MARCH, 1962

RSGB BULLETIN

VOL. 37, No. 9

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

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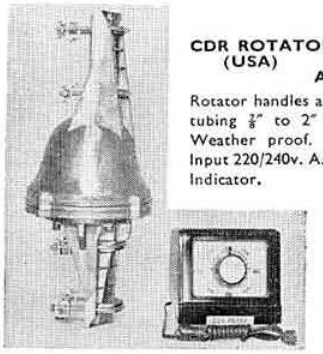

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2/6 Monthly

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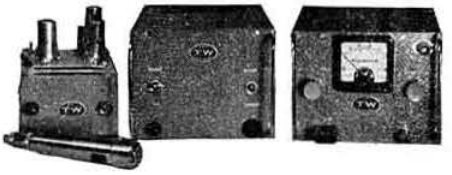

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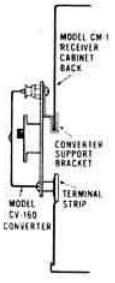

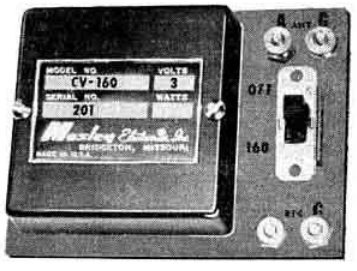

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Current Comment

discusses topics of the day

Committees of the Council

IT has been said on more than one occasion that the best results are achieved by a Committee of two with one member absent. Be that as it may, modern life revolves around the work of Committees.

What is the purpose of a Committee? Broadly speaking a Committee is set up to give detailed consideration to matters which fall within limits specified by terms of reference laid down by a Governing Body—in the case of the R.S.G.B., the Council—and to make recommendations to that body. If there were no Committees the Council would have to meet much more frequently. The task of the Council is to control the affairs of the Society and to make policy decisions. It wisely leaves matters of detail to the Committees.

" He works well in Committee " is one of the highest tributes that can be paid to any man who has a genuine interest in the cause he serves. How often has the good Committee-man come quickly to the top, be it in local government, in politics, in business or in a Society, such as our own?

Last month the BULLETIN listed the names of those members who had been invited to serve on Committees of the Council for the current year. No less that twelve Committees were mentioned. Only a few years ago there were but five—an indication of the growth of the Society and the scope of its interests.

In the course of a year about 100 Council and Committee meetings are held in the restricted confines of Headquarters. The majority of Committee members come from the London Region although, as in the case of R.A.E.N., the membership is drawn from a wide area, whilst the Zonal Representatives themselves constitute the Membership and Representation Committee. For obvious reasons such Committees do not meet very frequently.

It is the Committees that meet regularly, sometimes twice a month at peak periods, that the membership at large should think of with special gratitude, for if it were not for the work of those Committees the Society would most certainly not be able to offer such excellent facilities or provide such a good service as is now possible.

The Contests Committee affords an outstanding example of service to the membership. Year in, year out, often in the face of criticism, the Committee continues its difficult task of drawing up rules for, and judging the results of, a wide variety of events. A glance at the Contest Calendar will show that the Contests Committee has set itself the mammoth task of organizing no less than 26 contests, field days and direction finding events during 1962. The Committee meets about 15 times every year and each meeting lasts for about three hours which in aggregate amounts to more than a whole week's work for the average person. In addition, individual members of the Committee undertake the task of scrutinizing entries and preparing reports for publication. On top of all that, special checking meetings are held after the big events, such as B.E.R.U., N.F.D. and the Telephony Contest have taken place. No wonder there are so few volunteers to serve on that particular Committee!

Because the provincial members who serve on the Council are anxious to take their share in Committee work, several Committees meet at weekends prior to, or after, a Council meeting. The Finance and Staff Committee, for example, was in session one Saturday in February from 9.30 a.m. to 4.20 p.m., with only a brief break for lunch. Every member of that Committee, as well as the General Secretary, had been in attendance at a Council meeting on the previous Thursday from 6 p.m. until 10.20 p.m., and at the Institution of Electrical Engineers on the Friday night to support the President when he delivered his Address.

The Exhibition Committee, whose activities have attracted a good deal of favourable attention in recent years, devotes much time to the detailed work of organizing the Society's stands at the National Radio Show, Earls Court and at the Annual Exhibition in November. The enthusiasm shown by the members of the Committee knows no bounds, many of whom regularly give up weekends at crucial periods of the year in order to ensure that the Society is fully represented at the various exhibitions.

The activities of the Technical Committee—the senior Committee of the Council in years of establishment—although not so spectacular as those of some of the newer Committees, are, nevertheless, of the utmost importance to the Society, because it is the Technical Committee that formulates technical policy and deals with technical problems. Individual members of the Committee devote many hours each year to the task of reading and advising the editorial staff on the technical merits or otherwise of the various manuscripts submitted for publication.

It is not possible within the compass of a *Current Comment* to mention, even briefly, the activities of all the Committees of the Council but it is worth remembering that those who serve on Committees are prepared to give up many, many hours of their leisure time each year in order that the Society may be able to claim with justification that it provides a first-class service to members.

J. C.

A 430 Mc/s Converter using a Nuvistor R.F. Stage

By R. S. J. SMITH (G2DCI)*

THE converter to be described is the result of an attempt to combine good performance with simple constructional design. Although a fair amount of metalwork is involved, all can be carried out with hand tools.

Results obtained by many 144 Mc/s operators with the R.C.A. Nuvistor valve type 6CW4† prompted its use in the grounded cathode r.f. stage, the complete circuit being shown in Fig. 1. The r.f. stage is followed by a semiconductor diode mixer, CR1, from which output is fed to the tunable i.f. of 14-16 Mc/s for 432-434 Mc/s coverage. V2 and V3, both 6J6s, comprise the four stage crystal oscillator chain.

One half of V3 is connected as a Squier overtone oscillator employing a 7740 kc/s crystal, the output being approximately 23·22 Mc/s. The second half of the same valve triples to 69·66 Mc/s and is followed by one section of V2 operating as a frequency doubler to 139·32 Mc/s. The fourth stage is link coupled to a high *Q* break, L6, which is tuned to 418 Mc/s, the injection voltage being fed to the mixer via L5.

Other tunable i.f.'s could be employed with appropriate changes in the crystal oscillator chain, but should not be lower than 14 Mc/s.

Construction

The complete converter is built into an Eddystone diecast box measuring $4\frac{9}{16}$ in. × $7\frac{1}{4}$ in. × 2 in., which is divided into three compartments by three thin copper shields as shown in Fig. 2. The central screen (screen B in Fig. 3) divides the box into two compartments, input (upper in Fig. 2 (a)) and output. The input compartment is in turn divided into two cavities, each approximately $1\frac{3}{4}$ in. wide and contains the 6CW4 valve, V1. The third screen (screen C in Fig. 3) divides the output compartment to provide a further $1\frac{3}{4}$ in. wide cavity. Each screen is attached to the box with seven 6 B.A. screws and nuts.

The lines L2, L4 and L6 are made from copper or brass tube or rod, each measuring $4\frac{1}{4}$ in. long and $\frac{1}{4}$ in. outside diameter. If tube is used, both ends of each line must be plugged and the end attached to the side of the box filed or turned true. The other end is not so important but must be as true as possible. The lines are attached to the box by drilling and tapping the ends for 2, 4 or 6 B.A. screws. The three lines are fitted centrally in the $1\frac{3}{4}$ in. cavities and centred $\frac{7}{8}$ in. below the top of the box. It was thought that it might be necessary to fit lids to the cavities a $\frac{1}{4}$ in. below the edge of the box to make them $1\frac{3}{4}$ in. square, but this has not proved to be so.

At the open end of each line, a hole is drilled in the wall of the box and tapped 2 B.A. to carry the disc variable capacitors. These are made by threading a piece of $\frac{3}{16}$ in. brass rod 2 B.A. for a distance of $\frac{5}{8}$ in. and attaching a $\frac{1}{2}$ in. diameter disc of $\frac{1}{16}$ in. brass. The disc is made a tight fit to the threaded rod in each case and may be soldered and then filed or turned flush. A slot is cut in the end of each rod for adjustment purposes. The capacitors are locked by pieces of springy brass or phosphor bronze cut, drilled and tapped as shown in Fig. 2 (c). They are screwed onto the capacitor adjustment rods and attached to the box with 6 B.A. screws.

The hole in screen A for the base for the 6CW4 Nuvistor valve may appear to present some difficulty but a $\frac{1}{2}$ in., or better $\frac{31}{64}$ in. drill can be used to make a suitable hole, the slots for the retaining lugs on the valveholder being cut with a Geneva file about $\frac{3}{32}$ in. square. The same file can be used to square $\frac{3}{16}$ in. holes for the Radiospares ceramic trimmers used in the converter.

The base of the Nuvistor holder is in the input compartment one heater pin and the fixing lugs being soldered to the

* *15 Russell Bank Road, Four Oaks, Sutton Coldfield, Warwickshire.*

† As for example, the 6CW4 144 Mc/s pre-amplifier described in the *Amateur Radio Handbook*.

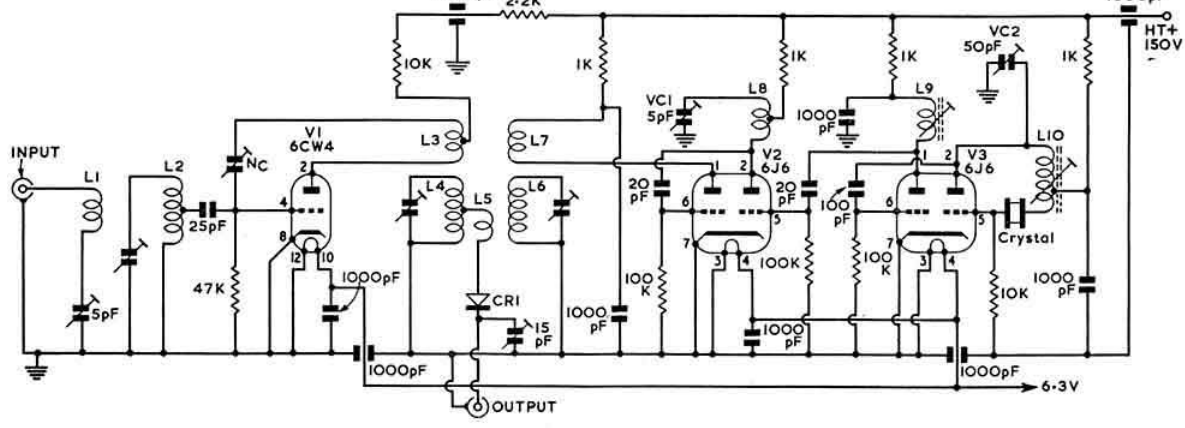


Fig. 1. Circuit diagram of a 430 Mc/s converter using a Nuvistor r.f. stage.

L1, 3, 5, 7, 18 s.w.g. copper wire, see Fig. 2(a) and text; L2, 4, 6, $\frac{1}{4}$ in. diam. copper rod or tube with adjusters, see text; L8, 8 turns 18 s.w.g. enam. $\frac{1}{2}$ in. i.d. centre tapped and series tuned to 139.32 Mc/s; L9, 5 turns 26 s.w.g. enam. on $\frac{7}{16}$ in. former slug tuned to 69.66 Mc/s; L10, 10 turns + 3 turns 26 s.w.g. enam. on $\frac{7}{16}$ in. former.

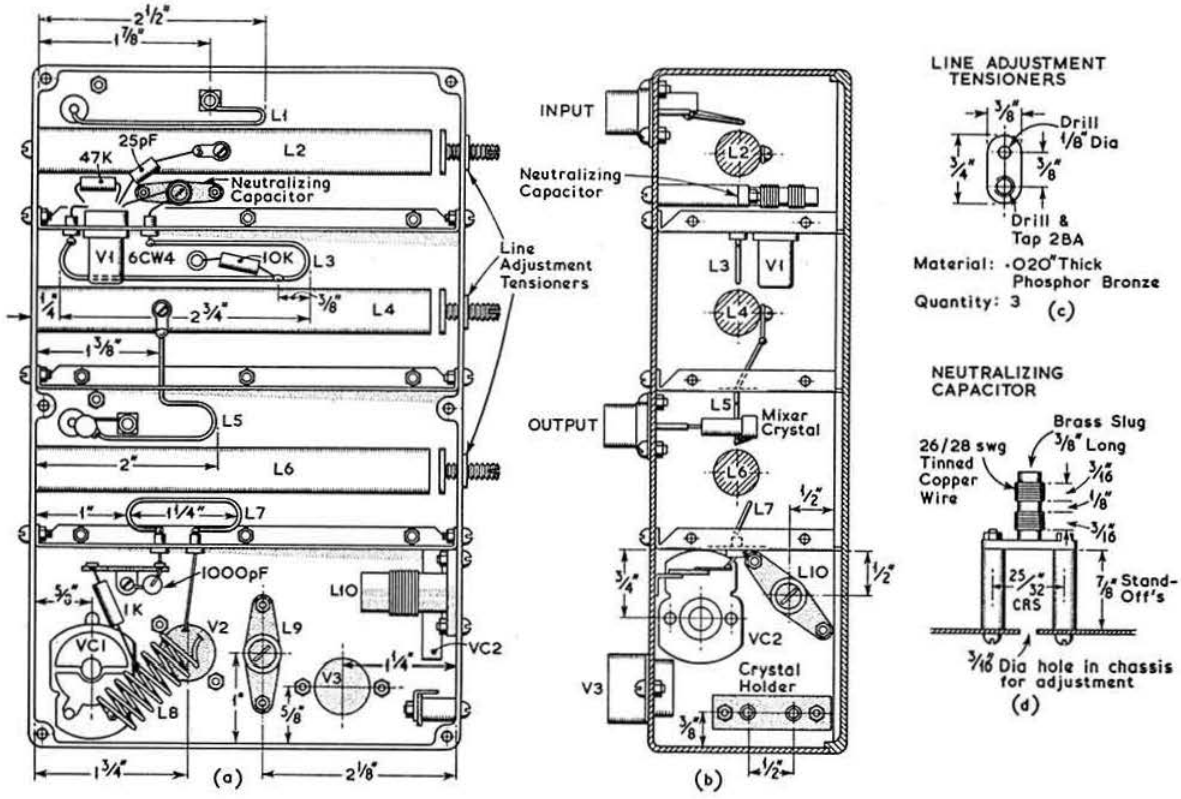


Fig. 2 (a) Layout of the principal components in the 430 Mc/s Nuvistor converter. (b) Sectional view of the diecast box showing the position of the tuned lines. (c) Construction of the line adjustment tensioners. (d) Detail of the neutralizing capacitor NC.

dividing screen. The " live " heater lead is bypassed with a 1000 pF miniature ceramic capacitor connected to the same earth point. The heater lead itself is taken through the top of the box via a 1000 pF feedthrough capacitor. Two nylon feedthrough bushes are fitted to this screen, one connected to the anode pin of V1 and the other to the anode side of the neutralizing capacitor NC which is made from a ¼ in. diameter coil former as shown in Fig. 2 (d). The grid of V1 is connected to a point 2 in. along L2 via a 25 pF silver mica capacitor, the grid return being via a 47 K ohms ½ watt resistor connected to the cathode.

The anode of V1 is connected via one of the nylon bushes to L3 which is made of 18 s.w.g. silver-plated copper wire (tinned or enamelled wire will make no noticeable difference to performance) and shaped as shown in Fig. 2 (a). H.T. is fed to L3 through a 10 K ohms ½ watt resistor and a 1000 pF feedthrough capacitor fitted to the top of the box.

Input to the crystal mixer CR1 is via L5 which is connected to a point 1⅜ in. along L4. The crystal in the writer's converter is a type 1N22, but any other type suitable for 430 Mc/s use may be employed. CR1 is connected directly between L5 and a Belling-Lee co-axial output socket also mounted on the top of the box. A 15 pF Radiospares‡ ceramic trimmer is used to tune out the reactance of the line.

Output from the oscillator chain is inductively coupled to L5 (and thus to CR1) from the high *Q* break, L6.

‡ Radiospares components may be ordered through retailers.

Alignment

H.T. and l.t. should first be connected to the oscillator valves V2 and V3, and VC2 adjusted to give stable oscillation on approximately 23·22 Mc/s. This can be checked by listening to the signal on a general coverage communications receiver. A milliammeter in the h.t. line will be helpful when making adjustments to this stage—consumption of the oscillator chain will be about 25 mA if the crystal is oscillating and 50-60 mA if it is not. Once the crystal oscillator is functioning correctly, the core in L9 should be adjusted for a second dip in the current indicated by the meter, followed by tuning of VC1 for a further dip.

Next, a meter with a f.s.d. of 1·5 mA should be connected across the co-axial output socket and the line L6 tuned. Starting with the adjuster touching the end of L6, the meter will give a violent kick as the adjuster is moved away and the line tuned to approximately 139 Mc/s, a smaller one at 278 Mc/s and an even weaker kick at about 418 Mc/s. The crystal current will be between 0·2 and 0·5 mA, depending on the mixer crystal in use. Adjustment of L4 will cause the meter to kick downward as it tunes through 418 Mc/s; the correct setting is approximately half a turn further out, i.e., when L4 resonates at about 433 Mc/s.

Alignment of the r.f. stage requires a local signal which may be conveniently the 433 Mc/s harmonic of the crystal oscillator in the station 2m transmitter.

The converter should be connected to the main receiver via the i.f. pre-amplifier and the local signal tuned in. With

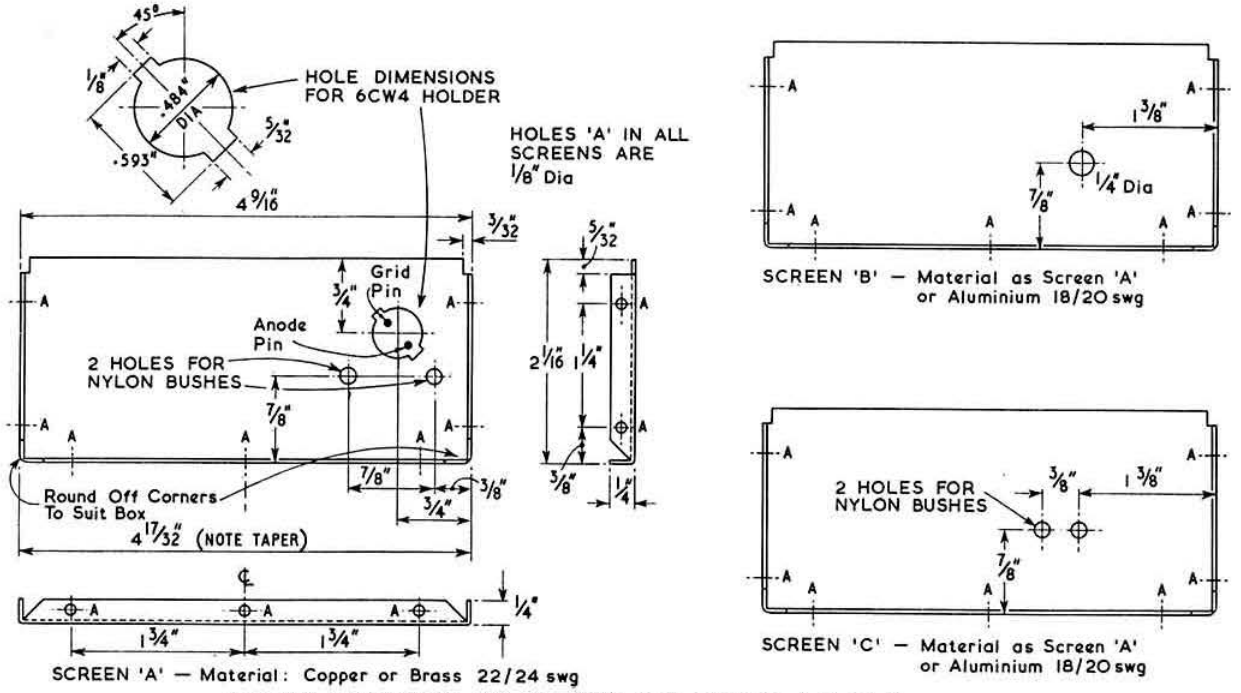


Fig. 3. Construction of the three screens used to divide the diecast box into compartments.

an aerial connected to the input socket, L2 and L4 should be tuned for *maximum* signal, followed by adjustment of the neutralizing capacitor NC for *minimum* signal with no h.t. connected to the anode of V1, re-aligning L2 and L4 as these adjustments are somewhat interdependent.

When neutralization is complete, h.t. may be connected to V1 and immediately checked to see that the current drawn does not exceed 8 mA with 70 volts on the anode of the valve. The signal should now be very much stronger and alignment is complete apart from tuning the 5 pF capacitor associated with L1 and the 15 pF trimmer across the output socket. Both should be tuned for maximum output. Final adjustment with a noise generator is advisable but by no means essential.

The noise figure for the prototype described is under 10db and compares favourably with that of a converter employing the larger and much more expensive A.2521 valve although no accurate noise factor measurements have been made.

The use of a 6CW4 valve as an r.f. amplifier in a 430 Mc/s converter certainly appears to be worth while as it provides gain, a big improvement in noise factor and isolation from i.f. breakthrough compared with a crystal mixer type converter with no pre-amplification.

92nd Signal Regiment Army Emergency Reserve

THE call GM6RI is well known to Top Band operators seeking a QSO with the county of Angus. Also well known is the fact that the holder of that call (Lt.-Col. W. Robertson) is also in possession of the Maitland Top Band Contest Trophy for the current year. What is less well known is that GM6RI commands the 92nd Signal Regiment, Army Emergency Reserve. This is a long-range W/T Communication Regiment, equipped with the most up-to-date gear. It is unique in having its own permanent radio station not far from GM6RI's home near Forfar. Around the station there is an array of rhombics and wide band dipoles to delight the heart of the most rabid DX hunter; into these work QRO transmitters with the latest products of a well-known firm on the receiving side.

The 92nd Signal Regiment is one in which licensed amateurs are active including GM2HIK, G3GVV and G3JNO. Training is limited to a fortnight each year (during July or August) for which full rates of pay are given—the minimum for skilled wireless operators or radio mechanics is 15/- a day; married men receive at least another £2 16s. a week, and there is an annual bounty which rises from £7 10s to £12.

During recent months the writer of this note has been invited by secretaries of several local clubs to talk at meetings about the specialised equipment used by 92nd Regiment. Secretaries of other societies and clubs interested in the work of the A.E.R. are invited to write to Major R. J. Hughes, T.D. (G3GVV), 65 Harlands Road, Haywards Heath, Sussex.

Visitors Welcome

A NEWCOMER to the ranks of licensed radio amateurs, Gunnar Esbjörnsson (SM2BZU) from Boden, Northern Sweden, is at present a patient in Ward 5 of the National Spinal Injuries Centre, Stoke Mandeville Hospital, Aylesbury, Bucks where he would be glad to meet local amateurs. Visiting hours are 2.30 p.m. to 9 p.m. daily. His bedside telephone is Aylesbury 5050, Extension 168. Gunnar who is 20 and whose English is very good has come for physiotherapy treatment after damaging his spine in a diving accident two years ago.

The F.B.5 Aerial†

A Five-band Array with High Gain and Low Angle Radiation for the DX bands

By G. A. BIRD, F.Inst.P.I., Assoc.Brit.I.R.E. (G4ZU)*

WITH conditions becoming erratic on the higher frequencies as the period of minimum solar activity is approached, an increasing amount of amateur activity is being concentrated in the 40 and 80m bands. The keen operator will, however, wish to be prepared for the short duration DX openings which will surely occur on the 10, 15 and 20m bands from time to time.

There are a number of wire arrays which work well on 40 and 80m and which can be pressed into service on the higher frequencies as the need arises, but the performance is generally found to be sub-standard due to the radiation pattern breaking up into a number of minor lobes, and the

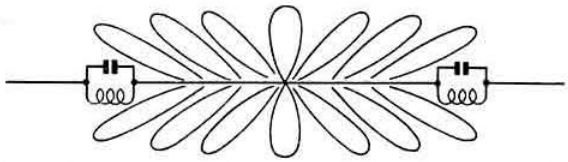


Fig. 1. Radiation pattern of 108 ft. trap dipole (or long wire) on 10m. On 15m there will be ten lobes and six on 20m.

s.w.r. tends to become prohibitive. The two most popular long wire multi-band arrays are probably the G5RV and the W3DZZ trap dipole. These both perform well on 40 and 80m in spite of some impedance mismatch (which is unimportant at low frequencies) but become increasingly reactive and suffer from pattern break-up on higher frequencies (see Fig. 1). With a normal 150 watt transmitter, the average power radiated in any given direction is probably not much more than 5 or 6 watts. A similar effect occurs with a Windom, Zepp, T2FD, W3EDP and the numerous other long wire arrays which have appeared from time to time.

The normal length for a trap dipole is 108 ft. This is approximately three half-waves on 20m, five half-waves on 15m, and seven half-waves on 10m. In the case of the G5RV, the designer specifies a top length of 102 ft. This is a little short for 80m and somewhat long for 40m but the aerial nevertheless performs well on both these bands. On 20m the top length is almost exactly three half-waves and matching is good but unfortunately the radiation pattern starts to break up. On 15m and 10m, respectively, the top lengths should be 113 ft and 119 ft. for a resistive match at the feed point; 102 ft. is much too short and the s.w.r. rises to a prohibitive level.

Similar effects occur with the trap dipole. On 15m, for example, there are 20 alternating spikes and nulls in the horizontal radiation pattern and on 10m no less than 28. At heights above 36 ft., the total number of lobes at various angles can amount to 42 or more.

In common with the two aerials discussed above, the F.B.5 starts with a basic length of three half-waves on 20m (approximately 102 ft.). However, part of the flat top is folded in the centre to form a stub about 10 ft. long so that the span reduces to about 82 ft. This produces a remarkable improvement in the radiation pattern, and at the same time achieves a useful power gain approaching that of a two element beam (see Fig. 2).

Due to the folding, it may be necessary to lengthen the flat top by approximately 2 per cent when the s.w.r. on 20 should readily reduce to not more than 1·5 : 1. In this form the performance on 40 and 80m will be similar to the G5RV. Similar s.w.r. troubles will occur on 15 and 10m due to the the fact that for resonance on these two latter bands the total length of wire should be 113 ft. and 119 ft. respectively. The problem therefore is to make the 102-104 ft of wire "look" like 113 ft. on 15m and 119 ft. on 10m, without affecting its electrical length on 20m. This is where ferrite beads come to the rescue.

A ferrite bead threaded on a wire behaves like a single turn toroid and increases the electrical length of the wire. If the current in the wire is sinusoidal, the greatest effect will be obtained at a point of maximum current. Conversely, a bead placed at a current minima will have negligible effect [1]. As the point of maximum current on a wire shifts with change of frequency, it is possible to select a suitable position on the F.B.5 where a group of beads will provide the required electrical lengthening on 10 and 15m, but leave the 20m conditions relatively undisturbed. The beads must of course be manufactured from a material suited to the frequency range under consideration. Suitable beads are produced by a number of manufacturers. In the Mullard range, grade B4 pattern FX1308 are suitable.

The writer found by experiment that approximately 25 beads each 1cm long were required on each leg of the aerial to produce the desired result, and the optimum position was either side of the point where the stub joined the flat top. By sliding the beads a few inches up and down the wire it was fairly easy to secure a s.w.r. better than 1·5 : 1 on 10, 15 and 20m. The improved pattern and gain on 20m has already been described. On 10 and 15m the stub acts to drive the two halves of the aerial in phase, again producing a pattern which is substantially broadside and with a gain of 4-4·5db.

At the higher frequencies, gain alone is not enough. Low angle radiation is equally or more important. V.H.F. enthusiasts will be well aware that stacking is one of the surest ways of producing low angle radiation, and it also contributes a useful increase in gain.

It is a fairly simple matter to stack two F.B.5 arrays one above the other to produce what is in effect a five band lazy H (Fig. 3). The two stubs can be brought together at the centre to ensure correct phasing and fed with 50 ohm coaxial cable. It may be found more convenient to replace the two stubs by

(concluded on page 436)

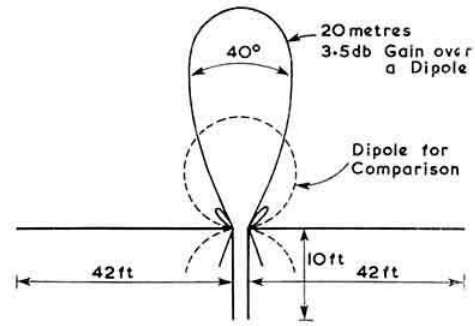


Fig. 2. Gain and pattern of F.B.5 aerial relative to a dipole at 14 Mc/s. (at 21 and 28 Mc/s gain is somewhat higher and the pattern a little broader).

† Precis of a lecture delivered to a meeting of Society members held at the Institution of Electrical Engineers, London, on October 27, 1961.

NOTE.—'Ferrite loaded aerials,' forms the subject of a Patent Application filed in May, 1959.

* *Sumner House, 26 Upfield, East Croydon, Surrey.*

Design and Construction of

Integrated Single Sideband Transceivers

By MIRKO VOZNJAK (YU1AD)*

DURING recent years, the integrated s.s.b. transceiver (i.e. the packaged s.s.b. receiver and transmitter, with some parts common to both) has become very popular. The reason for this is the common tuning control for both transmitter and receiver, a feature only fully appreciated by an operator fortunate enough to have used one. Additional advantages are a saving in the cost of components and a reduction in the overall size of the equipment.

For historical completeness it is desirable to mention the work of some of the pioneers in this field within the amateur movement. The author is aware of at least two who were using integrated s.s.b. transceivers of their own design prior to the appearance of the now well-known Collins KWM-1, which was the first commercially produced equipment of this type. First, R. J. Moser (W8OPB), who developed the "Autosync" system [1] by modifying a Hammarlund Super-Pro receiver. Secondly, TI2IO who, by liberally modifying a Collins 75A-4 receiver, produced a low power s.s.b. transceiver using an EL84 in the final. This equipment, feeding a cubical quad, provided world wide contacts. Another early worker in this field was La Rue [2] who modified a Collins receiver to form a 7 Mc/s c.w. transceiver.

There is no doubt that many amateurs, having heard KWM-1, KWM-2, Cosmophone 35 and amateur built transceivers on the air, have considered the possibility of building similar equipment. Some, with the necessary "know-how," have succeeded, but it is felt that the majority are awaiting a suitable article describing the results of successful experiences with this new type of equipment, before venturing further than the idea stage.

* *16 Kataniceva, Belgrade, Yugoslavia.*

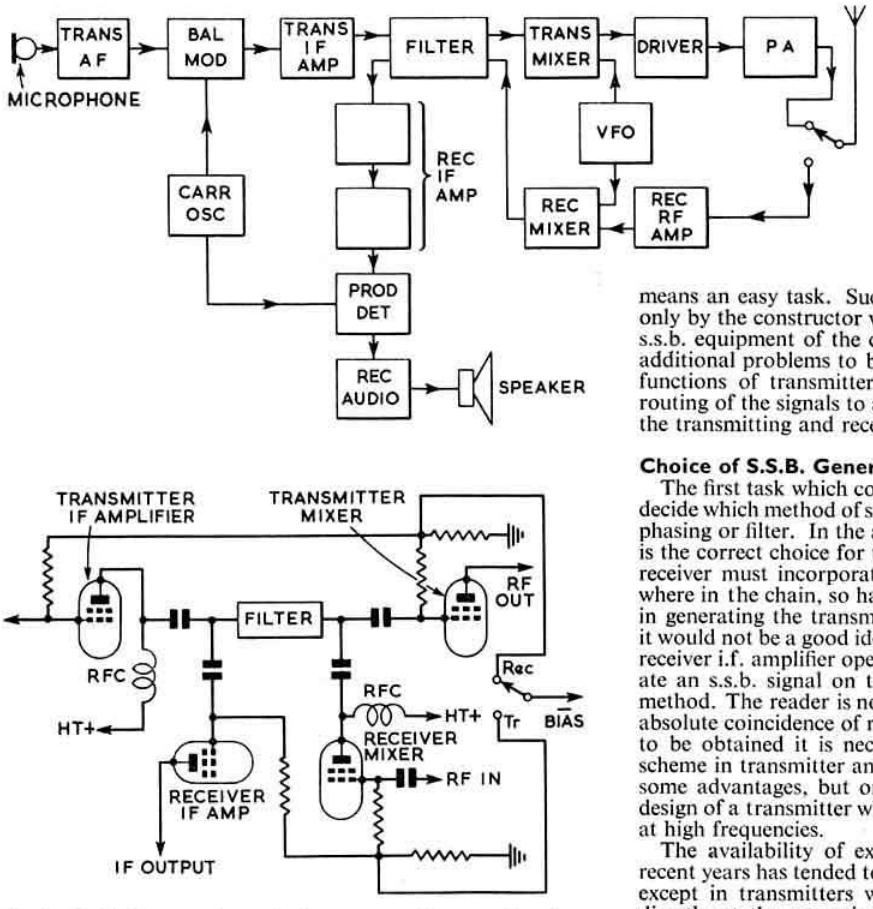


Fig. 1. Block diagram of a typical amateur s.s.b. transceiver for 80m with (below) circuit detail of the filter switching.

The object in writing the present article, then, is to encourage the enthusiast by presenting a number of practical ideas on the circuitry and construction of integrated s.s.b. transceivers. It must be admitted that building such a transceiver to give satisfactory performance is by no means an easy task. Success can be achieved in most cases only by the constructor with previous experience in building s.s.b. equipment of the conventional type. There are many additional problems to be considered when integrating the functions of transmitter and receiver, such as the proper routing of the signals to avoid undesired interaction between the transmitting and receiving sections.

Choice of S.S.B. Generation

The first task which confronts the prospective builder is to decide which method of sideband generation is to be used, i.e., phasing or filter. In the author's opinion the filter technique is the correct choice for the following reason. A good s.s.b. receiver must incorporate a highly selective element somewhere in the chain, so having incorporated it, why not use it in generating the transmitted signal as well? For example, it would not be a good idea to use a crystal lattice filter in the receiver i.f. amplifier operating at 455 kc/s and then to generate an s.s.b. signal on the same frequency by the phasing method. The reader is no doubt familiar with the fact that if absolute coincidence of receiver and transmitter frequency is to be obtained it is necessary to use the same conversion scheme in transmitter and receiver. The phasing system has some advantages, but only in that it tends to simplify the design of a transmitter where sideband generation is achieved at high frequencies.

The availability of excellent h.f. crystal lattice filters in recent years has tended to oust the phasing system altogether except in transmitters where the s.s.b. signal is generated directly at the operating frequency such as the Heathkit SB-10 or Barker and Williamson SB-51.

YU1AD with his own s.s.b. transceiver.

R.F. Stages

Another basic design consideration is whether to combine the functions of the receiver input circuitry with the transmitter output circuitry, at least in the low level stages of the latter. The Collins KWM-1 and KWM-2 utilise this principle —the first r.f. amplifier after the last mixer in the transmitter is also used as the receiver r.f. amplifier. The Cosmophone '35' and '1000' transceivers use separate tuned circuits for this purpose, and this method has been used in the transceiver recently built by the author. Generally speaking, solving this problem is a matter of taste and convenience. When the transceiver is designed for single band operation, as in the author's case, considerable simplification is obtained at the cost of one valve and two tuned circuits. As the latter are broad band no additional controls are introduced.

Typical Transceiver Arrangement

The main problems of the integrated equipment are perhaps best illustrated with the aid of a block diagram of an imaginary transceiver. For the sake of simplicity let it be a single band device, e.g. for 80m (see Fig. 1). It can be seen that there are three common units, viz., carrier oscillator/b.f.o., filter unit, and v.f.o. Only the filter unit handles both received and transmitted signals, the other two serving to provide other frequencies necessary to the receiving or transmitting process.

If the receiver i.f. amplifier, mixer and r.f. amplifier are muted, the route for the transmitted signal is from the microphone, through the a.f. stage, balanced modulator, transmitter i.f. amplifier, filter, transmitter mixer, driver and p.a. stage to the aerial. Alternatively if the a.f. stage is disabled, the carrier oscillator input to the balanced modulator is cut and the remainder of the transmitter stages muted, the received signal path is via the receiver r.f. amplifier, mixer, filter, receiver i.f. amplifier and product detector to the audio output and loudspeaker, the carrier oscillator now functioning as a b.f.o. Note that the signals pass through the filter in the reverse direction in the receive condition. The reason for this is as follows. If the anode of the receiver mixer is connected to the end of the filter nearest to the transmitting i.f. amplifier, and the receiver first i.f. stage to the same end as the transmitter mixer, capacitive coupling will occur between input and output of the filter via the interelectrode capacity of the valves, thus degrading the performance of the filter. Connecting the filter as shown eliminates this possibility.

Since the filter has to pass signals in either direction with no degradation of its performance it follows that the filter must be a symmetrical device in respect of input/output characteristics. For this reason the filter must be either a mechanical filter; a h.f. crystal filter of the McCoy pattern, two cascaded half lattice i.f. crystal filters of the W3FIU pattern [3] or finally, one stage of full lattice i.f. filter.

The entire send-receive switching in this, or any similar arrangement, can be achieved electronically by blocking the appropriate stages with high grid bias, with the exception of one point. It is advisable to disable the a.f. input to the transmitter during reception to avoid the a.f. signal entering the balanced modulator. If transformer coupling is used between the last audio amplifier and the filter, blocking bias can be used to mute the audio stage but the same solution cannot be applied when a cathode follower is used as the coupling medium since the cathode follower cannot be muted satisfactorily by this means. The alternative, as used by YU1AD, is to cut the h.t. to the cathode follower by means of a pair of relay contacts.

Balanced Modulators

It is timely at this point to say a few words on the general problems concerning balanced modulators, which apply not only to transceivers, but to s.s.b. transmitters in general. A frequent question posed by the designer of s.s.b. equipment is whether to use valves or semi-conductors.

The question is further complicated by the recent appearance of the R.C.A. sheet beam valve type 7360. The writer has done some experimental work with this valve and has lengthy experience with germanium diode modulators. As a result the diode ring modulator was chosen. This is not to say that the 7360 is not a satisfactory solution. On the contrary, it makes a very stable and excellent balanced modulator having a high output with very low distortion, but it is a valve, and the fewer valves in this type of equipment the better. This is particularly true of a configuration where the driving capabilities of the system are not dependent upon high output from the balanced modulator. The 7360 is ideal for small economy or portable equipments, where it is desirable to have an exciter using the minimum number of valves, but in transceivers where high gain i.f. amplifiers are used for reception, there is no reason why these amplifiers should not be used when transmitting. This point will become more apparent when the writer's 9 Mc/s i.f. system is discussed later.

With germanium diode balanced modulators, the best results have been obtained with the arrangement used by Collins (see Fig. 2). This circuit has been employed at 455 kc/s in conjunction with a mechanical filter, and also gave surprisingly good results on 9 Mc/s. Providing that a first-class set of four matched diodes is used, it shows remarkable stability of carrier balance making front panel control of carrier balance unnecessary. The best performance has been

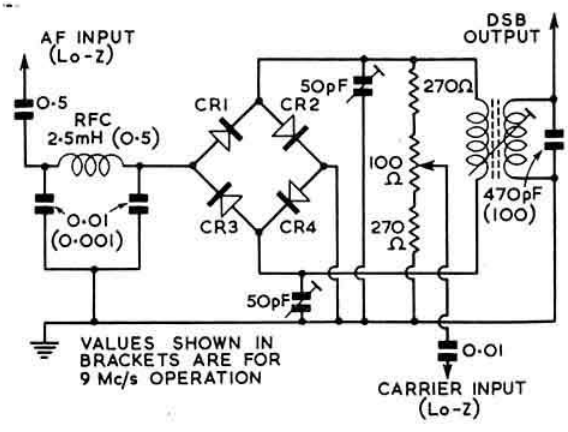


Fig. 2. Germanium diode modulator due to Collins Radio Co.

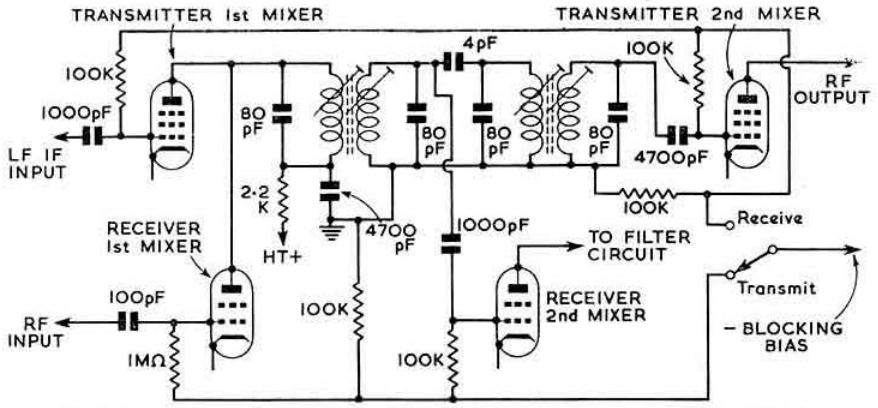


Fig. 3. Frequency conversion arrangements similar to those used in the Collins KWM-1.

obtained by using Telefunken diodes, supplied as a selected group of four diodes, termed a quad, under the code number OA154Q. They are quite low in price (7 DM per quad†) so that the cost is not a major problem for the average amateur. Measured at 9 Mc/s with 0·5 volt of audio signal and 1·5 volts of carrier input signal, the output signal is 1·2 volts of d.s.b. having excellent linearity.

The associated r.f. transformer is easily constructed. At 455 kc/s, the secondary is tuned to resonance with a 470 pF capacitor, while at 9 Mc/s a 100 pF capacitor is used. In both cases, the primary winding has one third of the number of turns used on the tuned winding, and is wound alongside it with the minimum spacing. No attempt was made to wind the primary on the bifilar principle since the carrier suppression obtained is the ultimate on both frequencies. Capacitive balance is easily obtained with the two 50 pF trimmers. From the transformer secondary, signals can be fed either into a d.s.b. amplifier, followed by a filter, or, in the case of a 9 Mc/s crystal lattice filter (a low impedance device) into a cathode follower which functions as an impedance transformer.

The tuning up procedure is simple: the secondary winding is tuned to resonance (indicated by maximum output) and then the 50 pF capacitors and the 100 ohm potentiometer (a good quality composition type must be used) are adjusted for maximum carrier suppression, i.e. *minimum* output. Since a certain amount of interaction occurs it will be necessary to repeat the adjustments several times until the carrier suppression is optimum. Thereafter these variable controls can be locked and forgotten, provided the modulator is situated at a reasonable distance from heat producing components such as valves, high wattage resistors and power transformers.

† About 12/-

Frequency Conversion

So far we have dealt with a simple transceiver using the single conversion principle. Where the s.s.b. signal is generated at low frequency and radiated at a higher frequency a double conversion system is required. This involves more complexity in a normal s.s.b. transmitter and considerably more in an integrated transceiver. To solve this problem, one of three methods can be used:

(i) In the case of low frequency filter s.s.b. generation, the system used in the Collins KWM-1 may be employed (see Fig. 3). A pair of over-coupled transformers is used between the first and second mixers for the transmitted signal while only one transformer is used for the received signal.

In the KWM-1 the transformers cover the band 3·9 to 4·0 Mc/s but for use in Europe they should cover 3·7 to 3·8 Mc/s since operation on the 80m band can be obtained by using single conversion, disabling the second oscillator, and employ-

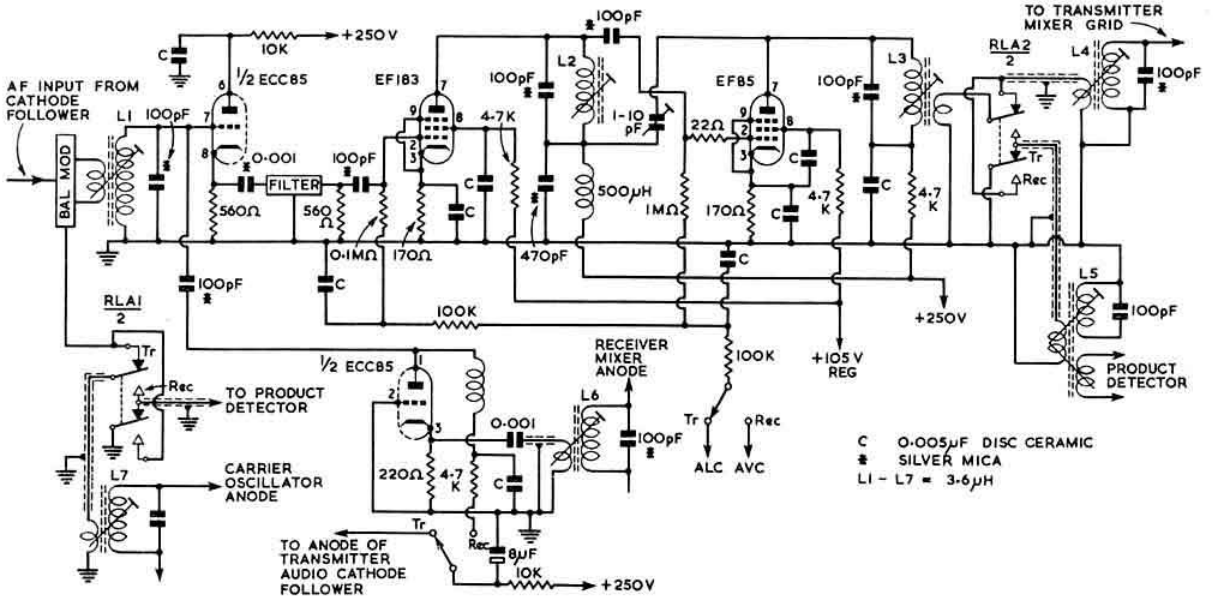


Fig. 4. Simplified circuit diagram of the YU1AD transceiver showing the relay switching.

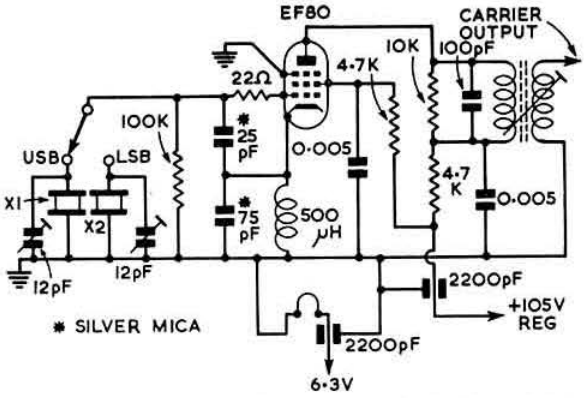


Fig. 5. Crystal controlled oscillator for use with the McCoy 9 Mc/s crystal filter and ring modulator.

ing the receiver first mixer and transmitter second mixer as non-amplifying gates by switching in resistors of a few thousand ohms as anode loads, instead of tuned circuits.

(ii) Using the circuit described above in the " fully integrated " manner means a saving of one broad band transformer only. Cost-wise this is not a noticeable saving, while space-wise it might be advantageous only in extremely compact portable equipment. For normal equipment, where such a small saving in space is of no consequence, it is advisable to use a separate transformer between the first and second mixers in the receiver, so avoiding the integrating principle as far as these tuned circuits are concerned.

(iii) An h.f. crystal lattice filter may be used with a single conversion system to cover the 3·5 Mc/s and 14 Mc/s bands. For other bands a second conversion mixer must be included in addition to a v.f.o. to heterodyne the 9 Mc/s signal to the required frequency band. This will not involve any integrating of functions in the transceiver since the frequency of the v.f.o. is the same whether on receive or transmit.

The YU1AD Transceiver

Now let us examine another method of routing signals around a selective filter, a system which is used in the 9 Mc/s crystal filter transceiver at YU1AD.

As rather high frequencies are being dealt with, it is necessary to incorporate additional precautions normally not employed in lower frequency i.f. systems, simply to avoid undesired signal leakage. These apply particularly to the switching arrangements where relays are used for the most vital circuits as the blocking bias method described earlier might not be efficient enough.

A simplified schematic diagram is shown in Fig. 4 from which it can be seen that relay switching is carried out at low impedance, the circuits not in use being earthed by the use of additional contacts. These two features help considerably in eliminating undesired signal pickup. Two small d.p.d.t. relays are used to switch r.f. and two telephone type relays to switch d.c. voltages and the aerial changeover relay. All four relays are controlled by the vox relay, a single pole type. The d.c. switching relays apply negative bias for blocking the receiver r.f., mixer and audio stages and the transmitter mixer, driver and p.a. stages. The same relays also switch h.t. for the a.f. cathode follower stages in the transmitter and the receiver i.f. grounded grid stages, as well as the a.v.c. on the i.f. amplifier. Finally, the S meter amplifier—the balanced d.c. amplifier type—is switched either to the a.v.c. line to read the strength of incoming signals, or to a germanium diode connected to the transmitter output to read the relative level of the outgoing signal.

As can be seen from Fig. 4, the signal travels in the same direction, whether transmitting or receiving, as far as the i.f. amplifier and filter are concerned. The gain of the two stage i.f. amplifier is appreciably lower at 9 Mc/s than it would be at 455 kc/s for example, and is further reduced by the low impedance crystal filter. This means that the two stages must operate at maximum performance to obtain adequate gain in the receive condition. For this reason, the frame grid EF183 valve is used for the last i.f. stage. There is no danger of self-oscillation in this stage since the grid " sees " only the 560 ohm termination of the filter. The second i.f. stage is an EF85 run at almost maximum gain and bridge neutralized to maintain a low noise level. This rather special i.f. amplifier is only necessary on receive because a somewhat inefficient product detector, to be described later, is employed. On transmit, a single EF85 stage would be more than adequate, so that additional bias is introduced via the a.l.c. (automatic load control) line to reduce the gain.

To make this transceiver more effective, as well as to provide a practical form for experimentation, it is built in so-called modular units. This makes it possible to obtain maximum physical separation between the critical stages. Additionally all power leads entering the modules are well filtered by feed-through capacitors. The i.f. amplifier is built as a single unit and all stages are arranged to be in a straight line, a practice recommended particularly at high frequencies. Careful shielding between the two stages, plus shielding across the filter to separate the input from the output is imperative.

Carrier Oscillator Circuit

Three stages of the equipment require to be discussed in more detail. The first is the carrier oscillator. The circuit suggested by the McCoy Company, manufacturers of the h.f. crystal filter, is a simple Colpitts using a triode, the output being taken directly from the cathode. This would be satisfactory if the carrier input to the balanced modulator were high impedance and provided there were little change in oscillator loading over the modulation cycle. However, the ring modulator offers quite the opposite conditions. As a result the oscillator was susceptible to frequency modulation at the a.f. switching frequency of the balanced modulator. It was therefore necessary to use an electron coupled Colpitts circuit using an EF80 pentode to give better isolation between the crystal oscillator and the balanced modulator (Fig. 5). Apart from increased isolation, the circuit has the advantage that the output can be varied by adjustment of the anode circuit tuning to set the carrier at the desired level. The tuned circuit is identical to that used at the output of the balanced modulator.

Product Detector

The second item requiring further description is the product detector (Fig. 6) which is the double diode balanced type. As this is a low impedance device the output is low, but quite adequate when used with a two stage a.f. section consisting of a voltage amplifier and output stage. This type of detector is

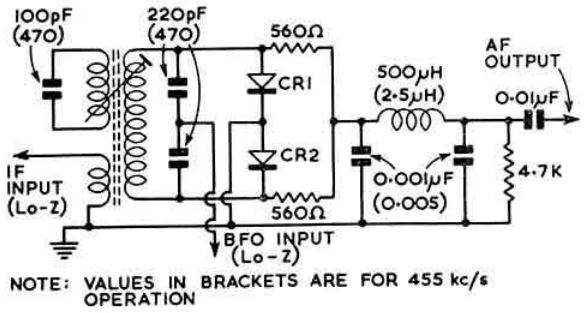


Fig. 6. Product detector for 9 Mc/s i.f. using germanium diodes.

impossible to overload under normal circumstances in a receiver with a fairly good a.v.c. system, and has very low distortion. If greater output is required from the product detector this can be easily obtained by employing a step-up transformer, the primary replacing the 4·7 K ohm resistor at the output of the filter in Fig. 6, the secondary feeding the grid of the first a.f. stage. The r.f. input transformer for this type of product detector is not difficult to wind. Using a typical coil former, the tuned winding has 18 turns; the link coil has four turns, wound at one end of the tuned winding, after which a layer of insulation is wound over the tuned winding and a six turn winding wound on it to form the coupling winding to the detector.

A.G.C. System

The third item for detailed discussion is a simple but very effective a.g.c. system for c.w. or s.s.b. applications. Similar systems often use several valves and rather tricky circuitry. The arrangement shown in Fig. 7 requires one diode plus, in some cases, one triode as an amplifier. A.G.C. voltage is derived from the audio signal and a very smooth rapid acting —slow release a.g.c. system is obtained for almost nothing.

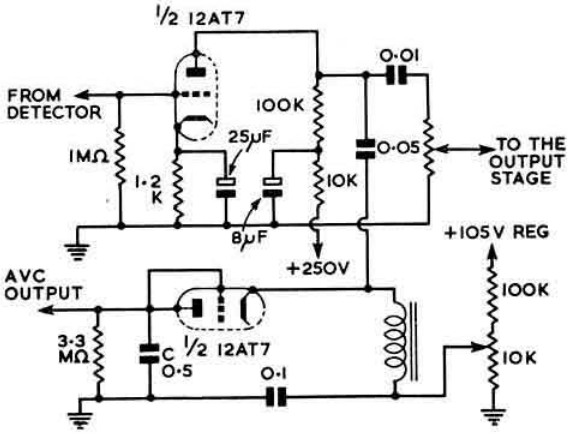


Fig. 7. Audio derived a.g.c. circuit.

If used with the low output product detector described earlier this simplifies matters further, since the first audio stage can also be used as an a.g.c. amplifier stage. This is possible since the a.f. gain control can be situated after the first audio stage which can then operate at constant gain, due to the fact that the small signal from the product detector can never overload it. Where this type of a.g.c. system is added to a receiver having a high output product detector, it will be necessary to add a triode stage to function as a separate a.g.c. system a.f. amplifier. This stage should derive its input from the high potential end of the a.f. gain control to obtain a constant input signal regardless of its setting. It is possible to use a semiconductor diode instead of a valve diode in this circuit but the system will not operate so smoothly due to the relatively low back resistance of the semiconductor diode compared with a valve diode. In consequence it would be necessary to use a higher value for the capacitor C (Fig. 7), so degrading quite considerably the quick-acting feature of the system.

The a.f. choke used as the diode load is not critical, the primary of an a.f. transformer with an impedance of 20,000 ohms having been used with excellent results. No attempt should be made to replace this choke with a resistor as it will introduce a large delay on the quick-acting part of the duty cycle. To obtain the quick-acting function it is necessary to charge the capacitor C through as low a value of d.c. resistance as possible, while still maintaining a high shunt impedance to audio frequencies. These conflicting requirements can only be obtained by means of an a.f. choke.

To obtain delayed a.g.c., the cathode of the diode is biased positively via the potential divider fed from the 105 volt stabilized supply. With the aid of the potentiometer in the divider network the delay can be precisely adjusted to the desired level and then ignored after the initial setting up.

If a greater a.g.c. voltage is required, it can be easily obtained by using a 1 : 3 ratio, say, step-up transformer in the anode load of the a.g.c. a.f. amplifier. The a.f. gain control is fed from the anode via a coupling capacitor as before, while the a.g.c. diode is fed from the secondary.

This a.g.c. system has been found to be very effective in the author's transceiver, particularly as the screen grids of the receiver r.f. stage and both i.f. stages (all a.g.c. controlled) are fed from the 105 volt stabilized supply. It should be noted that where this system is to be added to an existing receiver, care should be taken to ensure that the only earth return for the grids of the controlled stages is via the 3·3 Megohm diode load resistor in the time delay circuit.

* * *

The author wishes to thank most sincerely G2BVN for suggesting this article should be written and for encouraging him to write it within a reasonable time.

References

[1] "Autosync Frequency Control." R. J. Moser (W8OPB) *QST*, June, 1957.

[2] "A Contest-man's Receiver-tracking V.F.O. for 7 Mc/s." LaRue, *QST*, May, 1956.

[3] "The W3FIU Single Sideband Exciter." F. C. B. Jordan (W3FIU), R.S.G.B. BULLETIN, November, 1957.

Test Report

The Grundig Grid Dip Meter

THE Grundig grid dip meter type 701 is a self-contained instrument incorporating an a.c. power supply and employing an EC92 triode in the oscillator circuit. The frequency range covered is from 1·7 to 250 Mc/s in six ranges, selected by plug-in coils which are completely shrouded to prevent damage whilst in use. The accuracy of calibration is stated to be ±1½ per cent.

The function switch has four positions, i.e., "E," where, with the use of headphones the instrument operates as a monitor; "G" for use as a g.d.o.; "W" for use as an absorption wavemeter, and "S" in which the radiated signal is modulated with a 50 c/s tone for test purposes. The indicating device is a 0–1 mA meter with a horizontal scale set in the handle of the instrument, and conveniently located for observation during use. The instrument is 7⅞ in. × 3 in. × 2½ in. in size, and the metal case is finished in stove enamel.

In use the instrument was easy to handle and the frequency ranges could be clearly read. It is felt that it would be an advantage if the coil shape was slimmer and longer to facilitate probing into the less accessible circuits, and also if there was a greater degree of damping on the meter movement. The Grundig grid dip meter is obtainable from the Instruments Division of Wolsey Electronics Ltd., Cray Avenue, Orpington, Kent, the price being £24 10s.

R. F. S.

Enquiries Regarding Bulletin Articles

MEMBERS who write to the authors of BULLETIN articles are asked to enclose stamped addressed envelopes if they require replies.

Mobile Column

By C. R. PLANT (G5CP)*

ONE of the pleasures when meeting fellow mobile operators is to examine their equipment and to swap ideas. Due to the small amount of space available in the modern car, the ingenuity shown in miniaturizing and adapting various pieces of gear is always an absorbing feature. The writer is always very interested in the many types of aerials used which, in the main, show a high standard of engineering ability, but there are always one or two that appear to remain in a vertical position by " Act of God " and bits of string. No doubt this kind of aerial works reasonably well but to say the least, it is unsightly and may very well present a driving hazard. Again, on the point of appearance, the aerial is the only part of a mobile installation normally seen by members of the public and an untidy " lash-up " gives a very wrong impression of the average amateur's ability.

* *"Lynton," 12 Nottingham Drive, Wingerworth, Chesterfield, Derbyshire*

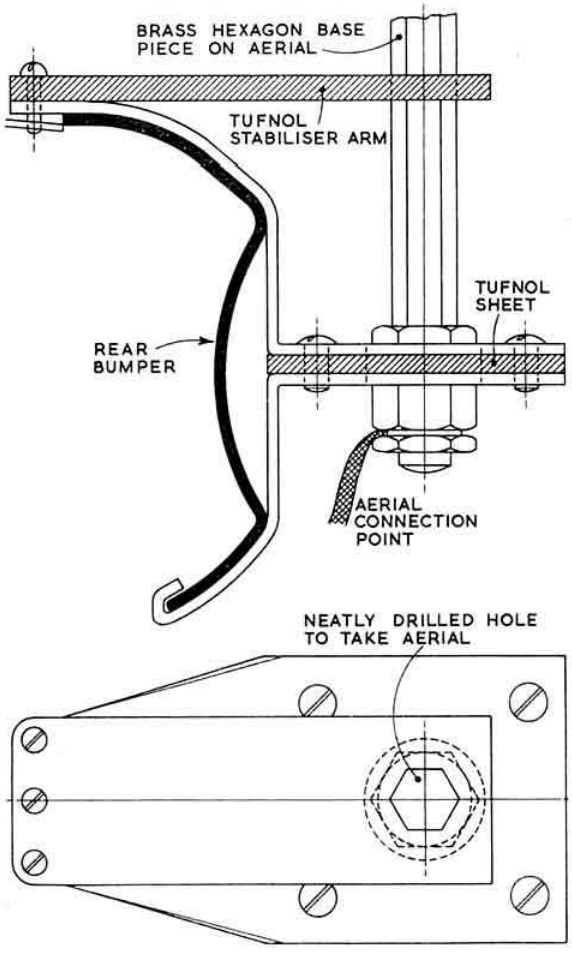


Fig. 1. Aerial mount used by G5CP/M.

Centre loaded whip mounted on G5CP's car.

It is a comparatively simple matter to mount a 144 Mc/s halo in a neat and safe manner, but it is a very different matter when a 12 ft. centre loaded aerial for Top Band is attempted. In the latter case, it is essential either to provide a stay device or alternatively a heavy section tube as the lower section in order to prevent undue swinging of the aerial when the car is in motion; then provided that the base is either of solid construction or very heavily sprung, the main aerial movement will generally be confined to the upper section.

When operation takes place on 3·5 Mc/s and the higher frequencies, the loading coil becomes progressively smaller and therefore lighter until at 21 and 28 Mc/s when it is usually dispensed with altogether. Unloaded vertical quarter wave aerials are extremely efficient radiators, a fact which many mobile amateurs have discovered, the low angle of radiation giving world-wide coverage when conditions permit. The writer recalls the halcyon days of 1958 when, with an input of 35 watts and an 8 ft. plain whip, phone signals were regularly exchanged with amateurs in all parts of the world. Unfortunately, the 11 year cycle of radio conditions is nearing its lowest point and we shall have to wait a few years for a return to similar conditions. G5CP does not operate on Top Band and has found that for the other bands the Master Mobile aerial in use requires only a small amount of stabilizing. Fig. 1 shows the method adopted, while the photograph taken in August at the Derby Rally gives a complete picture of the aerial set up for 3·5 Mc/s.

Mobile Rallies

The first event of the season is the North Midlands Mobile Rally on April 29 which, once again, is to be held at Trentham Gardens, Staffordshire, 12 miles north of Stafford and 4 miles south of Newcastle-under-Lyme on the A34. This is always a well-organized affair with plenty to interest everyone and the extensive gardens and boating lake are an attraction for the family; in addition excellent catering facilities are available.

The South Eastern Counties Mobile Rally takes place on May 6—further information next month.

A letter has been received from the Hon. Secretary of A.R.M.S., G3FPK, giving information of that society's Rally and A.G.M. which is to be held at the U.S. Air Base, Barford St. Johns, Oxfordshire, on June 24. Based on last

year's experience this should prove to be an extremely successful event. Information has also been received from the Bridlington and District Radio Society announcing the first East Yorkshire Coast Mobile Rally on June 24 at the Spa Royal Hall, Bridlington. The opening will be at 1 p.m. and facilities have been arranged to cover all weather conditions. Various competitions and a lecture on "Mobile Vehicle Interference Suppression" by G3GBH form the highlights of what promises to be an enjoyable day by the sea for Northern amateurs. The fact that both these rallies are fixed for the same day should not present any problems, because of their wide geographical separation.

Operating News

G2DSF (Leicester) writes to say that his car, a Singer 1500, registration No. UMX825, is at present equipped for Top Band only but a new outfit covering 1·8 to 21 Mc/s is nearing completion and should be heard this summer. G2DSF modified his Philips car receiver by the simple expedient of altering the position of the tuning slugs in the r.f., oscillator and mixer circuits so that 1·8 to 2 Mc/s appears at the lower end of the medium waveband. This is accomplished by unsoldering the slugs from the main tuning bracket and pulling them farther out. Apparently this has proved very satisfactory though of course the medium wave calibration no longer applies.

G2COP (Lichfield, Staffs.) has submitted a long and interesting letter covering many aspects of mobile operating. He has strong opinions about operating whilst driving and is convinced that in these days of traffic congestion, the

R.S.G.B. NATIONAL MOBILE RALLIES

May 13, 1962—Belton House, Grantham.

June 10, 1962—U.S.A.F. Base, Wethersfield, Essex.

September 16, 1962—Woburn Abbey, Bedfordshire.

driver should drive and leave operating to the passenger seated beside him. This is undoubtedly an ideal set-up when a second driver is available, but many mobile enthusiasts would have little opportunity for operating if this was rigidly followed. (G5CP usually calls in the services of the XYL to act as scribe and closes the station when driving conditions become too hectic.) G2COP's equipment covers 1·8 to 28 Mc/s with a 6146 in the final, the transmitter being built into a metal box measuring 10 in. × 7 in. × 7 in. so forming a very compact unit. The receiver comprises a Minimitter converter into which has been built an i.f. strip and noise limiter. The whole equipment is installed in a Bentley saloon registration No. AHC2.

G5ZT (Plymouth, Devon) has sent in three reports covering activity on 144 and 3·5 to 28 Mc/s. On 144 Mc/s Harold operated from several places in Eire last summer and worked many stations in Great Britain and Northern Ireland including G5CP/M mobile-to-mobile whilst on holiday in North Wales. Recently, equipment covering 3·5 to 28 Mc/s has been installed and reports show that during the first few weeks of operation quite outstanding results have been achieved. The two-way phone contacts whilst in motion with ZL4OD, VE1EV, VE3VYW and KZ5WZ, all on 3·5 Mc/s, and ZL3GJ, ZL3AB on 14 Mc/s are excellent; is it possible that any of these are first /M contacts? The equipment used on the h.f. bands is a KWM2 which feeds into a Webster Whip aerial mounted at the rear of the car. G5ZT is operational every weekday whilst travelling in Devon; it would seem from the results obtained that his routes take him over some of the high ground that makes Devon the attractive county it is.

The F.B.5 Aerial (continued from page 429)

a single 20 ft. length of 300 ohm ribbon with a feeder connection at the centre. Note that with this method of feed, no cross-over is required.

The overall gain with the stacked version is quite impressive. On 10m for example, the gain over the more simple version (stacking gain) is about 5db giving a total gain of 9·5-10db. On 15 and 20 the gain is somewhat lower, but still equal to that of a three element beam.

For those who are particularly ambitious, two such arrays could be strung up at right angles to increase the coverage, or a second similar array could be used as a parastic reflector to give gain figures up to 15db or more.

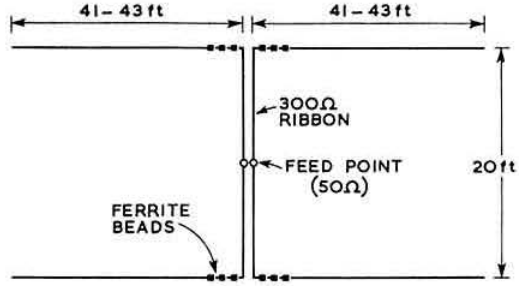


Fig. 3. Dual F.B.5 array with gains up to 10db and low angle radiation.

Where space is particularly limited, the total span of the array can be reduced to about 60 ft. by folding 10-11 ft. at each end into the vertical plane, or the single wire version could be bent into the form of an all band V beam, when it should fit into a plot less than 40 ft. square. Some loss of gain and worsened s.w.r. must be expected under such circumstances, and it will generally be found necessary to increase the wire length by a few per cent to restore resonance.

Members may like to know that a commercial version of the F.B.5 aerial is manufactured by the Minimitter Co. Ltd. who have agreed to make available small quantities of the special ferrite beads used by them.

Reference

[1] "Ferrite Loaded Aerials," G. A. Bird, *Journal of the Radar and Electronics Association*, May 1959.

Boy Scouts Jamboree-on-the Air

A REPORT on the Fourth Jamboree-on-the Air (October 21-22, 1961) has recently been issued by the Boy Scouts World Bureau, 77 Metcalfe Street, Ottawa, Canada. The report contains a reproduction of the special QSL issued to those who took part in the Jamboree as well as photographs taken at GB3BPH (London), VK4AH (Ashgrove, Australia) and VE3JAM (Ottawa).

The report proper contains a brief history of the Jamboree-on-the Air, details of the Fourth Jamboree, an account of the World Bureau station (VE3JAM), a summary of results achieved and an announcement that the Fifth Jamboree will take place during the weekend October 20-21, 1962.

The report is a noteworthy record of a noteworthy event.

When writing to the Author of an article published in the BULLETIN please enclose a stamped addressed envelope for reply.

Project Oscar

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

IF present plans are fulfilled, *Oscar II* should be in orbit before the Summer. It is regretted that this very approximate indication is all that can be given at the moment. The only way in which the Project Oscar Association may get a satellite launched into space is by the kind offices of the United States Air Force as part of one of the regular research rocket firings. This being the case, Air Force security demands that the time of launch shall not be divulged before-hand, and although it may be possible to give a much closer indication at a later date, observers will have to rely on more immediate forms of communication than the written word to tell them when " the bird will fly."

Close contact is being maintained with the Project Oscar Association and with the A.R.R.L. and arrangements are being made to get the news around as rapidly as possible on the 2m band and elsewhere as soon as it is known that the launch is imminent.

Meanwhile it is requested that reports for *Oscar II* shall fall into three categories:—

(i) The simple " I heard it " report giving date, time (G.M.T.), and the number of seconds taken by the satellite to send ten " HIs " in Morse (the telemetry signal). These details should be written on the station QSL card and either sent direct to the Project Oscar Association, P.O. Box 183, Sunnyvale, California, U.S.A., or to G2UJ for onward transmission to the Association. In either case the report will be acknowledged by an *Oscar II* QSL card in due course.

(ii) A report on the *Oscar I*—type tracking form which includes the data mentioned under (i) plus bearings (if possible in both azimuth and in elevation), the strength of the signal above noise and Doppler measurements.

(iii) The new *Oscar II* tracking form which requires the co-operation of two stations working as a team and situate some 50 to 100 miles apart. Comparison of the data obtained would enable these stations to determine the time of closest approach, altitude and path of the satellite from simultaneously taken Doppler curves and the application of simple algebra.

Those wishing to undertake observations under either (ii) or (iii) may obtain the necessary forms and instructions for their use by sending a stamped and addressed *foolscap* envelope to G2UJ, at the address given below.

Other Oscar News

" It seems that the G-amateurs take top honours! G3OSS reported the first European pass (revolution No. 3) and G2DQ reported the ' death ' of *Oscar I* on pass No. 339. Congratulations to both! " So says a message from Bill Orr (W6SAI), Publicity Manager for Project Oscar, a sentiment which we are sure will be echoed by all who took part in the historic experiment.

From the articles appearing in the February issue of *QST* some idea may be gained of the immense efforts made by the Project Oscar Association, enthusiastically supported by the A.R.R.L., first to bring their pipe-dream of an Amateur Radio satellite to reality, and secondly to carry through the necessary organization which culminated in the reception of 4300 tracking reports—and still counting!

Full marks must be given to the Association for their very comprehensive communications network which extended, at its farthest point, to Antarctica. There arrangements had been made with KC4USB at the United States base in Marie Byrd Land to listen for the satellite on its first orbit, and dead on time came the reception report back to the Association's communications centre in California via 20m s.s.b. that the little 100 milliwatt transmitter was indeed on its way and on course.

Another Oscar article which came our way was that written by Andre Bertemes (F3NB) in the February issue of *Radio REF*, official journal of the Réseau des Emetteurs Français, in which he describes with a wealth of detail, diagrams and tables his own unassisted observations on the *Oscar* signals. And when we say unassisted, we mean just that, for Andre had no predictions to help him except those he worked out for himself. Notable among his many interesting comments on the results obtained were details of four occasions when a burst of signal was heard for a brief period an appreciable time after the normally received signal had faded into the noise at the end of a pass. These bursts occurred from one to two minutes after the original fade-out, during which time the satellite would have travelled between 280 and 570 miles, and lasted from a few to as long as 15 seconds.

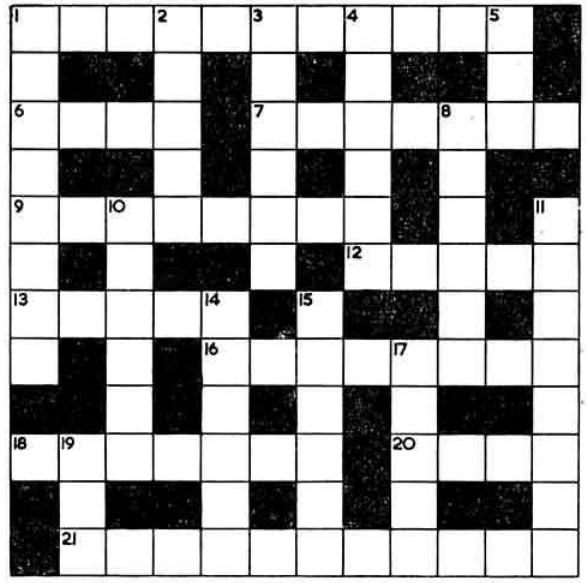
* *R.S.G.B. Project Oscar Co-ordinator, 24 Arundel Road, Tunbridge Wells, Kent.*

The Amateur Radio Handbook

MEMBERS who failed to obtain a copy of the new edition of the *Handbook* when it appeared last November and have been unable to purchase a copy since will be glad to know that a large reprinting is in hand and that fresh stocks are expected to become available during the early part of April.

RADIO CROSSWORD

Compiled by R. F. Wilkins (G2ALM)



ACROSS

1. Hat you can talk through at meals?
6. Usually eaten in drops.
7. Time Edward was sent.
9. Contact man.
12. Current offence.
13. Seen but really of what you fancy.
16. Often a flat type aerial.
18. Done nearly 20 years ago (3 & 4).
20. Forget and almost sick.
21. Before you now (4 & 7).

DOWN

1. J's next request.
2. You might stay in this building.
3. Mark the spot twice on the dial for DX.
4. Laminated tools?
5. Does the F8 regret living here?
8. Magnate.
10. Big brother gets a redeal.
11. If you've got one in here keep the door shut.
14. Sound system for trawlers.
15. Good for fish—bad for apparatus.
17. Was an unseen danger.
19. Skill.

(Solution next month.)

USING SILICON POWER RECTIFIERS

By PAT HAWKER (G3VA)

RECENT months have seen a marked improvement in the availability in the United Kingdom of relatively low-cost silicon power rectifiers. Silicon diodes rated at 250 mA mean output current and 1000 volts peak inverse voltage (p.i.v.) are being offered by BULLETIN advertisers for less than 9s., while those with a 400 volts p.i.v. rating can be purchased for about 3s. 6d.

Unfortunately, however, many members have found to their cost that it is all too easy to destroy these components—together, often enough, with the associated mains transformer. This is not due to any inherent unreliability of silicon diodes, but far more often because insufficient attention has been paid to fundamental design problems. The correct operation of these rectifiers has been touched upon several times in *Technical Topics* but it is felt that the subject is of sufficient importance to justify a fuller review of how these breakdowns occur, and how they can be avoided.

Why use Silicon Rectifiers?

First, consider why it is worth bothering about these rectifiers. After all, we have been using thermionic and selenium metal rectifiers happily enough for years, and have them well tamed. And, at present prices, a well-designed power supply with silicon diodes is not likely to prove cheaper than with other types of rectifiers.

Neither valve nor metal rectifiers can meet the definition of the ideal rectifier, that is to say, a device which offers zero impedance to current flow in one direction (forward resistance) and infinite impedance in the other (reverse resistance). It can be shown simply (though painfully) by touching the envelope that a valve rectifier has a fairly high forward resistance—the high operating temperature of the envelope derives from the power which is being wastefully dissipated inside it. The valve rectifier must also be considered as having a limited life. Metal rectifiers have appreciable forward resistance, which is why cooling fins are fitted. A metal rectifier takes up considerable space; furthermore the forward resistance tends to increase with age. Thus both valves and metal rectifiers occupy appreciable cabinet space, require special mounting in the form of a valve socket or mounting clips, need good ventilation, and generate a great deal of heat which may cause such effects as oscillator drift, or the deterioration of rubber wiring and electrolytic capacitors.

Germanium and silicon junction rectifiers are much nearer the ideal; they have very low forward resistance and high reverse resistance. Of the two, germanium has the lower forward resistance and is used for currents above about 1 amp. Silicon, though slightly less efficient, has a wider temperature range, and is generally used for currents of less than 1 amp., and increasingly in the 1-10 amp. range. Because of the low forward resistance, very little heat is dissipated. The smaller silicon diodes have no need of cooling fins, can be made as compact as small resistors, and can be similarly supported directly in the wiring. As with metal rectifiers, no heater supplies are needed. All these points add up to a highly efficient rectifier with very real advantages for many applications over all the earlier types of power rectifiers.

What then are the snags? The main problems arise partly from the relatively low peak inverse voltages which can be withstood by diodes* manufactured at the present state of the art and partly from the inherent high efficiency of the unit. Because the forward resistance is so low, the silicon diode can readily pass destructively high currents if excessive voltages are applied even for a short period (this compares unfavourably with the average selenium rectifier which is usually rated for unlimited instantaneous peak currents). Recent silicon rectifiers can withstand transient surges much better than earlier types, but nevertheless precautions are still necessary.

A frequent cause of previously unexplained silicon diode failures in this country and elsewhere is now known to be the momentary voltage surges which occur at irregular intervals on the electric supply mains; these overvoltages are usually of too short duration to affect electric appliances or lamps.

We thus have two main design problems: in the first place we must make sure that under normal working conditions we are keeping well within the p.i.v. rating of each diode; secondly, and just as important, we must do something to limit the high voltage and current surges that inevitably appear in power supplies at the moment of switching and during mains overvoltages.

Calculating P.I.V. Ratings

The first step when considering the design of a power supply using silicon diodes is to calculate the basic peak inverse voltages which will appear across each diode. Fig. 1 shows the situation for the most commonly used circuits (these theoretical figures ignore transformer and rectifier voltage drops, etc. but this is of little practical consequence).

Consider the case of the very popular bi-phase or full-

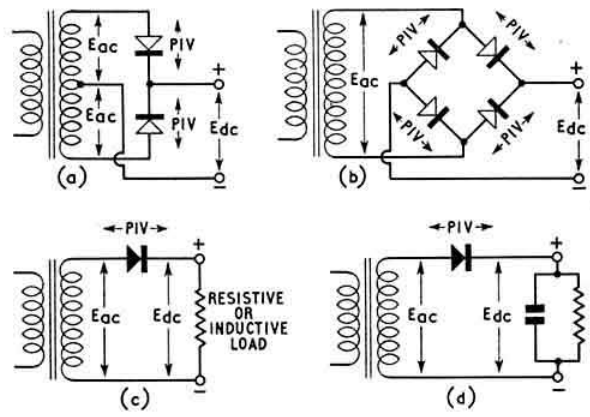


Fig. 1. Fundamental power supply relationships.

(a) Bi-phase or full wave rectifier. P.I.V. $\simeq$ 2·8 × E_{ac} or 3·14 × E_{dc}. $E_{dc} \simeq$ 0·9 × E_{ac}. With a capacitive load, the actual value of d.c. output voltage will be affected by the value of the reservoir capacitor in relation to the d.c. load.

(b) Full wave bridge rectifier. P.I.V. (each diode section) $\simeq$ 1·4 × E_{ac} or 1·57 × E_{dc}. $E_{dc} \simeq$ 0·9 × E_{ac} (see note above).

(c) Half-wave rectifier with inductive or resistive load. P.I.V. $\simeq$ 1·4 × E_{ac}. $E_{dc} \simeq$ 0·45 × E_{ac}.

(d) Half-wave rectifier with capacitor load. P.I.V. $\simeq$ 2·8 × E_{ac}. $E_{dc} \simeq$ 0·9 × E_{ac} (see note above).

* In fact the p.i.v. rating of a single unit or disc of a selenium rectifier is generally a good deal less than that of a silicon diode; but whereas selenium rectifiers are usually rated as a complete stack of discs, we are thinking here of individual silicon diodes (though stacks of diodes are also marketed).

wave circuit (Fig. 1(a)). The p.i.v. across each leg of the rectifier is approximately equal to $2\sqrt{2}$ (about 2·8) times the alternating voltage (measured in r.m.s.) across each half of the transformer secondary winding. Thus with a 350-0-350 volt transformer, the p.i.v. across each rectifier section will be roughly 2·8 × 350 volts, which is 980 volts. To provide a reasonable margin of safety, it will be advisable for each section to have a p.i.v. of about 1200 volts. A single diode with this rating would tend to be rather expensive; in practice we might well decide to use three 400 p.i.v. types in series (we could use one diode rated at 400 p.i.v. in series with one of 800 p.i.v. but, as we shall see later, there are some disadvantages in mixing different types of diodes). Thus, for this power supply, at least six 400 p.i.v. diodes would be needed in two series-strings of three diodes each.

In this calculation it has been necessary to distinguish between the a.c. input to the rectifiers and the theoretical d.c. output. This is because the multiplication factor to obtain the p.i.v. from the theoretical d.c. output is 3·18, appreciably higher than the 2·8 used. This can be important since we often tend to think in terms of a 350 volt power supply, rather than of one using a 350-0-350 volt transformer, forgetting that the two are not the same.

In order to obtain a rating of 1200 volts p.i.v. we cannot just connect three 400 p.i.v. diodes in series. The resultant p.i.v. would be 1200 volts only if the reverse resistance of each diode were precisely the same. Actually the voltage distribution across the three diodes resembles that of a potentiometer comprising three different value resistors—the higher the reverse resistance of any particular diode, the greater will be its share of the total inverse voltage. Unfortunately, the reverse resistance of current types of silicon diodes vary appreciably. A range of up to 3 to 1 has been quoted even for the same make and type of diode, while much greater discrepancies can be found among mixed types and makes. Since a limit is reached when any one of the diodes has a reverse voltage of 400 volts, the three 400 p.i.v. diodes are likely to have a combined series rating well below 1200 volts unless elaborate steps have been taken to match them.

Fortunately this problem can be overcome by connecting an equalizing resistor across each diode (as should be done incidentally for series-connected VR-tubes and electrolytic capacitors). The value of the resistor must be relatively small compared with the reverse resistances of the diodes. The peak inverse voltages are then shared almost equally between the diodes despite any differences in the diodes themselves. A typical value would be 150,000 ohms. These resistors will, of course, allow a certain amount of a.c. to bypass the diodes but this forms only a small part of the ripple current.

The above notes clearly show the advisability of always using equalizing resistors with a series string of diodes unless there is a great margin of safety. It is true that one still sees many published designs in which this precaution is omitted; the designers have either been lucky in their choice of diodes, or are depending upon the conservatism of makers' ratings, or have trouble in store! Even with equalizing resistors it is advisable not to operate series-connected diodes right up to their full p.i.v. ratings if this can be avoided. A good safety margin will give you something in hand to meet unavoidable current and voltage surges.

As an alternative to resistors, equalizing capacitors may sometimes be recommended for this purpose, forming an a.c. potentiometer.

Surge Limiting

With any rectifier having a low forward resistance (e.g. silicon or mercury-vapour rectifiers) consideration must be given to the effect of operating into a capacitive load such as that presented by the reservoir capacitor of the conventional ripple filter. At the moment of switching on, the reservoir capacitor represents an almost direct short-circuit across the output of the rectifier. Additionally, if the value of the capacitor is high, then large peak currents will flow during the relatively short duty-cycle of the rectifier. The peak current which will flow at switch-on will depend upon the precise moment in the a.c. cycle when the switch is closed; the worst possible conditions occur when the switch closes exactly at the peak of the sine wave. A silicon rectifier has no protective warm-up time so that it is possible for a heavy surge of current to flow into the reservoir capacitor.

As with mercury vapour and other low impedance rectifiers, this problem can be largely solved by using a choke-input rather than a capacitive-input, ripple filter; this change will also improve voltage regulation, though at the cost of some lowering of d.c. voltage output. However, a choke is a bulky and fairly expensive component and there are many applications where this solution is inconvenient. In such circumstances it is highly advisable to fit a surge limiting resistor between the rectifier and the reservoir capacitor, even though this results in some loss of rectification efficiency and the generation of additional heat. An acceptable value for a surge limiting resistor is roughly 30 ohms per diode: thus with a series string of three diodes, a suitable value resistor would be 100 ohms.

Transient voltages are generated whenever a magnetic component (such as a transformer or choke) is energized or de-energized. For example, transient voltages of a peak amplitude several times that of normal can be generated through the sudden interruption of current by switching.

Generally, we look upon urban and National Grid supply mains as well regulated, varying perhaps by a few per cent during peak consumption periods. It comes as something of a surprise to find that recent investigations have shown that in fact our mains supplies misbehave violently from time to time. G5CD has drawn our attention to an article* which discloses the results of a recent Mullard enquiry into industrial and domestic mains supplies in different parts of the United Kingdom. For example, at Dudley, Worcs., during a period of six weeks the following substantial overvoltages were recorded: 35 of 20-40 per cent above normal; 7 of 40-70 per cent; and 1 of over 100 per cent. At Cheam, Surrey, during a period of 12½ weeks, recorded overvoltages amounted to 27 of 20-40 per cent; 4 of 40-70 per cent; and 8 of 70-100 per cent. Such transients may last only a few microseconds and have little effect on valve rectifiers (except some large gas-filled types). But, since a 100 per cent overvoltage on 230 volt mains is equivalent to 460 volts r.m.s. or 650 volts peak, it will be appreciated that these voltage surges can all too easily result in semiconductor failures, even in otherwise well designed power supplies.

The built-in protection against voltage transients varies with the type and make of silicon diodes—some 800 volt p.i.v. types have transient inverse voltage ratings of around 1350 volts, but in many of the earlier diodes the margin is a good deal less. For the amateur designer, who will seldom have any reliable information on the overvoltages likely to appear on his particular mains supply, and who may not even have full makers' information on the diodes he wishes to use, a practical safeguard is to leave the most generous possible safety margins that are economically practical.

There are various circuit methods of reducing the effects of transients arising from switching surges and mains overvoltages. G2BVN passes along the information that one British manufacturer advises the use, with 800 p.i.v. diodes, of transient damping devices across the rectifier output and also across the transformer secondary: each of these damping devices consists of an 0·1 μF capacitor in series with a 1 K ohms resistor (here again watch a.c. ratings).

Temperature Effects

The characteristics of junction rectifiers, like those of other

* "Portable Mains Overvoltage Detector" *Mullard Technical Communications*, Vol. 6, Nr. 51, September, 1961.

semiconductor devices, are sensitive to changes in temperature. Although silicon diodes can be used at temperatures well above the boiling point of water (100° C), the maximum safe d.c. output current falls quite rapidly with increasing temperature. Just as many transmitter valves have to be " derated " with increasing frequency, so the maximum output of silicon diodes must be reduced with increasing ambient temperature. Some diodes are rated at 25° C or 35° C, others at 70° C so this point has to be watched.

The extent of the derating necessary can be quite severe; for example, a unit rated for full output at 35° C may need to be derated by 25 per cent at 55° C and by no less than 60 per cent at 100° C, although the figures vary a little with type. Thus a 250 mA diode might have to be restricted to about 100 mA if required to operate at a high temperature. In such cases, it is always advisable to check with makers' literature.

The amount of heat generated in the rectifier itself is low, so that it should usually be possible to ensure that the diodes run cool. They should be mounted so that a reasonable amount of cool air can reach all outside surfaces; they should

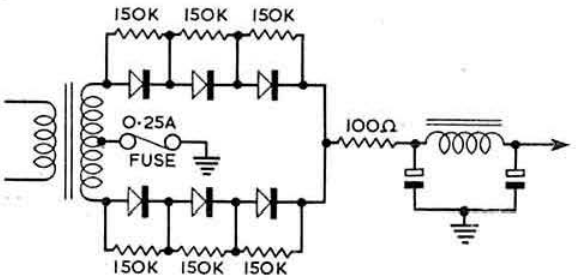


Fig. 2. Typical 350 volt power supply using series connected silicon diodes illustrating some of the precautions discussed in the test.

be kept away from heat producing valves and components. The running temperature of any equalizing or surge-limiting resistors can be kept low by fitting generously rated types. Try to ensure that the diodes are not mounted in currents of warm air coming from valves, etc.

Fusing

It is the unfortunate tendency of silicon diodes when breaking down to short- rather than to open-circuit. This, of course, greatly increases the danger that a fault in one diode will be followed by others and so endanger the transformer and other components in the power pack. To what extent can these hazards be avoided by protective fuses?

The typical power supply of Fig. 2 shows a fuse in the lead to the transformer centre-tap. Such a fuse is very useful in providing protection against a short-circuit across the load being fed by the power supply. It must be readily admitted, however, that it will provide only limited protection against other faults, for the following reasons:

If one diode in a string short-circuits, the p.i.v. across the remaining ones increases, and these in turn are likely to fail. Regardless whether or not the fuse blows, this process may continue until all six diodes have broken down; should these all short-circuit then an effective short-circuit appears across the total transformer secondary winding and this may burn out.

Better protection for the transformer is afforded by connecting a fuse in the transformer primary circuit. This however cannot usually be done with a conventional cartridge fuse since one rated low enough to offer adequate protection is likely to blow during switching on surges. Surge-proof Mag-Nickel delay fuses are likely to be more satisfactory. But for maximum protection what is really needed is some device which would immediately disconnect the unit on the failure of one diode.

Miscellaneous Points

The connection of two silicon diodes in parallel in order to increase the maximum current rating should be avoided if possible; this is because the forward resistance of individual diodes may differ appreciably so that the current load will not be shared equally between them. Should parallel operation be decided upon, the units should either be derated by about 30 per cent or individual equalizing resistors of upwards of about 10 ohms should be connected in series with each diode.

Most makers warn users to take care to avoid damage to the hermetic sealing and to avoid overheating of the junction when connecting diodes into circuit. At least $\frac{1}{4}$ in. of connecting lead should be left leading straight out of the unit before any bend or soldered connection is made in the wire. When soldering it is advisable to grip the lead between the rectifier and the joint with a pair of pliers to provide a heat shunt.

Conclusions

Many of the problems discussed above apply to a much lesser degree for low-voltage, medium current supplies for which germanium and silicon diodes are ideally suited. The low forward resistance is also of particular value for voltage doubling and for obtaining good regulation. In higher voltage supplies, these diodes—as we have seen—have both advantages and disadvantages compared with alternative types of rectifiers; the disadvantages however are steadily being overcome. Provided care is taken in design, long and reliable operation can be expected of silicon diodes. The inherent efficiency, low temperature operation, small size and ease of mounting ensure that these rectifiers will play an increasingly important role in amateur radio.

CONTESTS DIARY

March 16–18	–	A.R.R.L. DX Contest (c.w.) (see page 360, January 1962)
March 24–25	–	CQ WW S.S.B. Contest (see page 394, February, 1962)
April 7–8	–	Low Power Contest (For rules see page 454)
April 7–8	–	International Millenium SP Contest (c.w,)
April 14–15	–	International Millenium SP Contest (Telephony)
April 14–15	–	R.E.F. Contest (Telephony)
April 15	–	D/F Qualifying Event (London) (see page 454)
April 28—29	—	V.E.R.O.N. PACC (c.w.).
April 29	—	D/F Qualifying Event (Birmingham).
May 5—6	—	V.E.R.O.N. PACC (Telephony).
May 5—6	—	U.S.S.R. DX Contest.
May 6	—	144 Mc/s Field Day. *
May 13	—	D/F Qualifying Event (Oxford).
May 26—27	—	First 420 Mc/s Contest.
May 27	—	D/F Qualifying Event.
June 2—3	—	National Field Day. (see page 359)
June 16—17	—	70 Mc/s Contest.
June 24	—	D/F Qualifying Event (Newbury). 1250 Mc/s Tests.
July 7—8	—	V.H.F. National Field Day.
July 15	—	D/F Qualifying Event (Wirral).
August 10—11	—	European Fox-Hunting Championships (Ankaran, Yugoslavia)
September 1—2	—	Region 1 I.A.R.U. V.H.F. Contest.
September 9	—	D/F National Final.
September 16	—	Low Power Field Day.
October 7	—	R.A.E.N. Rally.
October 20—21	—	Second 420 Mc/s Contest.
October 27—28	—	R.S.G.B. 7 Mc/s DX Contest (Phone).
November 3—4	—	R.S.G.B. 7 Mc/s DX Contest (c.w.)
November 10—11	—	Second 1·8 Mc/s Contest.
December 1—2	—	R.S.G.B. 21/28 Mc/s Telephony Contests.

**To coincide with I.A.R.U. Region 1 V.H.F. Contest dates.*

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

"*SOMETHING must be done*" is the title of the editorial in the February issue of *The Sidebander*, which deals with the chaotic conditions now existing at the high end of the 20m band. K2HEA and K2MGE, the joint editors, deal firstly with two recent suggestions designed to improve the present position. The first by W2ZX recommends that United States s.s.b. operation should take place between 14,160 and 14,330 kc/s leaving the top 20 kc/s for s.s.b. DX stations. Apparently in the Americas the segment 14,100-14,200 is at present occupied only by relatively small numbers of a.m. and radio teletype stations. Secondly, W3JTC suggests that all W/K s.s.b. operation should, at some date to be fixed, take place at the low end of the sub band, whilst a.m. operators should move to the high end.

It is the opinion of K2HEA/K2MGE that neither of these plans is truly realistic, and a third solution is offered which allocates 14,300-14,350 kc/s for contacts between stations in the U.S.A. and to include phone patch and traffic handling. The portion 14,250-14,300 would be occupied by W/K stations looking for DX contacts, whilst the DX stations would operate in the segment 14,100-14,140 kc/s, naming the frequencies between 14,250 and 14,300 on which they were listening for United States signals. Readers will recognize the low end operation suggestion as having been previously put forward by VE3AYE and to which reference has already been made in *M.O.T.A.* It seems obvious that the plan by K2HEA/K2MGE is the only one that stands a chance of achieving adoption, and then only with the co-operation of sideband operators throughout the world. However much weight there may be behind a "gentleman's agreement" it only needs a rare DX station to commence operation at the high end of the band, using trans-receiver equipment and working stations only on his own frequency, when the 14,140-14,100 portion will suddenly become quite empty. If, however, the co-operation of all operators, W/K, DX and DXpeditioners alike, can be obtained then the plan could be the answer to the present unsatisfactory state of affairs. If you do not agree with this suggestion, can you offer a solution that is likely to be acceptable by all concerned?

A revised edition of the **R.S.G.B. Countries List** is now available, price 6d. This includes up-to-date listings of the new African prefixes and also a complete Zone list.

News from Overseas

G3JFF operated from the **New Hebrides** using the call YJ1MA from November 17 to 22, and from January 19 to 30. During the first period 310 QSOs were made with 46 countries on 14 Mc/s c.w. Weather conditions during January were very bad with tropical storms and torrential rain which hampered operation. However, 345 contacts were made with 53 countries, but conditions were so poor on 14 Mc/s that operation was often shifted to 7 Mc/s. The only United Kingdom stations worked were GI3NPP, G4OI, G6VQ, G6ZO and G8KS. The equipment used on both occasions consisted of a Panda Cub transmitter with a Murphy receiver preceded by a converter, and a long wire aerial. Power for the rig was provided by a motor generator and during one storm this was put out of action due to flooding. G3JFF expects to sail for Tarawa in the Gilbert and Ellice Islands in mid-March for a stay of seven to ten days. It is hoped that radio conditions will permit more European stations to be contacted. QSLs for the YJ1MA operation are now being distributed by W1HGT who has the logs in his possession.

The summary of the I.T.U. monitoring reports for the period ending August 1961, shows that there were 21 commercial stations of various types operating regularly in the band 7·0 to 7·1 Mc/s. These stations were located in all parts of the world and included Karachi, Teheran, Cairo, Peking, Tirana and Lahore.

VE3CXW/W4, who is ex-G2KB and GM2AH and is now based in Washington, D.C., is active on all bands from 3·5 to 21 Mc/s on c.w. and s.s.b. VE3CXW has recently returned from a visit to Antarctica and New Zealand where he called at the McMurdo, Byrd and South Pole stations and met ZL1TB, ZL3DX and others. It is hoped that it will still be possible to make contacts with United Kingdom stations from Washington despite the declining conditions.

VP8GO, John Juleff, writing from Port Stanley, is on the lookout for United Kingdom contacts, particularly on 21 Mc/s, in the Deal or Erith (Kent) areas. A new transmitter and a two element beam are under construction. VP8GO promises to QSL all incoming cards.

G3III writing from **Gan** expects to be operating s.s.b. shortly using the SB.10 adapter sent by K8RTW. The beam at Gan has been badly damaged but it is hoped to erect dipoles between 70 ft. poles. G3III is now awaiting the issue of his call which is expected to be VS9JH.

Cliff Evans (K6BX) is the publisher of the *Directory of Certificates and Awards*. He uses a Collins 75A4 receiver and has Hallicrafters HT32A and HT33 transmitting equipment.

* *Please send all reports to R.S.G.B. Headquarters to arrive not later than March 20.*

DXpeditions

XT2Z will be the call of 9G1DP when operating from Upper Volta during the *CQ* S.S.B. Contest on March 24/25. Operation will be on 14,342 and 21,342 kc/s and stations are asked to call 10 kc/s down from these frequencies. QSLs should go, as before, to K4TWF.

SMOM/HV1 will be activated by I1CNS and other Vatican City operators during the month of March. Application has been made to the A.R.R.L. for the Sovereign Military Order of Malta to be recognized as a separate " country "!

It is hoped that **VQ8BC** will operate from **Rodriguez** during May on 14 and 21 Mc/s using the call VQ8BCR.

VK3AHO has received permission to operate from **Wallis Is.** during May/June, but has not yet received the licence.

San Marino will be represented during the period March 23 to 26 by **I1SVZ/M1** and **I1PGM/M1**. Operation will be confined to s.s.b. using a Miniphase SB7M and half-wave dipoles for 7 and 14 Mc/s. A special QSL will be used to confirm contacts and cards should be sent to I1SVZ at 81, Via F. Dall'Ongaro, Rome, 8.

GW5BK/P operated by G3HCV, G3CGD, G3OLN, G3PME, with s.w.l. A. Ward, will be active from Radnor, Carmarthen and adjacent countries on 1·8 Mc/s for three days during the Easter holiday.

During the period April 12 to 17 a party from Simon Langton Boys' School will be operating **GW3OSL/A** from overnight stopping places in Caernarvonshire. The station will be operated on the 1·8 Mc/s band, generally between 1830 and 1900 kc/s, during the period 20.00 and 22.00 daily. The equipment is wholly portable, and the operator i/c, G3LCK, hopes that sufficient contacts will materialize to justify the effort involved.

Rutland, a favourite spot for Top Band DX'ers, will be the subject of activity by G3NRW, G3OVL and G3PDK during the period April 20 to 22 after 19.00 daily. Operation will be mainly on a.m. (with c.w. on request) under the call **G3PDK/A.**

From **5N2JKO** comes a brief account of the DXpedition by **5N2AMS** to Gabon (TR8). 5N2AMS first went to Gabon during the weekend January 27-28, but had modulator trouble and the only definite contacts made were with G2FHM and ZD6RM on c.w. Angus reappeared the following weekend and was very active working United Kingdom and European stations in the mornings and early afternoons and then North American stations for the rest of the day. The total QSO score is believed to be over 500. Unfortunately 5N2AMS did not keep his arranged schedules on s.s.b. and few, if any, European stations worked him on this mode.

QTH Corner

CP5EZ	Ivo Tadic DePolo, P.O. Box 930, Cochabamba, Bolivia.
EL6E	via VE4OX
W4JEZ/FA7	U.S. Consulate, Algiers.
FK8AZ	Box 40, Noumea, New Caledonia.
FP8BX	via W1RAN
HH2OT	Box 9027, Port-au-Prince, Haiti.
OX3BZ	via W2CTN
VE3BQL/SU	W. O. E. Veal, 56th Canadian Signal Sqn., CAPO 5049, U.N.E.F., via Montreal, Canada.
VP2AF	W. Martin, Market St., St. John, Antigua, W. Indies.
VP2GAC	AFB, via W4OPM
VP2LD	via W4CKB
VP2VI	via W2YTH
VP5BP	via VE3CJ
VP5CW	GMRD, Box 4187, Grand Turks AAFB via Patrick AFB, Florida, U.S.A.
VP8BW	via 32, Mariman Drive, Manchester, 8.
VQ5GJ	Box 355, Kampala, Uganda.
XE1CT	Box 907, Mexico City.
XW8AS	MAAG Laos, Box 179, APO 152, San Francisco, California, U.S.A.
ZC5BU	via VS1BU, P.O. Box 777, Singapore.
5A5TY	S.A.C. 1 Balloch, R.S.F., R.A.F. Idris, B.F.P.O. 57, Tripoli, N. Africa.
5N2BCF	B. C. Fisk, P.O. Box 173, Lagos, Nigeria.
5N2DPD	D. P. Darker, Ministry of Transport & Aviation, Civil Aviation Dept., Lagos
5N2FEL	F. E. Ledger, Ex-Lands Nigeria Ltd., Barakin Ladi, N. Nigeria
5N2HHT	H. H. Turnbull, c/o G. B. Ollivant (Nigeria) Ltd., Port Harcourt
5N2JRG	Dr. J. R. Golding, Dept. of Surgery, University College Hospital, Ibadan.
5N2NFS	N. F. Schroeder, P.O. Box 88, Lagos.

* * *

R.S.G.B. QSL Bureau: G2MI, Bromley, Kent.

Contests

The **Sixth Annual *CQ* World Wide S.S.B. Contest** will take place during the weekend March 24-25 from 12.00 on the Saturday to 18.00 on Sunday with only 24 hours of operating permitted. Copies of the rules and log sheets are available upon receipt of a large s.a.e. sent to G2BVN.

The eleventh **OZ-CCA Contest** will take place from 12.00 May 12 to 24.00 May 13 (c.w.) and from 12.00 May 19 to 24.00 May 20 (telephony). The object of this contest is for stations to contact as many other stations in all continents as possible under the rules and during the contest periods. Contacts with stations in OX, OY and OZ will count double under the system of scoring. A summary of the rules will be given next month. This contest is invaluable for making contacts to qualify for the OZ-CCA Award.

The Annual **CHC/HTH 1962 World Wide QSO Party** will take place from 23.00 June 1 to 06.00 June 4. Members of the Certificate Hunters' Club will be familiar with the details of the contest, and non-members may obtain full information and a membership list of the CHC by sending a self addressed envelope and IRC to K6BX at Box 385, Bonita, California, U.S.A.

Through the courtesy of GI6TK a translation of the rules of the **U.S.S.R. Contest** has been obtained and a summary follows: (i) The period of the contest will be from 21.00 on May 5 until 21.00 on May 6, but only 12 hours of continuous operation will count for scoring purposes. The log for the whole period of operation should be sent in; (ii) Contacts must be made on c.w. in the bands 3·5 to 28 Mc/s; (iii) The numbers to be exchanged will consist of the RST report plus a consecutive QSO number beginning with 001; (iv) The contest call will be CQM; (v) Only one contact with a station on each band will count for scoring purposes; (vi) The total score of each station will be the number of contacts, each of which will count one point, multiplied by the number of countries worked, Any mistake in the call-sign or number will prevent a contact from scoring points; (vii) Awards will be made to the first five stations in each country in (a) single operator and (b) multi-operator categories; (viii) Participants who contact 100 different U.S.S.R. stations will be awarded the W-100-U diploma. Those who make contact with six continents or 150 countries will be awarded the R6C and R150C diplomas respectively. For these awards it will not be necessary to present QSL cards; (ix) All logs must be sent to the Contest Committee, P.O. Box 101, Moscow, not later than May 15, 1962; (x) Logs must be submitted for each band used and the column headings should be: Date; Band; Time (G.M.T.); Call of station worked; Number received; Number sent; Points. The last column should be left blank. At the end of each band log there should appear three totals, viz: number of points for contacts; number of countries worked; total points. In addition each log should contain the full name and address of the operator and details of the equipment used.

In supporting the B.E.R.U. Contest **G3LPS** comments that obviously many operators have in mind the possibility of contacting other Commonwealth countries to improve their scores for E.DX.C and B.E.R.T.A. G3LPS finds the QSL response from Commonwealth countries unsatisfactory, and as an example quotes 61 QSLs sent in connection with the 1961 B.E.R.U. Contest to which only 32 replies have been received, despite the supply of s.a.e. or IRC.

Awards

In connection with the **CQ USA-CA Award** it is now announced that once a person has a record book on file, self prepared supplementary lists may be used when claiming for higher classes. DX winners of USA-CA-500 include: PJ2AF; ZL1TB; VE3BKL; TG9AD; DL9PF; SM5WI and KH6DKA. In addition, s.w.l. Andy Rugg is a winner of the USA-CA-500 Award on a heard basis. This is the first such award to a listener.

A note from **G3ISX** tells of the difficulties experienced in claiming the **W-160 Award,** and it would appear prudent to defer application for this until further information is forthcoming. Considering the large numbers of awards now available there are few whose bona fides are in doubt, but no operator would wish to risk the chance of losing those hard earned cards.

In connection with the rules for the **WPX Awards,** dealt with on page 295 of the December 1961 BULLETIN, the examples quoted under (iv) are incorrect and should read, e.g. ZD4 and 9G1, VS2 and 9M2.

The **Directory of Certificates and Awards,** published by K6BX on a non-profit basis, may be ordered through G2BVN at a cost of 30/-. This includes the original book and three revision supplements. Three ring binders are available with the Directories for an additional 7/6. The books are sent to each subscriber from K6BX and this ensures that only the latest issue is distributed.

DX Briefs

9M2MC is the present call of M. Creighton (ex-DL2AL, G3NBM, ZC4MC) who will be active on all bands with particular interest in s.s.b. on 3·5 Mc/s.

UA2AO reports that UP2AC, known in pre-war days as LY1KK, is now a Silent Key.

W. O. II D. H. Willoughby who has operated as MD5TS, MD2IW, 5A2TL, F7CU and DL2YU is back in the United Kingdom. His home address is 29 Mackenzie Drive, Shorncliffe, Kent.

G3NAC, now stationed at Swinderby, will be moving to Aden in June for a two-year spell of duty, where his call will be VS9AAA.

GM3DGU has changed his QTH to Campbeltown, Argyllshire, and will be active on Top Band, c.w., a.m. and mobile. Activity will be on most evenings after 20.00 and usually between 1900 and 1940 kc/s. His full address is: W. B. Kendal, Ministry of Aviation, Machrihanish Aerodrome, Campbeltown, Argyll.

W2GHK is anxious to trace the holder of the call **MB9AJ** in August 1947.

It is hoped that the U.S.S.R. portable transmitter will be available for s.s.b. operation from Franz Josef Land during the *CQ* S.S.B. Contest. Later news is that the transmitter will be operated by UA3CR who will look for European stations on 14,120 kc/s whilst transmitting on crystal frequencies of 14,290, '303 or '313 kc/s. QSLs to Box 88, Moscow.

TL8AC, previously active on 14 Mc/s c.w., will be returning from leave in France during October 1962. His home address is P. Sevestre, 3 rue Bertin, Angers, Maine et Loire, France.

Activity from **Canton Island** is now handled by KB6BC and KB6BV on s.s.b. and KB6BS on a.m. Any suggestions for obtaining QSLs from KB6BR will be welcomed.

S.s.b. operation in Belgium has now been officially approved subject to the equipment having carrier suppression of 20db and unwanted sideband suppression of 30db.

QSLs for **SM5BUG/9Q5,** unfortunately killed in the U.N. aircraft crash at Ndola, are being dealt with by **SM5AIO.**

W4JEZ/FA7, active on s.s.b., specifically requests that incoming QSLs should be accompanied by reply stamps (preferably) or IRC.

5N2JKO reports that the call-sign lists have been checked and that **5N2CPH** and **5N2JAS** are definitely pirates.

Band Reports

Activity on **1·8 Mc/s** has reached a high level and firstly a report from an area which does not often figure when this band is mentioned. Although Top Band is not available in Nigeria **5N2JKO** feels that this is probably because there has been no request for it. It is hoped that this situation can be rectified by some of the interested Nigerian stations, for many DX'ers would welcome the availability of 5N2. On January 7 5N2JKO heard G3ERN, G3PU, G5JU, G6BQ, W1BB/1, W1PPN, W8IQS, K0ZPT, W0NWX, VE1ZZ, VE2AYY and HC1AGI, all between 05.45 and 06.15. Nothing was heard before 05.45 although 5N2JKO was in fact listening on the band. On January 21 the following were heard: G3CHN, G3NXV, G3PU, G5JU, G6BQ, W1BB/1, W2KQT, W2FYT, W1PPN and W8NSF. Via G2DCG comes a note from **ZL1AH** (ex-G3AH) to the effect that he will be active on Top Band again in the near future, and is wondering if DX'ers using this band will be interested in the possibility of G-ZL contacts. It is hoped that ZL1AH will in fact make an appearance on the band and more details will be welcomed for reproduction in *M.O.T.A.*

ZC4PB reports the following stations as heard on January 21: GD3UB (00.05), G5LP (00.10), G3MY (00.32) and G3ODX/A (01.25). GD3UB was the best signal with 579, and ZC4PB is not certain of the call reported G3MY, who later worked G3OXD/A. The excellent 160m *DX Bulletin* produced by **W1BB** reports many new country-to-country contacts on this band. KH6IJ worked HC1AGI on January 7, and HC1AGI worked ZL3RB on February 28. VP8GQ (S. Orkneys) contacted W0IFH, W1BB/1 and VE1ZZ on the same date. From the United Kingdom the following are cited as providing outstanding and consistent signals: G3PU, G3ERN, GD3UB, G6GM, G6BQ and GI6TK. On February 4, HC1AGI reported hearing G3PU but unfortunately no QSO resulted. From the South Orkneys VP8GQ (ex-G3LET) is radiating an excellent signal on this band and has reported hearing G3PU, G3ERN, G5JU and G6BQ. VP8GQ uses an aerial 270 ft. long and a power input of 150 watts. The transmitting frequency is usually 1801 kc/s and VP8GO listens between 1825 and 1830 kc/s. A disadvantage encountered is the extremely high noise level in the Antarctic area.

Turning now to reports from the United Kingdom **G3ORD** (York) contacted OX3CB at 03.40 on February 18, but signals quickly faded. OX3CB was also heard by **G3OIT** (Billericay) and it is hoped that the former is not a pirate. Definite and further information on this would be welcome. **VE3BQL/SU** was heard calling CQ G between 22.00 and 24.00 on February 17 at RST559, but no contacts are reported although he was called by G3PQA. **EP2BK** was first heard by **G6BQ** (Gravesend) on February 3, at 03.20 on 1999 kc/s at RST459. He was not heard again until February 14 at 03.12 and a few minutes later replied to a call by G6BQ on 1803 kc/s who gave the Iranian station a report of 579. On the QSL subsequently received EP2BK mentions that although he had previously heard W2KGT and WA2KWB his QSO with G6BQ was his first on Top Band. EP2BK will be on the look out for United Kingdom stations on Wednesdays from 02.00 to 03.30 around 1800 kc/s and G6BQ has suggested to him that the best frequency will probably be 1808 kc/s. W1PPN and VE1ZZ were contacted during the A.R.R.L. contest and W2FYT, W2EQS, W3ECR and W3EIV were heard. On the subject of early QSOs G6BQ records the earliest QSO this season as being with K2DGT at 03.25 on October 11, which compares with an earliest ever time of 23.57 with the same station on March 2, 1961. G6BQ, who suffers from an extremely high noise level, being in the centre of Gravesend, has a number of comments to make on the most suitable types of aerials for working on 1·8 Mc/s. This

will be dealt with in April *M.O.T.A.* G3FPQ worked EP2BK on February 24 at RST589.

G3OQT (Romford) reports only fair conditions during the Test period on February 18, and the following stations were heard: W1BB/1, W2FYT, W2EQS, W9PNE, VE1ZZ and VO1FB. It is known that amongst the United Kingdom stations who made transatlantic contacts were G3PU, G3FPQ, G3IGW, G3OIT, G5JU, G6BQ and G6GM; G3FPQ was heard calling HR3HH. It is also reported that **FP8BX** (W1RAN) was worked by G3OQT on February 24/25. Our regular reporter, **B.R.S. 20317** (Bromley), concludes that the past weeks have been very satisfactory for Top Band DX and lists the following W/K stations identified during the test period: W1BB/1, W1PPN, W1TX, WA2KWH, K2PNF, W2EQS, W2FYT, W2GGL, W2IU, W2KQT, W2KHT, W2TR, W2UWD, W3ECR, W3EIV, W3GRF, W3GQF, W3RFA, W4KFC, W4YHD, K8EVG, W8HBR/8 and W8NSF. Amongst the new countries heard recently have been W0VEH/VP9 (05.25, 1807), HR3HH (06.05), CN8PZ (05.15), SV0WZ (05.10) from Crete and VP5BP (06.15) from the Cayman Islands. B.R.S.20317 gives the following numbers of DX stations identified on the various days as: January 21, 22; 28, 9; February 4, 10; 11, 2; 17, 8; and February 18, 15.

B.R.S.19107 (Beckenham) also reports a good month on 1·8 Mc/s including VP5BP (06.30), SV0WZ (05.48), HC1AGI (06.00 to 07.00), HR3HH (06.05) and K8RRH and W8NSF were noted in addition to the usual East Coast stations. The score on this band is now up to 50 countries, and taking into account countries that have been missed, B.R.S.19107 imagines that a DXCC on 1·8 is within the bounds of possibility. According to latest information the three leading stations are W1BB with 58 countries, W9PNE with 34 and W2EQS with 30. Information on the scores of the leading United Kingdom stations would be welcomed. A note on a QSL from HC1AGI mentions that he can only receive DX signals in the segment 1806 to 1816 kc/s and at the high frequency end due to interference from broadcast station harmonics.

The **3·5 Mc/s** band has also produced a large amount of DX on both c.w. and s.s.b. and **B.R.S.20317** reports the following on the latter mode: HK4EB (05.00), PZ1AX (01.30), SV0WT (Crete, 19.30), TG9AD (07.30), VE3BQL/SU (21.00), VP9DL (06.15), VS9AAC (23.40), UL7JA (19.45) and ZL4OD (08.00). Our reporter hears that 5H3GC and VQ2AT are both expected on this band in the near future. **MP4BBW** has been putting in a good signal during the evenings. **B.R.S.19107** mentions the DX reported above with, in addition, VP2VI from Tortola in the British Virgin Islands heard at 05.45, KZ5LC (03.58), KP4AWH (06.20), and OX3AI (20.35). He mentions that the Australian stations do not appear regularly in the evenings, but that it is probably easier to make a quick W.A.C. on this band than on any other. **G16TK** is now up to 45 countries worked on 3·5 Mc/s using a Viceroy transmitter and a G5RV aerial. It is believed that **G3FPQ** has reached the century mark.

The c.w. section of this band has also contained a welcome quantity of DX and **B.R.S.20317** records new countries in FP8BX (04.50), VP5BP (04.50), ZB2AD (02.50-04.00) and ZS1A (04.15). UL7JA was heard at the unusual time of 16.50 and our reporter queries VP5MJ heard at 07.40 on 3507 kc/s. This should be Montserrat according to the book but definite information will be welcomed. Other DX heard included EP2BK (03.50), HC1AGI (08.00), KV4CE (23.59), VS9AGA (03.00) and YN1AA (03.10).

The **7 Mc/s** band carries very few s.s.b. QSOs but doubtless there would be some interesting results if there could be some increase of activity on this mode. **B.R.S.19107** reports XE1CV at RS58 on 7195 kc/s at 09.55, also WA6QPE/KP4 (09.08), VS9AAC (21.30) and the West Coast of North America around 08.30. **B.R.S.20317** notes with pleasure the disappearance of Radio Pakistan on 7010 kc/s, but records the ghastly noise now making the band virtually unusable for DX contacts between 16.00 and 02.00 on frequencies above 7020 kc/s. New countries heard by our reporter include CR6CH (18.40), VP8GQ (21.28) and ZE5JF (18.49). VP8GQ has been heard putting in a fine signal to the United Kingdom on most evenings on this band and will obviously fill a gap in many DX lists. The earliest W station to be heard was W1DDF at 18.30 and the last K1DOE at 10.00. The path to the West Coast usually opens at around 02.00 with W6GTI and closes with WA6NNJ at 09.30. A number of signals from Africa have been logged but none at good signals strengths. **5N2JKO** mentions that it is of very little use for a 5N2 station to call a DX station because almost immediately the frequency is submerged under a welter of Middle European callers. During the afternoon period **B.R.S.20317** logged the following: JA5YAP (15.10), VK3APJ (15.30), VK4SS (15.55), PK4LB (15.15), 4S7EC (15.17) and 9M2FZ (15.20). In addition W6 stations were readable between 15.00 and 16.00, with UM8, UJ8, UI8 and UL7 all heard after 15.00. KH6IJ was a good signal at 08.45, with VE8RX (08.00) and UA0KAR (08.40), all providing breakfast time DX. Two unusual ones logged by B.R.S.19107 were UA0YB in Zone 23 at 19.55 and VP3AD at 23.45. It should be noted that some of the U.S.S.R. stations who are located on Sakhalin Island south of the 50th parallel say that they are in Zone 19, whereas correctly this should be Zone 25. **G3LPS** (Blackburn) has concentrated on this band, working CP5EZ, CT2AI, EP2BB, KV4AA, UF6AU, UM8KAB, VP6GC, VP8GQ, ZC4FC and 3V8CA, all during the evening hours.

Something of interest has been produced by **14 Mc/s** on most days, and it is noticed that morning conditions are improving with Pacific stations being heard, although at low signal levels. The band is also remaining open much later in the evenings, and an unusual characteristic has been a secondary opening on several nights around 23.00. **MP4BBW** aptly summarizes the situation by saying very much an up and down month as far as general propagation conditions are concerned, but there has still been quite a reasonable amount of DX available. The log at MP4BBW includes the following entries: AP2AD (13.20), CE3RC (11.25), CR6CA (17.42), CX2AX (11.15), DU1GF (14.09), EA8BA (12.50), EL6E (17.32), FK8AC, HC1FG (12.09), HS5OSQ (14.54), KG1FR (14.47), KP4CL (14.25), W9GBH/KV4 (13.22), KX6AE (12.16), KZ5SW (13.46), OX3BZ (13.16), PJ2AA (19.11), PZ1AX (10.48), TG9AD (14.28), UG6AW (13.15), VQ1DR (16.54), VS6EK (12.09), WG6AKU (13.08), XE1ZE (14.56), XW8AS (13.55), YV5ANE (14.27), ZS3LW (19.11), 3V8CA (12.31), 9M2CR (14.29), and 9Q5AF (12.37).

A feature of this band has been the appearance of a number of s.s.b. stations from the Caribbean area including VP2DA, VP2GAC and VP2SH. The first two have been freely worked from the United Kingdom around 11.00, but the signals from VP2SH have been comparatively weak. Due to the proximity of North America the Caribbean operators concentrate their operations to this area with the result that European stations find it impossible or very difficult to break into a long chain of W/K QSOs. It is to be hoped that some of the rarer DX stations will include periods of operation at the lower end of the band around 14,140 kc/s. VP5BP from the Cayman Islands was to be found around 14,120 at 17.00, and VP5CW from Grand Turks Is. was a good signal on several mornings around midday. TU2AK, in company with CN8AR, has been frequently active around 18.00 (14,300), and other " rare " s.s.b. countries have been represented by 9U5KU (18.00) and SM5ZS/ZC6 (13.10). CR7CI has a new linear and may often be heard with a much improved signal around 17.30 (14,290). ZB1A had the misfortune to suffer severe damage to his beam during recent gales but radiates a potent signal with a dipole pending the arrival of spares.

(*Continued on page 446*)

Single Sideband

By G. R. B. THORNLEY (G2DAF)*

A NUMBER of American manufacturers and at least one British manufacturer have been marketing successfully for some years complete s.s.b. transmitters using two 6146 valves in parallel capable of a p.e.p. input of 180 watts and a p.e.p. output of approximately 100 watts. This amount of r.f. can produce a single sideband signal capable of working any station in the world—subject only to suitable propagation conditions at the time. In fact, to the operator who prefers his transmitter " all in one box," a linear amplifier consisting of two 6146 valves giving 100 watts maximum signal output is an attractive proposition. That this is so is amply demonstrated by the number of amateurs operating Hallicrafters HT32, K.W. Viceroy and similar transmitters.

A 100 Watt Linear for the G2DAF S.S.B. Transmitter

The original G2DAF transmitter was primarily designed as an exciter suitable for driving any kind of separate power amplifier, either grid or cathode driven. With this in mind the output stage consisted of one 6146 valve and the pi tank circuit had fixed output loading as it was intended to work into a 75 ohm line correctly matched to the p.a. input.

In view of the excellent world wide contacts and the satisfactory reports obtained with a " modest " p.a. of 100 watts p.e.p. output, many builders of the transmitter described in the October and November 1959 issues of the BULLETIN have asked for details of the circuit values and the modifications necessary to the bias supply and the pi output circuit to enable two valves to be used in parallel instead of the single 6146 of the original design.

The circuit is shown in Fig. 1 together with the EF80 voltage amplifier (V12 in the original circuit) and the recommended bias supply. It will be noted that the GRID TUNING capacitor and the associated switched coils have been moved to the EF80 anode circuit enabling the class A amplifier to be series fed; this gives a marginally higher drive voltage. The grids of the 6146s must be isolated from the h.t. voltage appearing on the coils and the tuning capacitor, and the 150 pF blocking capacitor must not be omitted.

As the 6146 valve has been specifically designed for class AB1 operation there is no grid current under the correct operating conditions and therefore no driving power is necessary. The output from the EF80 voltage amplifier is more than adequate to drive fully the p.a. to its full rating of 180 watts p.e.p. input on all bands.

The pi network values have been calculated for an R_L of 2,000 ohms and are given for each band in Table I. Construction of the tank inductance is similar to the original design, with the 160m coil L3 on a separate ceramic former positioned at right angles to the main winding L2 and adjacent to its " cold " end; the self supporting 10m coil L1 is positioned at the " hot " end of L2 to form the connecting link between L2 and the stator plates of the anode tuning capacitor. It is convenient to use a standard broadcast receiver two gang capacitor of 500 pF each section for the aerial loading capacitor. As this would not have a large enough value for use on the lowest amateur band, the 160m position of the pi tank band change switch is used to bring into circuit a further fixed loading capacitor of 600 pF or thereabouts. On the 160m band power is reduced to the equivalent p.e.p. of a 100 per cent modulated 10 watt d.c. input A3 transmitter, either by switching the p.a. anode feed from the 650/750 volt line to

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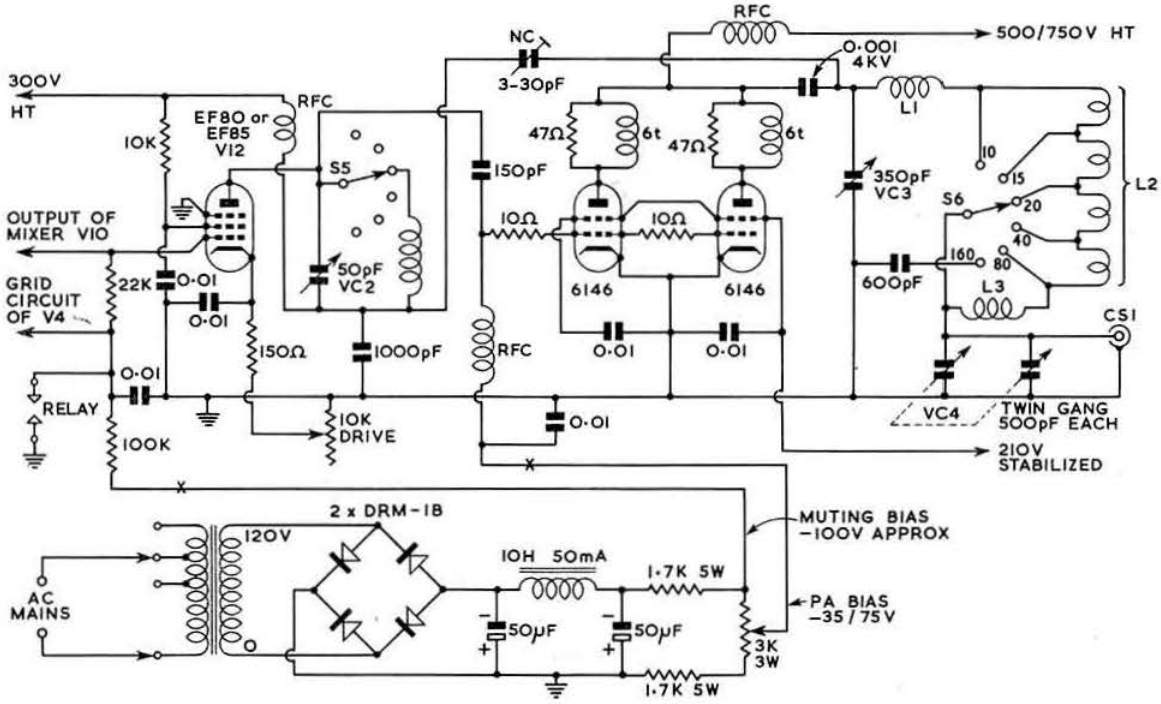


Fig. 1. Circuit diagram of a 200 watt linear amplifier and bias supply with modifications to the original G2DAF transmitter circuit. VC3 is a surplus item with 0·025 in. air gap (the brass vane 400 pF capacitor from the CTS12 transmitter is suitable). The anode r.f. choke must be a type designed for pi-network operation. The bypass capacitors are Hunts Moldseal type W.99. Details of the p.a. tank coils are given in Table I.

TABLE I

PI NETWORK DATA — TWO 6146 VALVES RL = 2,000 ohms			
BAND	XC1 = 200 ohms	XL = 250 ohms	XC2 = 46 ohms
80m	220 pF	11·0 μH	900 pF
40m	110 pF	5·5 μH	450 pF
20m	56 pF	2·7 μH	225 pF
15m	38 pF	1·8 μH	160 pF
10m	28 pF	1·4 μH	115 pF

TANK COIL

L1, 4 turns 16 s.w.g. tinned copper 1 in. diam. spaced to ¼ in. long, self supporting.

L2, One continuous winding of 18 s.w.g. tinned copper wound 16 turns per inch, 10 turns, $\frac{3}{16}$ in. gap, 8 turns, $\frac{3}{16}$ in. gap, 3 turns, $\frac{3}{16}$ in. gap and 2 turns. Total length approximately 2 in. diameter $1\frac{1}{8}$ in. supported by 4 lengths of ¼ in. diam. Polystyrene rod (as U.S. "Miniductor" coils).

L3, 32 turns 22 s.w.g. enam. close wound on ⅜ in. diam. ceramic former.

the 300 volt rail feeding the remainder of the transmitter, or alternatively breaking the heater supply to one of the 6146 valves by means of a panel mounted toggle switch.

Any small mains transformer with a secondary of 30/50 mA rating is suitable for the bias supply. If the secondary is centre tapped it is only necessary to use one Brimar DRM-1B rectifier (or equivalent) connected in the usual full-wave circuit. The small potted choke fitted in the Command series of receivers, or anything similar, is suitable for the smoothing. Remember that the positive side of the two 50 μF capacitors is connected to earth and that the cans must be insulated from the chassis. The original bias setting potentiometer VR7 is removed and replaced with a 100 K ohm ½ watt resistor—this is to prevent the bias power supply being short-circuited when the relay closes on transmit.

Layout

In regard to positioning components there is sufficient room on the chassis to mount the additional 6146 valve at the side of V13. The main pi tank coil L2 is pre-assembled and supported by the connections to the switch bank S6 (S7 is removed together with the associated fixed loading capacitors) and this is mounted on the panel in the position formerly occupied by the ANODE TUNING capacitor—this capacitor being moved to the former LOADING position. The new two gang pi output capacitor is then fitted in the position marked LIMITER. This makes a very compact assembly with all leads carrying r.f. as short as possible.

The recommended screen voltage is 210 volts stabilized (two VR105s in series) while the anode supply may be any convenient value between 500 and 750 volts. The bias setting potentiometer should be adjusted until the standing no-signal anode current is at a value just within the total anode dissipation of the valves—40 watts. With a 700 volt supply this will be 50 mA. *For a clean signal, correct loading and driving is essential;* load to an indicated anode current of 200 mA and *never* talk the amplifier up beyond the point at which the milliameter pointer swing reaches a peak of half this value—100 mA. Remember at all times that the meter movement has inertia; it cannot follow at syllabic rate—if it is indicating 100 mA the true peak current will be at least twice this value.

QSL Mystery

FOR a reason which is not made clear K9QIZ states in a letter to Headquarters that he is QSL Manager for 5N2NFS, ex-ZE5JI-G3PBM. We can only assume that 5N2NFS is now in some very remote part of the world although we were under the impression that he was operating from Lagos with a K.W. Victor Transmitter, a Geloso Receiver and a TA33JR Beam on 15 and 20 metres.

We have not yet heard whether 5N2NFS has been appointed QSL Manager for K9QIZ!

Month on the Air (Continued from page 444)

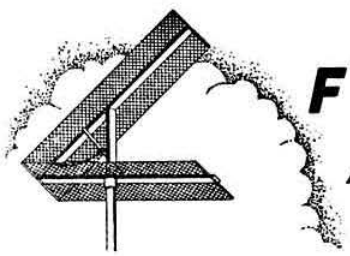
At the c.w. end of the band **G3HDA** (Stratford-on-Avon) has been busy to the tune of CR7IZ (19.40), DU1OR (13.00), FP8BX (19.35), HH2OT (19.55), UA0EW, UA0LL, and UA0RV, all in Zone 19 and at times around 08.30; UA0KYA (08.20), UJ8KAA (08.08), VP8GQ (19.35), ZP5OG (23.30), ZS3EW (18.50), 5N2JKO (07.15), 6W8DD (23.03) and 9M2GJ (15.15). Other stations heard were FG7XO (22.40), FK8AZ (08.00), FY7YI (19.15), VK9GP, Norfolk Is. (08.00), YA1AN (08.15) and ZD7SE (19.45). Altogether an effective answer to those pessimists who decry current conditions. **G8PL** (London N.W.3.) feels that there has been some improvement in that the band is not now dead at 06.00 although most of the signals are of Russian origin. A selection of those heard and worked include EP2BH, UA0RB, UA0KYA, UG6AB, UJ8KAA, UL7IJ, VQ5GY, 4X4BS and 5U7AC (06.00/07.00), SU1IM, UA6s, UH8BO, UI8CA, UJ8KAA, UL7NB, 5A3BC (07.00/08.00), UA0AG, UA0RB, UM8KAA, JA2XW, UA0KYA and ZL1AH (08.00/10.00). This list of DX shows the results that can be achieved with an indoor aerial. G8PL points out that servicing is not difficult, he merely stands on a chair! Using a DX40/1155 combination **G3PQR** (Thorpe-le-Soken) worked JA2DN (14.30), MP4BDH (14.10), UG6GG (21.25), UH8BO (07.40), UI8KIA (08,30), UL7KAA (08.30), UO5KAA (08.05) and VP8GQ (20.50). **VK4RZ** mentions that the long path to West Europe has been open in the early evening (Australian time) over the long path, with best signals switching to the short path about an hour later. There are few European signals penetrating the QRM and QRN on 3·5 and 7 Mc/s. Generally propagation is at present favouring the north/south paths, and the usual West Coast United States stations are almost entirely absent.

5N2JKO has been active on this band on a.m. and remarks on the similarity between 14 and 21 Mc/s as heard in Nigeria. TR8AC has been heard on c.w. giving the name of Paul and asking for QSLs via the R.E.F., but 5N2JKO feels that his signals are too strong for the distance involved and classes him as doubtful. In five QSOs 5N2JKO worked three members of the same family: K5AAD, aged 15, his grandfather W5PIO, aged 78, and W5MBB, who comes somewhere in between. Hearing the name of Mary 5N2JKO had not the courage to ask the operator's age!

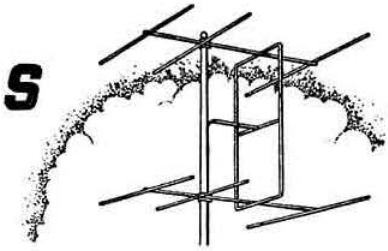
The **21 Mc/s** band has produced the usual worthwhile, but not exotic, DX, the only exception to this being the Gabon operation of 5N2AMS/TR8 which caused considerable activity on this band during the first weekend of the A.R.R.L. (Telephony) Contest. **A.2340** (Plymouth) logged CR6JL (15.41), EL2Q (17.35), CO8RA (16.59), KZ5TD (13.25); ZD6HK (12.51), ZD1JWC (16.49), VP1RL (16.14) and 5H3PBD (12.56).

Little of note has happened on **28 Mc/s** although **G3AAE** records QSOs with CR7ID, SM5ZS/ZC6, VS9ANW, ZC4SS and ZES in the period between 12.00 and 14.00. An unusual occurrence on this band was observed by G3AAE on February 24 when between 16.45 and 18.30 the east-west path suddenly opened. Heard and worked during this period were W1, 2, 3, 4, 5, and 9, VO2, HC4CD, XE1CT and KZ5TD. This period coincided with a forecast of sunspot activity.

Correspondents are thanked for their letters and reports and acknowledgements are made to the *DX'press*, the West *Gulf DX Club Bulletin* and *DX* (W4KVX).



FOUR METRES AND DOWN



By F. G. LAMBETH (G2AIW)*

THE " Four Metres and Down " Awards have now been available for over a year, and it is felt that v.h.f. enthusiasts may like to have a note of the awards which have already been made. They total 23, which is not a great number, but is probably due to difficulties experienced by many operators in obtaining the necessary QSL cards. If this is so, may we exhort anyone who owes a card, which may complete somebody's total, to send it? The list of recipients up to date is as follows:

144 Mc/s Transmitter

1. G3HBW	8. G3CO	15. G3KPT
2. G3BLP	9. G3BA	16. G3JYP
3. G3MTI	10. GW3MFY	17. G3KMT
4. G5YV	11. G3DFL	18. G3OHD
5. G3BNL	12. G3NAQ	19. G3BBR/A
6. G3MCS	13. G3NNG	20. G3HRH
7. G3LAR	14. G3OJY	21. GM3EGW

144 Mc/s Receiver
1. B.R.S.22550

420 Mc/s Transmitter
1. G3NNG

London V.H.F. Convention

The London V.H.F. Convention will be held on May 19 at the Kingsley Hotel. It is hoped to arrange another interesting programme of talks. The traditional "draw" will be differently arranged this year but we shall do our best to see that some good prizes are provided.

A Word of Warning

We have heard lately that certain stations (not many, thank Heaven!) are prone to over-modulation and other undesirable practices, in some cases using the air for the furtherance of petty local squabbles. This can only bring Amateur Radio into disrepute, and we ask that such childish practices should cease forthwith. They reflect no credit whatever on the users, and annoy everyone else.

British Isles Two Metre Band Plan

After three years' operation of the revised 2m band plan, it is time perhaps to review the situation (writes G3FZL). The original 2m band plan was suggested by G3CYY in the May, 1949 issue of *Short Wave Magazine* and after considerable comment was adopted and published by that magazine. At a meeting of the Five Band Club at the time only one or two of some 50 2m operators were opposed to the introduction of the plan. The plan was an immediate success. Later, a meeting was held between the *Short Wave Magazine*, the R.S.G.B. and other interested parties to discuss the possibility of adopting the band plan as the British Isles 2m band plan. This was done, the plan continued to be as successful as before, and was adopted by most 2m operators. The advantages were that operators did not have to search the whole 2 Mc/s for a weak DX signal, assuming that the station was operating in the correct zone, and also that strong local signals did not swamp the weaker and more distant signals.

In the autumn of 1958 the G.P.O. approached the R.S.G.B. because interference was being caused to service aircraft as certain band plan allocations coincided with the use of aeronautical frequencies in the same area (144·0, ·09, ·18, ·27, ·36, ·45, ·54, ·63, ·72, ·81, ·90 Mc/s). This applied particularly in Yorkshire and Lincolnshire.

To change those few areas concerned would have disrupted the logical allocation of frequencies of the old band plan and thus the R.S.G.B. and *Short Wave Magazine* jointly discussed a new band plan, the one now in current use, which had a similar logical allocation of frequencies to the old band plan but which as far as practicable moved

V.H.F. Band Plans

All v.h.f. operators are reminded of the British Isles Two Metre and Seventy Centimetre Band Plans, which are sponsored by the Society. Observance of these plans will assist in DX working and in avoiding QRM to Service frequencies in the 144-145 Mc/s band.

Zone	2 metres	70 cm.	Area
1	144·0–144·1	432·0–432·1	Cornwall, Devon, Somerset.
2	144·1–144·25	432·1–432·25	Berkshire, Dorset, Hampshire, Wiltshire, Channel Isles.
3	144·25–144·5	432·25–432·5	Brecon, Cardiganshire, Carmarthenshire, Glamorganshire, Gloucestershire, Herefordshire, Monmouthshire, Pembrokeshire, Radnorshire, Worcesterhsire.
4	144·5–144·7	432·5–432·7	Kent, Surrey, Sussex.
5	144·7–145·1	432·7–433·1	Bedfordshire, Buckinghamshire, Essex, Hertfordshire, London, Middlesex.
6	145·1–145·3	433·1–433·3	Cambridgeshire, Huntingdonshire, Leicestershire, Norfolk, Northamptonshire, Oxfordshire, Rutland, Suffolk, Warwickshire.
7	145·3–145·5	433·3–433·5	Anglesey, Caernarvonshire, Cheshire, Denbighshire, Flintshire, Merionethshire, Montgomeryshire, Shropshire, Staffordshire.
8	145·5–145·8	433·5–433·8	Derbyshire, Lancashire, Lincolnshire, Nottinghamshire, Yorkshire.
9	145·8–146	433·8–434	All Scotland, Northern Ireland, Isle of Man, Cumberland, Co. Durham, Northumberland, Westmorland.

Two Metre Band Guard Channels: The following frequencies in the 144-145 Mc/s portion of the 2-metre band are tabulated on the schedule to the Amateur (Sound) Licence to be avoided as they are allocated to Service use: 144·0, 144·09, 144·18, 144·27, 144·36, 144·45, 144·54, 144·63, 144·72, 144·81 and 144·9 Mc/s. *REMEMBER!* THE SAFETY OF AIRCRAFT AND HUMAN LIVES DEPEND UPON THE INTERFERENCE-FREE USE OF THESE CHANNELS.

* *R.S.G.B. V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex.*

frequency allocation areas away from service airfields using frequencies within that area. The new band plan was published in the R.S.G.B. BULLETIN of March 1959 and the *Short Wave Magazine* of April 1959 and was immediately adopted by the majority of United Kingdom 2m operators. Since then there have been very few cases of interference with service aircraft (one known case of interference was caused by out of zone operation) and on reflection the new band plan can be described as highly successful—in fact more successful than could have been hoped for at the time of revision.

The success is due to the co-operative spirit which is characteristic of United Kingdom v.h.f. activities. However, there are still a few operators who complain either that the band plan is a " Short Wave Magazine " or an " R.S.G.B." creation; it is not, it is a national agreement, the success of which depends upon voluntary action of every amateur user of the 2m band. No person can be blamed for ignoring it, but he does so in the knowledge that he is inconveniencing his fellow amateurs and this is not in keeping with the true " Ham spirit."

Critics say that the plan helps the high-powered mountain top v.h.f. man to work DX at the expense of the poorly situated or low-powered operator; but conversely it can be argued that the plan assists this operator in working DX because the high-powered local is not using a frequency very close to that of a weak DX station (this of course does not apply under EDX conditions when special consideration to possible interference must be given by all operators). The whole problem boils down to whether we wish to use the 144 Mc/s band for only local QSOs—if so no band plan is necessary. But if, at times, we wish to work DX, and almost everybody enjoys doing this when conditions are favourable, then the band plan is essential. Do your part in keeping to it as far as possible. This is particularly important as more operators come on to v.h.f. as has been the tendency over the last year or so.

Modulation

There is a widely held belief that it is necessary to use more audio power to modulate a v.h.f. transmitter than a low frequency one. The result is that a number of stations overmodulate causing serious interference to other local stations. This is especially true when an operator in his efforts to raise an interesting DX station shouts into his microphone to improve the readability of his signals.

One reason why it is possible to apply considerably more audio to some v.h.f. p.a. stages without actually breaking the carrier is that they are not neutralized, with the result that drive power reaches the p.a. tank circuit even when the p.a. has zero h.t. However, if a p.a. is modulated so that the h.t. goes below zero (i.e. overmodulated) severe distortion is likely to occur which results in sideband splash and other unpleasant effects. A properly neutralized p.a., modulated correctly, will perform on 144 Mc/s as effectively as it would on low frequency, assuming, of course, that the valve is suitable for v.h.f. use. A valve particularly suited to this application is the QQV06/40 as it has built-in neutralization.

This raises the associated problem, that of measuring the modulation percentage of a v.h.f. transmitter. The conventional trapezoidal or modulation envelope methods using a c.r.o. are not successful owing to the r.f. lead lengths involved and the internal capacities and lead inductances of conventional c.r. tubes. One solution is to build a c.r.t. into the transmitter, and apply the r.f. to the *Y* plates through a directly connected tuned circuit (either *L*/*C* or Lecher line). Another method is to use a simple superhet receiver to convert the modulated v.h.f. signal down to an intermediate frequency to which a c.r.o. will respond. This is effective but can give misleading results owing to the modulation percentage being changed during the various mixing processes necessary. Readers' comments are invited on this problem and various solutions will be reviewed in a later issue of the BULLETIN.

Better Stability Required

G3LTF (Galleywood) thinks there should be a drive for better stability and power ratios on 2m and 70cm. If only people realized that cutting bandwidth from 3 kc/s to 100 c/s is equivalent to increasing aerial gain by 15db or running 3 kW input instead of 100 watts, more would do so. The gain is only realizable if both receiver and transmitter are stable so that they will stay within the bandwidth even after switching off and on a few times. This means transmitter and receiver oscillators should be crystal controlled of course, lightly run, designed carefully as regards draughts and heating and in continuous operation from at least a neon stabilized supply. No serious v.h.f. work can be done with v.f.o.s. The problem is even worse on 70cm and to this end the G3LTF transmitter is now run from the 1 Mc/s sub-standard oscillator via a chain of 6AK5 doublers to 8 Mc/s and then into the normal drive strip. The oscillator is set against MSF. On the receiving side he is fortunate in possessing an oven which simplifies crystal stability problems and now has the facility for receiving signals in a 30 or 20 c/s bandwidth, *provided they can stay there.*

Two Metre Station Reports

G5CP (Chesterfield) maintains a regular sked with G5DW every Monday at 18.45 G.M.T. on 145·65 Mc/s but it does not often work due to the Pennines. No doubt the difficulty adds spice to the efforts! In five hours operating during the 144 Mc/s C.W. Contest G5CP worked 25 stations. Not a very good day. G3JYP (Appleby, Westmorland) was worked for a new county.

G8KL (Bilbrook, nr. Wolverhampton) had a really enjoyable time on January 28 in the C.W. Contest. He found conditions something like the curate's egg ("good in parts") with a dull patch in the middle of the afternoon. About 45 stations were heard and 29 worked in 21 counties, which appears quite a passable effort. The location is excellent, 400 ft. a.s.l., about 4 miles north-west of Wolverhampton, and only needs a 6-over-6. G8KL criticizes stations which persisted in what were apparently automatic CQ calls—on and on whilst he waited knowing that the call he would eventually make would probably be abortive, but that the CQ station was assured of a call after signing.

VE3CXW/W4 (Washington), who used to be G2KB at Rugby and GM2AH at Greenock, is with the British Embassy in Washington and operates 2m fixed portable and mobile. The fixed station runs 10 watts with a six element beam. The converter has a Nuvistor pre-amplifier. In Washington, 2m activity is considerable and contacts can easily be made with more than 100 locals. VE3CXW/W4 finds that the most active areas are San Francisco and New York. Some areas tend to use vertical polarization, but in the Eastern States horizontal polarization is normal.

G3NPF (Southend-on-Sea) is active on 2m with 20 watts phone and 30 watts c.w. The transmitter comprises an EL91 8 Mc/s c.o. and tripler driving another EL91 tripler driving a 5763 doubling to 144 Mc/s with a 6164 p.a. In all, 43

R.S.G.B. V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham Hill, Kent, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144·50 Mc/s).

Date	Time	Error
February 6, 1962	12.00 G.M.T.	1710 c/s high
February 13, 1962	12.05 G.M.T.	2060 c/s high
Feburary 20, 1962	No measurement made.	
February 27, 1962	12.55 G.M.T.	2300 c/s high

The station is in operation from 06.30-23.59 G.M.T. daily, but may be on for the full 24 hours for test purposes from time to time.

different stations have been worked in five weeks, the best DX being G3ILD on c.w. and G6ZP on phone.

EI2W reports that he worked G3LZB, G6PC, G5IG, G3KYU and G3OAF on February 20 when conditions were good.

EI2W is now working on 144·008 and 144·020 Mc/s whilst EI2A is on 144·16 Mc/s. Any new EI stations coming up on 2m will be found in the first 200 kc/s of the band.

GI3OFT (Belfast) has found activity low recently, no doubt due to poor conditions, apart from the regular G/GI skeds. GI3OFT, GI5AJ and GI3GXP were active during most of the Contest period on January 28 but results were disappointing considering that the barometer was a steady 1031 mb. GI3OFT logged eight stations only with nothing worked south of Manchester. However, G5MA, G3HBW and G8CP (?) were heard between 16.00 and 16.50 G.M.T. (mostly 54/59) and each called several times without result. A new and rare DX station GI3NFM is now active two miles from Pomeroy, Co. Tyrone. This is the *first ever* 2m fixed station from that county. The present power is 15 watts, but operation is shortly to be with a QQV06/40A p.a. and a 6CW4 pre-amp to the c.c. converter. GI3OFT and G3JYP (Appleby) have been running a sked at 18.00 G.M.T. every evening since July 24 last and GI3OFT would appreciate reports from other stations in England hearing any of the transmissions.

G3LTF (Galleywood) found conditions during the January contest quite good, and *because it was a C.W. Contest* some good QSOs were possible, such as G3BW, G3ILD, and G3JYP. No GMs were heard, although northerly Gs stations were heard working them.

GM3LTJ (Aberdeen) is now operative on 145·8 Mc/s with a four element Yagi beamed on Dundee.

SM6PU Auroral Report for January 1962 (via G4LX)

On January 10 there were strong signals via the aurora at 15.35 G.M.T. They faded out and reappeared at 18.45 G.M.T. QSOs were made with LA4YG, SM2CFG, SM3AKW and SM6BSW. OZ7IGY was heard.

On January 14 another small opening took place when SM3AKW was worked. Similarly on January 19, when SM3AKW was worked once more.

Isle of Man DXpedition

Cambridge University Wireless Society will be operating a station on 145,300 kc/s from an excellent site on the summit of Snaefell during the period March 28 to April 4, 1962, under the call-signs GD3MZM, GD3OYW, GD3PIT and GD3PNC, depending on who is operating at the time. The equipment will include a Withers Electronics 10 watt transmitter and a J-Beam 6-over-6 aerial. The station will be in operation from 4 p.m. to 2 a.m. each day.

At the same time, the society will be operating GD6UW on all bands from 10 to 160m from Douglas. Members who wish to make skeds should write to Ian Sykes (G3OYW), The Vicarage, Lostwithiel, Cornwall, as soon as possible.

QSL cards for contacts with the DXpedition stations should be sent via G6UW.

LONDON U.H.F. GROUP

will meet at the Whitehall Hotel, Bloomsbury Square, London, W.C.1.

at 7.30 p.m. on Thursday, April 5, 1962

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

Four Metre Station Reports

G5CP (Chesterfield) says that northern activity seems to be increasing and new stations include G3NAN (Leeds), G3HA (Bradford) with G3NTD, G2BOJ, G3NJC and G3MSB all building. A QSO between G5CP and GM3EGW on February 5 was about the sixth. Efforts are being made (noon Sundays and 19.00 G.M.T. Mondays) to work EI2W, without results so far; skeds have now been arranged for 20.00/21.00 G.M.T. daily. Active stations in the area are G4OF, G5PW, G3HA, G3AZU, G3HRP, G3MNQ, G3GCX, G3KNP G3BNL, G3FYP, G3BPD, G3FFV, G6XX, G8CB, G3NSW and G3OHH, with G3NAO (Dewsbury), G3NNO (Leeds) and G3NAN (Leeds) recent QSOs added in for good measure. Nothing has been heard of the GI stations.

EI2W reports on the first EI/GI on 4m which took place on February 10 at 21.09 G.M.T. between GI3HXV and EI2W, RS58 in both directions. There had been tests over a fortnight when EI2W's signals were received in Belfast but the above was the first two-way contact. EI2W's frequency is 70·662 Mc/s.

EI2W and **GM3EGW** made the first EI/GM 4m contact on February 16, 1962 at 19.32 G.M.T.

GI3OFT (Belfast) reports that GI3HXV (Belfast) had a very fine phone QSO with EI2W. He runs several skeds—that with GM3EGW (Mondays, 23.00) is usually no bother, but success is still awaited with the G3EHY, G3OHH, G5CP and GM2FNF skeds.

Seventy Centimetres

G3BYY (Wraysbury, Bucks) reports that due to the prodding of G6JP, who offered details of a transmitter which used good valves, he has at last got on to 70cm. The unit is similar to the low power driver of the GB3GEC beacon transmitter: A.2521 tripler to 435 Mc/s, A.2521 amplifier on 435 Mc/s and DET24 p.a. running at about 16 watts input. Both the A.2521 driver and the DET24 are modulated. To date 17 stations have been worked in nine counties using 433·900 Mc/s. The aerial is a 6-over-6 at 41 ft. The receiver is a " cheap and cheerful " version of G6JP's two cavity front-end with the home-built station receiver. After obtaining details from G6JP of a 70cm cascode and a suggestion that it could be used for lumped circuits, G3BYY produced such a version and from the time power was first put on it until the first QSO was about three hours. From the very first GB3GEC was heard, although some coil-pruning was needed to peak up the signals. The gain is such that an unreadable S2 became a good S7 with the amplifier in circuit. G3BYY thinks a lot of 2m operators would be on 70cm if they saw the " familiar round bits of wire " in a circuit as opposed to magical trough-lines and other clever stuff!

G6JP reports that GB3GEC (431·5 Mc/s), with a time schedule of 24 hours daily, is being received by PE1PL with an input to the receiver of about 0·8 microvolt, noted as an "excellent signal." Reports on the reception of GB3GEC (over as wide an area as possible) would be greatly appreciated, as it is desired, among other things, to deduce the radiation pattern of the aerial system. This is very desirable as it appears that some stations at right angles to the beam are getting usable signals.

GI3OFT (Belfast) says there is still no report of a first GI/EI QSO. However, GI3KYP (Belfast) is erecting an 8-over-8 slot fed Yagi on a 50 ft. tower, and hopes to be active very shortly, looking for this honour.

G3LTF (Galleywood) is putting up a 72 element stack (three 24 element arrays) and is changing his receiver from the 17 Mc/s region to 12 Mc/s for reasons of stability improvement.

EI2W's frequency is 433·7 Mc/s.

Scottish V.H.F. Convention

NEWS has been received from W. C. Bradford (GM3DIQ) that this year's Scottish V.H.F. Convention will be held at the Brablock Hotel, Paisley, on April 28. Tickets, price 21/- each, may be obtained from L. F. Benzies (GM3DDE), 83 Hillview Road, Corstorphine, Edinburgh, 12, and from W. B. Miller (GM3PMB), 13 Alder Road, Glasgow, S.3.

Society News

Presidential Address

ABOUT 60 members were present at the Institution of Electrical Engineers, London, on Friday, February 23, 1962, to hear Mr. E. G. Ingram (GM6IZ) deliver his Presidential Address. During the course of his address, Mr. Ingram traced briefly the history and development of police radio within the City of Aberdeen and described how the present police duplex system works. A number of members participated in the discussion which followed, after which the General Secretary read to the meeting a message of good wishes to Mr. Ingram which had been received from the Chief Constable of Aberdeen and a telegram of congratulations to the President from the Prestwick R.S.G.B. Group.

The Chair at the meeting was taken by Major-General E. S. Cole, C.B., C.B.E. (Immediate Past President) who at the outset of the proceedings installed Mr. Ingram as the 28th President of the Society and on behalf of all members wished him a very happy year of office.

The Council was represented at the meeting by the Executive Vice-President and Honorary Treasurer (Mr. N. Caws, F.C.A., G3BVG), Messrs. R. C. Hills, B.Sc.(Eng.), A.M.Brit.I.R.E. (G3HRH), A. O. Milne (G2MI), L. E. Newnham, B.Sc. (G6NZ), J. W. Swinnerton, B.Sc.(Econ.) (Hons.), A.I.L. (G2YS), P. H. Wade (G2BPJ), A. C. Williams (GW5VX) and E. W. Yeomanson (G3IIR).

Bulletin Contributors

MEMBERS who are willing to contribute articles to the Society's Journal are reminded that some notes are available to help them prepare manuscripts in a form that will assist in securing uniformity of presentation, simplify the work of the Society's printers and draughtsmen and help ensure that their instructions are easily understood.

A copy of *Hints to Contributors* can be obtained on application to the Editor.

All contributions to the Society's Journal including those for the *Regional and Club* and *Forthcoming Events* features should be typed with double-spacing between lines using one side of the paper only. Information for the R.S.G.B. BULLETIN should not be included on the same sheet of paper as material for news bulletins.

Photographs should be clear and sharply focused. Prints should preferably be glossy and should contain information of general interest to members. Captions should be written on a separate sheet of paper.

Technical Contributions

THE Council has decided that as from the July 1962 issue the amount of the copyright fee paid to contributors to the R.S.G.B. BULLETIN shall be from £2 2s. to £5 5s. per 1,000 words at the discretion of the Editor. The highest rate will be paid for first-class technical articles

Col. Thomas B.E.R.U. Trophy

MEMBERS are reminded that the handsome Col. Thomas Rose Bowl (donated to the Society by Lt.-Col. C. W. Thomas, then G6MW, in 1935) is awarded each year to the leading United Kingdom entrant in the High Power Section of the B.E.R.U. Contest.

Committees of the Council

MR. H. L. GIBSON (B.R.S.1224) has accepted the Council's invitation to serve on the Scientific Studies Committee.

Region 14 Representative

MR. D. R. MACADIE (GM6MD) of 154 Kingsacre Road, Glasgow, S.4, has been re-appointed Region 14 Representative.

The delay in filling the Region 14 vacancy which occurred on December 31, 1961, was due to the fact that Mr. T. P. Hughes (GM3EDZ) was nominated in opposition to Mr. Macadie but Mr. Hughes' original nomination was lost in the post. After a lengthy exchange of correspondence the Council agreed to accept a duplicate nomination and a ballot was due to take place this month. However, after all the arrangements had been made for an election, Mr. Hughes, with the agreement of his sponsors, withdrew his nomination on the grounds of ill health. Mr. Macadie therefore becomes Region 14 Representative once again, an office he has held for more than 10 years.

Headquarters Fund List No. 6

THE following is the sixth list of those who had contributed to the Headquarters Fund up to February 28, 1962.

M. W. Humphrey (B.R.S.22910), J. E. Bowie (B.R.S.22157), L. Knight (G5LK), E. C. Cosh (G2DDD), T. A. St. Jonnston (G6UT), Slade Radio Society, P. F. Cundy (G2MQ), L. F. Ivin (G5IC), A. C. Bryant (B.R.S.3999), W. H. Ward (G3PCP), Welwyn Garden City R.S.G.B. Group, J. L. Meddemmen (G2CKW), N. E. Holden (GM4MF), Southampton Group, British Amateur Television Club, J. E. Hodgkins (G3EJF), J. L. Spates (W1ARA), J. S. Galeski (W4IMP), D. R. Webster (W6CZP), T. I. Lundegard (G3GJW), A. H. Parker (G3OV), T. Edgar (G3BZZ), A. F. Ward (G3CAT/VQ4FB), D. Hayward (G3OMH), C. Bolek (A.2567), C. Greig (5H3FQ), A. Kettlety (B.R.S.20925), C. Badger (G3OHC).

Total amount contributed to date: £1,284 13s. 8d.

Mullard Award 1961

ALTHOUGH two nominations were submitted to the Society the Council decided that neither of them came completely within the scope of the rules governing the Award. Mullard Ltd. have been advised of the Council's decision.

I.A.R.U. Calendar

THE *Calendar* of the International Amateur Radio Union for December 1961 refers, *inter alia*, to Project Oscar, a bill before the U.S. Senate to make it possible for amateurs of countries other than the U.S.A. to operate within the boundaries of the United States for up to three years, and to the meeting of the Panel of Experts in Geneva in September 1961. A letter from the International Civil Defence Organization in Geneva is reproduced in which reference is made to a discussion at a recent conference in Montreux

London Meeting

Friday, March 30, 1962

V.H.F. Symposium

arranged by the London U.H.F. Group

"S.S.B. on Two Metres" by F. A. Griffiths (G3MED)

"Transistor Applications at V.H.F." by Norman Ross (G3LAR)

"Stabilized Power Supplies for V.H.F. Equipment" by A. J. Worrall (G3IWA)

"V.H.F. Transistor Receivers" by John Gazeley (B.R.S.20533)

"Nuvistor Pre-amplifiers" by G. M. C. Stone (G3FZL)

at the

Institution of Electrical Engineers, Savoy Place, Victoria Embankment

Buffet Tea 6 p.m. **Meeting Commences 6.30 p.m.**

Golden Jubilee of the Society

Preliminary Announcement

THE Council has decided that the Golden Jubilee of the Society shall be celebrated by a dinner at the Connaught Rooms, London, on Friday, July 5, 1963, which will be the 50th anniversary of the day on which the Society was founded. The dinner will be open to members and their ladies.

In addition to the dinner it is anticipated that certain other social functions will be arranged during the week June 30-July 6, 1963, details of which will be published later.

Provincial and overseas members who intend to support the Golden Jubilee celebrations are advised to make hotel reservations *now*.

The Royal Hotel, Woburn Place, W.C.1 has been asked to hold a certain number of rooms in reserve.

regarding liaison between radio amateurs and organizations capable of giving help when emergencies arise.

The *Calendar* reports that observers from the I.A.R.U. Region I Division expect to attend the Intermediate Meeting of certain Study Groups of the C.C.I.R. in June, 1962, in Bad Kreuznach, Germany.

The *Calendar* also reports that a proposal by the Malayan society that power input should be limited to 250 watts, that separate c.w. segments at the low frequency end of the 10, 15 and 20 metre bands should be provided and that message handling on these three bands should be restricted to c.w. except in cases of national emergency, was defeated by 17 votes to 9. R.S.G.B. voted in favour of the proposal.

Mobile and Outdoor Operation

THE G.P.O. were recently asked to give a ruling on an interesting point regarding mobile and outdoor operation.

The query was raised by a member who often takes some portable gear in his car and operates it from a suitable location out of doors. The equipment is not installed in the car but he uses an 18 ft. loaded whip aerial attached to the car which is stationary for the tests. In such circumstances is an Amateur (Sound Mobile) licence necessary, bearing in mind that the station is never operated under mobile conditions?

The International Radio Regulations define a " mobile station " as a " station in the Mobile Service intended to be used while in motion or during halts at unspecified points."

When an amateur station with a permanently fixed aerial suitable for mobile operation is installed in a vehicle and operated from that vehicle, either when it is mobile or during a halt, the station is a mobile station and its operation would have to be in accordance with the terms of the Amateur (Sound Mobile) Licence, with the suffix /M added to the call-sign. If, however, an amateur merely uses his vehicle to transport portable equipment to a temporary location (even if it can be identified only by a grid reference) he can use the apparatus in that location under the terms of the Amateur (Sound) Licence. The G.P.O. would not object if, for convenience, an amateur operating his station under temporary alternative address conditions affixed the aerial temporarily to his stationary vehicle.

More Pirates Fined

ON January 24, 1962, at Victoria Law Courts, Birmingham, George Frederick Green of 221 Hurst Street, Birmingham 5 and Anthony Dennis Grogan of 390 Green Meadow Road, Northfield, Birmingham each pleaded guilty to a charge of using wireless telegraphy apparatus without the necessary licence. Green was fined £1, ordered to pay £2 2s. advocate's fees and to forfeit the apparatus to the Postmaster General. Grogan was fined £8 and ordered to pay £2 2s. advocate's fee. On the same day and at the same court Derek Leslie Hunt of 68 Haygreen Lane, Bournville, Birmingham 30 pleaded not guilty to a similar charge. He was found guilty, fined £5 and ordered to pay £2 2s. costs.

At Liverpool City Magistrates' Court on January 17, 1962, John Chaffer of 3 Hodgsons Cottages, Town Row, Liverpool 12, and Stephen John Leigh Walsh of 1A Hilltop Road, Liverpool 16, each pleaded guilty to a charge of using wireless telegraphy apparatus without the necessary licence. Each was fined £5 and ordered to forfeit the apparatus to the Postmaster General.

On January 31, 1962, at Brierly Hill Juvenile Court a 16-year-old youth pleaded guilty to a charge of using wireless telegraphy apparatus without a licence. He was fined £15, ordered to pay £5 5s. costs and to forfeit the apparatus to the Postmaster General.

Amateur Licences in Malaya

MEMBERS requiring information on licensing conditions in Malaya and Singapore may like to know that a small number of copies of the 1961 *Malayan Radio Annual* are available from Headquarters on request. The *Annual* is published by the Malayan Amateur Radio Transmitter's Society, P.O. Box 777, Singapore, who will be pleased to deal with enquiries.

Burma National Society

THE name of the Burma Amateur Radio Society was changed to the Burma Amateur Radio Transmitting Society at an Extraordinary Meeting held on November 26,

Top table guests at the Christmas 1961 luncheon organized by the London Members' Luncheon Club included the President-Elect and the President of the R.S.G.B. From left to right May Gadsden, Norman Caws, G3BVG (Hon. Treasurer), Mrs. Caws, Major-General Eric Cole, G2EC (President), Mrs. Cole, Stanley Vanstone, G2AYC (Chairman of the L.M.L.C.), Mrs Vanstone, Clem Jardine, G5DJ (Hon. Treasurer, L.M.L.C.), Mrs. Jardine, Ted Ingram, GM6IZ (President-Elect). Frank Fletcher, G2FUX (Hon. Secretary, L.M.L.C.) acted as toast master to a company of 84 members and their ladies.

(Photo G3NMR)

1961. The address of the society, which is a member of the International Amateur Radio Union, is P.O. Box 800, 95 Maung Taulay Street, Rangoon, Union of Burma.

R.S.G.B. Exhibition

THE 1962 Exhibition organized by Mr. P. A. Thorogood (G4KD) and sponsored by the R.S.G.B. will be held at the Seymour Hall, Seymour Place, Marble Arch, London, W.1, from Wednesday, October 31, to Saturday, November 3, 1962.

Gerald Marcuse Memorial Fund

A TOTAL of £135 7s. 4d. was received in response to the appeal for donations to the Gerald Marcuse Memorial Fund. The main memorial will take the form of a teak seat to be placed near Bosham Church, West Sussex, close to where Gerald Marcuse lived for many years. In addition, with the approval of the present owner and in accordance with the wishes of many of those who made a donation to the fund, a plaque is to be fixed to "Coombe Dingle," Queens Park (now known as 14 Queens Park Road, Caterham, Surrey) the house from which Gerald Marcuse carried out his pioneer Empire broadcasts.

The seat and plaque have been designed by Mr. H. A. M. Clark (G6OT) who has conducted the negotiations with the various manufacturers.

The plaque will be unveiled by the Chairman of the Caterham and Warlingham Urban District Council (Councillor J. P. Blair, J.P.) at 3 p.m. on Saturday, April 7, 1962, which will be the day after the fourth annual reunion of the Radio Amateur Old Timers' Association. Gerald Marcuse died on April 6, 1961. The seat will be handed over to the appropriate authorities on a date to be settled later.

Any balance left over will be devoted to a Gerald Marcuse Memorial Prize Fund, details of which will be announced at the R.A.O.T.A. Reunion on April 6, 1962.

As the present owner of "Coombe Dingle" has very kindly offered to provide tea for those attending the unveiling ceremony on April 7 members who intend to be present are asked to write to the Founder Secretary, R.A.O.T.A., 16 Ashridge Gardens, London, N.13, not later than March 31, 1962.

Silent Keys

WALTER JOHN EDWARDS (GW2TY)

The world of Amateur Radio in South Wales has lost a colourful figure in the person of Walter John Edwards (GW2TY) whose death occurred recently at the age of 53. Licensed in the early thirties, GW2TY was one of the small band who started radio the hard way by obtaining his power supplies from hand-driven generators, and his skill in operating a Morse key and generator simultaneously was legendry.

Although he had been inactive for a number of years he restarted operation some while ago and was as enthusiastic as ever in his plans for the future.

For over a year preceding his death, he was very seriously ill but his enthusiasm was such that he had some of his equipment transferred to his bedroom in order to keep in touch.

He is survived by his widow and a teenage son to whom the sympathies of the Region are extended. C.H.P.

JAMES SPEAKMAN (G3GYV)

James Speakman (G3GYV) of Hartford, Cheshire, died on January 31, 1962, after a very short illness. Although Jim operated on all bands up to 144 Mc/s, his first love was Top Band, where his fine signal was extremely well known over a wide area. His regular contacts with his Cheshire friends attracted a wide audience among S.W.L.s, several of whom recently obtained their own licences as a result of Jim's friendly guidance.

He was R.A.E.N. Area Controller for East Cheshire, and it is tragic that he has not lived to see his group become fully operational after so much painstaking recruiting to build up an effective organization.

We extend our deepest sympathy to his widow, Mary, and his son, Bernard, in their great loss. Jim will be sadly missed by all his friends. G3ERB

Representation

THE following is an addition to the list of County Representatives published in the December 1960 issue:

CITY AND COUNTY OF BRISTOL
J. TANNER (G3NDT/T), 20 Hughenden Road, Bristol 8.

Town Representatives

THE following are additions to the list of Town Representatives published in the December 1961 issue.

REGION 1—LANCASHIRE WEST
PRESTON
G. LANCEFIELD (G3DWQ), 35 Brixton Road, Frenchwood.

REGION 2—YORKSHIRE WEST
HALIFAX
R. SMITH (G3NBI), 3 Hunter Hill Road, Mixenden.

REGION 4—LINCOLNSHIRE
SKEGNESS AND DISTRICT
L. R. BEESON (G3IVB), 20 Albert Avenue, Seacroft, Skegness.

REGION 7—LONDON SOUTH
NORWOOD AND SOUTH LONDON GROUP
G. D. GAUNT (B.R.S.19261), 394 Upper Elmers End Road, Beckenham, Kent.

LONDON EAST
CHINGFORD
R. H. SMART (G3MMC), 7 Brook Gardens, Chingford, London, E.4.
DAGENHAM AND HORNCHURCH
E. G. AUGOOD (G3MML), 49 Parkstone Avenue, Hornchurch, Essex.
EAST HAM
H. E. W. REEVE (G3JXZ), 284a Barking Road, London, E.6.
LOUGHTON AND BUCKHURST HILL
C. WATERMAN (G3NKX), 46 Danbury Road, Loughton, Essex
ROMFORD
N. MILLER (G3MVV), 55 Kingston Road, Romford, Essex.

REGION 9—SOMERSET
WESTON-SUPER-MARE
H. ANDREWS (G5DV), 6 Milton Avenue,

REGION 15—BELFAST
P. G. BOWER (GI3OFT), 8 Richhill Crescent, Belfast 5.

Affiliated Societies Representatives

THE following are additions to the list of Affiliated Societies Representatives published in the December 1961 issue.

CORNISH RADIO AND TELEVISION CLUB
G. W. Hubber (G3NVJ), 9 Cardrew Terrace, Redruth, Cornwall.

CRYSTAL PALACE AND DISTRICT RADIO CLUB
G. M. C. Stone (G3FZL), 10 Liphook Crescent, Forest Hill, London, S.E.23.

SOUTH SHIELDS AND DISTRICT AMATEUR RADIO CLUB
Derek I. Forster (G3KZZ), 41 Marlborough Street, South Shields, Co. Durham.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the August 1961 issue.

BLOXHAM SCHOOL RADIO CLUB—c/o I. K. Gurney, All Saints School, Bloxham, nr. Banbury, Oxon.

LYMINGTON AND DISTRICT AMATEUR RADIO SOCIETY—c/o W. Johnson, Denton, Hordle Lane, Hordle, Lymington, Hants.

SOUTH DORSET RADIO SOCIETY—c/o C. E. Briggs, 54 Prince of Wales, Road, Dorchester, Dorset.

TRI-ZONAL AMATEUR RADIO CLUB—c/o a/2C G. R. Macdonald, 6915th RSM, Kingsley Kaserne, Hof/Saale, Germany.

Change of Address

THE address of the Albright and Wilson Amateur Radio Society is now P.O. Box 3, Oldbury, Birmingham. The Society's station, which operates under the call G3OXD, is located in Worcestershire and not in Warwickshire.

Can You Help?

● H. Gould (A.3010), 37 Harehills Avenue, Leeds 8, who wishes to obtain the manual for the BC.348 receiver?

● R. K. Marshall (A.2977), "Braehead," Balbardie Road, Bathgate, West Lothian, who requires the handbook for the Hammarlund HQ120X receiver?

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, January 29, 1962, at 6 p.m.

Present: The President (Mr. E. G. Ingram in the Chair), Major-General E. S. Cole, Messrs. N. Caws, C. H. L. Edwards, R. C. Hills, L. E. Newnham, F. K. Parker, F. A. Russell, R. F. Stevens, G. M. C. Stone, J. W. Swinnerton, P. H. Wade, A. C. Williams, E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

Apology for Absence

An apology for absence was submitted from Mr. A. O. Milne.

* * *

New Members

The President extended a warm welcome to the new members of Council (Messrs. Stevens and Swinnerton) and explained briefly Council procedure.

Presentation

Mr. Hills handed to the President a framed telegram dated December 12, 1961, from the Oscar Association of California. The telegram addressed to the Society refers to the firing of the first amateur built orbital satellite radio transmitter (OSCAR) and records the entry of world wide Amateur Radio into the new field of space communications.

The President thanked Mr. Hills on behalf of the Council for his gift to the Society.

Testgear Components (London) Ltd.

It was reported that further letters had been received from members complaining of the poor service from Testgear Components (London) Ltd. The company had been asked in a letter to give an assurance that orders and correspondence would be dealt with promptly. The company in reply had expressed regret for the unsatisfactory service experienced by members from their mail order department but the position was such that they could not give the assurance required. In the circumstances the company had decided it would be better not to continue to advertise in the R.S.G.B. BULLETIN and other Society publications.

The Council agreed to accept the proposal made by Testgear Components (London) Ltd. not to advertise further for the time being in Society publications.

Membership

Resolved (i) to elect 110 Corporate members and 44 Associates; (ii) to grant Corporate membership to 14 Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to Bloxham School Radio Club, Dudley Amateur Radio Club, South Dorset Radio Society and Tri-Zonal Amateur Radio Club (Germany).

Marconi 60th Anniversary Celebrations

It was reported that expenses amounting to £73 2s. 4d. were incurred by the Cornish Radio and Television Club on behalf of the R.S.G.B. in connection with the Marconi 60th Anniversary celebrations at Poldhu, Cornwall. Marconi's Wireless Telegraph Co. Ltd. had very kindly made a contribution of £30 10s. towards the cost of entertainment.

Resolved to meet the account of £42 12s. 4d.

Annual General Meeting

Resolved to hold the 1962 Annual General Meeting of the Society at Over-Seas House, London, on Saturday, December 15.

Constitution of Committees 1962

The Committees of the Council for 1962 were constituted. (see page 404, February, 1962, R.S.G.B. BULLETIN).

QSL Manager

Resolved to re-appoint Mr. A. O. Milne QSL Manager for the year 1962.

V.H.F. Manager 1962

Resolved to re-appoint Mr. F. G. Lambeth V.H.F. Manager for the year 1962.

Raffle Prizes

Resolved to endorse the view expressed at the recent Regional Representatives' Conference that there should be a complete ban on applications for raffle prizes in connection with O.R.M.s during 1962.

O.R.M.s

Resolved to endorse the view expressed at the recent R.R.s' Conference that in future the initiative for suggesting O.R.M.s should be left to individual R.R.s.

Region 9 O.R.M.

Resolved to authorize the Region 9 Representative to hold an O.R.M. in Weston-super-Mare on September 30, 1962, or on such other date as may be decided later.

Composition of the Council

Mr. E. G. Ingram tendered his resignation from the office of Zone F Representative.

Resolved to accept the resignation; to declare that a casual vacancy exists on the Council; to invite Corporate members resident in Zone F to nominate a member to fill the vacancy.

In connection with the dual offices of Executive Vice-President and Honorary Treasurer held by Mr. Caws, the Council took note that the Finance and Staff Committee had already recommended that the present Articles of Association should be amended to prevent a member of the Governing Body from holding two offices. Mr. Caws stated that he would be prepared to do whatever the Council deemed to be wise.

Members of the Council expressed the opinion that they would prefer Mr. Caws to retain the dual offices for the current year.

I.A.R.U. Calendar

Resolved to cast an " aye " vote in favour of the election of R.A.L. (Lebanon) to membership of the I.A.R.U.

Reports of Committees

Resolved (i) to receive as Reports the Minutes of meetings of the Mobile Committee held on December 13, 1961, and of the Contests Committee held on December 14, 1961; (ii) to accept and adopt the Recommendations of the Contests Committee.

(The recommendations dealt with various contest matters including the calendar of events for 1962.)

Transtronic Kits

Attention was drawn to the fact that a firm in London were again offering for sale Transtronic kits of parts without informing would-be purchasers that a licence is required to establish and operate an amateur transmitting station. It was agreed to mention the matter to the G.P.O.

Amateur Radio Handbook

Mr. Williams and Mr. Hills stated that they had been asked by the Port Talbot and Welwyn Groups respectively to convey congratulations to those concerned with the production of the *Handbook*.

The meeting terminated at 10.30 p.m.

Posting Certificate

ALL copies of the February issue of the R.S.G.B. BULLETIN were posted on Thursday, February 15, 1962, and the Society holds a certificate to that effect from the Letchworth, Herts, Post Office.

Electrical Engineers Exhibition

THE Eleventh Electrical Engineers Exhibition will be held at Earls Court, London, from March 20-24, 1962. On the Tuesday, Thursday and Friday the Exhibition will be open from 10 a.m. to 7 p.m., on the Wednesday from 10 a.m. to 9 p.m. and on the Saturday from 10 a.m. to 6 p.m.

The Exhibition, which is one of the greatest displays of electrical equipment, is organized by the Electrical Engineers (A.S.E.E.) Exhibition Ltd., of which Mr. P. A. Thorogood (G4KD) is General Manager.

GB2RS SCHEDULE

R.S.G.B. News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.30 a.m.	North Midlands
	11 a.m.	North East England
	11.30 a.m.	South West Scotland
	12.00	North East Scotland
145·55 Mc/s	11.15 a.m.	Beaming south-east from Leeds
	11.30 a.m.	Beaming south-west from Leeds
	11.45 a.m.	Beaming north from Leeds
145·3—145·4 Mc/s	12 noon	Beaming north from South East England
	12.15 p.m.	Beaming west from South East England

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.

CONTEST NEWS

RESULTS — REPORTS — RULES

Low Power Contest 1962

THE rules for the Low Power Contest to be held on April 7-8 are the same as for previous years. The bonus to encourage the use of wholly transistorized transmitters is again included.

When: 18.00 G.M.T. to 23.00 G.M.T. on April 7 and 08.00 G.M.T. to 20.00 G.M.T. on April 8, 1962.
Eligible Entrants: All fully paid-up members of the R.S.G.B. resident in Europe.
Contacts: Must be made on c.w. (A1) only between 3500 and 3600 kc/s.
Scoring: Points will be scored on the following basis:

Watts input to p.a. stage	Up to 0.5	To 1	To 2	To 3	To 4	To 5
Points per contact	20	10	5	3	2	1

A bonus of 20 points may be claimed for the first contact with each different county code area listed on page 360 of the January issue of the R.S.G.B. BULLETIN. **Bonus for the use of wholly transistorized transmitter: double points.**

Contest Exchanges: RST reports followed by the contact number starting at 001 and the county code number, e.g. 559001 Nr.17.

Logs: (*a*) Must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Call-sign of station contacted," " My report on his signals and serial number sent," " His report on my signals and serial number received," " His County Code No.," " My input power," " Points claimed."

(*b*) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed.

(*c*) Details of the transmitter and power supply must be given. Entrants claiming bonus points for use of transistors must enclose a circuit diagram of the transmitter.

(*d*) Entries must be postmarked not later than **Monday, April 23, 1962.**

Awards: At the discretion of the Council, the **1930 Committee Cup** will be awarded to the winner and **certificates of merit** to the runner-up and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.

The General Rules for R.S.G.B. Contests published on page 361 of the January 1962 issue of the BULLETIN apply to the contest.

D/F Qualifying Events

DETAILS of forthcoming qualifying events are as follows:

LONDON

Sunday, April 15, 1962
Organizer: W. A. Martin (G3FVG), 6 Tyrrell Road, East Dulwich, London, S.E.22, on behalf of the Clifton Amateur Radio Society.
Frequency: 1875 kc/s
Call-sign: G3GHN/P
Map: Ordnance Survey, New Popular Edition, Sheet No. 171.
Assembly Point: near Scotshall Farm, Farleigh (N.G.R.379601).
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer at least 7 days in advance stating the number in their party requiring tea which will be held at the Pavilion Cafe, Green Street Green, near Farnborough, Kent (N.G.R.455633) at 17.30 B.S.T.

Second European " Fox Hunt " Championships

APPLICATIONS to take part in the Second Region I I.A.R.U. European Fox Hunt Championships to be held at Ankaran, Yugoslavia, on August 10-11, 1962, should be sent to Savez Radioamatera Jugoslavije, Post Box 324, Beograd, Yugoslavia, as soon as possible and in any event to arrive not later than May 15, 1962. The bands to be used in the Championships will be 3·5-3·6 Mc/s and 144-146 Mc/s.

Ankaran is a pleasant village on the northern coast of the Adriatic, about 20km south of Trieste and 80km south-west of Ljubljana. Accommodation will cost from 3,000 dinars (about 28s.) in an hotel to 2,250 dinars (about 21s.) in a camp or bungalow. Excursions to acclimatize participants are being arranged for the period August 6-9.

420 Mc/s Contests 1962

THE Council has accepted a recommendation of the Contests Committee that the date of the First 420 Mc/s Contest should be moved to May 26-27, 1962, and the date of the Second 420 Mc/s Contest to October 20-21, 1962.

V.H.F. National Field Day 1962

THE Council has accepted a recommendation of the Contests Committee that a V.H.F. National Field Day should be held on July 7-8, 1962, using the 144-146 Mc/s band only. Consequent upon this decision, the Second 144 Mc/s Field Day scheduled to be held on July 22, 1962, has been deleted from the *Contests Diary*.

The Contests Committee has asked that publicity be given to the intention that all v.h.f. and u.h.f. bands will be used in the **1963** V.H.F. National Field Day.

Grafton Radio Society Top Band Contest

CERTIFICATES will be awarded to the operators placed first, second and third in the Open Section of the G2AAN Top Band Contest arranged by Grafton Radio Society which is to be held between 22.30 G.M.T. on March 24 and 01.00 G.M.T. on March 25 (c.w. leg) and between 21.30 and 24.00 G.M.T. on March 31 (phone leg). One point will be scored for each contact, the final score being the sum of the scores for the two legs. Contest exchanges will comprise the RST or RS report followed by a serial number of the contact commencing between 001 and 100 for the first contact. The Open Section is open to licensed radio amateurs throughout the U.K.

Full details may be obtained from the Hon. Secretary, A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

Can You Help?

● I. B. Bullock (B.R.S.22374), 15 Salisbury Close, Princes Risborough, Aylesbury, Bucks, who wishes to borrow the service sheet for the National NC33 receiver?

● 4254423 J/T Wayman, N. (ZC4JW), R.A.F. Heraklis, B.F.P.O. 53, who wishes to know a source of supply of mu-metal?

A leaflet describing **inexpensive miniature relays** for voltages from 6-415 volts 50 c/s and 6-110 volts d.c., may be obtained from Electrical Remote Control Co. Ltd., Elremco Works, Harlow New Town, Essex.

The **" Paristor " is a calculator** for determining a wide range of values in parallel resistive and series capacitative circuits. An additional feature is that the device indicates directly the most suitable combinations of preferred values of parallel resistances and series capacitances to yield a desired value. The price of the calculator is 44s. 6d., and further information may be obtained from Paristor Ltd., 96 Park Lane, Croydon.

A catalogue describing the **coils and coil packs, b.f.o. units,** i.f. transformers and switches that are available from Electroniques (Felixstowe) Ltd., may be obtained from the firm at Bridge Road, Felixstowe, Suffolk, price 1s.

Alfred Imhof Ltd., Ashley Works, Cowley Mill Road, Uxbridge, Middlesex, has introduced a new construction system, the **Miniature Imlok,** based on the established Imlok system. A catalogue is available on request.

Details **of Avel-Dynaco amplifiers,** pre-amplifiers and tuners may be obtained from Aveley Electric Ltd., Ayron Road, Aveley Industrial Estate, South Ockendon, Essex. The units are available in either kit form, or wired and tested.

Electrolube, the electrical and mechanical lubricant, is now available in an aerosol container. An informative booklet on the uses of the product may be obtained from Electrolube Ltd., 16 Berkeley Street, London, W.1.

Letters to the Editor . . .

Neither the Editor nor the Council of the Radio Society of Great Britain can accept responsibility for views expressed by correspondents. Letters for inclusion in this feature should be concise and preferably not more than 200 words in length.

Headquarters

DEAR SIR,—I feel I must support the view, expressed by Mr. Moss (G8VF) in a recent letter, that the proposed new permanent Headquarters of the Society need not necessarily be sited in the London area.

It is my opinion that being " the heart of the Commonwealth " does not automatically make London the ideal place from which to conduct the affairs of the Radio Society of Great Britain. I know that were Headquarters sited more centrally *vis-à-vis* the country as a whole, then participation in Conferences, Lectures, Conventions, and Exhibitions would at least become a possibility.

It has been suggested that many members are not interested in local Group activities. This may be so for various reasons, not all of them mere apathy, but the major events which I would support are placed out of my reach by virtue of their geographical location in the South of the British Isles.

I would therefore suggest that the whole Membership be consulted before any final decision is arrived at. The views expressed by the various Regional Representatives are not necessarily the views of their constituent members on this issue.

Yours faithfully,

Dalmellington, Ayr. JAMES PATERSON (GM3ONA).

DEAR SIR,—S. W. Malin (B.R.S.3520) makes some interesting points in the February BULLETIN. It could well be, however, that the membership as a whole is not in favour of this project or, at least, as it has so far been outlined in the BULLETIN. For instance, we read on page 353 of the January issue " Overseas visitors are not impressed with the present facilities for entertaining them at Headquarters "—and the President stated, " It was for that reason efforts were being made to provide better accommodation where visitors could be made more welcome."

In my view, even with increased subscriptions, the Society cannot possibly meet the expenditure and maintenance costs involved in financing an enterprise for the express purpose stated above.

Yours faithfully,

J. H. CANT (G6FU)

Ash Vale, nr. Aldershot, Hants.

Subscription Rates

DEAR SIR,—Mr. Caws announced at the last A.G.M. that the annual subscription for Corporate Members is to be increased from 30/- to 35/-.

Why does not the Council take the " bull by the horns " and increase the subscription of licensed members to £3/3/- and of non-licensed Corporate members to £2/2/- instead of " playing about " with a few shillings each time the funds get low?

The technical and other information I glean from the BULLETIN is worth £2/2/- to me. Surely this, and the many extra facilities enjoyed by licensed members, including their representation by the R.S.G.B. in matters of International importance, is worth £3/3/- to them.

Yours faithfully,

IAN B. JAMIESON, B.SC. (B.R.S.6752)

Elgin, Morayshire.

R.S.G.B. QSL Bureau—An Appreciation

DEAR SIR,—With reference to the recent DXpedition to Kamaran Island, I express, on behalf of the Royal Air Force A.R.S., and the seven operators concerned, an appreciation of the excellent services rendered by G2MI and the R.S.G.B. QSL Bureau.

At the final count some 10,000 cards approximately will have passed through the Bureau. Without this efficient facility (the worlds' best?) this confirmation task could not have been accomplished.

Should any of these QSLs contain incorrect, or lack information, this is an unintentional error prompted by having to write, by hand, some 6,000 cards. It does not indicate " a lack of relish of QSL chores " or irresponsibility (*M.O.T.A.*, December 1961).

I will replace any such cards received by readers. Our aim is a 100 per cent. service—including those SWLs who " heard " us calling CQ and nothing else.

Yours faithfully,

(Sgt.) ROY HANDLEY (G3GJQ)

R.A.F., Swanton Morley, Norfolk. QSL Manager, Kamaran Island Expedition 1961.

Transatlantic Tests on 160 metres

DEAR SIR,—Bad manners seem to be on the increase. At 05.50 on Sunday, February 4, a GW3 + 3 called W1BB on the latter's frequency, 1809 kc/s. I feel sure he did so in total ignorance of the usual custom, yet on came a G station, with no call, and said, " QSY HF LID." A series of high speed dots were then sent, completely blotting out the frequency and then, " do you get msg now." I felt sorry for the GW and tuned down to 1809 in order to tell him the procedure but before I could do so, I heard another G station come on to the h.f. side of 1809 and advise the GW what to do: the operator of this station, a real old timer, explained most courteously and clearly what should be done to stand a chance of being heard in the U.S.A. The point here is that it was the unnamed G which was breaking regulations—not the GW! The latter was perfectly entitled to stay where he was. Nowadays, in the " rat race " for certificates, far too many amateurs think they are entitled to direct others what to do. Not so long ago I listened to a W do just this in a most offensive manner.

It is apparently more difficult for GM stations, and particularly the northern ones, to get across on 160—this is confirmed by W1BB. That being so, may I appeal to those Gs who have had regular contacts with W/VE on 160 to cut their repeat QSOs to the minimum? This will give others a better chance.

Yours faithfully,

Inverness. J. MACINTOSH (GM3IAA, ex-VS1AA)

A Plea for Courtesy

DEAR SIR,—It is becoming increasingly noticeable that a few amateurs are disregarding the normally accepted behaviour of intelligent people. It is recognized there may be many provocations, and patience is often necessary, especially in dealing with the newcomer and the inexperienced, or the one we think is just not as intelligent as we are!

Recently I overheard a United States amateur in a Caribbean Island tell a WA2 on 7 Mc/s that he was a pest. This same gentleman later told us that the air might be better without our signals! Another United States citizen, also on a Caribbean Island, was overheard to tell an amateur to " shut-up."

When a rare DX station is struggling to cope with a pile up, and perhaps not managing as well as some think he ought to, choice expressions of ill-mannered exasperation such as " lid " and " nuts " are being heard far more frequently than in the past. We have heard it said that some amateurs are not appreciating this crude behaviour by a few United States amateurs!

Let patience have her perfect work. . . .

Yours faithfully,

H. A. M. WHYTE (VE3BWY, ex-G6WY).

Toronto, Canada.

Operating Standards

DEAR SIR.—Enough of this self-congratulatory back patting! (*Current Comment*, June 1961.) The operating standards of the average G worked from here are no better, and often worse, than those of your neighbours in Central Europe. You don't compare to the Americans, Canadians, or Russians (yes, Russians), in operating proficiency.

Nor are the signals themselves any better quality-wise: chirps, clicks and rough notes seem to emanate just as readily from Chelmsford as Czechoslovakia (and, by the way, just as frequently from G6, G8 and G4's and G3N's). So please, less of " our

operating standards are among the highest in the world "—they're not and such complacency won't make them any better.

Another point from June *Current Comment*—you should have learnt by now, Mr. Editor, that the surest way of *not* getting replies from DX is to call off frequency. Why should a DX station bother to tune 5 kc/s away when there are plenty of stations calling on his frequency? If he's any good he'll be able to sort them out and reduce the frequencies occupied by callers.

Yours faithfully,

Elizabeth North, South Australia. — JEFF VALE (VK5NQ) TUBBY VALE (VK5NO)

Maritime Mobile Operation on the DX Bands

DEAR SIR,—I would refer to the Editorial comment to the letter from Mr. Hughes (G3OSR) printed in the November 1961 issue of the BULLETIN, and as a member of the largest "operating company," and, incidentally, an ex-Marine Radio Officer, I would like to clear up any misunderstanding which may exist in the minds of members.

A careful search through our records has failed to reveal that my company has at any time opposed for any reason the use of amateur equipment on vessels controlled by us.

Furthermore, it has always been the practice of operating companies to remit all or a large proportion of the Ship Tax portion of the charge on messages sent by members of the crew (all in the case of the Radio Officer), consequently any revenue loss would not be worthy of consideration.

Organizations which would suffer would be those administering coast station and land line services.

Yours faithfully,

London, W.3. — M. J. HICKS (G3ASI).

(We shall await with interest a letter from the operating company concerned to confirm they would raise no objection to the issue of /MM licences for DX operation.—EDITOR.)

Low Power Contests

DEAR SIR,—I refer to the comments in the December issue of the BULLETIN concerning Low Power Contests.

The R.S.G.B. is, in my opinion, largely to blame for the small number of entries for both the L.P. Contest and L.P. Field Day. Take the 1961 L.P. Contest for example. The rules were published in the March 1961 issue of the BULLETIN just three weeks before the contest was due to take place. How the average amateur with little time at his disposal is expected to design, construct and test gear in three weeks, I don't know. Unlike equipment required for other contests one can't go into a shop and buy a ½ watt transmitter. Again it has been threatened that the 1962 contests (if they take place) will be "all-transistor" affairs. The only effect of this will be that even fewer contestants will take part.

The BULLETIN report states that "contests are provided for three main reasons—the wish of the membership, to stimulate band occupancy and to promote the advance of "techniques." I contend that this is a lot of nonsense and that the main reason why 99 per cent of operators take part is for the sheer pleasure to be gained in operating competitively. Remember, *Amateur* Radio is a *hobby*.

Apart from the joy of operating in a contest there is pleasure in reading the results of the efforts of others, even when one's own entry is listed at the bottom of the table. In recent years on more than one occasion the results of the Low Power Contest and Low Power Field Day have merely consisted of a list of competitors—what incentive for others to take part? A full report on contests should *always* be given; in small type if space is a consideration.

As far as I know, the R.S.G.B. L.P. contest, L.P. Field Day are unique events, so I say *keep them in the contest diary* with the rules as they are at present, *but* give at least four *months* advance notice and publish full reports.

Yours faithfully,

Leatherhead, Surrey. — GEOFFREY R. HAYNES (G3CWL).

P.S.—I was unable to take part in L.P. F/D in 1961 as I was abroad at the time. If I had taken part my equipment would have weighed 12 lb.

Jamborees-on-the-Air

DEAR SIR,—The Fourth Jamboree-on-the-Air was held during the two days October 21 and 22, 1961 and, from the reports so far received from all over the world it proved very successful indeed. The event has two objects, the first being to enable Scouts everywhere to make contact with other members of the Movement overseas, to talk to them and learn something of their problems and activities. The second object is to interest them in Amateur Radio, and I am glad to say that we know of quite a number of new "amateurs" who first "caught the bug" at a previous Jamboree.

We fully realize that this annual event could not take place without the co-operation of the Amateur Radio fraternity, and Scouts everywhere owe them a great debt of gratitude for their willing co-operation and advice. Obviously, I cannot thank each one personally and so I would like you, if you would, to pass on my sincere thanks through the medium of your journal.

We propose to hold the Fifth Jamboree-on-the-Air over the weekend October 20-21, 1962 from 00.01 G.M.T. on the 20th to 23.59 G.M.T. on the 21st.

With renewed thanks,

Ottawa, Canada. — D. C. SPRY, *Director*
Boy Scouts International Bureau

Insurance on Club Events

DEAR SIR,—With reference to the Minutes of the Council Proceedings of October 23, 1961, you may like to advise future enquirers that it is quite simple and fairly inexpensive to arrange insurance to cover most club activities.

The best course is for the secretary to get in touch with any well-known insurance company and obtain a quotation without obligation. There is of course no reason why a quotation should not be obtained from several offices.

As an insurance clerk, I myself arranged the insurance for my own local club and as I also drafted the actual policy it does of course cover all the things we could think of.

Points to watch are:

(i) Indemnity to the local council if accommodation is hired from them.

(ii) Adequate cover for normal club meetings and any additional activities.

(iii) Activities away from the usual premises (i.e. Morse classes or committee meetings may be held elsewhere).

(iv) Cover for field days or social activities such as "Bucket and Spade Parties" and coach trips, etc.

All possible information should be given to the insurance company so that no point is missed. They will often require to make a survey before quoting, but this is part of the service and is not the responsibility of the club.

I am of course only referring to Public Liability Insurance; fire, burglary or other cover would be extra.

Lancing, Sussex. — J. R. TOOTILL (B.R.S.20543)

The Amateur is a Gentleman

DEAR SIR,—Wandering around the recent very interesting Radio Hobbies Exhibition, I stopped at one stand and overheard the following "tit-bit" of conversation:—

"... the 2 metre band? ... well, Sir, that is the only band on which you meet gentlemen ...!"

I am but a raw S.W.L. and must admit that this comment left me somewhat bewildered, and slightly amused. From time to time I have heard some queer things on most bands, but I must have a crack at this 2 metre band and then, perhaps, I will learn to distinguish the difference between 73 and 88 (or am I on the wrong track?).

Yours faithfully,

Wickford, Essex. — A. J. KERSHAW (B.R.S. 22513).

All Change

DEAR SIR,—Now that there seems to be a lull in the technical wrangle between the partisans of a.m. and Mr. Thornley, might it not be suggested to the G.P.O. that a date should be specified by which all a.m. stations in the United Kingdom should have changed to s.s.b.?

This would solve some problems.

Yours faithfully,

Oxford. — W. J. EPTON (G3NGJ)

(And introduce a few others!—EDITOR.)

Can You Help?

● I. W. Sheffield (A.2857), 5 Sciennes, Edinburgh 4, who requires the circuit of the R.1481 receiver which uses 13 valves and covers the 4m band?

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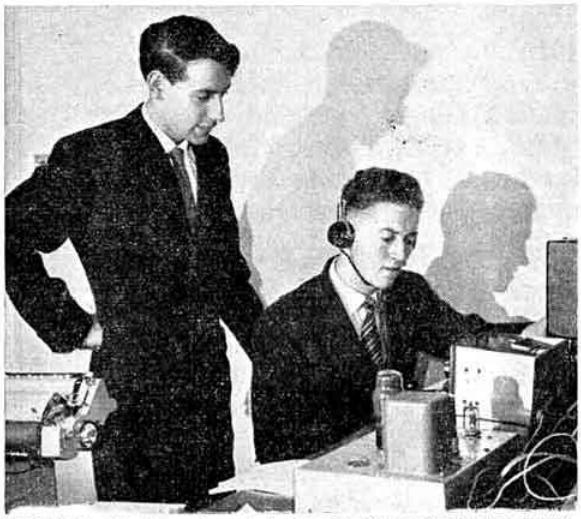
Published by Radio Society of Great Britain

28 Little Russell Street, London, W.C.1

R.A.E.N. Notes and News

By E. ARNOLD MATTHEWS (G3FZW)*

THE efficiency of a R.A.E.N. group can well be judged by its reaction to the possibility of imminent disaster, and in this respect **Norfolk** earn full marks for their prompt reaction to the mid-February gale which was responsible for the highest tide recorded on the coast since 1953. Late in the afternoon of February 16, the C.C., G3HRK, placed part of the North Norfolk group on semi-alert, and at the same time was informed that G6ZG had alerted his group. As soon as North Norfolk net was in operation the fact was reported to the police. By 18.30 the tide had passed the North Coast without damage, but a potentially dangerous situation still existed at Yarmouth and a mobile and walkie-talkie were despatched from the northern area. A constant flow of information was fed into the nets; a plan of action detailed, and a link with Suffolk established. After some very slight flooding, the tide passed and after 21.00 the nets,



G3NJQ/A at East Dereham during the Norfolk and Suffolk R.A.E.N. "Exercise Viking," arranged in collaboration with the Police. Left to right, G3NJQ and G3LDI. The station provided a 160 metre link between Kings Lynn and Norwich.
(Photo by Ron Newell, Dereham)

which included G3MWV, G3NMY, G3NHU, G3HPR, G3NHV, G3NTV and G3OEP, stood down. Special mention must be made of the fine work done by very many S.W.L. members.

Detailed reports have not been received from Suffolk, but it is known that this group was very active, and the link with Norfolk was run through G3IAO, G3JMU and G3DDK.

Stern Test for Warwickshire

Amateurs' personal views on R.A.E.N. often overlook that a third party is involved and that the user services' views must surely carry more weight than any amateurs' individual opinion. After all, the user service did ask for our services as radio amateurs! However, these organisations allow their local county branches to decide whether to use us or not.

Some years ago Warwickshire B.R.C.S. Branch Director said, " I shall be very pleased to use R.A.E.N. when it has something worthwhile to offer us ". This challenge was borne in mind by **Warwickshire** and **Birmingham** members, who have now shown that they measure up to required standards, and were again given ample opportunity to prove themselves at the B.R.C.S. annual training week-end held at Stratford-on-Avon on January 27 and 28. This they did by lectures explaining R.A.E.N. organization and methods, and by demonstration and participation in training exercises. The latter were of the usual local disaster story, and the general level of traffic seems to have been designed to saturate all circuits laid on. Outstations were calling in with ten and fifteen messages on file. Control station action demanded the use of a signalmaster who kept messages moving. Longer distance links to Malvern and Rugby had been laid on and these worked perfectly on 2m, and a very surprised B.R.C.S. Divisional Director at Rugby found himself presented with a message advising him of a " disaster " in his area and requesting him to report his planned action back to Stratford.

It seems to have gone rather unremarked that when one of the mock casualties collapsed from exposure to the cold, qualified medical aid was on its way within three minutes of origination of a message requesting aid.

Members participating included G3CNV, G3BA, G3AVE, G3JPN, G3MTI, G3LNN, G2DCI, and other Birmingham members, G3IKL and members of the Rugby Group.

R.A.E.N. Membership Cards

In an emergency the Police may require R.A.E.N. members to produce their membership cards. Carry yours with you—*always*.

Round the Groups

After an exercise held by **Keynsham** (Bristol) Group, in conjunction with B.R.C.S., G3LYW received a S.W.L. QSL from HB. A.C. G3NXU says that the scheme went off well although the writing speed of B.R.C.S. cadets wants improving.

Leicestershire C.C., G3GXZ, went to **Rugby** to lend a hand in a local exercise there recently. The two groups plan to rouse some active interest in **Northampton** where a need for R.A.E.N. has existed for some while.

There has been a bad set-back to plans for increased activity in **Cheshire** due to the loss of the A.C., G3GYV, whose death has left a gap difficult to fill. Jim Speakman was one of the original " Key Station Operators " of R.A.E.N., and maintained a steady interest in the Network at all times. Liaison with the County Police is being explored and the C.C., G3ERB, expects to get things moving in the near future.

G3ISV reports increasing activity in **Middlesbrough** and has some liaison with Co. Durham, but finds contact with Hull easier than with stations to the immediate south. G3IWG, the new A.C. for **Middlesex** north of the Thames, is getting his membership sorted out and is taking much trouble to get things organized.

In **Essex** a few small troubles have been smoothed out of the station at County Police H.Q. G8TL reports that the group has 35 mobile stations. Local members have erected aerials at Fareham, **Hampshire**, police station.

D. G. Scott (G4SC), 52 Waterloo Road, **Bedford**, will be pleased to hear from anyone in that county interested in R.A.E.N. work.

The Moment before the Hoist
Some of the members of the Southampton R.A.E.N. about to raise the beam on Eastleigh Police Station where they have established the Hampshire County R.A.E.N. Control. From left to right G3GOP (Deputy County Controller), G3MRA (Southampton Area Controller), G3MDH (in background), G3EUQ, G3ION (County Controller, kneeling), G3JLS, G3KEU, G3IXN and G3HXJ.

* *1 Shortbutts Lane, Lichfield, Staffs.*

R.S.G.B. Slow Morse Practice Transmissions

The following Slow Morse Practice transmissions are sponsored by the Society. Those responsible for the transmissions have a duty to the membership to adhere to the schedule but if they cannot do so for any reason they should notify the Honorary Organizer, Mr. C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex.

Time	Call-sign	kc/s	Town
Sundays			
09.30	G3BHS	1910	Southampton
09.30	G3HNJ / G3OFP / G3OMJ	1840	Doncaster
10.15	G3CGD	1875	Cheltenham
10.30	G3NCZ / G3OTA	1920	Blackburn, Lancs.
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3HZM	1860	Manchester
11.00	G3NXQ	1850	Warndon, Worcs.
11.00	GW3PCK / GW3PEX	1850	Cefncoed, Breconshire
12.00 †	G3HVI / G3IVB / G3OGD	1920	Stoke-on-Trent
12.00	G3ONQ / G3IGW	1900	Halifax
12.00	GI5UR	1860	Belfast
Mondays			
18.30	G3NC	1825	Swindon
18.30	G3NCZ / G3OTA	1920	Blackburn, Lancs.
19.00	G3EEL	1960	Peterborough
19.00	G3KTP	1850	Heanor, Derby
19.00	G3MXS	1915	Wirral
19.30	G3AJD	1940	Barnet
20.00	G3BMY	1838	Birmingham
20.00	G3GZE	1840	Blackburn
20.00	G3HJG	1825	Manchester
20.00	G3NIM	1910	Southampton
20.30	G3AGN	1875	Felixstowe
21.30 †	G3IRM / G3MWO	1981	Bury St. Edmunds
21.30	G3NOE	1900	Bradford
22.00	G3PRM	1916	Alvaston, Derbys.
Tuesdays			
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G3ONB	1850	Kirkby-in-Ashfield
19.00	GW3BQY / GW5VX	1918	Port Talbot
19.30	G3AJD	1940	Barnet
20.00	G3NBV	1910	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MEH	1900	Old Coulsdon, Surrey
20.30	G3NKX	1875	Loughton
21.00	G3EFA	1855	Southport
21.00	G3LSC / G3MKN / G3NUN	1875	Poole
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
22.00 †	G2CZU / G3LLM	1820	Bath
22.00	G3AWL	1980	Wingate, Co. Durham
Wednesdays			
19.00	G8RQ	1850	Chesterfield
19.30	G2BSQ	1930	Ashtead, Surrey
19.30	G3AJD	1940	Barnet
Wednesdays			
19.30	G3NQR	1875	Harrow Weald
19.45	G3KFE	1950	Stevenage
20.00	G3BHS	1910	Southampton
20.00	G3GZE	1840	Blackburn
20.00 †	G2HDR / G3IZM / G3OLB / G3OUK	1910	Bristol
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3LCK	1910	Canterbury
21.00 †	G3HVI / G3IVB / G3OGD	1920	Stoke-on-Trent
21.00	G3LSC / G3MKN / G3MXF	1875	Poole
21.00	G3AGX	1920	Hull
22.00			
21.30	G3HNJ / G3OFP / G3OMJ	1840	Doncaster
21.30	G3NOE	1900	Bradford
22.00	G3NXQ	1850	Warndon, Worcs.
Thursdays			
18.30	G3NC	1825	Swindon
19.00	G3EEL	1960	Peterborough
19.30	G3AJD	1940	Barnet
20.00	G3NBV	1910	Southampton
20.00	G3NHR	1900	Hounslow
20.00	G5XB	1890	Reading
20.15	G2AYQ	1875	St. Agnes, Cornwall
21.15	G3LGK	1916	Ilkeston, Derbys.
21.30 †	G3IRM / G3MWO	1981	Bury St. Edmunds
22.00 †	G2CZU / G3LLM	1820	Bath
22.00	G3AWL	1980	Wingate, Co. Durham
Fridays			
18.30	G3DMN / G3FVP	1880	Ipswich
18.30	G3NCZ / G3OTA	1920	Blackburn, Lancs.
19.00	G3JKY	1900	Beckenham
19.00	G3PGS	1850	Kimberley, Notts.
19.30	G3AJD	1940	Barnet
20.00	G2BOJ / G3NXZ	1840	Doncaster
20.00	G3JQS	1915	Totton
20.00	G3NYB / G3NXZ	1980	Doncaster
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.30 †	G3OVU / G3KSS	1900	Bradford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
14.30	G3NQA	1925	Birmingham
19.30	G3KPO	1900	Peterborough
19.30	G3KPO	1960	Peterborough

† *Alternately*

Alterations and additions to this list should be sent to the Honorary Organizer at the address given above.

Can You Help?

● The County Librarian, West Sussex County Council, County Hall, Chichester, who wishes to trace the publisher of *Coil Inductance Tables* advertised in the February 1950 issue of the R.S.G.B. BULLETIN by Technical Inspection (B), 14 Silverston Way, Stanmore, Middesex.

● W. J. Gilbert, 7 Poltair Road, Penryn, Cornwall, who requires the manual for the receiver R.206 Mark II ?

● K. C. Hooper (G3DGI), 24 The Close, Babraham, Cambridge, who requires the manual for the Hallicrafters S36A receiver?

● J. Pearson, 50 Rein Road, W. Ardsley, near Wakefield, who requires information on the Pattern W.7944 Transmitter 7 A.M.?

COPY DEADLINE

TO enable the R.S.G.B. BULLETIN to be printed in time for bulk postings to take place by not later than the 14th day of the month, the closing date for editorial copy, the 22nd day of the preceding month, must be strictly adhered to. Society Representatives and Club Secretaries will greatly assist the Editorial staff by posting copy to reach Headquarters by not later than the 20th of the month whenever possible.

Copy received after the 22nd day of the month will be held over for future use if still topical.

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the 18th of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out the copy preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.

DATES FOR YOUR DIARY

March 30.—London Lecture Meeting (V.H.F. Symposium).
April 29.—North Midlands Mobile Rally, Trentham Gardens, Staffs.
May 6.—South Eastern Counties Mobile Rally.
May 6.—Thanet Mobile Rally, Cliffsend, Ramsgate.
May 13.—R.S.G.B. National Mobile Rally, Belton House, Grantham.
May 20.—Hunstanton "Bucket and Spade" Party with mobile DF contest.
June 10.—R.S.G.B. National Mobile Rally, Wethersfield, Essex.
June 17.—Longleat Mobile Rally.
June 24.—Bridlington Mobile Rally and Hamfest.
June 24.—A.R.M.S. Rally at Barford St. John.
July 8.—South Shields Mobile Rally.
July 15.—Chiltern Mobile Rally at West Wycombe Estates.
August 19.—Derby Mobile Rally.
September 6.—G6UT's Ham Party.
September 8—B.A.T.C. Amateur Television Convention, Conway Hall, London, W.C.1.
September 16.—Lincoln Hamfest and Mobile Rally.
September 16.—R.S.G.B. National Mobile Rally, Woburn Abbey.
October 20-21.—Jamboree-on-the-Air.

REGION 1

Ainsdale (A.R.S.).—Wednesdays, 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Squires Gate Holiday Camp.
Bury (B.R.S.).—April 10 (Plans for N.F.D.). 8 p.m., Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—March 20, April 3, 17, 42 Jordangate.
Manchester (M. & D.A.R.S.).—Wednesdays, March 21 (Morse and D/F), March 28 (N.F.D. Discussion), April 4 (Morse and D/F), April 11 (Practical Night), April 18 (Morse and D/F), 7.30 p.m., King George VI Club, North Road, Moston, Manchester 10. **(S.M.R.C.)**—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield, Manchester 14.
Morecambe.—April 4, 125 Regent Road.
Preston (P.A.R.S.).—March 27 (Open Meeting), April 10 (Illustrated Tape Lecture on "Basic Valve Circuits"), 7.30 p.m., St. Paul's School, Pole Street, Preston.
Southport (S.R.S.).—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—March 28, April 11, 25, 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—March 21 (Constructional Contest), April 4 (Plans for N.F.D.), April 18, 7.45 p.m., 15 Balls Road, Claughton, Birkenhead.

REGION 2

Barnsley (B. & D.A.R.C.).—March 23 ("Hi-Fi Speakers," by J. Kruse), April 13 ("Workshop Practice," by J. Walker), 7.30 p.m., King George Hotel, Peel Street.
Bradford.—March 27 (A.G.M.), April 10 (Junk Sale), 7.30 p.m., 66 Little Horton Lane.
Halifax.—March 20 (Visit to White Windows Cheshire Home), 7.30 p.m., Beehive and Crosskeys for transport. **(Northern Heights.)**—March 21 ("Mobile Equipment," by G3GJV), April 4 (Ragchew), April 18 (A.G.M.), 7.30 p.m., Sportsman Inn, Ogden.

REGION 3

Birmingham (M.A.R.S.).—March 30 (Film—*Visit to Moscow*, by G. J. R. Ellison), Midland Institute, Paradise Street, Birmingham. **(Slade.)**—March 23 (Film Show), 7.45 p.m., The Church House, High Street, Erdington. **(South.)**—March 22, April 19 (Film Show), 7.45 p.m., Friends Institute, Moseley Road, Birmingham.
Cannock Chase.—April 5, May 3, 7.30 p.m., White Lion Inn, Bridgtown.
Coventry.—March 21 ("V.H.F. Communications," by D. Drybrough), April 18 ("Microminiaturization," by P. Pitts), 7.30 p.m., Main Lecture Room, Training Centre, G.E.C. Telephone Works, Stoke, Coventry. **(C.A.R.S.)**—Mondays, 7.30 p.m., R.A.F.A. Club, Holyhead Road, Coventry.
Stourbridge.—April 13 ("2DAF Receiver," by G3UK), 7.45 p.m., Foley College, Stourbridge.
Stoke-on-Trent.—March 21, R.S.G.B. Meeting at G3COY, 90 Princes Road, Hartshill. March 22 (A.G.M.).
Sutton Coldfield.—March 22 (Club Station Activities), April 12 (Sale of Equipment), 7.30 p.m., 92 The Parade, Sutton Coldfield.
Wolverhampton.—March 26 (Talk by G3KMT), 8 p.m., Neachells Cottage, Stockwell End, Tettenhall.

REGION 4

Derby (D. & D.A.R.S.).—March 21 ("Hot Pot Supper"), White Hart, Aston-on-Trent. March 28 (Open Evening), April 4 (Surplus Sale), April 11 ("More Advanced Work on Two Metres," by T. Douglas, G3BA), April 18, (Direction Finding League Fixture), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.
Derby (D.S.W. Exp. S.).—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston.
Grantham (G. & D.A.R.S.).—Mondays, 7.30 p.m., Club Rooms (rear of Manners Arms Hotel), London Road, Grantham.
Grimsby (G.A.R.S.).—March 15, 29, April 12, 26, May 10, 24, June 7, 21, 8 p.m., Abbey (R.A.F.A.), Abbey Drive West, Grimsby.
Grimsby (A.R.S.).—Alternate Thursdays, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Leicester (L.R.S.).—Mondays, 7.30 p.m., Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (L.S.W.C.).—Fortnightly, Wednesdays, 7.30 p.m., Lincoln Technical College, Cathedral Street, Lincoln.
Melton Mowbray (M.M.A.R.S.).—March 29 (Radio Control of Models, by D. Hoff, G3AWM), April 26 ("Audio Equipment," by A. Brown, G3OWR), 7.30 p.m., St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.
Nottingham (A.R.C.N.).—Tuesdays and Thursdays 7.30 p.m., Community Centre, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
Northampton (N.S.W.C.).—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
Peterborough (P. & D.A.R.S.).—April 6 (Direction Finding), 7.15 p.m., Technical College, Eastfield Road.
Retford & Worksop (N.N.A.R.S.).—Tuesdays (Beginners), Thursdays (Club), 7.30 p.m., Club Rooms, Victoria Institute, Eastgate, Worksop.

REGION 5

Cambridge (C. & D.A.R.C.).—March 23 (A.G.M.), 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge.
March (M. & D.A.R.S.).—Thursdays, 7.30 p.m., Club Room (rear of Police Headquarters), March.
Shefford (S. & D.A.R.S.).—March 22 ("Crystal Grinding," by W. Bigley, G2AUA), March 29 ("Transistorized Voltmeter," by J. Leviston, G3NFB), April 5 (Any Questions?), Thursdays, 8 p.m., Digswell House, Shefford.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
High Wycombe (Chiltern A.R.C.).—April 26, 7.30 p.m., British Legion Hall, St. Mary's Street, High Wycombe.
Wolverton (W.D.R.C.).—First Friday in each month, 7.30 p.m., Science and Arts Institute, Church Street.

REGION 7

Acton, Brentford and Chiswick (A.B.C.R.C.).—March 20 (General Discussion), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Bexleyheath (N.K.R.S.).—March 22 ("RTTY," by Dr. Gee, G2UK), April 12 (Getting Mobile, by A.R.M.S.), April 26, 8 p.m., Congregational Hall, nr. Clock Tower, Bexleyheath.
Dorking (D.D.R.S.).—March 27 ("Transistors at H.F./V.H.F.", by R. Greenwood, G3LBA and J. Greenwall, G3AEZ), 8 p.m., Star and Garter, April 10 (Informal Meeting), 8 p.m., Wheatsheaf. April 24 (Demonstration, General Instrumentation, Digital Voltmeters, by B. Bonehill, G3LHC), 8 p.m., Star and Garter.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—Tuesday fortnightly, 8 p.m., Leigh Road, East Ham.
East London District.—April 15 (Continuation of talk on "The G.P.O. Log and Licence and TVI/BCI," by Messrs. W. A. Kirkpatrick and J. A. Turner of the G.P.O.), 3 p.m., Lambourne Room, Ilford Town Hall.
East Molesey (T.V.A.R.T.S.).—April 7, May 2, 8 p.m., Carnarvon Castle Hotel, Hampton Court. May 2, G. A. Bird (G4ZU) on Ferrite Bead Loaded Aerial.
Edgware and Hendon (E. & D.R.S.).—Second and fourth Mondays each month, 8 p.m., John Keeble Hall, Church Close, Deans Lane, Edgware.
Enfield.—March 22 ("Quartz Crystals," by S. T. & C. Ltd.), 7.30 p.m., George Spicer School, Southbury Road.
Harlow.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays (R.A.E. and Morse), 7 p.m., Friday (Club), 7.30 p.m., Montem School, Hornsey Road, Holloway, N.7.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (nr. Seven Kings Station).
Kingston.—Lectures alternate Thursdays, Theory and Morse Classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston (Morse at 2 Sunray Avenue, Tolworth).
Mitcham (M. & D.R.S.).—Lectures alternate Fridays, 8 p.m., Morse Classes, 7 p.m., "The Cannons," Madeira Road, Mitcham. March 23 ("Unusual Radio Equipment and the Army Emergency Reserve").
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., Sundays, 11.30 a.m., Wednesdays ("Morse Practice"), 8 p.m., 225 New Cross Road, S.E.14.
Norwood and South London (C.P. & D.R.C.).—April 3 (Morse at G3IIR), April 6 (Joint Quiz Meeting at Clifton Amateur Radio Society),

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will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road at 12.30 p.m. on Friday, March 16, April 13 and May 18, 1962.

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

April 21 (Return Joint Quiz Meeting), 8 p.m., Windermere House Annex, Westow Street, Crystal Palace.

Paddington (P. and D.A.R.S.)—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.

Romford (R. & D.R.S.).—Tuesday, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.

Science Museum (C.S.R.S.).—March 20 (Informal Meeting), April 3 (A.G.M.), April 17 (GB2SM, Informal Meeting), 6 p.m., Science Museum, South Kensington.

Southgate & District.—April 12 (Junk Sale), Arnos School, Wilmer Way, Southgate, N.14.

Sutton and Cheam (S. & C.R.S.).—Every Third Tuesday, The Harrow, High Street, Cheam.

REGION 8

Crawley (C.A.R.C.).—March 28 ("The A.A. Communications Network," by D. J. Stevenson), April 11 (Informal). For details contact G3FRV.

Tunbridge Wells (W.K.A.R.S.).—March 23 (Film Show), April 13 (A.G.M.), 7.30 p.m., Culverden House, Culverden Park Road.

REGION 9

Bath.—April 9, 7.30 p.m., Committee Room, Bath Technical College, Lower Borough Walls, Bath.

Bideford.—First Thursday in each month, 7.30 p.m. alternately at T. G. Ward (G2FKO), 38 Clovelly Road (phone: Bideford 964) and D. H. Jones (G3BO), Rosebank, Westcombe (phone: Bideford 550).

Bristol.—March 16 ("Vanguard and Victor Transmitters," by G5WH), 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.

Burnham-on-Sea.—April 10 ("Two Metres," by H. Bollands, G5DW), 8 p.m., Crown Hotel, Burnham-on-Sea.

Dorchester (S.D.R.S.).—First Friday in each month, 7.30 p.m., alternately at the Labour Rooms, West Walks, Dorchester and the Waverley Hotel, Westham, Weymouth. April meeting Weymouth (A.G.M.).

Exeter.—April 3, 7.30 p.m., Y.M.C.A., St. Davids Hill, Exeter.

Falmouth (C.R. & T.C.).—First Wednesday in each month, Y.M.C.A., Falmouth.

Plymouth (P.R.C.).—Tuesdays, 7.30 p.m., Virginia House Settlement, St. Andrews Cross, Plymouth.

Torquay.—April 8 (A.G.M. and Junk Sale), 7.30 p.m., Y.M.C.A., The Castle, Torquay.

Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road, Weston-super-Mare.

Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—April 9 ("Linear Accelerator," by R. Ellis), 7.30 p.m., T.A. Centre, Park Street, Cardiff.

Penarth.—Last Monday in each month, 7.30 p.m., R.A.F.A. Club, Windsor Road, Penarth.

Port Talbot.—April 10, May 8, 7.30 p.m., 8-10 Jersey Street, Velindre, Port Talbot.

REGION 11

Prestatyn (F.R.S.).—March 26 ("Colour Television—Local Developments" by J. Thornton Lawrence, GW3JGA/T), 7.30 p.m., Railway Hotel, Prestatyn.

REGION 14

Ayrshire.—Third Sunday in each month, 7.30 p.m., Royal Hotel, Prestwick.

Falkirk.—First and last Thursday in each month, 7.30 p.m., Comely Park School, Falkirk.

Motherwell.—Third Friday in each month, 7.30 p.m., Carfin Hall, Motherwell.

REGION 16

Chelmsford.—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane.

REGION 17

Portsmouth.—Wednesdays, 7.30 p.m., Room 3, The Community Centre, Twyford Avenue.

Southampton.—April 14 ("Single Sideband," by D. A. Pilley, G3HLW), 7 p.m., Engineering Lecture Theatre, Lanchester Building, University of Southampton, University Road, Southampton.

Regional and Club News

Acton, Brentford and Chiswick Radio Club.—At the A.G.M. the following were elected: *Chairman*—R. Hindes (G3IGM); *Vice-Chairman*—R. P. Cole (G6RC); *Hon. Secretary and Treasurer*—W. G. Dyer (G3GEH), 188 Gunnersbury Avenue, Acton, London, W.3; *Committee Members*—J. Tovell (G5LQ), R. T. Wright (G5ZA) and A. Bryan (G2CAJ). Details of meetings are given in *Forthcoming Events* (Region 7).

At the Annual Dinner of the Halifax and District Amateur Radio Society at the Beehive and Crosskeys Hotel, Halifax, on February 6, 1962, Philip Wade, G2BPJ (R.S.G.B. Zonal Representative) presented a trophy, donated by B.C. Electronics Ltd. of Bradford, to M. G. Whitaker, G3IGW. The trophy is to be awarded annually to the member considered to have done the most for the society and Amateur Radio during the previous 12 months. Left to right, Philip Wade, G2BPJ, R. Smith, G3NBI, M. G. Whitaker, G3IGW, R. Goodall, G3ONQ, and B. Crisp, G3LHQ (Chairman).
(Photo by courtesy of *Halifax Courier and Guardian*)

Bristol.—There was an attendance of over 40 members and visitors at the meeting on February 16 when the future policy of the Group was discussed. Details of membership may be obtained from the *Hon. Secretary:* E. C. Halliday (G3JMY), 4 Parkside Avenue, Winterbourne, Bristol.

Cambridge and District Amateur Radio Club.—On January 27 the formal opening of the new club premises was performed by L. E. Newnham (G6NZ), Past President of the R.S.G.B. and member of the Council. On February 8 the club was "at home" to over 30 schoolboy enthusiasts, when the President, S. Granfield (G5BQ), talked on "Ham Radio as a Hobby." Members later demonstrated the club station in action on 2m and Top Band. Five members have recently passed the Morse Test and are now on the air. In future the Club will be open on Mondays, Wednesdays (Junior Evening) and Fridays when visitors will be particularly welcome.

Cheltenham.—The A.G.M. held in February showed a marked improvement in attendance, being the best for eight years. This appeared to be the result of a year full of activity including the Region 6 O.R.M. It was decided at the meeting not to hold the next Cheltenham Mobile Rally until 1963.

Chesterfield and District Amateur Radio Society.—Meetings are held on Wednesday evenings at the Technical College. All visitors will be made most welcome. *Hon. Secretary:* K. Hudson, 20 Tennyson Avenue, Chesterfield.

Clifton Amateur Radio Society.—Recent meetings have included discussions on forthcoming events (D/F and transmitting Field Days) and a demonstration of "Advance" test equipment. April 6 will see Clifton at home to Crystal Palace Amateur Radio Society in the first round of the Interclub Quiz. *Hon. Secretary:* C. Godsmark (G3IWL), 211 Manwood Road, Crofton Park, London, S.E.4.

Cornish Radio and Television Club.—There was an attendance of 26 at the February meeting in the Y.M.C.A., Falmouth, when G3NVJ gave a talk on mast erection and G3OCB described an s.s.b. transmitter he has under construction. *Hon Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn, Cornwall.

Coventry Group.—During the Coventry Cathedral Festival from May 25 to June 16, the Group will be operating GB3COV.

Crawley Amateur Radio Club.—Members took part in the Affiliated Societies' Contest from the home of the chairman, G3TR. At the February meeting, "Dud" Charman (G6CJ) was due to give his Miniature Aerial Demonstration. On March 28 at the West Green Centre, D. J. Stevenson of the A.A. will describe "The A.A. Communications Network." Visitors will be most welcome. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley, Sussex.

Derby and District Amateur Radio Society.—At the A.G.M. on February 7 the following were elected: *Chairman*—T. Darn (G3FGY); *Vice-Chairman*—J. Anthony (G3KQF); *Hon. Treasurer*—J. Pell (G3PEL); *Assistant Hon. Secretary*—B. J. C. Brown (G3JFD); *Programme Secretary*—K. J. Pegg (G3FSH); *Catering Manager*—H. Shaw; *Librarian*—B. J. Speakman; *Photographer*—M. Shardlow; *General Management*—A. Hitchcock (G3ESB) and F. Allsop (G3IFA); *Hon. Auditors*—C. M. Swift (G3IUK) and T. W. Brown. It was reported that membership had reached a new record. *Hon. Secretary*—F. C Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby.

East London.—At the February meeting components dating from the early 20's to the present day were reviewed. There were nostalgic references to many manufacturers once widely known and an insight was given into the research that precedes the production of modern parts. At the March meeting G. Brown (G5BJ) was due to give a talk on " Single Sideband." *District Representative:* M. McBrayne, 25 Purlieu Way, Theydon Bois, Essex.

Edgware and District Radio Society.—Owing to the closing of the Canons Park Community Centre, meetings are now held at the John Keeble Church Hall on the second and fourth Mondays in each month, commencing at 8 p.m. *Hon. Secretary:* D. L. Lisney (G3MNO), 17 Pickett Croft, Stanmore, Middlesex.

Flintshire Radio Society.—At the A.G.M. the following were elected: *Chairman*—J. Thornton Lawrence (GW3JGA/T); *Hon. Treasurer*—W. Davies (GW3PKH/T); *Hon. Secretary*—H. T. Jones (GW3NQP), " Bedwyn," Queens Walk, Rhyl; *Committee Members*—Alan Antley, Peter F. Jones (GW3FPF), John Nicholas (GW3OIN). Meetings are held at the Railway Hotel, Prestatyn, on the last Monday in each month. On March 26, at 7.30 p.m., GW3JGA/T will describe local developments in colour television.

Grimsby Amateur Radio Society.—Meetings at the Abbey (R.A.F.A.), Abbey Drive West, Grimsby, have been arranged for 8 p.m. on March 15 and 29, April 12 and 26, May 10 and 24. *Hon. Secretary:* J. M. Charles, 130 Hainton Avenue, Grimsby.

Harrow, Radio Society of.—On March 2, G2YS was due to give a talk entitled " Thirty Years of Amateur Radio." Plans for N.F.D. are to be discussed on March 16 while a Junk Sale is arranged for the 30th. Alternative weeks are devoted to practical work. R.A.E. instruction is given every week and Morse practice at each practical meeting. *Hon. Secretary:* A. C. Butcher, 95 Norval Road, North Wembley, Middlesex.

Hull and District Amateur Radio Society.—At the A.G.M. the following were elected: *Chairman*—L. D. Colley (G3AGX); *Hon. Treasurer*—S. Taylor; *Hon. Secretary*—D. Cocking (G3OMO). Meetings have been arranged for April 10 (" Workshop Practice " by Eric Dean), April 24 (" A Two Metre Portable " by G3FCY) and May 13 (R.A.E. Papers).

Manchester and District Amateur Radio Society.—Members of the Northern Heights A.R.S. were due to be the guests of the society at a potato pie supper and Junk Sale on February 28. A trip to the Lake District with a portable station is being planned for May and details may be obtained from the Hon. Secretary. Meetings are held on Wednesdays—see *Forthcoming Events*. *Hon. Secretary:* A. B. Langfield, 2 Rowland Street, Moston, Manchester 10.

Midland Amateur Radio Society.—The President of M.A.R.S. regrets that the announcement of a lecture by a representative of Stratton & Co. Ltd. published last month in *Forthcoming Events* was made in error, due to a misunderstanding. Stratton and Co. state that, for the present, they are unable to undertake lectures and demonstrations, but club secretaries will be advised when this is again possible.

Northern Heights Amateur Radio Society.—Recent events have included a demonstration of tape recorders by T. Fawthrop. Meetings will be held at the Sportsman Inn, Ogden, near Halifax, at 7.30 p.m. on March 21 (" Mobile Equipment " by G3GJV), April 4 (Ragchew) and April 18—the society's first A.G.M.

Nottingham Amateur Radio Club.—Recent events have included visits to the Notts County Police H.Q. Epperstone, and the Worksop club. N.F.D. arrangements are well under way. The club station, G3EKW, has received the W.A.C. certificate. The A.G.M. is due to be held next month. Meetings are held in Room 3, Woodthorpe House, Mansfield Road, Nottingham, on Tuesdays and Thursdays at 7.30 p.m. R.A.E. classes are held in the Lecture Room on Tuesdays. *Hon. Secretary:* T. Kirk (G3OMK), 33 Sunnydale Road, Bakersfields, Nottingham.

North Notts Amateur Radio Society.—On March 22 at 7.30 p.m. G3MBQ will continue his talk on RTTY at the Club Rooms, Victoria Institute, Eastgate, Worksop. Part 2 will be entitled " The Teleprinter." *Hon. Secretary:* E. W. Badger (G3OZN), 20 Tennyson Drive, Worksop.

Peterborough and District Amateur Radio Society.—There was an attendance of more than 36 at the January meeting when C. J. Guscott (G3HXR) presided. The following were elected: *Vice-Chairman*—A. E. Barnes (G2BYI); *Hon. Treasurer*—A. Walker; *Hon. Secretary*—D. Byrne (G3KPO), Jersey House, Eye, Peterborough; *Committee Members*—D. Gibbons (G3PDZ) M. Grierson and W. Taylor. At the February meeting, G3DAF gave a lecture on Christmas Island, illustrated with colour slides.

Port Talbot.—A joint meeting of the Port Talbot, Cardiff, Rhondda and Llanelly Radio Clubs was held at Port Talbot on February 13. There was attendance of nearly 50 including the Zonal Representative, the Regional Representative, the County Representative and the Cardiff Town Representative. Many projects were discussed including a summer picnic meeting at Aberavon Beach. The get-together was voted an unqualified success and will undoubtedly be followed by other events of a similar nature throughout the Region.

Reigate Amateur Transmitting Society.—At the Annual Dinner on February 10 attended by 39 members, wives and visitors, G3TR, the Chairman of the Crawley club, proposed a toast to "Amateur Radio and the Reigate Amateur Transmitting Society." Mr. J. S. McCulloch presented awards to the winners of the Constructional Contest in which G3BBR received the "G8KW Cup" for the open Class. S.W.L. R. Wells took the " XYL Cup " for the second year running. The evening concluded with games and dancing arranged by S.W.L. C. Cowan. On March 17 G3FRV will be talking about " Mobile Operation " with, it is hoped, practical demonstrations. Juniors meet at 43 Carlton Road, Redhill on April 7 for a discussion on " Propagation." *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

Rotherham and District Radio Club.—At the A.G.M. S. Biggin (G3HFD), and P. Gale (G3OJG) were re-elected *Chairman* and *Vice-Chairman* respectively. On February 7 G. Lyon (G3GJF) gave a talk on his G2DAF-type receiver. The programme for the year includes a Beginners' Course in Radio, Morse classes and many other lectures. Details may be obtained from the *Hon. Secretary:* S. J. Scarborough, 25 Crawshaw Avenue, Sheffield 8.

Stoke-on-Trent.—A meeting will be held at the home of the T.R. at 8 p.m. on Wednesday, March 21, to make arrangements for the equipping and manning of an R.S.G.B. stand at the North Midlands Mobile Rally at Trentham Gardens on April 29. All R.S.G.B. members in North Staffordshire are asked to attend. *Town Representative:* V. J. Reynolds (G3COY), 90 Prince's Road, Hartshill, Stoke-on-Trent.

Wolverhampton Amateur Radio Society.—From the February issue of the society's excellent newsletter, it is learnt that plans are well advanced for participation in this year's N.F.D. and for the Annual Dinner in May. The club station, G8TA, is active at the end of each meeting. *Hon. Secretary:* J. Rickwood (G3JJR), 738 Stafford Road, Fordhouses, Wolverhampton.

Wolverhampton.—A group is to be formed in the district for the purpose of taking part in various contests. Anyone interested should contact D. Lovesey (G3ONP), 11 Watson Road, Oxley, Wolverhampton.

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SALE MOHICAN £25.—TIGER Z MATCH £6, KW low pass filter £2, all in new condition. Also AR88D £35, Panda Cub £35, Minimitter Mercury 200 P.A. unit £12, Geloso V.F.O. dial etc. £8, K.W. multiband antenna £5. All offers considered.—Apply, G3ODD, Manor Farm, Hemingbrough, Selby, Yorks.

20 WATT TRANSMITTER cw/phone 80/40/20M with separate power supply. Complete with microphone. Carriage paid, £7.—G3MEW, 5 Testcombe Road, Gosport, Hants.

LABGEAR LG.300.—With Army power pack and modulator components, £33.—Ward, G3ADI, Beechwood, Poplar Road, Birkenhead. (Tel.: Claughton 2666.)

K.W. VANGUARD.—In new condition, reasonable offers considered. KW trap dipole and other gear for disposal. Also Eddystone S.640 recently overhauled by Webbs, £20. Free delivery London Area.—G3MIL, 15 Cromwell Road, S.W.7. KNI 3826.

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