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RSGB BULLETIN

VOL. 38, No. 11

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

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Current Comment

discusses topics of the day

Co-operation—or Chaos?

IT is now nearly fourteen years ago that, in the pages of *The Short Wave Magazine*, the first suggestion was made, by a correspondent, of a geographical plan for the sub-division of the British Isles into regions, whereby the tedious searching of the whole of the 145 Mc/s band then practised could be avoided. The history and development of the Band Plan for Two Metres is well known, and was covered in the columns of *Four Metres and Down* as recently as March, 1962. The plan had, and still has, its opponents, those who felt that it did not achieve the aims it claimed, those who felt that they could further their own activities by misusing it, and those who were " licensed for two megacycles and intended to use every cycle." We are not disposed here to act as judge and say who is right. But it is surely significant that by far the larger number of the users of the two metre band comply with the frequency allocations given by the Plan, and we are sure that they obtain better enjoyment from their operation by doing so.

It is a remarkable example of self-discipline that the Band Plan exists today, for it is mandatory on no one, and all who follow do so in the firm conviction that it is the right thing to do for all v.h.f. operators. To abide by the Plan has become increasingly difficult of latter years, not because it is impossible to find a channel in one's correct zone, for this is still far from the case and only requires the use of a can of household scouring powder and some patience. The greatest difficulty lies in the ease with which modern techniques can tempt one to stray, and make it easy to do so. V.F.O.s and V.X.O.s are simple to build and the increasing use of s.s.b. makes a shift of frequency as easy as tuning the receiver.

The use of such calls as QLH and QHM has added greatly to our operating skills and enjoyment in contests, but has brought with it that great temptation to slide up or down as the case may be, to be first in the queue. Perhaps this should be so, for indeed no one can deny that such operation is the next logical step in the improvement of v.h.f. operating technique. The question is, whether it is a reasonable price to pay, that we should sacrifice the Band Plan and the benefits which it has brought, and still can bring, to v.h.f. operating, for the newer benefits which are available to us through the technical development of v.h.f. equipment to a finer art. The time is rapidly drawing near when each and every two metre user must ask himself: " Shall it be self-discipline in the face of increasing temptation, or the survival of the strongest? "

Co-operation or chaos? The choice is yours.

R. C. H.

Society Membership

TO the question " What are you going to do to celebrate the Society's Golden Jubilee? " we might reasonably expect the answer " I'm coming to the Jubilee Dinner " or " I'm attending my local O.R.M." or even " I'm too far away and too busy to attend anything." How often do we receive the answer " I'm going to do something *for the Society* "? Yet in the excitement of planning visits and pleasure trips and personal QSOs we are apt to forget that we are celebrating for the Society's sake, and not for ourselves alone. This celebration can be made memorable just as much by the work of the remote and busy member as by the one with a holiday at hand and a near-London QTH.

One of the best—and most enduring—ways in which we can celebrate this Golden Jubilee is to enhance the strength and prestige of the Society. It is not generally realized that only just over 60 per cent of licensed amateurs in the British Isles are members, yet non-members benefit in great measure from the work of the Society *without contributing a penny to its upkeep*. While " membership of the union " is not a prerequisite to the grant of a licence (such a condition is not unknown elsewhere), the transmitting amateur gets far more for his annual subscription than just twelve issues of the BULLETIN; he gets representation of his interests at the highest level. The greater the prestige of the Society, the greater will be the force of that representation: the exertion of its influence when appropriate might well determine the conditions on which all our licences are held, or indeed whether they are held at all. One man can enjoy on his own the full benefit of the law once it has been made, but it is the great majority speaking with one voice that makes and maintains it.

Our " majority " of transmitting members is a slender one. *You* can remedy this state of affairs by making your personal goal the enrolment of at least one new transmitting member this Jubilee year. Help the Society to celebrate in this practical way—and thereby help yourself.

J. W. S.

RADIO SOCIETY OF GREAT BRITAIN
GOLDEN JUBILEE CELEBRATIONS

1913 1963

Programme of Events

Monday, July 1, 1963

1 p.m. Coaches leave Allsop Place, adjoining the London Planetarium, for visit to Radio Research Station.
2 p.m. Tour of Radio Research Station begins.
5 p.m. Coaches leave R.R.S. for return journey.
2.30 p.m. Technical visit to the B.B.C. Television Centre.
6 p.m. Open House at Mullard Ltd., Torrington Place, Tottenham Court Road, London, W.C.1.

Tuesday, July 2, 1963

1 p.m. Coaches leave Allsop Place, adjoining the London Planetarium, for visit to Radio Research Station.
2 p.m. Tour of Radio Research Station begins.
5 p.m. Coaches leave R.R.S. for return journey.
2.30 p.m. Technical visit to the B.B.C. Television Centre.
3 p.m. Open House at Mullard Ltd., Torrington Place, Tottenham Court Road, London, W.C.1.

Wednesday, July 3, 1963

12 noon London Members' Luncheon Club at Bedford Corner Hotel, Bayley Street, Tottenham Court Road, London, W.C.1.
6.30 p.m. Official Reception at the London Planetarium, Marylebone Road, London, N.W.1 (adjoining Madame Tussaud's). During the course of the evening there will be a Special Programme in the Planetarium conducted by Dr. H. King.

Thursday, July 4, 1963

10 a.m. Private launch leaves Westminster Bridge Pier for Hampton Court.
8 p.m. London U.H.F. Group Social Evening at White Hall Court Hotel, Bloomsbury Square, London, W.C.1.

Friday, July 5, 1963

6.30 p.m. Golden Jubilee Dinner at the Connaught Rooms, Great Queen's Street, Kingsway, London, W.C.1.

Admission to all these events will be by ticket only obtainable by completing the order form on page (ii) of the Supplement to the April issue of the BULLETIN *and sending it, with a remittance to cover the total cost, to Frank Fletcher, G2FUX, Hon. Business Manager, Golden Jubilee Celebrations, 11a Ickenham Road, Ruislip, Middlesex. Members are asked to note that some of the events take place simultaneously. Mr. Fletcher can deal only with correspondence relating to the Golden Jubilee Celebrations. Additional copies of the order forms are available on request.*

A Transistorized Receiver for the 432 and 1296 Mc/s Bands

By ARNOLD L. MYNETT, B.Sc. (G3HBW)*

THE receiver to be described is a triple superhet designed to cover the communications portions of the amateur 23 and 70cm bands, with good performance in all respects, but employing only inexpensive and readily available semiconductor devices. The noise figure of the receiver over the whole of the band 1296 to 1300 Mc/s is rather less than 10db, using a conventional 1N21 silicon-tungsten diode mixer in the front end. In the band 432 to 436 Mc/s, the use of two Philco m.a.d.t. transistors, type 2N2398 (T.2028), as common base r.f. stages feeding a GEX66 germanium diode mixer ensures the realization of a noise figure of 6db. Frequency-stability is excellent on both bands, as the local oscillators for the first two conversions are both crystal-controlled, allowing the main i.f. tuning to be performed in the range 2 to 4 Mc/s.

The tunable i.f. and subsequent portions of the receiver are, in general, similar to the corresponding parts of the 1·8 to 144 Mc/s Amateur Band Receiver described previously (R.S.G.B. BULLETIN, February, 1963), apart from a few minor modifications.

The 70 and 23cm sections are each in the form of double-superhet converters, with crystal controlled local oscillators, arranged to give output i.f.'s of from 2·0 to 3·0 Mc/s, exactly, for tuning, converted from input signal frequency bands of 432 to 433, 433 to 434, 434 to 435, 435 to 436, 1296 to 1297, 1297 to 1298, 1298 to 1299 and 1299 to 1300 Mc/s. In addition, the tunable i.f. is switched to cover either 2·0 to 3·0 Mc/s or 2·0 to 4·0 Mc/s, in order that 2 Mc/s wide bands having the same low-frequency ends as the above may be covered on one tuning range.

The v.h.f. and u.h.f. converters will be described in full but only a brief treatment of the tuner portion and subsequent stages will be given.

Organization of the Converters

The range coverage mentioned is achieved by the use of oscillators employing the third overtones of FT243 crystals to perform the second frequency conversion and harmonics of this overtone to accomplish the first conversion, from the signal input band to an intermediate broad-band i.f. The sixteenth harmonic of a nominal 25 Mc/s overtone is used for 430 Mc/s conversion and the sixty-fourth harmonic of a nominal 20 Mc/s overtone for 1300 Mc/s. The crystal fundamentals are therefore in the region of 8300 and 6700 kc/s, respectively.

For 430 Mc/s operation, the first i.f. is in the neighbourhood of 28 Mc/s whereas on 1300 Mc/s, it is around 23 Mc/s. It is arranged that each 1 Mc/s tuning range is converted to a second i.f. of exactly 2·0 to 3·0 Mc/s by switching into circuit a crystal adjusted accurately to frequency for that particular range. Eight type FT243 crystals in all are required. Two spare sockets are provided in each converter to permit additional ranges to be included, for example, 431 to 432 Mc/s for reception of the GB3GEC beacon. The tuned circuits in the frequency multiplier are made sufficiently broad band to accommodate all the wanted frequencies, both sub-harmonic and final output and yet must provide enough selectivity at each stage of multiplication to reject, to the extent of at least 20db, neighbouring unwanted harmonic frequencies. This, of course, applies also to the high-Q filter circuit feeding local oscillator power into the mixer.

Table 1 shows most of the frequencies involved in signal conversion on both bands. It will be observed that the first i.f. shifts slightly from range to range by the same amount by which the crystal overtone itself shifts. This requires an i.f. band change of 176 kc/s on 430 Mc/s and of 47 kc/s on 1300 Mc/s, to cover the four ranges on each band, which, in both cases, is relatively trivial as compared with the required bandwidth of at least 2 Mc/s.

Circuit diagrams of the converters are given in Fig. 1 and Fig. 2 on page 584.

The 430 Mc/s converter local oscillator chain is seen to comprise a collector-emitter feedback, series overtone oscillator, using a Philco 2N1744 transistor, operating between 25·2 and 25·5 Mc/s and driving two 2N1744 doublers. No order of frequency multiplication greater than

TABLE 1

MAJOR FREQUENCIES INVOLVED IN DOUBLE CONVERSION

430 Mc/s Converter

Signal Range (Mc/s)	First Oscillator Frequency (Mc/s) (16 X overtone)	First I.F. (Mc/s)	Second Oscillator (Mc/s) (overtone)	Nearest Crystal Frequency	FT243 Channel Number
431–432	403·765	27·235–28·235	25·235	8,400 kc/s	379
432–433	404·706	27·294–28·294	25·294	8,425 kc/s	380
433–434	405·647	27·353–28·353	25·353	8,450 kc/s	381
434–435	406·588	27·412–28·412	25·412	8,450 kc/s	381
435–436	407·530	27·470–28·470	25·470	8,475 kc/s	382

1300 Mc/s Converter

Signal Range (Mc/s)	First Oscillator (Mc/s) (64 X overtone)	First I.F. (Mc/s)	Second Oscillator (Mc/s) (overtone)	Nearest Crystal Frequency	FT243 Channel Number
1,296–1,297	1,274·091	21·909–22·909	19·909	6,625 kc/s	308
1,297–1,298	1,275·075	21·925–22·925	19·925	6,625 kc/s	308
1,298–1,299	1,276·060	21·940–22·940	19·940	6,640 kc/s	28
1,299–1,300	1,277·044	21·956–22·956	19·956	6,650 kc/s	309

The second i.f. in both cases is 2 to 3 Mc/s.

* *52 The Rutts, Bushey Heath, Watford, Herts.*

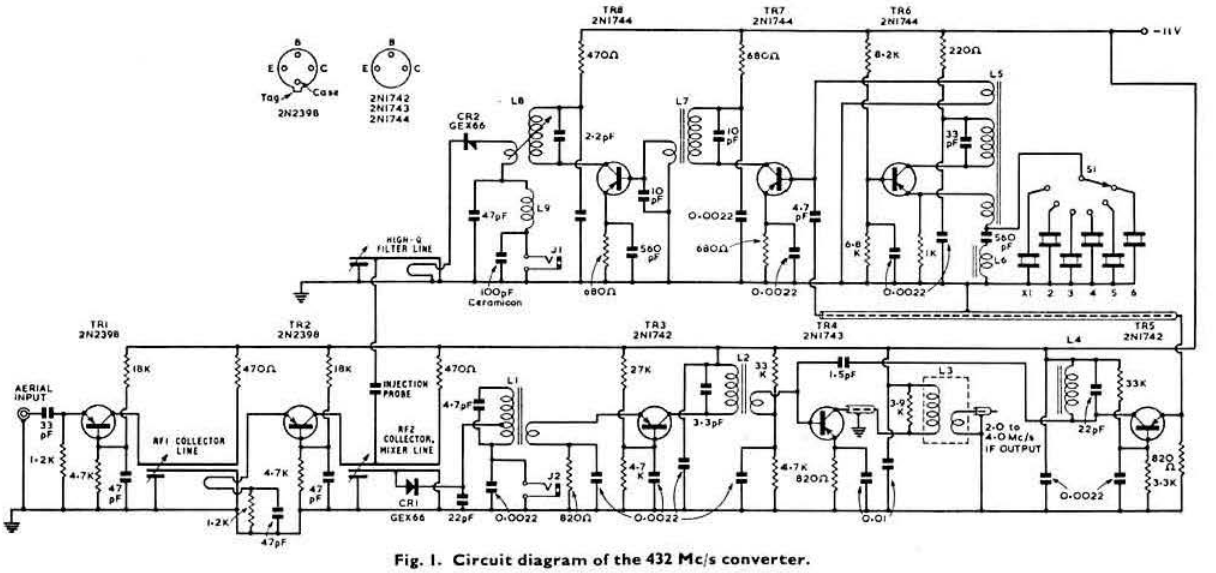


Fig. 1. Circuit diagram of the 432 Mc/s converter.

two is employed with transistors anywhere in the system, as it has been found experimentally that doubling always results in a considerably larger power output compared with higher orders of multiplication and, in fact, using transistors such as 2N1744's, permits multiplier chains to be built with approximately zero db stage-to-stage power loss for output frequencies up to at least 200 Mc/s. The multiplier stages are conventionally common-emitter, with forward biasing by base-emitter junction rectification, using a protecting resistor in series with the emitter circuit. Tuned circuit bandwidth is arranged to be of the right order, when matched, by choice of the tuning capacitance and is then finally adjusted by base link loading.

The 100 Mc/s output of the second doubler, approximately 5 to 10 mW, is used to drive a GEX66 u.h.f. germanium point-contact diode quadrupler. The collector tuned circuit impedance is matched into the diode impedance by means of a step-down link winding. The 400 Mc/s output is coupled, with a small loop, into an end-capacity tuned foreshortened quarter-wave line. The input and output coupling loops of the multiplier diode are effectively in series and their respective impedances at output and input frequencies must have reasonably low values compared with the diode impedances. The effect of the relatively small output coupling loop at the 100 Mc/s input frequency is insignificant but the input circuit impedance as " seen " by

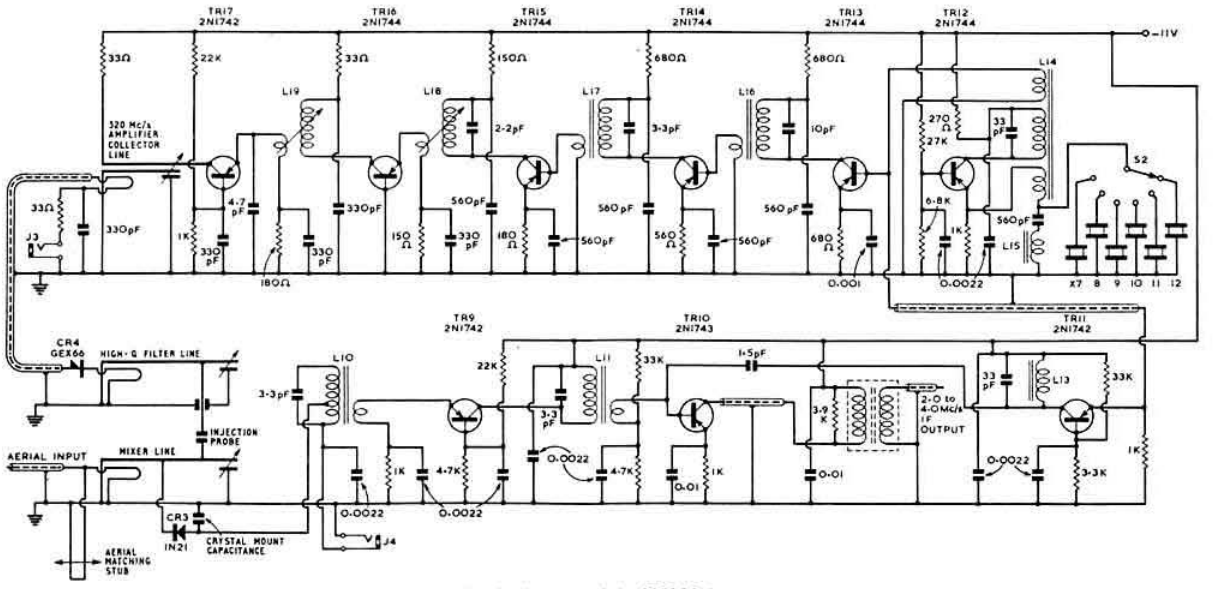


Fig. 2. Circuit diagram of the 1296 Mc/s converter.

the diode at the 400 Mc/s output frequency must also be arranged to be low and this is more difficult as the link winding must be quite a large one. The desired result is achieved by connecting a 400 Mc/s series resonant circuit to earth from the diode driving point. The 100 pF ceramicon and small choke in series might not perhaps appear to be such a circuit but it does in fact behave like one and was the most effective combination that could be found! Possibly the self-capacitance of the "choke" series resonates with the series inductance of the capacitor.

The mixer tuned circuit is another foreshortened, capacity-tuned quarter-wave line with the GEX66 mixer diode tapped across it. This line also performs the function of collector tuned circuit for the second 2N2398 r.f. amplifier stage. Local-oscillator injection is obtained by means of a capacity-probe attached to the inner conductor of the oscillator high-Q filter line, situated just over half-way along it from the cold end. This probe is visible in the underside view of the converters.

Loading on the injection line is fairly light, the working Q being about 80 to 100 compared with approximately 30 for the collector tuned line for the second r.f. stage. Thus, considerable protection against injection at unwanted frequencies is provided and further signal-frequency selectivity is contributed by the inter-r.f. stage tuned line, which also has an operating Q of about 30.

TABLE 2

Coil Winding Details

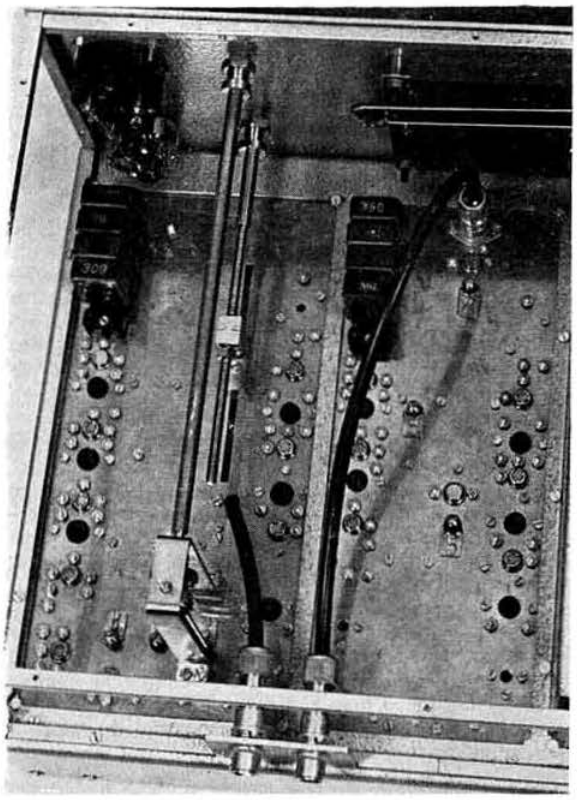
430 Mc/s Converter

L1, 26 turns 28 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, tapped at 8 turns up, with 5 turn coupling overwound at cold end.
L2, 26 turns 28 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, with 9 turn coupling overwound at cold end.
L3, 51 turns 34 s.w.g. enam. wound on Aladdin dust-pot core former, with 9 turn 30 s.w.g. enam. coupling.
L4, 13 turns 24 s.w.g. enam. close wound on ¼ in. dia. Aladdin former.
L5, 13 turns 24 s.w.g. enam. close wound on ¼ in. diam. Aladdin, with 3 turns emitter coupling interwound at cold end and 3 turn output coupling overwound at cold end.
L6, 11 turns 24 s.w.g. enam. close wound on ¼ in. dia. Aladdin former (fixing lugs removed from former).
L7, 11 turns 24 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, with 2 turn coupling interwound at cold end.
L8, 9 turns 20 s.w.g. enam. close wound, self-supporting, $\frac{7}{16}$ in. dia., with 2 turn output coupling loop.
L9, 5 turns 20 s.w.g. enam., self-supporting, ¼ in. dia. ⅜ in. long.

1300 Mc/s Converter

L10, 38 turns 30 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, tapped at 10 turns up, with 5 turn coupling overwound at cold end.
L11, 38 turns 30 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, with 9 turn coupling overwound at cold end.
L12, 51 turns 34 s.w.g. enam. wound on Aladdin dust-pot core former, with 9 turn 30 s.w.g. coupling.
L13, 17 turns 24 s.w.g. enam. close wound on ¼ in. dia. Aladdin former.
L14, 15 turns 24 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, with 3 turn emitter coupling interwound at cold end, and 3 turn output coupling overwound at cold end.
L15, 23 turns 24 s.w.g. enam. close wound on ¼ in. Aladdin former (fixing lugs removed from former).
L16, 13 turns 24 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, with 3 turn coupling interwound at cold end.
L17, 10 turns 24 s.w.g. enam. close wound on ¼ in. dia. Aladdin former, with 2 turn coupling interwound at cold end.
L18, 7 turns 20 s.w.g. enam., self-supporting, ⅜ in. dia., $\frac{7}{16}$ in. long, with 2 turn output coupling.
L19, 4 turns 20 s.w.g. enam. self-supporting, $\frac{7}{16}$ in. dia., $\frac{3}{16}$ in. long, with 2 turn output coupling.

Note: for L3 and L12, use the inner slot for the coupling winding, distributing the main winding in the other two.



An above-chassis view showing the oscillator crystals. The 1300 Mc/s converter is on the left of the photograph.

Both r.f. stages are operated in the common-base mode, with 47 pF ceramicons as base bypass capacitors. D.c. stabilization is by emitter series resistor and base potentiometer.

I.f. output from the mixer, in the range 27·2 to 29·5 Mc/s, is tapped into the input tuned circuit of a 2N1742 common-base i.f. amplifier which, in turn, feeds the 2N1743 second mixer. Local oscillator power for this mixer comes via a 2N1742 isolating amplifier stage which is driven through a short length of co-axial cable and a small series capacitor, together forming a capacitative potential divider from the output winding of the overtone oscillator itself. I.f. output in the range 2 to 4 Mc/s from the second mixer is coupled into a 72 ohm coaxial cable by means of a dust-iron pot-core transformer, whose primary winding in the mixer collector forms a damped tuned circuit with a small total tuning capacitance and hence of low Q (about 1·5) and large bandwidth.

The 1300 Mc/s converter uses a similar, although more elaborate local oscillator chain. A 2N1744 overtone oscillator operating in the region of 20 Mc/s drives four successive common emitter 2N1744 frequency doublers to give 320 Mc/s output which is amplified in a 2N1742 common-base stage with a linear collector circuit. The output of this stage, approximately 5 mW, drives a GEX66 germanium diode quadrupler via a coupling loop and short length of coaxial

cable whose transforming action results in the impedance, at the output frequency of the rather large driving loop as seen by the multiplier diode, to be low, thus reducing the loss of output r.f. power in the drive circuits. This, of course, corresponds to the series tuned circuit in the 70cm converter. The optimum length of cable in the transformer was found to be 11¼cm, which is almost exactly an electrical three-quarter wavelength at 1270 Mc/s. Final adjustment of the impedance of the drive circuits, as seen by the diode, is achieved by moving the driving loop relative to the amplifier collector line.

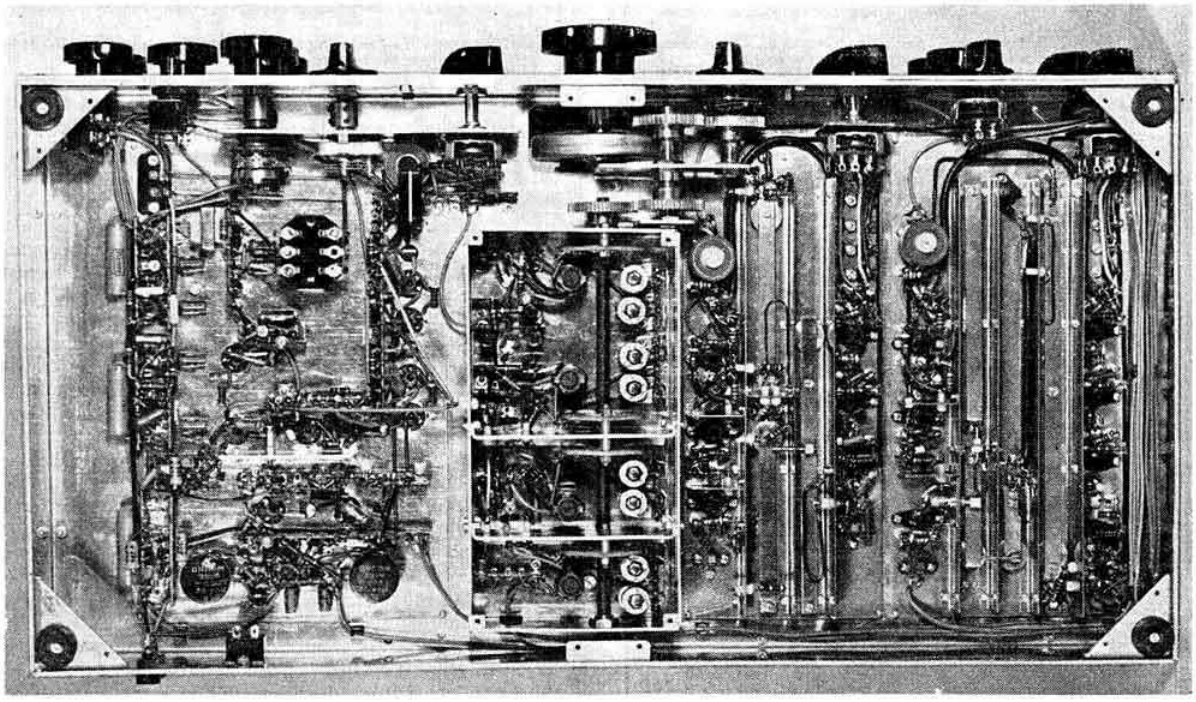
On the output side, 1270 Mc/s r.f. is coupled into a tuned line via a small, loosely coupled loop which permits the correct voltage step-up conditions to be realized, with accompanying selectivity to aid rejection of unwanted frequencies. The impedance of the small output loop at the 320 Mc/s drive frequency as seen by the diode is low, reducing the loss of drive power in the output circuits to a minimum. A small bypassed series resistor in the diode d.c. return circuit biases it to the correct operating point.

The mixer diode is tapped part-way up another end-capacity tuned line and oscillator injection is by means of a capacitance probe from the final multiplier tank circuit. With 2 mA rectified current in the multiplier diode, 250 μA rectified current is produced in the 1N21 silicon-tungsten mixer diode, the combined filtering action of the tuned circuits being such that all local oscillator components, other than the wanted 1270 Mc/s in the mixer, are at least 30db down with respect to it. Aerial coupling is by means of a shunt-stub tuned loop at the low-impedance end of the mixer line. The position of the short-circuiting bridge at the far end of the stub may be altered to tune out reactance at the aerial input. Local oscillator and signal frequency components in the mixer output are bypassed to earth by the capacitance formed by sandwiching a small brass plate, supporting the crystal diode holder, against the dividing screen with 0·006 in. thick polythene sheet as a dielectric. The reactance of the capacitance so formed is fairly large compared with the mixer output impedance at the i.f. The first i.f. amplifier, second mixer and oscillator isolating amplifier stages are very similar to those in the 430 Mc/s converter already described, apart from the different frequencies.

Selection of either the 430 or the 1300 Mc/s converter in the complete receiver itself is achieved by the use of a double-pole, double-throw Yaxley switch, one pole of which selects the output i.f. leads and the other the appropriate 12 volt supply input.

Practical Design

Both converters are constructed on a brass plate type of sub-chassis, intended to be bolted against the underside of the receiver main chassis, the latter being provided with suitable rectangular cut-outs. As can be seen in the photographs, each sub-chassis has several longitudinal screens, dividing it into narrow sections, into each of which is built a stage or group of stages. These screens also serve as the outer conductors of trough type tuned circuits, the inner conductors of which are formed from brass strips bolted against the main plate with rectangular brass block spacers, thus broadly following erstwhile valve-type u.h.f. TV tuner fashion. The lines are capacitively tuned, where necessary, at their open ends by means of brass discs on lengths of 2BA studding. Wherever a line inner conductor is required to be isolated from earth to provide a d.c. feed to a transistor or



A view under the chassis of the complete receiver. The converters are on the right of the photograph.

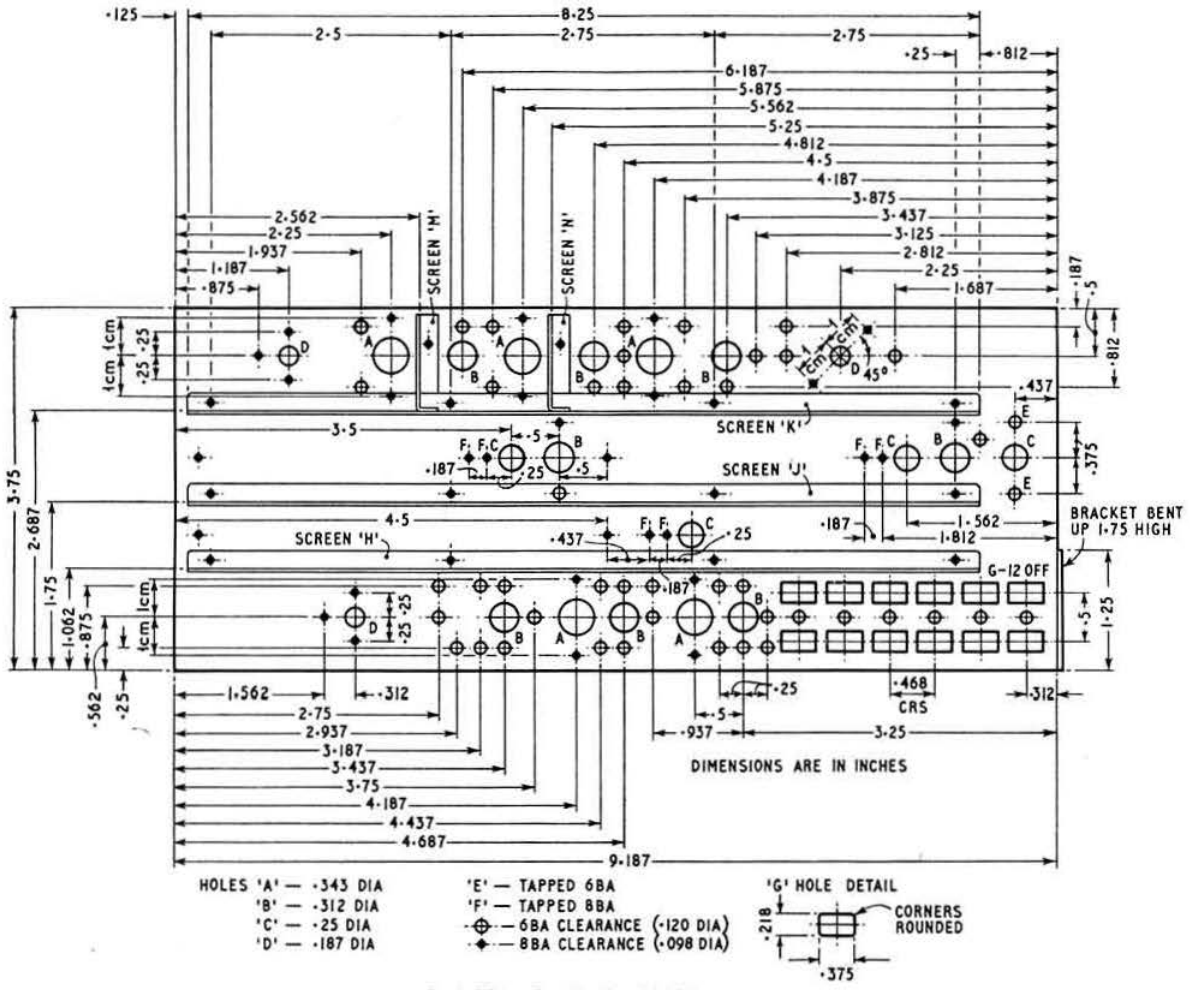


Fig. 3. Drilling plan for the 432 Mc/s converter.

diode electrode, for instance, it is made in the form of a sandwich of two 21 s.w.g. brass strips and one of 0·006 in. polythene sheet, bolted together using nylon screws. The earthed portion of the composite strip is arranged to be opposite to the chassis plate to prevent the tuning discs causing accidental short-circuits.

The first section of the 430 Mc/s converter, in the photograph of which may clearly be seen the group of six FT243 crystal holders, contains the oscillator stage and the two frequency doublers, together with the final quadrupler diode and its input circuits. The output loop and trough-line tuned circuit at final local-oscillator frequency is contained in the second section and the capacitance coupling probe projects from the line into the third section which comprises the two r.f. amplifiers and first mixer, together with their two tuned lines and a dividing screen carrying a loop coupling the first r.f. stage collector tuned circuit to the second r.f. stage emitter. The fourth section contains the i.f. amplifier, second mixer with output i.f. transformer, and local oscillator isolating amplifier.

The first section of the 1296 Mc/s converter includes the 20 Mc/s crystal oscillator and all multiplier stages up to 320 Mc/s. The second section consists of the 320 Mc/s grounded-base amplifier together with its capacity-tuned collector line and output coupling loop. In the third section is to be found the final diode quadrupler with its impedance-matching input cable, biasing resistor and bypass capacitor, current metering jack and output loop coupled to the quarter wave foreshortened line for 1270 Mc/s. The coupling probe projects through the inter-section screen into the fourth section which comprises the tuned mixer line with 1N21 diode, input coupling loop and aerial matching stub. The final (fifth) section includes the mixer diode mount and, as for the 430 Mc/s converter, the current-metering jack for the mixer, the first i.f stage, second mixer and local-oscillator isolating amplifier.

Construction

Complete drilling plans for the two chassis plates are given in Figs. 3 and 4, drawings of the longitudinal screens

in Figs. 5 and 6 and other details, including the strip lines in Figs. 7, 8 and 9. The numbers placed against holes refer to the BA clearance size required, unless stated otherwise. For 6 BA, use a No. 33 or $\frac{7}{64}$ in. drill and for 8 BA a No. 41 or $\frac{3}{32}$ in. Dimensions given are in inches, unless otherwise stated.

No features of the design should cause trouble in actual execution. Do not forget, when making the chassis plates, to allow extra length for the bent-up switch fixing bracket.

The positions of the holes for mounting the longitudinal screens on the chassis plates are not explicitly shown on the chassis drawings. After the mounting holes have been drilled in them, the screens should be placed against the plate in the correct positions and the holes marked through. Similarly, the i.f. dividing screens *F*, *G*, *M* and *N* should be placed against the longitudinal screens *D* and *K* and the chassis plate and their fixing holes marked out. In the case of the 70cm converter, two fixing holes for the middle screen *J* are also used to mount stand-off insulators and so should be 6BA clearance size.

The holes for transistor mounting should, if possible, be made a reasonably close fit by the use of a taper reamer. Too loose a fit may be remedied by packing with a small strip of polythene sheet. The transistors are inserted so that the case flange lies on top of the chassis. Although the tolerances on the diameter of the TO9 case, as used for the Philco transistors, are fairly wide, no difficulty has been experienced so far with non-interchangeability.

Tuning discs are easily made by drilling and tapping 2BA $\frac{3}{4}$ in. × $\frac{1}{16}$ in. brass blanks in a lathe, screwing in and soldering in position a suitable length of 2BA brass studding and then mounting the latter in a collet, enabling the edge and face of the disc to be turned. The chassis mountings for the discs were made by screwing the brass lug to a piece of wood and then using a single screw to hold the slotted threaded bush in the correct relative position so that the two parts could be soldered together with a small iron. A similar artifice helps when soldering blocks to the strip-lines. Care should be taken when making "sandwich" lines to remove all burrs from the edges of the strips. To bolt the strips together 6BA nylon screws are used. Wherever the screw will be opposite a tuning disc, the projecting threaded portion should be filed flush with the line.

The GEX66 mixer diode in the 70cm converter is connected to the line by means of an 8BA soldering tag, which is fixed to the line using an 8BA screw in a tapped hole in

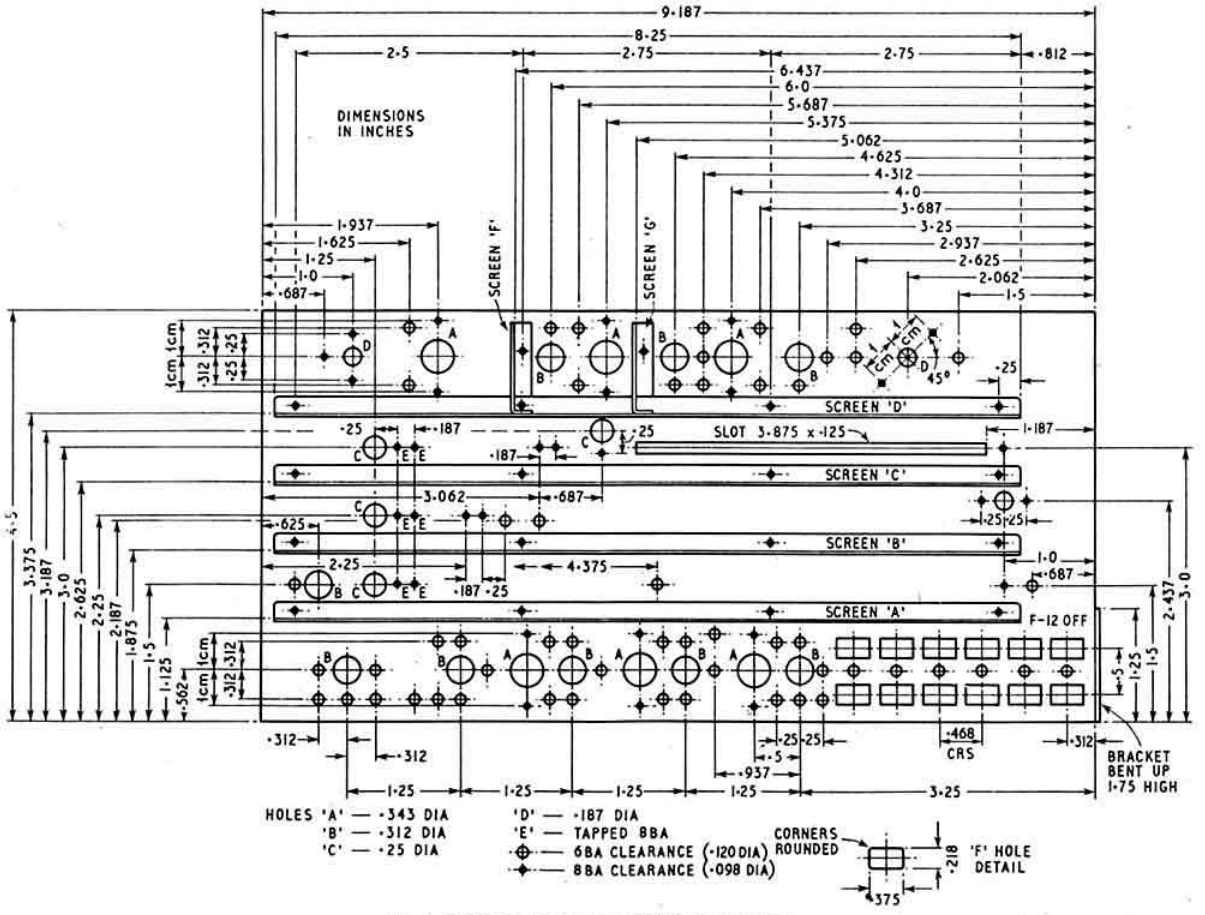


Fig. 4. Drilling plan for the 1296 Mc/s converter.

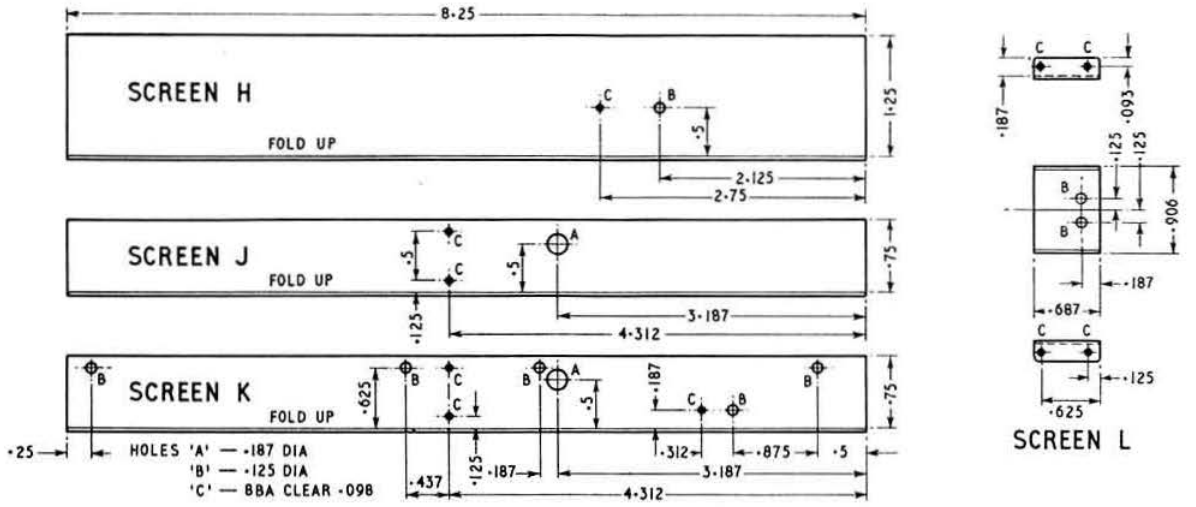


Fig. 5. Screens for the 430 Mc/s converter.

the latter. Great care must be taken here to file the threaded portion of the screw flush with the line to avoid puncturing the polythene dielectric.

Wiring the Converters

Earth wiring should be put in first, as usual. In grounded-emitter stages, the stand-off insulator opposite the emitter connection is normally used to clamp a 6 BA soldering tag to the chassis and that opposite the base connection is similarly employed in common base stages. These tags should have all bypass capacitors for the stage returned to them, wherever reasonably convenient to do so. However, the common-emitter stages in the multiplier chains have their emitter bypass capacitors returned to a tag clamped by the base stand-off. The three stand-offs surrounding a transistor all have their lugs bent downwards and placed

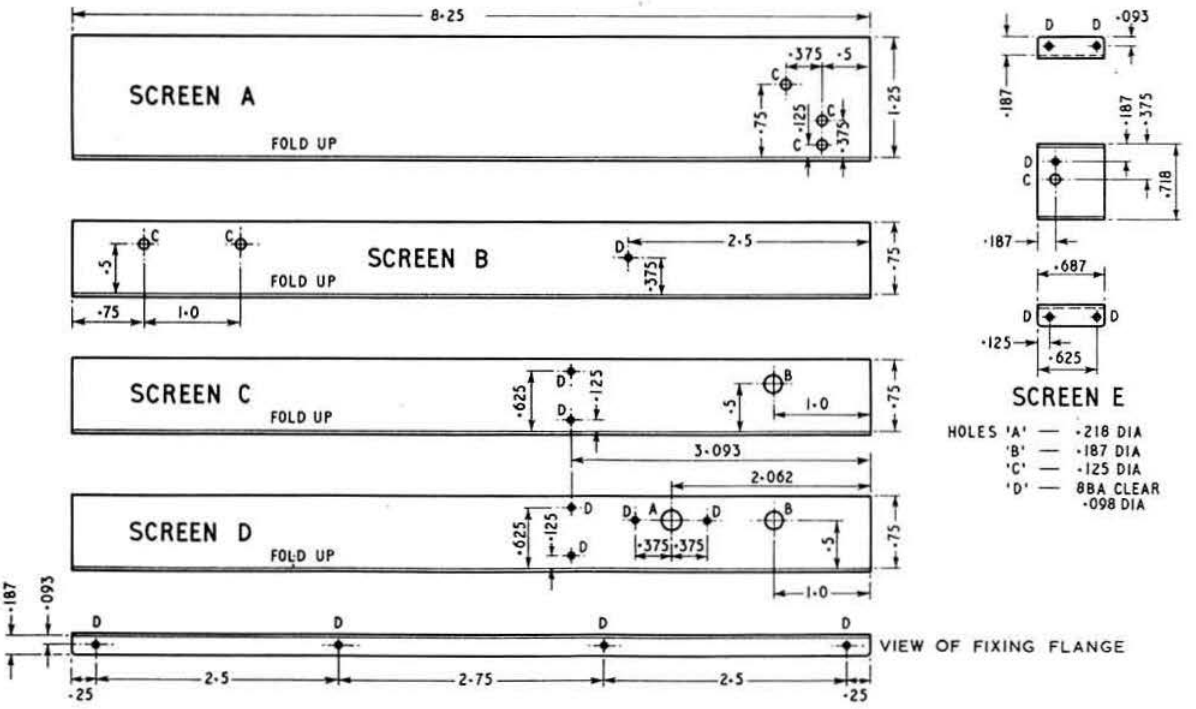


Fig. 6. Screens for the 1300 Mc/s converter.

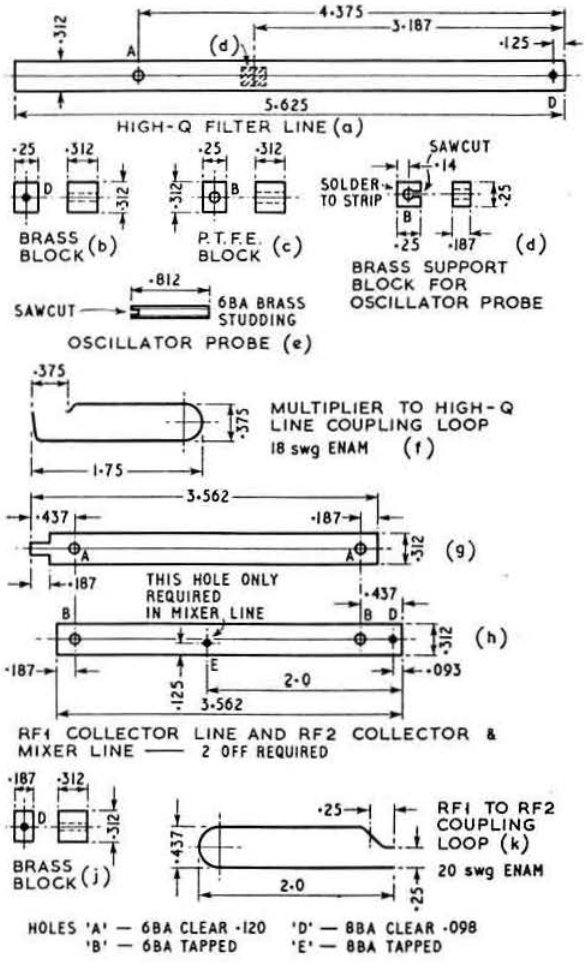


Fig. 7. Dimensions of the high-Q filter line and other parts of the 430 Mc/s converter.

facing inwards, so that the transistor leads may be soldered directly to them. All other wiring should be completed before transistor connections are made. When cutting transistor lead wires to length, always support the wire in a pair of narrow nosed pliers between the cutters and the transistor itself. Never bend the wires violently at the seal or severe internal damage may result! Although the Philco devices are reasonably resistant to thermal damage when soldering, it is advisable to use a pair of pliers as a heat shunt and never to solder closer to the seal than about $\frac{1}{8}$ in. *Always earth the soldering iron bit and the chassis.*

When winding coils on Aladdin formers, a layer of adhesive tape facilitates anchoring the wire. Wind on one turn of tape with its adhesive side against the former and then fold the tape back against itself, winding in the reverse direction for another turn. Ordinary Sellotape is not to be recommended for this purpose as it tends to absorb moisture in course of time but the same manufacturer markets a 0·002 in. thick Melinex-based tape, which is very suitable. Where a coupling winding is required to be interwound with the main winding, put the latter on first, double spacing it for the required number of turns. Overwindings are added over another layer of tape. To anchor the ends of windings securely, thread a short piece of sleeving stripped from p.v.c.-covered wire over one end and wind the other uncovered end round it for a couple of turns, pulling it tight.

All r.f. wiring should be kept as short as possible, of course. This applies particularly to the bypassing leads in

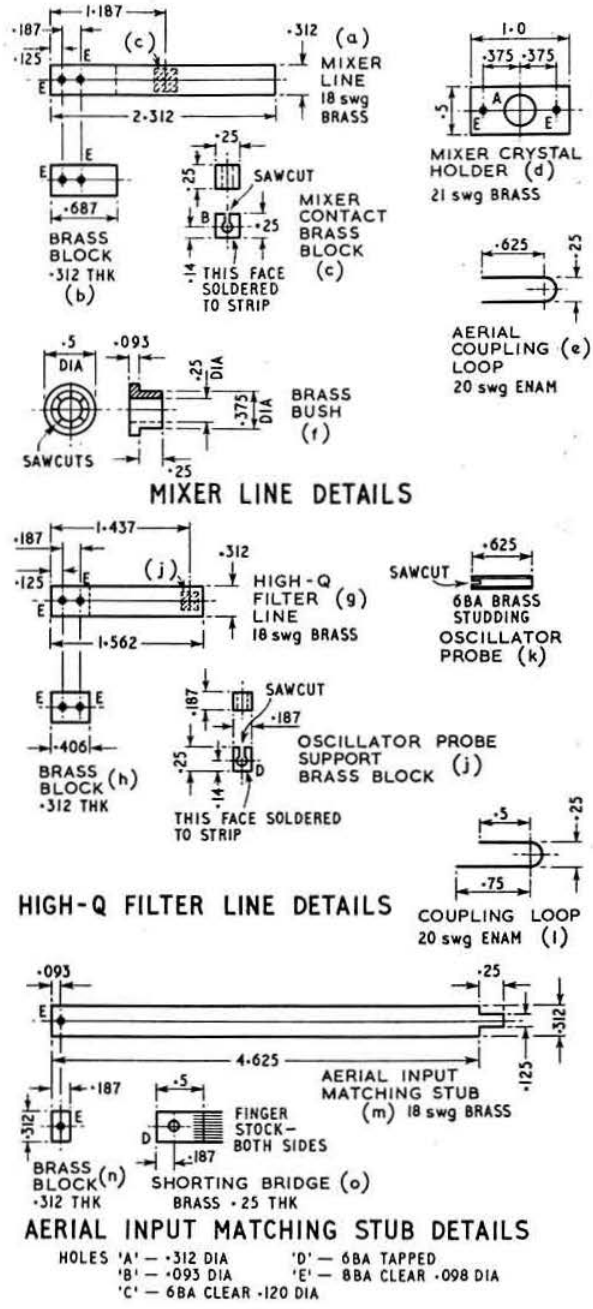


Fig. 8(a). Details of the mixer line and high-Q line in the 1300 Mc/s converter.

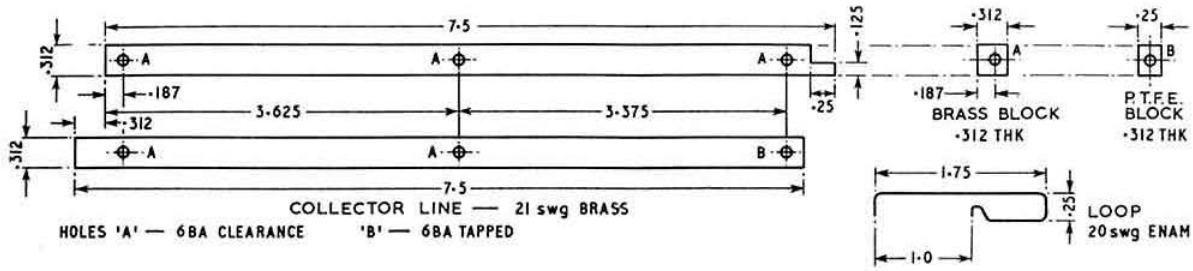


Fig. 8(b). The 315 Mc/s amplifier collector line in the 1300 Mc/s converter.

the 430 Mc/s r.f. stages and the 320 and 1270 Mc/s stages in the 1300 Mc/s converter.

Testing and Alignment

The 430 Mc/s Converter. The local oscillator section should be tested first. Note that l.f. range crystals are inserted closest to the front panel. Meter the collector current of TR7, which is a measure of the drive from the oscillator TR6. Less than 100 μA current should flow with no drive and this applies to all the transistor multiplier stages. Adjust the core of L6 until, as L5 is tuned, TR6 oscillates only at the crystal overtone, as checked by listening to it on a receiver. The collector currents of TR6 and TR7 should then be within 30 per cent or so of those stated in Table 3. Next, meter the collector current of TR8 and tune L7 for a maximum. This will probably be found to be fairly broad. Using an absorption wavemeter on L7, check that the drive to TR8 is mainly at 50 Mc/s. L8 may then be adjusted to produce maximum 100 Mc/s drive in CR2. The *L/C* ratios of the multipler tuned circuits have been arranged to give a compromise between good selectivity protection against adjacent harmonics on the one hand and reasonable power output on the other but it will probably be found that, in the earlier stages, adjacent harmonics are present at noticeable levels which will tend to broaden the apparent responses of the tuned circuits, when checking drive to the next stage. Consequently, it is best to perform the final tuning of all multiplier circuits when metering actual mixer current. The early stage tuning adjustments will then appear to be much more critical as the effect of a single harmonic per stage is being observed through the selectivity of the later tuned circuits.

TABLE 3

Measured electrode d.c. currents and voltages with 11 volt supply voltage

430 Mc/s Converter	I_c	V_b	V_e	1300 Mc/s Converter	I_c	V_b	V_e
TR1	1·55mA	2·15V	2·00V	TR9	1·60mA	1·80V	1·60V
TR2	1·50mA	2·10V	1·90V	TR10	1·00mA	1·10V	1·00V
TR3	1·45mA	1·25V	1·18V	TR11	0·70mA	0·80V	0·70V
TR4	1·21mA	1.40V	1·00V	TR12	1·70mA	1·80V	1·70V
TR5	0·91mA	0·80V	0·70V	TR13	2·20mA	1·70V	1·55V
TR6	4·00mA	4·1V	4·00V	TR14	1·20mA	0·83V	0·71V
TR7	1·80mA	1·2V	1·12V	TR15	2·00mA	0·50V	0·34V
TR8	2·80mA	1·0V	0·91V	TR16	1·10mA	0·23V	0·17V
CR1 I_{dc} = 30 — 50μA				TR17	1·60mA	0·35V	0·30V
CR2 I_{dc} = 5 — 7 mA				CR3 I_{dc} = 150 — 250μA			
				CR4 I_{dc} = 1·5 — 2·5 mA			

All measurements made with AVO Multiminor

Adjustment of the quadrupler output and mixer lines presents the usual problem of tuning two loosely-coupled circuits simultaneously to the same frequency. The difficulty may be surmounted if another 430 Mc/s converter with a local oscillator in the same frequency range happens to be available, in which case, by coupling the local oscillator directly into the mixer line, *using great care*, the latter may be aligned. After this, the high-*Q* filter line is tuned to resonance using the transistorized source. If another converter is not available, this part of the proceedings may be left until the rest of the converter has been completed, when it should be possible to receive a very strong locally-generated signal and peak the circuits up with its aid. The mixer current should be not less than 30 μA. The quadrupler output will probably be found to be very dependent upon the exact settings of both the input and the output coupling loops.

It is important that the d.c. supply to the second r.f. stage, both collector and base, should be connected when checking the mixer alignment as, otherwise, the extra damping produced on the mixer line by the collector of TR2 will be very large indeed. It is possible for TR2 to self-oscillate under some conditions and this should be borne in mind when

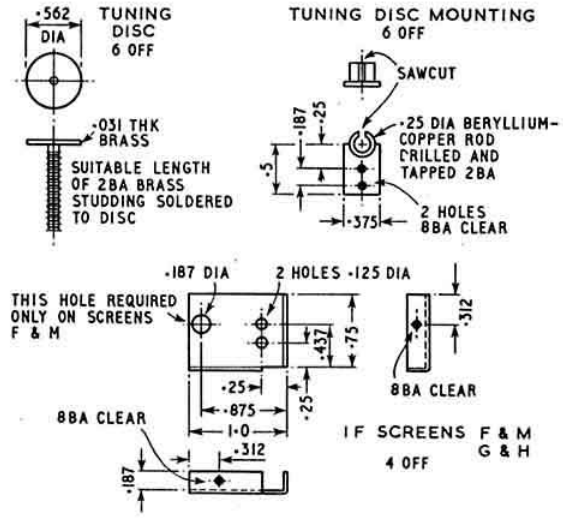


Fig. 9. Details of the tuning discs and i.f. screens used in both converters.

performing this operation. To stop the oscillations, it is usually only necessary to retune the first r.f. stage collector line slightly.

The next step is the alignment of the i.f. section, which is done using a receiver covering the 2 to 4 Mc/s output frequency and a signal generator in the input i.f. range of about 27 to 30 Mc/s. L4 is adjusted by peaking the collector current of the mixer, TR4. Next, the first r.f. stage collector line is tuned to signal frequency. This can usually be done on noise alone but a signal facilitates matters. The interstage coupling loop spacing is adjusted until the bandwidth of the whole signal frequency portion is in the region of 10 Mc/s. Gain and stability will then be found to be adequate.

The complete receiver for 432 and 1296 Mc/s for which G3HBW received the Silver Plaque at the R.S.G.B. International Radio Communications Exhibition in 1962.

Finally, the oscillator crystals are ground or etched until their respective frequencies are correct. This is best accomplished by the use of a crystal marker giving usable 1 Mc/s beats in the signal band and also at the 2 to 4 Mc/s i.f. The marker is, of course, tuned to zero beat with a standard frequency source such as MSF or WWV on 5 or 10 Mc/s. Note that for a final maximum error of 1 kc/s on the 430 Mc/s band, the 5 Mc/s harmonic must be adjusted to within 10 c/s and within 3 c/s for the same error on the 1300 Mc/s band. Start with the lowest frequency range crystal. A locally generated transmitter harmonic will help to avoid confusion between 1 Mc/s beats. The crystals are ground or etched until the signal frequency and output i.f. 1 Mc/s beats are coincident. A low end crystal ground too far may be used as a spare for the next channel up. The writer found this fact very valuable! Ultimately, however, using this method, all local oscillator frequency errors were reduced below 5 kc/s on 1300 Mc/s as well as on 430 Mc/s.

TABLE 4

Major Components Required

Component	Supplier	Number required in 430 Mc/s converter	Number required in 1300 Mc/s converter
M.A.D.T. transistors	Philco International		
2N1742	Ltd., 30-32 Grays Inn	2	3
2N1743	Road, London, W.C.1	1	1
2N1744		3	5
2N2398		2	–
GEX66 germanium diode	G.E.C. Ltd., Brook Green, Hammersmith, London, W.6.	2	1
1N21 silicon-tungsten diode†		–	1
FT243 crystals,			
6625 kc/s		–	2
6640 kc/s		–	1
6650 kc/s		–	1
8245 kc/s		1	–
8450 kc/s		2	–
8475 kc/s		1	–
(8400 kc/s)‡		1	–
FT243 crystal holders	McMurdo	6	6
Coil former type 356/8BA	Aladdin	6	7
Iron-dust pot core coil former	Aladdin	1	1
1000pF feed-through ceramicons type 700A	Erie Resistor Ltd.		
Miniature ceramic stand-off insulators type S1.2	United Insulator Co. Ltd., Tolworth, Surbiton, Surrey	1 40	1 50
Yaxley switches, 1 or 2 pole, 6 way		1	1
Jacks, subminiature type J.33*	Bulgin	2	2
Coaxial socket type L.604/S/CD	Belling Lee	1	–
P.T.F.E. feed-through insulators		12	5
Polyester adhesive electrical tape, type 1610**	Gordon and Gotch Ltd., 75 Farringdon Street, London, E.C.4		

† *Available on surplus market.* ‡ *Only required if 431–432 Mc/s coverage desired.* * *Plugs are Bulgin P.532.* ** *For coil winding.*

The 1300 Mc/s Converter. The alignment of the 1300 Mc/s converter is very similar to that for the lower frequency front-end. Stage-by-stage adjustment of the frequency multiplier chain is performed as before.

It should be possible to obtain 5 or 6 mA rectified current in the GEX66 quadrupler but it will probably be found that the correct setting of the drive loop for maximum 1270 Mc/s output will result in only about 2 mA current flowing. Once again, the actual mixer current will be found to be fairly critically dependent upon the positions of the quadrupler input and output coupling loops but, once set, these, like all the other adjustments in the converters, with the exception of the 1300 Mc/s aerial matching and mixer tuning controls, will probably never need to be re-adjusted, except when replacing active elements.

The Rest of the Receiver

The output i.f. signals from the converters are fed into a tuner covering either 2·0 to 3·0 or 2·0 to 4·0 Mc/s exactly. This is achieved by the use of a two-section four-gang tuning capacitor, as in the low-frequency receiver.* There are two i.f. stages, using 2N1742's in common-base, a common-emitter 2N1743 mixer and 2N1744 oscillator. The output i.f. of 456 kc/s is fed, via a phased, single-crystal filter, into an i.f. strip and hence into a detector and a.f. stages. A b.f.o., amplified "hang" a.g.c., noise limiter and S-meter are provided. A new feature is a tunable a.f. *Q*-multipler,

* R.S.G.B. BULLETIN, February, 1963.

which has been found very valuable when listening to extremely weak signals in the noise.

Results Obtained

As already stated, the sensitivity of both front-ends is very good, the measured noise figures of the 70 and 23cm converters being not greater than 6 and 10db respectively over the whole of the bands covered, with no re-adjustments.

Frequency stability is excellent, the drift being less than 1 kc/s on either band over a period of several hours. In fact, when using the complete receiver to listen to the output of a transistorized signal marker on 1296 Mc/s, it was found that the beat note did not change appreciably in one hour. The note is, of course, T9X when the receiver is supplied from batteries or a well-smoothed mains 12 V d.c. power pack.

On 430 Mc/s, a very large number of stations has been heard. During a recent opening, many stations from all over England and from the Continent were received at S9 plus, using an indifferent aerial in a good location.

The 1300 Mc/s converter also works well and G3GDR at six miles was an excellent phone signal with only 1 in. of wire as an aerial. Others heard include G2RD and G5DT, the best DX being about 25 miles.

Development History and Possible Modifications

When the original design for the 70 and 23cm receiver was contemplated, the most likely source of difficulties was anticipated to be in the design of the u.h.f. multiplier chain. It was known that variable-capacitance diodes (Varactors) were already available which would allow multiplier chains to be built operating from transistor drivers to give sufficient r.f. output for satisfactory diode mixing at frequencies of up to at least 10 Gc/s but there were two chief objections to this method. Firstly, Varactor frequency multiplier circuits were known to be somewhat critical in design and, secondly, the cost of suitable devices, usually measured in tens of pounds each, was prohibitive. It was therefore decided to attempt to develop transistor and/or point contact diode multiplier stages to give 1270 Mc/s output. The Philco T.2030, with a claimed average gain-frequency product, f_t, of 1·6 Gc/s, was selected for trials. A simple trough-line circuit was made up with a bridge-tuned collector line and output coupling loop. Both common emitter and common base operation were tried with biasing by base-emitter junction rectification, as usual, and 320 Mc/s drive was supplied from the 6J6 tripler stage in the station valve 1300 Mc/s converter. A word of warning is in order here for those thinking of attempting the same sort of experiments: more than one transistor abruptly ceased to exist during these operations, due to excessive drive being accidentally applied from the 6J6 tripler, whose maximum available output was in the region of a watt!

With a collector current of 2 mA, it was found possible to measure a collector current dip of about 10 per cent when the collector circuit was tuned to resonance at 640 Mc/s, and sufficient r.f. output was produced, mostly on this frequency, to drive a further similar stage to about 1·5 mA collector current. Again, a measurable collector current dip was produced when the collector circuit of the second stage was tuned to 1270 Mc/s and the output, fed via the high-Q filter into the mixer line of the valve converter, gave about 20 μA crystal current, which was greeted with triumph! An attempt was then made to quadruple directly in the second stage and this resulted in no less than 60 μA crystal current being obtained, with 1·5 mA collector current. Then it was found that replacing the T.2030 by a 2N1744 (half the price!) gave only a negligible reduction in output in this application. Finally, the transistor was in turn replaced by a GEX66 germanium diode link coupled into the former collector tuned circuit and, under the same 320 Mc/s drive conditions, with 3 mA flowing in the GEX66, a current of 150 μA was produced in the crystal mixer. Consequently, the circuit line-up already described was decided upon and a prototype unit was built. This worked successfully and a tidier copy was made for inclusion in the complete receiver.

TABLE 5

Results obtained with different multiplier diodes (320 to 1270 Mc/s, same driver output in each case)

Diode Type	Total series resistance	Rectified current	Rectified current in 1N21 mixer diode
1N64	33 ohms	0·55 mA	80 μA
	133 ohms	0·30 mA	80 μA
	1·5 K ohms	0·14 mA	60 μA
1N82	33 ohms	2·40 mA	110 μA
	1·5 K ohms	0·31 mA	125 μA
	10 K ohms	0·07 mA	80 μA
GEX66	33 ohms	1·40 mA	175 μA
	10 K ohms	1·40 mA	85 μA

It was hoped that the 430 Mc/s converter oscillator chain would be less of a problem than the higher frequency one but, in fact, it was found quite tricky to obtain adequate injection from the diode quadrupler into the mixer when the mixer line was loaded by the second r.f. stage collector. Finally, however, the present satisfactory quadrupler arrangement was evolved. One attempt to save a certain amount of space by folding the multiplier output high-Q line into a long " U " shape, to eliminate the second chassis compartment, resulted in a very large fall in output and presumably, therefore in Q!

The Mullard AFZ12 could probably be used, if desired, to replace the 2N1742 series in most, if not all positions, but it is possible that the performances of the higher frequency stages and, in particular, of the 320 Mc/s amplifier, would be degraded somewhat. Experiments have been carried out to test the Sylvania 1N82 and General Electric (U.S.A.) 1N64 in place of the GEX66 in the 320 to 1270 Mc/s multiplier. The results obtained, using different values of series resistor, are shown in Table 5. It is thus fairly certain that both diodes could be successfully employed in either multiplier stage but ordinary point contact diodes could probably not be used. Additional tests carried out suggest that adequate local oscillator injection might well be obtained if the 320 Mc/s amplifier stage were to be omitted but the gain margin would certainly be reduced. However, the number of transistors required for the 1300 Mc/s converter would be reduced to eight.

If, in addition, final i.f.'s for tuning in the range 20 to 30 Mc/s were considered acceptable, the second mixer and oscillator isolating amplifier stages could be omitted in either converter but it would still be desirable to retain the i.f. amplifier stage. This would reduce the number of transistors required for either converter to six, probably the absolute minimum for satisfactory operation. For interest, it may be worth quoting that the unit retail costs of the 2N1742 series of transistors and of the GEX66 diode are considerably less than £1 and that of the 2N2398 device, used in the 70 cm r.f. amplifier, is just over £2.

OSCAR III is to be a V.H.F. Translator

Here, based on an article by William I. Orr, W6SAI, in the February, 1963 issue of QST, *is the brief story of the development of* Oscar III *by the team which successfully put the first two Amateur Radio satellites into orbit in 1961-62.*

MEMBERS of Project Oscar Inc.—previously known as the Project Oscar Association—are, and have been for some time, working on the formidable problems entailed in putting into orbit a translator satellite capable of repeating signals received in the 50 kc/s segment of the 2m band between 144·075 and 144·125 Mc/s and retransmitting them over a 50 kc/s portion of the band lying between 145·875 and 145·925 Mc/s.

Repeater stations have been in use for some time to maintain contact between two sites out of radio range of one another, the normal procedure being to receive a signal on the frequency to which the receiver is tuned, demodulate it and retransmit the intelligence on another discrete frequency to the distant point. What is required from *Oscar III* is the ability to deal simultaneously with a number of signals being transmitted in one part of the 2m band, whether they be c.w., a.m., f.m., s.s.b. or what-have-you, and to retransmit them, still in the same relative frequency distribution one to another, in another portion of the same band.

To understand the method of operation, assume that *Oscar III* picks up a signal on a frequency of 144·105 Mc/s, near the centre of its receiver passband. The signal passes from the quarter-wave whip or ground-plane aerial *N* (Fig. 1) through a rejection filter *M* to r.f. amplifier *A* and thence to mixer *B* where it is converted, with the aid of a locally generated signal on 114·1 Mc/s, to the first i.f. of 30 Mc/s. The low gain amplifier *D*, with a bandwidth of 200 kc/s, drives the second mixer *E* which converts the signal, with the aid of oscillator *F*, to the second i.f. of 3 Mc/s. The high gain amplifier *G* has a passband of 50 kc/s which establishes the passband of the whole translator. The 3 Mc/s signal is next applied to the third mixer *H* where it is combined with a further locally generated signal on 148·9 Mc/s *J* to produce the transmitted frequency of 145·9 Mc/s. This is amplified in two linear stages, *K* and *L*, and fed back to *the same aerial* from which it started, at a peak envelope power level of one watt. The transmitted signal will be a replica of that received except for frequency inversion which, incidentally, would convert lower sideband s.s.b. signals to upper sideband and vice versa.

The most remarkable piece of the whole equipment is probably the rejection filter (*M* in Fig. 1) which provides 70db of protection to the receiver from the one watt output of the transmitter while passing a 50 kc/s slice of the band with the minimum of attenuation!

The function of the command receiver *P* is to enable the transmitter in the satellite to be blocked by a signal from Project Oscar Headquarters should it be considered that the translator is being misused. It is understood that the normal state of the equipment will be " on " and it is not the intention to use the command facility unnecessarily to control the satellite transmitter.

The experimental " breadboard " version of the *Oscar III* equipment was designed and built by Don Norgaard, W6VMH, and Ed Hilton, W6VKP, and the package first went on the air from the former's station in October last year, fixed to the top of a 30 ft. mast. At the time when the *QST* article was written the experimental model had not been engineered into its final satellite form, nor had the vexed problem of the power supply been satisfactorily settled. The power requirements are 5 watts—much more than could be supplied by any form of battery—and with the restrictions on the size of the final package, insufficient area for both solar cells and the necessary heat radiation surface exists. Presumably some solution is in sight, although it has not yet been divulged, as the target date for launch into orbit is late spring or early summer 1963. W. H. A.

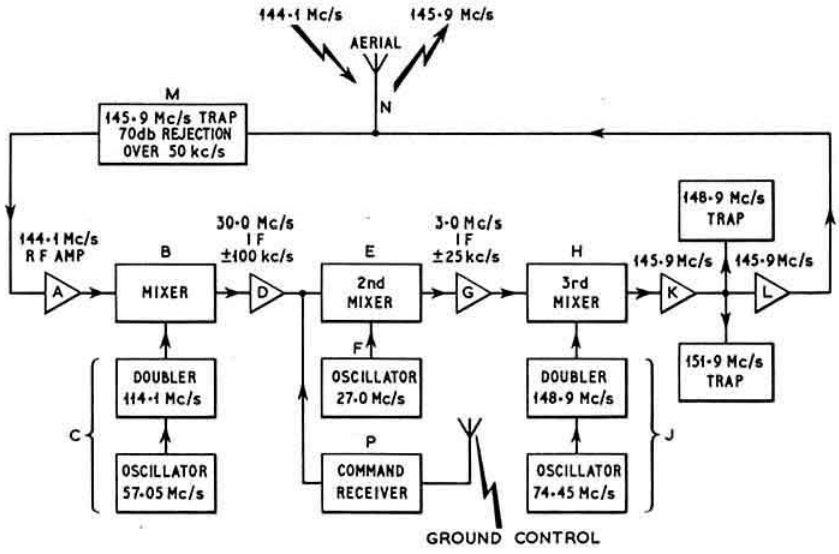


Fig. 1. Block diagram of the prototype Oscar III translator.

Pre-War HAF1B

THE DAUGHTER OF THE LATE CSINCSAK KALMAN, operator of pre-war HAF1B, wishes to contact friends of her father who may still possess photos of him, or letters from him. Members who knew HAF1B are asked to write to Mrs. T. G. Pazar (who now lives in Australia), c/o Louis Varney (G5RV), 184 Galleywood Road, Chelmsford, Essex.

200-PLUS ON TWO

A Scientific Investigation into V.H.F. National Field Day, July 7-8, 1962

By R. G. FLAVELL, F.R.Met.S. (G3LTP)*

This analysis of conditions on 144 Mc/s during the V.H.F. National Field Day last year employs the principles described in part 1 of *V.H.F Weather* published in the March, 1963, issue of the R.S.G.B. BULLETIN.

AFTER the thrills of a Field Day are over, and the portable rigs have been put back on the shelves, the Contests Committee begins the arduous task of checking logs, totalling scores and awarding the honours. Then, when the work is completed, another file is added to the collection at Headquarters, perhaps never to be opened again.

With the V.H.F. National Field Day, July 7-8, 1962, however, there was another aspect. With the approval of Council, the Scientific Studies Committee was allowed to extract data from the contest logs in order to examine the possible scientific uses of propagation data obtained from them. As this contest coincided with a period of anomalous propagation it was thought that the report to the Committee would be of general interest to many of those who took part.

Some aspects of this investigation will be unfamiliar to readers of the BULLETIN, but an article explaining the radio-meteorological technique involved as well as examining the more basic issues of tropospheric propagation has been published in an earlier issue of the BULLETIN [1].

Scope of the Investigation

To avoid complications arising from the wide divergence of sites and equipment, as well as the inevitable differences in personal judgement when estimating signal-strengths, the study was based entirely on signal-paths of abnormal length, only the fact that a two-way contact was possible being taken into account. For this contest, 200 miles was used as a qualifying distance; taking less than this produced an unmanageable wealth of detail involving more than tropospheric conditions alone, while beyond it the number of allowable contacts dropped off rapidly.

Once the data had been extracted, two ways of using it suggested themselves. One was to study the geographical distribution of long-range contacts at intervals during the contest to see if a definite pattern could be detected. The other was to examine the long-range signal-paths open at times when upper-air meteorological information was available to see whether they supported a theory connecting optimum signal-conditions with the horizontal distribution of a function of radio-refractive index.

The Signal Path Maps

The series of 24 maps (Fig. 1) on pages 596-7 shows the locations of all signal paths 200 miles or over in length, logged during each hourly period of the contest. This was the only criterion, no account being taken of signal-strength reports nor of whether the transmission was on phone or c.w.

The Delta-K Maps

For the purpose of this discussion it will be sufficient to define the quantity delta-K as the gradient of Potential Refractive Index (a function of pressure, temperature and humidity) taken over the first 5,000 ft. of the atmosphere.

A study of continuously-monitored fixed paths has suggested that, at times of high signals, the delta-K values along the path are symmetrical about the centre, and that departure from symmetry leads to a reduction in signal-strength. In other words, the most favourable paths at a given time lie across the delta-K pattern in such a way that the values at the sites of the transmitter and receiver are roughly equal, with a maximum or minimum value (not necessarily the centre of a closed pattern) lying approximately in the middle.

The four delta-K maps (Fig. 2) shown below cover the period of the contest and the 18 hours immediately preceding. They must not be confused with isobars on a normal " weather map " to which they bear a strong resemblance.

Analysis of Data

In anticyclonic situations, such as the one occurring over the British Isles during the contest, a boundary layer forms in the stratosphere between relatively warm, dry air descending from above, and cool, moist air stirred up from below by convection and turbulence. The thickness and extent of this layer and its position relative to the signal-path largely determine the signal-strength at the receiving end, and, indeed, the range which can be worked.

This particular occasion was by no means outstanding in terms of refractive index changes in the vertical. On the other hand it is not possible to detect any definite logical movement of the centres of activity from one map to the next, and the two things may well be related. In the absence of a really well-defined layer conditions are very susceptible

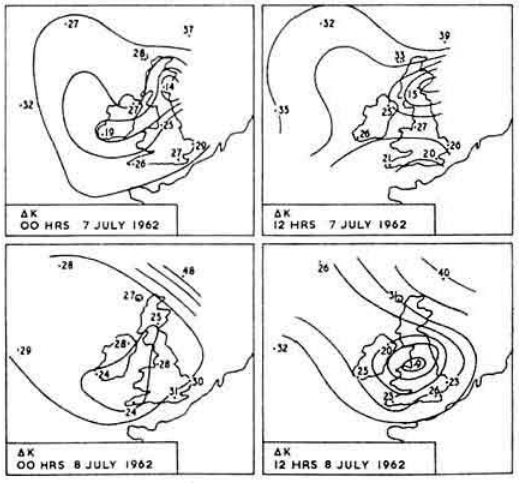


Fig. 2. Contours of equal potential refractive index change with height (delta-K).

* *141 Clyfford Road, Ruislip, Middlesex.*

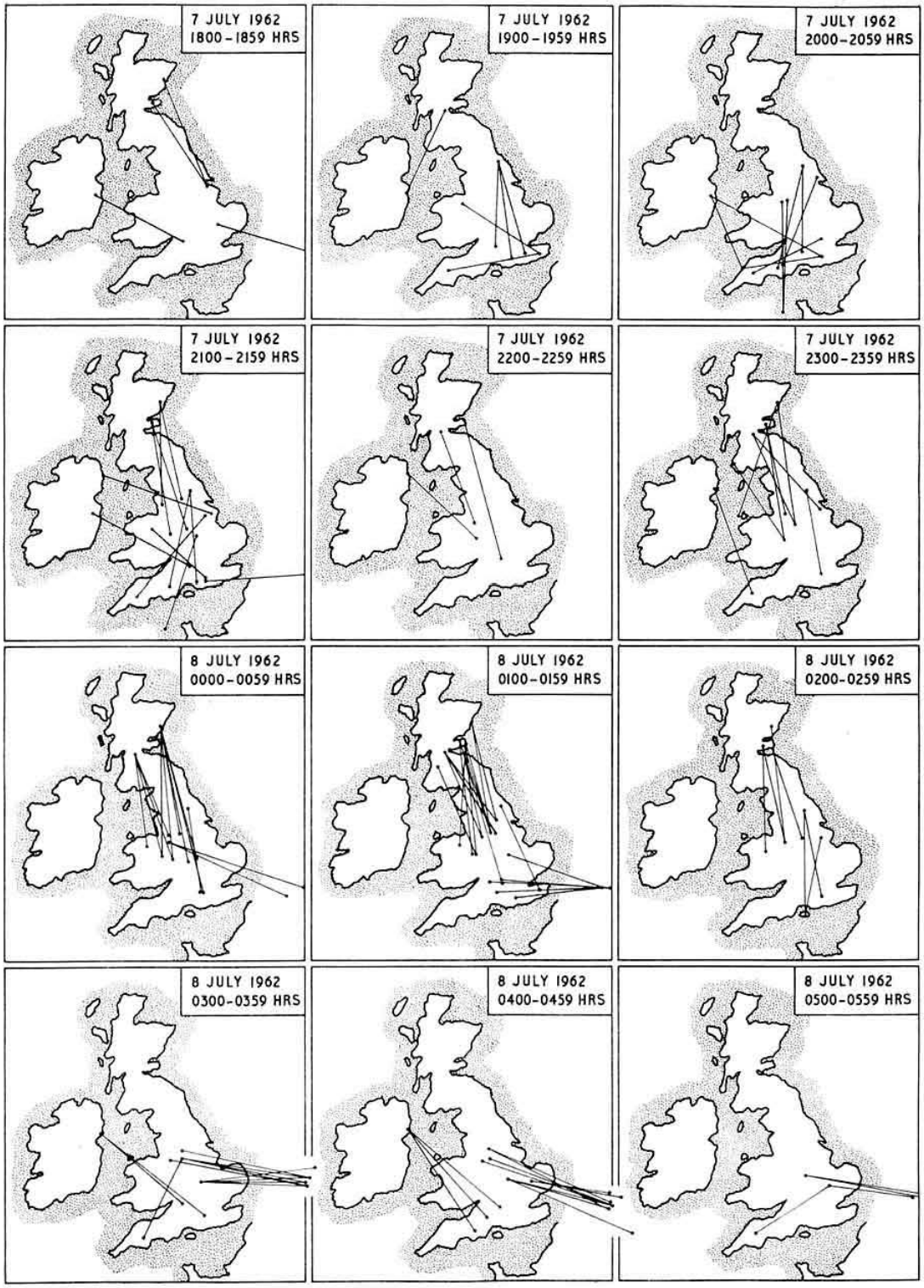


Fig. 1. Series of 24 charts showing signal-paths of 200 miles and over, logged during each hour of the contest.

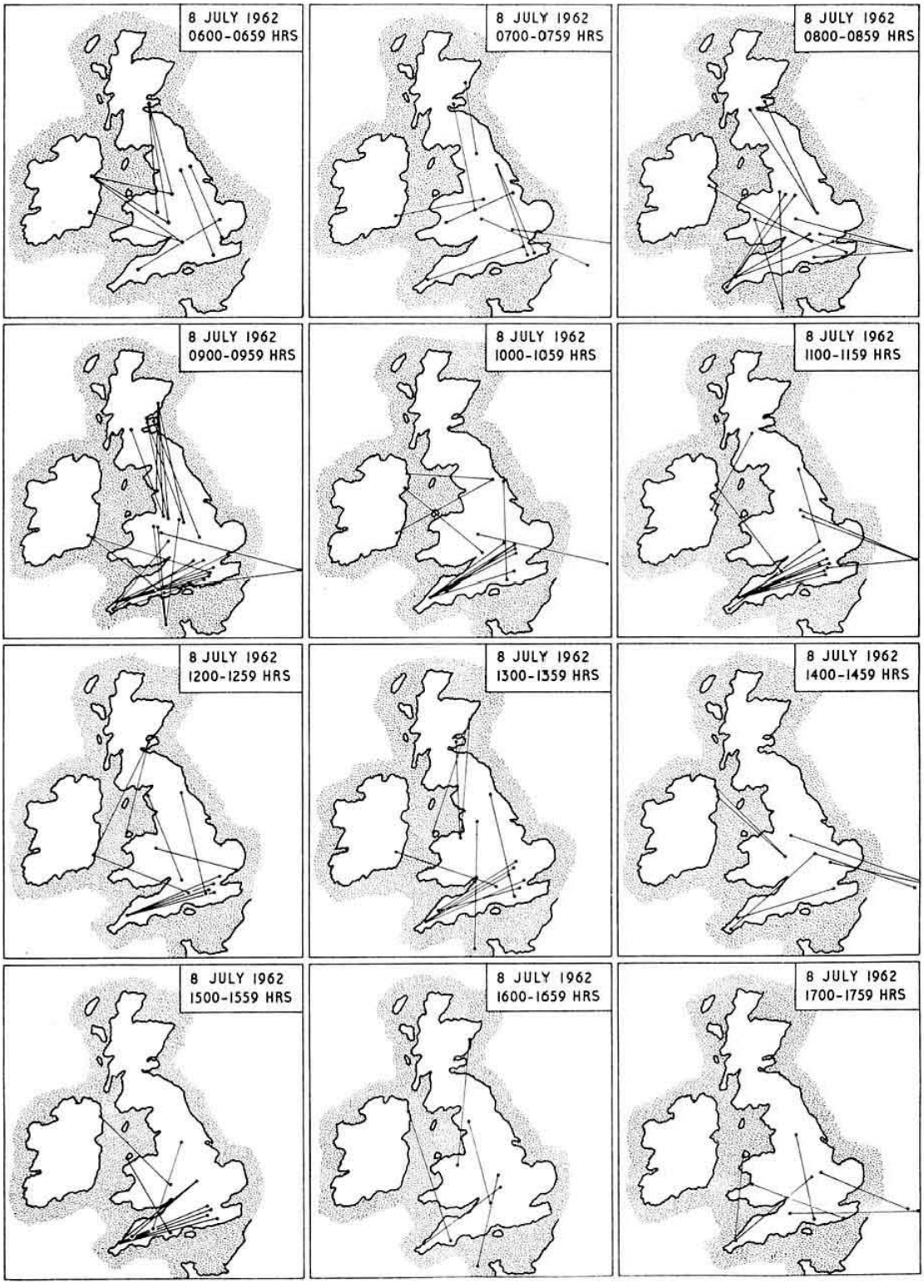


Fig. 1. Series of 24 charts showing signal-paths of 200 miles and over, logged during each hour of the contest.

to quite local changes in surface conditions, which, by affecting the amount of turbulence or convection in the lower levels, could alter the nature of the boundary sufficiently to throw the emphasis from one part of the country to another without amounting to a movement of the system as a whole. The delta-*K* charts are of necessity coarse, due to the wide spacing of the upper-air meteorological network, so that the pattern inferred over the country as a whole is not capable of revealing localized deviations and will either ignore them if they are not affecting one or more of the radiosonde stations or average them out over a wide area if they do.

This needs to be borne in mind when interpreting Fig. 3, where two of the delta-*K* maps have had the relevant signal-path data superimposed. In the case of the chart for 00.00 hours, July 8, 1963, it would appear at first sight that the symmetry theory is only partially successful, although reference to the original map, Fig. 1, reveals that at the time the values at the stations in the Hebrides, Northern Ireland and Lancashire, on which the pattern is based, were almost identical, being 27, 28 and 28 respectively. Therefore in this case the run of the line for 25 is rather arbitrary and local conditions will certainly play a major part in deciding which paths ought to be favourable from a study of the pattern. The situation by midday had become more definite, and there is a correspondingly better correlation between the pattern and signal reports. No attempt has been made in this study to explain the contacts with the Continent, since no upper-air information was available for stations outside the United Kingdom at the time that this investigation was made, although, if this exercise were to be repeated on another occasion it would clearly be of interest to take steps to obtain it. In all probability the pattern over the British Isles is part of a larger system, the true extent of which could only be determined by collecting and reducing upper-air meteorological data for a large number of stations in north-west Europe.

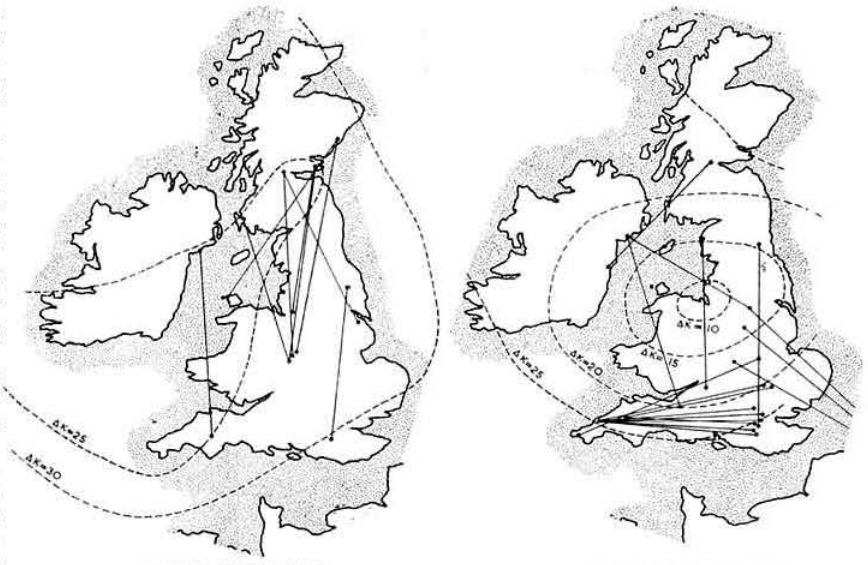


Fig. 3. Two delta-K charts of conditions during the contest period with the relevant signal-path data superimposed.

Conclusions

It would appear that use can be made of v.h.f. contest logs in amateur propagation studies. The fact that conditions were not very well-developed on this occasion has limited the usefulness of the present exercise, but observations seem to confirm the connection between delta-*K* pattern and optimum signal-paths noted elsewhere. Plotting signal-paths exceeding, say, 200 miles, provides a method of studying hour-by-hour movements of centres of activity, which on a more favourable occasion may yield a useful addition to our knowledge of v.h.f. propagation.

These are exercises for which the radio amateur is ideally suited, since the cost of establishing and monitoring a comparable number of simultaneous links would be prohibitive to a professional research organization.

The author is grateful to the Director of Radio Research, D.S.I.R. for permission to apply radio-meteorological methods, developed as a part of his programme, to amateur activities.

Reference

[1] Flavell, R. G., "V.H.F. Weather," Part 1, R.S.G.B. BULLETIN, March, 1963.

Enquiries Regarding Bulletin Articles

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

NORTH WALES OFFICIAL REGIONAL MEETING

COLWYN BAY HOTEL, COLWYN BAY

Sunday, May 12, 1963

Programme:

12 noon	Assembly
1 p.m.	Luncheon
2.30 p.m.	Business Meeting
4.30 p.m.	Buffet Tea

Tickets (Luncheon 11/6, Buffet Tea 3/6) may be obtained from the Region 11 Representative, R. Jones, GW3JI, Beirut, Albert Drive Gardens, Deganwy, Caernarvonshire. Last day for reservations, May 8, 1963. The Council will be represented by Mr. L. E. Newnham, G6NZ, Mr. R. C. Hills, G3HRH, Mr. A. C. Williams, GW5VX (Zonal Representative) and Mr. John Clarricoats, O.B.E., G6CL (General Secretary).

Test Report

Withers Electronics' "Topmobile" and "Twomobile" Receivers

CONSIDERABLE interest was aroused when the Withers Electronics' transistor receivers were shown at last year's R.S.G.B. Radio Communications Exhibition, and we were therefore pleased to have the opportunity to "air test" them under typical amateur conditions.

The receivers are of similar appearance, housed in cases measuring 6 in. wide, 6½ in. deep and 3 in. high finished in grey hammertone and designed primarily for portable operation. A 6 volt dry battery serves as power source and this, together with a 3 ohm loudspeaker, is connected through a four-pin plug to a socket on the back of the chassis. The aerial connection in each receiver is made to a Belling Lee co-axial socket also at the rear of the chassis.

The "slide-rule" tuning scale is 2¾ in. long with smooth and positive slow-motion drive, the tuning ranges being 1·8 to 2·0 Mc/s and 144 to 146 Mc/s respectively. The weight of both receivers, less of course the loudspeaker and battery, is approximately 3¼ lb., so both are worthy of consideration for portable work at inaccessible sites. The controls on both receivers comprise tuning, b.f.o. switch, r.f. gain and a.f. gain.

"Topmobile"

Considering first the "Topmobile," the line-up is r.f., mixer/oscillator, two i.f. amplifiers at 470 kc/s, diode detector/a.g.c., noise limiter, b.f.o., a.f. amplifier, driver and push-pull class B output stage, the latter delivering one watt of audio.

A somewhat indifferent loft aerial was used for tests with no attempt to match it into the low-impedance input socket and results were most satisfactory on both 'phone and c.w. signals. Unfortunately no s.s.b. transmissions were heard during the tests, but as frequency stability was of a high order, reception of this mode should have presented no difficulty on that score.

Naturally, in so compact a design, i.f. selectivity is fixed and must, therefore, be a compromise. This proved to have been well chosen and while doing full justice to good quality 'phone transmissions had sufficiently sharp cut-off either side of the passband to give really good adjacent channel selectivity to prevent the excessive spread of strong signals. Although such conditions are not ideal for c.w. reception, the b.f.o. being fixed tuned at the centre of the i.f. for s.s.b. working, no great difficulty was experienced provided normal care was exercised in setting the r.f. and a.f. gain controls, and good signals were received from GM, GW, OK and ON on this mode. B.f.o. injection is effected early in the i.f. amplifier and had no apparent effect on a.g.c. The noise limiter was effective in reducing pulse interference from Loran to manageable proportions while not causing distortion on deeply modulated telephony.

With a class B output stage, battery consumption depends greatly upon the a.f. gain setting, but on average signals reproduced at ample volume for normal operation, the 6 volt battery was called upon to supply peaks of 40 to 50 mA, while weaker signals demanded little more than the standing current of 25 to 30 mA. Provision is made for the insertion of two miniature dial lamps, if desired, when operating from a car accumulator. Tests were made with various battery voltages from just over 4·5 to 7·5 volts, the only difference being the maximum audio output available. Little effect was noticed on oscillator frequency. Only one weak spurious response was heard, at around 1850 kc/s.

The Withers "Topmobile" transistor receiver for 1.8-2 Mc/s. The "Twomobile" is similar in appearance. Both receivers measure 6 in. wide, 6½ in. deep and 3 in. high.

(Photo by courtesy of Withers Electronics)

"Twomobile"

The "Twomobile" is essentially the "Topmobile" receiver suitably altered to cover the range 4 to 6 Mc/s, with the addition of a 2m converter ahead of it. The latter was found to be extremely compact, measuring 3½ in. by 1 in. by 1 in. and obviously the result of considerable development, for the results compared very favourably with a good valve converter employing a 6CW4 r.f. stage both as regards sensitivity and signal to noise ratio.

The converter contains three transistors, type 2N1742 (r.f.), 2N1743 (mixer) and OC170 (oscillator). The aerial connects to the emitter of the r.f. stage through a Band 1/Band 2 trap but has no other preselection. The second harmonic of a 70 Mc/s fifth-overtone crystal is injected into the emitter of the mixer.

The response over the 2 Mc/s tuning range was to all intents and purposes flat; no mean feat in view of the comparatively low value of the tunable i.f.

At the writer's station about 10 miles from the three B.B.C. f.m. transmitters at Wrotham, Kent, no trace of breakthrough of Band 2 signals was found on this equipment. On a 6-over-6 array, 60 ft. above ground and with an interrupted view of the Wrotham aerials six miles away there was some interference, but even under these conditions the f.m. signal was not unduly strong and tuned quite sharply. Some c.w. breakthrough at low level was experienced at both sites from stations operating in the 4 Mc/s shipping band when the receiver was operating at maximum sensitivity. These signals did not come in via the aerial and appeared to be picked up on the case and it is understood that the manufacturers are fitting additional screening to prevent this in future. Bearing in mind that the receiver is intended primarily for mobile operation with very much smaller aerial systems than are found at the majority of fixed stations, the degree of spurious signal reception is not considered serious.

The noise limiter seemed even more effective than on the "Topmobile" and practically no car ignition interference was experienced. The a.g.c. proved effective in holding a signal constant except under the most severe conditions of aircraft reflection and again the adjacent channel selectivity was excellent.

The "Topmobile" costs £19 19s. and the "Twomobile" £28 : both may be recommended for their respective roles.

W. H. A.

I.E.E. Convention on H.F. Communication

THE Electronics Division of the I.E.E. held an important "Convention on H.F. Communication" in London during March 25-27. This was the first major convention dealing with this subject since 1947, and many of the latest techniques used in point-to-point and mobile communications by the G.P.O., Cable and Wireless, the Services, and other users of the h.f. bands were described. Sessions were devoted to propagation, aerials, fixed equipment, systems, applications and operational problems.

While attending the convention on behalf of *Electronics Weekly* it became clear to the writer that many of the topics discussed had direct interest to radio amateurs. However, since the sessions totalled some 20 hours and the papers occupy more than 400 pages, it is possible here only to outline briefly a few of the many points which emerged.

Aerials and Propagation

Users of frequency prediction charts may like to note that G.P.O. experience has shown that during sunspot minimum periods signals tend to arrive from easterly and westerly directions during daytime on frequencies appreciably higher than would be expected from the charts.

Similarly, more than 30,000 wave-arrival measurements have proved that long-distance signals arrive at angles well below 10° to the horizon for a large proportion of the time, with a trend towards even lower angles during the fade-out period. This confirms general amateur experience, and is of course the reason why beams and other aerials having low vertical angle radiation give an improvement (particularly when the band starts to fade) well beyond the simple forward power gain of the array.

For some years, British point-to-point working has relied to an increasing extent on rhombics. Recently, to improve low-angle performance there has been a "growing appreciation of the importance of aerial neight," and heights of up to 300 ft. are now being advocated for rhombics.

One paper described a broadband biconal monopole aerial covering a 2·6 : 1 frequency range (e.g. one aerial could cover 12-30 Mc/s). This aerial is rather like the inverted discones which have been described in various amateur journals but without the top disc so that construction is considerably simpler. Since the aerial requires only a single mast of moderate height (preferably insulated from ground at the base) with a bird-cage type cone of wire radiators, construction should be well within the capabilities of many amateurs.

On this question of broadband operation, great interest was shown in various forms of log periodic arrays using folded dipole and broad dipole elements. A broad dipole fixed array covering 13·5-41 Mc/s was described, occupying a space 1·3 wavelength long, 0·43 wavelength wide at 13·5 Mc/s. Gain over an isotropic dipole (this is an imaginary dipole element radiating equally in all directions) is 13db and the input resistance is a convenient 100 ohms. Log periodics were first announced in 1957 and seem to be coming into increased use for all sorts of applications (log periodic TV receiving aerials are marketed in the U.S.A.). They seem likely to have a big future and we would mention that an introductory article appeared in *QST* for November, 1959.

The value of inverted-V dipoles (single centre support with low ends) for portable military operation was mentioned by one speaker—this again is a technique increasingly used by amateurs.

Equipment

On the equipment side—skipping such topics as automatic error correction which have no amateur application—there proved many interesting features even in rigs running at a cool 85 kW output. In particular, we were struck by the rapid acceptance of frequency synthesizer techniques for both transmitters and receivers, providing highly stable output—often derived from a single crystal—on any desired frequency selected by simply rotating 1-10 dials in 10 Mc/s, 1 Mc/s, 100 kc/s, 10 kc/s, 1 kc/s and even 100 c/s steps. Unfortunately most designs are pretty complex (in receivers the synthesizer often seems to contain as many stages as the rest of the receiver put together). These, like most commercial equipment apart from power amplifiers, are often transistorized in the latest versions.

Another technique which has attracted much interest recently is the wideband distributed amplifiers for up to 1 kW output fitted in many Marconi transmitters. These provide output throughout the h.f. spectrum without any re-tuning whatsoever (if desired several different outputs can be obtained at the same time). But here again we cannot see any application to amateur operation to compensate for the extra valves etc. Clearly, though, there is a very marked tendency in all big transmitters towards various automatic tuning and aerial loading systems to make possible remote operation.

A 200 watt (output) power amplifier for military mobile use is entirely sealed against water. This leads to problems of heat dissipation not unlike those facing amateurs building compact fully-screened units. Two CV1905 (QY3-65, 4-65A) valves in parallel are kept cool by using a light alloy block clamped to the outer case with two holes lined with beryllium copper wire springs into which the valves fit. We have heard of amateurs using this type of cooling on v.f.o. units.

A very compact transistorized h.f. pack-set for Army use has a receiver with crystal-controlled front-end and tunable first i.f. The transistor transmitter is rather QRP but can be used to drive a separate amplifier with a quick-heating tetrode to give 16 watts output. The main modulation system is "phase modulation" (i.e., n.b.f.m.) and we were interested to learn that the advantages of this system (weight, power consumption, etc.) were considered to more than offset the slightly lower punch than a.m.

An interesting experimental technique to ensure that transmitters are fully modulated at all times uses a syllabic constant-volume amplifier. Tape recordings showed how such signals really push noise aside. But since there has to be an expansion unit at the receiving side controlled by another f.m. channel this looks like being a commercial-only device.

On the receiving side, we were particularly interested in a new G.E.C. receiver for the Navy with extremely high protection against cross-modulation but this will be referred to in another article. Standard Telephone Laboratories have been producing prototype mechanical filters, so maybe one day we will not be dependent for these most useful devices on U.S. and Japanese sources.

The problem of harmonic suppression on the big rigs has led to considerable use of Pi-L tank networks (see *T.T.* August, 1962) giving appreciably lower harmonic output than the ordinary pi arrangement. One of the main ways in which transmitter reliability is being improved is the adoption of silicon diode rectifiers. It was stated that provided the necessary transient surge suppression was used, these are really "fit and forget" components.

Several amateurs were spotted at the Convention or in the lists of the 287 participants—including G2EC, G3BGP, G3HRH, G5RV, G6XN and G8PB.

G3VA

A Transistor Receiver for D/F

By M. A. NIMAN, D.F.M. (G3LGN)*

THE formation of a D/F Section by the Manchester and District Amateur Radio Society meant that interested members had to build or acquire suitable receivers. The writer already had a broadcast type transistor set which was rarely used, and it was decided therefore to alter the medium-wave section to cover Top Band (1·8 to 2·0 Mc/s).

From previous observations, it was known that an extremely good null could be obtained when the ferrite rod was directed at a transmitting station, and thus, if a satisfactory screen for this type of aerial could be designed, a good, portable D/F set would result.

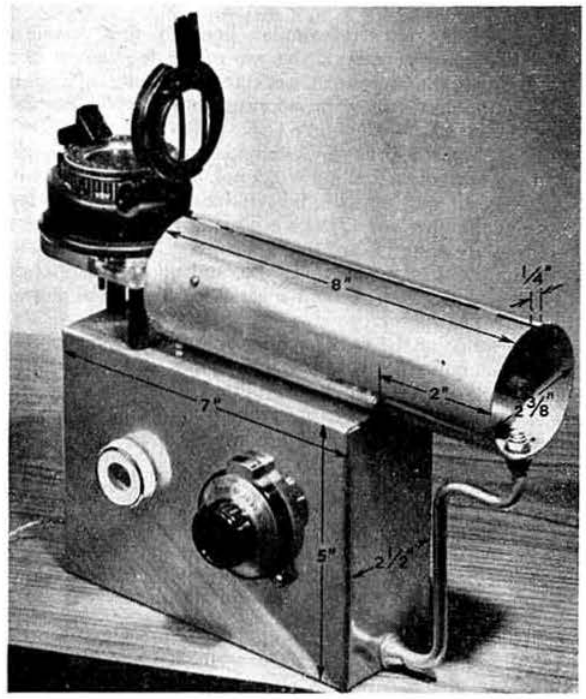
The first task was to alter the aerial coil on the ferrite rod. As the highest frequency to which this coil could tune was 1·5 Mc/s, some turns had to be removed, this being done very carefully with the aerial tuning capacitor meshed to about 25 pF, and with a grid dip oscillator available to check resonance. When the aerial circuit had been resonated to 1·9 Mc/s, it was left, and attention was paid to the frequency-changer stage.

The first stage of the receiver originally used a Mullard OC44 transistor and this was replaced by an OC171 in an effort to improve the signal-to-noise ratio. With the aerial still tuned to 1·9 Mc/s, the g.d.o. was removed to another room in the house, well away from the receiver, and left generating a 1·9 Mc/s signal. On retuning the oscillator coil for maximum signal strength, such a large difference between the fundamental and second channel signal was noted that there was little chance of tuning to the wrong one.

The intermediate frequency of the receiver in question, like most transistor radios manufactured in this country, is centred on 470 kc/s. The original coverage on the medium-wave band was 600 to 200m, i.e., 500 kc/s to 1·5 Mc/s; the oscillator, being set high, thus had to cover 970 kc/s to 1·97 Mc/s. This was very convenient because it meant that the same oscillator could be employed, by placing it on the low side of the signal frequency. On 1·8 Mc/s it is on 1·33 Mc/s; on 1·9 Mc/s it is at 1·43 Mc/s, and on 2·0 Mc/s at 1·53 Mc/s.

When the basic modifications were complete, the receiver was tried experimentally for a few days and was found to work very well, provided it was not used within half a mile of a transmitting station. At closer ranges the receiver blocked, a good null being difficult to obtain, but a cure was found by separating the aerial tuning from the oscillator tuning. This was accomplished by inserting a 25 pF variable capacitor in the aerial lead, which enabled the aerial coil to be tuned off resonance under strong signal conditions without affecting the accuracy of the bearings taken. It also made practicable peaking of the aerial coil to maximum in every part of the band under weak signal conditions. This was found to be far better than depending on the accurate design and alignment of the ganged capacitor.

After carrying out all the modifications, the receiver was used for a further week to check on its performance. As the results were satisfactory, it was decided to go ahead with the design of a suitable cabinet, which had to be fabricated from metal, and be of minimum possible dimensions for portability. A slotted screen in which to house the ferrite rod, and some form of platform on which to mount the compass, had also to be devised. Additionally, all possible precautions against any of the metal parts having an effect on the compass had to be taken. Aluminium was used therefore for the cabinet and Perspex for mounting the compass. Brass nuts and bolts were used throughout.



Dimensions of the cabinet used by G3LGN. Note the slot in the screen around the ferrite rod aerial and the mounting of the compass.

After assembling the receiver, aerial, and compass into a single unit, further tests were made. It had been expected that the screen would reduce the sensitivity of the receiver, but this was not found to be the case, for the difference was barely perceptible. It did, of course, make a considerable difference to the bearings taken. A further advantage of the slotted screen was found to be that when tuning the aerial coil off resonance failed to prevent blocking, short circuiting the slot allowed bearings to be taken to within a few yards of the transmitter. The attenuation could also be controlled by sliding the shorting link from the end of the slot to a position directly above the aerial coil, this being the position of minimum sensitivity. A further precaution, taken to prevent damage to the OC171 in close proximity to a transmitter, was to fit a small neon from a " Command " receiver across the aerial coupling coil.

When the receiver was first built, other members asked whether the ferrite rod affected the compass. Experiments with the compass and a similar rod showed that the type in use had no adverse effect. Information received since, however, indicates that certain ferrites are susceptible to magnetization, and this should be borne in mind when con-

* *9 Montgomery Drive, Unsworth, Bury, Lancs.*

structing apparatus on similar lines to that described. Another query concerned the use of headphones in close proximity to the compass: the effect that the internal magnets had on the needle is so pronounced that a crystal earpiece has to be used.

The compass was an ex-Government marching type, with a damped movement floating in alcohol. Any type of marching compass should, however, be suitable; the use of this type enables the operator to take a bearing along the barrel or aerial screen slot, and simultaneously swing on to the minima. This saves valuable time, and allows the operator to apply correction to the magnetic bearing before plotting on his ordnance survey map.

The range of the receiver homing on a reasonably good signal is about 16 miles; and on a good, well-sited station, about 20 miles. A b.f.o. was not fitted in the prototype, as it was found to be just as easy to take bearings on c.w. as with a.m. A possibility for further modification includes the fitting of a sense aerial, but no details can be given, as experiments have not yet been undertaken in connection with the system.

In conclusion, many enjoyable hours have been spent taking part in D/F hunts with the receiver. Anyone can find pleasure in it, for no additional licence is necessary. All that is required is a reasonably good receiver, a compass, protractor, ruler, pencils and rubber, a map of the area, some means of transport and time.

A few words of advice: every moment spent in learning to read and understand an Ordnance Survey map will be well spent, for it is obviously no use taking a first-class bearing and then plotting it on the wrong part of the map!

The writer is indebted to members of the Manchester and District Amateur Radio Society for help in the design of the mechanical assembly. Particular thanks are due to Bill Mason who undertook the construction of the special cabinet shown in the photograph.

I.A.R.U. Region I Conference

MR. ERIK ESPING, TECHNICAL DIRECTOR of the Radio Department of the Swedish Board of Telecommunications will be the chief guest at the opening of the I.A.R.U. Region I Conference in Malmo, Sweden, on June 10, 1963.

About 70 delegates, observers, and ladies will attend the Conference including the President of the A.R.R.L. (Mr. Herbert Hoover, W6ZH) and Mrs. Hoover, and the General Manager of the A.R.R.L. (Mr. John Huntoon, W1LVQ). Mr. Hoover and Mr. Huntoon are President and Secretary respectively of the I.A.R.U.

As the Radio Sports Federation of the U.S.S.R. is now a Member-Society in the I.A.R.U. an invitation has been extended to the Federation to appoint representatives to attend the Malmo Conference. It is expected that Mr. Ernst Krenkel (RAEM) will be one of the Soviet representatives.

Present indications are that at least 20 I.A.R.U. Member Societies will be represented at the Conference.

Hamfest at Turner's

MR. NORMAN TURNER, G4NT, was host to nearly 100 radio amateurs at a Hamfest held in the canteen of Chiltern Works, home of Ernest Turner Electrical Instruments Ltd. on Sunday, March 24, 1963.

Mr. Turner opened the proceedings by welcoming his guests and outlining the entertainment which had been laid on for them during the course of the afternoon.

The first speaker was Mr. S. C. Gordon, A.M.I.E.E., of the Post Office Research Station, who gave an account, illustrated by film and colour slides, of the events leading up to the first reception of colour television from America via the satellite Telstar. A buffet tea followed, during which G4NT showed a number of his fellow-amateurs round his own shack at Chiltern Works.

The second guest speaker, Mr. H. W. Cumming, B.Sc., A.R.I.C., of A.E.I. Ltd., spoke of the latest developments in the field of microelectronics—that branch of the industry which is opening up new horizons by building complete circuits in the space previously occupied by a single commercial transistor. The talk was illustrated by colour slides and by a remarkable model demonstrating the stages in the manufacture of a micro-circuit.

G4NT later screened a colour film depicting his holiday in Barbados, when he made personal QSOs with amateurs in that part of the world.

The new Heathkit Model RA1 amateur bands receiver.
(Photo by courtesy of Daystrom Ltd.)

New B.B.C. Television Station for Scotland

THE B.B.C.'S NEW TELEVISION STATION to serve Balluchulish, Argyllshire, was brought into service on Monday, March 18, 1963. The transmiss.ons are on Channel 2 (vision 51·75 Mc/s, sound 48·25 Mc/s) with vertical polarization.

The Ballachulish station is one of several small relay stations which the B.B.C. is building to extend and improve its television and v.h.f. sound services in the Scottish Highlands and Islands. It receives its programmes for retransmission via a radio link from the new station at Fort William which started test transmissions in December and is now in full service.

Two further stations, which are combined television and v.h.f. sound stations, forming the group to serve the south-western part of the Highlands, are under construction and nearing completion at Kinlochleven and Oban. The Oban station will also serve a large part of the Island of Mull.

V.H.F./U.H.F. BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emission	Aerial Direction
GB3CTC	Redruth, Cornwall	144.10 Mc/s	A1	North East
GB3VHF	Shooters Hill, London	144.50 Mc/s	A1	North West
GB3GEC	Hammersmith, London	431.5 Mc/s	A1	East

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

The frequency of the Society's stand-by v.h.f. beacon transmitter at Shooters Hill, South East London, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144.50 Mc/s).

Date	Time	Error
March 19, 1963	20.30 G.M.T.	246 c/s low
March 26, 1963	18.45 G.M.T.	200 c/s low
April 2, 1963	10.50 G.M.T.	250 c/s low

Hifix

By W. BLANCHARD (ex-G3JKV) *

FOR a large number of amateurs Top Band holds a certain fascination apart from its usefulness for local contacts, part of which lies in the number of odd sounds which appear in it from time to time. Sometimes these are just the result of badly adjusted transmitters, but at other times there is a more definite purpose behind them which may not always be communication. A well-known example of this is the Loran (LONG RANGE NAVIGATION) system which provides aircraft and ships with navigational information over a large part of the Northern Hemisphere, and which is based on the measurement of pulse transit times from chains of stations. These chains use two basic frequencies, 1950 kc/s and 1850 kc/s, differentiation between chains also being made by the use of different pulse recurrence frequencies based on 25 and 33⅓ p.p.s. As the p.r.f.'s of the chains beat against each other, the rising and falling note typical of Loran is produced. The nearest chain using 1950 kc/s covers the

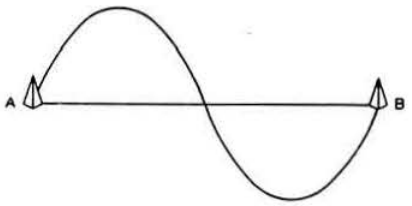


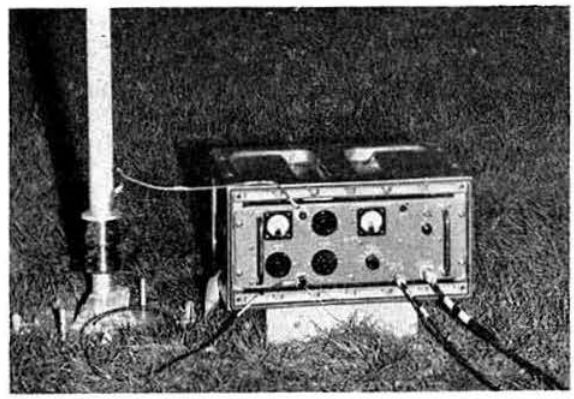
Fig. 1. Transmitting and receiving stations separated by one wavelength.

area between Northern Scotland and Iceland, while the nearest chain on 1850 kc/s covers the western coast of Greenland, the next two nearest on this frequency being in the Caribbean area. However, a description of the transmitters would be of little more than passing interest to an amateur because the high powers and large aerials used are not typical of amateur practice.

Another navigational system that appeared in Top Band some years ago was the French Radio-Web, which, it may be remembered, transmitted multiple audio tones modulating four or five carriers centred on about 1925 kc/s. This system was only experimental, and is no longer transmitting.

A third system, the Decca Hifix navigational aid, first appeared on frequencies in Top Band some eighteen months ago and merits a description on the grounds that both the transmitters and aerials could well have been designed for amateur Top Band Field Day use, being small, portable, and easily set up. In spite of this, their signals may be heard all over the U.K. at night, and over most of it by day, which shows that big aerials and high power are not necessary for a good signal provided that what is available is used and adjusted correctly.

* "*Hilldean*," *Furnace Wood, East Grinstead, Sussex.*



A Decca Hifix transmitter. On the left of the picture is the base of the portable aerial mast.
(Photo by courtesy of Decca Navigator Company Ltd.)

Principle

Without using more transmitting and aerial equipment than can be put into a Minivan, a Hifix station can help to provide very accurate fixes (within five feet) over a relatively short range (30 miles or so) for specialized purposes such as dredging harbours, survey work and so on, and in this country the use of these chains tends to be mainly around the coast. The principle on which the system works is that of time-difference measurement, in common with a number of other radio navigational systems, but the method by which the measurements are made is unusual.

In Fig. 1, a transmitter at point A is assumed to be radiating a continuous unmodulated wave. If the phase at A were known instantaneously at point B (which is in fact impossible) the difference in phase would be found to be zero, since the two points are one wavelength apart. But no measurement is possible at B because there is no reference point from which to make the phase difference reading.

However, a second transmitter placed at B (Fig. 2) can be used as the reference, provided it is maintained in phase-lock with that at A at all times and is, of course, on the same frequency. A receiver at C would measure zero phase difference because it is the same distance from both transmitters, and this reading would be the same for an infinite number of points all equidistant from the transmitters, forming a line of position. In this particular case the line would be a straight one bisecting the baseline between the transmitters at a right angle, but it can be shown that all other position lines would be hyperbolae with foci at A and B.

Two stations only would not give a complete fix, for which

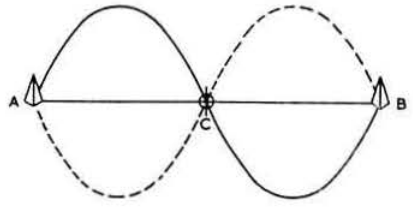


Fig. 2. Use of two transmitters.

at least two position lines are always required, but two pairs of stations (four transmitters) would do so if they were suitably sited so that the two position lines intersected at somewhere near a right angle. In practice, only three transmitters are used, as two can be combined in one, which then acts in conjunction with both the other two, without affecting the operation of the system. This transmitter is called the " master " station, and the other two " slaves."

There are, however, two difficulties to be overcome, and these are:

(*a*) If the baseline length were to be greater than half a wavelength, then a given phase difference would repeat itself every half wavelength, with resultant ambiguity.

(*b*) Phase comparison can obviously be made only at a frequency common to both stations, but if both stations radiated simultaneously on the same frequency receiver design would be greatly complicated by the amplitude variations which would then appear.

These problems may be solved in several ways, but in the case of Hifix, (*a*) is overcome by setting the receiver to a known position initially and thereafter counting the phase-difference cycles, and (*b*) is eliminated by time-sharing, i.e. the transmitters use the same frequency but at different times.

Method of Operation

The sequence of events—Fig. 3—is that the master station transmits a signal for one-tenth of a second which is 60 c/s lower in frequency than the chain frequency, and this signal initiates the switching sequence in the other two transmitters and the receivers. It then transmits on the chain frequency for three-tenths of a second, and is followed by the other two transmitters radiating in the same way.

The arrival of the initial frequency-shift signal at the receiver starts a timer which then governs its subsequent operation. A stable oscillator is phase-locked on to the next transmission to be received at the chain frequency, which will be the master, and thereafter this oscillator is used as a " memory " of the master station's phase for the purpose of phase-comparison with the two slave stations, which is done when their two signals are received slightly later. The results are displayed on counters, and can also be shown on automatic plotters.

A single Hifix chain heard on an ordinary receiver with the b.f.o. on produces a sound rather like a long Morse letter " J," but the existing transmissions at around 1900 kc/s appear to be modulated by an irregular 1 kc/s tone due to the presence of several chains separated by 1 kc/s in frequency. The receiver has a bandwidth of only about 100 c/s and can therefore operate on chains with this small separation quite happily.

The transmitters are completely self-contained, the primary power being supplied by a 24 volt petrol generator. The p.a. stage (a 5B/258M) and aerial tuning unit are contained in a metal case measuring 24 in. × 14 in. × 10 in. which is normally placed at the base of the aerial, a 35 ft. vertical mast, which has a certain amount of capacitive top-loading by virtue of the fact that about two-thirds the length of each of the eight guying stays is wire, connected to the metal mast at their upper end. The purpose of this top loading is merely to minimize changes in capacitance of the aerial due to movement in strong winds, which would cause unwanted phase shifts. There is also a fairly comprehensive counterpoise earth system consisting of 24 wires each 40 ft. long which are run out radially from the base of the aerial and pegged down. The p.a. and a.t.u. are quite conventional in making use of a pi-network output, and the 5B/258M is run at about 45 watts input, the complete system giving about 10 watts of radiated power. The p.a. is driven by a highly stable crystal controlled oscillator contained in a separate unit which may be located some little distance from the aerial, usually in a small caravan. The equipment normally runs unattended, being capable of operation for long periods without adjustment.

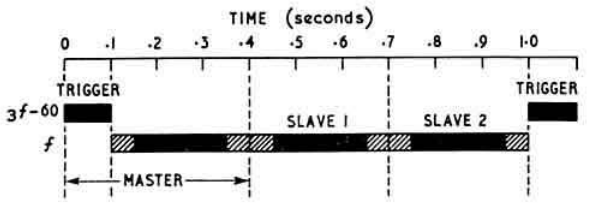


Fig. 3. Sequence of transmissions from Hifix master and slave stations. Shaded areas represent receiver "guard" periods to avoid overlap of transmissions.

Although these chains can operate on frequencies anywhere from 1700 to 2000 kc/s, they normally operate in this country within the band 1899 to 1901 kc/s, which has been allocated by the Post Office on the same basis as amateur frequencies, i.e., non-interference with essential services. Within this band, chains may operate with 200 c/s spacing even if located in the same general area, but if there is physical separation of 200-300 miles, the same nominal frequencies may be used, although the precise frequencies are usually made to differ by 20 or 30 c/s to eliminate any possible sky-wave interference. The stability of the transmissions is of a high order—frequency is held to within one-third of a cycle, and phase lock to within 3°. Since the data rate is quite low, and there is no modulation, the transmitted bandwidth is extremely narrow, and so no off-frequency interference should be experienced, unless of course proximity causes receiver over-loading. The general band of frequencies used was chosen because of the necessity of obtaining reasonable radiated power with small aerials and transmitters, at the same time having a certain amount of freedom from skywave at short ranges.

Hifix chains are at present operating at Belfast (1900 kc/s), Liverpool (1901 kc/s), and Southampton (1900 kc/s) with several others abroad. The use of these transmitters as indicators of the state of propagation on Top Band is obvious since it can be assumed that when they can be heard, amateur c.w. communication over the same path should be possible, and probably 'phone also if the signals are reasonably strong.

Thanks are due to the Decca Navigator Company Ltd. for their permission to publish these details.

I.T.A. Sound Carrier Frequencies

THE INDEPENDENT TELEVISION AUTHORITY has announced that the sound carrier frequencies of four of its Channel 9 stations have been slightly altered. The new frequencies are

Croydon	191·266 Mc/s
Black Mountain	191·234 Mc/s
Durris	191·266 Mc/s
Stockland Hill	191·234 Mc/s

These small changes were made to avoid interference in the service areas of these stations from the signals of a new transmitting station recently opened in Eire.

Single Sideband

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

BY present day standards the 813 valve is now out of date. Nevertheless it has always been a popular valve with amateurs, partly because of its availability on the surplus market at a low price and partly because of its satisfactory performance as a 150 watt anode-modulated power amplifier. Many R.S.G.B. members have one or two 813 valves in the shack and there is considerable interest among single sideband operators in the capability and expected performance from one or two of these valves operated in the G2DAF linear amplifier.

Because there was a limit to the amount of space the Editor could make available for a specialist article it was not possible in the text of *The G2DAF Linear Amplifier*† to give operating details for a number of different valve types. However, the

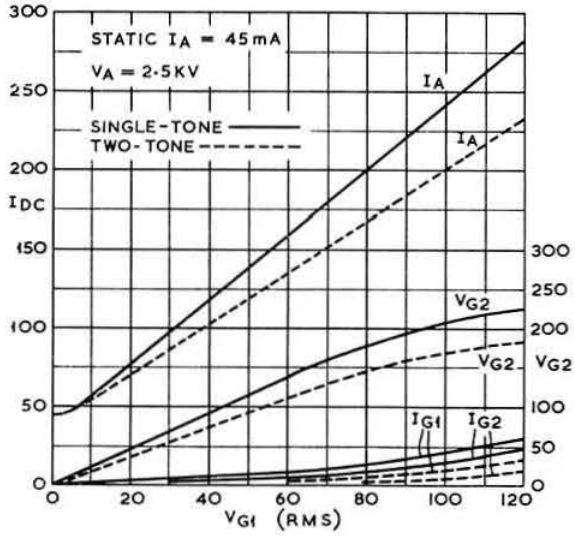


Fig. 1. Dynamic characteristics for one 813 valve in the G2DAF Linear Amplifier.

writer is concerned to avoid having to answer individual letters and in view of the popularity of the 813 as a linear amplifier makes no apology for dodging the correspondence by giving the required information in *Single Sideband*.

The 813 in the G2DAF Linear Amplifier

In many ways the 813 is a quite remarkable valve—in fact its performance in the G2DAF amplifier is quite outstanding. With 2·5 kV anode potential it is possible to run *one* valve to the full maximum licence rating of 400 watts p.e.p. output. This is possible without degradation of linearity, and in fact " on the air " reports indicate that the intermodulation distortion products are at a level 45db down in relation to the wanted voice sideband signal. This is about 5db better than the writer's amplifier using a pair of 4-125A valves.

* *5 Janice Drive, Fulwood, Preston, Lancashire.*

† "The G2DAF Linear Amplifier," R.S.G.B. BULLETIN, April, 1963.

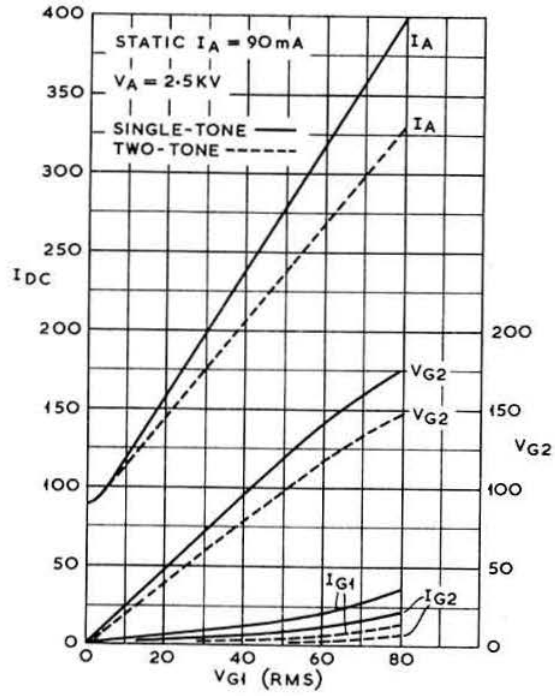


Fig. 2. Dynamic characteristics for two 813 valves in the G2DAF Linear Amplifier.

Running amplifier valves beyond the rated maximum-signal anode dissipation is a method of operation that has been used by a number of single sideband operators in the past. Because the valve only exceeds the rating on voice " peaks " and has resting periods in the " troughs " the average dissipation over a period of time embracing a number of words is less than half of the peak-signal value. Due to this fact it is possible to grossly overdrive a valve and get away with it!

The 813 running to a p.e.p. output of 400 watts is being operated at a level where the two-tone input power is 500 watts d.c. and the anode dissipation is 300 watts. This is greatly in excess of the manufacturers' rating of 125 watts, and while it is permissible to do this under voice input conditions where the valve is only being driven to its peak input at syllabic rate, it would be dangerous under continuous single-tone or two-tone input conditions. This means that the amplifier—at maximum input—cannot be correctly loaded or monitored on the oscilloscope, other than for a very short period of time. For this reason it is recommended that a single 813 is not driven to a power output of more than 200 watts p.e.p. If the requirement is the full licensed maximum, the amplifier should be built using two 813 valves in parallel.

The principal dynamic characteristics are given in Fig. 1 for one valve, and Fig. 2 for two valves. Most notable is the excellent linearity, the low values of both control grid and screen grid current and the modest r.f. driving voltage requirement.

At 2·5 kV anode potential the zero signal anode current (one valve) is 45 mA and the anode dissipation 112·5 watts. This is just nicely inside the rated dissipation of 125 watts

TABLE I

One 813 Valve (VA = 2·5 KV)	Single-Tone	Two-Tone
Anode Current	260 mA	200 mA
Power in (DC)	650 Watts	500 Watts
PEP Input	650 Watts	650 Watts
Screen Current	17 mA	8 mA
Grid Current	25 mA	12 mA
Screen Voltage	210 Volts	170 Volts
Grid Drive (RF)	110 Volts RMS	105 Volts RMS
PEP Output	400 Watts	400 Watts
P Out (Mean)	400 Watts	200 Watts
Anode Efficiency	61·5 %	40 %

and therefore limits the maximum h.t. supply voltage to 2·5/2·75 kV. For those operators who do not like high voltage power supplies, the valve will operate just as satisfactorily in regard to low distortion product level with 1·2/1·5 kV, but obviously the output power and the efficiency will be less.

The 813 is a high voltage-low current valve and therefore requires a high value of anode load (R_L). For one valve at 2·5 kV anode voltage the recommended value of R_L is 10,000 ohms, and for two valves in parallel 5,000 ohms. Table I gives the maximum signal operating conditions for both single-tone and two-tone inputs. The efficiency figures are lower than for the more modern valves such as the QY3-125 and 4X150A, as would be expected, but in fairness to the 813 it should be noted that measurements were made with one valve in the standard station amplifier (normally using two 4-125A valves) with a tank circuit designed for an anode load of 5,000 ohms. Under the correct operating conditions—R_L = 10,000 ohms—the efficiency figures would be improved. Reference to the Mullard manual *Valves for Single Sideband Suppressed Carrier Service* will show however that at 2·5 kV anode potential the usual figure for two-tone efficiency for the modern tetrodes is nearer to 40 per cent and in practice any amplifier giving an efficiency figure for two-tone input of between 40 and 50 per cent is doing very well and can be considered to be operating in a satisfactory manner. Fortunately the s.s.b. operator is rated by the G.P.O. on output power so the lower efficiency of the sideband linear amplifier is not of any particular importance. What is of particular importance is the amplifier linearity—the better the linearity the lower the distortion product level. It is far better to operate at a lower level and sacrifice some of the efficiency and it is sincerely hoped that all prospective operators of the G2DAF amplifier will bear this in mind. After all, another 100 watts obtainable by " pushing " the amplifier means about one more decibel on the signal strength—is it worth it? To any sensible amateur who takes a pride in his signal the answer is " No!"

Britain to Process Own Information from Satellites

BRITISH EQUIPMENT will be used for the first time to process the " raw " data received from the Anglo-American satellite to be launched by N.A.S.A. next year. The satellite is at present known as S52, and is now at an advanced stage of construction. The equipment, which is being manufactured in this country, will be installed and in working order by mid-July 1963 at a special data processing centre to be set up at the D.S.I.R.'s Radio Research Station, Slough. This centre will carry out the first stages in the chain of operations required before the results of each experiment can be presented in a form suitable for analysis.

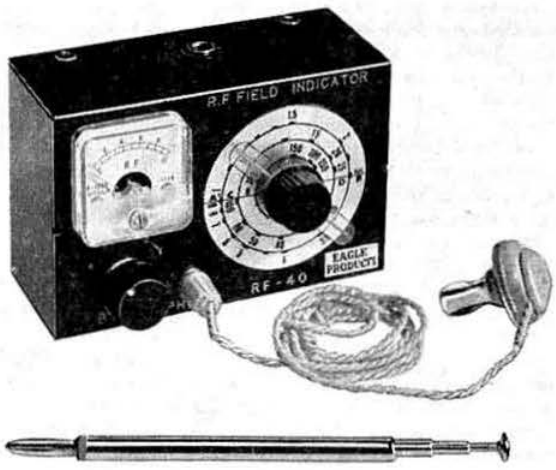
In the case of *Ariel*, the first Anglo-American satellite (launched on April 26, 1962), the initial stages of data processing are undertaken by the National Aeronautics and Space Administration of the U.S.A. at the Goddard Space Flight Center, near Washington. Later stages are carried out in this country.

In the case of S52, the magnetic tapes on which the telemetered information is recorded will be sent to Slough from receiving stations throughout the world. They will contain intermingled measurements from several experiments recorded in a pulsed frequency modulation code together with timing information. The new processing equipment will be required to convert this information into a digital form so that it can be used as input in fast digital computers for further processing and for eventual analysis by those taking part in the experiments.

The tapes will first be " edited " to select the satisfactory parts and to assess their overall usefulness. Those tapes that are found to be of adequate quality will then be passed to the main programming and digitizing part of the system where the pulsed frequency signals are separated from the background noise and recorded into a form acceptable to the digital computer.

The system is being designed in such a way that it can be modified or extended to handle other forms of telemetry if this should be required or to produce input tapes for many of the large scientific computers expected to be in service in the near future.

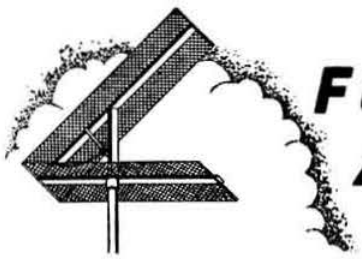
The processing equipment will use transistor circuits throughout and will be entirely automatic; an operator will only be necessary to load and unload the tape transports.



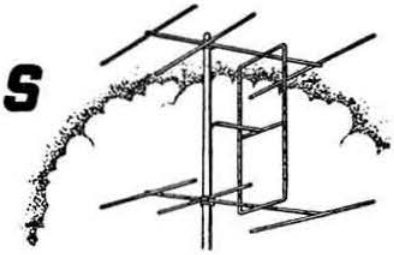
The Eagle Products Model RF-40 r.f. indicator covering 1·250 Mc/s in five ranges. The meter is 200 μA f.s.d. and the base of the instrument is fitted with a magnet *(Photo by courtesy of Eagle Products)*

Special Activity Station

REIGATE AMATEUR TRANSMITTING SOCIETY will be operating a station at the Exhibition of Leisure Activities at the Albury Manor County Secondary School, South Merstham, Surrey, on the evening of May 10 and the morning of May 11. G3REI/A will be active on 160m, with G3PIJ/A on 2m. An h.f. rig may also be in operation.



FOUR METRES AND DOWN



By F. G. LAMBETH (G2AIW)*

THERE has been a fair amount of comment on the report on U.K. 4m activities in the March issue of the BULLETIN. Most of it, we are pleased to say, has been favourable. Typical is the opinion of **G2AIH** (Epsom Downs) who operates exclusively on the 4m band at the present time, and comments on how popular it is becoming. He considers it is a "natural" for mobiles, of whom some have been worked; for instance G3LBA/M and G3JHM/M, who has been worked from his /A location down to Worthing over the top of the South Downs.

G2AIH has three transmitters for the band: the 50 watt *R.S.G.B. Handbook* design which is normally used for DX work; an 8 watt rig intended for portable/mobile; and a transistor transmitter. He uses a crystal controlled converter with a 6CW4 Nuvistor r.f. stage, and also a 10 transistor receiver. Up to now, 14 stations have been worked with a completely transistorized station at G2AIH. The best contact was with G3KEU/P near Swindon, where, with only 180 mW input to the p.a., a 539 report was received over a distance of 72 miles. G2AIH says that he would also like to see a few extra kilocycles added to the band, for with its popularity increasing as it has been recently, QRM is likely to be a problem, and there appears to be plenty of unoccupied space outside both ends of the band.

G3PXB (Gloucester) will be active during the next 4 to 5 months on 70 Mc/s, from high ground in Buckinghamshire and neighbouring counties. Activity will be mainly during the evenings and particularly at weekends. A completely transistorized receiver and a dipole aerial will be used.

G3OWA (Kingston-on-Thames) was also very pleased to see so much news of 4m in the March BULLETIN. He has been active on the band since September, 1962, and has so far worked 35 different stations in 10 counties from a very poor QTH. The environment is such as to prevent any Midland and Northern stations being heard. A better aerial, promised soon, will perhaps remedy this situation. The equipment in use is an Eddystone S440C running 9 watts; the receiver is an RF27 unit in front of an AR88D, and the aerial a dipole at 22 ft. The nominal frequency is 70·290 Mc/s. Local activity is usually such that a QSO can be had nearly every evening with such stations as G2AIH, G2AVC, G3MFB, and G3PRQ, as well as the Surrey R.A.E.N. mobiles. It sometimes appears that the activity has increased to the point where there are more 4m stations on the air than on 2m! An unidentifiable f.m. station has, however, been radiating a very poor signal on 70·26 Mc/s recently, causing much unnecessary QRM. If anyone should have any information concerning this station, perhaps he will let the V.H.F. Committee at Headquarters know.

Region I V.H.F. Contest 1962

Three in the first five in Section 1 (145 Mc/s fixed stations) and three in the first ten in Section 2 (145 Mc/s portable/mobile)—that is the story of the U.K. entry for the Region I I.A.R.U. V.H.F. Contest held on September 1-2, 1962. A first class performance by G2JF, Ashford, Kent, netted 69,971 points to head Section 1 table with a clear lead of more than 30,000 points over the next station, PA0EZ. This score had, of course, already gained for him the award for the concurrent R.S.G.B. National 144 Mc/s Open Contest, and now brings home to the U.K. the new PZK Trophy for the second highest score in both 2m sections, the overall winner being ON4AB/P who heads the Section 2 table with 75,249 points. Well done, G2JF!

Third in the Section 1 listings was F3LP, to be followed very closely by a very good effort on the part of G3IAS with 25,802 points. This is particularly creditable when one remembers that G3IAS won the *Low Power* section of the R.S.G.B. Open event with an input of less than 30 watts. Fifth in the table was that well-known club station from the Midlands, G3OXD/A. Altogether a first rate effort by our 2m fixed stations.

Section 2 proved a harder nut to crack, and G3OHF/P did well to gain a sixth place with 43,104 points. Although some 32,000 behind the winner, only another 3,900 would have gained him third place. Seventh was G5ZT/P who also won the Portable Section of the R.S.G.B. Open, and tenth was G2HIF/P, followed at eleventh place by the only entry from a U.K. station outside England, GW3KMT/P. Although these results were not so good as in the Fixed Station class, nevertheless they bring credit to the Society, and in fact as a team entry were only bettered by the D.A.R.C with second, third and ninth places in this section.

It is interesting to note that had G6GN, who was runner-up in the R.S.G.B. Open Fixed Station Section with 28,412 points, put in an entry for the Region I Contest, he would have made third place and given us four in the first six. Perhaps even more important, although to him alone, is that had G3OHF/P put in an entry to the Portable Section of the Open, he would have won it!

After the congratulations due for the showing in the 2m sections, we now have to ask a question—where were all our 420 Mc/s stations? Only G3LQR submitted an entry to gain a creditable fourth in the overall Section 3 table with 1,205 points and we had no representation at all in the Section 4 lists (420 Mc/s portable/mobile). This is a very poor effort indeed and completely unworthy of the considerable number of active 70cm stations in the U.K. They certainly were not engaged in the 2m sections and their absence remains a mystery. Perhaps they will put up a better show this year and let the other Region I Societies know that u.h.f. activity does have a determined following in the U.K. Needless to say there were no R.S.G.B. entries in either section of the 1250 Mc/s class, but there were only two entries anyway, from HG5 stations, and the fact that they both had the same score suggests that they had only the one contact with one another, over a distance of 86 km. This is less than the existing U.K. record for fixed station working on this band and could surely be bettered by choice of suitable portable locations. To lead Europe in these classes

* *21 Bridge Way, Whitton, Twickenham, Middlesex. Please send all reports for the* June *issue by* **May 10** *and for the* July *issue by* **June 8.**

of the contest in 1963 would bring real prestige to the efforts of those few who are showing the way over here.

The following are the complete listings for the top ten in each section, together with final scores.

Section 1 (Two Metre Fixed Stations)

1.	G2JF ..	69,971	6.	DL1BF ..	22,645
2.	PA0EZ ..	38,535	7.	DM2ADJ ..	21,497
3.	F3LP ..	27,760	8.	I1CZE ..	19,969
4.	G3IAS ..	25,802	9.	DJ3EAA ..	19,915
5.	G3OXD/A ..	24,992	10.	DL3SPA ..	19,503

The PZK Trophy goes to G2JF.

Section 2 (Two Metre Portable/Mobile Stations)

1.	ON4AB/P ..	75,249	6.	G3OHF/P	43,104
2.	DL6TU/P ..	48,516	7.	G5ZT/P ..	42,641
3.	DJ7NL/P ..	46,950	8.	HB1KI ..	41,538
4.	PA0YZ/P ..	45,652	9.	DJ4OB/P ..	39,939
5.	PA0LX/P ..	44,695	10.	G2HIF/P ..	38,116

The Region I V.H.F. Trophy goes to ON4AB/P.

Section 3 (Seventy Centimetre Fixed Stations)

1.	DL3SPA ..	2,270	6.	I1ACT ..	989
2.	I1US ..	1,597	7.	OK1EH ..	976
3.	HB9VS ..	1,419	8.	PA0COB	950
4.	G3LQR ..	1,205	9.	OK1AMS ..	767
5.	DL6EZA ..	1,015	10.	I1PDN ..	744

Section 4 (Seventy Centimetre Portable/Mobile Stations)

1.	OK1KCU/P	2,483	6.	I1RN/P ..	1,263
2.	OE2JG/P ..	1,745	7.	I1BUT/P ..	1,234
3.	I1SVS/P ..	1,573	8.	OK1KKH/P	1,035
4.	OK2BBS/P ..	1,321	9.	DJ1RV/P ..	836
5.	OK1KTV/P	1,276	10.	DL1EI/P ..	820

Some time ago there was a considerable amount of discussion about the relative merits of holding 145 Mc/s and 420 Mc/s contests concurrently, and the view was put forward that it was not possible to enter on both bands and hope to do well on either. Last year DL3SPA did not seem to have this trouble for not only did he win the 420 Mc/s Fixed Station section but he managed to pull a tenth place out of 311 entries in the 145 Mc/s Fixed Station section as well!

The following list shows the number of entries received for each section of the contest, together with the U.K. contribution and that of the society submitting the most entries for that section.

Section	*U.K. Entries*	*Most Entries*	*Total Entries*
1	5	58 (OK)	311
2	9	42 (DL)	202
3	1	8 (DL and I)	30
4	nil	6 (OK)	17

Although certain sections did well in scoring, the overall U.K. entry is very poor and certainly does not do justice to the amount of v.h.f./u.h.f. activity regularly occurring in the British Isles. It is quite evident that both the Czech and German societies are in a very commanding position, and appear to be leading Europe in the field. It is up to all of us this year to show them that we can still produce a trick or two.

For the 1962 Contest, the use of the QRA Locator system was not compulsory, but it is very likely that at the next meeting of the Region I V.H.F. Managers, to be held at Malmo during the Conference in June, a decision will be taken to make the use of this system mandatory for the 1963 and future events. The Contest Committee have already indicated that this method does not find favour over here for scoring purposes, and have instructed the Society's V.H.F Manager to try to obtain some modification to the Region I rules to permit our traditional exchange of QTH. However, R.S.G.B. has only one vote and it is very possible that the decision will go against us. A map of the whole of Europe is being prepared by the Czech Society, and a map of 1,000 km around Brussels has been produced by the U.B.A. Arrangements will be made for the R.S.G.B. to hold stocks of both these, and we should all try and get into the QRA Locator habit, for very soon now a QRA Locator may be all that we shall get from the Continental stations, however, eloquent our pleas. Just how lone is the U.K. attitude to this system is shown by the last table which shows the percentage of contacts for each country in combined Sections 1 and 2, in which no QRA Locator was exchanged.

Country		*Contacts*	*Percentage without QRA Locator*
Austria	(OE)	254	1·58%
Belgium	(ON)	266	22·3%
Bulgaria	(LZ)	4	nil
Czech'ia	(OK)	4,355	0·26%
Denmark	(OZ)	78	64·1%
Great Br.	(G)	2,020	73·8%
Finland	(OH)	12	100·0%
France	(F)	2,095	0·32%
Germany	(DL)	5,913	6·9%
Holland	(PA)	1,680	0·76%
Hungary	(HG)	614	0·69%
Italy	(I)	4,160	0·89%
Lithuania	(UP)	28	100·0%
Poland	(SP)	873	0·81%
Sweden	(SM)	193	75·6%
Switzer'd	(HB)	891	nil
Yugoslavia	(YU)	837	4·06%

Of those countries with anything other than just a token entry, only Sweden and Denmark show the same dislike of the QRA Locator system, its use everywhere else being almost complete.

All the information given above was extracted from the complete results sheet prepared in very good time by the Swiss society U.S.K.A., to whom thanks are due for the judging of the Contest and for the excellent way in which the results were presented. This report was prepared by the Society's V.H.F. Manager, G3HRH, who says that he has a spare copy of the complete results sheet which is available on loan to everyone who is interested. Please send a large s.a.e. to his address in the *Call Book*.

V.H.F./U.H.F. Contests

The Contests Committee would like to remind members about the following contests. We hope that the numbers participating will be even better than the figures previously attained.

Sunday, May 5 .. .. First 144 Mc/s Portable Contest 1963.

Saturday, May 25 and Sunday, May 26.. .. First 420 Mc/s Open Contest 1963.

Two Metres

G2PL (Wallington), who is well-known for h.f. band operation, has now come on 2m with a rig capable of about 10 watts p.e.p. output and "home brew" equipment throughout, including a transistorized receiver. He would like c.w. operators to listen for 2m s.s.b. stations. G2PL wonders if we could encourage the formation of an s.s.b. net. The number of s.s.b. devotees is steadily rising and its popularity is growing apace.

B.R.S.15822 (Clapton, London E.5) has been collecting QSLs on 2m for some time now, in order to qualify for the

" Four Metres and Down " listener award. A new drive unit has been fitted to the 4-over-4 slotfed aerial, which now rotates easily. B.R.S.15822 is very interested in the activities of G5MR and G2JF whom he hears frequently.

G3PXB (Gloucester) will be operating portable during the next few months, as outlined under the 4m News section. Power input will be 5 to 10 watts, depending on the state of the car battery!

G2JF (Wye, Ashford, Kent) found conditions during March better than in January or February. Total contacts for the month reached 222 continentals and 262 British Isles stations. The high spot was March 24 when 11 F, 15 PA and 26 DL/DJ stations were worked. New stations worked numbered 23 in the U.K. and continental 36. G2JF's general impression of 2m activity is that there appears to be very little sign of an increase in band occupancy over the past six or eight months, but that given warmer weather and better propagation there could easily be a decided change for the better. All the same the above is a very refreshing report at a time when it was thought that poorish conditions had gone on long enough!

G3PTM (Solihull, Warks.), a comparative newcomer to 2m, made 56 contacts with stations in 20 counties during the Open Contest on March 2-3. A total of 24 counties have been worked since January 1 from a site 450 ft. a.s.l.

The transmitter, built in December last, comprises a 6AK5 Colpitts using an 8 Mc/s crystal oscillating on its third overtone, driving an E180F tripler to 72 Mc/s, followed by another E180F as a doubler to 144 Mc/s with a QQV03-20A in the p.a. running 35 watts input. The E180F valves are run at the recommended voltages and provide more than 3·5 mA of grid current in the p.a. The final frequency is variable ± 20 kc/s by means of a slug tuned coil in series with the crystal.

The converter is a G3FZL/G3IIR type (described in the BULLETIN for November, 1962) feeding into an AR88D tuning 2-4 Mc/s. The aerial is an indoor 4-over-4 but it is hoped to erect it at about 36 ft. shortly.

A 430 Mc/s converter is under construction and a tripler-amplifier using QQV03-20A's is in the planning stage.

G3OCB (nr. Truro, Cornwall) says that a short spell of listening on April 2 revealed activity by G3XC, G3OJY, G3EKM and G3MTG (Bristol) who was about S6 on phone.

G3CCA (Oadby, leics.) reports that as the first series of low noise reception tests has now been completed and some startling facts exposed, a complete receiver (minus parametric device) has been designed and is nearing completion. Stability is the prime factor in v.h.f. reception, and it has been found that the standard crystal oscillator is not sufficiently stable to enable netting to be accomplished without very slight tuning adjustments. With this in mind, the new v.h.f. receiver uses crystals operating at 75°C in a low-priced Cathodeon crystal oven. The receiver designed, developed and built by G3CCA, consists of a push-pull grounded grid amplifier employing 8058 Nuvistors, followed by a second r.f. stage using the now well tried 6DS4-8058 cascode arrangement, and a 6CW4 mixer. The 24 to 26 Mc/s output is then fed to the tunable i.f. by means of a 6CW4 cathode follower. The oscillator also uses a 6CW4 in a 15 Mc/s fundamental Colpitts arrangement. The crystal frequency is doubled in the anode circuit to 30 Mc/s, and a 6CW4 subsequently quadruples this to 120 Mc/s.

The tunable i.f. uses a 6CW4 with an 8058 mixer, and is followed by a tunable oscillator with another 6CW4, resulting in an i.f. of 465 kc/s. The remainder of the receiver follows standard practice, using a crystal filter, *Q*-Multiplier, 7360 product detector, a.m. detector, S-meter calibrated in microvolts, and an a.g.c. " hang " circuit. A crystal calibrator is also included to provide standard reference frequencies for accurate measurements.

An s.s.b. transmitter is also being constructed, and is based on the G3BA method, which employs an exciter on 14 Mc/s feeding a mixer to produce the 144 Mc/s output. The exciter is a modified Heathkit SB10-U s.s.b. adapter, altered to incorporate a drive oscillator. As the oscillator forms an important part of an s.s.b. system, the transmitter also includes a crystal oven for the 14 Mc/s crystal. The QQV06-40A in the final linear amplifier has an anticipated p.e.p. in the region of 200 watts.

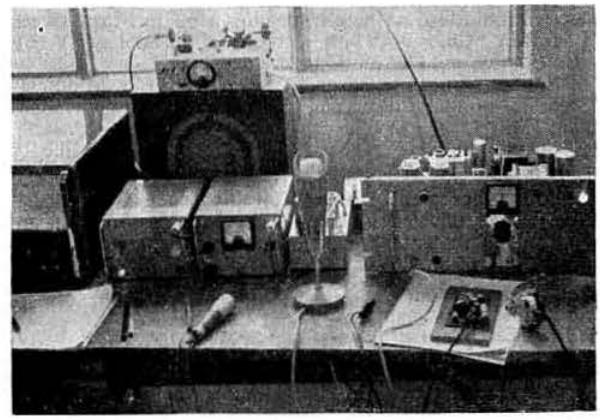
Interesting contacts have been made with G3RND (Pontefract), G2XK (Harrogate), G5YC (City and Guilds, London), G3KKK (Hertfordshire), G3EDD (Cambridge), and G2XV (Cambridge). The reports given to all these stations were between 58 and 59+, while G3EHY (Banwell, Somerset) received a 59+ 20db report.

C.U.W.S. Expedition to the Isle of Man

The Cambridge University Wireless Society's expedition to the Isle of Man used a complete 2m station (loaned by Withers Electronics) comprising a TW2 10 watt transmitter and a Nuvistor converter feeding into an Eddystone 940 (loaned by Stratton and Co. Ltd.). The 4m gear was kindly loaned by the Pye Telecommunications Amateur Radio Group. The latter comprised a 35 watt transmitter and a converter with an i.f. output of 3·2 to 3·4 Mc/s. The 940 again proved its value as a good general coverage receiver with very good selectivity. The aerials, loaned by J-Beam Aerials Ltd, were a 6-over-6 2m slot-fed beam and a 4m four element Yagi, which were mounted about 20 ft. up on the top of Snaefell. Prior operation from Douglas proved unsuccessful as the beams were inside the house firing down a terrace of houses toward the mainland! On March 26, the first day on the mountain, 4m skeds were successfully kept with GI3HXV, G3PJK and GM3FYB. On 2m G3FAN and G3EDD were heard calling on sked with excellent signals, and G3BNL and G3BA were worked. Subsequently conditions seemed to deteriorate, but as the operators became more used to the equipment results improved, and G3FAN and G3EDD were worked more than once on 2m.

On 4m on the morning of March 31 G3EHY was a colossal phone signal when worked on sked for the best 4m DX. Propagation conditions appeared to be better on 4m than on 2m although no 4m stations in the Home Counties were heard despite very careful listening. GW3MDY provided a fourth country on 4m.

The weather was a little better than last year but there were still falls of 2 to 3 in. of snow each morning on Snaefell! All QSOs will be confirmed via the Bureau. The operators



The v.h.f. equipment at GB3CUW. From left to right, the Eddystone S940 receiver, Withers Electronics power pack, TW2 transmitter, TW 2m converter and a Pye 4m transmitter. A pre-amplifier built by G3NUH stands on top of the loudspeaker.

of GB3CUW were G3MZM, G3NUH, G3OQP, G3OYW, G3PIT, G3PKB, G3PWT and G3RSE. Shortwave listeners who helped with the logging, were R. K. Towers, J. P. H. Burden and G. Biddy.

It Will be a Four-Decker Convention

The specialized techniques of today become the common place of tomorrow—and it is common place to make a statement like this! Nevertheless, it is a true one, as any member can see for himself by studying the mighty spread of s.s.b., of transistor circuitry and of v.h.f. from the few to the many.

Our immediate concern is with the last named. By now, no v.h.f. enthusiast needs reminding that the Ninth Annual V.H.F./U.H.F. Convention takes place on Saturday, May 18, at the Kingsley Hotel in the Bloomsbury area of London, as last year.

Daily the number of v.h.f. enthusiasts multiplies as the delights of operating on relatively QRM-free bands are tasted. Gone indeed are the days when v.h.f. was a hard nut to crack. Recognizing this wider appeal, the Society's V.H.F. Committee has drawn up a truly popular Convention programme for this " Ninth Annual." You can if you like regard it as a four-decker, laid out as follows:

The Exhibition: A select group of top flight v.h.f. specialist firms will have their services and products on view throughout the day; ***The Lectures:*** Quite a change from past practice is evident here. There will be five short lectures of 20 minutes each on topical technical subjects: ***The Dinner:*** A West End-type meal in Central London surroundings; and fourthly what will be to many probably the most important (if least tangibly solid) feature of all—***The Social Side:*** Although at Conventions of *any* kind there are opportunities for acquaintances to meet in person, at the V.H.F. Convention this is peculiarly so in that everyone knows everyone else, or seems to. This is the measure of friendliness and helpfulness that so characterize the v.h.f. worker, and it is to be hoped will always do so, however popular the bands may become.

Habitué or new timer alike, no one can fail to be impressed by the remarkable value for money offered by this Ninth Convention. In spite of rising costs and the unavoidability of West End prices, a ticket for the Convention and Dinner will cost only 27s. 6d.—and only 3s. 6d. if you do not go to the Dinner in the evening. It is hoped that slight delays in issuing tickets will have been overcome by the time this is read.

And any member who wants to go but has not sent in his cash should lose no time in posting it off to Frank Green, G3GMY, who is both hon. secretary of the Society's V.H.F. Committee and Convention secretary too.

Write to him at 48 Borough Way, Potters Bar, Middlesex, *now*, for no applications can be accepted after next Wednesday, May 15.

See you there! " Uncle Mike "

" Four Metres and Down " Certificates

These certificates, intended to mark successful v.h.f. and u.h.f. achievements, are available in eight categories.

	Qualifications	
Four Metre Award Four Metre Listener Award	20 Counties	3 Countries
Two Metre Award Two Metre Listener Award	30 Counties	5 Countries
Two Metre Senior Award Two Metre Senior Listener Award	60 Counties	15 Countries
Seventy Centimetre Award Seventy Centimetre Listener Award	20 Counties	3 Countries

The rules governing the award of the certificates are as follows:

(i) All claims must be fully supported by QSL cards.
(ii) All contacts must have been made on or after January 1, 1961.
(iii) Eligible counties are those of the United Kingdom of Great Britain and Northern Ireland, listed on the claim form available from Headquarters on request.
(iv) Stations are eligible for certificates in the following groups:
  (a) Fixed stations
  (b) Alternative address stations (—/A any address)
  (c) Portable stations (—/P any location)
  (d) Mobile stations (—/M any location)
  Categories cannot be mixed.
(v) All claims must be submitted to the V.H.F. Committee at R.S.G.B. Headquarters, 28-30 Little Russell Street, London, W.C.1.
(vi) All claims must be accompanied by a check list.
(vii) All cards will be returned by recorded delivery service and return envelopes are not required.

The following is a list of those to whom " Four Metres and Down" certificates have been awarded.

144 Mc/s Transmitting Section

1 A.L. Mynett, G3HBW
2 J. Haydon, G3BLP
3 A. D. Smith, G3MTI
4 H. Beaumont, G5YV
5 L. Sharrock, G3BNL
6 W. R. Hawthorne, G3MCS
7 N. A. Ross, G3LAR
8 J. B. Kay, G3CO
9 T. P. Douglas, G3BA
10 W. M. Lee, GW3MFY
11 G. C. Hill, G3DFL
12 G. H. Grayer, G3NAQ
13 C. L. Desborough, G3NNG
14 A. M. Laidler, G3OJY
15 G. V. Farrance, G3KPT
16 W. B. Capstick, G3JYP
17 R. J. Thomas, G3KMT
18 H. W. Darvill, G3OHD
19 K. J. Wheatley, G3BBR/A
20 R. C. Hills, G3HRH
21 J. F. Shepherd, GM3EGW
22 P. G. Bower, GI3OFT
23 P. Dutfield, G3OBD/P
24 C. Sharpe, G2HIF
25 P. D. Lucas, G3JDN
26 J. Redrup, G8VZ
27 S. J. Harden, G2AXI
28 F. Jeanmonod, G3JYT
29 J. Hum, G5UM
30 W. Bates, G3EJO
31 W. D. Sellars, G3PBV
32 R. G. Morris, G3FDG
33 M. Hall, G3OSA
34 A. E. Latham, G3JLA
35 W. E. Butt, GC2FZC
36 H. M. Synge, G3BOC
37 A. D. Smith, G3MTI/M
38 A. M. Laidler, G3OJY (New QTH)
39 B. A. Maycock, G3JWQ
40 G. Eddowes, G3NOH
41 G. Harvey, G3PSL
42 R. T. Greenwood, G3LBA
43 F. K. Parker, G3FUR
44 G. Johnson, G2BJY

144 Mc/s Receiving Section

1 D. A. S. Drybrough, B.R.S.22550
2 E. J. Boys, B.R.S.22322

144 Mc/s Senior Transmitting Section

1 J. Stace, G3CCH

420 Mc/s Transmitting Section

1 C. L. Desborough, G3NNG
2 G. V. Farrance, G3KPT

Mobile Column

BY C. R. PLANT (G5CP)*

THE attraction of operating mobile whilst on holiday has for many operators been the driving force behind a constructional programme for appropriate apparatus. Usually, this becomes delayed so that the weeks immediately prior to the vacation are spent in finalizing and installing the gear in the car, which is followed by a period of testing. Only those who have passed through the various stages outlined can know of the thrill experienced when the first reply is received and a satisfactory contact completed. The advantage of having a station available whilst away from home, particularly if the weather is inclement, is also something which, to most operators, fully repays the considerable effort involved.

Operation in Other Countries

Some of the more adventurous (and wealthy) amateurs will be taking their cars abroad this year, and this raises the question of obtaining a licence to operate mobile outside Great Britain. This can not usually be done, except in the case of Eire, where it is only necessary to write to the Department of Posts and Telegraphs, G.P.O., Dublin, enclosing details of the applicant's fixed and mobile licences, current receipts, the registration number of the car, the frequencies to be used, and the dates covering the holiday period. There is no charge for this facility. A call-sign will then be issued in the EI9 series. Two typical ones that have been granted in this way are EI9AK (G5ZT) and EI9AL (G3AZI).

In the past, several British amateurs have been able to obtain a licence to operate mobile whilst in the U.S.A., by entering through Canada and using the reciprocal licence exchange arrangement which exists between the two countries. Unfortunately, however, the writer understands that this facility is now only available to Canadians.

It is possible that some European countries will issue temporary licences for mobile stations, and if anyone has information concerning this, I shall be grateful for details, in order that publicity can be given.

Forthcoming Rallies

The Thanet Radio Society will be holding its Mobile Rally at the usual venue, The Cliff Top Site, Cliffsend, Ramsgate, Kent, on Sunday, May 5. The talk-in stations will be G3DOE/P on Top Band and G3BAC/P on 144 Mc/s. Refreshments will be available and, given good weather, this should be a good place to visit, for it is on the coast, is at an elevated site for good radio transmission, and has facilities for the family. A full programme has been arranged to keep up a continued interest.

On Sunday, May 12, a Hamfest and Mobile Rally arranged by the Grimsby Amateur Radio Society will take place at the Bird's Nest Cafe, Boating Lake, Cleethorpes, Lincs., commencing at 2 p.m. Tickets, price 10s. each, which includes High Tea and parking facilities, may be obtained in advance, from the Hon. Secretary, B. Walster, 47 Richard Street, Grimsby, Lincs. The afternoon activities will start with a "get together," followed by a group photograph, lecture, High Tea and Junk Sale. It is hoped to have talk-in stations active on Top Band and 144 Mc/s. The cafe is virtually situated on the sea shore, which should encourage family parties.

The Northern Amateur Radio Mobile Society is holding the Northern Mobile Rally at Harewood Park, Harewood, near Leeds, on Sunday, May 26. This has always been a most successful rally, and this year should prove to be even better. The Hon. Secretary, Bernard Crisp (G3LHQ), Ashmount, Moorhouse Lane, Birkenshaw, Nr. Bradford, Yorks., will be pleased to send further information, on receipt of a stamped, addressed envelope.

The Hunstanton Bucket and Spade Party has for many years been an attraction to many amateurs living in the Eastern Counties. Its fame has gradually been extending farther afield; visitors last year came from the Midlands, and some from even more distant places. This year, the party is to be held on Sunday, May 26, at Hunstanton, Norfolk, and as usual a Mobile D/F Contest is included in the programme. This, too, is an ideal place for a family outing, and should therefore attract many mobile amateurs.

The first of the Reading Amateur Radio Club "Mobile Picnics" will be held on Whit Sunday, June 2, at the Childe Beale Trust, Lower Basildon, near Pangbourne, Berks., whilst the second is scheduled for August 25. Talk-in stations will operate on 1·8 Mc/s and 144 Mc/s. Visitors are asked to bring their own refreshments, as there are no facilities at the site. The location is in one of the most beautiful parts of the country.

The R.S.G.B. National Mobile Rally is once again to be held at the U.S. Air Force Station, Wethersfield, Essex, on Whit Sunday, June 2. The Society's Mobile Committee is running this event, and has gone to considerable trouble to make it a success. The final result now rests with us, the mobile amateurs, by supporting it. The nearest village is Finchingfield, Essex, and the airfield is located on the B1053, about 11 miles from Great Dunmow.

The Cheltenham Mobile Rally on May 26 will take place in the Montpelier Gardens, Cheltenham. A pre-rally dinner will be held the previous evening, and further information may be obtained from the Hon. Secretary, T. A. Russell (G3JFH), 10 Dale Walk, Bishops Cleeve, Cheltenham, Glos., but please enclose a stamped addressed envelope. A full programme has been arranged for the rally, which includes a Mobile Contest to take the competitors around

R.S.G.B. GOLDEN JUBILEE MOBILE RALLY

United States Air Force Base, Wethersfield, near Braintree, Essex

Whit-Sunday, June 2, 1963

Programme

Grand Raffle
Mobile Installation Competition
Cinema Show
Go-Kart racing
Fire Fighting Display
U.S.A.F. Band Programme
Static Aircraft Display
Trade Exhibition
Exhibition station on H.F. Bands
Dance
Refreshments—Bar-B-Que
Many other attractions including, it is hoped, pleasure flights and model railway rides for the children.
Ample indoor accommodation if wet.

Talk-in Station
GB3RS on 144 Mc/s and Top Band

Organized by the R.S.G.B. Mobile Committee

Admission Free

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

some of the most attractive Cotswold villages, where they will have to pit their skill and equipment against each other. Talk-in stations will be G5BK/A on Top Band, and G3IER on 144 Mc/s. Local stations will also be keeping an eye on 3·5 Mc/s for any mobile s.s.b. stations attending the rally. The " Cotswold " contest has previously been exciting and interesting, and this year should prove to be no exception.

Operating Notes

A welcome letter from **G2AKR** (Sale, Cheshire) describes his mobile equipment and results obtained on Top Band. The station transmitter runs at 10 watts input, and contacts have been made with GI, GD and GW, together with many Gs. The whip aerial is only 7 ft. high, but gives very satisfactory performance. Basically, both r.f. and audio sections have a similar line-up: two EF91s and a 6BW6 in each, the heaters being connected in series pairs across the 12 volt supply. A Command receiver, modified to give greater gain, is used, with a 6AC7 in place of one of the 12SK7 i.f. valves. The associated 12SK7 was changed to a 6SK7 and the discrepancy in heater currents corrected by connecting an EA50 in parallel, leaving a spare diode to be used in a noise suppression circuit. A PCR-3 Power Pack, modified by the substitution of silicon diodes, gives an output of 310V at 110 mA. The whip loading coil, mounted 2 ft. from the base, consists of 150 turns 20 s.w.g. enamelled copper wire, close wound on a 2½ in. diameter paxolin tube, and finally coated with shellac. The outstanding mobile QSO was with G3LIQ (Hull, Yorks.), whilst running between Sydenham and Thornton Heath in a built-up area.

G6AU (Blackburn, Lancs.) runs a Triumph " Courier," and operates solely on Top Band using a modified Command transmitter with a built-in ECC83 speech amplifier and a single 1625 anode and screen modulating a single 1625 in the p.a. using an SCR522 modulation transformer. The receiver is a standard Command type covering 1·5 to 3·0 Mc/s. A separate battery, with provision for charging from a car, or home battery charger, is used. The h.t. supply, 250V at 125 mA, is derived from a rotary converter. Apart from mobile contacts, a kite aerial has been used on many occasions. This originally consisted of some 300 ft. of wire, but the static charge caused the XYL to disapprove, and consequently the aerial has been reduced to about 140 ft., which gives much less trouble in this respect. G6AU says that of all the facets of Amateur Radio, mobile operating has given both him and his family the greatest enjoyment, particularly during the many mobile rallies where numerous new friendships have been made.

G6DN (Manchester) tells of the welcome given by the Manchester City Police to the mobile assistance of the R.A.E.N., which is indeed another justification, if one is necessary, for mobile working. It certainly provides a definite purpose for this branch of the hobby.

G6SN (Birmingham), who is at present on a pleasure trip to South Africa, has written telling of his 144 Mc/s mobile equipment which he has used successfully for the past few years. Anyone knowing of his past experience of building equipment under difficult conditions (the receiver he made in one of the Stalags during the last war is on permanent view at one of the London museums), would expect a neat and robust construction and this is just what has been done. The transmitter contains only three valves (6U8/EF82 triode overtone oscillator, EL85 doubler, QQV03-10 p.a.) and occupies a space measuring 8 in. long by 2 in. wide fitted to the back of the receiver chassis. Power is taken from an Aveley transistorized unit giving 250 volts at 150 mA. The receiver is a double conversion superhet based on the VQ4EV circuit, but using a PCC84. The full story of G6SN's equipment and method of testing will be described in a later *Mobile Column*.

MOBILE RALLIES 1963

May 5	Thanet Mobile Rally, Cliffsend, Ramsgate.
May 12	Grimsby Amateur Radio Society, Hamfest, Birds' Nest Cafe, Boating Lake, Cleethorpes.
May 26	Bucket and Spade Party, Hunstanton.
May 26	Cheltenham Mobile Rally.
May 26	Northern A.R.M.S., Harewood House.
June 2	Reading A.R.C. Mobile Rally, Pangbourne, Berks.
June 2	R.S.G.B. National Mobile Rally, U.S.A.F Station, Wethersfield.
June 16	A.R.M.S. Rally, Barford St. John, Oxon.
June 16	Cornish Radio and Television Club Hamfest and Mobile Rally.
June 30	Longleat Mobile Rally, Longleat, near Warminster, Wilts.
July 7	South Shields and District Mobile Rally, South Shields, Co. Durham.
July 14	Chiltern Amateur Radio Society Mobile Rally, West Wycombe Park, Bucks.
August 11	Torbay A.R.S. Mobile Rally, Naval College, Dartmouth.
August 18	Derby Radio Societies Mobile Rally, Rykneld School, Derby.
August 25	Reading A.R.C. Mobile Rally, Pangbourne, Berks.
September 8	Thames Valley Amateur Radio Transmitters' Society Mobile Rally.
September 15	Lincoln Hamfest and Mobile Rally, Kesteven Grammar School, North Hykeham, Lincoln.
September 22	R.S.G.B. Woburn Abbey Mobile Rally.
September 29	Region 9 Mobile Rally, Weston-super-Mare, Somerset.

Members of the Manchester R.A.E.N. Group hold regular exercises with the police, with a view to providing an additional communications channel should the police communications become overloaded in an emergency. Left to right: Arthur Brennan, G2AUC/M, Charles Denny, G6DN (Area Controller) and Police Sgt. Glyn Parry.

(Photo by courtesy of the Manchester Evening News)

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

THE results of the poll to determine the 15 most wanted countries produced a considerable diversity of requirements but the final result was never in doubt after the first few lists had been examined. The sought after countries comprise (in prefix order):

AC3 Sikkim	VK9 Christmas Is.
AC4 Tibet	VK9 Nauru
C9 Manchuria	VK0 Heard Is.
CE0/A Easter Is.	VP8 South Sandwich
FB8 Tromelin	VQ8 Rodriguez
FU8/YJ New Hebrides	VQ8 Agelega
VK4 Willis Is.	XU Cambodia
	ZM7 Tokelau

Amongst the remainder, the requirements were for San Felix Is. (CE0) and Kuria Muria Is. (VS9), these being areas which were given country status for the DXCC in advance of planned DXpeditions which unfortunately did not materialize.

By the time that this is being read it is hoped that W4BPD will have fulfilled most of the requirements in so far as Tromelin is concerned. Nauru figures on the programme of the Hammarlund DXpedition organization, and may well lose its rarity status in due course, and HL9KH has designs on AC3 later this year. The possibility of operation from South Sandwich remains no more than that, owing mainly to the volcanic nature of the islands, and permission to operate from Christmas Is. (the Indian Ocean variety) is apparently difficult to obtain.

Jumping quickly to the other side of the fence it has been suggested that if A.R.R.L. abolished the monthly DXCC listings and various other journals no longer offered similar facilities, then the opportunity would again be present for a worthwhile QSO with that station in some unusual spot replacing the stereotyped 30 second effort which seems to be so common these days. Probably the postal administrations would lose considerable revenue, but anyway the collection of small coloured pieces of cardboard can hardly be the only justification for an adult person to engage in our hobby of Amateur Radio. Certainly not a thought calculated to impress delegates at an international conference determining future frequency allocations.

News from Overseas

The editorship of the **West Gulf DX Club** *Bulletin* has undergone its annual change and occupying the chair for the next 12 months is F. Campbell, W5IGJ, 2153 University Boulevard, Houston, 25, Texas. The annual subscription to this weekly and reliable source of DX information is $12, this covering despatch by air mail.

From **Nigeria, 5N2RSB** records two new stations now active, **5N2AAK** using a K.W. Viceroy, and **5N2JWB** using a home-built transmitter with a pair of 807 in the p.a. 5N2JKO, now temporarily **G3JKO,** is enjoying a well-earned leave in the U.K. 'JKO has been on the air often on Top Band, and not looking for the DX, but does not expect to put in very much operating time before flying back to Nigeria on May 7. 5N2RSB reports the bands generally as being rather disappointing, with 14 Mc/s the only reliable source of DX. 7 Mc/s is very noisy but several Europeans were worked during B.E.R.U., and 21 Mc/s has spasmodic openings to the U.S.A. and the West Indies.

W5ARJ has kindly provided a copy of the revised conditions applying to Top Band operation in the U.S.A. These rules are too long to reproduce here but any interested reader may obtain a photostat copy from R.S.G.B. Headquarters by sending a s.a.e. Every state has additional frequency privileges, notably the Gulf area, Alaska and the possessions, previously barred from 1·8 Mc/s operation. There are some alterations in the power input allowed and s.s.b. operation is barred w.e.f. April 15, 1963. These new privileges are given on the understanding that there will be no interference with the Loran service and the arrangements may be altered at any time without notice.

In a letter to G3AAE, Raoul, **VQ8AI** tells of the arrival of Gus, W4BPD, in the Colony, on January 25, when he spent eight days with VQ8BI at Curepipe. Before he left Mauritius VQ8AI and Gus had planned to go to Rodriguez and other VQ8 islands, but a temporary licence was refused him as he was not a British subject. However W4BPD will be returning to Mauritius during May before he proceeds to India and it is hoped that the required permission will be forthcoming. It should be recorded here that the R.S.G.B. requested facilities for W4BPD whilst in the Mauritius area and this request was forwarded to the Department of Technical Cooperation who deal with such matters which concern the colonies.

W4BPD commenced operation from Tromelin Is. on April 8 and was extensively worked from the U.K. on c.w. and s.s.b. In common with all the trips made by Gus, QSLs should go to W4ECI.

The radio amateurs of **Iran** will be holding a field day on June 28 between 04.00 and 24.00 at a location 30 miles North of Teheran having an altitude of 8000 ft. in the Alborz mountains. It is hoped that all bands and all modes will be used. (G3JBR and G3AAE).

Frank Phillips, **HS1P,** is now established in Bangkok and will be looking for U.K. contacts, for which QSLs should be sent to the address in *QTH Corner*. On the way to Thailand HS1P spent several days in Hong Kong and speaks highly of the hospitality accorded to him in the Colony by VS6DC and others.

OE1ME submits this month a very excellent list of DX worked and it is noticeable that stations in the Pacific are being heard and worked at good strengths but that, at the same time, U.K. stations are often unable to hear the DX stations. QSOs with VR3O and ZL1ABZ around 18.30 are particularly outstanding in that there are no reports of

* Please send all reports to R.S.G.B. Headquarters to arrive not later than **May 10** for the **June** issue and **June 11** for the **July** issue.

Four well-known DX men at the home of VQ8BT. Left to right (seated), W4BPD and VQ8AI; (standing), VQ8BI and VQ8BT.

contacts made by U.K. stations at that time of the day. **G3HCT** confirms the point when he mentions ZK1AR and ZK1BV being worked by Central European stations, but being completely inaudible in Warwickshire. An interesting comment by OE1ME is that the commercial RTTY stations very quickly moved out of the band (14 Mc/s) after the start of the *CQ* S.S.B. Contest!

ST2AR is now on s.s.b. and has provided many stations with their first s.s.b. QSO with the Republic of the Sudan. The rig in use is a commercial unit manufactured by Redifon, and at the present time Eric is uncertain how long he will be able to retain the transmitter. ST2AR comments on a G3-G8 QSO on 14 Mc/s going on for a couple of hours with the channel also occupied by a ZD8 and a PJ2. May we suggest a QSY to 28 Mc/s or v.h.f. for local contacts?

There has been a certain amount of confusion on the location of **UA0EH,** who over the air and on his QSL card states Zone 19. This is contrary to the information appearing in the *U.S.S.R. Call Book*, and *CQ Magazine* have stated that UA0EH is good for Zone **25** credit when claiming W.A.Z. Stations known to be located in Zone 19 include UA0AV, UA0DK, UA0LA, UA0EK, UW0IF and UW0IN.

The home and station of **FG7XT,** John Wegimont, was recently destroyed by fire, one of the few objects salvaged being the station log. John hopes to be back on the air in the near future using a SR-150. *(DX)*

DXpeditions

The President of the Hammarlund Manufacturing Company, Stuart Meyer, **W2GHK,** announces the creation of the **" DXpedition of the month "** in the interest of world-wide s.s.b. and c.w. dx'ing. This programme will commence shortly and will continue throughout 1963 and 1964. The initial operations planned are: **VR1N,** Ocean Island, May 1-15; **VK9BH,** Nauru, May 15-30, and **VR4CB,** Solomon Islands, between June 1 and 30. It will be realized that these dates are only approximate and will depend upon transport facilities. Operations will be in the bands between 3·5 and 21 Mc/s and occasionally on 1·8 Mc/s. QSL cards will be handled through Hammarlund DXpedition, General Post Office, P.O. Box 7388, New York, 1, N.Y., U.S.A. I.R.C. and s.a.s.e. envelopes will **not** be required. The equipment to be used will include a HX-50 transmitter, HQ-170A receiver and Hy-Gain aerials.

St. Helena will be the scene of s.s.b. activity when G3PEU arrives around August 7 equipped with a KWM-2, 30L1, K.W. Viceroy and a K.W. 77. In addition to operation as **ZD7BW** it is hoped that the reserve equipment will enable ZD7SE to commence s.s.b. activity. QSLs can go via the R.S.G.B. or direct to the home QTH of G3PEU, and will be dealt with on return at the end of the year.

Further confirmation of the **Trinidade Is.** trip by PY4AS and party has come to hand and operation should commence at the beginning of July. The QSLs for the previous c.w. operation from this spot by **PY1BCR** are now said to have been dealt with by PY1CK and distribution through the bureaux has begun.

In connection with the operation from **VS9ALD/P,** it is understood that copies of the log are held by both W9JJF and VS9AAA.

The trip to the **Isle of Man** by the **Cambridge University Wireless Society** produced a number of s.s.b. QSOs on the h.f. bands using a K.W.77 receiver and a Hammarlund HX-50 transmitter, feeding a Mosley V3 Jr. trap vertical and a G5RV dipole. In all some 900 QSOs were made on c.w. and s.s.b. and these will be confirmed by QSLs which will be sent off through the bureaux by the end of the month.

The trip by **WA2WUV** to the **Galapagos Is.** signing **HC8CA** may have concluded by the time that this is being

QTH Corner

EP2RC	via K1KOM (home call).
FH8CE	via W4ECI.
FY7YI	s.s.b. operation via K8ONV.
HI8XAA	via W8NWO.
HS1P	F. A. Phillips, SEATO School, Bangkok, Thailand.
KB6CP	Box 5, USPO, Canton Is., S. Pacific.
KG6SZ	via VE7ZM.
KH6EYW/KH6	via WA6QLH.
WA4LTX/KJ6	Box 100, APO 105, c/o Postmaster, San Francisco, Calif., U.S.A.
KM6CI	Box 23, Navy 3080, FPO, San Francisco, Calif., U.S.A.
KM6CX	A. Barron, PACMIDET, c/o FPO San Francisco, Calif., U.S.A.
W4EIL/KS6	P.O. Box 998, Pago Pago, American Samoa.
LA5FI/P and **LA9RG/P**	via LA8LF, A. M. Thorrud, Rosenkrantzgt 376, Drammen, Norway.
PJ5CG and **PJ5CH**	via K0GZN.
PX1IR	via K7BVZ.
VE3FFW/SU	Canadian Forces, RAFAH, UN BPO, Beyrouth, Lebanon.
VP2GAC	F. Rojas, Public Relations & Govt. Infn. Officer, Ministry Bdgs., St. Georges, Grenada.
VP2SY	via W4OPM or G8KS for s.s.b. contacts only.
VR2EK	via W6AL (home call).
VS1LP	R. M. Snyder, Mount Elizabeth Flats, 55E Nutmeg Road, Singapore 9.
VS9ADV/P	via VS9AAA or P.O. Box 4297, Aden.
VS9ALD/P	via W9JJF.
YN3KM	via K1KDP.
ZD6OL	via G3JUL.
5N2AAK	A. King, c/o Telegraph Office, Nigerian Railway Corp., Kaduna, Nigeria.
5N2JWB	J. Best, c/o Nigerian Maintenance Service, Kaduna, Nigeria.
5U7AH	via K9EAB.

* * *

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

read and QSLs should be sent to The Long Island DX Association, c/o W2MES, 65-33 78 Street, Middle Village, 79, N.Y., U.S.A.

The trip by **G8KS** and **G3IFB** to Jersey resulted in 1690 QSOs with 60 countries during the period between 12.40 on Friday, April 12, and 00.45 on Tuesday, April 16. Conditions during the afternoon periods were poor but the evenings produced intense activity from the Americas and the Caribbean area. Propagation to the Middle East was poor and the African continent produced only one QSO. All QSLs should go, with appropriate s.a.s.e. or I.R.C., direct to the home QTH of G8KS.

DXCC News

The latest listings on the **Honor Roll** show the top three as **W1FH** (312/327), **W6CUQ** (311/325), and **W2AGW** (311/324). The leading U.K. stations are **G2PL** (306/318), **G4CP** (305/318) and **G3AAM** (303/316).

A.R.R.L. have decreed that **VQ9A/8C** QSOs will not be valid for DXCC credit and totals will be reduced where applicable. However, Chagos QSLs will be accepted for the *CQ* Single Sideband Awards.

Alterations to the *R.S.G.B. Countries List* since the last issue in November, 1962 include the additions of **LH4,** Bouvet Is.; **FR7/J,** Juan da Nova; **GC,** Jersey; **GC,** Guernsey, etc.; Marcus Island, **KG6;** and the merging of Eritrea (ET2) and Ethiopia (ET3).

Contests

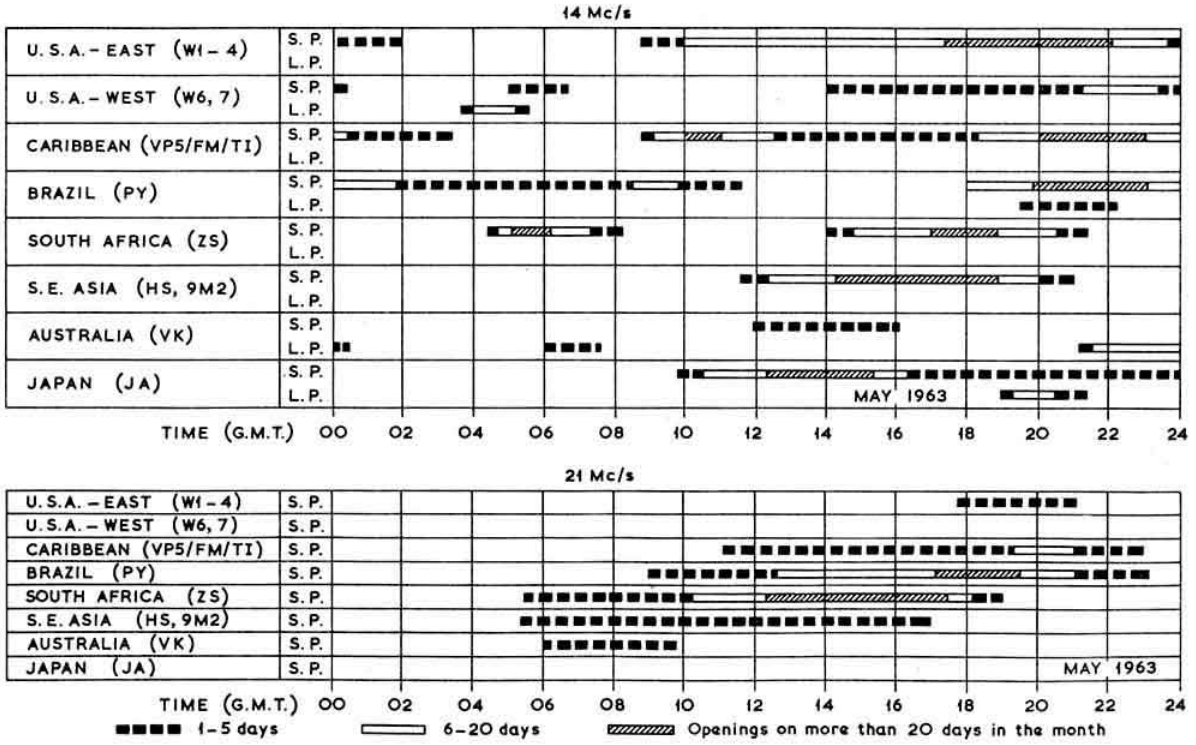
The **Twelfth OZ-CCA Contest** will take place as follows: *c.w.* section: 12.00 May 11 to 24.00 May 12; *phone* section: 12.00 May 18 to May 24.00.

The object of this contest is to work as many amateur stations in all continents as possible on the bands between 3·5 and 28 Mc/s. The numerical exchange will consist of the signal report plus the number of the QSO starting with 001 for the first contest QSO. Each contestant earns 1 point for a correctly received report and 2 points for each correctly received QSO number; each contact therefore can yield 3 points, but contacts with OX, OY and OZ stations count double. Each country is a multiplier and also each of the licensing areas in the following countries: W/K, VE, PY

PROPAGATION PREDICTIONS

The month of May should provide an improvement in conditions on 14 Mc/s due to the higher F2 m.u.f. experienced during the shorter daily period of darkness, when compared to the winter months. This band will remain open much later and on exceptional occasions signals may be heard during the entire period of darkness. The long path to Japan and Australia may sometimes produce stronger signals than the short path, and the path to Hawaii can be expected to open between 06.00 and 09.00. The 28 Mc/s band will be of little use for DX working and 21 Mc/s will usually provide openings only to Africa and South America. However, both 28 and 21 Mc/s may produce short skip QSOs by reflection from the sporadic-E layer, the distances involved lying between 500 and 1,200 miles. Contacts by auroral reflection may also be possible on these bands. Propagation conditions on 3·5 and 7 Mc/s will show little alteration from those experienced during the previous month.

The provisional sunspot number for March, 1963, provided by the Zurich Observatory, is 16·9, with the period of greatest activity lying between March 6 and 10. The predicted smoothed sunspot numbers for August and September are 15 and 14 respectively.



LU, VK and ZL. Contest logs must be mailed not later than June 15, 1963, to E.D.R. Contest Committee, P.O. Box 335, Aalborg, Denmark.

The **Casablanca International Fair Contest** is organized by the A.A.E.M. (the national society of Morocco) and runs from April 25 to May 11, 1963. An amateur station will operate from the Fair under the call **CN8MC** using the 7 and 14 Mc/s bands. A cup will be awarded to the station which contacts CN8MC the most number of times, one contact per day per band being allowed.

The results of the 1962 **Eighty Metre Contest,** arranged by the **TOPS C.W. Club** show that the first three contestants were: DJ1PN (2700 pts.), OK1KUR (2256 pts.) and OH2UQ (1691 pts.). The 1963 Contest will take place during the third weekend in December.

Conditions during the weekend of the *CQ* **W.W. S.S.B. Contest** were far from optimum but some excellent scores were recorded. QSO numbers in excess of 900 were being given by **HL9KH** and **DL3LL**, whilst **GB3RAF**, the HQ station of the R.A.F. A.R.S. at Locking clocked up 747 QSOs, with **G4CP** in the 500 region. It is hoped that all participants will send in logs and suitable forms can be obtained by sending a s.a.e. to G2BVN.

A breakdown of the contacts at **GB3RAF** show that a total of 71 countries and 160 prefixes were worked. A total of 28 effective prefixes and 16 countries were worked on 3·5 Mc/s, whilst 132 prefixes and 70 countries were produced on 14 Mc/s, giving a total provisional score of 233,600 points. The highest QSO rate was achieved between 16.00 and 17.00 on the Saturday when 62 contacts per hour were recorded. (G3GJQ)

Just before this issue closed for press, the principal results of the *CQ* World Wide Contest become available and are as follows:

Top Ten
All Band—Single Operator

XT2Z	647,836	5A1TW ..	234,624
HC1DC ..	426,972	HK1QQ ..	225,106
KP4CK ..	390,648	K5MDX ..	208,517
5N2JKO ..	307,461	W1ONK ..	207,540
ZL1AIX ..	302,267	VR2DS ..	207,393

Continental Leaders
Single Band
28 Mc/s

LU1DAB ..	120,984	K5ORH ..	8,950
5A5TW	19,404	I1TDJ	4,746
	JA1HGY 288		

FG7XT's home station in Pointe-a-Pitre, Guadeloupe, which was recently destroyed by fire. FG7XT hopes to visit FS7 for a fortnight next July with an SR150 s.s.b. transceiver.

21 Mc/s

G3FXB	80,940	K9ECE ..	25,110
9G1YL ..	72,324	AP2MR ..	22,563
PY3AHJ ..	53,618	DU1MR ..	21,546

14 Mc/s

MP4BBW ..	203,700	PY4AS	161,952
KA2JL	199,836	UC2AA ..	154,008
VR3O	162,475	ZE4JO	144,592
	XE1AE 79,222		

7 Mc/s

W3PHL ..	7,379	JA1DRQ ..	4,500
	OK2KOJ 1,066		

3·8 Mc/s

ON4UN ..	13,068	I1AIM	12,980
	W1BU 3,162		

England

G5ZT	A	**48,760**	**255**	**30**	**85**
G3MEA	A	41,886	193	37	80
G3NFV	A	37,376	231	33	95
G2NH	A	3,685	62	12	43
G3MWZ	A	1,408	36	10	22
G3JKY	A	1,160	28	9	20
G5HZ	**28**	**3,032**	**40**	**10**	**17**
G3FXB	**21**	**80,940**	**322**	**23**	**72**
G3OPJ	21	15,732	108	20	49
G3NNT	**14**	**136,416**	**501**	**31**	**81**
G2AJB	14	3,276	80	7	29
G3NSY	14	3,210	101	6	24

Scotland

GM3BCL	**A**	**38,912**	**190**	**39**	**89**
GM3NQB	A	4,465	100	10	37
GM3JDR	**14**	**24,414**	**215**	**23**	**55**

Number groups after call letters denote the following: Band (A-all), Final Score, Number of QSOs, Zones and Countries. Certificate winners are listed in **bold face.**

Awards

The **G300 Certificate** is available to any amateur in the world for scoring 300 points by means of contacts with English stations as follows: G2 = 2 pts.; G3 = 3 pts.; G4 = 4 pts.; G5 = 5 pts.; G6 = 6 pts.; G8 = 8 pts., and any GB = 5 pts. All contacts after January 1, 1960, will count, and all-one-band and all-mode certificates are available, except that British stations may only apply for single band certificates. Alphabetical log data and declaration by two other amateurs that they have seen QSLs, together with five I.R.C., should be sent to G3PEU, Button End, Church Drive, Linby, Notts., who is administering this award of the Amateur Radio Club of Nottingham.

The **Worked All Winnipeg Award** is available to any amateur who can produce proof of contacts with 15 VE4 stations located in Greater Winnipeg and who are members of the A.R.L.M. QSL cards should be accompanied by a remittance of 50 cents, or the equivalent, and should be sent to the Awards Committee, Amateur Radio League of Manitoba, Box 26, Winnipeg, Manitoba, Canada. All contacts after January 1, 1958, are eligible.

The **QAU Award** is available to any operator who can produce proof of contact with the Channel Islands on the following basis: Gt. Britain and Eire, nine GC QSLs; Rest of Europe, six GC QSLs, and outside Europe, four GC QSLs. All QSOs after January 1, 1947, will count and more than one of the Channel Islands must have been worked. Contacts with the same station on more than one band count separately. Claims, together with a remittance of 7s. 6d. or the equivalent, should be sent to the Secretary of the QAU Club, Mrs. Jill Banks, 23 Marett Court, Marett

Road, Jersey. The recipients of the first eight certificates were SM5AHK, GI3JEX, W2FXA, ST2AR, K2CPR, GI6TK, DL1PM and DL1ES.

The requirements of the diploma issued by the **Lebanese Radio Amateurs' Association** have been modified in that stations outside the Lebanon need to contact only 10 Lebanese stations to qualify. The previous number required was 25. All contacts after July 1, 1958, are eligible.

The **HK5 Certificate** is available to those operators who can produce proof of contact with three stations in this call area after January 1, 1957. Cards should be sent to HK5EV, Box 6149, Cali, Valle, Colombia.

The attractive **Finnmaid Award** may be claimed by operators who have contacted five OH-YL stations (from the U.K.) after July 10, 1947. Claims may be sent to the Finnmaid Custodian, Box 306, Helsinki, Finland.

Details of the Highveld Award were published in *M.O.T.A.* for November, 1962, and it should be noted that only contacts dated July 1, 1959, and after are valid for this Award.

Around the Bands†

The **1·8 Mc/s** band has provided erratic conditions during the past month with hardly any transatlantic stations to be heard on some days. **B.R.S.20317** (Bromley) comments that most DX activity appears between 04.00 and 07.00 G.M.T. and reports W4DQS, K4FMA, W1ME, W2GGL and VE3AGX, all at S6. Activity in the band 1895 to 1900 kc/s, just allocated to the U.S. amateurs, has been heard. Also logged were W2FXT, W1BB, W1BU, W1TX, W2KHT, W3GQF and KP4AXU on one day only at S6 (1·996 Mc/s). Finally, DX from Europe was UB5WF at 04.50. Short wave listener **A.2340** (Plymouth) reports DL1FF and OK2KGV also from this area and a selection of Ws including W1TX, W2KQT, W2FYT, W1BU, W1BB, W1PPN, W1BHQ, W2KHT and W2GGL.

The best of the DX on **3·5 Mc/s** this month has come from the West and South-West with conditions falling off towards the end of the month. **A.3449** (Crayford, Kent) records YV5ANS, PZ1BDT, KP4ASK, VP7CW, VP7LG and VP3HAG, all between 05.00 and 08.00 on s.s.b. **David Hayes** in Finchley, who has now logged 91 countries on this band, sends a comprehensive list including T12PI (07.00), CO8RA (04.00), XE1CV (05.15), YV5ANS (06.00), VP3HAG (05.35), VE6SF (07.00), VE5FN (07.00), VE8RG (06.00), HK4EB (02.45), PJ2AA (04.30) and a large selection of Ws from all areas and east coast VEs, all on s.s.b. Loggings from other areas included ZL3UC (07.20), VS9ASS, UF6FB (20.15), 3A2CL, HH2V (03.45) and EA9AZ (06.35). **A.2340** confirms conditions with YV5BNW (07.15), VP9L (01.45), KP4ASK (06.30), YV5ANS (07.13), H18XAA (06.27), ZL4OD (06.55), VE6SF (06.01), VE5FN (07.00) and W6VBY (07.41), also on s.s.b. **B.R.S.20317** (Bromley) reports strong signals from 4W1AA on c.w. between 00.45 and 01.00 at S7/8 working Europeans and the occasional American. Also heard were YV5AGD and YV5ACP at 01.50, KZ5MF (04.40), ZL2FT and ZL2GS (07.15), all on c.w.

Not one a.m. report this month. Come on you chaps with transmitters—what have you?

Most reporters have found variable conditions on **7 Mc/s** this month but nevertheless some excellent DX has been worked. **G3JAG** (Rochdale) reports good conditions to the Antipodes and worked no less than 35 VK/ZL stations in the month as well as other Pacific areas. The highlights were (all c.w.) JA2DCN (18.00), JA6AK (19.30), KL7PI (07.10), KH6AFS (07.10), KZ5FC (06.50), PJ5ME (07.50), VP9VRE (22.55), VE7BAX/W7 (06.00) and ZL4JF (06.45). The got-aways included 3W4GT, 9N1AA and FR7ZI, the latter monopolized by Ws. **G3PVS** (Woking) reports TF5TP (21.05) whilst **A.2340** (Plymouth) heard c.w. from PY7UH (22.55), PY1BPJ (23.31), VP7AT (23.39), VP8HK (23.29). **B.R.S.20317** (Bromley) confirms conditions with the following summary—

Far East—Improving conditions and good signals from HL9KP (16.45, S7), HL9TF (17.00), HL9KH (15.20). Many JAs averaging S4/5 including JA1BZS, LYK, 2BTV, 3BDO, TT, 5PL all between 15.30 to 18.30. Also heard: KR6MD (16.30), UA0BP (15.20), VU2GG (16.00), VS1LS (16.25), VR2DK (18.00), KG4NAA (15.45), and several VKs.

Africa—Little heard but should improve as winter draws on in the southern hemisphere. Logged were VQ4IV (18.30), VQ2WR (22.25) and ZS2HI (04.27).

Central/South America—On s.s.b. HC1DC (08.15 at S7), YV1II (08.10), OA4DI (08.25) whilst c.w. yielded CE4AD (00.22), HR2FG (02.25), HI3PC (09.40), YV5ANT (09.10), VP4TR (22.15) and PJ2ME (07.00 onwards).

Conditions on **14 Mc/s** have been excellent and the DX worked (let alone heard) is legion. Conditions to the Pacific were exceptionally good and **G6XL** (Leeds) reports VR2DK (08.00) and 599 both ways c.w.; on s.s.b. CR8AA (14.17), VR2EK (08.45), VR2BJ (08.34), VR3O (07.35), KC4USV (08.03), KH6PD/KG6 (08.00), KG6SZ (13.15), KC6BO (13.40), KM6CX (08.00), KB6CP (08.00), and WA4LTX/KJ6 (06.45). **G3AAE** (Loughton) adds on c.w. VK9RH (08.30), HL9TH (09.15), VK9LA (16.30), VS4RB (16.30), VS4RS (16.45), KG6NAA (12.15), KX6AJ (11.25), KM6CL (11.35), VS6EC (12.52), DU1CV (15.40), 5R8CM (20.20) and KG6SZ (11.30) on Saipan Island. Other countries worked were ZP5OG (20.20), TN8AF (18.30), FH8CE (18.40), LU1ZAB (20.50) in the Antarctic, CP5EZ (20.15), HI8MMN (20.50), HH2CE (21.15), ZD6OL (17.45), YA1AW (13.00), HS1A (13.40), FR7ZI (17.45) and ZS7M (18.50). **G8PL** (London) records JAs, KL7s, PYs, VKs and notably EL2Y, EP2BQ, EP2RH, TN8AF, TT8AL, VS9AJA, YI2WS, 5U7AC, 9G1ES and 9Q5AB, all on c.w. between 06.00/09.00 G.M.T. A comprehensive list from **G3HCT** (Warwickshire) includes FB8XX (18.05), JT1KAA (09.30), KV4CI (07.50), KR6ML (13.55), 9M2UF (16.50), 6W8DD, 6W8DF (07.30), all worked on c.w. Many other reporters confirm the conditions represented by the above with large numbers of contacts and good signal strength.

Openings to the south and south-west have been appearing regularly and VP8GQ has been providing an outstanding

G3MZM operating GD6UW during the Cambridge University Wireless Society's expedition to the Isle of Man at the beginning of April. The Hammarlund HX50 s.s.b. transmitter is on the left of the photograph and the K.W. Electronics KW77 receiver on the right.

† Compiled by J. G. Cottrell (G3PSY)

Claims for R.S.G.B. Certificates

During the first two months of 1963 the Society's Honorary Certificates Manager, Ken Hurrell, G3NBC, dealt with claims for approximately 140 certificates. Whilst the majority of these claims were correctly presented, a minority of applicants (about 25 per cent) failed to observe the rules for applications for W.B.E., B.E.R.T.A. and the Empire DX Certificate. Non-observance of the effective dates for contacts with *South African* stations accounted for a large proportion of the unacceptable claims. It is emphasized that only contacts *before June 1, 1961*, are valid for the certificates mentioned above.

Claims from non-members for W.B.E. and B.E.R.T.A. must be accompanied by a remittance for 7s. or the equivalent thereof. Non-compliance with this requirement leads to unnecessary correspondence.

Full details of the conditions of issue of the Society's awards (except the v.h.f. awards) together with a check list, are provided on a leaflet obtainable from R.S.G.B. Headquarters to which certificate applications should be sent, and the receipt of which will be acknowledged. Co-operation in connection with claims leading to a reduction in the amount of avoidable correspondence will enable the Certificates Manager to reduce delays to a minimum.

Members are reminded that W.A.C. certificates are not issued by the Society but that verified claims are passed to I.A.R.U. HQ at West Hartford, U.S.A., for action.

signal at S8/9 during the evenings for long periods. **G3POI** (London) has worked VP8HD (19.53), ZS1XR (19.38), 9G1DZ (19.55), ZS3EW (19.21), CR6CH (19.38). **G3HDA** (Stratford-on-Avon) contacted CO8BO (21.15), HV1CN (10.30), ST2AR (11.40), TG9AZ (22.23), VP6KL (20.05), YN3KM (20.15), YN7GS (19.15), YS1MS (21.55), YS1O (13.15), YS2SA (22.05), ZD8DW (19.10), ZP5OG (22.05) and 5U7AH (08.10) all on s.s.b. **G3PVS** (Woking) reports LU2EN (21.10), LU2ENZ (20.22) and LU7AL (22.01). **G3YF** (Chingford) submits an enviable list of DX worked, some not reported by anyone else such as HS1B (14.15), BV1US (09.00), FY7YI (10.45), 5X5FS (19.05), AP5KC (08.10), FO8AQ (09.25) on s.s.b. whilst c.w. yielded VQ9HB (15.15), XZ2KN (17.05), FH8CW (14.45) and ZK1AR (07.25).

Listeners **A.3062, A.3526, A.2452** and **A.2498** all submit long lists confirming the good conditions. The **OE1ME** (Vienna) list this month shows that Southern Europe is also experiencing good openings and amongst his list are KH6DDD/MM (11.00) off Iwo Jima, VS9ADV/P (15.15), ZD8DW (19.10), HI3SMP (20.50), KB6CP (07.40).

Activity on **21 Mc/s** is still sparse but some interesting contacts are there if you are prepared to search for them. **5B4TJ** in Cyprus reports VU2BK, VU2SO, VK5 and VK6s, TN8BE, 6O2GM, 4S7YL, 5R8BX, FR7RD, 9U5BH, ZD6RM, 5U7AC and numerous South African stations, all on a.m. On c.w. **G3PSY** (Thorpe Bay) found CR6FW (16.43), CE3UT (18.59), FR7ZD (14.22), VK9LA (14.00), VQ2WM (11.34), 5R8AG (14.10), 6W8DD, DE, DF and BL (18.15 to 18.45). **A.3062** (Camberley) heard on a.m. FG7XL (19.43), EL2S, EL5C, EL8S (17.36), CR7FP (17.36), KZ5LW (14.21), OX3KM (13.15), ZE2JA (17.24), ZS1AB (16.23), ZS1YX (16.51), 5H3HZ (14.21), 9G1DF, EC, EE, EM and 9Q5CL (16.45). **A.2340** (Plymouth) adds, also on a.m., ZD6RM (17.30), TN8AD (17.50), TU2AC (17.58) and many others.

A welcome report on **28 Mc/s** from **5B4TJ** (Cyprus) lists ZE3JU, ZS6EB, ZS6BEJ, ZS6AYG, ZS4RF, ZE8JZ and ZE2KL with average strength five to seven showing that the North to South path is there to be used if one cares to try. He finds the band opening at 08.00 and closing between 16.00 to 18.00 G.M.T. and would be pleased to operate a schedule with anyone interested during afternoons and weekends. Suggested times, etc. should be sent to 4262734 S.A.C. Farrar, A.R.I.C. (W.E.) R.A.F. Episkopi, B.F.P.O. 53.

DX Briefs

A note from **G3PAG**, the QSL manager for **VP8GQ**, mentions that cards will only be sent to s.w.l. when the information given on the incoming card justifies this. John Davies has received many cards which simply say " your sigs 599 OM pse QSL," and this type of request is just not good enough. Listener reports should, as a minimum, mention the call-sign of the station in QSO with VP8GQ and give the correct time in G.M.T.

G3FGT comments on the excellence of the past DX season on **Top Band** during which he achieved his ambition of completing WAC on this band, by a QSO with ZL3RB. The country score on 1·8 Mc/s is 39 worked and 38 confirmed, the outstanding card being that from VP8GQ. On this matter G3PAG assures that just as soon as the cards arrive from the printers the outstanding QSLs will be honoured.

AC4TD was worked by W4ECI on 14,034 kc/s at 13.00 on March 29, and any information on this call will be welcomed. At first sight this would appear to be a companion of AC4AX worked from the U.K. some weeks ago. Strangely enough, AC4TD asks for QSLs via the R.S.G.B. and answers to the name of Joan! G2MI cannot assist nor can the alleged QTH of Limari be traced in the usual references.

The **Swiss Broadcasting Corporation** will transmit information regarding sunspot numbers in programmes beamed to England and Ireland at 19.50 on the following dates: June 8, July 6 and August 3. The wavelengths used are 49·55m and 31·04m.

The **Voice of America** programme is usually well heard in the U.K. on Sundays at 22.30 on 3980 kc/s, when the Amateur Radio feature is broadcast, the m.c. being Bill Leonard, W2SKE.

It is believed that some **PJ5MB** QSLs may have gone astray in the post and **K9KDI** will be pleased to honour further requests accompanied by the usual s.a.e.

TA5SW has been reported on 14 Mc/s s.s.b. around 21.00. There have been rumours that Rundy, OD5CT, may obtain permission to operate from Turkey.

The Yasme Foundation are endeavouring to arrange a trip to **Christmas Island** (VK9) by ZS6LM, who has operated from Cocos-Keeling during recent months.

JT1KAA has been worked on a number of occasions between 11.00 and 12.30 on 14,040 to 14,060 kc/s, whilst JT1AG has also been active.

5B4CZ reports that the **Cyprus QSL Bureau** holds a large number of cards for ex-ZC4s CH, FL, LL, PR and SG. These will be held until September 30, and if not claimed prior to this date, will be destroyed. Claimants should send a remittance to cover postal charges.

DJ2KS sends his thanks to the many U.K. stations that he contacted on Top Band, and regrets that his activity was curtailed after mid-January.

* * *

The numerous correspondents are thanked for their reports and information, and co-operation from the following is acknowledged: *DX'press* (PA0FX), the West Gulf DX Club *Bulletin* (K5ADQ), *The DX'er* (WA6TGY) and *DX* (W4KVX). Please send all items to R.S.G.B. Headquarters to arrive not later than **May 10** for the June issue and **June 11** for the July issue.

Society News

Mr. J. C. Graham, G3TR, now a Member of Council

MR. JOHN C. GRAHAM, G3TR, of Crawley, Sussex, has accepted an invitation extended to him by the Council to fill the casual vacancy on the Governing Body brought about by the death of C. H. L. Edwards, G8TL. Mr. Graham has also accepted an invitation to serve on the Exhibition Committee.

R.S.G.B. QSL Bureau

THE R.S.G.B. QSL BUREAU will be closed from May 23 to June 11 inclusive. Members are asked not to send cards or envelopes to Mr. Milne which will arrive between these dates.

Military Affiliate Radio System

TO REMOVE ANY DOUBT that may exist, the Post Office have advised the Society that amateur traffic is not permitted over any M.A.R.S. station in the United Kingdom. M.A.R.S. stations operate on frequencies outside the amateur bands.

Vacancy on the Council
Zone A Representative
Ballot

Mr. A. C. Dunn (G2ACD) of Bridlington, Yorkshire, and Mr. L. N. Goldsbrough (G3ERB) of Bebington, Cheshire, having been duly nominated to fill the vacancy on the Council for the office of Zone A Representative, a Ballot now becomes necessary.

Corporate Members resident in **Zone A (Regions 1 and 2)** are invited to record a vote for one of the two candidates in the form prescribed below.

Ballot for Zone A Representative

I wish to record my vote in favour of Mr..... for the vacant office of Zone A representative. I certify that I am a fully paid-up Corporate Member of the society.

Signed .....

Ballot Papers must be posted in ***sealed envelopes*** containing no other communication. Envelopes must be marked " Ballot " and be addressed to the General Secretary, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London,W.C.1, to arrive not later than **12 noon on Wednesday, May 15, 1963.** The envelope must be signed by the member voting who must write his address, call-sign or B.R.S. number on the back of the envelope only. The Ballot Paper itself must not be signed.

ONLY CORPORATE MEMBERS RESIDENT IN REGIONS 1 AND 2 MAY VOTE

Mr. Dunn was nominated by Messrs. D. P. Tipper (G3JBR), J. Scott (G3LXS), J. H. Hargreaves (G5VO), G. H. Brown (G3FVW), P. Watson (G3PEJ), S. Stephenson (G3KS,) R. S. Scales (G3NRS), P. Blakeborough (G3PYB), E. Gibbins (G3JTG) and H. C. Hopkins (G3NRI).

Mr. Goldsbrough was nominated by Messrs. P. Jones (G3PYU), N. Kendrick (G3CSG), W. A. Fletcher (G3PSX), J. K. Birch (G2FOS), A. J. G. Keiller (G3KXR), E. J. B. McArthur (B.R.S.23241), H. M. Synge (G3BOC), J. P. G. Jones (G3IGG), B. O'Brien (G2AMV) and J. R. Petty (G4JW).

More Pirates Fined

ON JANUARY 3, 1963, at Uxbridge Magistrates Court, A. R. Harriner of 82 Cornwall Road, Ruislip, Middlesex, pleaded guilty to a charge of using wireless telegraphy transmitting apparatus without the necessary licence. He was fined £10 and ordered to forfeit the apparatus to the Postmaster General.

Amateur Radio Lawyers

J. FOY GUIN (W4RLS), P.O. Box 26, Russellville, Alabama, has compiled a list of lawyers who currently hold Amateur Radio call-signs. Included in the U.K. section are G2HNO, G3WW, G3AFJ, G3FPQ, G3NWV and G8PC. Members who are solicitors or barristers but whose call-signs are not listed already are invited to write direct to W4RLS.

G3CWL Bereaved

IT IS WITH PROFOUND SORROW we record the accidental death on February 9, 1963, of Philip Haynes, aged 20 months, son of Mr. and Mrs. Geoffrey R. Haynes (G3CWL/3A2DA) of Leatherhead. Philip had accompanied his parents on two DXpeditions to Monaco and on various field day events.

Peter Pendleton Eckersley

THE DEATH OCCURRED on March 18, 1963, of Peter Pendleton Eckersley, one time Chief Engineer of the B.B.C. and a pioneer of British broadcasting. Capt. Eckersley's association with the famous Marconi Company experimental station at Writtle during the early 1920's brought him world-wide publicity, while his famous cry "This is Two Emma Toc, Two Emma Toc, Writtle"—with special emphasis on the " r " in Writtle—will long be remembered by all who listened to those early programmes.

Peter Eckersley was closely associated with the Wireless Society of London and he was Vice-President for many years. His voice will remain with us, because a talk which he gave fairly recently to a meeting of East London R.S.G.B. members was recorded for the R.S.G.B. Tape Library. During that talk " P. P. " recalled many of the highlights of the early days of broadcasting.

Born in Mexico 71 years ago Capt. Eckersley was a grandson, on his mother's side, of Prof. T. H. Huxley, the scientist. He served as a Wireless Officer in the Royal Flying Corps during the First World War and he was a founder member of the British Wireless Dinner Club. He frequently contributed to the technical press and on occasion his views were revolutionary and led to debate—which he enjoyed. He recalled his own early days in a series of articles published a year or two ago in *Wireless World*.

He was at one time head of the experimental section of the designs department of Marconi's Wireless Telegraph Company and was responsible for the design of the Croydon Airport Wireless Station. He was Chief Engineer of the B.B.C. from 1923 until 1929 after which he was a radio consultant to various government organizations. Capt. Eckersley planned the U.K. regional scheme for broadcasting and in 1932 was invited to Australia to put forward a plan for national broadcasting there. He was one of the first to advocate wire broadcasting.

Peter Eckersley was a man of great charm and ability whose name will always be linked with the birth of British broadcasting. J. C.

What are we doing about the New Headquarters?

By NORMAN CAWS (G3BVG)*

SO MANY MEMBERS ASK WHAT is being done to find a new Headquarters for the Society that I should like to tell you a true but frustrating story.

Many offers of buildings have been examined in recent months. From the scores considered, two were quite suitable but proved to be too expensive.

On Monday, March 25, however, I received a letter from a firm of Estate Agents offering a building in Queen Anne Street, which is near Oxford Street in the West End of London. It sounded most promising. I know Queen Anne Street, so I was personally satisfied as to the position and felt that the price and terms would also be satisfactory: £18,500 for a 22-year lease at a ground rent of £200 per annum. I hoped that it would be a case of third time lucky.

I contacted a member of the Headquarters Building Committee who works in the area and asked him to have a look at the outside of the building before meeting me on his way home. While he was doing this, I telephoned two insurance companies to enquire the terms for Sinking Fund policies so that we could discuss all aspects of the offer. The plan was that during the period of the lease the Society should set aside each year a sum which at the end of the term would provide capital for the purchase of a further lease or another property.

As a result of our discussion, we decided to make a full inspection at 2.30 p.m. the following afternoon. Another Council member working in the locality joined us.

After a thorough examination of the building with the Agent, the three of us agreed that we should make a conditional bid at once, as it was too good an offer to miss. We therefore went to the offices of the selling agents and made a bid subject to contract, survey and planning permission being satisfactory.

Then the snag arose: there was planning permission for " professional " use for seven years only, with reversion to " residential " after that. However, we were told that an application was being made for an extension of the planning permission for professional use. So we made our offer conditional upon the Society having full permission for the term of the proposed lease.

The following Monday morning—only a week later!—I received another letter from the Agents saying that the landlords would only permit " professional " use and that did not include " society " use. So much for the third time being lucky.

The search continues.

* President, 1963

Headquarters Fund List—No. 19

THE FOLLOWING IS THE 19th list of those who had contributed to the Headquarters Fund up to April 19, 1963:

A. M. Robertson (B.R.S.17033), Radio Society of Harrow, A. A. Blythe (G3LOJ), H. G. Cavill (B.R.S.24939), H. J. M. Box (G6BQ), T. G. M. Baillie (ZE4JS), A. Mathews (G6QM), C. Richards (9M2CR).

Total amount contributed to date: £1,652 7s. 6d.

YOUR LAST CHANCE TO BOOK FOR THE . . .

NINTH INTERNATIONAL V.H.F.-U.H.F. CONVENTION

Saturday, May 18, 1963

Kingsley Hotel, Bloomsbury Way, London, W.C.1

Programme:

Convention opens	11 a.m.
Exhibition of commercial and home constructed equipment	
Lecture Symposium	2 p.m.
Convention Dinner	7 p.m.
Presentation of 1962 V.H.F. Committee Cup, and Raffle draw	9 p.m.
Convention closes	10.30 p.m.

Tickets may be obtained from F. E. A. Green, G3GMY, 48 Borough Way, Potters Bar, Middlesex at the following prices:

Convention only 3/6

Convention and Dinner 27/6

Bookings for the Dinner cannot be guaranteed if received later than Wednesday, May 15, 1963.

Tube Stations: Holborn and Tottenham Court Road. Buses: 78, 23, 25, 32.

Organized jointly by the R.S.G.B. V.H.F. Committee and the London U.H.F. Group.

Society Affairs

A digest of the business discussed at the February, 1963 meeting of the Council.

This new feature replaces the more formal *Council Proceedings* in which business discussed at Council meetings has been brought to the attention of members in recent years. Members' comments on the new presentation, which is experimental, will be appreciated.

THE February meeting of the Society's Council was held in two sessions: the first, attended by Messrs. Norman Caws (President), H. A. Bartlett, D. A. Findlay (Honorary Treasurer), R. C. Hills, E. G. Ingram, J. Douglas Kay, A. O. Milne, L. E. Newnham, F. K. Parker, A. D. Patterson, R. F. Stevens, G. M. C. Stone (Executive Vice-President), J. W. Swinnerton and E. W. Yeomanson, John Clarricoats (General Secretary) and John A. Rouse (Editor) was held on February 25. All attended the resumed meeting on March 6 with the exception of Mr. Patterson who was ill.

* * *

The proceedings opened with those present standing in silent tribute to the memory of the late C. H. L. Edwards, G8TL, and H. A. M. Clark, G6OT, both of whom had died since the January meeting.

* * *

The President formally welcomed Messrs. Bartlett and Patterson on their re-election to the Council.

* * *

Headquarters

The Headquarters accommodation has been a talking point for some time whenever Society affairs are discussed. At this meeting Mr. Caws explained that as notice had not yet been given the Society could not be required to vacate the Little Russell Street premises when the present lease expires on June 23, 1963. However, the fact must be faced that it is probable that a very much higher rent may be charged after that date.

It was reported that premises in Holborn, London, for which the Society had made a bid, had been sold for a figure of around £40,000.

New Members and Affiliated Societies

An important part of every Council meeting is the approval of applications for membership: at this meeting 95 applications for Corporate and 39 for Associate membership were approved. Of the 39 Associates, 36 were aged between 14 and 18.

Three applications for affiliation by local radio societies (Burton-on-Trent, R.A.F. Scampton and Verulam, St. Albans) were approved.

Committees

This year there are 13 committees of the Council and Mr. Stone reported that he had prepared new draft terms of reference in a common format. It was agreed to discuss the draft at the next meeting.

Cheques on the Society's Accounts

The arrangements for the signing of cheques drawn on the Society's accounts were revised at this meeting. In future, the two signatories required will be drawn from the President, Executive Vice-President and Honorary Treasurer on the one hand and either the General Secretary or the Assistant Secretary on the other. In the event of a cheque being signed only by members of the Council, one of them must be the Honorary Treasurer. A cheque cannot be signed only by members of the Headquarters staff.

Regional Meetings

The Council gave a good deal of thought to its representation at the many O.R.M.s to be held during Golden Jubilee Year and it was decided that three members should attend each meeting. In addition, it was agreed that Mr. Clarricoats should be authorized to attend every meeting, bearing in mind that he will be retiring at the end of 1963.

The Council also agreed that the President should accept an invitation to attend the Annual Dinner of the French Society on May 26, 1963. Mr. Caws reported that he had been invited to attend the Annual Dinner of the Radar and Electronics Association.

Golden Jubilee

The Council approved the Golden Jubilee Celebrations programme and appointed Mr. Frank Fletcher to act as Honorary Business Manager. Details of the programme were published last month.

Publications

Publications are an important part of the Society's operations and on this occasion the Council made a number of decisions concerning the publishing programme during the next few months: the production of a new edition of *A Guide to Amateur Radio* was approved, it was agreed to place an order for 7000 copies of the 1964 *Call Book* and a fourth, and larger, printing of the *Amateur Radio Handbook* was authorized.

In connection with the *Handbook*, Mr. Stevens reported that *CQ* Magazine is willing to handle it in the U.S.A.

It was decided to agree to a request of the National Institute for the Blind to publish Braille editions of *A Guide to Amateur Radio* and the *Radio Amateurs' Examination Manual*.

I.A.R.U. Conference at Malmo

In connection with the I.A.R.U. Region I Conference to be held in Malmo, Sweden during June, it was agreed to place the following matters on the agenda: (i) News Bulletin Services and Slow Morse Transmissions, (ii) Emergency Services in Region I (iii) Co-operation during the International Quiet Sun Year, (iv) The economical use of the amateur bands, (v) Co-operation in scientific projects in the v.h.f. bands, (vi) Items in connection with operational v.h.f. matters.

RESOLVED to authorize Miss May Gadsden to accept an invitation extended to her by the I.A.R.U. Region I Executive Committee to take charge of the Secretariat at the I.A.R.U. Conference in Malmo in June, 1963 and that she, together with the General Secretary, be released to undertake secretarial duties in Malmo. (Mr. Clarricoats is Honorary Secretary of I.A.R.U. Region I Division.)

Secretary's Pension

RESOLVED that the General Secretary be permitted to commute part of his pension for a cash option in accordance with his request and with the certificates from the Legal and General Assurance Society as submitted (Mr. Clarricoats will draw a retirement pension of £382 p.a. and a cash option of £1,135; in addition he will receive an ex gratia payment of £200 p.a.).

Insurance

Any organization of the Society's size inevitably has to insure against many risks. At this meeting it was decided to ask Mr. Bartlett and Mr. Findlay to look into the policies at present in force to make quite sure that all the necessary cover is dealt with in as economical a manner as possible.

Headquarters Telephones

The expanding activity of Headquarters and rising membership has led in recent times to the Society's main telephone, Holborn 7373, being frequently overburdened. As a first step to alleviating the situation, it was decided to remove the second line, Holborn 2444, from the ex-Directory list and also to endeavour to obtain an extra line.

Committee Meetings

An important part of every Council meeting is devoted to discussing reports from the hardworking Committees. On this occasion, the reports dealt with the following business:

The Contests Committee put forward two reports dealing with

business discussed on January 31 and on February 7, 1963. At the first of these meetings the Committee dealt with the problem of gaining contest experience in N.F.D., the first R.S.G.B. 7 Mc/s DX Contest, the R.S.G.B. 21/28 Mc/s Telephony Contest 1962 and the programme of D/F qualifying events for 1963. On February 7, the Committee gave further consideration to the 21/28 Mc/s Contest and spent a considerable time discussing the checking of contest entries and the points deduction to be made for errors in call-signs, reports and serial numbers. Altogether, the Committee was in session for six hours.

The Scientific Studies Committee met on February 4 and dealt with projected articles on v.h.f. progapation, the continuing work of analysing auroral data from the I.G.Y./I.G.C. periods, the beacon stations, GB3CTC and GB3GEC, Project Echo A-12 and arrangements for R.S.G.B. participation in the I.Q.S.Y.

The V.H.F. Committee met on February 11 to discuss correspondence from R.E.F. regarding the exchange of QRA Locator maps, claims for v.h.f. operating awards, beacon stations, arrangements for the International V.H.F./U.H.F. Convention in May and space communication.

* * *

The Council was in session for a total of eight hours.

Representation

THE FOLLOWING IS AN ADDITION to the list of Area Representatives published in the December, 1961 issue.

REGION 1—LANCASHIRE

LIVERPOOL

A. D. H. Looney (G3LIU), 448 East Prescot Road, Liverpool 14.

Affiliated Society Representatives

THE FOLLOWING ARE ADDITIONS to the list of Affiliated Society representatives published in the December, 1962 issue.

CANNOCK CHASE AMATEUR RADIO SOCIETY

C. Dixon (B.R.S.21632), The Wood, Rawnsley, Cannock, Staffs.

GRIMSBY AMATEUR RADIO SOCIETY

P. Linsley (G3PDL), 19 Taylors Avenue, Cleethorpes, Lincs.

STOCKPORT RADIO SOCIETY

E. C. Wigzell (G3RQL/T), 54 Clarendon Road, Hazel Grove, Stockport, Cheshire.

SUTTON AND CHEAM RADIO SOCIETY

F. R. Scott (G2CZH), 140 Seymour Avenue, Morden, Surrey.

Silent Keys

S. D. MARSHALL (G3COT)

The death has occurred in tragic circumstances of S. D. Marshall (G3COT), of New Barnet, Herts. Mick, to all his friends, was killed whilst on his way to work on March 25, 1963.

An active member of the Barnet Radio Club he had also been a member of the R.S.G.B. since 1947. Mick will be sadly missed by his many friends in Amateur Radio circles.

Sympathies are extended to his widow Audrey, son Brian and daughter Joy. G3GMY

BERT PHILLIPS (GW5PH)

It is with deep sorrow that we record the death of Bert Phillips (GW5PH), at the age of 62, on March 24, 1963.

Bert had been ailing for some years, but remained working as an electrical engineer until the last. He was introduced to Amateur Radio in the 1930s, and was very active, particularly on 80m, until just before his death.

We extend our deepest sympathy to his widow, son and daughter. GW2HPG

J. F. SMITH (B.R.S.16871)

We record with sorrow the death on March 3, 1963, of Mr. J. F. Smith (B.R.S.16871), Managing Director of H. L. Smith & Co. Ltd., 287/239 Edgware Road, London W.2. Mr. Smith had been a member of the Society since 1948.

LT. COL. C. W. THOMAS, C.B.E., ex-G6MW

The death is reported of Lt. Col. C. W. Thomas, C.B.E. of Oldswinford, Stourbridge, Worcs, at the advanced age of 97 years. Lt. Col. Thomas was responsible for presenting to the Society in 1936 the B.E.R.U. Rose Bowl that bears his name. The Rose Bowl is awarded to the leading British Isles station in the High Power section of the annual B.E.R.U. Contest.

Lt. Col. Thomas who had been a member since 1926 held the call G6MW until fairly recently. He was a former President of the British Ceramic Research Association.

Secretary-Accountant

As a result of the staff changes announced on page 186 of the October 1962 issue of the R.S.G.B. BULLETIN applications are invited for this newly-created post on the Headquarters staff.

Candidates must possess a sound knowledge of general office administration and bookkeeping. The successful candidate will be required to attend occasional evening and weekend meetings. An interest in Amateur Radio would be an advantage.

Write in confidence giving details of career to date, and salary required to the General Secretary, Radio Society of Great Britain, 28 Little Russell Street, London, W.C.1.

Vacancy on the R.S.G.B. Bulletin

There is a vacancy at Headquarters for a keen licensed (or prospective) amateur to join the editorial staff of the R.S.G.B. BULLETIN. Enthusiasm, coupled with good command of English, is more important than experience. The ability to mix well would be an advantage.

The continuing programme of expansion of the Society's activities in the publishing field make this a challenging opportunity to gain wide experience of editorial production.

Write in confidence giving details of career to date, and salary required to the General Secretary, Radio Society of Great Britain, 28 Little Russell Street, London, W.C.1.

Can You Help?

● W. L. Nye (VK2XU), P.O. Box 235, Crows Nest, N.S.W., Australia, who would appreciate information, particularly the circuit diagram and test readings concerning the Valve Tester Type 4.

● H. S. Johnstone (A.3165), 2 Fox Hill, Distington, Workington, Cumberland, who requires data for improving the operation of the Hallicrafter SX24 receiver, on the 10 and 15m bands, and also the component values in the R208 receiver.

NORTHERN IRELAND
GOLDEN JUBILEE CELEBRATIONS
WOODBURN HOUSE HOTEL, BELFAST
Saturday, May 4, 1963

Programme

2.30 p.m. Assemble

3 p.m. Lecture: " Exploration of the Universe by 21 cm Waves " by Dr. B. L. Moiseiwitsch
Afternoon Tea
Demonstration of and discussion on radio equipment

Separate programme for the ladies

7.30 p.m. for 8 p.m. Golden Jubilee Celebration Dinner

The Council will be represented by the President, Mr. Norman Caws, G3BVG, the Zonal Representative, Mr. Barney Patterson, GI3KYP, and the General Secretary, Mr. John Clarricoats, O.B.E., G6CL. Visitors who are interested in private accommodation for the event should write as soon as possible to Mr. Patterson at 24 Cyprus Avenue, Belfast 5.

A Report on the Activities of the Society's V.H.F. Committee

By R. C. HILLS, B.Sc.(Eng.), A.M.I.E.E., A.M.Brit.I.R.E. (G3HRH)*

DURING 1962, the Committee held seven ordinary meetings, and one joint meeting with the Contests Committee. The Committee comprised Messrs. W. H. Allen (G2UJ), N. Caws (G3BVG), F. E. A. Green (G3GMY), F. A. Griffiths (G3MED/T), J. H. Hum (G5UM), R. C. Hills (G3HRH), F. G. Lambeth (G2AIW), A. L. Mynett (G3HBW) and G. M. C. Stone (G3FZL), appointed by Council in January, 1962. Additionally Mr. R. G. Flavell (G3LTP) was co-opted in August to serve on the Committee for the remainder of the year. The Chairman was R. C. Hills, B.Sc.(Eng.), A.M.Brit.I.R.E. (G3HRH), and the Hon. Secretary F. E. A. Green (G3GMY).

Two V.H.F. Conventions took place during the year. The first was held in Glasgow on April 28 and was organized by the Scottish V.H.F. Group, the Council being represented by Mr. F. G. Lambeth (G2AIW), the Society's V.H.F. Manager in 1962. The Eighth International V.H.F./U.H.F. Convention, now a well-established event, was held in London on May 19. On this occasion the Committee presented to the Society a trophy to be known as the " 1962 V.H.F. Committee Cup " to be awarded to the winner of the Construction Competition: the first winner of the cup was Mr. C. Tucker (G5DT) for a display of 23cm equipment, a photograph of which appeared in the June, 1962, issue of the R.S.G.B. BULLETIN.

Certificates

The Committee dealt with a steady flow of claims for " Four Metres and Down " Certificates, and up to December 1, 1962, the following awards had been approved (1961 figures in brackets):

(i) 2m transmitting	38 (17)
(ii) 70cm transmitting	1 (nil)
(iii) 2m receiving	1 (nil)

(A full table of certificate holders appears in this issue of the BULLETIN.)

The Committee was pleased to note that the 2m award has now been won by a representative station in each prefix area except GD, and has also been awarded to both a portable and a mobile station. As an outcome of the Geneva restrictions on the use of the 72 Mc/s band, the rules for the 70 Mc/s section of the award were amended in June, 1962, to require only 20 counties and three countries.

Beacon Stations

After a further year of satisfactory service, the Wrotham Beacon Station, GB3VHF, was shut down for a complete overhaul in October. Transmissions were resumed in mid-November.† During the year, Mr. P. Balestrini (G3BPT) was brought in to replace Mr. Beadle (G3KLI) on the maintenance team, led by Mr. J. B. Kay (G3CO). The Committee was pleased to record that negotiations on behalf of the Cornwall Technical College resulted in G.P.O. approval of the Cornish Beacon, GB3CTC, which commenced operation in May, 1962. Mr. W. D. Old (G3CZZ) was responsible for installing and running this station. Preliminary proposals were also discussed late in the year for a Northern Ireland Beacon Station, to be organized by the Belfast V.H.F. Group.

Contests

At a joint meeting with the Contests Committee in September, the use of the QRA Locator was discussed in detail, and a small panel of experts was formed to draft alternative proposals for submission to the Region I I.A.R.U. Conference at Malmo in 1963. A decision was reached at this meeting in respect of the status of certain counties for Society awards and contests. In addition draft rules were approved for the 1963 V.H.F. N.F.D. event.

The Committee has recorded its thanks to G3LTP and the staff of the R.R.S. Slough who have agreed to run a checking station in a series of v.h.f. frequency measuring tests to be held in 1963. (It was unfortunate that technical trouble on the GB3VHF equipment prevented the test from taking place, and it is hoped to try a trial run as soon as the permanent beacon is operational again.)

High Power Permits

During the year, 2m high power permits were successfully negotiated for a further two stations to engage in propagation experiments conducted by the Scientific Studies Committee. An application to operate high power in the 70cm band was refused.

The provincial V.H.F. News Service, GB2RS, was reorganized during the year, having been intermittent in the early months due to the temporary loss of the North of England reader. After a period of negotiation by the Committee, the service was restored to the North of England, with G5YV and G2HHV, as operators, together with a new Midland service run by G3BA. The South of England service continued to be run by G3FZL, G3IIR, G3NGS and G6OX. During this reorganization, the Society provided crystals for the operators to permit each regional bulletin to be radiated on a zone edge frequency as follows:

London	145·10 Mc/s	Midlands	145·30 Mc/s
North	145·50 Mc/s		

Preliminary arrangements for a Northern Ireland service were also discussed. The Committee has recorded its thanks to Mr. R. A. Wade (G3IRW) for his service in etching the necessary crystals.

Satellites

A second amateur satellite, *Oscar II*, was launched by the U.S.A.F. in June under conditions of such secrecy that there was unavoidable delay in getting the tracking organization into operation. The orbit was less favourable than that followed by *Oscar I* and the satellite burned up 18 days after launching.

As a result of representations initiated by the Committee, the Society was able to negotiate with the G.P.O. for permission for amateurs requesting the facility to listen to signals from satellites on 136 Mc/s.

Future Activity

The 1963 Committee will have on its agenda the following items for action:

(i) The Ninth International V.H.F. Convention in London.
(ii) Negotiations for a Northern Ireland V.H.F. Beacon Station.
(iii) Preparation of a general brief for the Society delegates to the Region I I.A.R.U. Conference in 1963.
(iv) Possible extensions to the GB2RS V.H.F. News Service.

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* *Chairman, V.H.F. Committee, and R.S.G.B. V.H.F. Manager.*

† A fault on the aerial system occurred during the very severe weather in January, 1963 and a temporary beacon at Shooters Hill has been operating since then.

CONTEST NEWS

RESULTS — REPORTS — RULES

Affiliated Societies' Contest 1963

ONLY 43 ENTRIES WERE RECEIVED for this year's Affiliated Societies' Contest held on February 2-3. Unfortunately, due to failure to comply with the General Rules for R.S.G.B. Contests, many of the entries were not eligible for positions. The winning station was that of Gravesend Amateur Radio Society, G3GRS, operated by G3MXJ and G6BQ who between them made 165 contacts. In second position came Kingston and District Amateur Radio Society, G3KIN, operated by G3NFV, with 147 contacts.

Some confusion was caused by an omission in the published rules of the contest, but most entrants interpreted them correctly in working stations twice during the contest—once on each day. The standard of operating was good although some operators complained of the lack of break technique! The method of denoting an R.S.G.B. Affiliated Society was misused by many stations; some club stations failed to send, and some non-club stations insisted on sending A.F.S. when making a contact.

Contest conditions were generally good and it is noticeable that many more clubs were active than actually sent in entries. The lower points discrimination meant that the non-club station was in great demand and they rose to the occasion by giving the contest considerable support.

Several comments and suggestions were made regarding the rules and these will be discussed when the Committee considers the rules for the 1964 event.

Check logs from G3KAY, OK1KRM and OK1OO are gratefully acknowledged.

RESULTS

Posn.	Society	Call-sign	Points
§	Medway Amateur Transmitting Society	G2FJA/A	424
1	Gravesend Amateur Radio Society	G3GRS	415
2	Kingston and District Amateur Radio Society	G3KIN	384
3	Reigate Amateur Transmitting Society	G3REI	376
4	Crawley Amateur Radio Club	G3TR	367
‡	Stourbridge and District Amateur Radio Club	G6OI/A	362
‡	Midland Radio Contest Club	G3RSR	
‡*	Harlow and District Radio Society	G3ERN	359
*	City and Guilds College Radio Society	G5YC	350
*	Courtaulds Amateur Radio Group	G3CQD	349
5	Surrey Radio Contact Club	G2AJS	345
*	Sutton and Cheam Amateur Radio Society	G2XP	320
**	Sheffield Amateur Radio Club	G3RCM	317
6	Barnsley and District Amateur Radio Club	G2AFV	314
6	B.B.C. (Langham) Club	G3AYC	
8	Clifton Amateur Radio Society	G3GHN	313
‡	R.A.F. Amateur Radio Society	G8FC	310
†	Wolverton District Radio Club	G3LCS	308
‡	Torbay Amateur Radio Society	G3NJA/A	
‡	Radio Society of Harrow	G3EFX/A	306
9	Atomic Energy Research Establishment Amateur Radio Club	G3PIA	303
‡	Cornish Radio and Television Club	G3OCB	302
‡	The Standard Radio Club (Harlow)	G3NIS	293
10	Cheltenham and District Amateur Radio Society	G5BK/A	280
‡	Royal Signals Amateur Radio Society	G3CIO	276
‡	Acton, Brentford and Chiswick Amateur Radio Society	G3IIU	263
11	Purley and District Radio Club	G3OVL	248
12	Ainsdale Radio Club	G2CUZ	242
‡	South Shields and District Amateur Radio Society	G3DDI	231
13	B.B.C. Club (Bush House)	G3GDT	223
14	Albright and Wilson Amateur Radio Society	G3OXD/A	208
‡	Burnham-on-Sea Amateur Radio Club	G3NUK/A	200
15	Southport Radio Society	G3FJG/A	197
††	Stoke-on-Trent Amateur Radio Society	G3GBU	184
16	Edgware and District Radio Society	G3ASR	178
17	B.B.C. (Evesham) Club	G3PPG	165
18	B.O.A.C. Speedbird Radio Club	G3NAF/A	156
19	G.E.C.-Research Amateur Radio Society	G5FK	155
‡	East Kent Radio Society	G3LTY	147
‡	Pye Telecommunications Amateur Radio Group	G3PYE	142
20	Thanet Radio Society	G3DOE	137
21	Ravensbourne Amateur Radio Club	G3HEV/A	123
‡	Scarborough Amateur Radio Society	G4BP/A	90

* No club name on cover sheet.
** No cover sheet.
† Operators' names not shown on log.
†† No declaration.
‡ No operators' names on cover sheet.
§ General Rule 7.

144 Mc/s C.W. Contest 1963

PROPAGATION CONDITIONS were generally poor over the whole of the country during the 144 Mc/s C.W. Contest held on January 27, 1963. The weather was very bad and the combination resulted in a contest with less activity than normal. Despite this, however, it was generally agreed that it was an enjoyable event. It is encouraging to note that the number of entries again increased, several being received from stations in outlying parts of the British Isles. Owing to the poor conditions no exceptional contacts were made but many stations remarked on the benefits of c.w. under the adverse conditions.

As some stations again had difficulty with the scoring system the Contests Committee is attempting to redraft this rule and it is hoped that there will be no trouble next year.

The overall winner this year came from the Low Power Section: G. Eddowes, G3NOH, who operated portable from Okeford Hill in Dorset and scored a total of 1,580 points from 71 contacts. The leader of the High Power Section was G3OXD, the club station of Albright and Wilson, which was operated during the contest by G3OHC. G3OXD scored 1,410 points from 58 contacts.

G2UJ, G2DHV and G3ENY are thanked for their useful check logs.

HIGH POWER SECTION

Posn.	Call-sign	Points	Posn.	Call-sign	Points
1	G3OXD/A	1410	15	G5DS	855
2	G3LTF	1335	16	G3INU	825
3	G2JF	1333	17	GW8UH	775
4	G4LU	1321	18	G5YC	774
5	G3CCH	1230	19	G3JYP	750
6	G3EVV	1200	19	GW2HIY	750
7	GW3MFY	1195	21	G2AXI	705
8	G3HRH	1190	22	GI3OFT	590
8	G6GN	1190	23	G3CO	575
10	G3JXN	1150	24	G3HWR	555
11	G3KMT	1075	25	G2BHN	463
12	G3EDD	1063	26	G3AGN	450
13	G2XV	1035	27	G2BJY	417
14	G3NNK	900			

LOW POWER SECTION

Posn.	Call-sign	Points	Posn.	Call-sign	Points
1	G3NOH/P	1580	13	G6TS	478
2	G3IAS	1175	14	G3FIJ	475
3	G3NNG	1073	15	G2CPM/A *	460
4	G3BOC	995	16	G3GVV *	440
5	G4CM	875	17	G3JKY	403
6	G8KL	869	18	G3HXI	375
7	G2RD	860	19	G3JR	370
8	G5UM	820	20	G3LAS	350
9	G3FD	775	21	G3PAC/A	335
10	G3GVM/A	745	22	G3KWH	320
11	G3GKH	590	23	G3BJF	240
12	G3PWK	495	24	G3GRA	238

* *Multi-operator entry.*

R.S.G.B. 21/28 Mc/s Telephony Contest 1962

IN THE REPORT IN THE April issue of the BULLETIN, the call-sign of the station placed tenth in the Overseas Section should read 5H3IW. MP4BDC placed twelfth and K2UTC placed twenty-sixth in the same section are both certificate winners. The call-sign of the station placed eighteenth in the Home Section should read GM3NPR.

R.S.G.B. 1250 Mc/s Tests 1963

THE COUNCIL AND THE CONTESTS COMMITTEE hope that the eighth series of R.S.G.B. 1250 Mc/s Tests will again attract the support of u.h.f. workers. The Contests Committee would very much like to receive information on routine local contacts as well as reports on special contacts during the Tests.

The event will have few fixed rules, other than the duration, which will be from 17.00 G.M.T. on Saturday, June 22, to 22.00 G.M.T. on Sunday, June 23, 1963, and the provision that all entries must be from fully paid-up Corporate Members of the R.S.G.B. and accompanied by the declaration set out below. Entries will be accepted on behalf of individual stations or groups of stations and no limitation is placed on the number of operators or assistants. Entries from receiving stations will be welcome and will be eligible for the award.

The entries will be required to include details of stations heard or worked (with distances) and general observations on the band. A full description of all equipment used should be included and this information and any other evidence submitted of work carried out on the band will be taken into consideration when judging the event. The Contests Committee reserves the right to abstract information for the purpose of preparing a report on the Tests. The entrant submitting the best entry in the opinion of the judges may be recommended to the Council for the award of the *Arthur Watts Trophy*.

Entries must be addressed to the Contests Committee, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, and be postmarked not later than July 8, 1963. Entries must contain the following declaration.

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

Date..... Signed.....

R.S.G.B. 70 Mc/s Contest 1963

THE RULES FOR THIS YEAR'S 70 Mc/s Contest organized by the R.S.G.B. are enlarged to invite the submission of check logs from listeners.

The General Rules relating to R.S.G.B. Contests published in the January, 1963 issue of the R.S.G.B. BULLETIN will apply except as superseded by the rules of this Contest.

When: From 17.00 to 23.59 G.M.T. on **June 15** and from 07.00 to 19.00 G.M.T. on **June 16, 1963.**

Locations: Stations, fixed and portable, must be operated from the same site throughout the contest.

Eligible Entrants: Only fully paid-up Corporate Members of the R.S.G.B. resident in Europe. Multiple-operator entries will be accepted provided only one call-sign is used (see R.S.G.B. General Rules for Contests, Rule 7).

Contacts: The entrant may transmit only on his licensed frequencies between 70 and 73 Mc/s. Contacts may be made on A1, A3, A3a or F3.

Scoring: Will be on the basis of one point per mile.

Contest Exchanges: RST (RS) reports followed by the contact number (starting with 001) followed by the location (e.g. RST579001 5NE Oxford).

Entries: (a) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed. The N.G.R. of the site must be stated. The location transmitted for each contact must be given on the Cover Sheet. (This location must be identifiable on the Ordnance Survey 10 mile to the inch map.)

(b) Logs must be tabulated in columns headed (in this order) (i) Date/Time (G.M.T.); (ii) Call-sign of Station Worked; (iii) My report on his signals and serial number sent; (iv) His report on my signals and serial number received; (v) Location of station as received; (vi) Points Claimed.

(c) Entries must be postmarked not later than Monday, **July 1, 1963.**

Awards: At the discretion of the Council, a certificate of merit will be awarded to the winner and runner-up. A certificate of merit may also be awarded to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.

D/F Qualifying Events

DETAILS OF THE SLADE RADIO SOCIETY'S D/F qualifying event are as follows:

SLADE

Sunday, May 19, 1963

Organizers: Messrs. P. M. and G. M. Williams, 20 George Road, Water Orton, Nr. Birmingham.

Frequencies and Call-signs: To be announced at the start, at least 15 minutes before commencement of test.

Map: Ordnance Survey, Seventh Series, Sheet No. 120.

Assembly Point: Nr. Tomlinson's Corner, approximately 1½ miles W.S.W. of Draycott in the Clay. (N.G.R. 122277).

Assembly Time: 13.00 B.S.T.

Entries and Tea: Intending competitors should notify the organizers as soon as possible, stating the number in their party requiring tea.

B.E.R.U. Contest 1962

IN THE B.E.R.U. CONTEST, 1962, the results of which appeared in the September, 1962, issue of the BULLETIN, VP8GQ on Signy Island, South Orkneys, made a claimed score of 2365 points. Unfortunately VP8GQ's entry, although posted on March 27, 1962, did not reach Headquarters until January 29, 1963.

Second 420 Mc/s Contest 1962

IN THE REPORT of the Second 420 Mc/s Contest in the February, 1963, issue of the BULLETIN the number of stations worked by G3JMA placed second should have been given as 52.

Can You Help?

● D. W. J. Haylock (G3ADZ), 3 Norris Gardens, Warblington, Havant, Hants., who urgently requires the circuit and/or full operating details of the Power Supply Unit type 870 (Reference No. 10K/16127)?

CONTESTS DIARY

May 4–5	PACC (phone).
May 4–5	U.S.S.R. DX (c.w.) Contest.
May 5	First 144 Mc/s Portable Contest.* (For details, see page 498, March 1963).
May 11–12	OZ-CCA (c.w.)
May 12	D/F Qualifying Event (Rugby). (For details, see page 558.)
May 18–19	OZ-CCA (phone).
May 19	D/F Qualifying Event (Slade).
May 26	First 420 Mc/s Contest.* (For details, see page 498, March 1963.)
June 1–3	CHC/HTH QSO Party.
June 8–9	National Field Day. (For rules, see page 308, December, 1962.)
June 15–16	70 Mc/s Contest.
June 22–23	1250 Mc/s Tests.
June 23	D/F Qualifying Event (South Manchester).
June 30	D/F Qualifying Event (Derby).

July 6-7	—	Second 144 Mc/s Portable Contest.*
July 21	—	D/F Qualifying Event.
August 11	—	D/F Qualifying Event (Newbury).
September 7-8	—	V.H.F. National Field Day (For rules, see page 373, January 1963).
September 15	—	D/F National Final.
September 22	—	Low Power Field Day.
October 6	—	R.A.E.N. Rally.
October 19-20	—	7 Mc/s DX Contest (phone).
October 27	—	Second 420 Mc/s Contest.
November 2-3	—	7 Mc/s DX Contest (c.w.).
November 9-10	—	Second 1·8 Mc/s Contest.
November 16-17		R.S.G.B. 21/28 Mc/s Telephony Contests.

* *To coincide with Region I I.A.R.U. Contest dates.*

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' Fund

DEAR SIR,—We have pleasure in enclosing a second contribution from the Radio Society of Harrow towards the Headquarters' Building Fund. You will note with regret that this is less than previously and this is for a very good reason. We are not hard up, in fact the club is flourishing as never before, but there is a growing dissatisfaction with the way this important matter is being handled.

At a recent ordinary meeting, in the presence of fifty members, the committee asked three questions:

(i) Who has not heard of the Building Fund: nine members admitted they had not!
(ii) Are you satisfied with the way this appeal is being conducted: only *one* hand was raised!
(iii) Are you in favour of a further contribution: only nineteen so voted!

Now what is the reason for this state of affairs? We do not believe this is due to apathy among club members. We draw our membership from a large area of North West London, and most are keen enough to travel many miles to meet weekly at our headquarters. No, we believe as a result of discussions with many members of long standing that the trouble is due to two things. Firstly, lack of a target, and, secondly, lack of a properly conducted campaign towards a target. No one seems to be clear about what the money is wanted for, or how much we need. No one is sure whether it will be spent wisely or to the best advantage of the membership as a whole.

As for a "campaign," well, the trifling amount of space devoted to this in the BULLETIN is shameful, and as for the list of names of recent contributors, quite probably this puts people off! When we compare our efforts with those of the A.R.R.L. who have just the same problem, it makes one wonder if we really want the money!

Well, you don't want carping criticism, you want suggestions; here are a few:

(i) State the current policy clearly and often.
(ii) Give up-to-date information about its implementation.
(iii) Conduct a vigorous campaign to raise the money in the following ways:
  (a) Use a progress ladder monthly in the BULLETIN.
  (b) Give a graph of progress to date.
  (c) Report progress in the Weekly News Bulletin.
  (d) Encourage a bit of competition between the regions (on a *per capita* basis?).
  (e) Get an argument going in the correspondence columns—perhaps this will start one!
  (f) Get promises of *regular* contributions—say by bankers' order.
  (g) Enlist the aid of the clubs to provide collection boxes, and to publicise the campaign by giving Messrs. Stevens and Levi opportunity to address the members.
  (h) Appeal to the members for better ideas than these.

Yours faithfully,
B. HUMMERSTONE, G3HBR, *Chairman*
R. C. RAY, G2TA, *Hon. Treasurer*
A. C. W. BIDDELL, G3GNM, *Hon. Secretary*
C. D. BARR (G3PFO), D. NAPPIN (G3MLS), P. HANDOVER (G3PUK), F. I. R. HUNT (G3LNQ) and A. L. MYNETT (G3HBW), *Members of Committee.*
Radio Society of Harrow.

R.A.E. Supplement

DEAR SIR,—It is with pleasure that I note the valuable supplement of R.A.E. model answers in the March issue of the BULLETIN. With the *Examination Manual* issued by the Society and R.A.E. course facilities offered all over the country by technical institutions, often at considerable expense to the authority concerned, surely every facility is now offered to those who wish to obtain a licence to transmit.

It is to be hoped that every advantage will be made of these efforts to help beginners by more experienced members and that some of the present nominal penalties imposed for unlicensed operation, often obtained after considerable expense of public money to obtain the conviction, should be made more realistic.

Yours faithfully,
R. E. GRIFFIN, M.I.E.E.E. (G5UH)
Bristol.

"A Modern Instrument Knob"

DEAR SIR,—The difficulty of drilling a hole for the spindle in the home-made instrument knob described by your contributor (G3GOG, R.S.G.B. BULLETIN April, 1963) may be eliminated entirely by forming the ¼ in. hole during the filling process. This is easily done by inserting a ¼ in. spindle into the liquid Araldite, the spindle being smeared with a silicone grease (Midland Silicones Ltd.) which enables the spindle to be withdrawn easily after the filler has hardened. The grease is unaffected by the filler and by the rise in temperature which usually occurs after adding the hardener. A jig will be necessary to hold the spindle in place and this could be constructed in a similar manner to that described by G3GOG using wood for the top portion.

Silicone grease is also useful for lining moulds for the potting of components and circuits in Araldite, the hardened block being easily removed. I have used moulds made of copper sheet for the encapsulation of small transformers with great success, the inside of the mould being lined with silicone grease before pouring in the filler.

Yours faithfully,
R. S. CHRISTIAN (G3GKS)
Liverpool 16.

The Rovan Project

DEAR SIR,—During a recent lecture tour of Iran, Raymond A. Cook, W4JOH, a professor at an American University, was appalled by the suffering caused by the earthquake disaster of several months ago.

As a result of what he saw in Rovan (a village near Teheran), where there are only 33 survivors, W4JOH has launched an appeal for donations from radio amateurs throughout the world to help this small community.

I am sending donations for the Rovan Project, as it is now known, direct to EP2AC and shall be pleased to forward any received from R.S.G.B. members.

Yours faithfully,
HAROLD E. PERKINS (G3NMH)
6 Haven Close, Stratton St. Margaret,
Swindon, Wiltshire.

Help Wanted

DEAR SIR,—In response to Basil Tait's, G3DDN, letter in last month's "BULL" which raises again the question about helping to forward our movement amongst young people, I think a number of points arise. One is that many amateur radio clubs appear to have a number of boys in the membership looking for guidance, but I have found some evidence that they are not too popular with a few of the older members, and not a great deal can be especially organized for them. An answer would be to find a keen responsible leader for them, who is active in the group. Perhaps we ought to encourage such members to attend a short course in Youth Leadership. This could be organized for a weekend, and might include representatives from many areas and clubs. This might help to overcome the critics who were heard at a meeting decrying the manners of the young operators on the air. We have an answer surely—train them!

In East London there has existed for some years a Boy's Club founded on Amateur Radio. Very successful camps have been held, and R.A.E. work is carried out. I must add, however, that help from all sources is required for this sort of thing. I only wish I could find other people and other organizations keen to support this kind of work.

The N.A.B.C. has not really shown much interest, I must admit, but their advice would be most useful.

I have often wondered where R.S.G.B. stands regarding work with young people: perhaps a committee for youth activities, or education should exist, as it does in our contemporary, the British Astronomical Association.

I feel it's time for some views to be expressed on this matter.

Your sincerely.
KENNETH L. SMITH, B.SC. (G3JIX)
Walthamstow, London.

DEAR SIR,—May I enquire through your columns whether there is any radio amateur who would be prepared to help this squadron in the setting up of an Amateur Radio section?

The squadron meets in Southwark on Monday and Thursday evenings, and if a local amateur would be prepared to give, say, two evenings a month the cadets would be enthusiastically grateful. We already have an amateur-band receiver and one or two other bits of equipment and more can be obtained if and when required.

The writer, who lives at Weybridge, is unfortunately unable to take this job on himself, but any amateur who is interested is promised plenty of support, and will have the satisfaction of doing an interesting and worthwhile job for these young cadets.

Yours faithfully,
DAVID ROWSE (G3LOD) *Hon. Secretary*,
409 (Bermondsey & Southwark) Squadron Air Training Corps.
98/120 Southwark Bridge Road, London, S.E.1.

"Getting Going on Bottom Band"

DEAR SIR,—I should like to point out to Mr. Smith that the government developed and used a solar powered "Bottom Band" transmitter for daylight QSOs. These transmitters were relatively high powered but any member wishing to build a solar powered transmitter should enquire regarding the maximum permissible input power. I have not made any enquiries myself but since this band is a shared allocation care should be exercised to avoid interference to other services.

Regarding receivers, G3MTI's three stage pre-amplifier may not find universal favour. The vast majority of "Bottom Band" receivers are equipped with two front-ends connected in parallel. On many receivers trouble may be experienced with the automatic blanking system which is designed to blank off the unused channel so may I suggest to intending operators that they employ a variably tuned pre-amplifier designed for twin-channel operation. These are readily obtainable on the surplus market, usually ex-Admiralty.

Yours faithfully,
C. J. de L. Brown-Greaves (G3NOL)
Catterick Camp, Yorks.

(*Caution:* The solar power transmitter can generate dangerously high temperatures if incorrectly adjusted, especially on midsummer's day.)

DEAR SIR,—I should like to suggest to G3MTI that solar QRM need not disrupt his use of Bottom Band if the QRM itself is used as a carrier. He may object that this would require separate transmitters for day and night use, but while this is perfectly true the daytime transmitter can be easily and cheaply made up from bits and pieces from the junk box and dressing table. Army manuals of the time of the Boer War, when such transmitters were first used, may be consulted for constructional and procedural details.

Yours faithfully,
M. A. BUTCHART (G3LWC)
Debenham, Stowmarket, Suffolk.

DEAR SIR,—During the war *QST* ran a very interesting series on speech transmission by a modulated light beam, and another on using mains wiring for v.l.f. propagation. Security considerations may prevent a full disclosure of the potentialities of the system described by G3MTI, but it is well worth investigating.

For the cavity a standard beer can gives excellent results. Two holes $\frac{1}{8}$ in. diameter, drilled in one end with a centre to centre spacing of 1·97 in. will help to produce a steady oscillation. It may be necessary to try several cans before satisfactory results are achieved.

Although the article is non technical the simple mathematics of the circuit will repay study, and the following formula will give some interesting results:

$$f = K \frac{T \omega \delta}{log \sqrt{-1} \sim \varphi}$$

where f = frequency in Gc/s
T = temperature of cavity in degrees Centigrade, reduced to absolute zero (-273°)
ω = angular velocity in radians/sec
δ = logarithmic decrement expressed as a function
K = variable constant.

The hula hoop aerial described in *Technical Topics* appears to offer similar opportunity for developments by the Technical Committee. A series of such aerials, erected concentrically would give an all band antenna with polarization in ever decreasing circles.

Yours faithfully,
A. STUART MCNICOL (GM3UU)
Aberdeen.

DEAR SIR,—The writer of the article on "Bottom Band" (R.S.G.B. BULLETIN, April, 1963) may be interested to know that I have been working mobile on this band for many years now, my car being fitted with no less than fourteen transmitters of the type he describes. These have various power inputs and filters and may be controlled by simple on-off switches although four of them are driven by a thermal modulator running at about 1 c/s. I would agree with his remarks concerning attentuation of signals in atmosphere of high moisture content and would suggest he tries using an amber filter under these conditions.

Yours faithfully,
R. G. CHRISTIAN (G3GKS)
Liverpool 16.

The Zener Diode Transmitter

DEAR SIR,—May I say how pleased I am to see that the "BULL" is still leading us ahead with modern circuitry. I especially refer to the transistorized and dioded mobile transmitter described by Mr C. R. Plant in the March issue. Many members will by now have quickly got this gadget going, and I am happy to offer a couple of slight modifications to the original.

The 50 K ohms resistor passes quite heavy current, especially if the p.a. is paralleled, and this resistor should be replaced with a hot plate from the domestic cooker; when used mobile, this is an excellent substitute for a spirit stove. The 5 milliameter should be shunted with a 100 watt soldering iron, so that experiments can be continued in the field.

Incidentally, as the output has very square waves, it is possible to transmit on v.h.f. at the same time as l.f.—very cunning indeed.

I look forward to hearing other member's experiences.

Yours very sincerely,
W. S. SMITH (G3HHZ)
Cirencester, Glos.

N.F.D. Experience

DEAR SIR,—With regard to obtaining contest experience I can thoroughly recommend the attitude of Derby and District A.R.S. to N.F.D.

G3HIS and I, being rather isolated and members of no local group, were permitted by Derby to attend their festivities last June. They made us very welcome. They asked no questions about our key proficiency. They asked only, "Would you like a crack?" We had one and enjoyed it as much as each member of that society seemed to enjoy it, be he key-worthy, tea-worthy or just plain observer.

The morale of the society is very high and their position in the results table shows no lack of desire to win if possible.

There may be something in Southgates' problem (March BULLETIN) but Derby have solved it. In the words of their secretary last year, "We're here to enjoy this day out. We shall try to win, incidently."

Yours faithfully,
D. J. DEAN (G3JSK)
Uttoxeter.

Is "Bulletin" Outmoded?

DEAR SIR,—Now that the Society's journal has been enlarged to at least 64 pages every month and the subject coverage increased, it seems to me that the title BULLETIN is more than ever unsuitable.

The word "bulletin" means "a short official report or statement on the progress of some activity or invalid's condition" and is often used to describe a trade handout. May I suggest, therefore, that a more appropriate title be adopted which more realistically covers the journal's purpose?

Perhaps other members would like to express their views on this rather important matter.

Yours faithfully,
G. R. JESSOP (G6JP)
Eastcote, Pinner, Middlesex.

(The Council has given long and careful consideration to the

(Continued on page 631)

Regional and Club News

Barnet Radio Club.—The lecture by Ray Hills (G3HRH) at the March meeting, a " Survey of V.H.F. During the Past Decade," proved to be very interesting, although attendance was low owing to illness. On April 30, Stan Chrees (G3DZW) gave a talk on "Home Constructed S.S.B. Gear." At the time of going to press, full details concerning the May 28 meeting were not available, although a Junk Sale will definitely be held, and possibly a film show. *Hon. Secretary:* F. E. A. Green (G3GMY), 48 Borough Way, Potters Bar, Middlesex.

Blackpool and Fylde Amateur Radio Society.—The new officials, elected at the A.G.M. in February, are as follows: *Chairman:* D. Taylor (G3OPT); *Vice-Chairman:* H. Fenton (G8GG); *Hon. Secretary:* J. Boulter (G3OCX), 175 West Drive, Cleveleys, Blackpool; *Hon. Treasurer:* L. Beevers (G3JLF); *Committee Members:* R. Cavill (G3AOI), H. G. Newland (G5ND), and P. McCurrie. A programme of lectures and visits to local places of interest are being arranged. All interested are welcome to attend the meetings held every Monday evening.

Bristol Group.—Equipment constructed by local members was exhibited and described to a gathering of 33 members and visitors at the meeting on March 22 at the Royal Fort, University of Bristol. The contributors of what must have comprised an impressive array of apparatus were G3CHW, G5UH, A.1437, G3IFV and G3RQ. *Hon. Secretary:* E. C. Halliday (G3JMY), 4 Parkside Avenue, Winterbourne, Bristol.

Cambridge and District Amateur Radio Club.—At the A.G.M. held on March 15, the following officers were elected: *President:* S. J. Granfield (G5BQ); *Chairman:* F. A. E. Porter (G2CDX); *Hon. Secretary:* H. L. Lowe (G3PEI), 34A Verulam Way, Cambridge; *Hon. Treasurer:* J. B. Foster (G3IIT); *Committee Members:* J. N. Carter (G3OWB), M. T. Dilley, D. C. Free (G3NBP), L. D. Rooks (G3PUO), F. C. D. Taylor (G3RFP), A. W. Tomalin (G3PTB), and E. Warner (G3PTK). The " Granfield " Trophy was presented to Arnold Tomalin, in recognition of his outstanding services to Amateur Radio.

Clifton Amateur Radio Society.—The subject of the lecture given at the meeting on March 15 was " Transistor Transmitters," by M. V. Bond (G3NWF), who also displayed his 7 and 27 Mc/s transmitters, the latter being designed for radio-control. The Members' All-Band Contest brought ten entries, seven being from transmitting amateurs. R. Dilworth (G3NWD) and C. Jenner (S.W.L.) were the winners. *Hon. Secretary:* C. E. Godsmark (G3IWL), 211 Manwood Road, London, S.E.4.

Cray Valley Radio Society.—At the A.G.M. held on March 7, a new committee was elected: *Chairman:* W. Green (G3FBA); *Hon. Secretary:* S. W. Coursey (G3JJC), 49 Dulverton Road, London, S.E.9; *Hon. Treasurer:* N. B. Reeves (B.R.S. 23199); *Committee Members:* D. Owen (G3MCA), and S. Harrison (G3KYU). The meeting concluded with a talk and demonstration by D. R. Bowman (G3LUB) on his home-constructed G2DAF communications receiver. Meetings continue to be held on the first Thursday in each month, and visitors are welcome to attend.

Crystal Palace and District Radio Society.—The society triumphantly won the first round of the inter-club quiz contest when they competed with Clifton on March 23. The team consisted of G3IWA, G3OJE, G3GWD and S. Yeomanson. On May 18 there will be a lecture on " Sound Broadcasting Techniques " by J. Bennet (G3FWA); a sale of surplus gear will take place on June 15. Meetings begin at 8 p.m. and are held at the Civil Defence Training Centre, Bromley Road, Catford. *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, London, S.E.23.

East London Group.—At the March meeting, R. Waldron of the M.O. Valve Co. spoke on " Valve Applications." The majority of the lecture was confined to the discussion of transmitting valves, and the best methods of using the popular types to best advantage. *District Representative:* M. McBrayne (G3KGU), 25 Purlieu Way, Theydon Bois, Essex.

East Worcestershire Group.—Regular meetings, which began with a " Junk Sale " on April 11 to help the group's funds, are being arranged by the recently elected committee. The meetings are to be held on the second Thursday in each month. Further information is available from L. Hickingbotham (G3HZG), 95 Oakenshaw Road, Redditch, Worcs.

English Electric (Stafford) Radio and Electronics Society.—Although only recently formed, the society already boasts 30 members. Suitable premises have been found for a workshop and station, for which a transmitter and receiver have already been acquired. Lectures, demonstrations, visits and discussions are being arranged, which should make the future meetings at the premises of the English Electric Social and Athletic Association, Stafford, worth a visit. *Hon. Secretary:* K. B. B. Cunningham (G3PBW), c/o The English Electric Co. Ltd., Stafford.

Halifax and District Amateur Radio Society.—This year's annual dinner took the form of a running buffet on April 2 and was attended by eight local amateurs and a considerable number of short wave listeners. The future programme will comprise a lecture on a " 160m Transmitter," by M. G. Whittaker (G3IGW) on June 4, and a talk given by J. Ingham (G3RMQ) concerning his " First Six Months on the Air." The meetings continue to be held in the Beehive and Crosskeys Inn at 7.30 p.m.

Newbury and District Amateur Radio Society.—At the A.G.M. on March 29 the following officers were elected: *Chairman:* W. B. Mansell (G2CPM); *Vice-Chairman:* J. A. Gale (G3LLK); *Hon. Secretary:* W. C. Povey (G3MWB), 35 Valley Road, Newbury, Berkshire; *Hon. Treasurer:* E. Reynolds; *Committee Members:* R. H. Bates (G3OJF), R. Fuller (A.2521), H. Newland, S. J. Dawson (G3JPS), and L. Northway (G3OTT).

Northern Heights Amateur Radio Society.—A junk sale and a talk on " Radio Astronomy " by W. Dougherty of the Halifax Technical College were among the subjects at recent meetings. Forthcoming meetings include a " Ragchew " on May 22; " Any Questions? " on June 5. A visit to the Emly Moor TV Station has been arranged for June 6. *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Pontypool Amateur Radio Club.—The club is now licensed with the call-sign, GW3RNH, which is used regularly at the weekly meetings. Plans are well advanced for N.F.D. and the V.H.F. Field Day, but the help of more operators would be appreciated. *Hon. Secretary:* J. S. Hammond (GW3JBH), " Amberley," 23 Park End, Langstone, nr. Newport, Mon.

Reigate Amateur Transmitting Society.—The talk given at the March meeting by T. Withers (G3HGE) on his 2m equipment proved to be very informative. The May meeting will be devoted entirely to arrangements for N.F.D. The Reigate Borough Council is sponsoring the printing of a special QSL card for use by G3REI in connection with the borough's Centenary Year. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill, Surrey.

Royal Naval Amateur Radio Society.—Membership is open to serving or past members of, or those who have been connected

At the Thanet Radio Society's Dinner-Dance on March 23, 1963: (left to right) Norman Cramp (Chairman), G2AIW, F2XO (Nancy), ON4TJ and XYL, G2IC (President), F2XO (Jean), Mrs. Cramp, Mrs. G. A. Chapman. The call-sign F2XO is held jointly by Jean and Nancy Lambert.

(Photo by Ron Townsend)

with the Royal Navy, Royal Marines, Women's Royal Naval Service, Reserves or Commonwealth Navies. Further details may be obtained from G3BZU, or from the *Hon. Secretary:* R.N.A.R.S., H.M.S. *Mercury*, Leydene, Petersfield, Hampshire.

Slade Radio Society.—Interest in direction-finding is growing amongst members and an introductory contest was held recently. Although apparently a simple one, G3HKC located the station in less than an hour and all participants obviously enjoyed themselves. In view of this, a further contest is being arranged for May 17. Further details are available from the *Hon. Secretary:* D. D. S. Williams, 117 The Boulevard, Wylde Green, Sutton Coldfield.

South Birmingham Radio Society.—J. A. Ashton, 103 Monica Road, Small Heath, Birmingham, 10, has been appointed Hon. Secretary of the Society.

Stamford and District.—A regular net is held on 28·2 Mc/s at 11.30 a.m. clock time on Sundays, those participating being G2HOP, G3ARS, G3HES, G3KWC, G3JUZ, G3OJQ, G3OKB, and G3FUR. The operators would welcome reception reports.

Stourbridge and District Amateur Radio Society.—The April meeting was well attended, and members heard a talk by I. T. Cashmore (G3BMY) on "Common Transmitter Faults." The principal item on May 7 will be an R.S.G.B. recorded talk, with slides, on "Semiconductors." Visitors will be most welcome. An R.A.E. course is being arranged for next autumn. *Hon. Secretary:* R. A. G. MacIntosh (B.R.S.20894), 50 Field Lane, Oldswinford, Stourbridge.

Surrey Radio Contact Club.—The 22nd A.G.M. was held on April 9, but no details were available when this issue went to press. Members attending the Club Constructional Contest at the Blacksmiths Arms, South End, Croydon, on May 14, will be called upon to vote for the winner of the Dave Deacon Coronation Year Committee Cup. *Hon. Secretary:* S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, South Croydon, Surrey.

Thames Valley Amateur Radio Transmitters Society.—"Dud" Charman, B.E.M. (G6CJ) gave his famous talk on "Aerials" at the April meeting. "Dud" presented the lecture in his own inimitable style. On May 8 there will be a talk on "Radio Frequency Measurements," by K. A. Fletcher, of Wayne Kerr Ltd.

Thanet Radio Society.—The San Clu Hotel, Ramsgate was again chosen for the 16th Annual Dinner and Dance on March 23, at which there was a record attendance of 98. Those present included F. G. Lambeth (G2AIW), Norman Mattock (G2DFG) (Region 8 Representative), Jean and Nancy Lambert (F2XO) and George Thys (ON4TJ). A large number of prizes from Holland were given away during the evening, and B. Hawthorne (G3MCS) received a special prize for contacting the largest number of PA0s.

Torbay Amateur Radio Society.—The March meeting, presided over by W. B. Sydenham (G5SY), attracted an attendance of nearly 30 members. The Chairman, E. J. Hayman (G3ABU), gave an illustrated talk on "The Theory and Development of Transmitting Aerials for the Radio Amateur." Preparations for N.F.D. will be discussed at the May meeting. The A.G.M. was held in April, and the following were elected: *President:* W. B. Sydenham, B.Sc. (G5SY); *Chairman:* E. J. Hayman (G3ABU); *Hon. Treasurer:* H. E. Cockrem (G3ZC); *Hon. Auditor:* A. Bullock (G3IEA); *Committee Members:* D. Webber (G3LHJ), D. Morris (G3REW), R. Western and F. Bolton. *Hon. Secretary:* Mrs. Gee Western G3NQD), 118 Salisbury Avenue, Barton, Torquay.

Welwyn Garden City.—A piece of v.h.f. equipment has again won its builder the "G3EPK Challenge Trophy," awarded annually in the Group's Constructors' competition. Last year G3INU of Stevenage won it with an all-transistor transmitter, and this year Ray Hills (G3HRH) was awarded pride of place by the judges for his complete receiving system for 144 Mc/s. Runner-up was John Kirby (G3JYG), with a G2DAF transmitter and receiver.

Wolverhampton Amateur Radio Society.—The future programme includes a lecture at 8 p.m. on May 6 dealing with "Advice on R.A.E. to Junior Members," coupled with talks by various senior members on "How I started in Amateur Radio." The May 20 meeting will be devoted to a Home-built Gear Competition and Best Lecture Ballot (1962). This year's Annual Dinner will be at the Black Hoss Hotel. Tickets will cost 14s. each. *Hon. Secretary:* J. Rickwood (G3JJR), 738 Stafford Road, Fordhouses, Wolverhampton.

Ray Hills, G3HRH, winner of the Welwyn Garden City Group's G3EPK Challenge Trophy, with the judges, John Galvin (centre) and Peter Kidd, G6FL.

CLOSING DATE FOR JULY ISSUE
JUNE 8

FOR THE AMATEUR STATION

WEBB'S RADIO LOG BOOK. Inexpensive paper-backed log book conforming with G.P.O. requirements. **Price 6s. post paid.**

QRA LOCATOR MAP. Outline map of the British Isles superimposed with the QRA Locator grid. **Price 2s. 6d. post paid in stout tube.**

R.S.G.B. COUNTRIES LIST. Duplicated list of call-sign prefixes in alphabetical order. Also contains list of call areas in each of the 40 Zones. **Price 9d. post paid.**

PANEL-SIGNS. Transfers for neatly lettering home-built equipment. Set No. 1 for receivers and amplifiers, Set No. 2 for test equipment, Set No. 3 (white lettering) for receivers, amplifiers, transmitters, test equipment, Set No. 4 as Set No. 3 but black lettering. Published by Data Publications Ltd. **Price 4s. per set post paid. R.S.G.B. Publications (Dept. B) 28 Little Russell Street, London, W.C.1.**

LONDON S.S.B. DINNER

Waldorf Hotel, Aldwych, London

Saturday, May 11, 1963

3.30 p.m. Informal Get-together
Display of Equipment

6.45 p.m. Dinner, followed by Dancing and Cabaret

Raffle for K.W.77 receiver and HX50 transmitter.

Tickets, price £2 10s. from N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.

Organized by J. A. Steele, G3KZI, and N. A. S. Fitch G3FPK.

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the first 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.

REGION 1

Ainsdale (A.R.S.).—May 16, 30, June 14, 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Mondays, 8 p.m., Pontins Holiday Camp, Squires Gate.
Bury (B.R.S.).—May 14 (Tape Recorded Lecture), June 11 (Annual Junk Sale), 8 p.m., Knowsley Hotel, Kay Gardens,
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Eccles (E. & D.R.C.).—Tuesdays, 8 p.m., The Congregational Mission Church, King Street.
Liverpool (L. & D.A.R.S.).—Thursdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Childwall.
Macclesfield —May 14, 28, June 11, 42 Jordongate.
Manchester (M. & D.A.R.S.).—Wednesdays, 7.30 p.m., 203 Droylsden Road, Newton Heath, Manchester 10. **(S.M.R.C.).**—Fridays, 7.45 p.m., Rackhouse Community Centre, "Rackhouse," Daine Avenue, Northenden.
Morecambe.—June 5, July 3, 125 Regent Road.
Preston.—May 14 ("General Receiver Construction" by N. Horrocks, G2CUZ), May 28 ("On the Air"), June 11, St. Paul's School, Pole Street. (All meetings start with a Morse practice at 7.30 p.m.)
Southport (S.R.S.).—Wednesdays, 8.30 p.m., Sea Cadets' Camp, The Esplanade.
Stockport.—May 8, 22, June 5, 19, 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral.—May 15 ("Radio Mathematics" by G3EGX), May 22 ("N.F.D. Meeting"), June 5 (Open Meeting), June 19 (N.F.D. Inquest), 7.45 p.m., Harding House, Park Road West, Claughton.

REGION 2

Barnsley.—May 24 (Visit to Power Station), June 14 (TV Lecture by Harry Green), 7.30 p.m., King George Hotel, Peel Street.
Catterick Camp.—Tuesdays and Thursdays, 7.30 p.m., The Club Room, Vimy Road.
Halifax.—May 7 ("Working Mobile," by G3LHQ), June 4 ("160m Transmitter" by G3IGW), 7.30 p.m., Beehive and Cross Keys Inn.
(Northern Heights A.R.S.).—May 8 (Visit to Manchester Radio Society), May 22 (Ragchew), 7.30 p.m., Sportsman Inn, Ogden.
Heckmondwike (Spen Valley A.R.S.).—May 16 ("Guided Missiles" by M. A. Browne, F.R.A.S.), 7.15 p.m., Grammar School, Heckmondwike. May 30, Visit to Baird Television, Lidgett Green, Bradford.
Scarborough.—Thursdays, 7.30 p.m., Chapman's Yard, North Street.

REGION 3

Birmingham (M.A.R.S.).—May 21, 7.30 p.m. ("Hi-fi Reproduction" by F. B. Griffin), Midland Institute, Paradise Street, Birmingham. **(Slade).**—May 10, 24, 7.45 p.m., The Church House, High Street, Erdington.
Coventry (C.A.R.S.).—Mondays, 8 p.m., Willenhall Scout H.Q., Little Farm Buildings, Littlethorpe, St. James' Lane, Willenhall, Coventry.
Cannock (C.C.A.R.S.).—May 2, June 6, 7.30 p.m., "Tavern," Bridgetown.
Lichfield.—May 6, 21, 7.30 p.m., Swann Inn, Lichfield.
Stourbridge (S.T.A.R.S.).—May 7 (Tape Recorded Talk), May 28, 7.45 p.m., Foley College, Stourbridge.
Sutton Coldfield (S.C.R.S.).—May 9, 23, 7.30 p.m., 92 The Parade, Sutton Coldfield.
Wolverhampton (W.A.R.S.).—May 6 (Advice on R.A.E.), May 20 (Home-built Gear and Best Lecture Competitions), 8 p.m., Neachells Cottage, Stockwell End, Tettenhall. May 27, Annual Dinner at "The Black Horse," Thompson Avenue, Wolverhampton.

REGION 4

Burton-on-Trent (A.R.S.).—First Wednesday in each month (R.A.E. Lecture), Wednesdays, 7.30 p.m., Club Rooms, Stapenhill Institute, Burton-on-Trent.
Chesterfield (C. & D.A.R.S.).—May 8, June 12, 7.30 p.m., Newbold Observatory, Newbold Road, Chesterfield.
Derby (D. & D.A.R.S.).—May 8 ("Safety in the Shack"), May 15 ("First Aid"), May 22 ("Fire Risks and Protection"), May 29 (D/F Practice Run), June 5 (Surplus Sale), 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W. Exp. Soc.).**—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Club Rooms, Nunsfield House, Boulton Lane, Alvaston, Derby.
Grantham (G. & D.A.R.S.).—Mondays, 7.30 p.m., Club Rooms, rear of "Manners Arms," London Road, Grantham.
Grimsby (G. & D.A.R.S.).—May 7, May 21, June 4, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Leicester (L.R.S.).—May 6 (Tape Lecture on "Aerials" by F. J. H. Charman, G6CJ), May 13, May 20 (Mystery Night), May 27, 7.30 p.m., Club Rooms, Old Hall Farm, Braunstone, Leicester.
Loughborough (A.R.S.).—Fridays, 7.30 p.m., Corporation Hotel, Wharncliffe Road, Loughborough.
Lincoln (L.S.W.C.).—First Wednesday in each month, 7.30 p.m., Lincoln Technical College, Cathedral Street, Lincoln.
Melton Mowbray (A.R.C.).—May 18 ("Wired Television" by L. Root), 7.30 p.m., St. John Ambulance Hall, Asfordby Hill, Melton Mowbray.
Mansfield (M.R.C.).—Fridays, 7.30 p.m., "Hope and Anchor," Union Street, Mansfield.
Nottingham (A.R.C.N.).—Tuesdays (R.A.E. Lecture), Thursdays (Lecture), Room No. 3, Sherwood 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.).—May 3 ("Receivers"), 7.30 p.m., Room No. 14, Peterborough Technical College, Eastfield Road, Peterborough.
Retford & Worksop (N.N.A.R.C.).—Tuesdays (Beginners), Thursdays (Informal), 7.30 p.m., Club Rooms, Victoria Institute, Eastgate, Worksop, Notts.

REGION 5

Cambridge (C. & D.A.R.C.).—Fridays, 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge.
March (M. & D.R.A.S.).—Tuesdays, 7.30 p.m., Police Headquarters, High Street.
Shefford (S. & D.A.R.S.).—May 9 (N.F.D. discussion followed by Junk Sale), May 16 (Talk by W. Bigley, G2AUA), May 23 (N.F.D. procedure and discussion), Digswell House, Shefford (No meeting on May 30).

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
High Wycombe (C.A.R.C.).—Last Thursday in each month, 8 p.m., British Legion, St. Mary Street, High Wycombe, May 30, Lecture on "The National Grid" by Mr. Shelley of C.E.G.B.

LONDON MEMBERS' LUNCHEON CLUB

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REGION 7

Acton, Brentford & Chiswick (A.B.C.R.C.).—May 21 ("Field Day Briefing"), 7.30 p.m., A.E.U. Club, 66 High Road, Chiswick.
Bexleyheath (N.K.R.S.).—May 9, 23, Congregational Hall, Chapel Road, Bexleyheath.
Barnet (B.R.C.).—May 28, 8 p.m., Red Lion Hotel, Barnet.
Croydon (S.R.C.C.).—May 10, 7.30 p.m., "Blacksmiths Arms," South End, Croydon.
Dorking (D. & D.R.S.).—May 14, 28, 8 p.m., "Wheatsheaf," Dorking.
East Ham —Tuesdays fortnightly, 8 p.m., 12 Leigh Road, East Ham, E.6.
East Molesey (T.V.A.R.T.S.).—May 8 ("Radio Frequency Measurements" by K. A. Fletcher, Wayne Kerr Ltd.), June 5 (Meeting on N.F.D.), 8 p.m., Carnarvon Castle Hotel, Hampton Court.
Edgware & Hendon (E. & D.R.S.).—May 27 (G2AOX on "Oscar"), 8 p.m., John Keble Hall, Church Close, Deans Lane, Edgware.
Enfield —May 21 (Junk Sale and Final N.F.D. Plans), George Spicer School, Southbury Road, Enfield.
Gravesend (G.R.S.).—Thursdays, 7.30 p.m., R.A.F.A. Club, 17 Overcliffe, Gravesend.
Harlow —Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Harlow (S.R.C.).—Wednesdays, 7 p.m. S.T.C. Rectifier Division, Edinburgh Way, Harlow.
Harrow (R.S.H.).—Fridays, 8 p.m., Roxeth Manor County School, Eastcote Lane, Harrow.
Holloway (G.R.S.).—Mondays and Wednesdays (R.A.E. and Morse), 7 p.m., Fridays (Club), 7.30 p.m., Montem School, Hornsey Road, N.7.
Hounslow (H.A.D.R.C.).—Mondays, 7.30 p.m., Isleworth Town Hall, Twickenham Road, Hounslow.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (near Seven Kings Station).
Kingston.—Alternate Thursdays (Lectures), 8 p.m., Y.M.C.A., Eden Street, Kingston. (Morse Classes weekly at 2 Sunray Avenue, Tolworth).
Loughton.—May 17, 31, 7.30 p.m., Loughton Hall, near Debden Station.
Mitcham (M. & D.R.S.).—May 24 (Film: "This is the B.B.C."), 7 p.m., "The Canons," Madiera Road, Mitcham.
New Cross (C.A.R.S.).—Fridays, 8 p.m., 225 New Cross Road, S.E.14.

LOOKING AHEAD

May 3.—R.A.O.T.A. Reunion, Horse Shoe Hotel, London, W.1.
May 4.—Northern Ireland Golden Jubilee Year Celebrations.
May 12.—North Wales Official Regional Meeting, Colwyn Bay.
May 26.—Hunstanton "Bucket and Spade" Party and D/F Contest.
June 2.—R.S.G.B. Golden Jubilee Mobile Rally, Wethersfield, Essex.
June 10-15.—Region 1 I.A.R.U. Conference, Malmö, Sweden.
June 16.—A.R.M.S. Rally, U.S. Air Force Base, Barford, St. John, Oxon.
June 23.—Bridlington Mobile Rally.
July 5.—R.S.G.B. Golden Jubilee Dinner.
July 7.—South Shields Mobile Rally.
August 18.—Derby Mobile Rally.
September 8.—G6UT's Ham Party.
September 15.—Lincoln Mobile Rally.
September 22.—Woburn Abbey National Mobile Rally.
September 22.—Surrey Radio Contact Club 144 Mc/s D/F Hunt.
September 29.—South West Mobile Rally, Weston-super-Mare.
October 30-November 2—R.S.G.B. Radio Communications Exhibition.

Norwood & South London (C.P. & D.R.C.).—May 18 (" Audio Broadcasting Techniques " by W. E. Sutton, G3FWI), C.D. Training Centre, Bromley Road, Catford.
Paddington (P. & D.A.R.S.).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
Purley (P. & D.R.C.).—May 3 (Lecture), May 17 (A.G.M.), 8 p.m., Railwaymen's Hall (Side Entrance), Whytecliffe Road, Purley.
Reigate (R.A.T.S.).—May 10, 11, Exhibition Station at Albany Manor Secondary School, Merstham. May 18, 7.30 p.m., The Tower, High Street, Reigate.
Romford (R. & D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Science Museum (C.S.R.S.).—May 7 (Lecture and Demonstration " 625 Line TV Receivers and Techniques "), May 21, Informal Meeting, 6 p.m. Science Museum, South Kensington.
Sidcup (C.V.R.S.).—May 2 (Junk Sale), 7.30 p.m., Congregational Church Hall, Court Road, Eltham.
Southgate and District.—May 9, 8 p.m., Atlasta Lodge, Tottenhall Road, N.13.
Slough (S.A.R.S.).—First Wednesday in each month, 8 p.m., United Services Club, Wellington Street, Slough.
Sutton and Cheam (S.C.R.S.).—May 21, 8 p.m., " The Harrow," High Street, Cheam.
Uxbridge (U.D.R.S.).—First and third Mondays in each month, 7.30 p.m., Central Hall, Corner of Park Road and Uxbridge Road. Newcomers welcome.
Welwyn Garden City.—May 9, 7.30 p.m., Conference Room, Murphy Radio, Bessemer Road, Welwyn Garden City.

REGION 8

Crawley (C.A.R.C.).—May 22 (" U.H.F. Equipment" by R. W. Standley, G8RW), June 12 (Informal). For details contact G3FRV.

REGION 9

Bath.—May 20, 7.30 p.m., Committee Room, Technical College, Lower Borough Walls, Bath.
Bristol.—May 8, 7.30 p.m., Mullard Film Show, Victoria Rooms, Clifton, Bristol 8. May 24 (" Hi-Fi Audio Equipment " by A. J. Rawlings G3PFC), 7.30 p.m., Royal Fort, Bristol University, Woodland Road, Bristol 8.
Burnham-on-Sea.—Second Tuesday in each month, 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.
Camborne (C.R. & T.C.).—First Thursday in each month, Staff Recreation Hall, S.W.E.B. Headquarters, Pool, near Camborne.
Exeter.—First Tuesday in each month, 7.30 p.m., Y.M.C.A. St. Davids Hill, Exeter.
Plymouth (P.R.C.).—First Tuesday in each month, 7.30 p.m., Guild of Social Service Building, Plymouth. Other Tuesdays, Virginia House Settlement, St. Andrews Cross, Plymouth.
South Dorset (S.D.R.S.).—First Friday in each month, 7.30 p.m., alternately at Waverley Hotel, Westham, Weymouth and Labour Rooms, West Walks, Dorchester. (May meeting at Dorchester).
Torquay (T.A.R.S.).—May 11 (Preparations for N.F.D.), Club H.Q., Belgrave Road, Torquay.
Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road.
Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Park Lodge, The Park, Yeovil.

REGION 10

Cardiff.—June 10, 7.30 p.m., T.A. Centre, Park Street, Cardiff.
Pontypool.—Tuesdays, 7 p.m., Educational Settlement, Rockhill Road, Pontypool.

REGION 13

Edinburgh (L.R.S.).—May 9 (" Railway Communications " by R. McInnes, GM3LNE), May 23 (N.F.D. Briefing), June 13 (Constructional Competition), June 27 (A.G.M.), Y.M.C.A., 14 South Saint Andrews Street, Edinburgh.

REGION 16

Basildon (B. & D.A.R.S.).—Next meeting at Wickford, Thursday June 6, 7.30 p.m. Further details from G3RQT, 472 Long Riding, Basildon.
Chelmsford (C.A.R.C.).—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford. May 7 (" Diesel and Electric Trains " by B. N. McLarty, O.B.E.), June 4 (" Communications " by A. W. Cole of Marconi's W.T. Co. Ltd.).
Southend (S. & D.R.S.).—Alternate Fridays, 7.30 p.m., canteen of E. K. Cole Ltd., Priory Road, Prittlewell, Southend, May 3 (" D.F. Receivers "), May 31 (" 150 watt Transmitter for 2 metres ").

Letters to Editor (continued from page 627)

point raised by Mr. Jessop but the difficulty lies in finding a really good alternative to the present title. Suggestions from members will be welcome.—EDITOR)

Bulletin Articles

DEAR SIR,—I should like to say that I agree wholeheartedly with VQ4KPB's letter in the March BULLETIN. Of course the beginner must be adequately catered for, but long may articles such as those from G3VA and G2DAF continue. While sympathizing with G2HCJ in the preceding letter on the subject of humorous articles, can he really maintain that he read the s.s.b. article in last July's issue without feeling the better for it?

Finally, may I express my appreciation of the monthly Frequency Predictions.

Yours faithfully,
C. C. STEVENS (G6XH)

Chorley Wood, Herts.

DEAR SIR,—In strong protest against Mr. Taylor's letter in the March BULLETIN, I am writing on behalf of the non-transmitting fraternity, which so far has not been represented in this discussion.

Mr. Taylor's idea of a high technical standard of articles in the Society's BULLETIN is all very well for the experienced amateur, but what about the newcomers? I honestly do not think they are going to be encouraged by the type of articles Mr. Taylor would like to see published; in fact, it is reasonable to say that a large proportion of them would lose all interest in Amateur Radio, let alone following it through to obtaining their tickets, and where would we be then? Slowly this hobby of ours would diminish.

As regards Mr. Taylor's view on humorous articles lowering the standard of the BULLETIN, he seems to forget that this is a hobby, and I think I would be right in saying that a humorous article in the BULLETIN is in keeping with the true " ham " spirit of our hobby, and would definitely not lower the standard.

Finally, I would like to say, from the newcomers' point of view, I am in full agreement with the Society as regards their proposed " down to earth " policy on articles published in the BULLETIN, as I am sure this will be of great benefit to newcomers and prospective amateurs like myself. I think I would be right in summing up with the phrase, " The short wave listeners of today are the transmitting amateurs of tomorrow."

Yours faithfully,
VINCENT C. LEAR (A.2849)
Age 13

Wallasey, Cheshire.

Posting Certificate

ALL COPIES OF THE April issue of the R.S.G.B. BULLETIN were posted on Tuesday, April 2, 1963, and the Society holds a certificate to that effect from the Letchworth, Herts., Post Office. The BULLETIN is now published on the first Wednesday in each month.

Can You Help?

● C. Thompson, " Mere Close," Hull Road, Hornsea, Yorkshire, who requires information on the ex-A.M. R1134A battery amplifier?

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
	10.15 a.m.	Belfast
	10.30 a.m.	North Midlands
	11 a.m.	North East England
	11.30 a.m.	South West Scotland
	12 noon	North East Scotland
145·30 Mc/s	10.30 a.m.	Beaming north west from Sutton Coldfield
	10.45 a.m.	Beaming south west from Sutton Coldfield
145·50 Mc/s	11.00 a.m.	Beaming north from Leeds
	11.15 a.m.	Beaming east from Leeds
145·8 Mc/s	11.30 a.m.	Beaming west from Belfast
	11.45 a.m.	Beaming north east from Belfast
145·10 Mc/s	12 noon	Beaming north from London area
	12.15 p.m.	Beaming west from London area

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.

Publications for the Radio Amateur and Shortwave Listener

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