The following details of performance were obtained without any special adjustments and should be easily reproduced:

A.F. filter and amplifier section

The noise level with no microphone connected is below minus 55 db.

The maximum gain over the useful audio range is 30 db.

Output is constant over an input variation of 25 db.

Frequency response is shown in Fig. 3.

R.F. Section

Output 500 mW ±10 mW between 3·5 and 3·7 Mc/s, −20 mW at 3·8 Mc/s.

Potentiometer settings for 800 c/s shift with scale markings 1 to 8: 3·5 Mc/s—8, 7 Mc/s—5, 14 Mc/s—3, 21 Mc/s—2·5, 28 Mc/s—2.

Potentiometer settings for minus 6db first sideband on A2 with scale markings 1 to 10: 3·5 Mc/s—8, 7 Mc/s—6, 14 Mc/s—5, 21 Mc/s—4, 28 Mc/s—2·5.

Midget Self-Contained Transistor Receiver

By S. F. WEBER (B.R.S. 19317)*

WITH transistors readily available to the amateur, the author decided to take advantage of their small size and low current consumption to build a receiver which was completely self contained—including batteries and aerial—in a box of about the same size as a packet of 20 cigarettes, to fit into a small leather case intended for a photo-electric exposure meter. No attempt was made to use the minimum possible space, with the result that although the receiver appears crowded, it could, with a little thought, have been made some 40 to 50 per cent smaller still using the same components.

To ensure adequate sensitivity and selectivity it was decided to use a circuit (Fig. 1) comprising an r.f. stage followed by a crystal detector and two a.f. amplifiers. For a unit of this size it would be neither possible nor consistent with the general style to use a loudspeaker, so a deaf aid ear piece was decided on. To simplify mounting of the components—and also to avoid affecting the aerial rod—the box was made up from $\frac{1}{8}$ in. polystyrene sheet and fitted with a removable lid. Its actual size is 7 by 2·6 by 5·8 cm. The main components are secured either with cement or 10 BA nuts and bolts.

The miniature receiver with the battery removed. Its size can be judged from the earpiece.

The Circuit.

As the receiver was built on such a small scale, it was unfortunately impossible to use a variable condenser, so fixed tuning had to be resorted to for one medium wave station. Of course a switch could have been used to give a selection of stations, but it was not thought either convenient or worth while to do so.

The r.f. amplifier uses a Mullard OC51 point contact transistor in an earthed base circuit so arranged as to remove the need for a separate bias battery (Fig. 2). The aerial is wound on a Ferroxcube rod, either $\frac{3}{8}$ in. or $\frac{1}{4}$ in. diameter; in the latter case two in parallel are used. The coil is tapped about one-quarter the way up from the earthy end and a small amount of reaction is used.

In areas of high signal strength (the author lives just north of Wimbledon), the gain provided by one r.f. stage should be quite adequate for all normal purposes. If, however, extra gain is required, a second r.f. amplifier of similar design will be necessary. With care it should be possible to build this extra stage into the same box, but the extra current consumption might prove rather a strain on the battery. The coupling coils between first and second r.f. stages could well be the same as those between r.f. and detector stages, with, however, the secondary tapped about one-quarter the way up. Alternatively pi coupling could be used.[1] Experimentally determined characteristics of the OC51 transistor are shown in Fig. 3.

The output from the r.f. stage is coupled into the detector which uses a diode of the GEX35 variety. The a.f. signal from this stage is then stepped down through a 4·5 : 1 transformer, the primary of which should have a d.c. resistance of about 1,500 ohms and the secondary about 200 ohms. The signal then passes through the volume control into the first a.f. stage, an OC70 junction transistor in an earthed emitter circuit.

*65 Combemartin Road, Southfields, S.W.18.

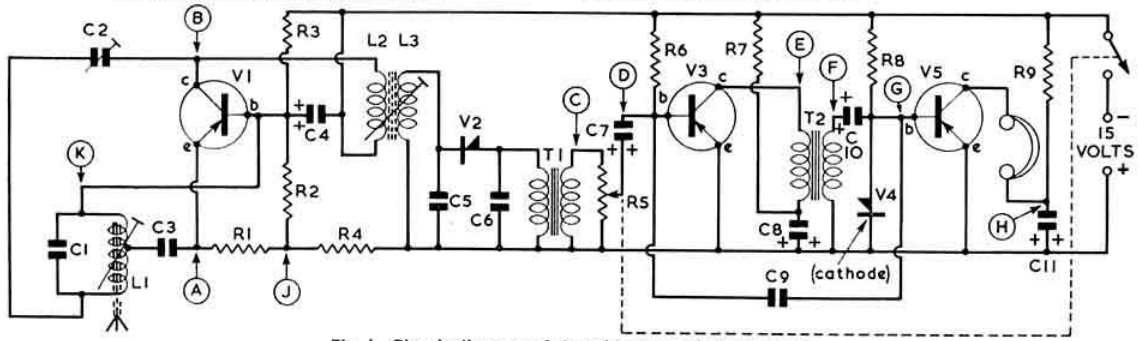


Fig. 1. Circuit diagram of the midget transistor receiver.

C1, 300pF mica or ceramic; C2, 10pF mica in parallel with 10pF trimmer (Wingrove and Rogers); C3, 0·01μF; C4, 7, 8, 10, 6μF 3V electrolytic; C5, 233pF mica or ceramic ±2 per cent; C6, 9, 1,000pF ceramic; C11, 1μF 18V electrolytic; L1, 44 turns 9/40 Litz wire wave wound on ferroxcube rod (Teletron type FRM rewound) tapped at 12 turns, total length $\frac{1}{4}$ in.; L2, 3, medium wave crystal set type (Osmor "Q"); R1, 1·2K ohms; R2, 470 ohms; R3, 6·8K ohms; R4, 3·3K ohms; R5, 2·2K ohms variable with switch; R6, 680K ohms; R7, 15K ohms; R8, 270K ohms; R9, 6·8K ohms; T1, 2, 4·5 : 1 step down transformer (primary to pass up to 1 mA; primary d.c. resistance 1·5K ohms; secondary 200 ohms); V1, OC51 (Mullard); V2, GEX35 or equivalent; V3, 5, OC70 (Mullard); V4, 1N72 (or similar low impedance mixer type diode); earpiece, 200 ohms d.c. resistance; battery, Ever-Ready deaf aid type B121 (15 volts). Voltage measurements with respect to h.t. positive (see text) are as follows: point D—0·12V; point G—0·17V; point H—2·5V.

With a.f. amplifiers of this type, the base impedance is very much lower than the collector impedance, so some matching device from one stage to the next must be used. It may be thought that with a transformer stepping down, all the signal voltage is being wasted, but it must not be forgotten that there is a corresponding step-up in current (assuming, of course, that the output is matched) and that transistors are current amplifying devices.

The output from the first a.f. stage passes through another step-down transformer and a small proportion is returned to the previous stage as negative feedback, considerably improving the listening quality. The final amplifier—another OC70—feeds directly through a deaf aid ear piece (available on the surplus market) which should have a d.c. resistance of about 200 ohms.

Some further points need explanation. The purpose of the diode across the input to the final stage is to short-circuit any positive going peaks which can otherwise cause a very unpleasant form of distortion. The amplifier stage runs with a bias of only -0·17 volt, and this can be overcome on peaks in speech and music. The diode must therefore have a very low forward impedance and only mixer diodes are really suitable; i.e. 1N21-3 or 1N72. Cutting the forward peaks off to this extent does not appear to have any serious effect on the quality as there is virtually no action with a signal of average level.

It should be noted that the a.f. coupling condensers must have a very high capacity as they are used in an extremely low impedance section and are effectively in series with the transistor input impedance and the transformer d.c. resistance. Even with the 6μF recommended, about 25 per cent of the signal voltage is lost.

Readers may wonder why a battery of 15 volts should be used when the highest voltage across any transistor is only about 6. In the first case large series resistances can be used to safeguard the transistors in case of accidents and still enable them to be operated on a favourable portion of their characteristic curves; secondly, the B121 hearing aid battery recommended is smaller than any available battery of lower voltage, although, of course, its continuous current rating is severely limited.

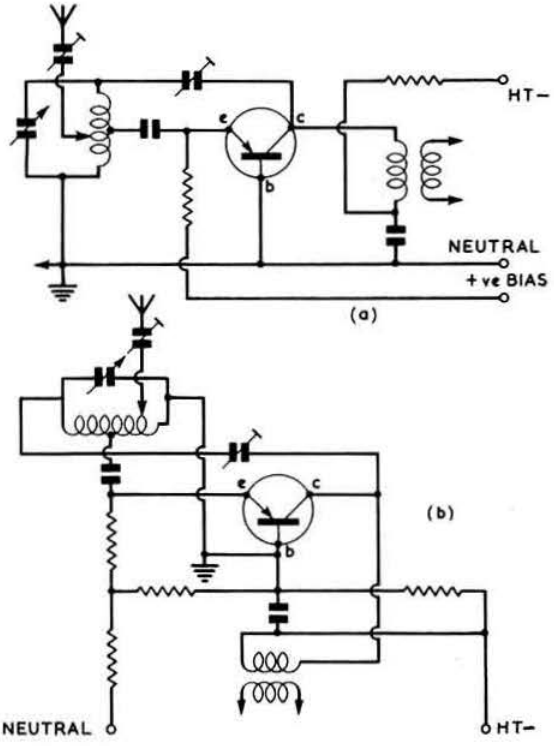


Fig. 2. (a) Point contact transistor r.f. amplifier of conventional type. (b) Arranged to operate without a bias battery.

Construction, alignment and testing.

The volume control with its associated on/off switch is placed in the top panel, the aerial rod and r.f. amplifier down the left centre, the crystal detector and first a.f. amplifier at the bottom and under the battery, and the output stage in the top right hand corner. There is of course no need whatever to stick to this layout—it just happened to be convenient in the writer's case.

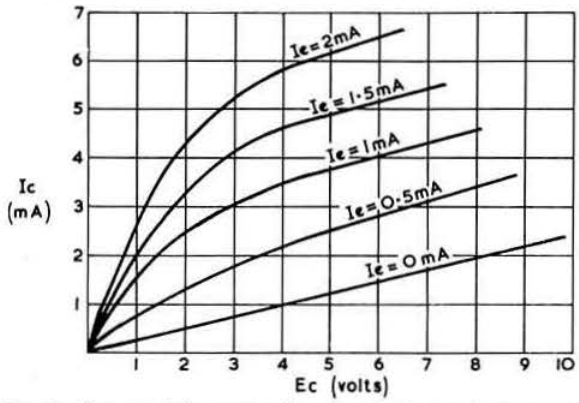


Fig. 3. Characteristic curves for the OC51 transistor found experimentally by the author.

It is essential that only good class components should be used and that care should be taken when wiring up not to overheat anything. The transistors are particularly prone to damage in this respect and should not have their leads soldered nearer than 15 mm. from the glass seal, an adequate heat shunt of course being used (pair of pliers, etc.). Connection is made to the OC51 with small clips (do *NOT* solder!) as also to the battery. Connections to the OC51 and OC70 transistors are shown in Fig. 4.

When testing initially, the negative feedback loop and limiter diode should be disconnected, the volume control turned to maximum (and progressively reduced as the receiver is aligned) and C2 to minimum capacity. A reasonably good earth should be connected to the h.t. *positive* (i.e. neutral) line.

Starting with the a.f. amplifiers, putting a screwdriver on point " F " (Fig. 1) should produce a characteristic buzz or click; putting the diode into circuit should increase the intensity of this as well as making audible a slight

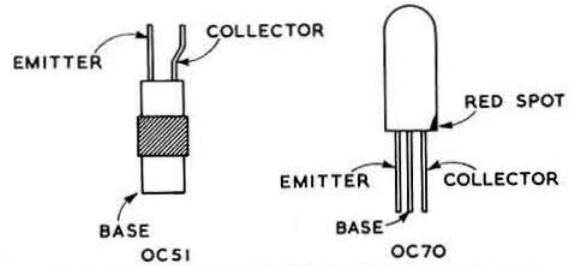


Fig. 4. Connections to the OC51 and OC70 transistors.

background hiss. Putting a screwdriver on points " D " or " C " should also produce a buzz or click but very much stronger than at " F." There may be a tendency to oscillate in this condition. If everything is in order so far—and there is not really very much that can go wrong—reconnect the feedback loop, which will reduce the h.f. response of the amplifier. If the receiver oscillates when this is put in circuit, the connections to either the primary or secondary of T2 should be reversed.

Now connect an aerial (a few yards of wire should suffice) through a 50pF condenser to " B." Tune the core of L3 for maximum output from the station required. This will be quite critical so it should be done carefully. The value of capacitance given for tuning this coil (233 pF) is right for the B.B.C. Home service on 908 kc/s but will need altering to cover anything widely different in frequency.

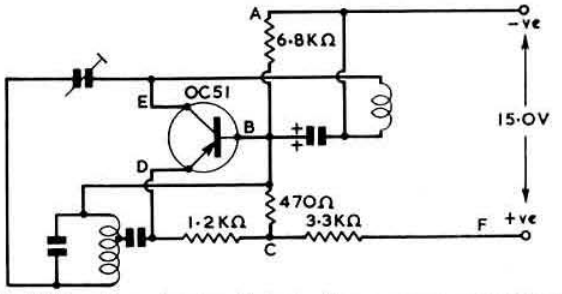


Fig. 5. Transistor r.f. stage. Typical voltage measurements using a valve voltmeter are as follows: AB, 4·14V; DC, 0·697V; DB, 0·414V; EB = AB; AC, 5·25V; CF, 9·75V; BC, 1·11V. Typical currents are: BE = FCBEA, 2·2mA; DB = FCDBA, 0·6mA. (Tolerance ±5 per cent).

Next connect the aerial to point " A " and again tune L3 for maximum, keeping the volume to a minimum. Finally remove the aerial and adjust L1 on its former for maximum; increase the capacity of C2 until a reasonable sensitivity has been achieved without increasing the selectivity unduly; remove the earth connection—which now should make no difference—and trim L1, C2 and L3 again for maximum output.

The voltages mentioned in Figs. 1 and 5 can only be measured by a valve voltmeter as in some cases the current involved is only a few microamps.

Most of the components used are available very cheaply on the surplus market and through normal channels and the total cost of the receiver should not exceed a few pounds.

Conclusion

No claim is made that this is the last word in miniature receivers, in fact there is obviously room for improvement in several directions; however, the results obtained have been very promising and with the experience gained in its construction should lead to further experiments in extreme miniaturisation.

Reference

[1]. *Transistors and Crystal Diodes*, B. R. Bettridge, Norman Price (Publishers) Ltd.

EI Activity during N.F.D.

WATERFORD RADIO CLUB members operated three stations from a site 400 ft. a.s.l. at Tycor, County Waterford, during N.F.D. EI9Q/P operated on 20 and 80 metres, EI4AB/P on 15 and 40 metres and EI3R/P on 15 metres exclusively. Practically all the operators were members of R.S.G.B.

South Wales O.R.M.

MEMBERS who intend to support the Region 10 meeting in Cardiff on Saturday, September 21, 1957, are requested to apply to Mr. E. White (GW3LAD), 41 St. Alban Avenue, Heath, Cardiff, for their tickets (price 12/6 which includes high tea with alternative menus) by September 7 latest.

Those who propose to stay overnight at the Park Hotel should write immediately to the R.R. (Mr. Cyril Parsons, GW8NP, 90 Maesycoed Road, Heath, Cardiff) because hotel accommodation in Cardiff, even at weekends, is very difficult.

The organizers wish it to be known that ladies will be very welcome. Arrangements will be made for the ladies to be taken on an escorted tour of the city while the business meeting is in progress.

Features of the O.R.M. will be a display of radio equipment loaned by manufacturers and dealers and a raffle for useful prizes. A well known pottery is making special ash trays to mark the occasion and these will be offered at a modest price.

Full details of the programme are given in a separate announcement on page 75.

The Council will be represented at the meeting by the President (Mr. D. A. Findlay, G3BZG) and the Honorary Treasurer (Mr. W. R. Metcalfe, G3DQ).

National Radio Show

LABGEAR (Cambridge Ltd.) will be making a special display of Amateur Radio equipment on Stand 217 at the National Radio Show, Earls Court, from August 27 to September 7, 1957.

Current Comment

Continued from page 55

Proceedings (of which the résumé is a digest of publishable size) have themselves been approved and duly signed by the Chairman (usually the President). The résumé will then go for typesetting; which explains why the July Résumé will not appear until next month.

No fears need exist that topicality suffers by this procedure. Council matters of immediate moment requiring early publicity are approved for printing in the next issue.

Hence the editorial footnote that frequently appears against items in the Résumé to the effect that " this matter was dealt with on page so-and-so of the last issue of THE BULLETIN."

" *Why were there so many v.h.f. articles in the June* BULLETIN, *and three by the same author?* "

This is an easy one: because we wanted to use up all the articles which our former printer had standing in type.

Now to ask a question in return:

Is your Bankers Order up to date in the light of the increase in the subscription rate to 30/- per annum?

If not, and if you remember to adjust it NOW, time and money spent in sending reminders later will be saved at Headquarters. Thanks, OM!

J. H.

Subscriptions paid by Bankers' Order

If you are a Home Corporate Member and you renew your subscription by means of a Bankers' Order please amend the order to the new rate of 30/- per annum

I.G.Y News

By G. M. C. STONE (G3FZL)*
R.S.G.B. I.G.Y. Co-ordinator

AS members will have read in the National Press, the International Geophysical Year commenced shortly after a solar outburst of unusual intensity had been observed. Barely three hours after H.R.H. The Duke of Edinburgh had introduced the I.G.Y. on B.B.C. Television in the programme *The Restless Sphere*, a polar aurora (northern lights) of sufficient intensity to cause reflection of 144 Mc/s signals occurred. Between 23.45 and 02.00 on July 1, GM3EGW of Dunfermline contacted stations in Denmark, Germany and England and also heard Belgian stations. Many more carriers were heard but were unidentifiable as signals received by auroral reflection are so distorted as to make phone quite unreadable. All v.h.f. operators are therefore especially urged to sign on c.w. when Special World Intervals are in progress to save others the frustrating experience of not being able to identify signals. Under auroral conditions beams should be pointed northwards and then orientated for maximum signals. GM3EGW found that maximum signal strengths were obtained when his beam was pointed north-east (actually 050°) whilst stations in Denmark found that their beams had to be pointed due north for optimum results.

Special World Intervals

Special World Intervals are initiated as soon as unusual solar activity is observed and considered to be likely to cause magnetic storms. Scientific observation is then intensified to obtain the maximum possible amount of data. The first effect of a solar flare is that the intense burst of radiation disrupts the properties of the ionosphere causing radio fade-outs in the high frequency bands. These fadeouts usually last for periods of a few minutes to half an hour or more. Some one to three days later the atmosphere is bombarded by particles released from the solar flare and these give rise to many effects, the most interesting of which to the v.h.f. operator is the aurora, with the simultaneous interruption of the properties of the ionosphere resulting in further radio fadeouts or disturbances.

Notification of Special World Intervals

To be able to make the most of unusually high solar activity it is essential that warnings of Special World Intervals reach observers as quickly as possible. All information from world solar observations is sent to the Central Radio Propagation Laboratory at Boulder, Colorado, U.S.A. From there world alerts are sent out and received in this country by the Meteorological Office Communications Centre, Dunstable. The warning is then sent out to the many centres in this country interested in I.G.Y. observations. (For obvious reasons the number of telegrams to any one addressee is limited; the R.S.G.B. receives three copies).

In addition to this world network, information on S.W.I.s will be broadcast by a number of stations, the form of the alert being as follows:

AGI—AAAAA	indicating state of Alert
AGI—EEEEE	indicating state of No Alert
AGI—SSSSS	indicating Special World Interval will begin at 00.01 G.M.T.(Z) of following day.
AGI	three extra long dashes indicating Special World Interval in progress.
AGI—TTTTT	indicating Special World Interval terminates at 23.59 G.M.T. of same day.

This information will be broadcast as follows:

* *10 Liphook Crescent, Forest Hill, London, S.E. 23*

Geophysical Year opens with great Solar Outburst

WWV: (Washington)	Frequencies: 2·5, 5, 10, 15, 20 and 25 Mc/s. Times 4½ and 34½ minutes past each hour. The information follows a code identification of the station call and the time in G.M.T.
WWVH: (Hawaii)	Frequencies: 5, 10 and 15 Mc/s. Times: 14½ and 44½ minutes past each hour.
JJY: (Tokyo)	Frequencies: 4, 5, 8, 10 and 15 Mc/s. Times: 18 and 48 minutes past each hour.
LOL: (Buenos Aires)	Frequencies: 5, 10 and 15 Mc/s. Times: Every 5 minutes from 11.00-03.00 U.T. during interruption of tone, e.g. 04.05, 09.10, etc.
W1AW:	Frequencies: On c.w., 1·885, 3·555, 7·08, 14·1, 21·01, 50·9 and 145·6 Mc/s. On phone: 1·885, 3·645, 7·255, 14·28, 21·33, 50·9 and 145·6 Mc/s. Times: 24.00 G.M.T. c.w. and 01.00 G.M.T. phone Sunday to Friday. Also 03.30 phone and 04.00 c.w. Monday to Saturday.
GB3IGY:	Frequency: 145·50 Mc/s. Times: During International Study Periods and S.W.I.s every hour and half hour for five minutes. At other times 6 p.m. to midnight clock time every hour and half hour for five minutes.
GM2FHH:	Frequency: 28·2 Mc/s. Time: 23.00 clock time.

(Clock-time is G.M.T. or British Summer Time, whichever is in force.)

The B.B.C. has also agreed to include short notices of I.G.Y. warnings after the 11 p.m. news bulletin in the Home Service.

Further information on the reporting network will be published from time to time as experience is gained in its use and effectiveness.

Beacon Stations

As announced in the June 1957 issue of the R.S.G.B. BULLETIN, a beacon station has been set up at the home of G5KW using the call-sign GB3IGY on a frequency of 145·50 Mc/s.

V.h.f. observers are especially asked to report on the reception of GB3IGY. Instructions and standard log forms will be distributed shortly.

In addition to this British station several other European countries will be setting up similar stations. Details are summarized below.

Denmark

Call-sign: OZ7IGY.
Frequency: 144·05 Mc/s.
Time: from approximately one hour before to one hour after sunset.

Poland

Call-signs: SP5FM, SP5IL, SP3PK and SP2DX.
Frequencies: 50, 70 and 145 Mc/s.
Power: 0·5 kW on 50 and 70 Mc/s; 0·1 kW (later 0·5 kW) on 145 Mc/s.
All aerials beamed North.

Yugoslavia

Call-sign: YU1AO.
Frequencies: 72 and 145 Mc/s.
Further information will be published as soon as detailed information regarding operating frequencies and times is known.

I.G.Y. Observers

The response to the request published in the June BULLETIN has been extremely encouraging and it is surprising how many amateurs have receiving equipment for bands other than those allocated by the G.P.O. for transmission. As a result of this it will be possible to cover almost the entire spectrum from 50 to 150 Mc/s with observers as far apart as the North of Scotland to the Channel Islands and as far west as Eire.

Casual Observers

In addition to the registered observers it is felt that there are many amateurs who would be prepared to assist in I.G.Y. so long as no further tasks than their normal operating or listening activities were involved. Information of this type is required on 28 Mc/s and v.h.f./u.h.f. contacts. However a reasonable monthly coverage is necessary with concentrated efforts during the study periods as shown in the I.G.Y. calendar published in the June issue. It will only be necessary to transcribe from the station log on to the special reporting forms (to be provided) details, for example, of 28 Mc/s contacts with North America and Canada (i.e. the trans-auroral path) and v.h.f. contacts, or listening reports, with stations more than 50 miles distant. Unusual occurrences such as auroral reflection work, where it is often possible to hear both the direct and reflected rays should also be recorded; the 50-mile range criterion is not to be applied to this type of report. Amateurs are invited to offer their services as casual observers following which they will be allocated to an Area Activity Co-ordinator as for registered observers.

Long Delay Radio Echoes

Dr. Briggs of the Cavendish Laboratory, Cambridge, has written suggesting a further subject for study by radio amateurs. This is to listen for long delayed radio echoes from signals in the 3-30 Mc/s band. These echoes are believed to come from streams of ionized particles originating from the Sun and therefore their study fits conveniently into our programme as already discussed. However, their origin has been by no means established and there are conflicting views amongst scientists as to their cause.

Reference is made to these echoes in the book *The Polar Aurora* by Carl Störmer (Oxford Clarendon Press) and anyone who wishes to study the subject seriously might well start by reading the appropriate matter in this book.

These echoes are delayed by approximately 1-10 seconds and should not be confused with the common " round the world " echo of approximately ½ second. The long delay echoes are very much rarer and it is possible that they will occur in the early stages of a Special World Interval. Any type of signal in the range 3-30 Mc/s is worth observing for the presence of echoes, but the most favourable would probably be high power commercial c.w. stations. There have been reports of echoes having been heard on amateur signals. With " break-in " operation there is the possibility of hearing echoes from one's own signal.

If echoes are heard the fullest information should be noted in the log immediately. This should include date, time, frequency, station, time delay of echo (measured with a stop-watch if possible) and whether the frequency of the echo, as judged by its beat note using the receiver b.f.o., was the same or different from the transmitted signal. Some details of the band at the time would also be useful. Once an echo is heard, it should be monitored as long as possible or until it disappears. The time of disappearance should be noted.

The importance of giving full details cannot be stressed too much. Vague reports that echoes were heard on a certain day are not of much scientific value.

Reports on these echoes from registered or casual observers should be sent through A.A.C.s to the Amateur Radio I.G.Y. Centre at R.S.G.B. Headquarters. Others should send their reports direct to the A.R. I.G.Y. Centre at Headquarters. The information will then be collected and passed on to the Cavendish Laboratory.

Correspondence

The volume of correspondence concerning the I.G.Y. has grown so enormously in recent weeks that it is impossible to reply individually to all letters. However, the I.G.Y. Co-ordinators are to issue a number of information and data sheets to observers which it is hoped will resolve most queries. These sheets, which will contain a good deal of specialized and useful information, cannot be published in the BULLETIN because of pressure on space.

Area Activity Co-ordinators

As mentioned in the March BULLETIN a number of Area Activity Co-ordinators (A.A.C.s) have been appointed and are listed below. Observers will be allocated to various A.A.C.s according to their geographical locations, although no hard and fast boundaries will be established. Individual reports from observers will be sent in monthly, or more frequently if found necessary, to their nominated A.A.C. Each observer will receive individual instructions in this respect. A.A.C.s will then scrutinize the reports for accuracy of format, add appropriate comments and dispatch these to the Amateur Radio I.G.Y. Centre (A.R. I.G.Y. Centre) at R.S.G.B. Headquarters.

Those interested in joining in this important work who have not yet registered and may live near to an A.A.C. are invited to contact the A.A.C. direct and arrangements will then be made for registration.

Channel Islands

Walter Butt (GC2FZC), Meo Voto, Green Lanes, St. Peterport, Guernsey, Channel Isles.

England

Harold Beaumont (G5YV), 8 Ashfield Avenue, Morley, Leeds. J. Bradshaw (G2NY), Wyngarth, Bilsborough, Nr. Preston, Lancs. V. Collins (G2HOF), 37 Rosclare Drive, Wallasey, Cheshire. Don. Hayter (G3JHM), 16 A'Becket Gardens, Worthing, Sussex. F. R. Howe (G3FIJ), 29 Kingswood Road, Colchester, Essex. Norman Hyde (G2AIH), 114 Tattenham Grove, Epsom Downs, Surrey. Arnold Mynett (G3HBW), 52 The Rutts, Bushey Heath, Herts. Ralph Royle (G2WJ), Haydens End, Great Canfield, Essex. Arthur Simons (G5BD), The Elms, Church Road, Mablethorpe, Lincs. W. Tyler (G3CGQ), 94 Alexandra Avenue, Luton, Beds.

Ireland

Harry Wilson (EI2W), The Limes, Plunkett Avenue, Foxrock, Co. Dublin.

Scotland

L. Hardie (GM2FHH), 91 Inchbrae Drive, Aberdeen. J. W. Kyle (GM6WL), 67 Gardner Street, Glasgow, W.1. J. F. Shepherd (GM3EGW), 8 Garvak Hill, Dunfermline.

Farnborough Air Show

THIS year's Flying Display and Exhibition organized by the Society of British Aircraft Constructors will be held during the first full week in September. The largest and most comprehensive collection of guided weapons produced by any nation will be on view in a special enclosure adjacent to the Exhibition building itself. A wide range of electronic and radio equipment will be on display in the Exhibition.

A new grandstand to seat 2,000 people will be brought into use for this year's Display which promises to be one of the best ever staged. The Display opens on Tuesday, September 3, the preceding day being reserved for the Press and Technicians. The Show will be open to the public on September 6, 7 and 8. Gates will be open from 10 a.m. and flying will commence at 3 p.m. On the 7th and 8th the admission charges will be 5/- for adults and 2/6 for children (under 14).

Radio Amateur Emergency Network

By C. L. FENTON (G3ABB)*

IN certain areas it is not proving possible to provide the Red Cross with the co-operation they desire, because there are no enrolled members of R.A.E.N. Just such an area is Cambridgeshire, without a single member, although the adjoining counties of Hertfordshire and Huntingdonshire have a reasonably good membership. The B.R.C.S. County Director in Cambridge is most anxious to co-operate with R.A.E.N., and to run joint exercises. Are there any volunteers?

The B.R.C.S. has specifically asked that their cadets be allowed to act as messengers for R.A.E.N. in exercise and emergency. Such assistance should prove of considerable help to groups.

R.A.E.N. Rally

As will be seen elsewhere in this issue, the 1957 R.A.E.N. Rally will be held on September 8. The rules are unchanged from last year, and application should be made to the Hon. Secretary for Test Phrases and Log Sheets as soon as possible.

Red Cross Film

A film is to be made during the next three months showing the British Red Cross Society's emergency relief work, and incorporating R.A.E.N. activity in this field. The film will, to a large extent, be made in Kent, and will require the use of fixed station equipment, together with mobiles and at least two walkie-talkies. The producer will, in due course, be making contact with the Area Controllers adjacent to the area where he proposes to film.

News from the Groups

Lincolnshire. A full-scale county exercise, "Exercise Poacher," was held on July 14, in conjunction with the Nottinghamshire, Leicestershire, Rutland and Norfolk groups and G3JOH in Hull. The emergency situation was that the Grimsby and Cleethorpes areas had been rendered devoid of all communications. The purpose of this exercise was to demonstrate the potentialities of R.A.E.N. to all interested parties. Observers were present, so far as is known at the time of writing and with reports yet to come in, at all stations. The observers were amazed at the efficiency of communications, delighted with the result, and enthusiastic beyond all expectations. Whilst there is to be the usual inquest on this event, criticisms so far indicate no major faults, but a few minor points need attention.

Emergency stations, all operating on accumulators, put out extremely good signals with no equipment failures. Messages were not seen by the operators until they were handed in for transmission, yet, with approximately 200 transmissions and receptions involved, repeats were requested in only two instances, showing a very high degree of accuracy. One point very clearly shown was that it is far easier to obtain good operating procedure by example and practice than any amount of written rules.

In addition to observers from St. John Ambulance Brigade and British Red Cross Society, about 38 people took part in the exercise including G8ON, G3KPU, G4OF, G3DMU, G3ASJ, G3BTU/M, G3ADJ, G3KOG/A, G3JOH, G2ATS, G4XC/A, G3LDB/P, G3HTI, G3JXF/M, G2BQC, G5LL, G5BD, G5CY, G8GI, G2ABK, G3DXI, G3FJV, G3IVB, G2FT/P, G3HRX, G3HES, G3IUF, G3FUR, G3GXZ/A, G2ATL/M, G3FQY, G8QZ, G3KTP, G2RP and G3ELZ/M. Apologies are tendered to any participating station who may have been omitted from this list.

Notts. The Notts county net operated for the first time on July 14 in conjunction with the Lincolnshire exercise "Poacher." Participating were G3BTU/M on loan to Lincolnshire, G3KPU, G3DG, G3IQM, G5VU, G8QZ, G2RP, G3KTP, G3FRW/M and G8ON. A few more fixed and mobile stations are still required, when it should be possible to operate four nets within the county.

Dartford, Kent. The Area Controller is making renewed efforts to organize an active group in this area, and would appreciate any assistance from local members in neighbouring groups. **Godalming, Surrey,** are in touch with their local B.R.C.S. officials, and are hopeful of organizing a local exercise in the next few months. More members are needed throughout the county, especially mobiles. Area Controller G3DBB will be on 1900 kc/s between 10.00 and 11.00 every Sunday from September 1, looking for Surrey members, or prospective members, who are interested in the exercise. Two metre and mobile enthusiasts will be particularly welcome. **Preston.** Regular nets will be held on three nights a week, calling on 1980 kc/s and QSY to 1925 kc/s—Sundays at 10.00, Mondays 19.00, and Thursdays 19.00. More members are needed, and a recruitment drive is under way.

Romford conducted a very successful field-day-cum-portable exercise on May 26 at South Weald. Activity, which was mainly on Top Band, was contributed by G3IMP, G3KXE, G3KXP, G3GOT, G3JHL, G3KGS/M, G3JVS and G3KRZ, ably assisted by B.R.S. members A. Barker, D. Jones, R. Fronius and R. Hicklin. G3KXE/P worked distances of up to 20 miles with his motor-cycle portable gear. **Chelmsford** deeply regret the resignation of their Area Controller, R. Ferguson (G4VF), who finds it impossible to continue owing to pressure of business and frequent trips abroad. Whilst G4VF's valuable assistance will be missed by the Chelmsford members, they welcome their new Area Controller, George Cutting, G3GNQ. **Worcester,** it is learnt, have acquired a YL as hon. secretary. Nice work, boys.

Birmingham held a more advanced, but small scale, exercise on June 6. **Stafford** members met on June 13 to discuss the results of the recent exercise. **Armoy, Northern Ireland,** continue to test mobile equipment, and would like to hear from anyone with experience of systems of obtaining 230 volts a.c. from 12 volt car batteries.

Lowestoft and Holt groups co-operated again on June 23 in a joint B.R.C.S./R.A.E.N. exercise at Snetterton Motor Races. Operating from 10.00 to 17.00 were G3JMU/P assisted by G3JMX and YL, G3JYG/M with SWL assistance, G3JNR/P, and G3HRK/A (control) assisted by SWL Jim Sutton. This gave three stations attached to F.A.P.s or ambulances around the track, and a Control at B.R.C.S. Headquarters. Thanks are due to the Lincolnshire boys, who so very kindly left the 1980 kc/s frequency clear.

Appointments

The following appointments have been made:

County Controllers: L. N. Goldsbrough (G3ERB), 54 Kings Lane, Bebington, Cheshire; C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex; H. S. Chadwick (G8ON), 25 Raines Avenue, Worksop, Notts; G. Henry (GI3BHX), Carrowlaverty, Armoy, Ballymoney, Co. Antrim. (N.I. Controller); W. C. Holley (G5TN), "Waverley," Worlebury Hill Road, Weston-super-Mare, Somerset.

Area Controllers: G. Cutting (G3GNQ), 72 Well Lane, Galleywood, Chelmsford, Essex; G. E. Herringshaw, Westhope Manor, Seifton, Craven Arms, Shropshire.

Resignations

The following have resigned:

J. E. Swayne, formerly Area Controller for Witney, Oxon; H. S. Chadwick, formerly Area Controller for Worksop, Notts; R. Ferguson, formerly Area Controller for Chelmsford; S. Sawyer, formerly Area Controller for Ilford; J. J. Wright, formerly Area Controller for Scunthorpe; H. Staff, formerly County Controller for Norfolk.

* *Hon. Secretary, R.A.E.N. Committee, "Niarbyl," Gay Bowers, Danbury, Chelmsford, Essex (Danbury 518).*

THE MONTH ON THE AIR

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

BY S. A. HERBERT (G3ATU)*

ONCE again a summery month has meant that lots of activity has taken place off the air rather than on it and the post-bag is correspondingly light. The International Geophysical Year, which started on July 1, got away very literally with a bang, when there occurred on that day one of the biggest solar explosions ever to be recorded, while not many hours later another and almost equally potent outburst took place. The short wave bands were all affected and our amateur allocations were useless for DX for several days, during which time receivers all over the world were being " peaked up " by frantic owners who were unaware of what was going on! However, all things come to an end and conditions soon returned to normal. Indeed, there is no doubt that, on average, things are livelier and better than they were a year ago. Ten metres is always unreliable during the summer months, but both 15 and 20 have been exceedingly good at intervals and the fact that 15 has been doing its stuff so well is a sure sign of the times. Which makes as good an introduction as anything for our start for this month.

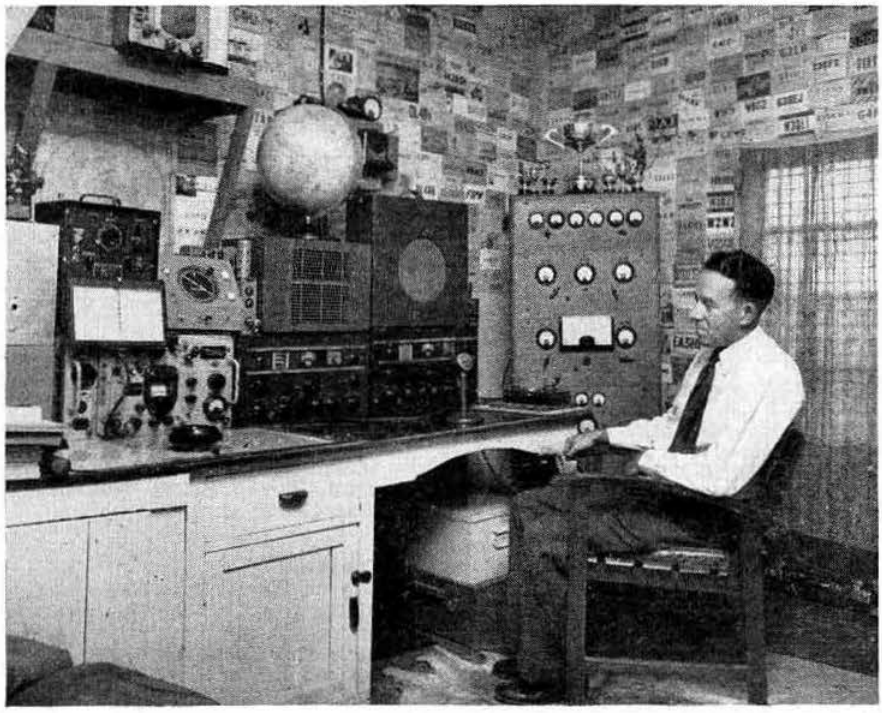
Fifteen Metres

Once the solar storms had died away, the 15 metre band quickly came back to life and business has been brisk to all parts of the world. Some of the early morning periods in particular have produced W5, '6, '7, KL7, LU and VK, all roaring in at the same time, but it is fair to add that the band is inclined to be erratic and can change completely in seconds from a wide-open to an almost dead state.

G3DQ (Bridlington) remarks that although he has not written before about things on the air, even at his age, it is never too late to start! Cliffe has just returned from a trip to the West Indies and he now runs a nightly sked with four of the VP6 boys. VP6WR is always S9 plus and '3DQ has been getting exceptional reports both from him and from DX such as PJ2MC, YN, HC, JA, DU, KH6, VK and ZS, using an LG300 into what he describes as a " quite wrong " aerial—a 33 ft. top fed in the middle by 600 ohm line some 45 ft. long. It works fine—in fact a " CQ " by mistake in the U.S. phone band brought back thirteen Ws! Cliffe asks his DX contacts if they would like to become members of the R.S.G.B. and if they are interested—as most are—he gets Headquarters to send them a copy of the BULLETIN. It works!

G3KBH (Gravesend) is another to use what he calls a " poor " aerial. This one is a two-wavelength wire, fed at a quarter-wave with co-ax line. The whole thing is no higher than 25 ft. and screened by trees, but it got him good reports from KR6RB (16.00), KG1HL (17.00), HB1UE/FL on phone and Ws, VS6DO and PX1FC on the key. Mike cares nothing for the manners of certain Gs who work a DX station and then sit on his frequency, chatting among themselves. As he says, if they were faced with the same behaviour by a foreign station, they would be quick enough to call *him* a lid.

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



VQ4AQ, Nairobi, Kenya Colony, had 420 contacts during the 1957 B.E.R.U. Contest and scored 3943 points to secure second place in the Senior Section. In this picture, the equipment visible includes two RCA AR88 receivers, a BC221 frequency meter, beam indicator, and the source of his potent signal—a very fine transmitter comprising a Geloso v.f.o. with a 100TH in the p.a. running 150 watts. A large collection of QSL cards from all parts of the world adorns the walls of the " shack," which is built a short distance from the house. But perhaps the most noteworthy feature in the whole picture is the collection of silver ware on top of the transmitter cabinet.

Incidentally, not all rebuilds are tedious affairs. Mike rebuilt his own transmitter in one week-end—and it worked first time! **GM3ITN** (Clydebank) gave a new country both to CP1CJ and OA7I and worked FB8BX (Nossi-Bé) on c.w. VP2LU, VQ6ST and " the usual gang " answered his n.b.f.m.

G2DHV (London, S.E. 13) contacted FF8BZ, PJ2CH, PX1FC, VP5BL, VE8GD, KL7 and CE3, while **G2HIO** (Nottingham) used phone to work an impressive amount of DX, which includes BV1US (18.20), CP1CF (06.30), ZK1BS (Bill, 07.30), VK9HO (Rabaul, N.B., 12.20), VQ6ST (15.00), VR2AS, '2DA (10.15, 10.30), KH6ABX (09.00) and 3A2BG (operated by I1ZCT). Alan hears from those concerned that VP7NV (ex-VP5RR, W5HVV) is going to Ascension Is. and hopes that ZD8RR will be issued in due course. ZB1LQ is going to Aden and should be active by September, possibly as VS9AC. SV0WB will be K0IOR once more soon. Useful QTHs are VQ6ST: c/o P.O., Berbera, British Somaliland; HH2DB: c/o U.S. Embassy, U.S.Q.M., Port-au-Prince; CP1CF: J. Avarez Daza, Box 320, La Paz; BV1US: A.P.O. 63, San Francisco; VR2DA: c/o P.O. Vatukoula, Fiji.

G3AAE (Barnet) has had the bad luck to fall victim to TVI with the TV array sitting leering at his Zepp, ten feet away! He is busy with a beam which will repose at the bottom of the garden, farther away from trouble, but meanwhile he is on only after television hours, when KH6BXE, FP8AA (12.00), HC and WP4 fell to him on c.w., with CP1CF, KA8JT, VP5AR, VP5EM, KG4AN, HI7LMQ, ET3XY, VP1EE, ZS4GK and MP4KAM worked on phone—all between 04.30 and 08.00 . " Note the time," says John!

B.R.S. 20135 (Newport, I.o.W.) found that with the temperature around 90 degrees, his shack was not an ideal place to be in; nevertheless, he sweated it out for a time and combed the phone band for 4S7YL (18.30), VP4MM, VP9DM, HZ1AB (s.s.b.), CR5SP, VS9AI (20.30), VK2NN and VK7RM (08.00). **B.R.S. 20317** (Bromley) is finding conditions generally rather better than last year. Indeed, in 1957 he has already heard 199 countries, 180 of them on c.w. —no mean feat. EA8BF, FQ8AX, KG4AN and PX1FC were pulled in on the key for new ones on the band, as was VQ3AC on phone. **B.R.S. 20106** (Petts Wood) is also on the 199 mark this year and his latest catches include EA0AC (17.17), XE1PJ (17.00), PJ2ME (22.00), JAs (21.00) and FU8AA (16.42) on c.w. and ZD6DT, VS4JT (15.00), FS7RT (s.s.b.-23.00), FB8BX, FB8AH (17.50) on phone. The DX there is rare enough for anyone, we imagine.

G3ATU managed to work ZC5AL (Jesselton, 15.00) and OA7I, who turned out to be Evert Kaleveld, ex-PA0XE, now settled happily in Peru with plenty of space for big aerials. He still prefers low power, even though he is allowed 1kW. With his 40 watts making RST579X into Europe, he should do well enough.

Twenty Metres

During these summer days, twenty is generally rather quiet, apart from the ever-present short-skip, but conditions during the dusk and dawn periods have been very good indeed on occasion, with openings to the Pacific area almost daily in the early mornings. One particularly interesting development is the amount of DX c.w. traffic on the high end of the band. Possibly it was the transmissions from *Tahiti-Nui* that started things moving. Be that as it may, almost any morning now the spectrum around 14300 kc/s is full of c.w. One day in particular, your commentator listened up there and between 06.00 and 07.00 G.M.T. he heard W6, W7, VE6, ZL, FO8AK, FO8AO, ZK1BS and ZK2AB. Unfortunately, most of them were calling PX1FC at the time, but at least they were there and strong signals, too!

G3IFB (Harrow) worked VS2FF (17.45), EA9AP, FP8AA (22.30), VP7AU (22.30) OH3TI/0, F9SC/FC, HH2LD, UA0OM, KH6 and IS1, all new ones for him, while **G3KBH** raised HZ1NA on phone, OH3AA/0 on c.w. and heard UA0KAD working UA0KUA. **GM3ITN** heard from CR6AI a little late to pass on that CR5P was on Principe Is. on 14150 phone—July 16/17. Les needs only North Dakota for his W.A.S. and wonders if anyone can help.

G2DHV worked UM8UJZ (competition at last for UM8KAA!), UD6DD and UD6IL, then went on holiday to Broadstairs and Thanet, where as **G2DHV/A** he worked HB1MX/FL, VK, VE3, ZS and JA. In July, **G2DHV/A/M** was due to be on from the I.o.W. George says the " G5RV " aerial works very well. **G3AAE** heard VR6TC on c.w. for a second one morning—then the " W " pack descended. Too bad! However, John did work VP5BL (00.30), VS6DN (21.45), KV4BO, HE1AW, PX1FC and OH0. He had a letter from W3ZA, now in Saigon and having a tough time with the licensing authorities. Meantime he listens a lot with his 75A4. He says there is little chance of getting any more QSLs from XW8AB, but XW8AG is very active on 14 Mc/s c.w.

B.R.S. 21279 (Oldbury) logged VE3AHU/P (Gaza Strip), FB8AC (20.00) and FB8CD (Comoro Is.) on phone. Martin had a personal QSO with a well-known Birmingham DX " Mann " and learned that ZA2ACB, active for four days recently, was operated by DM2ACB, one of the crew of the East German ship *Wilhelm Pieck*, which recently visited Albania and that **VQ9HAY** is on from the Seychelles using low power c.w. He works KV4AA and others on Saturdays at 13.00 G.M.T. with KV4AA using s.s.b. on 14310 kc/s. **B.R.S. 20135** heard ZD1EO and CT2AH (Santa Maria Airport) on phone, while **B.R.S. 20317** found his time on the band rewarded by three brand-new ones in FB8CD (19.00-20.00, '097), HL2AJ (Seoul National University, 18.30-20.00, '016) and YA1AM (14.30, '050), followed by EA0AB, EA0AC, 3W8AA, ZD4CM, VS4BA (16.00-17.00, '086) and JA1JG (Prince Harald Coast, Antarctica, 18.15, '015)—all on c.w. **B.R.S.20106** logged the Comoro FB8 on c.w. at 19.30 and heard FO8s (06.00-08.00), FE8AH (06.00), 3A2BF, VP8CC (19.30), LA8YB/R (Norway) and LA2JE/P (01.30). This one should be in the Arctic, but just where, we are not sure.

G3ATU heard OK1MB operating the OK1KSR Club station and took the opportunity of asking him about the licence situation. (UP2AS, UQ2AN, OK1MB and others were variously reported to have had their licences withdrawn for some reason.) Beda confirmed that his call had, in fact, been in abeyance for two months, but that it had now been restored.

Third in the 1957 B.E.R.U. Contest was ZC4IP of Limassol, Cyprus. In this picture, the BC221 frequency meter is to the left of the 1936 vintage HRO receiver and a home-built 85 kc/s i.f. unit to the right.

Overseas News

Pitcairn Is.: From **G2RX**—*en route* for New Zealand—comes first-hand news of the situation on Pitcairn, where a brief stop was made. A number of the islanders boarded the ship to sell their wares and '2RX found himself chatting to Thomas Christian (**VR6TC**) in person. '6TC uses a DX35 transmitter, a HQ120X receiver and a long wire and has so far worked mainly on 14020 kc/s c.w. with some 14 Mc/s phone. He gets on the air most evenings (local time, presumably), but " hundreds of Ws " call him as soon as he presses his key and he had not worked the U.K., up to July 2, although he had heard some G stations, notably G2PU, who has been shaking windows all over the island and who was called to no avail! '2RX suggested he should use 21 and 28 Mc/s for QSOs with Europe and he agreed to try. As he works ZK1BS regularly he will doubtless be guided by that capable source. **VR6AC** is also active, but only, we think on low-power phone.

Spitzbergen: G5XD (Bedford) learns from a Polish source that the Polish Spitzbergen Expedition will operate an amateur station with the call-sign **LH3B** on " all bands " from August 15 or thereabouts, so they may be on by the time this issue appears.

Albania: SP5HS (Warsaw) has news of interest to the thousands who must have missed ZA2ACB! '5HS says that members of the Kosice (Czech) Radio Club have an expedition to Albania organized and they should be on the air from there on either August 1 or September 1. (The latter, we hope, for the sake of readers.) They are taking a complete all-band station as a gift to ZA amateurs, so there may even be a genuine, honest-to-goodness ZA call from then on. SP5HS dismisses ZAs '1AA, '1AB and '1KUN as no good at all.

VS1HU (Royal Naval Wireless Station, Kranji, Singapore) is none other than **G3JFF,** whose call-sign was familiar in past years from exotic spots in the West Indies. He is active on 80 and 40 metres with 40 watts and is busy with a 150 watt outfit for the high frequencies. His 40 watter covers *Top Band* and he will be there this winter. As to 40, Europe has been good from 20.30 G.M.T., while on 21 and 28 Mc/s conditions have been excellent, with QRM provided by W6, '7, CE, etc. DXCC was finally confirmed from G3JFF and Mike doubtless will do it again from VS1.

ZD4CM (P.O. Box 100, Saint Francis' College, Hohoe, Ghana) is also G5BH and ex-G2DT and is at present almost exclusively on 14 Mc/s c.w. Some 35 countries have been worked since late May and a 138 ft. wire works well in all directions except into the U.K., so that '4CM is thinking of putting up a fixed beam especially for QSOs with home. He is very keen to work stations in the British Isles and he will welcome B.R.S. reports, which will be acknowledged promptly. At present, activity is 20.00 to 22.00 G.M.T. weekdays and 05.30 to 07.20, usually on Sundays. He generally operates between 14010-'020 kc/s or between '080-'090 kc/s.

ZD8JP (C & W Staff Mess, Georgetown), says his gear is extremely simple and consists of a R107 receiver and a B2 sender, with a modulator being built. Various long wires are used and supports are no problem, as the island has a bamboo forest containing an unlimited supply of 30 ft. poles! The island has a population of 350, some wild donkeys and numerous large land-crabs.

ZC4II (Nicosia) reports the main news this month is the arrival of a second junior operator—a boy—so Greg will probably be working DX around 04.00 for a month or two! His latest DX on 21 Mc/s phone was W6GRM/MM (plying between Ceylon and Malaya), VU2RL, VS4JT and KA2AL, while on 14 Mc/s he heard KL7KM. Greg's thought for the month: " Surprising the number of operators who say ' Pse QSL ' and yet don't themselves "!

VP6FO at the operating position of his station in Barbados.

From the Other Bands

There is little news this time of the remaining bands, which come last for a change, but **G3IFB** worked ZD6RM for a new one on *ten*, where **B.R.S.20135** heard VK6GU, '6TH (09.00), ZD8SC, VQ3AC, '5EK, ZE2KO, ZC4JU and ZD3BFC. On *forty*, **GM3ITN** worked PY4OD, using a new " G5RV " dipole and **B.R.S.20106** logged K0EMI and W5CTG on s.s.b. in the early hours. The QTH of **FB8CD** is simply " André Liénard, Anjouan Is., Comoro Islands."

(Editorial query—" What is a G5RV dipole? " It does not appear to have been described in any Amateur Radio publication.)

I.R.T.S. Officers, 1957
From left to right: Rev. Jim Stone, EI4Q, Dr. Denis O'Farrell, EI6F (Immediate Past President), Prof. M. E. Folen, EI6W (Vice-President) and Tom Green, EI9N (President) at a dinner following the recent A.G.M.

Frequency Predictions for September, 1957

PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA	ANT-ARCTICA
M.U.F.	30 Mc/s 1800	35 Mc/s 1800	38 Mc/s 1700	40 Mc/s 1600	35 Mc/s 1530	36 Mc/s 1400	33 Mc/s 1300	32 Mc/s 0900 SP	39 Mc/s 1600
28 Mc/s	1600—1900	1000—2000	1000—2000	0800—1900	0800—1800	0830—1700	1000—1600	0800—1230 SP	1000—1900
21 Mc/s	1000—2300	0900—0000	0830—0300	0600—2300	0600—0100	0700—2200	0600—1800	0900—1100 LP 0930—1700 SP 2030—2330 LP	0800—2100
14 Mc/s	0830—0300	1730—1130	1730—1000	1430—0200	ALL DAY	1400—0700	1400—0000	0400—1000 LP 1300—2200 SP	1600—0200
7 Mc/s	0400	2300—0700	0000	0000	0000	2000	0000	1900	0000
3.5 Mc/s	0400	0000	0000	0000	0000	2000	0000	1900	0000

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T. Between May and September Sporadic 'E' propagation may result in very short skip conditions on the higher frequency bands.

Radio Hobbies Exhibition

SIR Harold Bishop, C.B.E., Technical Director of B.B.C. Engineering Services, has agreed to open the Radio Hobbies Exhibition at the Royal Horticultural Society's Old Hall, Vincent Square, London, S.W.1, at 12 noon on Wednesday, October 23. The Exhibition, which will remain open until Saturday, October 26, from 11 a.m. to 9 p.m. daily, is being organized by Mr. P. A. Thorogood (G4KD).

Home construction and " do-it-yourself " will be the main theme and a Silver Plaque will again be presented for the most outstanding piece of home-made equipment on show. Visitors will have an opportunity to win a communications receiver.

Technical Articles Wanted

THE editor will be pleased to consider for publication articles on a wide variety of subjects including descriptions of standing wave ratio meters, simple receivers, crystal controlled V.H.F. convertors, frequency measuring equipment, panoramic adaptors for receivers and a review of 1250 Mc/s equipment. Members are invited to write to Headquarters for a copy of " Hints to Contributors."

South Wales Regional Meeting

SATURDAY, SEPTEMBER 21, 1957

AT THE

PARK HOTEL, PARK PLACE, CARDIFF

Programme

Assemble	**2 p.m.**
Meeting	**2.45 p.m.**
High Tea	**5 p.m.**
Lecture and Raffle Period	**6 p.m.**

Tickets, price 12/6 per head (which includes high tea with alternative menus), available from Mr. E. White, GW3LAD, 41 St. Alban Avenue, Heath, Cardiff. Hotel accommodation and luncheon can be arranged for those who give prior notice when ordering tickets. To assist the organizers and hotel management early reservations are essential.

North Wales Regional Meeting

SUNDAY, SEPTEMBER 29, 1957

AT THE

NANT HALL HOTEL, PRESTATYN

Programme

Assemble	**12 noon**
Luncheon	**1 p.m.**
Photograph	**2.15 p.m.**
Meeting	**2.30 p.m.**
Tea and Draw	**4.30 p.m.**
Disperse	**5.30 p.m.**

Tickets, price 12/6 per head, available from Mr. F. Southworth, GW2CCU, Samlesbury, Bagilt Road, Holywell, Flintshire, not later than September 24, 1957.

FOUR METRES AND DOWN

BY F. G. LAMBETH (G2AIW)*

World Record for 144 Mc/s soars to 2600 miles

RADIO history was made and all previous DX records for frequencies above 144 Mc/s were shattered on July 8 when W6NLZ at Palos Verdes Estates, near Los Angeles, California, worked KH6UK at Kahuku, Oahu, in the Hawaiian Islands, a distance of about 2,600 miles. This is an improvement of 1,200 miles on the previous record set up by W5QNL and W6ZL in June, 1951. No all-water path of greater than about 700 miles has been covered previously.

The exact nature of the propagation medium that made the contact possible has not been definitely established but the steady quality of the signals received at both ends of the circuit for more than one hour indicates that exceptionally stable weather conditions over the Pacific may have been responsible. If this is true, it is the first time that tropospheric propagation has been observed over anything approaching this distance.

Both KH6UK and W6NLZ used 1 kW input and sensitive low-noise receivers. The equipment was home-built. The Hawaiian station employed a huge array consisting of four 24 ft. Yagi-type bays arranged in a box formation. A 13-element 24 ft. Yagi was used at the Californian station. W6NLZ's QTH is 910 ft. a.s.l. with a clear view out over the Pacific.

The record breaking c.w. contact is a great tribute to both operators for their painstaking work over the preceding nine months during which daily tests were carried out.

W1HDQ, who supplied the above information, has tape recordings of both ends of the contact and says it " certainly sounds like tropospheric ducting, which encourages one to think of a transatlantic QSO on 144 Mc/s." He adds that excellent equipment and *great* patience will be required.

Two Metre News

The R.S.G.B. 144 Mc/s Open Contest on July 6 and 7 was not notable for first class conditions, although many counties were heard from the London area. The propagation seemed somewhat unstable, with QSB very evident, although the stations audible at a distance were usually 100 per cent workable. There was a fair amount of activity however, and some stations were kept very busy. QSOs around the 100 mile mark were fairly easy, with the odd one up to 200 miles.

The rest of the period has had some excellent spots including the great opening at its beginning, but since that time, possibly by comparison with the opening, conditions have appeared only ordinary. A little auroral propagation has been noticed.

Further news regarding the opening of June 18 and 19 has been received. The opening extended all over the U.K. including Northern Ireland, **GI3GXP** working DL stations.

GM6WL amplifies the news from Scotland and says that GM2FHH, '3HLH, '3EGW, '3DDE, '3FGJ, and '6XW, ranging from Aberdeen through Dundee to Larbert, were working the Europeans " like shelling peas "! '6XW (Larbert) worked DL, PA, SM and OZ—if not at one sitting, at least over the period. **GM6KH** worked DL1LB on the 18th, and heard DL3YBA and '3YY. The effect of the duct was progressively less to the westward and '6KH was not so fortunate as the East Coast stations. In Glasgow signals were few and far between and the only two heard by '6WL were DL3VJ (whilst working a GW3 portable in Pembroke!) and OZ2IZ, who was working them all right up the East Coast as far as Aberdeen. **GM2FHH** says that the arrival of OZ, PA, DL and SM stations was much enjoyed by himself and other GMs from Aberdeen to Dunfermline, but that no Glasgow stations were apparently being called. There seemed to be a broad 30° position roughly south-east in which all the above DX could be worked. The signal strengths were extraordinary: OZ2IZ and DL1LB were S9 + 40db and PA0KH was heard for over four hours at S9 and was the last to disappear. Only about a dozen Gs were heard and most of these were working Europe.

In the Bristol area, which usually misses these openings, G3KHA worked three DLs near Hanover and PA0BU. '3KHA says he had to stay up till 01.30 to do it, but they were all S9. Some of the Welsh stations were in this also; altogether there must have been many unusual QSOs.

B.R.S. 15822 (Clapton, E.5) says that June 19, 20 and 21 were three really good days with DL3YBA a terrific signal on c.w. (589). Even when the conditions began to change on June 21 PA0NO was still R5 S7/8. ON4ZK and '4HN were the strongest stations heard. **B.R.S. 16075** (Shirley, Southampton) also had an interesting month, all the more remarkable as reception was still on the indoor dipole! June 19 gave the same crop of DLs and other continentals. During the opening there was plenty of DX on the f.m. band also; the German stations made it difficult sometimes to identify the B.B.C. Isle of Wight transmitters! **G3IBI** is a newcomer locally to 2m. He is now testing and should be operative by the time this is read.

B.R.S. 20133 (Melton Mowbray) really has been very unlucky in that after all his searchings after Continental DX the local opening occurred whilst '20133 was at the " other

G3EMU/P operating during the First 144 Mc/s Field Day.

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

end of the DX " and could not log the DLs, PAs and ONs heard by G8CZ. During the Open Contest '20133 heard sufficient to keep him listening throughout the Sunday. Success was not great, the best heard being GW3GWA/P. From 23.30 Saturday to 01.30 Sunday nothing was heard, but at 09.00 on Sunday until the close there were many. G2FNW was portable and is reported to have done quite well, whilst G3JWQ was " as usual " rocking the shack. G3JXN was also well in evidence.

B.R.S. 20162 (Selsdon) came on the band on June 19 to find it better than for 2 years. In all 28 continentals were logged that evening. During the whole period conditions were variable, activity being low except during the big opening and the Contest week-end. **B.R.S. 21136** (Ruislip) found conditions from average to good (June 13/24, and on July 2). During the contest there was much activity but little DX but the " big boys " enjoyed themselves " even if at the expense of the little ones." **B.R.S. 19162** (Dewsbury) logged most of his DX in the period June 20/July 3, since when conditions have been very poor, '19162 heard many DLs, PAs, and ONs during the opening, to say nothing of GM, GI and GW! Finding that EC92 valves are fairly readily obtainable '19162 wonders what an EC92 cascode would be like. Can anyone help him?

G3ENY (Bridgnorth), who has been working German stations from the car, is thinking of building a v.f.o. for use with the home station, the reason being ability to break in on rag-chews and thus increase activity. He wonders what other 2m operators would think of this idea?

G5BM (Highnam, Glos.) noted an interesting magnetic disturbance on June 30. The effect was seen on a TV set 10 miles from Highnam and when '5BM arrived home at 19.30 there was still typical " aurora " QRM on his own picture (Sutton Coldfield). There was no interference on Channel 8. The 2m band was immediately checked and one solitary garbled carrier was found about 144·3 Mc/s which was audible with the beam north-west. Some calls were put out, but the only station worked was GW2ANT/P (Llangollen) with a clear note and no auroral reflection. The television picture was clear of interference by 20.30 B.S.T. '5BM thinks a 12-channel TV receiver is an excellent means of checking v.h.f. conditions and wonders if other 2m operators likewise make daily checks on the various channels.

G2QY (Pinner) has been /P in Norfolk and was in the middle of the opening on June 21 when conditions were absolutely fantastic. To anyone like '2QY with a poor location at home this was a complete eye-opener! The band was full from end to end with continental signals. Full use could not be made of the conditions as '2QY had to leave while the band was still full (23.15 G.M.T.). It must have been very thrilling anyhow! The gear included a transmitter running 5 watts to a 12AT7; a receiver comprising a cascode converter into a 3·5 Mc/s t.r.f. and a four-element Yagi above the roof of the car, 10ft. off the ground.

G8VZ (Princes Risborough) reports on his sked with G3JWQ (Ripley, Derbys). The first QSO was on November 1, 1955, and up to July 12 this year 221 skeds have been kept, 215 being successful (two way) over a distance of nearly 100 miles. The skeds are on Mondays at 20.45 B.S.T., Fridays at 18.45 and Saturdays at 13.30. '8VZ's maximum power is 12 watts to an 832 with a six element stack at 50 ft. During the opening G2FO (Co. Durham) was worked for a new one. Altogether 48 counties, 6 countries and 257 different stations have now been worked. Barometric pressure and humidity are now being checked during operating times, a habit which is commended to others.

G3JR (Barnes) who uses 12 watts and a five-element indoor Yagi 27 ft. up at sea level has worked seven countries, the latest being DL during the recent opening when he worked three German stations DL1CK, DL3VJ and DL3IY. He has also worked PA, ON, F, GC and GW and 30 counties. This information is offered as some encouragement to other indoor aerial users. '3JR has noted recently a clear case of signal " stimulation " during a thunderstorm. On June 18 G3IRS was heard at RS22 around 17.40 G.M.T. The sky was dark in the west, and sharp cracks due to distant lightning were heard in the receiver. Whenever one of these occurred the Somerset signal jumped to RS56 for the duration of the discharge, and was positively identified by this means.

G3WW (Wimblington) returned to 2m on June 27 and was welcomed back by all the regulars " plus a very few new stations." Many of these were worked during the Contest but the band has relapsed into its usual state of " deathly silence " since that time. '3WW says that some stations still call CQ and only work whom they choose and/or E-DX even during the Contest time, which is deplorable.

G5MA (Great Bookham) had quite an eventful month. In addition to GM3EGW worked by auroral reflection there was also a QSO with GM3KYI (Dundee). Things were so quiet otherwise during that time (1½ hours) that GM3EGW called for a second QSO. Propagation was only good for c.w., of course, all notes being T5 or worse. During the month '5MA had six QSOs with GD3UB, two with G2FO, two with GI3GXP and five with G6XM/A (Co. Durham) with DL0MR and '3YBA for good measure, to say nothing of rare portables like G2ANT/P (Norfolk and Denbigh), GW8UH (Monmouth), G2HCJ/P (Hereford and Radnor) and GW3KEQ/P (Brecknock, Carmarthen and Pembroke).

G2HCJ was out portable/mobile on June 18 when conditions were at peak. A most enjoyable evening. Since then a trip has been made to Radnor and Hereford, " mainly to give G3CCH Radnor and G2FJR Herefordshire," but also to give many other stations two welcome rare counties. '2HCJ has tried to assess the relative merits of the 12 ft. 10-element long Yagi and the 6-over-6 slot-fed beam and thinks that the 6-over-6 with the same gain is better for portable, but that for a home station in a town the narrow bandwidth of the Yagi would be useful in rejecting TV oscillator harmonics. '2HCJ noted a strong unmodulated carrier on 145·4 Mc/s coming from the Dublin direction on June 6.

G3EMU (Canterbury) worked PA0s never before heard on June 19/21. It mattered little what they were using, they were all S9+! One was using a wire dipole in the shack, and another his TV aerial! For 2½ hours '3EMU worked phone non-stop, indeed, until his voice nearly gave out! One well equipped PA0 station gave '3EMU a report of 15 microvolts in his aerial, measured across the co-ax.

G3HBW (Bushey Heath) was roused at 23.45 on May 27 with a telephone call from G5BD and got on the band in time to hear a good signal from GM2FHH but no QSO resulted. On the 29th GM3EGW was also heard weakly but again no QSO. Faint signals were heard, for the first time, from GM6XW on June 12. As a result of all this '3HBW concentrated on the North and during the entire opening resisted the temptation to turn the beam to the Continent, although a few S9+ QSOs were achieved with DLs and PA0s. On June 13, GI3GXP was worked at good strength and on the evening of June 19 things began to happen. GM2FHH was heard at 599 plus all evening, but nothing developed at 400 miles—'2FHH was working them at 600! At 23.00 GM3HLH (Dundee) was raised 57 on phone (with a single slot). By this time an unofficial sked had developed with G2FO (Stockton-on-Tees) and in fact there were 10 evening QSOs during the period. The following evening '2FHH was heard again, without result. Since June 21 conditions have been very poor, although a couple of QSOs were managed with G6XM/A at Washington, Co. Durham, whose signals were very consistent.

G2HDR (Stoke Bishop, Bristol) is now on 2m, with a G2UJ R.S.G.B. converter feeding a 640, the transmitter being another R.S.G.B. design running 12 watts to an 832

and a four-element Yagi on 145·35 Mc/s. G3JGY/P (Hereford) is the best DX to date. GW3KEQ/P (Carmarthen) was called without success and G5YV heard in the Contest.

G5MR (Hythe Kent) worked DL1CK (15m east of Brunswick and only 5 miles from the Russian Zone border) on June 19. On June 21 a first QSO was made with G3FUR (Stamford, Lincs).

On July 30, **GI3GXP** worked **F8MX** for the first GI/F contact on 2 metres.

Two Metre News from Scotland

GM3EGW (Dunfermline) worked several stations by auroral reflection on June 30. G3KFD, '3KUH, '5MA, DL3VJ and OZ7BB were all contacted whilst ON4ZH, '4DW and DJ1VK were heard. Others were heard but could not be identified, *because they didn't use c.w.* The " party " started at 23.40 when a " Morse interrupted steam jet " turned out to be G5MA; at 02.55 OZ7BB was still " chuffing " through. The aurora was north-east from Dunfermline and apparently north from Denmark. The opening of June 17/21 gave GM3EGW a fair number of continentals and his first OZ. (Later a second, OZ7BB, was worked via the aurora.) It was a pleasure to hear G2JF and '3BLP just like local signals! What is perhaps most interesting is the number of times G5MA has been heard. He was called five times in May, eight in June and twice so far in July, as well as being heard on other occasions. Fraser says the band, even when dead, is often, if not open, at least ajar for fair distances. Keep on the band and call, after having measured humidity, temperature and barometric pressure—phew!

GM6WL (Glasgow) informs us that he will be portable in the Mull of Galloway (Wigtownshire) from August 17 to 30 with 2m and 70 cm equipment and possibly with 4m gear. **GM2FHH** was portable on June 16 on Cairn o' Mount, (Kincardineshire) with 5 watts input and worked G3CCH and '2FO, as well as some GMs. G5MA was the best DX heard but was not raised.

Two Metre News from Wales

GW3GWA (Wrexham) heard the Midlands stations working DLs on June 18 but none were then heard at Wrexham. The following evening however GW3GWA was amazed to hear DL3VJ at S9 + 20db, the strongest signal from the continent, who was audible at S9+ from 23.30 to 03.15 when a contact resulted after repeated calls all through that period. DL1WP, DJ1XX, ON4DW, and ON4DZ were also worked. Since then conditions have fluctuated but mainly for the worse. On the Saturday evening of the 144 Mc/s Open Contest southern stations came up to the top of the Vron very well. Thunderstorms played a part in this and operation was maintained all through them. The feeling cannot be very comfortable when one is working at 1300 ft. a.s.l. in an exposed position " at the receiving end of a lightning conductor." On Sunday conditions were flat and only semi-locals were heard. GI3GXP and GW8UH were among the best QSOs.

GW3FKO/P has been ranging Pembroke and Carmarthen and hopes to be in Wales once a fortnight with a further spell from September 24 to October 8. A new transmitter using 12AT7, 12AT7, QV04/7 has been tested. Stations recently joining the Severn Valley area are G3GMN (Gloucester), G3HXN (Cambridge 10 miles south of Gloucester) and G2HDR (Bristol). This natural area extends from Cheltenham and Gloucester to South Wales.

G6DP (near Warrington) has been making tests at Abersoch in the Lleyn Peninsula of North Wales. The area used by GW6DP/P is 5 to 10 miles southwest of Pwllheli and is screened from England by the North Wales hills. The transmitter was the mobile rig with about 8 watts to an 832 and a simple three-element Yagi. The receiver is a normal crystal controlled converter with cascode r.f., and 6AK5 mixer into a 3-6 Mc/s Command receiver. Several sites were tried ranging from 50 to 750 ft. a.s.l. and from every one reliable two way contact was maintained on schedule with G2JT situated 600 ft. a.s.l. near Oldham. Fading was always present but it was usually possible to copy phone from G2JT. The path is about 110 miles; 25 miles over Cardigan Bay and then through the Moelwyn Hills (about 2,500 ft.) and thence through varying heights of hills for a further 40 miles. Several stations in the same general direction were worked at around 100 miles and it was always possible to copy phone. Apart from these the most interesting QSO was with G2NY (Preston). The distance is 100 miles *but* Snowdon and its associated mountains are in the way (3,000 to 3,500 ft.) followed by high ground (1,000 to 3,000 ft.) for about 25 miles. The final 50 miles is over the sea. This was phone both ways, G2NY being very strong indeed. These results illustrate very clearly the diffraction of 2m signals which occurs over mountains and G6DP thinks that although these took place in a period of very hot weather they would still be possible generally. No " real DX " was heard during the period.

Seventy Centimetres

One of the requests made at the Paris Conference was for a complete list of 70 cm stations and their frequencies. We have asked for this before—*without any replies*—but cannot think that 70 cm operators are really so lacking in public spirit. Please send G2AIW a postcard—it only takes a minute.

Further details of the record QSO between G3HAZ (Northfield, Birmingham) and DL3YBA (Heessel 10 km east of Hanover) are now available. This distance is just short of 500 miles—a world record! The contact took place at 22.32 G.M.T. on June 19 following a preliminary link up on 2m. G3HAZ's signals were RS59 and DL3YBA's RST569. Later DL3YBA was heard in QSO with G2XV and G6NB at RS57/8. The 2m signals were S9+ both ways—at that time the band was full of DJ and DL stations. Apart from the above, DL3YBA worked G5YV, G5BD and G2FNW on 70 cm. Conditions were so good that if GI, GM and EI stations had been on at the time, and equipped for 70 cm, other contacts would almost certainly have been made.

The aerial used at G3HAZ was a 24-element wide spaced stack at about 30 ft. The site, although not exceptionally good for " take-off," is 500 ft. a.s.l. The transmitter is 8012 tripler in a coaxial line (no h.t., the anode being earthed for d.c.) giving about 15 watts output. The receiver comprises a G3BKQ type converter with a head amplifier (6AK5, EC91 and 6AK5 triode) into an S640 receiver.

F3SK says that the previous 70 cm record was not between W1RFU and W4VVE but between FA8IH near Algiers and F9RG in Toulon in July 1954. This first QSO was followed by many others in the succeeding months. The distance is over 400 miles. General conditions between these points are of course favourable for such working (it is an oversea path throughout). FA8IH is also equipped for 24 cm.

* * *

G3IBI (Southampton) hopes to be on 70 cm soon, and it is intended to combine forces with B.R.S. 16075 (Shirley) to transmit TV using the latter's camera and control gear which is already working very well on closed circuit.

GM3EGW (Dunfermline), now back on 70 cm, recently

worked GM5VG (crossband) and GM6KH two way on 70 cm.

GM6WL (Glasgow), thanks to the helpful cooperation of John Graham, a Glasgow listener, went portable with a receiver only on July 11 to a good spot near Kilmacolm, about 51 miles from Edinburgh and Dunfermline and received very loud phone signals (S9+) from GM3DDE of Corstorphine, who has a QQV03/20A going well as a p.a. and is modulating it splendidly. Five minutes later GM3EGW using only a tripler was tuned in on c.w. at 579. GM3GUO (Glasgow) was naturally a good loud phone signal, even though not beamed on the listeners. All of this was in pouring rain and wind. They had the gear in the boot of the car and John was standing holding the aerial and turning it as requested. This was in the nature of a test for GM6WL's portable receiver which he will be taking to the Mull of Galloway.

Four Metres

Confirmation has come from **FA3JR** (Oran) of the QSO with G5KW on June 16 which established 4 metres definitely as a DX Band. G5KW was RS58 and was also heard by FA8JO and FA3GA. F8WV monitored the QSO and called G5KW afterwards, but no G/F contact ensued at that time. FA3JR remarks that he is now looking for such stations as EI2W and GM2FHH. For this purpose he operates daily on 72·070 Mc/s from 12.00 to 13.00, 17.00 to 19.00 and 20.00 to 21.00 G.M.T. If c.w. is used please make it QRS —FA3JR prefers phone.

On the same night as the QSO mentioned above, FA3JR contacted 14 French stations, which he considers extraordinary. He uses only 25 watts to a transmitter comprising EL41 (crystal oscillator on 8007 kc/s to 24 Mc/s), EL84 tripler to 72 Mc/s and a QQE04/20 p.a. The receiver uses 6AK5, 6J6 mixer and 6J6 crystal oscillator into a BC348. The aerial is a three-element beam for transmission and a folded dipole (300 ohms) for reception.

G5KW reports that he heard FA9VN (RST599+ on c.w.) on June 25 at 12.30 G.M.T. FA9VN was in QSO with F9ZA and F9IW at the time. FA3JR has written saying he heard G5KW at the time he was calling FA9VN.

GM2FHH (Aberdeen) will be on 4m soon. **G5MR** (Hythe, Kent) has worked F8NB (Versailles) and has heard F9CZ and F9ZA. A second QSO with F8GH took place on June 30. A permanent transmitter is now on the stocks and G5MR will soon be back on 4m after a temporary absence due to reconverting the tripler final to 70 cm for tests with G2JF. The 4m aerial in use at present is a rotary folded dipole.

F3SK writes that contacts between Algeria and French amateurs as far north as Paris, are still going on.

New Bands for Norwegian Amateurs

For the period of the I.G.Y., Norwegian amateurs have been given permission to operate from 05.00 to 19.00 G.M.T. daily in the 50 to 54 Mc/s band and on 70·6 and 72 Mc/s using A1, A2, A3 and F3.

Paris Conference

The Paris Conference of V.h.f. Managers took place on April 27/28, 1957, but the official Minutes have only just become available. The meeting was attended by delegates from Germany, Finland, Sweden, Italy, Holland, Yugoslavia, Luxemburg, Ireland, Belgium, Switzerland, Austria, France and Great Britain. G2MI attended as Hon. Secretary of the Region 1 Bureau (I.A.R.U.). A very welcome observer, SP5FM, was there to represent Poland. The Chairman was DL3FM and the Secretary ON4BK.

V.E.R.O.N. suggested that the 144/144·2 Mc/s portion of the two metre band should be used exclusively for DX. After a long discussion a proposal made by G2AIW that the DX portion of the band should be 145·8 to 146 Mc/s, as this portion is generally unoccupied, was agreed. Similarly, 433 to 435 Mc/s was agreed as the DX section of the 70 cm band. OH2TK asked that the Scandinavian calling frequency of 434 Mc/s should be noted.

However, no agreement could be reached for 23 cm, the R.E.F. (France) delegate strongly opposing the R.S.G.B. proposal that 1298-1300 Mc/s should be used. French amateurs use 1260 Mc/s. As there appeared to be no present basis of agreement the matter was left in abeyance.

It was agreed that I.G.Y. co-operation between the various national societies should take the form of exchanges of information obtained from their work planned in collaboration with their own national I.G.Y. authorities.

A discussion on DX records resulted in a recommendation that all such records, after being noted by Region 1 Bureau will be published in Region 1 News and submitted to I.A.R.U. Headquarters for possible recognition as a world record. The Region 1 Bureau will award a certificate for the latest record in each v.h.f., u.h.f. or s.h.f. band every year. The initial list would be made up from details obtained by each v.h.f. manager from his society's own records.

The Conference unanimously confirmed that the dates for future I.A.R.U. v.h.f. contests should be during the first weekends of March, May, July and September (the date sequence 31/1 not counting as a weekend). On the question of scoring systems, there was much discussion, some delegates favouring a system of points per mile or kilometre. However, it was pointed out that this would be an intolerable burden for those checking logs due to the almost impossible task of determining exact distances for each contact. It was therefore agreed that the zone system be tried first.

In cases of borderline dispute it was suggested that the lower score should apply. PA0DD drew attention to the rule that contest logs must be sent to the v.h.f. manager of the entrant's national society, even though the contests are open to non-members.

PA0BL asked that societies should compile lists of the calls and frequencies of active 70 cm stations in their areas.

Many other topics of v.h.f. interest were discussed at length but it must be emphasized that any decisions reached during the Conference are subject to ratification by the councils of the member societies.

The thanks of all are due to the French society, R.E.F., for defraying the costs of the Conference and also for their hospitality to the delegates. The next meeting of v.h.f. managers is to take place in Brussels in June 1958. As the agenda can only deal with members' problems if those problems are made known in good time, it is hoped that suggestions will be put forward as soon as possible.

* * *

The deadline for next month must be August 19 certain—if you can make it earlier, please do so. We hope the reports will be as lively as those received for this issue.

MONDAY NIGHT AT 8
IS TWO METRE ACTIVITY TIME

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

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

AND WEDNESDAY NIGHT, TOO

Listen on 70·2 to 70·4 Mc/s on Wednesdays. This is four metre activity night.

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, June 24, 1957, at 6 p.m.

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

Apologies: Apologies for absence were submitted on behalf of Messrs. W. H. Allen and W. A. Scarr.

Absent: Mr. R. H. Hammans.

* * *

I.G.Y. Automatic Station

It was reported that the G.P.O. had given clearance for the operation of an automatic station from the home of Mr. K. E. S. Ellis (G5KW) on a frequency of 145·5 Mc/s using A1, 2, 3 and 3a with a power input of 1 kW. Mr. Ellis stated that he proposed to begin the automatic transmissions with an input power of 150 watts working up to higher power later on. His transmissions would be beamed towards the auroral curtain.

Reports of Committees

R.A.E.N.

Resolved (i) not to accept a recommendation of the Committee that full details of the East Coast Flood Warning System should be published in the R.S.G.B. BULLETIN; (ii) to inform the Committee that the Council is prepared to authorize the Committee to meet on three further occasions during 1957; (iii) to inform the Committee that the question of the frequency of Committee meetings will again be reconsidered by the Council early in 1958.

Mr. Hicks-Arnold offered to furnish the Committee with 100 additional copies of the East Coast Flood Warning System map. Mr. Hicks-Arnold's offer was accepted with thanks.

Exhibition

Mr. Edwards reported that he had, at the request of the Committee, written to the R.I.C. requesting that the Society be allocated a more suitable site at the Earls Court Radio Show. No reply had yet been received.

Resolved to authoize the President to make a final decision in respect of the Society's participation, or otherwise, in the Earls Court Radio Show.

Contests

Resolved to accept a Recommendation of the Committee in respect of the 1957 B.E.R.U. Contest. (The Recommendation dealt with the award of trophies and certificates).

Report of the General Secretary

Membership

Resolved (i) to elect 84 Corporate Members and eight Associates (ii) to grant Corporate Membership to six Associates who had applied for transfer.

The Secretary reported that 96 of the 570 members whose subscription became due on March 1, 1957, became three months overdue on May 31, 1957, and that 13 of the 96 members had written to resign.

R.S.G.B. Certificates and Awards

Mr. Milne explained that European amateurs, generally, who are not members of the R.S.G.B. must purchase International Reply Coupons to the value of approximately 21/- in order that the Society may receive the equivalent of 7/- for each certificate claimed.

The Secretary was instructed to obtain information on the Exchange Control requirements in order to see whether European amateurs can remit currency to this country.

London Lecture Meetings

Resolved to confirm the Secretary's action in reserving accommodation at the Institution of Electrical Engineers on the following dates: September 27, November 1, November 29, 1957, January 24, February 14, March 21, 1958.

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

It was reported that due to the very considerable amount of work involved in bringing the Call Book up to date, Mr. Kempton was not yet in a position to state when the new edition will appear. It was anticipated that copy would be sent to the printers during the autumn.

It was agreed to invite Mr. Kempton to fix a " dead line," after which date no further amendments or additions could be made to the main text. A " stop press " column would be used to include late amendments and additions received up to the final closing date for press.

News Bulletin Service (GB2RS)

The Secretary reported that support for the News Bulletin Service had been falling off in recent months.

After a full discussion it was agreed to inform the membership, through the medium of the News Bulletin itself, that unless better support in the way of news items is forthcoming it may be necessary to cancel or reduce the frequency of the service.

Jubilee of Scouting

It was reported that the President and General Secretary had been invited by International Boy Scout Headquarters to attend the Jubilee Jamboree at Sutton Coldfield. (An Amateur Radio station was operated from the Jamboree site by members of local societies and an Amateur Radio stand was manned by Region 3 members.—EDITOR).

Third International V.H.F. Convention

It was reported that a statement of account, of which the following is a copy, relating to the Third International V.H.F. Convention held in London on May 25, 1957, had been submitted by the Organizer (Mr. F. G. Lambeth, G2AIW).

Income				*Expenditure*			
81 at £1/1/0	85	1	0	Tickets		17	6
31 at 3/6	5	8	6	Luncheons	2	6	3
				Tips		10	0
				Hotel Charges	85	16	0
				Part Postage		19	9
	£90	9	6		£90	9	6

The Secretary reported that six guest tickets were absorbed in the above account while the actual amount spent on postage was more than £3. Mr. Lambeth had, however, stated that he did not propose to place the account in debt for this reason.

Resolved to receive the Statement of Account and to thank Mr. Lambeth for organizing the Convention and for bearing part of the cost of postage.

D.A.R.C. Convention

It was reported that a D.A.R.C. Convention would be held in Coburg, Germany, on August 3 and 4 and that the Society had been invited to send a delegate.

Resolved not to appoint an official delegate to attend the Convention.

The Secretary was instructed to write a suitable letter of appreciation to the D.A.R.C.

North and South Wales O.R.M.

Resolved (a) to appoint the President and Mr. Metcalfe to represent the Council at the Region 10 O.R.M. on September 21, 1957. (b) to appoint Messrs. Newnham and Hicks-Arnold to represent the Council at the Region 11 O.R.M. on September 29, 1957.

It was agreed to consider at a future meeting the question of appointing members of Headquarters staff to attend the O.R.M.s in regions 10 and 11.

Membership Records

Consideration was given to the following resolution passed at a meeting of East London T.Rs:

" That in the December issue of the R.S.G.B. BULLETIN a business reply paid card, returnable to HQ, be included every year, giving full details of members' name, addresses, call-signs, B.R.S., town and county. These cards would then be sorted into county areas for re-distribution to the respective areas. The East London District would be prepared to do the initial work."

After discussion it was agreed that the Secretary should write a suitable letter to the East London Group thanking them for their interest and explaining the reasons why the Council is unable to adopt the suggestion referred to in the resolution.

A.S.R.s

The Aberdeen Amateur Radio Society wrote to enquire whether a member of an affiliated society who is not a member of the R.S.G.B. can take part in N.F.D. whether with the R.S.G.B. station or with a station entered by the affiliated society.

The Secretary was instructed to inform the Aberdeen Amateur Radio Society that only Corporate Members of the R.S.G.B. may take part in N.F.D.

The meeting terminated at 8.20 p.m.

Society News

Subscriptions Paid by Bankers' Order

HOME Corporate Members who renew their subscriptions by Bankers' Order are requested, unless they have already done so, to amend their present Order to the new rate of 30/- per annum.

More than 190 subscriptions were paid by Bankers' Order during July 1957 but less than a dozen were renewed at the new rate. This failure to amend Bankers' Orders adds to administrative costs and to the burden of routine work undertaken by Headquarters' staff.

Members who are not due to renew their subscriptions until later in the current financial year are asked to apply to Headquarters for a new Bankers' Order form or to amend their current Order by writing direct to their Bank. It is important to advise the Bank that the new Order supersedes any earlier Order that may have been given.

The 5 Ack R Memorial Trophy

THE Council has been pleased to accept from Mrs. F. E. Ostermeyer, widow of the late Mr. E. Dawson Ostermeyer, G5AR (Past President), a Silver Trophy—to be known as The 5 Ack R Memorial Trophy—for annual competition.

The rules governing the award of the trophy are set out below.

(1) The trophy shall be awarded annually to the Corporate Member of the Society who in the opinion of the Council, acting on the advice of the Technical Committee, has contributed to the Society's Journal the most meritorious description of a piece of home constructed radio or electronic equipment.

(2) Before making a recommendation to the Council the Technical Committee shall take such steps as they may deem to be desirable to ensure that a high degree of workmanship and skill was shown in the construction of the piece of equipment concerned and that the author constructed the piece of equipment personally.

(3) The Council shall reserve to themselves the right to award the trophy for any purpose other than that outlined in Rules 1 and 2.

The first award in connection with The 5 Ack R Memorial Trophy will be based on articles published in the current volume of the R.S.G.B. BULLETIN.

Bevan Swift Memorial Premium

ACTING on the advice of the Technical Committee the Council has decided to award the Bevan Swift Memorial Premium for 1957 to Mr. B. J. Rogers (G3ILI) author of an article entitled " *A Single Sideband Exciter for 144 Mc/s.*"

This article was considered to be the most meritorious published in Volume 32 of the Society's Journal.

Norman Keith Adams Prize

AS no paper published in Volume 32 of the Society's Journal was considered by the Technical Committee to be sufficiently original to warrant the author being recommended to receive the Norman Keith Adams Prize the Council has decided to make no award for the current year.

Varney Trophy

AS no paper on the subject of Amateur Radio interference published in Volume 32 of the Society's Journal was considered by the Technical Committee to be sufficiently meritorious to warrant the author being recommended for the Louis Varney Trophy the Council has decided to make no award for the current year.

R.S.G.B. at the National Radio Show

THE Society will again be exhibiting at the National Radio Show, to be held this year at Earls Court, London, from August 27 to September 7. The stand will be number 309 in the Gallery and will be under the management of Fred Ruth (G2BRH). Equipment of all kinds, ranging from the very simple to the advanced, will be on show. A wide range of publications and supplies will be on sale.

Volunteers to help man the stand are still required; offers should be sent to Headquarters immediately.

GB3IGY

THE Postmaster General has authorized Mr. K. E. S. Ellis (G5KW) to establish and use an automatic station with the call-sign GB3IGY at " Hill Top," Well Hill, Chelsfield, Kent, for the purpose of sending messages on behalf of the R.S.G.B. during the International Geophysical Year. The automatic station will operate on a frequency of 145·5 Mc/s. A power of up to 1 kW may be used with emissions A1, 2, 3 and 3a, using a high gain aerial beamed in a northerly direction.

I.G.Y. Co-ordinators

THE Council has accepted with regret the resignation of Mr. D. W. Furby (G3EOH) from the office of I.G.Y. Co-ordinator. Mr. C. E. Newton (G2FKZ) of 105 Underhill Road, Dulwich, London, S.E. 22, has been appointed in his stead.

Radio Amateurs' Examination

THE City and Guilds of London Institute report that 562 candidates entered for the Radio Amateurs' Examination last May and 377 passed.

The report on the examination will be published as soon as it becomes available.

London Meetings

THE following programme of meetings and lecture meetings has been arranged:—

September 27, 1957	"Trends in Aerial Design for the Amateur" by S. Kharbanda, A.M.Brit.I.R.E., Assoc.I.E.E. (G2PU), Labgear (Cambridge) Ltd.
November 1, 1957	Details not yet settled.
November 29, 1957	"Some Aspects of Atmospheric Radio Noise"* by F. Horner, M.Sc., A.M.I.E.E. (D.S.I.R. Radio Research Station).
December 13, 1957	Annual General Meeting at Kingsway Hall, Kingsway, London, W.C.2.
January 24, 1958	Presidential Address followed by a lecture "The Human Machine as a Radio Operator" by F. J. H. Charman, B.E.M. (G6CJ).
February 14, 1958	"The TVI Problem" by G. A. Bird, G4ZU (Radio Group, London Regional Headquarters, G.P.O.).
March 21, 1958	"The Junction Type Transistor and its application to Short-wave Radio" by E. Wolfendale, B.Sc., A.M.I.E.E. and L. E. Jansson (Mullard Radio Valve Co. Ltd., Southampton).

*Provisional Title.

With the exception of the Annual General Meeting all meetings will be held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, commencing at 6.30 p.m. Buffet tea from 6 p.m.

Annual General Meeting

THE 31st Annual General Meeting of the Society will be held at the Kingsway Hall, Kingsway, London, W.C.2, at 6.30 p.m. on Friday, December 13, 1957.

Zonal Representatives

THE result of the ballot for a new Zone D representative was as follows:—

Mr. W. J. Green, G3FBA, of Bath	57 votes
Mr. R. T. Poeton, G3CTN, of Bristol	44 votes

The Ballot was scrutinized by the President and Mr. Milne who accepted 101 Ballot Papers and rejected 2.

Mr. Green has therefore been elected to fill the casual vacancy caused by the resignation of Mr. R. G. Lane.

Mr. E. G. Ingram, GM6IZ, of Aberdeen was returned unopposed to fill the casual vacancy caused by the resignation of Mr. James Taylor, GM2DBA, from the office of Zone F Representative.

Messrs. Green and Ingram are now Members of the Governing Body of the Society.

N.F.D.—LEADING STATIONS

Overall Leaders: (1) Slough (G6NA/P and G6CJ/P). (2) Bristol (G2IK/P and G6GN/P). (3) Cambridge (G8PB/P and G5DQ/P).

Band Winners: 1·8 Mc/s—Wirral (G2AMV/P); **3·5 Mc/s**—Gloucester (G3MA/P); **7 Mc/s**—Gravesend (G6BQ/P); **14 Mc/s**—Croydon (G6LX/P); **21 Mc/s**—Stamford (G3FUR/P); **28 Mc/s**—High Wycombe (G5WW/P).

Scottish N.F.D. Trophy—Aberdeen (GM6IZ/P and GM3EOJ/P).

All the above are subject to final confirmation. Full report and placings next month.

Affiliated Society Representatives

IN accordance with the terms of the notice published on page 418 of the March 1957 issue of the BULLETIN, the following Corporate Members have been appointed Affiliated Society Representatives for the current year:—

Ariel Radio Club (B.B.C.): B. A. Toms (G3BBU), 38 Ashbourne Avenue, South Woodford, London, E.18.

Bailleul Radio Society: E. J. Younge (G3IVH), 3 Trg. Bn., R.E.M.E. Bailleul Camp, Arborfield, Berks.

City of Belfast Y.M.C.A. Radio Club: R. J. Boal (GI3AXI), 127 Hillman Street, Belfast, N. Ireland.

Gravesend Radio Society: V. H. S. Curling (G6VC), 66 Burch Road, Northfleet, Kent.

Ilkeston & District Amateur Radio Society: J. Eaton (G3EZZ), 74a Station Road, Langley Mill, Nottingham.

Liverpool and District Amateur Radio Society: C. J. Fox (G3HII), 69 Feltwood Road, West Derby, Liverpool 12.

Midland Amateur Radio Society: M. A. Brett (G3HBE), 55 Chestnut Drive, Erdington, Birmingham 24.

Ravensbourne Amateur Radio Club: J. H. F. Wilshaw (B.R.S. 18936), 4 Station Road, Bromley, Kent.

Slade Radio Society: G. Nicholson (G3HKC), Flat 4, 109 Eachelhurst Road, Erdington, Birmingham 24.

Worthing & District Amateur Radio Club: R. B. Forge (G3FRG), 14 Poulters Lane, Worthing, Sussex.

An announcement dealing with the election of A.S.R.s for the year 1958 will be published next month.

Members are reminded that United Kingdom clubs or societies affiliated to the R.S.G.B. will, in future, be permitted to enter for the N.F.D. event organized by the R.S.G.B. provided an A.S.R. has been elected prior to April in any particular year.

Radio Amateurs' Examination

FOR the guidance of members who wish to prepare for the Radio Amateurs' Examination a list is given below of those colleges which advised the City and Guilds of London Institute that a course of instruction leading to the examination was in operation during the 1956-7 session.

Aberdeen Trades College.
Barrow-in-Furness. Central College of Further Education.
Blackburn Municipal Technical College.
Bolton Technical College.
Bradford Technical College.
Brentford Evening Institute.
Bridgwater Technical and Art Institute.
Brighton and Preston Technical Institute.
Burnbank School of Engineering, Hamilton.
Calder College of Further Education, Todmorden.
Coleraine Technical School, Northern Ireland.
Connahs' Quay. Flintshire Technical College.
Croydon Technical College.
Derby and District College of Technology.
Dudley and Staffordshire Technical College.
Dunfermline. Lauder Technical College.
Glasgow. Allen Glen's Further Education Centre.
Grimsby College of Further Education.
Hastings and St. Leonards Technical College.
Huddersfield Technical College.
Ilford Literary Institute, Ilford.
Ilkeston College of Further Education.
Kingston-upon-Hull College of Technology.
Leicester College of Technology and Commerce.
Liverpool. Riversdale Technical College.
London. Islington Men's Evening Institute.
London. South East London Technical College, S.E.4.
Londonderry Municipal Technical College.
Loughborough College of Further Education.
Luton and South Bedfordshire College of Further Education.
Middlesbrough Constantine Technical College.
Oldham Municipal Technical College.
Salford. Royal Technical College.
Swansea Technical College.
Swindon. The College.
Walsall Technical College.
Wembley Evening Institute.

Interested members should make early enquiries to ascertain whether a similar course of instruction is to be offered during the 1957-8 session.

Tests and Contests

420 Mc/s Contest, 1957

TECHNICALLY equipment was similar to that used in previous contests except that r.f. stages appear to have been added to many receivers, at least by the leading stations. Nothing spectacular seems to have happened and conditions appear to have been very much " bread and butter."

Three entrants topped the 1,000 points mark and two exceeded the second and third scores of last year without being placed. Five of last year's contestants did not enter and three of them failed to " appear " on the air, yet there was a greater number of stations active and seven of them were new contestants. This contest is probably the best of any because 30 per cent of those active enter as against something like 10 per cent in other events.

One could expect accuracy and efficiency with these v.h.f./u.h.f. workers; it is a natural corollary to their scientific attention to small detail necessary at these frequencies—and so we find very accurate logging although, let it be stated, most signals were given in the 55/59—559/599 classes. Points lost, with single exceptions, were not for logging errors, but for inaccurate distance estimation. It is indeed surprising, very surprising, that with such seekers after the *Nth* degree of efficiency that they should have rejected in previous years such a simple yet accurate method of distance determination as offered by the National Grid Reference System. V.h.f./u.h.f. workers will spend hours in building and rebuilding; in testing and adjusting; and will develop techniques for more accurate measurement of anything except distance! All that is needed is two lines at right angles, marked off to scale and a ruler to measure accurately, easily, and with certainty, the distance between any two stations in the British Isles to the nearest kilometre. It must have taken longer to pore over maps with a ruler (which had in any case, to be converted into miles) than to do the simple arithmetical deductions of the scientific method.

NO! The checkers had to recalculate them again and recast. The claimed positions have not changed, which is indeed fortunate; but this work being " a bit much " it will be found that all but the leading stations have been listed with their claimed scores.

One station claimed only half the distance due to him, because he could not find the place on the map (*no* map is needed for the grid method of calculation); another worked a station twice, fixed and portable, completely contrary to a specific rule on this point. But these are only minor details—the contest has greatly improved these last two years or so—and it could be hoped that all contests were of this standard.

Leading Stations

The equipment used by the leading stations was as follows.

G2XV *Transmitter:* 6AG7, QV04/7, QV04/7, 832, QQV06/40, QQV06/40.
Receiver: 6AM4 (grounded grid r.f.), crystal diode, 6BQ7 (i.f. amplifier), into SX28.
Aerial: 20 driven elements with 20 reflectors, 40ft high, fed with co-ax.

G6NB *Transmitter:* QQV06/40.
Receiver: E2521 (r.f. amplifier), crystal mixer (crystal controlled injection head), i.f. amplifier, to HRO.
Aerial: 32 element stack.

G3HBW *Transmitter:* 5763 tripler, 5763 doubler, QQV03/20 tripler, p.p. DET24 amplifier, ACT22 p.a.
Receiver: Crystal controlled converter, 6AM4, DET24 and 446A r.f. stages, crystal mixer.
Aerial: Corner reflector.

The following were active during the Contest in addition to those who submitted logs: G2DD, G2RD, G2WJ, G2HDJ, G2HDY, G2FNW, G2FMJ, G3DCI, G3DFL, G3ENY, G3FUL, G3GDR, G3GTH, G3IRA, G3IRW, G3JHM, G3KBS/P, G3KJO, G3KFD, G3LGJ, G5BD, G5CD, G5DF, G5DS, G5DT, G5LL, G5YV, G6LL, G6NF, G6YU and G8RW. A check log from G3MI is gratefully acknowledged.

Results 420 Mc/s Contest, June 16, 1957

Posn.	Call-sign	Location	Contacts	Points
1	G2XV	Trumpington, Cambridge	19	1236
2	G6NB	Brill, Bucks.	25	1182
3	G3HBW	Bushey Heath, Herts.	29	1112
				Claimed Scores
4	G3GZM/P	Clee Hills, 5 mls. S.E. Ludlow	14	881 *
5	G3KEQ	Sanderstead, Surrey	23	860
6	G3JZG	Willenhall, Staffs.	14	560 *
7	G8SK/P	2mls. S.W. Dunstable, Beds.	17	519
8	G8OY/P	Ilmington Downs, Warwick.	11	435 *
9	G3FP	Thornton Heath, Surrey	20	408 *
10	G8AL	Chingford, Essex	20	386 *
11	G3HAZ	Birmingham	11	379
	G3HAZ/P	Lickey Hill Beacon, 8 mls. S.W. Birmingham	11	379
12	G2DDD	Littlehampton, Sussex	6	335 *
13	G3FCA	Edgware, Middx.	17	251
14	G5UM	Bulls Green, Knebworth, Herts.	10	244 *
15	G3CGQ	Luton, Beds.	6	117

* *Did not compete in 1956.*

Second R.S.G.B. 1250 Mc/s Tests

THE second 1250 Mc/s Tests organized by the R.S.G.B. will take place on August 25, 1957, and should again prove of outstanding interest to all u.h.f. workers. Although comparatively few members took part in the first tests held in September 1956, valuable experience was gained and the event acted as a considerable spur to interest in the band.

The Contests Committee still feels that a contest organized on a point-scoring basis would be an unsuitable form of activity for the band and would penalize experimentally inclined amateurs on whom the exploitation of these frequencies directly depends.

Rules

The event will have few fixed rules, other than the duration which will be from 10.00 G.M.T. to 22.00 G.M.T. on Sunday, August 25, 1957, and the provision that all entries must be from fully paid-up Corporate members of the R.S.G.B. and accompanied by the declaration set out below. To give all entrants an equal opportunity, entries can be accepted only on behalf of the activities of an individual station, though no limitation is placed on the number of operators or assistants. Any type of operation or mode of transmission may be used provided that entrants adhere to the terms of their licences.

The entries will be required to include details of stations heard or worked (with distances) and general observations on the band. A full description of all equipment used should be included and this information and any other evidence submitted of work carried out on the band will be taken into consideration when judging the event. The copyright of the descriptive matter may be retained by the entrant, though the Contests Committee reserve the right to abstract information for the purpose of preparing a report on the tests. The entrant submitting the best entry in the opinion of the judges will be recommended to the Council for the award of the *Arthur Watts Trophy*. Such recommendation will not be directly dependent upon the number of contacts made or the mileage covered; such factors as original experimental work, ingenious equipment, the compilation of a detailed report, and the general amount of effort put into the test will also be taken into account. Entries from receiving stations will be welcome and will be eligible for the award.

Entries must be addressed to the Contests Committee, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, and postmarked not later than September 9, 1957. Entries must contain the following declaration:

I declare that my station was operated strictly in accordance with the rules and spirit of the Tests and I agree that the ruling of the Council of the Radio Society of Great Britain shall be final in all cases of dispute.

Date.....Signature.

EUROPEAN V.H.F. CONTEST

The Region 1 (I.A.R.U.) European V.h.f. Contest will take place during the weekend of September 7 and 8, 1957, under the rules published on page 422 of the March 1957 issue of the R.S.G.B. BULLETIN. Particular attention is drawn to the rule requiring that two copies of logs should be sent to the V.h.f. Manager of the country concerned. British amateurs should address their entries to F. G. Lambeth (G2AIW), R.S.G.B. V.h.f. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex.

The contest is being organized this year by the R.S.G.B.

A National V.h.f. Contest will be held during the same period under the same rules but no separate entry form will be required.

D/F National Final

Important Notice

DUE to unforseen circumstances it has been found necessary to postpone the D/F National Final for one week. Intending competitors are asked to note that it will now take place on **September 15, 1957.**

Contests Diary

1957

August 18	-	Second 144 Mc/s Field Day[1]
August 25	-	1250 Mc/s Tests[6]
September 1	-	Low Power Field Day[2]
September 7-8	-	European V.H.F. Contest[3]
September 7-8	-	National V.H.F. Contest[3]
September 15	-	D/F National Final[4]
October 5-6	-	Low Power Contest
November 9-10	-	Second Top Band Contest
November 16-17	-	Second 70 Mc/s Contest
November 23-24	-	21-28 Mc/s Telephony Contest[5]

1958

January 25-26	-	B.E.R.U. Contest

[1] See page 29, R.S.G.B. Bulletin, July, 1957.
[2] See page 29, R.S.G.B. Bulletin, July, 1957.
[3] Both under Region 1 I.A.R.U. rules. See page 422, R.S.G.B. Bulletin, March, 1957.
[4] See page 29, R.S.G.B. Bulletin, July, 1957.
[5] See page 516, R.S.G.B. Bulletin, May, 1957.
[6] See page 83

Radio Amateurs' Examination—Courses of Instruction

The following course is additional to those listed on page 32 of the July BULLETIN.

Islington L.C.C. Men's Evening Institutes, Isledon School, Upper Hornsey Road, Holloway, London, N.7. A course of instruction in preparation for the Radio Amateurs' Examination will take place on Mondays (Radio Theory, 7 to 9 p.m., Morse, 9 to 10 p.m.) commencing September 23. The instructors will be S. H. Iles, G3BWQ (Theory) and L. Barber (Morse). Enrolments will take place during the week September 16 to 20 from 7.30 to 9 p.m. but applications should be made in the first instance to A. W. H. Wennell (G2CJN), Hon. Secretary, Grafton Radio Society, 145 Uxendon Hill, Wembley Park, Middlesex.

Fifth Annual Topsfest

THE Fifth Annual Topsfest organized by the TOPS C.W. Club will be held at The Swan Hotel, Lichfield, Staffs., on Sunday, August 25, 1957. Inclusive tickets for admission and high tea can be obtained from Mr. C. J. Morris (G3ABG), 24 Walhouse Street, Cannock, Staffs., price 8/6 each. Admission at the door will cost 2/-.

R.S.G.B. members are cordially invited to support this event for which a comprehensive programme has been arranged.

Silent Keys

ARNOLD DEVEY (G2AU)

The members of the Wolverhampton Amateur Radio Society have suffered a grievous loss with the passing of their Vice-President, Mr. Arnold Devey, G2AU, after a short illness. He was a founder member of the Society and had been an active member for 37 years, during which his cheerful disposition endeared him to all.

He recently retired after many years service with the G.P.O. in which capacity he was known to many amateurs by inspecting their stations.

The Society was represented at his funeral and the sympathy of all the members has been conveyed to his widow and daughter in their great loss.—J. V. R.

E. HAMLETT (G3IXX)

With sorrow we record the passing on July 6, 1957, of Ernie Hamlett, G3IXX, a keen member of the East Ham R.S.G.B. Group who took part in all local activities.

By his death the Group have lost a very good friend and wise counsellor.

A number of Society members attended the funeral on July 11 at Manor Park, London when floral tributes to his memory were sent by the local Group and friends.

Sympathies are extended to his relatives.—W. H. P.

W. G. R. SMITH (G3ZR)

It is with deep regret that we record the death of W. G. R. Smith (G3ZR) on May 19, 1957, at the early age of 56 after a long illness.

"Smithy" was well-known to amateurs in North and East London and was active on 10 metres until about two years ago. He joined the B.B.C. in the 1920's, and the B.B.C. Television Service in its earliest days. He returned to Alexandra Palace at the end of the war and later supervised the installation of the new Crystal Palace station.

Those of us who knew him well will always cherish the memory of his kindness and helpfulness at all times.

To his wife and children we extend our deepest sympathy.

—A. J. M.

JOHN WHEELER (G3GUK/VS1GO/VS9AW)

It is with much sorrow that we record the death of John Wheeler, G3GUK, as the result of an air crash on July 1, 1957, whilst travelling between Chittagong and Dacca. The aircraft, owned by Pakistan International Airlines, crashed on an uninhabited island.

John Wheeler also held the calls VS1GO and VS9AW and it was whilst operating as VS9AW that he gave first contacts with the Arab state of Oman to many DX workers.

When on leave in England John made a point of attending gatherings of the London Members' Luncheon Club where he was always a welcome visitor. At the time of his death he was working for the Decca Navigator Co. Ltd. at Chittagong, East Pakistan.

Condolences are offered to his father, sister and fiancée in the great loss they have suffered.—G4IB.

R.A.E.N Rally 1957

Rules

1. The Rally is open to all R.A.E.N. members, who will be divided into three groups:
   (*a*) Out stations (R.A.E.N. members operating portable or mobile);
   (*b*) Fixed stations (R.A.E.N. members operating from home stations);
   (*c*) Receiving stations (R.A.E.N. members operating as receiving stations at home or as outstations).

2. The Rally will take place on Sunday, September 8, 1957, from 0900 to 1200 G.M.T., 1400 to 1700 G.M.T. (telephony) and from 1800 to 2100 G.M.T. (Morse code A1). Operation will be in the 1·8, 3·5, 28, and 144 Mc/s bands. R.S.G.B. band planning must be observed. Licensed power must not be exceeded.

3. Outstation equipment will not be connected in any way to public mains electricity supply and must be located at least one mile from home, or other normal fixed station site.

4. Scoring—Transmitting Sections.
   Contacts will score points as follows:
   Outstation to outstation—5 points.
   Outstation to fixed station—3 points.
   Outstation to non-R.A.E.N. Station—1 point.
   Fixed station to outstation—3 points.
   Fixed station to fixed station—2 points.
   Fixed station to non-R.A.E.N. Station—1 point.
   Ten scoring contacts only will be allowed with non-R.A.E.N. stations during the rally.
   No station may be worked more than once on each band by the same mode of sending. (G3XXX, G3XXX/P and G3XXX/M count as one station for scoring purposes.)
   The best two periods' scores will be counted for placing.

5. Each participant will, on application to his E.C.O. (or the Honorary Secretary, R.A.E.N. Committee in cases where participants have no E.C.O.) be issued with a test phrase. This test phrase will be passed to the first R.A.E.N. station contacted, in exchange for the test phrase from that station. The test phrase received will be passed to the next R.A.E.N. station contacted, in exchange again, and so on. No test phrase will be passed to non-R.A.E.N. stations. **E.C.O.s should make application for block issues of test phrases to the Honorary Secretary, R.A.E.N. Committee, by not later than August 31, 1957.**

6. Stations will call "CQ from Radio Amateur Emergency Network Station. . . ." and sign "from Radio Amateur Emergency Network Station. . . ." The letters or word RAEN must **not** be used in any circumstances.

7. Printed log sheets will be issued at the same time as the test phrases, by the Honorary Secretary, R.A.E.N. Committee, to all participants through E.C.O.s in cases where there is an ECO.
   Completed entries for all the periods worked must be returned to the **Honorary Secretary, R.A.E.N. Committee, "Niarbyl," Gay Bowers Road, Gay Bowers, Danbury, Essex,** postmarked not later than Monday, September 23, 1957. Location and signal reports must be given, received and logged.
   Participants should complete, on the top sheet of their log, the details of their station, in the appropriate spaces provided. The declaration must be signed.

8. Receiving Stations—Scoring and Logs.
   Receiving stations will score three points per R.A.E.N. Station heard in contact, provided that the details required by the printed log sheet are correctly recorded therein.
   Receiving stations operating portable or mobile will receive a bonus of one point per R.A.E.N. Station correctly logged.
   Logs must be submitted on printed sheets obtained from the Honorary Secretary, R.A.E.N. Committee through E.C.O.s, or direct where participants have no E.C.O. The details and declaration required should be completed and signed on the top sheet only.
   Entries should be posted to reach the Honorary Secretary, R.A.E.N. Committee and should be postmarked not later than Monday, September 23, 1957.

9. Awards will be made to the participants who score the highest number of points in each of the groups: Outstations, Fixed Stations and Receiving Stations.

Component Information

MR. H. HARRIS (B.R.S.12959), "The Huon," Branksome Hill Road, Bournemouth, offers to identify for members components and equipment used by the British and U.S. Armed Forces. The only information he requires is the manufacturers' reference number or, if this is not available, the name and part number.

Mr. Harris has an extensive reference library of technical manuals from which information can be obtained. Alternatively, arrangements can be made for members to inspect the manuals in London or Bournemouth.

All enquiries should be accompanied by a stamped addressed envelope. As Mr. Harris provides this service to members entirely voluntarily, there may sometimes be a little delay in replying to letters owing to pressure of personal business.

Mobile Rallies

Sunday, September 1, 1957

GRAND MOBILE RALLY AND HAMFEST

Stock Hall Farm, Matching Green, Essex.

(Matching Green is 5 miles east of Harlow).

Programme includes Amateur Television Demonstration, Raffle, Display of Commercial Equipment, facilities for Children's Games. Good Parking. Refreshments. "Checkers Inn" near at hand.

Wet-day facilities on site.

Control stations will be in operation from 10 a.m. to talk-in mobiles, using the call-signs G3JMA/P on 144 Mc/s and G3ERN/P on 1·8 and 3·5 Mc/s. Further details may be obtained from P. W. Winsford (G4DC), 137 Hall Lane, Upminster, Essex, to whom intending visitors are asked to send a postcard stating the probable number in their party.

Organized by Harlow and District Radio Society

* * *

Sunday, September 15, 1957

TUNBRIDGE WELLS MOBILE RALLY

Dunorlan Park, Pembury Road, Tunbridge Wells, Kent.

(From London, take the Hastings road through Tonbridge (A21), turn right just after Pembury Hospital onto Pembury Road (A263) towards Tunbridge Wells at Woodsgate Corner. Dunorlan Park is on the left, about two miles and is marked on the O.S. Sheet 171 one inch map. Coming through Tunbridge Wells, make for the Pembury (i.e. Hastings A263) road. The site will be found about one mile from the town centre. Buses between Pembury and Tunbridge Wells pass the gate).

Programme includes a prize for the most attractive and well arranged mobile installation and a raffle with prizes for OMs and XYLs. Private rally car park (enter through main gate). Light Refreshments. Dunorlan contains several acres of park land with excellent picnic sites and a boating lake.

Control stations will be in operation on 144 Mc/s (G4IB/P), 1·8 and 3·5 Mc/s from 12 noon to talk-in mobiles.

Organized by West Kent Amateur Radio Society.

* * *

Sunday, September 29, 1957

WOBURN ABBEY MOBILE RALLY

Woburn Abbey, Bletchley, Buckinghamshire.

(by permission of His Grace the Duke of Bedford).

Historic Woburn Abbey, set in a beautiful park of 3,000 acres with more than 2,000 animals, has one of the finest collections of pictures and superb works of art. There are over 7 miles of private roads.

Full details in next month's BULLETIN.

Members intending to be present are asked to send a postcard to *Mobile Column*, R.S.G.B. Headquarters, stating the number in their party.

Can You Help?

- J. E. Gunn, 24 Goldhanger Cross, Basildon, Essex, who requires the instruction manual and/or circuit diagram for the Model 906 F.M./A.M. Signal Generator manufactured by the McMurdo Silver Co. of U.S.A.?
- G. V. Haylock (G2DHV), 63 Lewisham Hill, London, S.E. 13, who requires the circuit diagram of the MCR1 battery receiver?
- J. H. Phillips (B.R.S.20347), 57 Trafalgar Street, Gillingham, Kent, who wishes to obtain the manual for the Marconi CR300 receiver?
- D. W. Thompson (B.R.S.21429), 94 Archers Way, Letchworth, Herts., who requires information on the Air Ministry Transmitter-Receiver type TR9D (Receiver 1120 and Transmitter 1119)?
- S. L. Yeo (A.1440), 35 Nelson Street, Rosyth, Fife, who wishes to obtain information on the modification and conversion of the RF24 unit to a converter tuning 20 to 30 Mc/s?
- W. E. Green (G3BTC), 20 Roseacre Road, Welling, Kent, who requires the circuit diagram and any other information for the Radio Receiver BC923 covering 26 to 40 Mc/s.

Regional & Club News

Bristol—A grid dip oscillator, an Antennamatch, a multi-range meter, high and low pass filters, and a crystal controlled converter were among the items described by members at the July meeting. Those taking part in the demonstration and discussion included G2HDR, G3IFV, G2FYT, G3FBA, G3FBY, G3CHW and B.R.S.19985. On August 23 Past President Arthur O. Milne (G2MI) will be talking about "The International Aspect of Amateur Radio." An account will be given of last year's important I.A.R.U. Conference at Stresa and G2MI will be showing some colour films taken during that event. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 1.

Bury Radio Society—The society is holding a Hamfest at the Derby Hotel on September 14. The programme will include dinner, a raffle, and the film *Race for Life*. Tickets, price 10/6 each, are available from the *Hon. Secretary:* L. Robinson, 56 Avondale Avenue, Bury. Meetings at the George Hotel, Kay Gardens, Bury, have been arranged for 8 p.m. on September 10 ("The Panda," by G3DZU) and October 8 ("Matching Matters," by R. H. Hammans, G2IG).

Flintshire Radio Society—On July 1, members visited the Prestatyn Telephone Exchange. Hugh Owen (GW3KHO) travelled from Bangor for the meeting and was warmly welcomed. On July 18, 30 members visited the recently completed power station at Connah's Quay.

Grafton Radio Society—The G2AAN Cup has been awarded to P. Bernal (G3KQX), winner of the society's recent Top Band C.W. Contest. The runners-up were W. Black (G2HGT) and D. MacLennan (G3KGM). The society expresses its thanks to all those who helped to make the contest a success. The annual field day on Hampstead Heath was again well supported, two stations equipped for all bands making many DX and local contacts. Meetings recommence on September 6 after the summer recess. The A.G.M. will be held the following Friday (the 13th). R.A.E. and Morse classes start on September 23. *Hon. Secretary:* A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

London Members' Luncheon Club—Thirty-three members and visitors attended the luncheon on July 19 when Stan Vanstone (G2AYC), Chairman, welcomed K2USG, W2WBM, W1CJM, W8LMK, W9JDF, HB9TS, HE9ELH, SM6KA and ZE3JJ. They were introduced in turn by G6CL. New lapel badges for members and visitors were introduced at the meeting. Amateurs in London on August 16 are invited to attend the meeting that day at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road (12.30 for 1 p.m.). Visitors are asked to notify G2FUX (Ruislip 2763) or R.S.G.B. Headquarters (HOLborn 7373) of their intention to be present.

Lothians Radio Society—The first meeting of the new session will be held in the Chamber of Commerce Rooms, 25 Charlotte Square, Edinburgh, on September 12 commencing at 7.30 p.m. All members and others interested are cordially invited to attend. *Hon. Secretary:* J. S. Nicholson, 145 Liberton Brae, Edinburgh 9.

Norwich and District Radio Club—Meetings are held on Fridays at 7.30 p.m. at "The Golden Lion," St. John's Maddermarket. Recent lectures have included a talk on Electronic Computers by G3ASQ. The club station, G3JGI, will be operating from Scoby Sands off the East Coast on August 25 from 12.00 to 17.00 B.S.T. Special QSL cards will be used to confirm all QSOs. *Hon. Secretary:* Henry Staff (G4KO), 59 Charles Avenue, Thorpe, Norwich.

Nottingham and District Amateur Radio Society—The next meeting will be held at Basford Hall Miners' Welfare, Nuthall Road, Cinderhill, on September 20 at 7.30 p.m. There will be no meeting during August. *Hon. Secretary:* H. H. Pickering (G3DUL), 43 Plains Road, Mapperley, Nottingham.

Nottingham Amateur Radio Club—Meetings are held every Tuesday at Woodthorpe House, Mansfield Road, from August 27. Prospective members are invited to attend any meeting and are assured of a warm welcome. *Hon. Secretary:* F. V. Farnsworth, 32 Harrow Road, West Bridgford, Nottingham.

Pontefract Area Transmitting Group—A private room at the Queen's Hotel, Pontefract, has been obtained as a headquarters and is being redecorated. The new arrangement will permit a more formal programme of meetings to be arranged and it is hoped that this will lead to increased membership. A club station is to be installed. *Hon. Secretary and T.R.:* W. Farrar (G3ESP), 6 Hemsworth Road, Ackworth, Pontefract.

Poole Amateur Radio Society—The first meeting of this new society was held at the Rechabite Hall, Parkstone, on July 17 when the following officers for 1957 were elected: *Chairman:* J. Hamilton; *Hon. Treasurer:* E. J. Bartlett; *Hon. Secretary:* A. E. Harvey (G3IUG), 39 Curlieu Road, Oakdale, Poole, Dorset; *Committee Members:* D. Wyatt (G3LSC), A. R. Knight (G2HKQ), B. Crane (G3ABH), G. A. Tilsed, W. G. West and P. Sycamore. The society is to issue a monthly magazine under the title *QUA*. Details of the fortnightly meetings may be obtained from the Hon. Secretary.

Radio Society of Harrow—Four members took part in the *CQ* DX Contest earlier this year, the club entry producing a pleasing result. On the occasion of his 75th birthday, the oldest member, "Pop" Wilson, received a suitably engraved memento from the President. Meetings take place in the Science Laboratory, Roxeth Manor Secondary Modern School, Eastcote Lane, South Harrow, on Fridays at 8 p.m. The programme includes a Quiz on August 16, Electrical Puzzles on August 30 and a Junk Sale on September 13. *Hon. Secretary:* S. C. J. Phillips, 131 Belmont Road, Harrow Weald, Middlesex.

Science Museum Radio Society—The first meeting of the winter season will take place on September 10 at 6 p.m. when Major G. Watson (VP8BP) will give an illustrated talk on "Radio in Antarctica." Membership of the society is open to all civil servants and full details can be obtained from the *Hon. Secretary:* G. C. Voller (G3JUL), The Science Museum, London, S.W.7. (Telephone KENsington 6371, Extension 237).

Shefford and District Amateur Radio Society—Meetings are held on Fridays at Digswell House, commencing at 8 p.m. G2DUS/T recently gave a demonstration of high class amateur colour television while talks have included "Ham Jargon" by G3FYG and "Club History" by J. Brunt. On August 16 G2DUS will describe a two metre portable transmitter and J. Brunt will give a talk on Superhet Alignment on the 23rd. A circuit drawing quiz is arranged for the 30th. G3GKA will lecture on Single Sideband on September 6. On September 13 there will be talk entitled "An Outline of Pharmacy." *Hon. Secretary:* G. R. Cobb (G3IXG), Western House, Ampthill Road, Shefford, Beds.

Slade Radio Society—The programme includes a discussion on "Coil Design" opened by N. B. Simmonds (August 16), a visit to the sound recording studios of Hollick and Taylor (August 30) and a demonstration of the Eddystone 888 Receiver by Stratton and Co. Ltd. (September 13). D/F Tests in connection with the Harcourt Trophy will be held on August 25 and September 22. The Slade Net will be on the air again on September 6. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

REGIONAL REPRESENTATIVES

Region 1.—North Western. B. O'Brien (G2AMV), 1 Waterpark Road, Prenton, Birkenhead, Cheshire.

Region 2.—North Eastern. J. R. Petty (G4JW), 580 Redmires Road, Sheffield, 10, Yorkshire.

Region 3.—West Midlands. W. A. Higgins (G8GF), 28 Kingsley Road, Kingswinford, nr. Brierley Hill, Staffs.

Region 4.—East Midland. E. S. G. K. Vance, M.B. (G8SA), 43 Blackwell Road, Huthwaite, Sutton-in-Ashfield, Notts.

Region 5.—Eastern. T. A. T. Davies (G2ALL), Meadow Side, Comberton, Cambridge.

Region 6.—South Central. N. F. O'Brien, F.B.I., A.C.C.S. (G3LP), 143 Brunswick Street, Cheltenham, Gloucestershire.

Region 7.—London. F. G. Lambeth (G2AIW), 21 Bridge Way, Whitton, Twickenham, Middlesex.

Region 8.—South Eastern. Office Vacant.

Region 9.—South Western. W. J. Green (G3FBA), 82 Bloomfield Avenue, Bath, Somerset.

Region 10.—South Wales. C. Parsons (GW8NP), 90 Maesycoed Road, Heath, Cardiff, Glam.

Region 11.—North Wales. F. G. Southworth (GW2CCU), Samlesbury, Bagillt Road, Holywell, Flintshire.

Region 12.—East Scotland. L. Hardie (GM2FHH), 91 Inchbrae Drive, Garthdee, Aberdeen.

Region 13.—South-East Scotland. Office Vacant.

Region 14.—West Scotland. D. R. Macadie (GM6MD), 154 Kingsacre Road, Glasgow, S.4.

Region 15.—Northern Ireland. J. W. Douglas (GI3IWD), 54 Kingsway Park, Cherry Valley, Belfast.

R.S.G.B. QSL BUREAU: G2MI, BROMLEY, KENT

Stockport Radio Society—Activity has continued at a high level during the summer months and attendance has been well maintained. On August 28 there will be a talk on S.S.B. by G3AOO and a talk on TVI by G3AUB on September 11. *Hon. Secretary:* G. R. Phillips, 7 Germans Buildings, Buxton Road, Stockport.

South Shields and District Amateur Radio Club—The July meeting took the form of a debate on the subject of Commercial v. Amateur Built Equipment, Messrs Smith (G5WZ), Corston (G2BCY), Anderson (G5TG) and Sketheway opening the proceedings. Members recently visited the B.B.C. TV station at Pontop Pike. The club will be operating GB3SFS from the Flower Show from August 23 to 25 and requests that QSL cards should be sent to GB3SFS, c/o South Shields Flower Show, Bents Park, South Shields. Meetings are held on the last Wednesday in each month. *Hon. Secretary:* W. Dennell (G3ATA), 12 South Frederick Street, South Shields.

Torbay Amateur Radio Society—At the July meeting J. Hawke (G3FUT) gave a talk on Audio Fault Finding. Mr. D. Willoughby (DL2YU) was due to speak to the society on August 10. *Hon. Secretary:* G. Western (G3LFL), 118 Salisbury Avenue, Barton, Torquay.

Welwyn Garden City—On July 11 a large party, including six wives, visited the *Hertfordshire Mercury* printing works at Hertford to see a demonstration of the new electronic scanning method of producing printing blocks, by co-operation with Mr. Stanley Harrison, J.P. (G3EPK), a director of the establishment. The method is quicker, cheaper and much cleaner than the old copper-and-acid technique and the end-product is a plastic half tone, blue in colour (though of course printing black!) To radio men electronic blockmaking is interesting not only for its scanning system but for the big amplifier terminating in push-pull-parallel 807s which is an integral part of the equipment.

In the wallet of Eric Shapton (G3JMS) that evening was a snapshot of a rival group (Southgate) busy ousting the Welwyn Garden City Group on N.F.D. This picture was turned into an electronic block in ten minutes. Here it is.

New Books

INTRODUCTION TO PRINTED CIRCUITS, by Robert L. Swiggett. 101 pages. Page size 8¾ in. x 5¼ in.

Printed circuits provide a method of making electrical interconnections without wires and a supporting medium for components in a form that is readily adaptable to machine handling and machine assembly.

This book describes various types of printed circuits encountered in current electronic equipment, discusses their characteristics and functions, describes how they are made and their effects on the techniques for servicing devices that contain them. The purpose of the book is to provide the general reader with a broad knowledge of the printed circuit field and the technician with the specific information he needs when he encounters printed circuit assemblies.

The book is published in New York by John F. Rider Publishers Inc. and in England by Chapman and Hall Ltd. Price in England 21/-.

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TUBE SELECTION GUIDE 1956/57 (Electronics Tube Series of Philips Technical Library). 124 pages. Page size 9 in. x 6 in. 32 illustrations. Price 9/6 from Cleaver-Hume Press Ltd., London, W.8.

It is the purpose of this book to help users of valves and cathode ray tubes quickly to determine which Philips type is to be preferred in a particular application. The tables list CV and other equivalents, while the transmitting section indicates the highest operating frequency for each class of valve.

There is a very comprehensive translation section covering the English, French, German and Spanish languages.

* * *

RADIO AMATEUR OPERATOR'S HANDBOOK. Data Book Series No. 6 (4th Edition 1957/8). 48 pages. Published by Data Publications Ltd. Price 3/-.

This useful little book compiled by the staff of *The Radio Constructor* in collaboration with the International Short Wave League provides a wealth of information for the DX enthusiast.

The present edition has been fully revised particularly in regard to call prefixes many of which have altered very considerably in recent years. The tabulated lists are arranged to provide space for the recording of first contacts on various bands with Countries, United States, Counties of England, Scotland, Wales, Northern Ireland and Channel Islands. Radio Zone Boundaries and Call Areas are also featured with Mileage Tables and Local Time Conversion Charts. There is also an up-to-date list of QSL Bureaux of the World.

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.). — Wednesdays, Gadsby Street Hall, off Nelson Road.
Bury (B.R.S.). — September 10, 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.). — September 4, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.). — Tuesdays, 8 p.m., Room "A", Wavertree Community Centre, Penny Lane, Liverpool, 18.
Manchester (M. & D.R.S.). — September 2, 7.30 p.m., Brunswick Hotel, Piccadilly.
Manchester (S.M.R.C.). — Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 20.
Preston (P.A.R.S.). — Wednesdays, 7.45 p.m., 48 High Street, off Lancaster Road.
Southport. — Thursdays, 8 p.m., Sea Cadets' Camp, Esplanade.
Stockport (S.R.S.).—August 28, September 11, 25, 8 p.m., Blossoms Hotel, Buxton Road.
Warrington (W. & D.R.S.). — August 15, September 5, 19, 7.30 p.m., Royal Oak Hotel, Bridge Street.
Wirral (W.A.R.S.). — August 21, September 4, 18, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley (B. & D.A.R.C.). — September 13, (A.G.M.) 7.30 p.m., King George Hotel, Peel Street.
Bradford.—August 20, September 3, 7.30 p.m., 66 Little Horton Lane.
Doncaster.—September 3, 7.30 p.m., Lord Nelson Hotel, Cleveland Street.
Hull.—Second and last Tuesdays, 7.30 p.m., "Royal Oak" (Tony's).
Leeds. — Wednesdays, 7.30 p.m., 4 Woodhouse Square.
Pontefract. — August 29, September 5, 8 p.m., Queen's Hotel, Tanshelf.
Rotherham. — Wednesdays, 7 p.m., "Cutler's Arms," Westgate.
Sheffield (S.A.R.C.). — August 28, 8 p.m., "Dog and Partridge," Trippet Lane.
Slaithwaite. — Fridays, 7.30 p.m. 3 Dartmouth Street.
South Shields (S.S. & D.R.C.). — August 28, 7 p.m., Trinity House Social Centre.
Spen Valley. — August 21, September 4, 7.30 p.m., Temperance Hall, Cleckheaton.
York. — Thursdays. 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (M.A.R.S.). — August 20, ("Amateur Radio at Scout Jamboree." By Alan F. Dennis, G3CNV). September 17, (A.G.M.), Midland Institute, Paradise Street. (Slade). — August 16, 30, September 13, 7.45 p.m., Church House, High Street, Erdington. (Bournville).— Tuesdays, 7.30 p.m., No. 4 Committee Room, Cadburys, Bournville.
Coventry. — August 23, 7.30 p.m., Vine Street School, Coventry. (C.A.R.S.). — August 26, September 9, 7.30 p.m., 9 Queens Road, Coventry.
Solihull. — August 26, September 9, 7.30 p.m., Civil Defence H.Q., Sutton Lodge, Blossomfield Road.
Stourbridge & District. — August 23, 8 p.m., "White Horse" Amblecote. September 3, 8 p.m., King Edward VI School.
Wolverhampton (W.A.R.S.).—August 19, ("Eddystone 888 Receiver" by G5JU,) 8 p.m., Nechells Cottage, Stockwell Road, Tettenhall.

REGION 4

Alvaston. — Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Boulton Lane, Alvaston, Derbys.
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.). — Thursday meetings commence September 5, 7 p.m., Room 5, Ilkeston College of Further Education, Field Road.
Leicester (L.R.S.). — August 26, September 9, 7.30 p.m., Leicester.
Lincoln (L.S.W.C.). — September 4, 7.30 p.m., Technical College, Cathedral Street.
Newark (N. & D.A.R.S.). — September 1, 7 p.m., Northgate House, Northgate, Newark.
Northampton (N.S.W.C.). — Fridays, 6.30 p.m., J-Beam Aerials' Factory, Weston Favell, Northampton.
Nottingham. — August 16, 7.30 p.m., Basford Hall Miners' Welfare, Nuthall Road, Cinderhill.
Peterborough. — September 4, 7.30 p.m., 21 Hankey Street.
Scunthorpe (S.A.R.S.). — September 5, 7.30 p.m., Talbot Hotel, Earl Street.
Retford & Worksop. — No August Meeting.

REGION 5

Chelmsford. — September 3, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Great Hallingbury. — September 15, 2.30 p.m., "Normandale." New Barn Lane (G6UT's Annual Ham Party. Ladies Welcome).
Norwich. — Fridays, 7.30 p.m., The Golden Lion, St. John's, Maddermarket.

REGION 6

Cheltenham. — September 5, 8 p.m., Great Western Hotel, Clarence Street.
Cheltenham (C.A.R.S.). — Wednesdays, 8 p.m., Club Room, St. Mark's Community Centre, Brooklyn Road.
Gloucester (G.R.C.). — Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road.
High Wycombe. — September 25, 7.30 p.m., G5WW, Nethercote, Totteridge Lane, Totterridge.
Oxford (O. & D.A.R.S.). — August 28, September 11, 7.30 p.m., Club Room, Cherwell Hotel, Water Eaton Road, Oxford.
Portsmouth. — Tuesdays, 7.30 p.m., British Legion Club, Queen's Crescent, Southsea.
Southampton. — September 7, 7 p.m., 1 Prospect Place, Above Bar, Southampton.
Stroud. — Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

London (L.M.L.C.). — August 16, September 20, October 18, 12.30 p.m., Bedford Corner Hotel.
London (U.H.F. Group). — September 5, Bedford Corner Hotel.
Acton, Brentford and Chiswick. — August 20, September 17, A.E.U. Rooms, 66 High Road, Chiswick, W.4.
Bexleyheath (N.K.R.S.). — Second and Fourth Thursdays, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Chingford. — For date and venue phone: Wanstead 2321 or Silverthorne 1740.
Croydon (S.R.C.C.). — September 10, 7.30 p.m., Blacksmith Arms, 1 South End, Croydon.
Ealing. — Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, W.5.
East Molesey (T.V.A.R.T.S.). — September 4, 8 p.m., Carnarvon Castle Hotel, Hampton Court. ("The Transatlantic Cable.")
Harlow & District. — Tuesdays, 7.30 p.m., rear of G. E. Read (G3ERN), 6 High Street, Harlow, Essex.
Holloway (G.R.S.). — Mondays (R.A.E. and Morse from September 23), Fridays (club, from September 6), Isledon School, Upper Hornsey Road, Holloway, N.7.
Ilford. — Thursdays, 8 p.m., G2BRH, 579 High Road, Ilford.
Norwood & South London. — August 16, ("Using the Mains," Cyril Waterer, G2HP). September 20, ("Receiver Design," C. E. Newton, G2FKZ). Windermere House, Westow Street, Crystal Palace.
Slough. — September 3, QTH from G2HOX, 13 Quaves Road, or G3YD, 5 Parklands Avenue, Slough.
Welwyn Garden City. — September 12 (Symposium on Converters, with examples brought by members), 8 p.m., I.C.I. Recreation Club, Blackfan Road; October 10, Annual Dinner, "Red Lion" Hatfield, 7 for 7.30 p.m. Tickets 14/6d. from G5UM, before September 27. (Guest of Honour: The President, Mr. D. A. Findlay, D.F.C., G3BZG.)

REGION 9

Bath. — September 16, 7.30 p.m., 12 James Street, West.
Bristol. — August 23, September 20, 7.15 p.m., Carwardine's Restaurant, Baldwin Street.
Exeter. — August 15, 7.30 p.m., G3HTA, 12 Clevedon Close, Pennsylvania. September 12, 7.30 p.m., G2FCI, 5 Glenmore Road, Heavitree.
Falmouth. — First Wednesday in each month, 7.30 p.m., Y.M.C.A., Bar Road, Falmouth.
North Devon (Bideford). — September 5, 7.30 p.m., G2FKO, 38 Clovelly Road, Bideford.
Plymouth. — Alternate Tuesdays, 7.30 p.m., Virginia House Settlement, Barbican.
Torquay. — Second Saturday in each month, 7.30 p.m., Y.M.C.A., Castle Road.
Weston-super-Mare. — Second Wednesday in each month, 7.30 p.m., Albert Hotel, Sea Front.
Yeovil. — Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff. — September 9, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath and Port Talbot. — September 3, 7.30 p.m., Royal Dock Hotel, Briton Ferry.
Pontypool. — Tuesdays, 7 p.m., Educational Settlement, Rockhill Road.

REGION 11

Prestatyn (F.R.S.). — September 2, 7.30 p.m. ("Uses of R.F. in Landline Communication), Railway Hotel.
Rhyl (F.R.S.). — October 2, 7.30 p.m., Marine Hydro, Rhyl (Mullard Film meeting).

REGION 14

Glasgow.—August 30, 7.15 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2. (Hi-Fi Demonstration by John Churchill and James Kerr).

SUBSCRIPTION RATES

The current annual subscription rates for the various grades of membership are as follows:

Home Corporate Members	£1 : 10s : 0d
Overseas Corporate Members	£1 : 1s : 0d
Associates (under 21)	£- : 15s : 0d

LONDON MEMBERS' LUNCHEON CLUB

will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,

at 12.30 p.m. on Fridays, August 16, and September 20, 1957.

Telephone table reservations to HOL 7373 prior to day of luncheon. Visiting amateurs especially welcome.

LONDON U.H.F. GROUP

will meet at the Bedford Corner Hotel, at 7.30 p.m., September 5, 1957.

All u.h.f. enthusiasts welcome.

New Members

THE following were elected to Membership at the June, 1957 Meeting of the Council:—

Corporate Members, Home (Licensed)

G2CPL †N. J. BRUNDLE, 23 The Avenue, Lowestoft, Suffolk.
G3ATZ †H. MORRIS, 24 Kingsley Road, Boughton Heath, Chester.
G3DCV †A. R. WATSON, "St. Elmo," Lewis Road, Istead Rise, Northfleet, Kent.
G3DFV †D. N. FOVARGUE, Mirosa, Stallingborough Road, Healing, Grimsby, Lincs.
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(*Continued on page 96*)

WANTED BC610 Hallicrafters, E.T.4336 transmitters, BC312 Receivers, BC221 Frequency Meters and spare parts for all above. Best cash prices. P.C.A. Radio, Beavor Lane, Hammersmith, W.6. (266

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Printed in Great Britain for the RADIO SOCIETY OF GREAT BRITAIN, New Ruskin House, Little Russell Street, London, W.C.1 by Loxley Brothers Limited, Letchworth, Hertfordshire

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