APRIL, 1961

RSGB BULLETIN

VOL. 36, No. 10

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Volumn 36 No. 10

April 1961

2/6 Monthly

R.S.G.B. BULLETIN

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John Clarricoats, O.B.E., G6CL

DEPUTY EDITOR:

John A. Rouse, G2AHL

EDITORIAL OFFICE:

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

Telephone: HOLborn 7373

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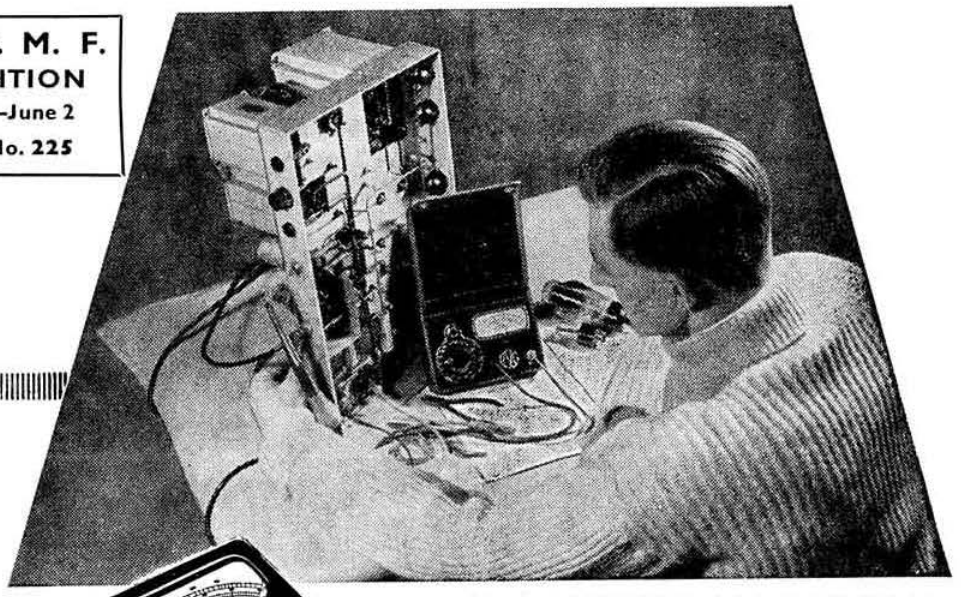
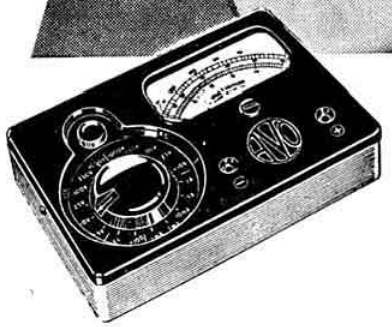


Using an AVO Multiminor to balance the D.C. component across the output transformer of a High Fidelity Amplifier.



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Current Comment

discusses topics of the day

Geneva Conference Decisions Implemented

THE January 1960 issue of this Journal carried a full account of the final decisions reached at the Geneva Radio Conference insofar as they would, in due time, affect the Amateur Service within Region I generally and within the United Kingdom particularly.

On the following page appear the revised frequency schedules to the Amateur Sound, Sound Mobile and Television licences which the G.P.O. will bring into use on May 1, 1961—the effective date of the Geneva Conference Radio Regulations.

It is important to notice that for the first time the term " secondary basis " is used in respect of certain of the amateur allocations. By definition, stations of a secondary service shall not cause harmful interference to stations of primary or permitted services to which frequencies are already assigned or to which frequencies may be assigned at a later date. Furthermore, stations of a secondary service cannot claim protection from harmful interference from stations of a primary or permitted service but they can claim protection from harmful interference from stations of the same service or from other secondary services. Watch the QRM!

The " secondary basis " clause affects the lower half of the 144-146 Mc/s band, as well as the other u.h.f., v.h.f., and s.h.f. bands except the highest of them all (21,000 Mc/s), but no difficulties should arise, provided care and attention are paid to Note 4, which applies specifically to the lower half of the 144-146 Mc/s band.

Top Band operation is now governed by a new footnote (No. 194) appended to Article 5 of the Radio Regulations. The footnote states, *inter alia*, that when allocating bands within the range 1715-2000 kc/s to their Amateur Service, administrations shall, after prior consultation with administrations of neighbouring countries, take such steps as may be necessary to prevent harmful interference from their Amateur Service being caused to the Fixed and Mobile Services of other countries.

Although it has been recorded here on other occasions that Top Band is *not* allocated to the Amateur Service as by right in Region I the fact needs to be restated, because some who use the band still labour under the illusion that it is shared on a basis of equality with other Services. Although Top Band is *not* an amateur allocation in Region I within the meaning of the Radio Regulations, amateurs in the United Kingdom, and in certain other countries in the Region, may use up to 200 kc/s between 1715 and 2000 kc/s, provided they cause no harmful interference to the Services which are internationally authorized to use those frequencies, namely the Fixed and Mobile Services.

As from May 1, 1961, amateurs in Europe, and most other parts of the world except the Americas, will not be authorized to work outside the band 7000-7100 kc/s. The cut of 50 kc/s (7100-7150 kc/s) forced upon Geneva delegations by the demands of new and developing countries for more frequency space for short-wave " prestige " broadcasting, was reported upon at the time of the Conference. Whilst the cut is not as serious as had seemed likely at one stage of the Conference, amateurs the world over will deplore this further ingress into the most famous of all DX bands.

The new schedules show that the present band 28-30 Mc/s is to become 28-29·7 Mc/s. The slightly reduced allocation will now bring the United Kingdom into line with all the other countries who implemented the Atlantic City Radio Regulations ten or more years ago! The fact that U.K. amateurs were permitted to use frequencies between 29·7 and 30 Mc/s certainly surprised amateurs of other countries but there were valid reasons for the concession being continued—a concession which, incidentally, proved very useful during the last period of high m.u.f.

It is interesting to note from the new schedules that frequency modulation is to be permitted in all bands allocated to the Amateur Service in the U.K. Previously this form of modulation was not authorized in the band 70·2-70·4 Mc/s.

Another interesting point—the present licence allocates only half a megacycle exclusively to the Amateur Service in the band 144-146 Mc/s. As from May 1, 1961, the upper half of the band (145-146 Mc/s) will be allocated exclusively to amateurs. Users of the lower half will be required to continue to avoid certain spot aeronautical frequencies.

An important concession by the G.P.O. is the allocation of 30 Mc/s between 420-450 Mc/s to U.K. amateurs on a " secondary basis." Amateur operation elsewhere in Europe will be limited to the band 430-440 Mc/s.

Two new bands, 3400-3475 Mc/s and 21,000-22,000 Mc/s, will become amateur allocations from May 1, 1961. At the moment there does not appear to be much interest in bands of the latter order of frequency, but the next few years should see the first steps being taken to probe the territory around 3400 Mc/s. Wave-bands of thumb-nail length should offer a great challenge to amateurs of future generations.

The schedule, insofar as it applies to the Amateur Television licence, reflects one small change as a result of Geneva decisions, namely, the reduction in the width of the band 420-460 Mc/s to 425 Mc/s-445 Mc/s.

Two years ago with the Geneva Radio Conference near at hand there were many who spoke dismally of the

future of the Amateur Radio movement. Absurd rumours had already began to circulate both in the U.S.A. and the U.K. but those who had a clear picture of what was being proposed felt confident that the Amateur Service would suffer no serious setbacks. True, we finally lost 50 kc/s of valuable territory in the 7 Mc/s band but if we stop for a moment to reflect upon the demands which were made at Geneva for frequencies for new and expanding services we would do well to congratulate ourselves on the successful outcome of the Conference. Certain it is that the work done by the International Amateur Radio Union Region I team of observers and by the Society's own representative on the United Kingdom delegation produced good results.

Commercial publications concerned with Amateur Radio matters would be wise to pay some regard to the part played by the I.A.R.U. and by National Societies prior to, at, and after International Telecommunications Union Conferences. It is a fact that the existence of such publications would be in jeopardy if the efforts of the National Societies failed to secure the retention of a fair share of the frequency spectrum for the Amateur Service. To ignore—as does one magazine—the very existence of the Radio Society of Great Britain in such matters is absurd. J. C.

Silent Keys

GERALD MARCUSE (G2NM)

It is our sad duty to record the death on April 6, 1961, of Gerald Marcuse (G2NM), a Past President of the Radio Society of Great Britain, and a Founder Vice-President of the International Amateur Radio Union. Mr. Marcuse—Gerry to his countless friends in Amateur Radio circles—was in his 74th year at the time of his death.

A full tribute to the memory of one whose whole life had been dedicated to Amateur Radio will appear next month. In the meantime the sympathies of all members are offered to his widow Irene and her son David.

The funeral took place at Brighton Crematorium on April 10, 1961.

* * *

FERGUS SOUTHWORTH (GW2CUU)

It is also our sad duty to record the passing on April 4, 1961, of Fergus Southworth (GW2CUU) of Holywell, Flintshire.

Fergus had been the Society's Representative in Region 11 for more than 10 years and throughout that time he had rendered most valuable assistance to the membership in North Wales. A fuller tribute to his memory will be published next month.

The sympathies of his many friends in the Society are extended to Mrs. Southworth and her family.

LONDON U.H.F. GROUP

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

at 7.30 p.m. on Thursday, May 4, 1961

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

Amateur (Sound), (Sound Mobile) and (Television) Licences

WITH effect from May 1, 1961, the following revised schedules of bands available, types of emission and permitted power inputs under U.K. amateur licences will come into force.

AMATEUR (SOUND) AND (SOUND MOBILE) LICENCES

Note No.	Frequency Bands (in Mc/s)	Classes of Emission	Maximum D.C. Input Power
1	1·8 — 2	A1, A2, A3, A3A, F1, F2 and F3	10 watts
2	3·5 — 3·8		150 watts
–	7·0 — 7·10		
–	14·0 — 14·35		
–	21·0 — 21·45		
–	28·0 — 29·7		
3	70·2 — 70·4		50 watts
1 and 4	144 — 145		150 watts
–	145 — 146		
1	420 — 450		
1	1215 — 1325		
1	2300 — 2450		
1	3400 — 3475		
1	5650 — 5850		
1	10000 — 10500		
–	21000 — 22000		
1	2350 — 2400	P1D, P2D, P2E, P3D and P3E	25 watts mean power and 2·5 kilowatts peak power.
1	5700 — 5800		
1	10050 — 10450		
–	21150 — 21850		

Notes

1. This band is allocated to stations in the Amateur Service on a secondary basis on condition that they shall not cause interference to other services.
2. This band is shared by other services.
3. This band is available to amateurs until further notice provided that frequencies between 70·2—70·3 Mc/s inclusive may not be used on the North West side of the line Firth of Lorne to the Moray Firth.
4. The following spot aeronautical frequencies must be avoided: 144·0, 144·09, 144·18, 144·27, 144·36, 144·45, 144·54, 144·63, 144·72, 144·81 and 144·9 Mc/s.
5. The symbols used to designate the classes of emission have the meanings assigned to them in the Telecommunication Convention.

AMATEUR (TELEVISION) LICENCE

Frequency Bands (in Mc/s)	Classes of Emission (see A below)	Maximum D.C. Input Power (see B below)
*425 — 445	A1, A2, A3, A5, F1, F2, F3 and F5	150 watts
*1225 — 1290		
*2300 — 2450		
*5650 — 5850		
*10000 — 10500		
21000 — 22000		

Notes

* This band is allocated to stations in the Amateur Service on a secondary basis on condition that they shall not cause interference to other services.

A. The symbols used to designate the classes of emission have the meanings assigned to them in the Telecommunication Convention.

B. D.C. input power is the total direct current power input to the anode circuit of the valve(s) energizing the aerial in the fully modulated condition, e.g. peak white in an amplitude modulated positive modulation system.

Receiving Licences

DURING January 1961, the number of combined television and sound licences throughout Great Britain and Northern Ireland increased by 72,459 bringing the total to 11,148,463. Sound only licences total 3,997,148, including 464,226 for sets fitted in cars.

A High Gain Low Noise Transistorized Crystal Controlled Converter for 144 Mc/s

By J. R. GAZELEY (B.R.S.20533)*

THE availability within the last few months of the Semiconductors Ltd. range of "entertainment" transistors with performances and prices comparable with thermionic valves prompted the writer to build a 144 Mc/s converter using transistors in all its stages. The chief advantages of such a converter are compactness, portability and complete independence of mains supplies coupled with very low running costs. In the light of the data published on the T.1832 (2N1742)—a noise factor of about 5db at 200 Mc/s and a power gain of some 19db—it was hoped that the performance would compare favourably with many of the valve converters at present in use by amateurs.

The unit to be described in fact has a very good noise factor, while the gain is somewhat higher than a conventional five valve converter although the battery consumption is only 10mA at 12 volts.

Circuit Description

The circuit of the complete converter is shown in Fig. 1. Five transistors are used: TR1 (a 2N1742/T.1832 microalloy diffused base type) operates as an earthed emitter neutralized r.f. amplifier, while L1, C1 comprises the input tuned circuit. The 72 ohm aerial feeder is tapped down L1 in order to effect the optimum impedance match to the base of TR1 to obtain the best noise factor rather than maximum power transfer. (This tapping point may vary with different specimens of transistor.) L2 is the isolating winding feeding the base of TR1.

From the standpoint of power transfer there is little advantage to be gained from tuning the base circuit but it does provide some selectivity and a higher impedance across which to connect a protection diode.† This is not shown in Fig. 1 and tests at G3FD using his 40 watt transmitter indicated that the T.1832 did not suffer damage provided a good coaxial relay was used. The converter was connected to the relay by an electrical half-wave length of cable.

The potentiometer method of bias stabilization is used so that the optimum working point can be easily arranged. The gain, bandwidth and noise factor are all affected by the biasing. The makers recommend a 2·5mA collector current for the T.1832.

L3, C5 provide the collector tuned circuit for TR1, the collector being tapped down L3 to obtain the correct bandwidth. C2 provides neutralization of the collector base

* 192 Haselbury Road, Edmonton, London, N.9.

† "Transistors in the Two Metre Receiver," N. Coupe (G3KBS), R.S.G.B. BULLETIN, November 1960.

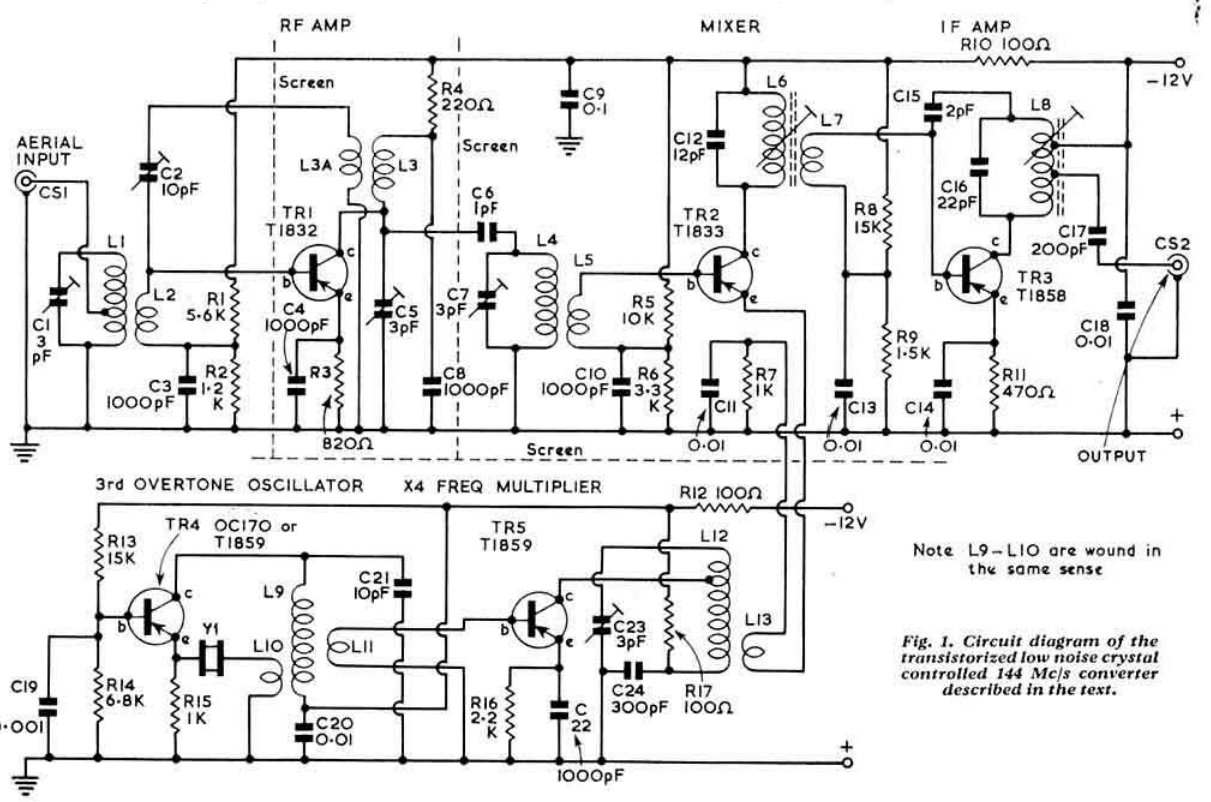
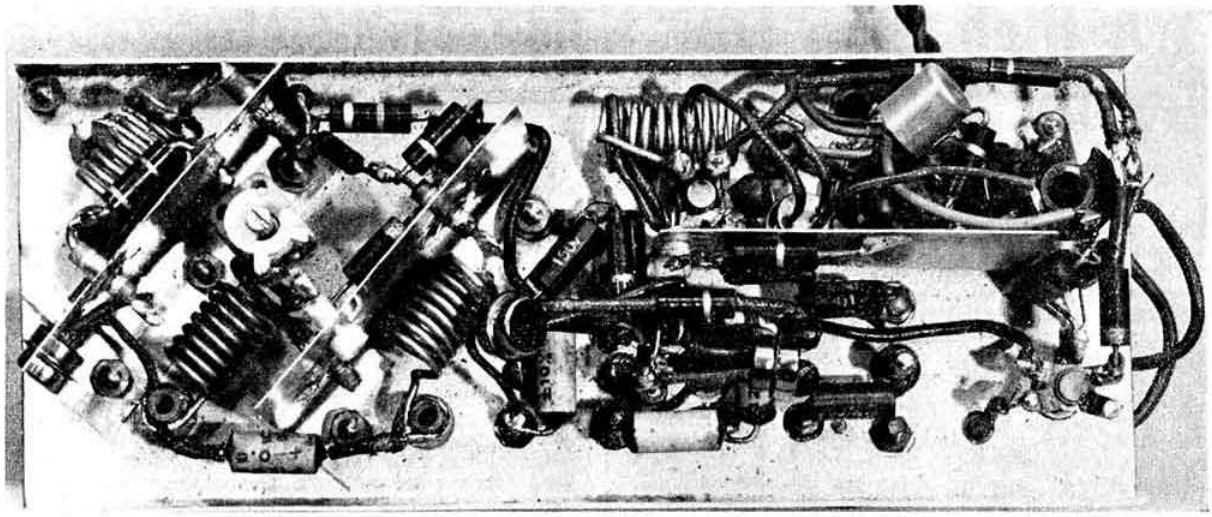


Fig. 1. Circuit diagram of the transistorized low noise crystal controlled 144 Mc/s converter described in the text.



An under chassis view of the converter. The components may be identified by reference to Fig. 2.

capacitance: its adjustment is very critical and can only be carried out with the aid of a noise generator if the lowest noise factor is to be achieved. C1 and L2 must be screened from L3 to prevent instability. When properly neutralized the noise level decreases when the aerial is disconnected. L3, C5 is top end coupled to L4, C7 via a lpF capacitor, C6. A screen is placed between L3 and L4, an arrangement which increases front-end selectivity and reduces the chances of i.f. breakthrough.

L4, L5 provide a step-down transformer coupling to the base of TR2 (a 2N1743/T.1833) which is used as a mixer in the earthed emitter mode, oscillator injection being in series with the emitter. Potentiometer base biasing is used to provide a standing collector current of about 1mA. C6, C12 are tuned to the tunable i.f. (19·7-21·7 Mc/s in the writer's version) the output impedance giving sufficient damping to realize a 2 Mc/s bandwidth. L7 is a small link winding which can be used either for connection to the main receiver or to the base of an i.f. amplifier.

A head i.f. amplifier is not essential, the overall gain being quite adequate for most receivers. However, the writer built one into the converter as indicated in Fig. 1, a T.1858/2N1745 (TR3) being used as a neutralized grounded emitter i.f. amplifier. It gives more than adequate gain to mask any i.f. breakthrough with all but the most poorly screened receivers used as i.f. strips and is controllable by varying the base bias. It is possible to connect the converter to the main receiver a.g.c. line so that the mixer stage in the main receiver is not overloaded, the latter being a common cause of cross-modulation.

The oscillator chain is crystal controlled and employs two transistors. An OC170 (TR4) functions as a grounded base overtone oscillator with a potentiometer biasing network adjusted for highest output consistent with reliability. A 10·3583 Mc/s crystal operating on its third overtone controls the frequency at approximately 31·075 Mc/s. The second transistor, a 2N1744/T.1859 (TR5), is employed as a frequency quadrupler to 124·3 Mc/s. This stage is biased by the drive from TR4 but a limiting resistor R16 is used in the emitter circuit to ensure that the dissipation is kept below the maximum ratings of the device and to reduce the chance of thermal runaway.

It should be appreciated that in view of transistor production spreads the circuit values given are not necessarily the optimum for any particular set of transistors.

Construction

The general layout may be seen in the photograph and follows normal practice, i.e. short leads and in-line layout with the aerial input socket remote from the oscillator stage and the i.f. output socket. The base and collector circuits of the r.f. amplifier are screened from each other and it is suggested that the r.f. amplifier collector coil and mixer base coil be screened from one another in order that all the coupling between them be via C6 alone.

The oscillator section should be screened from the i.f. section and L6, L7 and L8 should be in screening cans to minimize magnetic coupling between them.

The coils should be wound as follows:

L1, 8 turns 18 s.w.g. $\frac{5}{16}$ in. inside diameter, $\frac{5}{8}$ in. long, tapped 2 turns from "earthy" end.

L2, 1 turn 22 s.w.g. covered with sleeving and interwound at "earthy" end of L1.

L3, $6\frac{1}{2}$ turns 18 s.w.g. $\frac{5}{16}$ in. inside diameter, $\frac{3}{4}$ in. long, tapped 2 turns from each end.

L3A, 1 turn 18 s.w.g., sleeved, spaced one wire diameter from "earthy" end of L3.

L4, 8 turns 18 s.w.g. $\frac{5}{16}$ in. inside diameter, $\frac{5}{8}$ in. long.

L5, 1 turn 22 s.w.g. covered with sleeving and interwound at the "earthy" end of L4.

L6, 20 turns 30 s.w.g. close wound on $\frac{1}{4}$ in. former in screening can.

L7, 2 turns 30 s.w.g. interwound at cold end of L6.

L8, 22 turns 30 s.w.g. close wound on a $\frac{1}{4}$ in. diameter former in screening can. The winding is tapped at 16 and 18 turns from the collector end and slug tuned.

L9, 15 turns 30 s.w.g. close wound on a $\frac{1}{4}$ in. diameter former, slug tuned.

L10, L11, 1 turn 30 s.w.g. interwound at the "earthy" end of L9.

L12, $9\frac{1}{2}$ turns 18 s.w.g. $\frac{5}{16}$ in. diameter, $\frac{3}{4}$ in. long, tapped 3 turns from C22 end.

L13, 1 turn link interwound at "earthy" end of L12.

Adjustment

After the wiring has been carefully checked over, 12 volts d.c. may be applied and the total current consumed noted. It should be between 10 and 15mA. Care should be taken to see that the *correct polarity of the battery* is observed.

The oscillator should be adjusted first. The slug in the coil assembly L9/L10/L11 should be carefully adjusted while

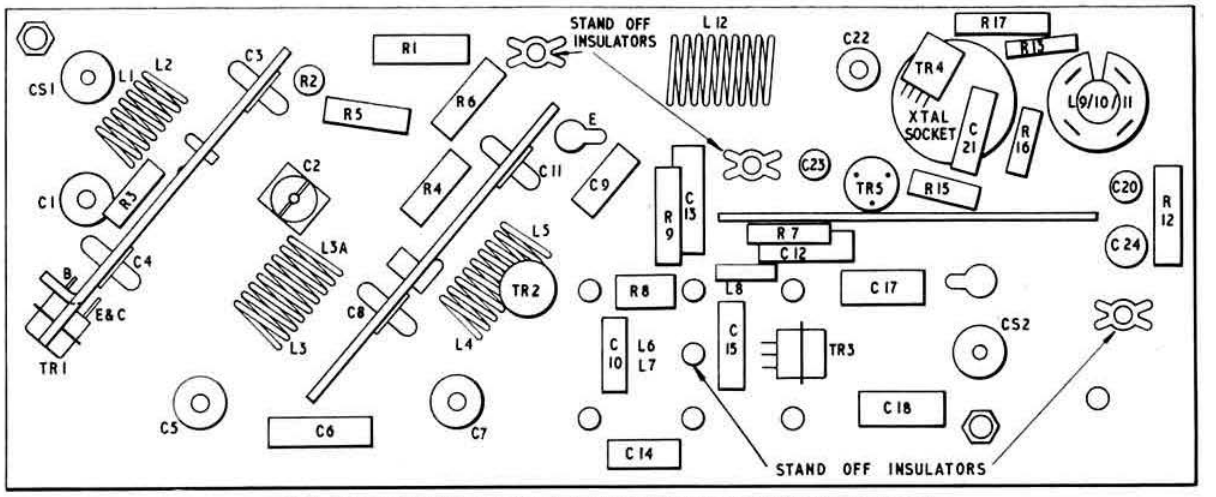


Fig. 2. Under-chassis layout showing the positions of the principal components.

monitoring the crystal overtone frequency (31·075 Mc/s) until a point is reached where altering the slug causes no appreciable change to the note received. The power should then be switched off and then on again to check that the oscillator remains on the same frequency; if it does not, some slight adjustment of the slug in L9/L10/L11 will be necessary. If the oscillator refuses to oscillate or cannot be locked to the crystal, the biasing of TR4 should be checked.

The next step is to test the multiplier TR5. It is important that the total current drawn by this stage should not exceed 5mA—if it does the transistor may be damaged. Reducing the drive from TR4 or increasing the value of R16 will maintain the dissipation at a safe level.

The current flowing through the mixer transistor TR2 should be approximately 1mA initially. C22 should be

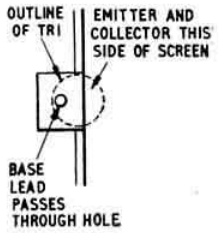


Fig. 3. Mounting of TR1 on its associated shield.

adjusted until the current rises to 40 per cent higher. If an absorption wavemeter tuned to the required injection frequency (124.3 Mc/s) is then held close to L12 there should be a dip in the mixer current. Use of a g.d.o. is *not* recommended because of the possibility of damage to the transistors.

The supply to the r.f. amplifier TR1 should next be disconnected and the i.f. amplifier coils peaked for maximum noise over the tuning range. The noise level should be flat with no peaks over the full 2 Mc/s range. Peakiness indicates instability which is best overcome by changing the value of the neutralizing capacitor C15. A small 10pF trimmer could be used with some advantage in this position.

When the i.f. coils have been aligned, the supply to TR1 can be reconnected and with C2 set at a low value C1, C5 and C7 adjusted for maximum noise output. At this stage an aerial can be connected and ignition noises should become apparent.

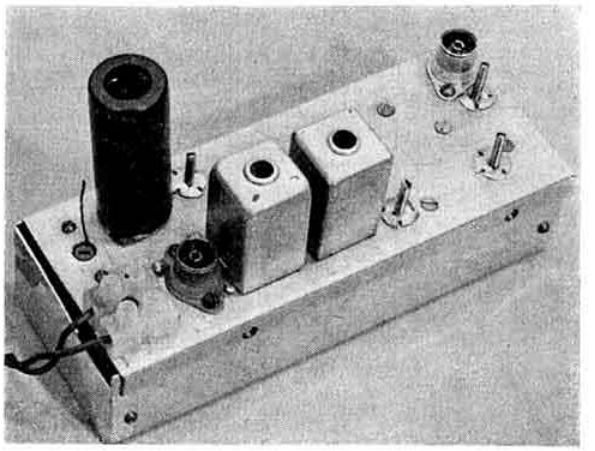
The various stages can now be peaked up on a strong local signal. C2 should be adjusted for minimum noise output, though final adjustment should be made using a noise generator. Adjustment of the tuning of C1, L1 and the aerial tapping point on L1 may also be needed.

The TR1 collector tapping point on L3 may also require attention as may the level of oscillator injection and biasing of the mixer stage (TR2). All these adjustments are best carried out using a noise generator.

Results

The performance of the converter compares favourably with most 2m converters apart from those with very low noise valves using the most expensive modern types. Tested against four different converters, this transistorized unit was slightly inferior to three (all cascode type) and superior to the fourth, an EC91 grounded grid type. No claims are made as to an exact noise figure but it is believed to be better than 6db.

The writer is indebted to G2JF, G2UJ, G3DOO, G3FD, G3GOZ, G3HGE and G6LL who tested the converter at their home stations.



The transistor converter in its screening box. The crystal is at the top left.

The G2DAF Communication Receiver

Component Selection – Alignment – Performance Figures

Part 2.

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

AMATEUR Radio is a hobby and it is natural that the average amateur contemplating new construction is rightly concerned with initial cost. The writer is no exception to this rule and made the maximum use of components available either in the " shack " or on the surplus market.

The main bandchange switch assembly S1 to S6 is made up from the AR88 unit which employs ceramic wafers with 360 degree rotation for the six band positions. The 12 coil formers in the signal frequency section and the three formers in the tunable i.f. section were taken from a stripped AR77 and the original windings removed. Marconi CR100 or similar formers would be suitable although it is preferable to use polystyrene formers for the three higher frequency ranges. Denco *Maxi-Q* formers are also suitable.

As the r.f. amplifier is neutralized by out of phase feedback from the grid input circuit, the frame of the grid section of the two gang " RF TUNE " preselection capacitor is above earth. Accordingly this component is made up with two separate 50pF capacitors (items from the surplus RF26 and RF27 units are suitable) mounted on an insulated panel and ganged together with an Eddystone type 529 flexible shaft coupler.

It will be seen from the photos that the i.f. transformers are rather large by modern standards. They were used because they have precision threaded metal shaft adjustments to the dust cores and also because they were available. They were made by the American Sickles company and are type SA-2612-A. The primary coil is resonated with a 75pF capacitor and the secondary coil with a 60pF capacitor to allow for the additional grid input capacity of the valve. This coil is tapped, but not centre tapped, and where this is required in the three i.f.t.'s in the bandpass filter, the original 60pF capacitor should be removed and replaced with two 150pF silver mica capacitors in series, and the junction of the two taken to a separate lead-out wire. The secondary of the last i.f.t. feeding the bridge diode c.w. and s.s.b. demodulator has to be modified to low impedance series output by replacing the original capacitor with a 1000pF unit and whatever value is required to resonate the coil in series as shown in the circuit diagram. The value required with the Sickles i.f.t. is 100pF. Low impedance output is required to feed the c.i.o. output to the OA79 bridge diode demodulator. This is made up by removing one " pie " from a standard i.f.t. and replacing it with a 50 turn scramble winding of 36 s.w.g. enamelled wire tightly coupled to the existing coil.

There is nothing worse than attempting to tune a selective receiver with a " lumpy " drive mechanism or with one that has backlash in the gearing. A really first class reduction drive—preferably with a reduction of 100 : 1 or thereabouts—is essential. The one used by the writer came from a scrapped CR100 receiver and the 11 in. dial and the pointer traversing mechanism were made up in the workshop. A readily available alternative is of course the beautifully engineered Eddystone type 898 drive and dial assembly.

The mains transformer used was also ex-CR100 while the mains transformer for the bias supply is a Ferranti Type O.P.M.1(C) push pull audio output transformer with the whole of the original secondary across the mains and the output taken from half of the primary. The output of 115 volts a.c. is a little higher than actually necessary but the transformer was available, so it

* 5 Janice Drive, Fulwood, Preston, Lancs.

The first part of this article was published in the March, 1961 issue of the *R.S.G.B. Bulletin*, copies of which are available, price 2/6 each, from R.S.G.B. Headquarters.

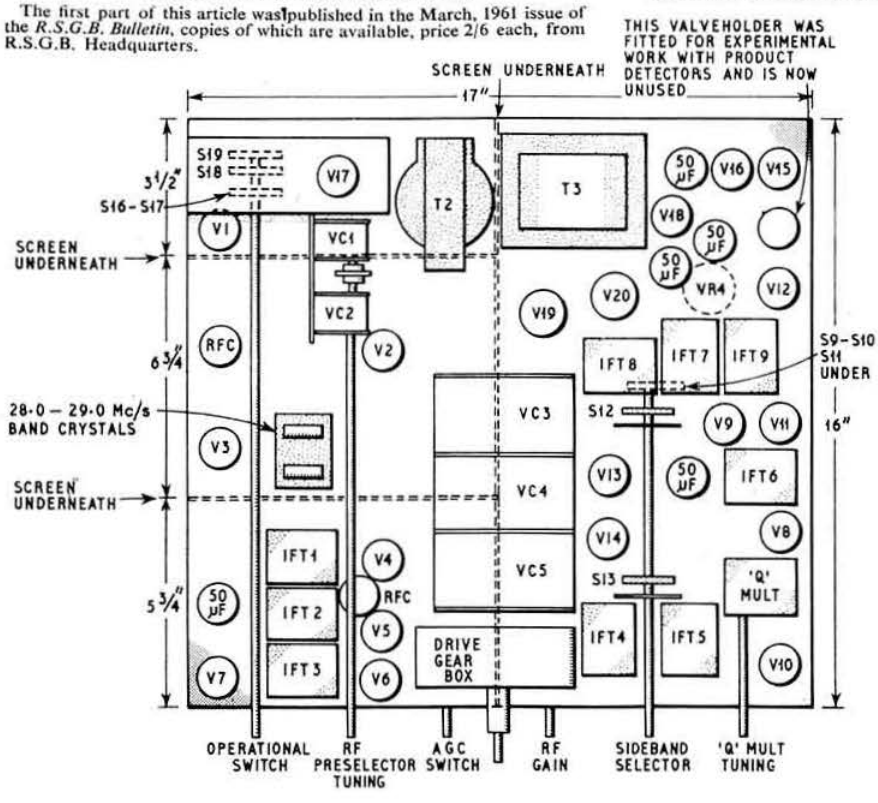


Fig. 3. Layout diagram showing the positions of the screens on the under side of the chassis.

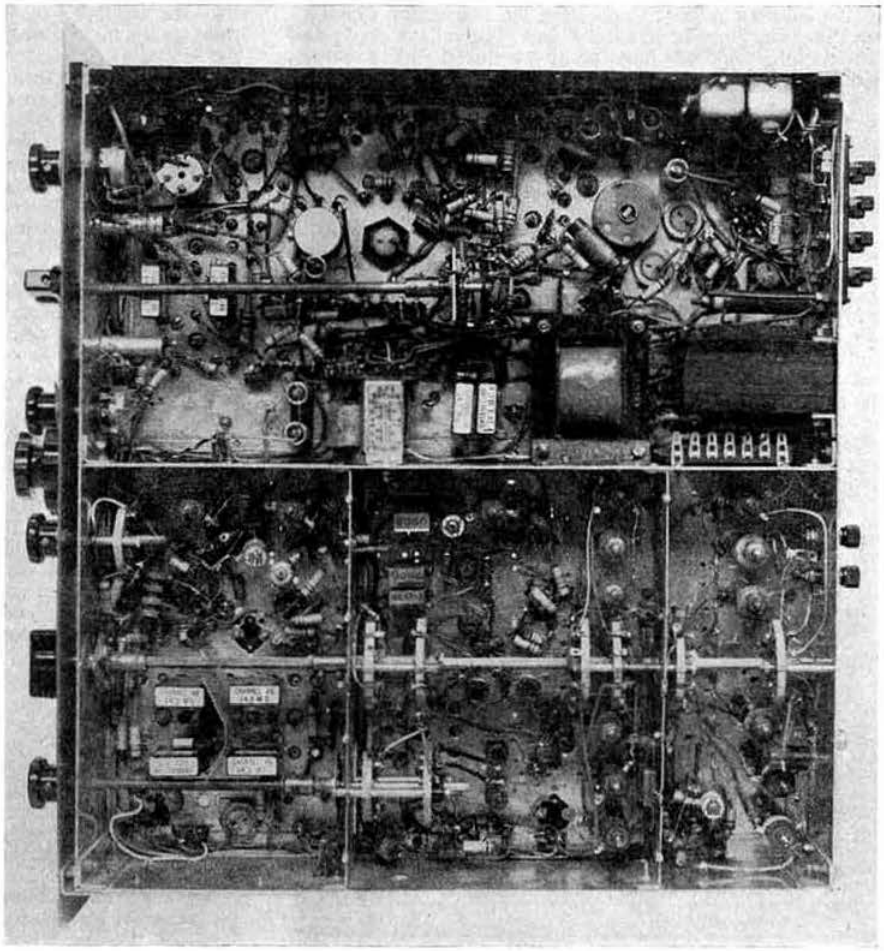
was used. It has now been in continuous service in this application for three years.

All variable potentiometers are standard types (wire wound below 100 K ohms and carbon above 100 K ohms) except for VR4 in the balanced diode bridge circuit; this is for balancing r.f. and must be non-inductive and therefore carbon.

The total number of crystals in the receiver is 16 (coverage on 10m 28·0-29·0 Mc/s) and these are all surplus types in the FT241 and FT243 ranges. Where necessary the FT241 crystals are moved on to the frequency required by grinding one edge. All the h.f. crystals are available in the FT243 range except for the 80m band (tunable i.f. of 5·0-5·5 Mc/s) and this is a 8650 kc/s type FT243 etched to the required frequency of 9·0 Mc/s.

The conversion oscillator valve (V3) is a type EF80 and is particularly suitable for this requirement. It must not be replaced with a 6AM6, 6BA6 or similar, because these valves will not give the required r.f. output voltage.

Any suitable moving coil meter of between 500μA and 1·5 mA full scale deflection is suitable for the S meter. The original scale can be covered with glazed drawing paper and hand calibrated as previously described in the BULLETIN, and finally removed and marked in with Indian ink.



Under chassis view. The three tunable i.f. coils can be seen in close proximity to the central screen. They are immediately below the three gang tuning capacitor.

Construction

Construction of the chassis and panel from 16 s.w.g. aluminium is quite straightforward The necessary screening is indicated in Fig. 3 and the photographs. The chassis, 17 in. by 16 in. by 3½ in. deep with a 19 in. by 10½ in. panel is standard rack and panel size. The actual measurements are determined by the physical size of the components used, particularly the i.f. transformers and the three gang tuning capacitor. However, it is strongly recommended that the chassis is not made smaller than suggested unless this is possible without reducing the signal frequency coil compartments. The *Q* of the coils and those in the tunable i.f. circuits can be reduced considerably by too close proximity to the cross screens and chassis sides. Close spacing of coils can also lead to undesirable mutual coupling and absorption effects. If a smaller chassis must be used, because of limitation of space or to be able to make use of an existing cabinet, it is recommended that the coils be wound on smaller diameter formers and that all unused coils be shorted out by making use of switch banks with full shorting plate facility.

When the Eddystone 898 dial is used the capacitor drive spindle is higher than usual. If the dial is mounted in the panel in the normal "top half" position, the three gang capacitor will require lifting about 2 in. above the chassis. A drilling plan for the front panel is given in Fig. 4.

Alignment

An ambitious project such as the construction of a double superhet communication receiver will only be undertaken by an experienced amateur with past constructional knowledge. In addition the procedure for ganging and tracking the tunable i.f. circuits, obtaining a reasonably linear dial calibration and the method of calibrating the S meter have been dealt with in a previous article.* Detailed alignment instructions will not therefore be given. The procedure, as in any receiver, is to start from the back and finish at the front. In this case, that means alignment of the second i.f., the crystal bandpass filter and the carrier insertion oscillator, followed by the tunable i.f. and v.f.o. section, and finally the signal frequency circuits. The 100 kc/s pips from the calibration oscillator in conjunction with the S meter will be found very useful during this process.

The level of the conversion oscillator and v.f.o. inputs to the two mixers V2 and V4 is important. There should be sufficient input voltage to obtain correct mixing action but not so much that spurious product generation is increased. A simple way of determining the approximate peak drive voltage to the first mixer without needing a diode probe valve voltmeter is to break the 20 K ohm grid resistor connection at the earth end and use a 500μA meter to measure the grid current. This will vary over the six bands because

* See R.S.G.B. BULLETIN, September and October, 1960.

of the different mode of operating the conversion crystals but should be between 100 and 300μA. The cathode drive to the second mixer will have to be measured with a diode probe valve voltmeter and should be approximately 2 volts r.m.s.

The output of the carrier insertion oscillator V13, also measured with a valve voltmeter, should be between 10 and 20 volts r.m.s. at the anode while the r.f. to the two OA79 diodes (either end of the balancing potentiometer) should be about 2·0 volts r.m.s.

With regard to the a.g.c. system the preferred method of calibrating the S meter has been previously dealt with in detail.* As the negative control voltage is developed across the diode load resistance, this can be adjusted in value to give any required operating condition on maximum input signal. It is however necessary to know whether the r.f. drive voltage from the secondary of i.f.t. 9 is the required amplitude. These values are therefore included in Table 4 showing the a.g.c. characteristics.

Audio negative feedback is provided both as an aid to reduced distortion and also to give control of the total audio amplification. The 330 K ohm feedback resistor is adjusted in value so that at full audio gain setting with the a.g.c.

TABLE 4
A.G.C. CHARACTERISTICS

Signal Generator Input into aerial terminal (microvolts)	Relative Audio Output Voltage (Vol. Control set to give 100V out at 10,000μV Sig. Input)	R.F. Voltage at Anode of A.G.C. Rectifier V12a (R.M.S. Values)	
	A.G.C. on	A.G.C. on	A.G.C. off
10,000	100	13	46
1,000	96	11	46
100	92	8·8	44
10	78	5·8	32
8	76	5·3	28
6	72	5·0	24
4	67	4·4	18
2	60	3·4	10
1	50	2·6	5

operating, the drive to the output valve V16 is just less than the point of positive grid excursion.

With either suggested choice of tunable i.f. range (5·0 to 5·5 Mc/s or 4·7 to 5·2 Mc/s) the receiver can be tuned to MSF on 5·0 Mc/s by setting the bandswitch to the " 3·5-4·0 Mc/s " position and the " RF TUNE " preselection capacitor to the minimum capacity position. This will peak the signal frequency circuits to 5·0 Mc/s and the first mixer will behave as an amplifier and feed the MSF input into the tunable i.f. stages. This will provide a standard frequency (correct to 5 parts in 10^9) for receiver drift measurements and also for adjustment of the 100 kc/s calibration oscillator by means of the pre-set capacitor across the grid circuit of V17, so that the calibration pip on 5·0 Mc/s is zero beat with MSF.

The 56 K ohm resistor feeding h.t. to the noise limiter control VR1 is a nominal value only. It should be adjusted to obtain correct limiter action.

The signal frequency descrimination against i.f. breakthrough is at its worst point when the receiver is in use on those frequencies nearest to the tunable i.f. range. This is at the h.f. end of the 80m band. Accordingly, a 5·3 Mc/s i.f. trap is connected in series with the input to the primary of the 80m coil and this gives an additional 20-40db attenuation over the range 3·6 to 3·8 Mc/s. To tune the 5·3 Mc/s i.f. trap, set the main tuning control to 3·7 Mc/s (bandswitch in the 3·5-4·0 Mc/s position) and feed a 100 millivolt signal into the aerial terminal from a signal generator set to 5·3 Mc/s. Adjust the trap dust core for minimum S meter reading. With the lower i.f. range in Table 3, the signal generator should be set to 4·9 Mc/s and the trap tuned to attenuate this frequency.

It is not possible to give detailed alignment instructions for the bandpass filter because this is affected by the activity of the crystals used, the choice of crystal spacing and the L/C ratio and the coefficient of coupling of the associated i.f. transformers. In the writer's receiver the carrier crystals are positioned at the 20db points. It should be remembered that the actual oscillating frequency *in situ* will be between 100 and 200 c/s lower than the series resonant mode. A small amount of neutralizing capacity—2pF—was used across two of the filter sections but this would not necessarily give the same response characteristics with some other type of i.f. transformers.

A reasonably linear dial calibration can be obtained by the method described in the BULLETIN.* The writer improved this still further in his own receiver by slightly reducing the rotor profile of the v.f.o. section of the tuning capacitor by hand filing to make the 100 kc/s calibration points coincide with the divisions of the logging scale. The vernier dial therefore rotates twice for each 100 kc/s; as it is divided into a hundred divisions, each division represents 500 c/s. This is a useful operating advantage and although there is still some error at the l.f. end over the last 100 kc/s, the linearity is quite good over the remaining 400 kc/s of the tuning range.

Muting

Modern practice is to control a transmitter and receiver by means of a relay with either voice (VOX) or press-to-talk operation. Breaking h.t. or cathode connections usually causes clicks and thumps and the most satisfactory control method is a source of negative voltage applied to the grids of the controlled valves. In many cases there is already a source of negative voltage provided for the p.a. bias supply and the available potential is usually suitable for muting requirements.

The controlling voltage can be any value from about 30 to 100 volts and is connected to the receiver " muting " terminal. During transmission periods the applied voltage disables the second mixer and the second audio amplifier and so " kills " the receiver. The time constant is fast and the control is free from clicks and thumps. As the controlled r.f. valve (V4) is not connected to the a.g.c. line the action and the time constant of the receiver a.g.c. system remains unaffected. Obviously there must always be a return path for the controlled grid circuits and if muting is not required the " muting " terminal must be strapped to earth.

The alternative method is to control the receiver from the transmitter send-receive switch. If this is required the receiver can be linked back to the transmitter control switch circuits by means of the " SB " position of the receiver operational switch S16 and the " Stand by " terminal provided.

Performance

Sensitivity

Signal to noise ratio figures indicate the ability of the receiver to amplify a weak signal above its own self generated noise. They give a " figure of merit " for the receiver and are therefore important. It will be appreciated that they are dependent on the accuracy of the signal generator and the attenuator used.

During March 1960, G6VX and G2HDU were interested enough to request the loan of the writer's receiver and conducted a series of measurements using some of the latest test

* R.S.G.B. BULLETIN, August 1960, pp. 61-62.

* R.S.G.B. BULLETIN, September 1960.

equipment available. This included an Airmec Type 201 Signal Generator, a Marconi Type TF.1073 100db r.f. attenuator, and a Berkeley Model 7370H Universal Output Meter. The writer was pleased to note that the figures, given in Table 5, agreed very closely with his own.

TABLE 5
SIGNAL TO NOISE RATIO

Band Mc/s	Aerial Input in microvolts for 10db S/N Ratio A3a Reception	Aerial Input in microvolts for 20db S/N Ratio A3a Reception
1·5–2·0	0·3	1·2
3·5–4·0	0·28	1·0
7·0–7·5	0·38	1·4
14·0–14·5	0·32	1·2
21·0–21·5	0·32	1·0
28·0–29·0	0·32	1·0

Selectivity

The selectivity is 2·5 kc/s wide 6db down and 3·7 kc/s wide 60db down. The shape factor of the filter is 1·48. The filter response was plotted to 72db down before deterioration due to side lobes became evident.

Second Channel Rejection

The image rejection to both mixing processes is not less than 60db on all bands.

I.F. Breakthrough Rejection

This is not less than 60db.

Spurious Responses

On all bands self generated spurious responses are below a level (throughout the 500 kc/s tuning range) equivalent to a 0·25μV aerial input signal.

Automatic Gain Control

Audio rise is 6db for 80db change in signal input above 1μV, and 3db for 60db change in signal input above 10μV.

Stability

The initial drift from switching on is approximately 500 c/s; the v.f.o. is stable within 10 to 15 minutes (depending on ambient temperature) from cold. Thereafter drift is less than 100 c/s over any one hour period. The measurements were made receiving MSF on 5·0 Mc/s with the open chassis on a bench under normal room temperature conditions. Self generated heat from the chassis in a poorly ventilated cabinet would adversely affect these figures and require additional negative temperature coefficient compensation. The necessary value would have to be found experimentally.

Circuit Correction

There were three errors in the circuit diagram on pages 424 and 425 of the March issue of the BULLETIN:

(i) The 100 ohm resistor in the cathode circuit of the second triode section of V1 should be bypassed with a 0·01 μF capacitor.

(ii) There should be a 0·01 μF blocking capacitor in the lead from the left hand anode of V14 to S10.

(iii) A 220 K ohm resistor should be connected between

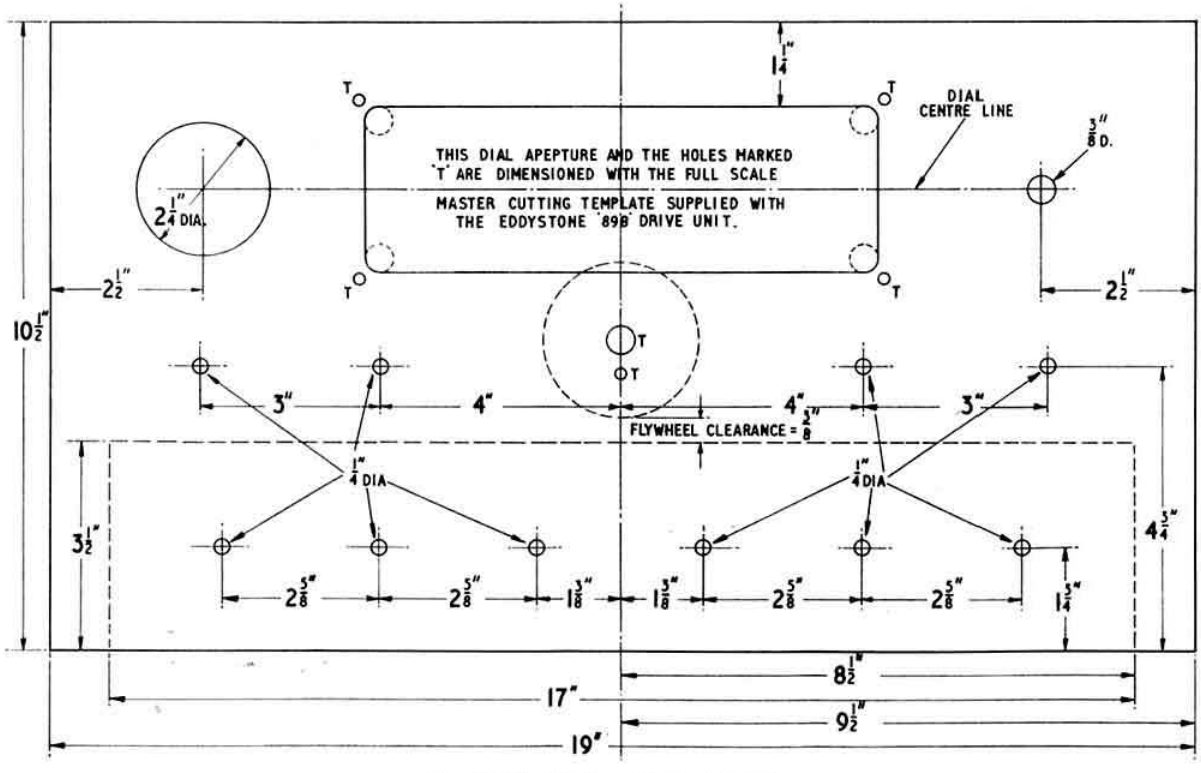


Fig. 4. Drilling plan for the front panel.

the 200 V h.t. rail and the junction of the 100 K and 220 K ohm resistors connected to the anodes of V14.

Obtaining the Components

Members building the G2DAF receiver may find the following information of assistance in obtaining the components.

Surplus AR88 wavechange switches are available from Proops Bros. Ltd., 52 Tottenham Court Road, London, W.1, and from G. W. Smith & Co. (Radio) Ltd., 3-34 Lisle Street, London, W.C.2.

Current production wavechange and other wafer switches are obtainable from Electroniques (Felixstowe) Ltd., Radio Works, Bridge Road, Felixstowe, Suffolk. This firm can also supply coils including the *Q* multiplier coil, r.f. chokes, and i.f. transformers.

Miniature i.f. transformers with $2\frac{1}{4} \times \frac{3}{4} \times \frac{3}{4}$ in. cans are suitable for IFT1 to IFT9, and are available from Home Radio (Mitcham) Ltd. The centre tap for IFTI, 2 and 4 is obtained by removing the existing shunt capacitor and replacing it with two capacitors of twice the value in series across the winding as shown in the circuit diagram.

The FT243 type crystals required for the crystal controlled front-end are available from Henry's Radio Ltd., 5 Harrow Road, London, W.2. Another firm selling surplus crystals is Southern Radio Supply Ltd., 11 Little Newport Street, London, W.C.2. The FT241 crystals for the lattice filters are more difficult to obtain and it may be necessary to "shop around" to find them. The FT241 crystals required are one Channel 47, three Channel 48 and four Channel 49. They are edge ground to the final frequency. Both FT241 and FT243 crystals are available for all channels from U.S. Crystals Inc., 1342 S. La Brea Avenue, Los Angeles 19, California, U.S.A. Current production crystals are available to order from Brookes Crystals Ltd., Lassell Street, Greenwich, London, S.E.10, and from the Quartz Crystal Co. Ltd., Q.C.C. Works, Wellington Crescent, New Malden, Surrey.

Metalwork for the receiver can be obtained from E. J. Philpotts' Metalworks Ltd., Chapman Street, Loughborough.

The two 50 pF variable capacitors used in the pre-selection tuning are Polar type C28-141 (maximum capacity 44·8 pF). The three gang tuning capacitor is a surplus item and may be any value between 100 and 250 pF (see p. 112, R.S.G.B. BULLETIN, September 1960).

The electrolytic capacitors are Hunt's List No. KN409, 50 μF 350 volt d.c. working. All the 0·01 μF bypass capacitors are Hunt's Type W99 Moldseal 400 volts d.c. working.

Unless otherwise indicated, all resistors are Erie Type 8, standard 20 per cent. tolerance. The valveholders are McMurdo B7G and B9A types with skirts and screening cans. The audio output transformer in the author's receiver is a Wharfedale Type GP8 used on its 36 : 1 tappings.

Conclusion

It is hardly likely that the construction of an ambitious receiver such as that described in this article will be undertaken lightly. Assuming construction as a hobby—in available spare time—the work involved is likely to take six months or more. This is a long time for one project but the effort will be found interesting and instructive and a refreshing change from the more usual radio activity.

Finally, it is undeniable that a receiver is the most used and the most important piece of apparatus in an amateur station. Its construction can be guaranteed to result in a pride of possession and a pleasure of operation that will give a greater reward than that experienced with any previous Amateur Radio activity.

Retrospect—No. 2

The second of a series of edited extracts from the record of the Development of Wireless Telegraphy published in the 1922 edition of the "Year Book of Wireless Telegraphy and Telephony."

1845

Lindsay began making experiments across the River Tay, his method being to transmit messages by means of electricity or magnetism through and across the water without submerged wires, the water being utilized as the conducting medium. S. F. B. Morse had just previously made wireless experiments by electrical conduction through water across the Washington canal and wide rivers. Later Dr. O'Shaughnessy Brooke passed intelligible signals across the 4,200 ft. wide Hooghly river in India but found the cost of power prohibitive!

Mr. David Macadie (GM6MD), Region 14 Representative, receiving the Founder's Trophy from Mr. E. G. Ingram (GM6IZ), Executive Vice-President and Zone F Representative.

1867

James Clerk Maxwell read a paper before the Royal Society in which he laid down the theory of electro-magnetism he developed more fully in 1873 in his great treatise on electricity and magnetism. He predicted the existence of the electric waves that are now used in wireless telegraphy.

1870

Von Bezold discovered that oscillations set up by a condenser discharge give rise to interference phenomena!

1879

David E. Hughes discovered the phenomena on which depend the action of what was subsequently known as the coherer. These phenomena many years later were used in early electric signalling. He found that a tube of metallic filings was sensitive to electric sparks made in its vicinity and he was able to obtain such effects on a tube connected to a battery and telephone 500 yd. away.

1882

Sir William H. Preece made an experiment, using Morse's method, to connect the Isle of Wight with the mainland across the Solent on two occasions during the failure of the submarine cable in the Solent.

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

A LIMITED number of copies of the **1960** edition of the *R.S.G.B. Amateur Radio Call Book* are available from Headquarters, price 1/6d. (by post 2/-).

The 1961 edition costs 4/- (by post 4/6d.).

TECHNICAL TOPICS By PAT HAWKER (G3VA)

Keys, Keying and Keyers · Converting TV Receivers · T-Notch Filter for BC453
New Valve Bases · Tunnel Diode Transmitter · Ceramic Filters · Sine-wave Oscillator

TECHNICAL TOPICS has no wish to enter the age-old controversy of c.w. versus 'phone. Microphone, Morse key, teleprinter keyboard or television camera; each can provide plenty of interest, technically as well as operation-wise. Everyone to his own taste—though by coincidence " taste " is German for Morse key. But if excuse be needed for a more prolonged glance than usual at some of the problems facing the c.w. operator, we could quote the late Ken Warner who, when managing secretary of A.R.R.L., wrote " c.w. is inescapably the basic form of amateur communication." Just because the process of switching on and off a

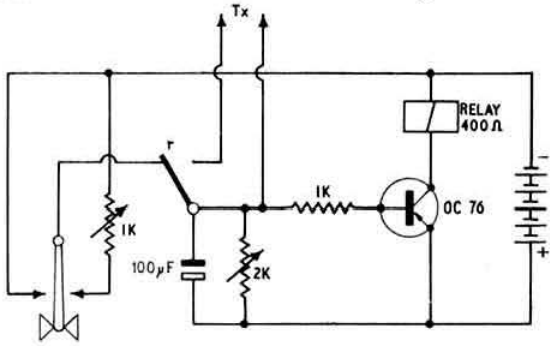


Fig 1.—Transistorized el-bug described by OE8K1 in CQ-OE.

transmitter appears at first sight to be technically so simple, keying is often dismissed rather superficially, even in the standard texts.

Morse keys have a long history. It is said that when the first conception of an electric telegraph code based on a system of dots and spaces came in mid-Atlantic to the American artist Samuel F. B. Morse, he thought in terms of automatic sending; it did not occur to him that anyone could operate a switch fast enough or to the necessary degree of accuracy. That there is much more than meets the eye in the whole business of how the brain controls the hand at speeds greatly exceeding that of normal reaction times was made clear in G2PT's fascinating article (R.S.G.B. BULLETIN, May, 1956) *Morse, Keys, Keying and Codes.* Morse's original code was thus based solely on numbers, intended to be used in conjunction with a " telegraphic dictionary " or code book. Later came the Continental code which still stands up well by modern " communication theory " standards. One wonders what he would have thought of those champions of the thirties whose copying speeds exceeded 70 w.p.m.

The Morse key, basically the same as that used today, soon evolved, the cleavage between the American-style light keys and the more solid European pump handles appearing very early on. Even the semi-automatic " bug " key is now over fifty years old, having been invented in 1904 by H. G. Martin and marketed under the name " Vibroplex." A small insect was stamped on the key as a trade mark, hence the name " bug." In the thirties a rather complicated mechanical key based on the bug but having two booms, one for dots and the other for dashes, was marketed but never achieved widespread use. The first practical amateur electronic key providing automatic dots and dashes was probably that of Harry Beecher (W2ILE) using a gas triode (thyratron), described in *QST* in April, 1940—exactly 21 years ago.

Electronic Keys

Though " el-bugs " (does the credit for coining this term belong to OZ7BO who did so much to popularize them in Europe?) have now reached maturity, there is still a steady flow of new ideas.

These range from the transistorized " Ultimatic " key (17 transistors!) using computer techniques (*QST* September/October, 1960) and the multivibrator key mentioned in *T.T.* (February, 1961) to the simple transistor type noted by G2BVN in *CQ-OE* (November, 1960) and shown in Fig. 1. Another basically simple idea was described in the German *Funk-Technik* (March 1, 1961) and uses a " slugged " relay with two separate windings; one has a 100 μF electrolytic capacitor across it to govern the holding over time, the other a 300 μF. For lower speeds additional capacitors with the same relationship can be switched into circuit.

It is unusual to find an electronic semi-automatic key (auto dots only) but G3OIT sends along the circuit of one which he has developed (Fig. 2) and which gives no trouble. He writes, " The paddle assembly only need be mounted on the operating table, the rest can be built into the transmitter. Full break-in can be accomplished if the receiver and the transmitter exciter stages are run from the same h.t. supply, which is then joined to B, while A supplies the receiver and C the exciter. The p.a. should be well clamped, and it is advisable to include a second relay in series with the first one for keying an audio oscillator for monitoring. The VR circuit provides a sawtooth oscillator which with correct component values will hold over the relay for the required dot time."

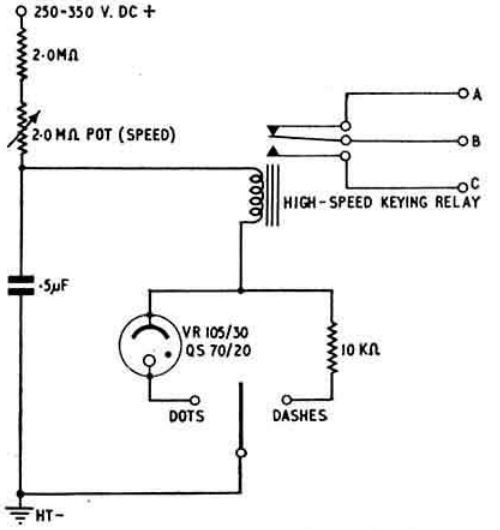


Fig. 2—Semi-automatic electronic key used by G3OIT.

Presumably one day the completely foolproof electronic key which in no circumstances could be incorrectly keyed will come along: when this happens it may be necessary to re-introduce some element of uncertainty to retain the operator's interest. It is said that an American firm marketing cake mixtures deliberately leaves out one simple item which the housewife adds . . . to make her feel she is exercising her skill as a cook!

Poor Signals

The problems of telegraphy are by no means confined to the choice of a suitable key. One has only to tune across the c.w. bands to realize that not all twittering thrushes, chirruping canaries and pouting pigeons are of the winged variety. As receiver selectivity curves are sharpened up, it becomes increasingly clear that full advantage cannot be taken of the theoretically extremely narrow bandwidth of A1 until vast numbers of stations improve the stability and keying characteristics of their signals. It does not need much drift on a signal for it to disappear between " overs " on a receiver having a 200 c/s bandwidth and good shape factor; while on such a receiver clicks, thump and chirp make signals unnecessarily difficult, if not actually impossible, to copy.

The requirements of high-stability oscillators and correct " lag " filters have been described repeatedly in amateur journals, but it is still worth taking a brief look at some of the lesser known causes of poor keying characteristics.

Keying Thump and Instability

With a conventional capacitor-input ripple filter and a separate power pack for the final stage, h.t. voltages under no-load conditions are likely to be 50 per cent or so above those existing at normal load. Thus with the key contacts open the filter capacitors are charged to the no-load figure; when the key is depressed this higher voltage is applied momentarily to the power amplifier. Unless some effective " lag " is applied *to this stage* the radiated power will be considerably higher at the commencement of each keying pulse, dropping sharply to its normal level. This tends to produce keying " thump," detracting from the readibility of the signals and causing unnecessary frequency spread. It can be cured by increasing the time-constant of the lag-filter to what would otherwise produce excessively " soft " keying.

Apart from, and possibly more important than the thump, is that such conditions tend to produce sharp spikes of spurious emission which may occur at almost any frequency. This is because many power amplifiers which are perfectly stable at normal anode and screen grid voltages suffer from self-oscillation and/or parasitic oscillation when these potentials are increased. To overcome this fault (which is often difficult to identify without an oscilloscope) it is necessary either to ensure that the stage is completely stable under all the voltage conditions which can arise during operation or alternatively to improve the voltage regulation of the h.t. power supply. The simplest method of improving regulation is to change to a choke-input ripple filter, either by the incorporation of a swinging choke or more simply by omission of the reservoir capacitor. It is worth noting that for A1 operation, good voltage regulation (particularly of the screen potential) is often more important than eliminating every trace of ripple.

Occasionally, when using an h.t. supply that is only lightly loaded under key-up conditions and is inductively smoothed, it is possible for " ringing " (that is, a series of damped oscillations) to take place in the smoothing choke when the key is pressed, and this can adversely affect the keying characteristics.

Contact Bounce and Relays

Under normal conditions, the actual key acts purely as an on-off switch and has no bearing on the radiated signals. That this is not always true was proved some years ago at G3VA when it was noticed that clicks appeared on the signal whenever a certain bug key was used. This was almost certainly due to " contact bounce " which can also easily occur in some relays and which produces a sharp spike of radiation at the commencement of each keying pulse—in a bug key usually only on the dots. This can often be cured by careful adjustment of the key (particularly by increasing damping on the dot U spring) so that no bounce occurs, or alternatively by increasing the time-constant of the lag filter so that the first " spike " is completed before the transmitter output rises.

Relays used in keying circuits must be of the high speed type. This has not always been appreciated even by professional designers, and much of the wartime Morse would

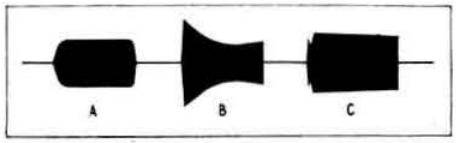


Fig. 3—Typical dot waveforms based on oscillographs taken by W2BFB, using high speed dots (75 w.p.m.) to accentuate the slope. (a) Ideal, (b) Poor voltage regulation, (c) Relay contact bounce with too steep wavefront.

have sounded better without the severe dot clipping introduced by relays at many installations. The dot length for good manual keying is of the order of only 30 milliseconds or so; thus clipping can begin to be troublesome (particularly with an operator who already tends to clip his dots) if the contact delay exceeds about two milliseconds. In order to conserve the life of a good high speed relay it is advisable to key at a point of relatively high impedance and also low voltage; for example in grid and screen grid keying or to control a valve keyer. Valve keyers have much to commend them, particularly the ease with which lag characteristics can be controlled.

Note that when a keyed stage in which the correct rounding or lagging characteristics has been achieved is followed by a succession of class C frequency multipliers and amplifiers, the keying pulses will tend to be sharpened and may cause clicks. This is one of the reasons for using " sequence " keying of more than one stage (see, for example, *T.T.* April, 1959).

Where a transmitter is used also for anode modulated telephony and keying is in an early stage, a final shaping of the waveform can sometimes be obtained by making use of the inductive effects of the modulation transformer. But extreme care is needed because of the very high voltages induced across the transformer by the sudden change in current—voltages which can reach as high as six to ten times the applied d.c. For this reason most operators prefer to play safe and short-circuit the transformer winding.

Guidance on a small valve-keyer and the use of oscilloscopes for checking keying waveforms was given in an article prepared by the R.A.F. Amateur Radio Society (BULLETIN, May, 1952).*

Screen Keyer

Screen grid keying is not as popular as it might be. This is largely due to the need, during key-up periods, to apply sufficient negative voltage to cut off completely the anode current and so eliminate the " spacer " signals which occur if the screen feed is simply broken. Fig. 4 shows a combined valve keyer and clamper valve arrangement for screen keying which does not require an additional source of negative voltage. Both the bias voltage for the keyer valve and the negative blocking voltage for the screen of the

* This isue is now out of print.—EDITOR.

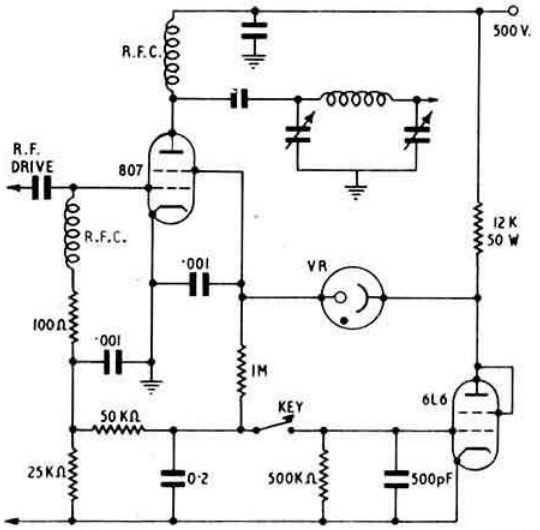


Fig. 4—Combined clamper and screen keyer. Component values will require modification with different valves or h.t.

r.f. power valve are derived from the r.f. drive. The screen supply for the r.f. valve passes through a dropping resistor and a voltage regulator tube. When the key is open the clamper valve conducts and the voltage across the regulator tube drops below its extingushing voltage, thus removing the positive voltage and replacing it through the high value resistor with a negative blocking voltage. The keying characteristics will be determined by the capacitor-resistor network in the clamper valve grid circuit and also by the slight delay in ionization of the VR tube.

T-Notch filter for BC453

To judge by the response to a recent note on BC453 conversions, this equipment—with its 2·5 kc/s selectivity—is still as popular as ever. One new major conversion by W2PPL appeared in *QST* (February, 1961), using the Command set as the heart of a high performance triple conversion receiver. An interesting feature of this conversion is the inclusion of a bridged T-notch filter (see *T.T.* January, 1960) in the 85 kc/s section to provide a variable depth notch for removing heterodynes. At this i.f., these filters can be used "straight" without the *Q*-multiplication generally found in 455 kc/s i.f. receivers. Fig. 5 gives the essential details, though the problem remains of finding a British source

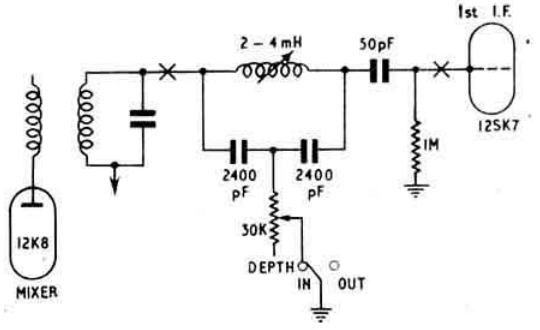


Fig. 5—T-notch filter for BC453 85 kc/s i.f. strip described by W2PPL in QST.

of a suitable high *Q* variable inductor of approximately 3 mH value preferably with panel control to facilitate tuning of the notch through the i.f. passband.

Swords into Ploughshares

The American journals have recently run several articles on turning obsolete television receivers into low-cost amateur equipment (for example a 65 watt multiband transmitter in *QST*, March, 1961). With old TV chassis readily available on both sides of the Atlantic at almost give-away prices this type of conversion would appear highly attractive. Unfortunately, although quite a lot of useful components and the chassis can be obtained from old British models, the major disadvantage of our sets compared with the American ones is that it is now many years since they included a fully isolated power supply—one of the main attractions of the discarded American receivers. It is also difficult to utilize valves with odd voltage ratings, intended for series-chain operation.

Tunnel Diode Transmitter

Now that the output of h.f. transistors can be measured in watts, it is clear that the real QRP enthusiasts will soon be dismissing them as power houses. But their next step is already mapped out. In *Radio-Electronics* (March, 1961), ZL1AAX describes a 3·5 Mc/s tunnel diode transmitter which draws some 50 mA from a 1·5 volt battery but promptly dissipates about 30 mA in a potentiometer designed to provide low source impedance. Exactly how many milliwatts are exhaled by this rig is not known, but it chalked

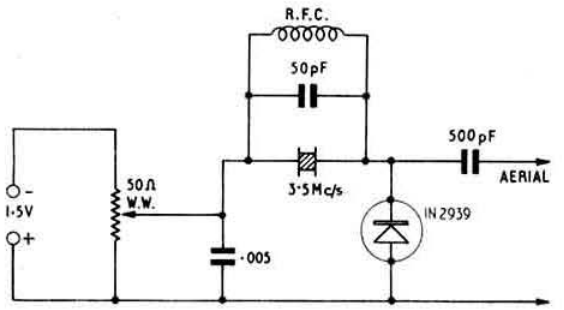


Fig. 6—ZL1AAX's transmitter using U.S. General Electric 1N2939 tunnel diode.

up an RST339 report from ZL1AOF, 160 miles distant. Fig. 6 thus shows the form which our vest-pocket transmitters of the next decade may take. If you feel like trying this rig, it is advisable to read the original article as care is needed to avoid spurious emissions.

Ceramic Filters and Transformers

Piezoelectric effects are not confined to the classic materials of quartz and Rochelle salt. In recent years increasing use has been made of certain ceramics, such as barium titanate for pick-ups and lead zirconate titanate (PZT). Small discs of PZT ceramics can be resonated in the radial dimension and then used in bandpass i.f. filters in much the same way as quartz crystal, though at present the *Q* is considerably lower. An article in *Electronics Weekly* (March 1, 1961) gave some account of their development and explained how, by providing two sets of electrodes, PZT ceramics can be used directly to provide an impedance transformer and thus can be used as a complete replacement for an i.f. transformer. This type of piezoelectric ceramic i.f. transformer is particularly useful for selective transistor receivers, providing a convenient means of obtaining low impedances for transistor input circuits. Such transformers

are in fact used in the new British Heathkit " Mohican " receiver.

For those who are interested in designing bandpass ladder filters using ceramic resonators and who can face the mathematics, there is an article on this subject in the March *Electronic Engineering*.

New Valve Bases

After several years of relative calm, we now seem destined —to judge by American trends—for a whole new batch of valve bases. Apart from the miniature 12 pin base with two guide lugs needed for the R.C.A. ceramic-metal Nuvistors, there is a new miniature 10 pin base coming into use, much the same as the noval (B9A) but with an extra pin in the centre. Then there are the squat " Compactron " range of multiple valves, requiring a new 12 pin base. Finally, several companies have introduced all-glass valves intended to replace the remaining octal-base types, these have nine-pin bases with a pin circle diameter of 0·687 in.

Transistor Sine-wave Oscillator

A two-terminal oscillator using two general purpose transistors and said to produce almost pure sine-wave output over a wide frequency range (actual frequency is

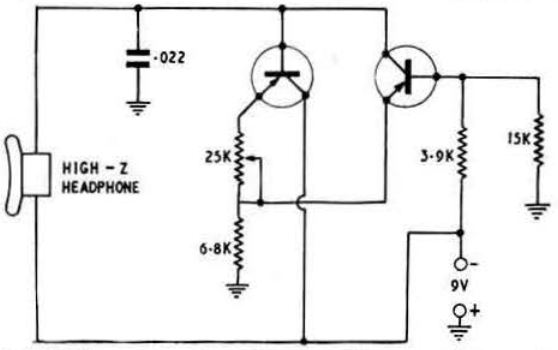


Fig. 7—Wide-range negative resistance oscillator providing near sine-wave output.

largely determined by the value of the inductive load) is described in *Radio-Electronics* (March, 1961). Using a high impedance headphone for the inductive load, this negative-resistance oscillator provides some 0·3 volt output at about 1500 c/s with the component values shown in Fig. 7. The two CK722 transistors could be replaced by almost any general purpose a.f. types.

Also Noted

An extension of the inverted-V dipole principle (*T.T.* October, 1960) but permitting a much smaller base area is ex-PA0GE's contribution (*CQ*, February, 1961) to space problems with low frequency aerials. A single 40 ft. pole and a base area some 42 ft. square is sufficient for a full wave 3·5 Mc/s aerial; general appearance is indicated by its name—" The Guywire Pyramid."

An account is given in the *Journal of the Brit. I.R.E.* (January, 1961) of the reception of B.B.C. television sound transmissions (41·5 Mc/s) at Halley Bay, Antarctica, on no less than 130 days between April/October 1958 using a five element Yagi.

In a letter to *QST* (December, 1960), K3IQU suggests that those who spend much time flattening the double humped response curve of a crystal lattice filter may be wasting their time: there is some evidence that a humped filter response may actually improve reception when signal-to-noise ratio is low.

A recent article in *Proc. I.E.E.* indicates that electric shock risks may be considerably greater in summer than in winter—so watch out as the days grow warmer.

A Transistorized Mixer Fader Unit

By C. H. L. EDWARDS (G8TL)*

THE unit to be described was designed to mix two microphones for Radio Amateur Emergency Network operation in a car but it is equally suitable for mixing microphone in other types of service, i.e. tape recording. It uses two circuits of the type shown in Fig. 1 feeding a common output.

As there was plenty of gain in hand on the writer's mobile modulator no further amplification was required and the

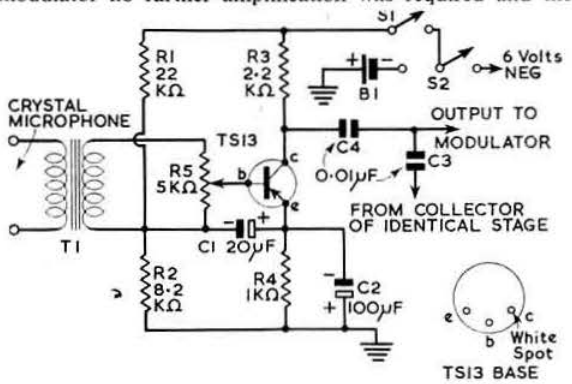


Fig. 1. Circuit diagram of one section of the simple transistorized mixer fader unit. C1 and C2 are 12 volt sub-miniature electrolytics. R1, 2, 3 and 4 are ¼ watt rating. T1 is a miniature microphone transformer.

values shown are therefore to provide mixing rather than additional gain. If it is necessary to provide amplification as well as mixing the circuitry may be modified as shown in Fig. 2.

Each section of the mixer unit is of similar design, the number of sections depending on the number of microphones it is desired to accommodate. All the sections are fed into the common output plug through 0·01μF capacitors. The transistors are S.T.C. TS13s which are ideal for the job.

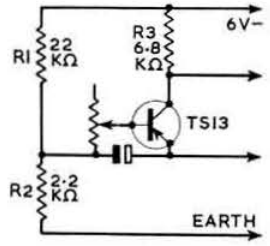


Fig. 2. Modifications for increased gain.

The unit carries its own power supply (an advantage for mobile or portable operation) but is provided with switching so that external batteries can be used whenever possible. The internal battery is a Mallory TR115 6·5 volt mercury transistor power supply with a capacity of 350 mAH. It is mounted in a small metal box fitted with a lid in order to protect the other components from corrosion should the battery be left in its case long past its useful life. The total drain of two sections is 2·4 mA, so nearly 150 hours of continuous operation is possible before a new cell is required.

The components are mounted on an aluminium chassis 4 in. × 3 in. × 1¼ in. All leads are kept as short as possible and 18 s.w.g. tinned copper wire is used to ensure rigidity. Care should be taken when soldering to the transistors and the miniature Egen 5 K ohms potentiometers. The use of heat shunts is recommended. However, apart from this precaution, the construction is simple and no one should have any difficulty in getting the unit to work satisfactorily.

* *28 Morgan Crescent, Theydon Bois, Essex.*

The MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

WHENEVER operators interested in DX working meet, a certain way of provoking discussion is to mention the DX Century Club. In order to correct some of the woolly ideas now current on this subject the basic facts will be briefly mentioned. The DX Century Club Certificate is issued by the A.R.R.L. to those operators who can produce evidence of two way communication with at least 100 different countries. So far the going is easy but directly one attempts to define a " country " trouble commences. The A.R.R.L. have enumerated certain factors which are taken into account when determining country status. These are: (i) the degree of political-administrative independence, (ii) the geographical separation, and (iii) whether the given areas have foreign land between them.

With regard to geographical separation by water, where the place in question has no political sovereignty it must be at least 225 miles from the nearest land to which it is politically or administratively attached to qualify for separate country status. Where foreign territory divides a country there will have to be a minimum distance of 75 miles of this territory separating the two areas in question. These considerations do not apply to islands in a natural grouping. It will be seen, therefore, that geographical separation from a mainland might be sufficient to produce a separate listing where the administrative position would not be justification. Similarly, the degree of autonomy may well be the determining factor, where the physical separation is insufficient on its own.

Such, then, are the factors considered by the A.R.R.L. when determining country status, and with which, apparently, a large number of operators find fault. It has been suggested that (i) the creation of " countries " favours the American continent, and (ii) the value of the DXCC certificate has decreased and, therefore, a new certificate of similar type should be created and for which the rules should be framed in a different manner. In so far as the value of the certificate is concerned the figures given in February *M.O.T.A.* prove that interest continues at a high level. Moreover, it is felt that whatever the deficiencies of the present arrangement it would be unwise to attempt to originate a new certificate having world-wide appeal in view of the number of new awards now being offered every month.

The WPX award (based on prefixes) may provide an alternative to those unwilling to adopt the DXCC as the yardstick of their DX achievements and for the adherents of the latter the *Countries List* recently produced by the R.S.G.B. should be invaluable.

News from Overseas

Wilkes Land, Antarctica, may be heard around 10.00 on 14,300 kc/s in the persons of **VK0VK** (Steve) and **VK0WB** (Bill) who operate a KWS-1. The location is 110°E, 61°S. This information came via VK3AXX who also mentions the increasing number of Australian stations now going over to s.s.b.

9N3PM/AC4 is the call allotted to the Himalayan expedition of Sir Edmund Hillary. Based on Katmandu, the expedition may be heard using a KWM-2.

5U7 is the new prefix for the Niger Republic, formerly FQ8. 5U7AC is active on 14 Mc/s c.w. and his address appears in *QTH Corner*. FF4AB is now signing TU2AE from the Ivory Coast.

In a letter to G3AAE, Paul, **VQ8AD** sends the following news from **Mauritius:** VQ8BM and BC very active after 16.00 on 14 Mc/s c.w.; VQ8AR active on a.m.; VQ8AP planning to go to St. Brandon on August 1; VQ8AH now QRT. VQ8AD has in his possession the logs for **VQ8BBB** and will be pleased to confirm contacts direct if an I.R.C. is enclosed.

Sven Elfving (Solgardsgat 15, Ornskoldsvik, Sweden) of the Polar Bears Radio Club has now come up with a call book listing some 900 stations in the rarer countries of the U.S.S.R. including 350 from UA0. Location, zone and oblast number are given for each station, and the call book may be obtained from the above address, price 10/-.

W4OSG, the secretary of the **Taiwan American Radio Club,** reports the establishment of a QSL Bureau serving all stations having BV prefixes. The address will be found in *QTH Corner*. The **K6BX Call Book Goodwill Programme** has now accounted for the despatch of over 3,000 call books to DX stations but nearly 1,000 applications still remain to be filled. If you have an old *Call Book* a line to K6BX will bring the QTH of a suitable recipient.

ZC4CT mentions the possibility of a separate prefix for the Republic of Cyprus. At present there is a standstill in the issue of new licences.

VE3BQM is the call of ex-G3MXF now active from the shores of Hudson's Bay, with a beam for 14 and 21 Mc/s, and looking for G contacts.

K2HEA and K2MGE (Irv and Dorothy Strauber), Co-Editors of the **CQ** *S.S.B column and* **The Sidebander.** *Very active on 14 and 21 Mc/s, K2MGE was voted " Sidebander of the Year, 1961 " by the SSBARA. She is the first XYL to earn the " Worked 200 " award.*

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

DXpeditions

After the successful operation from **UA3FE/0** in Zone 23 (when s.s.b. contacts were made with 86 countries in 38 zones) the 130 watt p.e.p. rig was sent to the Uzbek S.S.R. and operated under the calls **UA4IF/UI8** and **UI8AG**. UM8KAA was also activated. The rig is scheduled next for UA2.

ZC4CT still has intentions of visiting **Jordan** but there is no further news at present. Assistance is forthcoming from the R.A.F. Pergamos A.R.C. (ZC4PC) but s.s.b. equipment is, unfortunately, not available.

Latest news on **PX1EP** is that 24 hour a day operation is planned for the first week of May. A.m. will be the *modus operandi* and the QSL address appears in *QTH Corner*.

Radnorshire is the destination of the Purley and District A.R.S. during the weekend of April 22 to 24. All bands from 1·8 to 144 Mc/s will be used with the following calls: 1·8 Mc/s—GW3JSQ/P; 3·5 to 28 Mc/s—GW3OGO/P; 144 Mc/s—GW3KVC/P.

The long deferred trip to the **Laccadive Islands** became reality during the last two weeks of March when **VU2NRM** appeared on c.w. and s.s.b. Conditions were not at their best and signals were not strong but stations in the Mediterranean area reported excellent reception. Fortunately the stay on the Laccadives turned out to be nearer two weeks than the 48 hours at first freely mentioned.

Kure Island, from where **KH6ECD** radiated a potent signal last month, is an atoll located at the north-western end of the Hawaiian Islands and about 60 miles west of Midway Island. There are apparently no inhabitants except large numbers of gooney birds who did not appreciate the intrusion. At the time of writing no decision was available on the question of separate country status.

Contests

The annual c.w. contest of the **U.S.S.R. Federation of Radio Sports** will take place from 21.00 on April 29 to 21.00 G.M.T. on April 30. The bands used will be from 3·5 to 28 Mc/s, and the numbers to be exchanged will consist of the signal report plus the serial number of the QSO, e.g. 599001. Logs should be sent to Box 101, Moscow, to arrive not later than May 15. G2BVN has a copy of the complete rules (in Russian).

The QSO Party of the **Goose Bay Amateur Radio Club** will take place from 00.01 G.M.T. on April 14 to 23.59 on April 24. All bands and all modes may be used, and stations outside the U.S.A. and Canada who contact three club members, or one club member on three bands, will receive the Worked All Goose certificate. Club members are: VO2s AA, AH, AV, AW, DP, ER, GR, HB, JH, NA, RC, RN, UA, WW, VE1MW/VO2, K1APZ/VO2, WA2AWN/VO2, WA2DSW/VO2, K3MJV/VO2, K0WRQ/VO2 and W0WWH/VO2. Lists should go to Jack Willis, VO2NA, Aeradio, Dept. of Transport, Goose Bay, Labrador.

Details of the PACC Contests (c.w. and phone) are available on receipt of a s.a.e. from G2BVN.

The Central Radio Club of Czechoslovakia is organizing a c.w. contest on the 1·8 Mc/s band called "**CW Monday Party.**" This affair is to be run from 19.00 to 21.00 on the second and fourth Monday in every month during 1961. The contest call is "CQ TP" and numbers to be exchanged will consist of the RST and the serial number of the QSO.

Sture Jönsson (SM7XY) in his shack at Växjö, Sweden. Active since 1934, SM7XY is now primarily interested in constructional work and the transmitter, beam control unit and bug-key shown in this picture are all home-built. The front panel of the transmitter was engraved with a machine design and built by him. SM7XY hopes to visit England in May.

(Photo by G3LEQ)

QTH Corner

BV stations	Taiwan A.R.C., Box 24, USTDC, A.P.O. 63, San Francisco, Calif., U.S.A.
CN2AR	R.C.A. Box 2087, Socco, Tangier, Morocco.
FB8CH	G. Picquette, Service de Securite, Majunga, Madagascar.
FG7XH	Box 335, Pointe-a-Pitre, Guadeloupe, W. Indies.
FQ8AC	A. Castry, Boite Postale 2253, Brazzaville, Rep. of Congo.
FQ8AX	Boite Postale 218, Brazzaville, Rep. of Congo.
HI8GA	P.O. Box 99, Ciudad Trujillo, Dominican Republic.
HK2WO	F. Abualara, Apartado 52, Mompos, Colombia.
ex-I5GN	15 Fawnridge Drive, Peekskill, N.Y., U.S.A.
KH6ECD	via KM6BI.
MP4BDG	Zebemah Road, Manama, Bahrein Is., Persian Gulf.
OA4KU	M. Marcias, Box 375, Lima, Peru.
PX1EP	Master Sgt. F. L. Bates, 431 F.I.S., Box 5004, A.P.O. 286, N.Y., N.Y., U.S.A.
VS1, VS4, VS5 and ZC5 Bureau:	P.O. Box 777, Singapore.
VS5JS	J. Sietsma, c/o Brunei Shell Petroleum Co., Seria, Brunei.
VU2NRM	via W4ANE.
ex-ZB1NR	45 Myrtle Road, Shirley, Surrey, England.
ZD9AL	via ZS5SG.
ex-ZD2CKH	K. Harrisson, 25 Morris Road, S. Nutfield, Redhill, Surrey.
ex-5N2JM	J. Macintyre, Tingha, The Glebe, E. Aberdour, Fife, Scotland.
5N2RSB	R. S. Briggs, 1 Brigade Signal Troop, Kaduna, Nigeria.
5U7AC	B.P. 1002, Niamey Airport, Niamey, Niger Republic.
6W8AU	P.O. Box 971, Dakar, Rep. of Senegal.
6W8BQ	P. Maire, Box 190, Dakar, Rep. of Senegal.
9M2 Bureau:	P.O. Box 777, Kuala Lumpur, Malaya.

* * *

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

Awards

New rules for the **Diploma Da Africa Portuguesa** (DAP) certificate have been published by the L.A.R.A., the national society of Angola. It is necessary to produce confirmation of contacts with stations in the Portuguese colonies of Africa as follows: CT3-2; CR4-3; CR5-1 (Guinea or Sao Tome); CR6-12; CR7-12. As contacts with the same stations on different bands are not allowed, one must, therefore, contact 30 different stations to obtain this attractive certificate. A copy of the rules is obtainable by sending a s.a.e. to G3IEC.

Revised conditions for the **W.A.OE Diploma** are that European stations must have worked three OE stations in each of the eight Austrian districts. A verified list of the contacts made should be sent with 10 IRC to the OE.V.S.V. Diploma Manager, Ing. H. Satz, Klagenfurt 1, P.O. Box 500, Austria. A certificate called H.A.OE. is available to receiving stations. Contacts may have been made on any licensed amateur band and using any mode. The operative date is since April 1, 1954, when licenses were first officially available in Austria.

The first three winners of the **150 Certificate** offered by the *Radio Amateur Yearbook* were: GB2SM, the Science Museum station; W8JIN, J. W. Ringland and UR2BU, K.

Kallemaa. For other aspirants to this award the closing date is August 31, 1961.

The Directory of Awards, published by K6BX, can now be obtained by amateurs in the U.K. by sending a remittance for 27/- to G2BVN, whereupon the book will be despatched direct from the U.S.A. to the subscriber. In addition to the *Directory*, the subscription covers the issue of four quarterly revision and addition supplements. There has been some difficulty in obtaining the three ring binders necessary for the *Directory* and these are now obtainable with the first issue for an additional 10/6d. The **DX-QSL-NL,** a quarterly news bulletin devoted to QSL listings and other pertinent DX information, can be obtained at a yearly subscription of 11/6d. The April issue will contain QSL information for nearly 2,000 stations. It should be mentioned that the various services and publications run by K6BX are on a non-profit basis.

The **Worked All VQ Award** is offered by the Radio Society of East Africa, and claims are dealt with by K. R. Long, VQ4KRL, P.O. Box 30077, Nairobi, Kenya. A remittance of 6/- should be enclosed with all applications and this covers return postage by surface mail.

Congratulations to **G3NUY** and **G3FKM,** the sixth and seventh G stations to receive the Worked 100 S.S.B. Certificate offered by *CQ* Magazine.

DX Briefs

UA1KED in Franz Josef Land has been worked by European stations on 14 Mc/s c.w.

The suffix " Z " appearing in a VU call indicates a novice licence, e.g. VU2THZ worked on 14 Mc/s c.w. by G6UT.

MP4BDG, ex-G3LOL, will be active on 14 and 21 Mc/s phone and c.w. and will be looking for G contacts. Address in *QTH Corner*.

5N2JM is now back in the U.K. on retirement from H.M.O.C.S. and asks that all stations requiring confirmation of a contact should write, enclosing s.a.e. or I.R.C., to the address given in *QTH Corner*. 5N2JM mentions that with the onset of the longer evenings in the Northern hemisphere the 14 Mc/s band will be open until at least 21.00 giving the opportunity for more G—5N2 contacts.

ZD2CKH is another now in the U.K., and operating as G3OPJ. 'CKH believes that all QSLs have been answered but any deficiencies can be remedied by writing to the address in *QTH Corner*.

5N2RSB is now active from Kaduna and on the lookout for G QSOs between 20.00 and 23.00 on 14 Mc/s, both a.m. and c.w.

KG1CC at Camp Century, Greenland, is believed to be the only amateur station deriving power direct from nuclear sources. The rotating mast for the beam runs through the ice roof of the station, as all living quarters are underground (or rather under ice!). KG1CC is often to be heard on 14 Mc/s s.s.b.

HZ1AB (operator W9FQM) is active daily on s.s.b. on 7296 kc/s (G3GJQ).

ZB1NR has returned to the U.K. from Malta and will answer QSL requests sent to the address in *QTH Corner*, provided pertinent data and s.a.e. are sent.

AP2F and **VU2GI** were active during 1949, but any station still lacking a QSL may obtain this by writing to H. A. M. Whyte (VE3BWY) and sending s.a.e. or IRC.

W.A.C.

Following the note last month information regarding fast W.A.C. QSOs has been coming in but at the time of writing the position is still in doubt. G6CJ remembers a prewar a.m. WAC QSO by G5ML in a very few minutes, and also a WAC of his own in 1936 which occupied but 20 minutes on 28 Mc/s. Dud also mentions a QSO with VK5KO on four bands in just over 30 minutes during 1948 (there was no 21 Mc/s allocation in those days). More recently ON4IZ made WAC in 100 minutes on 14 Mc/s c.w. on January 6 by contacts with EA6, W7, KH6, ZS4, UF6 and PY4. The aerial in use was a ground plane. During the period of operation by VU2NRM, G2BVN heard practically simultaneous calls on the frequency from 4X4, CN8, VK3, PY4 and numerous Ws. This was on 14 Mc/s at about 19.00. G3FBA recollects operation during N.F.D., probably 1948, when WAC was made within 15 minutes, using a collection of V beam aerials, and, of course, 10 watts maximum input.

(On January 4, 1938, G5ML, VK4JU, W4DLH, SU1KG, HK5AR and VU2CQ took part in a unique all-continents round table relay covering 54,100 miles in 3 minutes 20 seconds. Telephony was used at all stations. W4DLH originated the round table and acted as key station. The contacts took place on frequencies in the 14 Mc/s band.—EDITOR.)

One of the best-known voices heard on 80m is that of old timer Fred Mayer (G2LZ), who operates from his yacht **Rona** *in Weymouth Harbour. When this picture was taken, G2LZ (left) was entertaining a number of other old timers including the Region 9 Representative (Reg. Griffin, G5UH, centre) and Vic. Sims (G5VS). The ladies are Mrs. Sims and, in the foreground, Mrs. Mayer (" Sunshine " to all 80m enthusiasts). The shack can be identified by the position of the lead-in. Fred Mayer has been licensed for nearly 50 years.*

Band Reports

Although conditions have been fair to excellent during the period under review the various contests did bring an increase in DX activity, enabling some new ones to be worked.

During the weekend of the R.S.G.B. **1·8 Mc/s** contest conditions were excellent with U.S. Loran audible at 23.30. A number of East Coast Ws were heard beginning with W2FYT at 00.15. G5DQ worked W4KFC and numerous others. EL4A and VP2VA have also been heard on the band, the latter around 05.30. S.s.b. was heard from W4 at around 04.45 on 1805 kc/s. During one spell between 02.00 to 07.00 VE1ZZ worked 26 European stations, including G3FPQ, the latter also contacting, apart from the U.S.A., UB5WF (04.00) and ZC4AK (20.20).

On **3·5 Mc/s** conditions have always been interesting, if not spectacular, and VE1ZZ is now up to 129 on this band. The North American stations are usually audible from about 23.00 with South America shortly afterwards, and closing with ZL around 08.00. The earliest W heard was W2KQT at 23.10 and the latest W5BRR at 08.00. Other DX logged includes: VP5KT (05.00); CO2PY (07.50); HR3HH (07.00); KG1BU (00.10); YN1TAT (02.00); ZLs around 06.00 to 07.00; KP4AWH (23.35); YV1AX (03.25). On s.s.b. G3FPQ has worked all W call areas except 6 and 7, including an interesting QSO with K9BSE/Mobile 8, the latter using a KWM-2. Without doubt an interesting band which may well improve in the months ahead. B.R.S.20317, now up to 92 countries, mentions a certain ZL5HUS giving his name as " Xio " active during the A.R.R.L. contest. This brings to

DXotic Showcase

Call-sign	kc/s	Mode	G.M.T.	Country
HK0TU	14,345	s.s.b.	09.15	Malpelo Is.
AP2CR	14,343	s.s.b.	15.30	E. Pakistan
KC6UZ	14,275	s.s.b.	15.03	E. Carolines
VU2NRM	14,275	s.s.b.	20.45	Laccadive Is.
VR6AC	14,250	s.s.b.	06.50	Pitcairn Is.
UA0KYA	14,042	c.w.	08.45	Zone 23
ZD9AM	14,020	c.w.	19.45	Gough Island
5U7AH	28,320	a.m.	16.15	Niger Republic

mind 6L6GT who asked for QSLs via " Lighthouse Larry "!

7 Mc/s has probably produced more real DX than either of the other two l.f. bands, QRM permitting. The B.E.R.U. Contest encouraged activity and QSOs with the following were recorded by G3FPQ: MP4; VK; ZL; VP3MC; VP9BO, VQ2; VQ4; VQ5; VS9 and VU2XG, all on c.w. B.R.S.20317 records FF4AL (19.45); HP1IE (09.40); CR7CI (02.30); JT1AC (19.45); PY7LJ (20.30); OA4FM (23.20). Signals from North America were logged between 19.30 and 10.30, W6USA being heard at the latter time. During a personal QSO with VE7LB the latter expressed surprise at the difficult conditions experienced on this band in Europe, particularly the very heavy commercial QRM. In North America, 7 Mc/s is regarded by many as one of the major DX bands, and one can only hope that our restricted band of 100 kc/s will be kept clear of some of the more penetrating broadcast signals.

14 Mc/s has probably carried most of the DX traffic during the past month but conditions have been very variable. Several DXpeditions including VU2NRM, AP2CR (E. Pakistan) and KH6ECD (Kure Island) have contributed to heavy activity. The c.w. section has produced consistent results and UA0KYA has frequently been a strong signal between 07.30 and 09.00. 5U7AC is a new one on the band and has been heard up to 20.00 G.M.T. on c.w. HVICN has been active, usually over the weekends, at 15.00 to 16.00, and with the arrival of QSL cards an attack on the backlog is promised. Operators looking for contacts with the various U.S.S.R. countries would do well to scan the low end around 07.00 to 08.00 when all the prefixes have at one time or another been heard. UI8AG has been a good s.s.b. signal as late as 12.00, and similar results may be expected in due course from UM8KAA. From the Pacific there have been some very worthwhile signals including KC6UZ (E. Carolines) at 16.00; KW6 (15.00), BV1 (16.30); KG6 and KR6 (13.00 to 15.00); KH6 (18.00 to 19.00) and VR3 (07.30). KW6DB has provided an outstanding signal from Wake Island, while KG6AJB does the same from Guam. ZS4MG mentions that AC5PN has been very active during Sundays generally between 13.00 and 15.00, and with a T7 note. Frequently heard in Kroonstad with a strong a.m. signal on about 14,130 at 15.35 is VS5JS who QSLs exceedingly swiftly on receipt of IRC. There have been numerous 6W8 stations active, mainly on c.w., during the period between 14.00 and 17.00, and the QTH can be located in the *Call Book* by the substitution of FF8 for 6W8. ZD9AM has been frequently heard on c.w. around 19.30 (QSL via W2CTN) from Gough Island, whilst at the other end of the band VR2BJ has provided an outstanding s.s.b. signal at 08.30. At this time, however, the QRM in Fiji is apparently very heavy and patience is necessary.

The advent of considerable numbers of stations on s.s.b. has produced a deterioration in operating habits, and to those listening it is quite obvious that many of the operators calling DX have never heard the station in question, but have merely joined in on the strength of a call by someone else. Those who are active on the band will know the regular offenders.

21 Mc/s has been patchy but on the right day DX in quantity has been workable. In the morning about 09.00 VK9RO has produced strong signals from Papua, followed, it is good to see, by a rapid QSL. A number of the new French Republics have been heard on a.m. between 16.00 and 18.00, with 6W8CU heard as late as 18.50. FQ8HZ provides an excellent signal from the Congo Republic around 16.00 on 21,250 kc/s. G3NAC laments the curtailment of the band reports, but hopes that the time of hearing DX stations will continue to be mentioned. Your scribe is in full agreement with this, and accordingly lists (from G3NAC): EP2AT (12.50); FG7XH (21.13), a very worthwhile catch; FB8CO (16.20); VP3MC (21.15); VP4TP (13.05) and VP8DW (19.30). On the c.w. end UA0GF has been heard consistently around 08.00 and made many QSOs from Zone 19. UA0LO was logged on Sunday mornings on a.m. at 11.30. UA0LA has been suffering from TVI which perhaps has given him a chance to write out some of those long awaited QSLs.

28 Mc/s has produced DX only from the South and South West and new one logged was 5U7AH at 16.00 A fine log from F.R.S.309 (Virginia) makes it clear that the lull in conditions does not apply to the U.S.A. for a listing of some 57 countries is supplied.

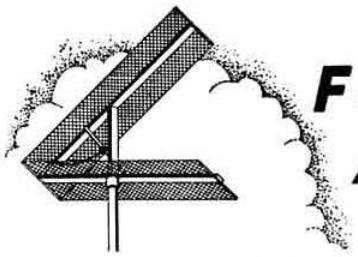
* * *

This offering is concluded by rendering thanks to all the correspondents who have troubled to write with news items, notes on band conditions and other information. Particular thanks to B.R.S.20317 and G3FPQ for valuable data on the l.f. bands, and to the regular sources of DX news, the *DX'Press*, the *West Gulf DX Club Bulletin* and *The DX'er* of the North Californian DX Club. Please send all letters to arrive at R.S.G.B. Headquarters not later than April 20.

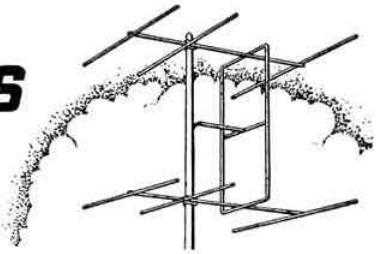
CONTESTS DIARY

April 15–16	–	R.E.F. Telephony Contest
April 15–16	–	Helvetia 22 Contest
April 23	–	First 420 Mc/s Open Contest (For details, see page 436, April 1961)
April 29–30	–	P.A.C.C. Contest (C.W. Section)
April 29–30	–	U.S.S.R. C.W. Contest (See page 474)
April 30	–	D/F Qualifying Event (London) (For details, see page 436, April 1961, and page 487)
May 6–7	–	P.A.C.C. Contest (Telephony Section)
May 6–7	–	OZ-CCA Contest
May 7	–	First 144 Mc/s Field Day* (For details, see page 436, April 1961)
May 14	–	D/F Qualifying Event (South Manchester) (For details, see page 487)
May 28	–	D/F Qualifying Event (Slade/Rugby)
June 3-4	–	National Field Day (For details, see page 338, January 1961)
June 10-11	–	1250 Mc/s Tests
June 17-18	–	70 Mc/s Contest
June 25	–	D/F Qualifying Event
July 2	–	Second 144 Mc/s Field Day *
July 9	–	D/F Qualifying Event
July 15-16	–	Second 420 Mc/s Open Contest
September 2-3	–	I.A.R.U. Region I V.H.F. Contest
September 10	–	D/F National Final
September 17	–	Low Power Field Day
October 8	–	R.A.E.N. Rally
November 11-12	–	Second 1·8 Mc/s Contest
December 2-3	–	R.S.G.B. 21/28 Mc/s Telephony Contest R.S.G.B. 21/28 Mc/s Telephony Receiving Contest
December 3	–	OK DX Contest

** To coincide with dates of I.A.R.U. Region I v.h.f. contests.*



FOUR METRES AND DOWN



Scottish V.H.F. Convention — Conditions Improve

By F. G. LAMBETH (G2AIW) *

THE Scottish V.H.F. Convention held at the Carlton Hotel, North Bridge, Edinburgh, on March 11, 1961, was organized by GM3DIQ and GM3DDE who have been the guiding lights of this function for some years. The attendance of 40 was a record and represented by far the greater part of the active v.h.f. force in Scotland. Among those who travelled far to be present were G3BW, G3FYS, GM2FHH, GM3HLH and EI2W. G3FZL and G2AIW represented the R.S.G.B. Council.

During the afternoon session G3FZL gave a talk on the use of the 6CW4 Nuvistor valve at v.h.f. He also gave a brief description of the Society's beacon, GB3VHF, and explained many points of interest regarding this station. G2AIW spoke about v.h.f. generally. The Dinner was a great success with EI2W in good form afterwards.

A committee of three was set up to consider the provision of a memorial trophy for the late Jock Kyle (GM6WL). Any member who wishes to make a donation to the fund is asked to write to W. C. Bradford (GM3DIQ), 6 Langside Park, Kilbarchan, Renfrewshire.

Those present were: GM2TW, 2CPC, 2CQI, 2FHH, 3NG, 3UM, 3BDA, 3DDE, 3DIQ, 3EGW, 3FGJ, 3FYB, 3GAB, 3GUD, 3GUI, 3HBY, 3HLH, 3INK, 3KPD, 3KRQ, 3KXM, 3KYI, 3LAV, 3LDV, 3MOR, 3OCV, 4HR, 4HX, 3JQ, 6KH, 6SR, 6XW, 6ZV, EI2W, G2AIW, 3BW, 3FYS, 3FZL, B.R.S.22904 and D. Slight.

Two Metre News and Views

There is no doubt that the v.h.f./u.h.f. season shows signs of being much better this year. Tropospheric openings so far have been quite promising, and have covered a greater area than did most of the last year's rather poor efforts. The unseasonable but generally fine weather of recent weeks is all to the good—long may it continue, although the gardeners among you may have divided loyalties!

B.R.S.20533 reports that members of Enfield R.S.G.B. Group will be operating G3FD/P on Ivinghoe Common during the First 144 Mc/s Field Day on May 7.

A.1657 (Gomersal, Yorks.) finds local activity low, with G5YV, G6XT, G3AZU, G3LRP and G8CB keeping the flag flying. G3IGW (Halifax) and G4BL (Wakefield) are both listening on the band. G4PL hopes to be transmitting soon. We should soon be hearing from some of the mobiles, such as G8CB/M and G3HA/M, as the weather improves.

G3MTI (Gt. Malvern) " took to " 2m in January 1960. For six months the 25 watts went into a single dipole at 8 ft., then for three months a halo in the eaves was used. After working almost 100 stations with these aerials, several of the locals helped to erect a 4-over-4 slot beam. This is now on a 35 ft. mast on a cliff about 80 ft. above the shack, its overall height being 950 ft. a.s.l. with an open take off everywhere except to the N. and N.W. G3MTI is certain that the new Certificates have inspired a lot more activity and has already worked enough counties and countries to qualify, needing only the QSLs—Aye, there's the rub!

Conditions since mid-February have been generally better and many stations have been worked. It was interesting to find that exactly half of the 96 stations worked during the Open Contest were first time QSOs! DX worked in the past month has included ON4VN, DJ1EH/P, DJ5KQ/P and F8MW. G8TA/A in Rutland was one that got away! G3MTI has completed a new 2m receiver using two valves and six transistors, which will shortly be installed in the car for mobile working.

B.R.S.21476 (Penarth) found a high spot on February 19 when G5TZ was heard (57) at midday. On March 4 G5TZ was 59 when beamed on GW. On March 5 it was a great surprise to hear GC2FZC (145·4 Mc/s) at RS59 for the first time for about two years. During the same weekend stations were heard from London and S. Coast areas, many of whom could not be positively identified because of the practice of calling CQ unnecessarily but giving the call-sign only once. An outstanding signal from London is G3BLP.

G3OSC (Ewell) has been on 2m for about 10 weeks with 60 watts to a QQV06/40A and a 4-over-4 Yagi at about 30 ft. During the evening of March 4 G3FIH (Bath) and G6GN (Bristol) were very strong signals. The following morning

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

G5ZT (Plymouth) was fairly good, and was worked on c.w. On the evening of March 6 G3ENY (Bridgnorth) was coming through. The next opening occurred on March 14, when G3CZZ/M was heard and worked, a 59 report being received from a location near Redruth. Lunchtime on March 15 brought QSOs with both G6ZP (Malvern) and G3EHY (Banwell). G3OSC reiterates the plea for more c.w. and says many DX contacts are probably lost because weak phone signals can not be copied.

G3EMU is on with a new p.a. and an E88CC cascode receiver. During the last month conditions have been good at Canterbury and about 70 contacts with Continentals have been made including six DL and many PAs. Good signals were received from a Dutch station running only 3 watts to an EL91 and another with his aerial 10 ft. *below* sea level! On March 3 three stations in Staffordshire were coming through when nothing else was to be heard but later a few good G-DX contacts were made. G3CCH's s.s.b. has been S8 in Canterbury several times lately.

G3IIR (Forest Hill) had a good time on the evening of March 14, when G5UF (Dorchester, Dorset) and G3FIH (Bath) were worked at good strength. G3EHY (Banwell) was also heard very strongly, in fact the band was wide open to the West and South West.

G3HWR (Hampstead, N.W.3) has found conditions very good lately. The highlight during the Open Contest was a first contact with GC2FZC, making the seventh new country and the fourth this year. Counties so far stand at 26.

G3HWR has submitted the following list of frequencies used by West Country stations.

County	*Call-sign*	*Frequency*	*Last Heard*
Cornwall	G3CZZ/M	144·094 Mc/s	March 1961
	G3FYR	144·49 Mc/s	June 1960
Devon	G5ZT	144·054 Mc/s	March 1961
	G5QA	144·070 Mc/s	July 1960
Dorset	G3AS/M	144·194 Mc/s	March 1961
	G3HLW	144·166 Mc/s	March 1961
	G3OBD	144·200 Mc/s	March 1961
	G3OSA	144·060 Mc/s	March 1961
	G5UF	144·137 Mc/s	March 1961
Somerset	G3KHA	144·63 Mc/s	January 1961
	G3FIH	144·039 Mc/s	March 1961
	G5DW	144·170 Mc/s	September 1960
	G3CHW	144·350 Mc/s	February 1961
	G3EHY	144·860 Mc/s	November 1960
	G2BHN	144·228 Mc/s	March 1961
	G3ICO	144·140 Mc/s	March 1961
Wiltshire	G3GYQ	144·135 Mc/s	February 1961
	G3OBD/P	144·130 Mc/s	March 1961
	G3IRA	145·162 Mc/s	March 1961
Guernsey	GC2FZC	145·460 Mc/s	March 1961

All ± 10 kc/s.

G5MR (Hythe, Kent) remarks on the good conditions during the Open Contest on March 4-5. Contacts with 23 French stations started the log off, some of them (including F8AT, Tours) being worked for the first time. On the Sunday two more Fs were added, as well as a number of Gs. The best DX was F8XT (Chillac, Charente) at 372 miles whom G5MR has previously worked several times.

G2UJ (Tunbridge Wells) has a Nuvistor 6CW4 neutralized triode pre-amplifier in use, similar to that described by G3FZL in the March BULLETIN in conjunction with a converter on the lines of the R.S.G.B. Two Metre Converter but employing a Mullard EC91 g.g.t. r.f. stage and triode-connected 6AK5 mixer instead of the 12AT7 of the original design. By itself the converter is by no means in the top flight by modern standards, but with the addition of the pre-amp, results are extremely satisfactory. A typical improvement is an RS44 report given with the unaided converter changed to RS57 with the 6CW4 in use. Although aware of the pitfalls of quoting noise factors at 145 Mc/s, G2UJ considers his present noise factor to be nearer 3 than 4db, and strongly advises all who are in a position to acquire a 6CW4 to do so without delay and find out what really *is* to be heard on the band with a good receiver. G2UJ says that his 6CW4 preamplifier is the biggest single improvement he has ever made to his equipment.

R.S.G.B. BEACON STATION GB3VHF

This station is now in operation from 06.30–23.59 B.S.T. but may be on for the full 24 hours for test purposes from time to time on **144·5 Mc/s**

The Purley and District Amateur Radio Society will be visiting Radnorshire on the weekend of April 22/23/24. The call **GW3KVC/P** will be used on phone and c.w. on 144 Mc/s.

G2DHV/M will be operating in Devon, Dorset, Wiltshire and Hampshire from July 29 to August 12 on 144·7 and 145·25 Mc/s and during as many summer weekends as possible.

G3LTF (Galleywood) writing from SM4, says he missed the Contest, but did work " a few DLs and F8XT (nr. Bordeaux) 59 + ". Skeds are being run for MS working with OK2VCG on Sunday mornings and things look quite promising. The four by 7-element beam has been performing well.

EI2W reports that EI6X (Limerick), with a 12 element stack 45 ft. high, is now on 2m looking for contacts. EI2AC (Roscrea, Tipperary) is on 2m.

From *CQ-OE* is it learnt that the beacon station DM0VHF (Posneck) is operating on 145·6 Mc/s sending " Test-DM0VHF " on A3 (Telephony).

G4LX's Auroral Report

The opening on February 4 covered a large area and in the sundry reports in last month's *Four Metres and Down* may be gleaned much of the experiences of G stations who enjoyed the conditions. From SMP6U comes the news that he had contacts with GM3BDA, GM3LAV, LA4YG, LA9T and UR2BU. Those who were heard but not worked included G5YV, GM2FHH, GM3GUI, LA4VC, OH2HK, OZ7BR and OZ9OR. Some 15 SM stations were also heard or worked by Olof. There were small openings in Sweden on February 7 at 21.30 G.M.T. when SM6PF heard SM3AKW, and on February 13 at 17.13 G.M.T. when SM6PU had a poor QSO with LA4YG. On February 17 GM2FHH, GM3BDA and OZ3NH were heard by SM6PU, who only made contact with four SMs. GM3LDU called GM2FHH GM3FGJ and GM3GUI that evening without success.

On March 5/6, GM3LDU reported a good opening when he had successful auroral QSOs with G3IOE, G3KJX, GM2FHH, GM4HR and GM6IZ. Other stations heard were GM3BDA, GM3EGW and GM6XW.

Sporadic *E* Propagation

It is interesting to see that OH2HK is active on 2m. In July 1958, when G4LX held a special permit to operate on 52·5 Mc/s a solid contact was maintained between OH2HK and G4LX on that frequency via sporadic *E*. With luck, it may be possible to repeat this on 2m when sporadic *E* conditions are at their peak later this summer.

SM6PU (Olof Karlsson, Svalhult, Malsryd, Sweden) writes that he will be on 2m from May to September for study of sporadic *E* openings. This will be during the times that f.m. stations between 88/100 Mc/s are audible. Many such stations were heard in 1958, 1959 and 1960 from England, Italy and France. SM6PU is on 2m most evenings and most of Sundays. If sporadic *E* f.m. DX is heard,the beam is turned towards the country concerned and CQ is called during the odd minutes (00/01, 02/03, etc.) on 144·31 Mc/s. The even minutes (01/02, 03/04, etc.) are listening periods. Sporadic *E* peaks about four hours after sunrise and

just after sunset, but sometimes persists during the period 07.00/22.30 G.M.T. on the TV band. Stations are looked for in the skip range 1000/2300 km. Anyone with a receiver covering 40/150 Mc/s and interested in sporadic *E* is asked to write to SM6PU for details giving a note of frequency and other useful details.

Scottish Two Metre News

GM3BDA (North Berwick) worked LA9T, G3IOE and G3KJX and heard SM6PU during the aurora of March 5/6. The aurora faded out at about 00.35 G.M.T. on the sixth. It appeared to be a small occurrence with very localized effect. On March 10 there was an auroral indication on 48·25 Mc/s but no effect was apparent on 2m. During the aurora of February 17, GM3BDA worked LA4VC while in the March 5/6 aurora GM3LDU (Glasgow) heard GM2FHH first then worked GM4HR, GM2FHH, G3KJX, G3IOE and GM6IZ. GM3BDA is the editor of the V.H.F. Section of *The Lothians Radio Amateur* and would like v.h.f. news for publication. GM3ENJ/A has worked GM8FM (crossband 2m to 20m) respectively, by R.T.T.Y. This is the first such QSO, and almost perfect copy was received at both ends. GM3ENJ/A now wants at least one other 2m R.T.T.Y. station to come up!

Northern Ireland Two Metre News

GI3OFT (Belfast, 5) reports that activity in Belfast and district is comparable to that around most other similar places, but QSOs across the water, with the exception of pre-arranged skeds, seem to occur only at random intervals. The fact that the skeds *do* take place, and sometimes at good strength (e.g. GI5AJ to G2NY and also to G3CCH and G3ILD) indicates that the fault does not necessarily lie with propagation conditions. Many other G/GW stations are heard, called but not worked, possibly because 145·8/146·00 Mc/s is a forgotten zone. *Please* tune the whole band!

A further note gives news of the Contest on March 4/5 when GI3KYP and GI3HXV worked /A from Ballyhalbert on the East Coast using a 4-over-4 on a 20 ft. mast but almost at sea level. Having spent previous contests at Slieve Donard (1959) and Slieve Croob (1960) and having little success, they dreaded trying to find the elusive signals as they came off the sea! GI5AJ, GI3NEB, GI3FJA and GI3OFT were all busily engaged spreading points around. One complaint common to all the above was that large numbers of G stations were heard on phone but just not quite readable—usually off the back of their beams. Some were eventually raised, including G3LLJ/A, G3IKV and G3BW, who were clearly amazed to hear 599 signals from GI land. Please turn your beams towards GI as the operators there are convinced they are the " forgotten ones." **GI3OMQ** will shortly be using 30 watts on 145·8 Mc/s. GI3FJA has been working a new county every night since the 6-over-6 beam was raised to 33 ft. (totalling 680 ft. a.s.l.!) G2NY has been heard in GI around S6 on phone, and G3ILD and G3CCH are putting over good signals s.s.b. on sked with GI5AJ.

Seventy Centimetre News

G2XV (Cambridge) recently contacted G2CIW, G3KPT/T, G3LHA and G3KPT—all on phone within one hour following a single CQ call. Gone are the days of fixing QSOs by letter, telephone—or 2m!

G5MR (Hythe, Kent) worked F8AA for the first time on March 5. On the same day F8LO (Paris) was heard. On March 14 conditions were again good and an excellent QSO was had with F8GH whose c.w. and phone were both S7. G5MR will be taking part in the First 420 Mc/s Contest on April 23 on 435·48 Mc/s. If any reader has any *practical* advice to offer on the subject of a 150 ft. " G string " feeder for 70 cm. G3MTI would be very interested to hear of it.

SM6ANR informed G3LTF that the opening which resulted in the QSO with SM7BAE did not extend as far as Gothenburg. G3LTF hopes to get a 150 watt p.a. completed and operating soon.

GI3OFT reports that it is proposed to attempt a two way contact between Aberporth (South Wales), 200 ft. a.s.l., and Newtownards (North Co. Down), 700 ft. a.s.l., on 70 cm. The transmitter will deliver 60 watts r.f. in each case to five element Yagis. Crystal controlled diode mixer receivers have been built. The biggest obstacle is expected to be the Isle of Man. The call-signs to be used are not yet known.

Four Metres

Will some of our 4m enthusiasts take some observations during periods of auroral propagation to see what can be worked on this band? There could be some surprises.

GI3HXV hopes to be active on 4m soon, and at present is busily listening. **B.R.S.21476** (Penarth) says that only G3EHY is consistently received on this band at the moment. **G5FK** (G.E.C., Wembley) will be on 4m at lunch times and occasionally during the evenings looking for contacts.

Overseas News

PA0FB (The Hague) has had a belated but welcome report of the hearing of his signals by HA7-003 (Szolnok, Hungary) during the aurora of April 1 last year. During the last month he worked (13/2) G5TZ, G3LTF (14/2), G3LRP, G3OTJ, G3BNL, G3KMT, G3BGL (16/2), G3LTF, G6WU, G2DQ, G3BNL, G6GN (Bristol), G6NB, (17/2) G6OX, (19/2) G3EMU, (20/2) G2HOP. PA0FB has been having many good reception sessions from Mendlesham TV and finds that very good reception conditions practically always coincide with a slowly falling barometer (from whatever position the fall commences, whether high or lowish, say 1000mb.).

Project OSCAR

The latest news of Project OSCAR (see *Four Metres and Down*, March 1961) is that the first beacon has been completed and was due to be flight tested in an aeroplane on April 9. If present arrangements go according to plan, the first space flight should take place about the middle of June 1961.

European V.H.F. Contest, 1959

The following are the leading results in each section of the 1959 European V.H.F. Contest with the nearest relative British entries, as certified by the Italian society, A.R.I.

Section 1—Fixed Stations (144 Mc/s)

1. PA0LQ	26,440 points	4. G5YV	21,580 points
2. F3LP	23,703 points	6. G3MED	20,495 points
3. F8MX	22,335 points	7. G3HBW	19,831 points

Section 2—Portable Stations (144 Mc/s)

1. PA0YZ/A	36,688 points	3. PA0TP/A	28,503 points
2. G2DTO/P	28,956 points	4. PA0EZ/A	27,983 points
		5. GW3KMT/P	23,861 points

Section 3—Fixed Stations (420 Mc/s)

1. F8MX	3,204 points	3. F3LP	1,481 points
2. OK1KRD	1,686 points	7. G3AYC	821 points

Section 4—Portable Stations (420 Mc/s)

1. OK2KEZ/P 2,795 points

No U.K. entry.

German National Convention

THE German National Society, D.A.R.C., is holding its 1961 Convention in Dortmund from May 19-22. The programme will include lectures and discussions on a wide range of Amateur Radio topics, a mobile contest and an exhibition of equipment. The Convention station will operate under the call-sign DL0KTA.

An attendance of 2-3,000 amateurs from Germany and neighbouring countries is expected and visitors from the U.K. will be most welcome. Further details may be obtained from D.A.R.C. Deutschlandtreffen 1961, Tagungsbüro, Borsigstr. 68, Dortmund, West Germany.

Single Sideband

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

RECEPTION of one sideband and demodulation with a locally inserted carrier is a single sideband technique—it is, however, being increasingly adopted by many amateurs for the reception of a.m. signals. The receiver bandwidth required is 2·5–3·0 kc/s and this order of selectivity adds materially to the reduction of adjacent channel interference. However, the attenuation of one sideband of a double sideband transmission in the i.f. amplifier results in the loss of this sideband voltage at the detector and reduces the available audio output voltage by 6db. It would therefore be very unfair to evaluate the "talk power" of the a.m. and s.s.b. methods of transmission on a basis of single sideband reception of the a.m. signal. If the comparison is to be a realistic one it must be based on the correct reception of each mode of transmission—a receiver bandwidth of 6 kc/s for a.m. and a receiver bandwidth of 3 kc/s for s.s.b.

"Talk Power"

Perhaps the clearest method—least open to misinterpretation—is to show the relative efficiency of the two systems in diagrammatical form where the powers and voltages concerned are in the same relative values. This method has been adopted in the accompanying table. The basis of comparison given in column A is an a.m. transmission of 100 watts d.c. power input rating, modulated by 50 watts of audio. At the crest of the modulation cycle the peak envelope power (p.e.p.) is four times the carrier power—or 400 watts. The term peak envelope power is defined as the R.M.S. power developed at the crest of the modulation envelope.

* 5 Janice Drive, Fulwood, Preston, Lancashire.

The carrier of one power unit in value requires a half power unit of audio for 100 per cent modulation (this is the maximum power that can be used; any greater audio input than this produces overmodulation and distortion) and this produces two sidebands with 0·25 unit of power in each. As voltage is proportional to the square root of the power, the carrier voltage is 1 and the voltage of each sideband is 0·5. The r.f. envelope developed by the voltage vectors is shown and for 100 per cent modulation the peak envelope voltage (p.e.v.) is the sum of the carrier and the two sideband voltages and this equals two units. This results in a p.e.p. of four units of power.

The r.f. signal is demodulated in the receiver and the diode detector develops an audio output voltage that is equivalent to the sum of the upper and lower sideband voltages. The noise power per kilocycle is an arbitrary value equal for a.m. and s.s.b. For a 20db signal/noise ratio the noise voltage would be 0·1 volt for the 6 kc/s receiver bandwidth and the signal/noise ratio is then 20 log. the ratio audio voltage: noise voltage.

Column B shows the power and voltage relationships for an s.s.b. transmission of equal *sideband* power to the a.m. transmission. The audio output from the s.s.b. transmission (recovered by heterodyning the received signal with a locally inserted carrier) is 0·707 units in value and this represents a loss in detector output voltage of 3db due to the s.s.b. power being in *one* sideband. However, the reduction in receiver bandwidth gives a 3db advantage therefore the signal/noise ratio is the same for the two modes of transmission.

Column C shows the relationships for an s.s.b. transmission of equal *rated* power (100 watt a.m. transmitter and a 100 watt p.e.p. input s.s.b. transmission). It is seen that the audio voltage developed at the output of the diode detector is equal to the audio voltage of the a.m. transmission. The reduction of receiver bandwidth gives a 3db advantage and the signal-to-noise ratio is 23db.

(Continued on page 483)

	A.M. 100 WATT D.C. INPUT 50 WATT AUDIO FROM MODULATOR (A)	S.S.B. EQUAL SIDEBAND POWER (B)	S.S.B. EQUAL RATED POWER (C)	S.S.B. EQUAL PEAK POWER (D)
RATED POWER	0·25 LSB, 1 C, 0·25 HSB; RATED CARRIER POWER = 1	0·5 LSB; RATED P E P = 0·5	1 LSB; RATED P E P = 1	4 LSB; RATED P E P = 4
VOLTAGE VECTORS	LSB 0·5, C 1, HSB 0·5	0·7 LSB	1 LSB	2 LSB
R.F. ENVELOPE	PEV = 2, PEP = 4	PEV = 0·7, PEP = 0·5	PEV = 1, PEP = 1	PEV = 2, PEP = 4
RECEIVED SIGNAL AUDIO VOLTAGE	LSB + HSB = 1	= 0·7	= 1	= 2
NOISE VOLTAGE FOR ARBITRARY NOISE POWER EQUAL FOR A.M. AND S.S.B. PER Kc/s BANDWIDTH	VOLTAGE = 0·1 FOR 6 Kc/s RECEIVER BANDWIDTH	VOLTAGE = 0·07 FOR 3Kc/s RECEIVER BANDWIDTH	VOLTAGE = 0·07 FOR 3Kc/s RECEIVER BANDWIDTH	VOLTAGE = 0·07 FOR 3Kc/s RECEIVER BANDWIDTH
SIGNAL TO NOISE RATIO	$20 \log. \frac{1}{0.1} = 20$ db	$20 \log. \frac{0.7}{0.07} = 20$ db	$20 \log. \frac{1}{0.07} = 23$ db	$20 \log. \frac{2}{0.07} = 29$ db

Power relationships for a.m. and s.s.b transmission. Single tone sine wave modulation.

Society News

The Mullard Award 1960

THE Mullard Award Committee considered three nominations and decided unanimously that the Award for 1960 should be made jointly to Miss Enid Bottomley (G3OHB) and Mr. Graham Thomas (G3OGT) of St. Teresa's Home, Marazion, Penzance, Cornwall—one of the Group Captain Cheshire, V.C., Homes.

Three years ago a local member of the R.S.G.B. called at the Home having heard that some of the patients were interested in Amateur Radio. He explained to them the nature of the hobby and the requirements which would need to be fulfilled before a licence could be obtained. Miss Bottomley and Mr. Thomas and some others showed great interest and a group of five from the Home attended a meeting of the Falmouth Radio Club in September 1958, having been brought in their wheel chairs in a furniture van. Those present at that meeting still remember with admiration the courage and cheerfulness of the patients. Following the meeting Miss Bottomley and Mr. Thomas began to prepare for the May 1959 R.A.E. They took the examination but failed. Undaunted, they began again and to the great

Miss Enid Bottomley (G3OHB) in the Amateur Radio station she shares with Mr. Graham Thomas (G3OGT).
(Photo by courtesy of "Electronics Weekly.")

pleasure of all concerned they were successful in 1960. During all this time they had been receiving Morse instruction and when the time came they both passed the G.P.O. test with flying colours.

From the outset Group Captain Leonard Cheshire, V.C., has shown great personal interest in the Amateur Radio activities of Miss Bottomley and Mr. Thomas. His promise to provide them with a radio room if they succeeded in obtaining their licences has been fulfilled.

The successes achieved by Miss Bottomley and Mr. Thomas has enabled the Group Captain to recommend patients in his other Homes to take an interest in Amateur Radio so that eventually patients throughout the country will make regular over-the-air contacts with one another.

The Mullard Award Committee considered that the fortitude and courage shown by Miss Bottomley and Mr. Thomas provided a fine example of personal service to the community which for them is the Group Captain Cheshire Homes.

The Awards will be presented at a ceremony in Penzance later in the year, details of which will be published in the Society's Journal.

London Lecture Meeting

THERE was an attendance of 38 at the meeting of the Society held on Friday, March 24, 1961, to hear Mr. Norman Fitch (G3FPK) lecture on " Mobile Operation and its Problems."

The Chair was taken by the President (Major-General E. S. Cole, C.B., C.B.E., G2EC) who had the support of Council Members Arthur Milne (G2MI), Geoff Stone (G3FZL) and C. H. L. Edwards (G8TL).

Messrs. Thurlow, Stone, Fletcher, Margolis and Edwards were among those who took part in the discussion. A vote of thanks to Mr. Fitch was proposed by Mr. Milne.

At the conclusion of the lecture the President congratulated Mr. F. G. Lambeth (G2AIW) on being elected a Vice-President of the Society and handed to him a Vice-President's badge. Mr. Lambeth made a suitable response.

Television and Broadcast Interference

MEMBERS with television or broadcast interference problems are invited to write to Headquarters for a copy of the TVI/BCI Committee's interference questionnaire. This form is designed to give the Committee a comprehensive picture on which to base their advice to a member.

Early Issues of T. & R. Bulletin wanted

THE Derby and District Amateur Radio Society have a complete collection of copies of the *T. & R. Bulletin* and R.S.G.B. BULLETIN except for the first eight issues of the first volume (July 1925 to March 26). Mr. Fred Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby, will be glad to hear from any member who can supply the missing issues which, together with all other issues in bound form, will be displayed at an exhibition to be held in Derby during August next to commemorate 50 years of radio.

Geneva Convention

THE Government of the United Kingdom of Great Britain and Northern Ireland has ratified the International Telecommunications Convention of Geneva (1959), the Final Protocol and the Additional Protocols annexed to the Convention. The ratification also applies to the Channel Islands and the Isle of Man.

I.T.U. Now 100 Strong

WITH the accession of the Republic of Chad, the International Telecommunications Union has become the third of the United Nations Specialized Agencies to have 100 Members. There are, in addition, five Associate Members.

MIDLANDS OFFICIAL REGIONAL MEETING

TRENTHAM GARDENS, NEAR STOKE-ON-TRENT, STAFFS.

Sunday, April 30, 1961

Programme:

2.15 p.m. **Business Meeting**
3.30 p.m. **Film and Demonstration in association with North Midlands Mobile Rally**

The Council will be represented by the President, Major-General E. S. Cole, C.B., C.B.E., G2EC, Messrs. R. C. Hills, G3HRH, G. M. C. Stone, G3FZL and the General Secretary, Mr. John Clarricoats, O.B.E., G6CL.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, February 20, 1961, at 6 p.m.

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

Apologies for absence were submitted on behalf of Dr. R. L. Smith-Rose and Mr. F. A. Russell.

Absent. Mr. A. C. Williams (indisposed).

* * *

Membership

Resolved (i) to elect 99 Corporate members and 43 Associates; (ii) to grant Corporate membership to 10 Associates who had applied for transfer.

It was reported that during the year 1960 the Council had elected 1,562 members of whom 422 (27 per cent) were Associates.

Resolved to discuss at the March meeting the matter of Associate subscription rates.

Applications for Affiliation

Resolved to grant affiliation to the B.B.C. (Rampisham) Club; Stratford & District Radio Club; Wolverton & District Radio Club.

Vice-President

In accordance with the requirements of Article 12 of the Society's Articles of Association a ballot was ordered for the election of Mr. Frederick George Lambeth (G2AIW) as a Vice-President of the Society. (Mr. Lambeth's election was reported upon in the March issue.—EDITOR.)

The Amateur Radio Handbook

Mr. Hawker having advised the Council that due to pressure of business he would no longer be able to co-ordinate the production of the *Amateur Radio Handbook*, it was resolved that Mr. Rouse shall take over the editorship.

Annual General Meeting

Resolved to hold the Annual General Meeting of the Society in the St. Andrew's Hall of The Royal Over-Seas League, London, S.W.1, on Saturday, December 16, 1961, commencing at 2.30 p.m.

Mullard Award 1960

It was reported that three nominations for the Mullard Award 1960 had been received.

Resolved (i) to submit the three nominations to the Mullard Award Committee; (ii) to appoint the President, Honorary Treasurer, and General Secretary to serve as the Council's representatives on the Mullard Award Committee.

Mobile Safety Regulations

It was reported that the Amateur Radio Mobile Society had asked the Society to examine and comment upon a set of Mobile Safety regulations.

The Chairman of the newly-formed Mobile Committee (Mr. Milne) stated that the Committee had examined the regulations and would shortly be submitting their views to the A.R.M.S. The President intimated that he would be glad to examine the proposed regulations.

Mobile Rallies

Resolved to authorize the organizers of the Southern Counties and Longleat Mobile Rallies to write to manufacturers and others for raffle prizes.

East London

Consideration was given to a resolution passed at a meeting of East London T.R.'s to the effect that membership records held by T.R.'s are frequently inaccurate.

It was agreed to ask the London R.R. to advise the East London Group that the points raised in the resolution were being looked into.

Building Fund

It was agreed to accept the principle of collecting funds for the establishment of new Society Headquarters but to take no further action until the Finance and Staff Committee have reported to the Council on Headquarters accommodation.

Official Regional Meetings

Resolved (i) to authorize Messrs. Hills, Wade and the General Secretary to attend the Blackpool meeting as representatives of the Council; (ii) to authorize Messrs. Parsons and Southworth respectively to organize O.R.M.'s in Cardiff on September 16, 1961, and in Prestatyn on September 10, 1961.

Reports of Committees

Resolved to receive as a Report the Minutes of a meeting of the Contests Committee held on February 9, 1961, and to accept the recommendation contained therein.

Resolved to authorize the use of the Business Reply Service in order to obtain the views of members on certain proposals in respect to the Golden Jubilee celebrations.

QSL Service

A member of the Council expressed the opinion that the statement broadcast recently in the R.S.G.B. News Bulletin service in regard to a decision to destroy unclaimed cards should be countermanded.

Resolved (i) to request the QSL Manager (Mr. Milne) to submit to the March 1961 meeting of the Council a report on the working of the Society's QSL Service; (ii) to consider at that meeting a suggestion that the Council should officially authorize the QSL Manager to destroy cards addressed to persons who have specifically expressed a desire not to collect them.

Subscription Rates

A member of the Council expressed the opinion that the time has come for the Council to consider introducing a substantial increase in subscription rates. He suggested that the present efforts being made to run the Society on " a shoe string " throw an impossible burden on the shoulders of the Council.

It was agreed to request the Finance and Staff Committee to give consideration to the suggestion.

The meeting terminated at 8.45 p.m.

SOUTH EAST SCOTLAND
OFFICIAL REGIONAL MEETING
CARLTON HOTEL, EDINBURGH

Saturday, May 13, 1961

Programme:

2.15 p.m.	**Assemble**
2.30 p.m.	**Business Meeting**
4.15 p.m.	**Buffet Tea**
5 p.m.	**Address by Major-General E. S. Cole, C.B., C.B.E. (G2EC)**
5.45 p.m.	**Demonstration of Commercial Equipment**
7.30 p.m.	**Dinner**

The Council will be represented by Major-General E. S. Cole, C.B., C.B.E. (G2EC) (President), Mr. E. G. Ingram, GM61Z (Executive Vice-President and Zone F Representative) and Mr. John Clarricoats, O.B.E., G6CL (General Secretary). Tickets, price 25/- each are obtainable from Mr. G. P. Millar, GM3UM, 8 Plewlands Gardens. A circular is being sent to all members in Region 13.

NORTH WEST OF ENGLAND
OFFICIAL REGIONAL MEETING
IMPERIAL HOTEL, BLACKPOOL

Sunday, April 23, 1961

Programme:

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

Talk-in Station

GB2ORM on 1·8 and 144 Mc/s

Preceded by a Mobile Rally and Treasure Hunt on Saturday, April 22, 1961

The Council will be represented by Messrs. R. C. Hills, G3HRH, P. H. Wade, G2BPJ (Zone A Representative) and John Clarricoats, O.B.E., G6CL (General Secretary).

Tickets, price 17s. 6d. each (double, 32s. 6d., children 10s. each) are obtainable from H. G. Newland (G5ND), 161 Penrose Avenue, Marton, Blackpool, from whom applications to take part in the Treasure Hunt and information on overnight accommodation are available.

NATIONAL FIELD DAY 1961
FINAL DATE FOR ENTRY

Members responsible for stations participating in this year's N.F.D., to be held on June 3-4, are reminded that details of call-signs and frequencies to be used, together with the name of the group, club or affiliated society concerned, must reach the Contests Committee at R.S.G.B. Headquarters not later than May 1, 1961. The information should be set out as shown in Rule 6.

The rules for N.F.D. 1961 were published in the January 1961 issue of the R.S.G.B. Bulletin.

R.S.G.B. Tape Recorded Lecture Library

APPLICATIONS from R.S.G.B. Groups, Affiliated Societies and Clubs, to borrow tape recorded lectures should be sent to the Hon. Librarian, Mr. N. C. Ta'Bois (G3HWG), 81 Snakes Lane, Woodford Green, Essex, as far in advance as possible. A list of the recordings available may be obtained from Headquarters.

Australian Licences

INFORMATION has reached the Society that, notwithstanding the decisions reached at the Geneva Radio Conference, Australian amateurs are likely to be allowed to continue to share the band 7100-7150 kc/s with broadcasting after May 1, 1961, which is the date the new Radio Regulations become effective. There is also a possibility that Australian amateurs may shortly be allowed to use a band 60 kc/s wide between 1715 and 2000 kc/s, besides retaining their occupancy of the bands 52-54 Mc/s and 144-148 Mc/s.

The temporary use of the bands 50-54 Mc/s, in addition to the bands 56-60 Mc/s, has been extended for an indefinite period by the Australian licence issuing authorities. Incidentally Australian amateurs are now permitted to use foreign languages during QSOs, a facility that was withdrawn some time ago.

U.S. Amateurs' Trip Cancelled

THE tour of Europe planned by a group of American amateurs for this year has been cancelled. It had been hoped that the party would be in England from April 23-26.

Single Sideband (Continued from page 480)

Column D shows the relationship for an s.s.b. transmission of equal *p.e.p. input*. It is seen that the s.s.b. transmission gives a gain in detector output voltage of 6db. This, in addition to the 3db improvement in receiver noise output, gives a total signal-to-noise ratio of 29db—a system gain for s.s.b. of 9db.

It will be noted that the carrier envelope voltage of the a.m. transmission serves no useful purpose other than to beat against the sidebands and demodulate the signal at the detector. Further, that for both modes of transmission the audio voltage recovered at the detector is directly proportional to the total *sideband* voltage, and that the two transmitters, a.m. and s.s.b., of equal *rated* power will produce an equal receiver audio voltage.

It is the intention next month to deal with the relative figures for the two methods of transmission, a.m. and s.s.b., with the two transmitters adjusted for the maximum operating conditions defined in the Amateur (Sound) Licence and to consider the effect on the figures quoted of the difference in p.a. efficiency under class C (a.m.) and linear amplifier (s.s.b.) conditions.

NORTH MIDLANDS MOBILE RALLY

Trentham Gardens, Staffordshire

(4 miles south of Stoke-on-Trent on the A34 Manchester-London road)

SUNDAY, APRIL 30, 1961

Many attractions for the whole family and full restaurant service without prior booking. More car parking space will be available this year. In the event of bad weather, there will be plenty of indoor accommodation. Trade and amateur exhibition. The Gardens will be open from 9 a.m. Admission: 2/- for adults, 1/- for children.

RALLY STATIONS

1·8 Mc/s—G2AMN, G3GBU/A and G3OGD
144 Mc/s—G3MAR/A

Organized by the Midland Amateur Radio Society and the Stoke-on-Trent Radio Society.

CHELTENHAM MOBILE RALLY

Montpelier Gardens, Cheltenham

SUNDAY, MAY 7, 1961

Attractions will include a mobile competition. A dinner is being arranged for the evening prior to the rally.

RALLY STATIONS

1·8 Mc/s—G5BK/P 144 Mc/s—G3IER/P

Further information and tickets for the dinner may be obtained from T. A. Russell (G3JFH), 10 Dale Walk, Bishop's Cleeve, Cheltenham.

THANET MOBILE RALLY

Cliffsend, Ramsgate

(on the A.256)

SUNDAY, MAY 7, 1961

RALLY STATIONS

1·8 Mc/s—G3DOE/A 144 Mc/s—G3BAC/A

Organized by Thanet Radio Society.

HUNSTANTON MOBILE RALLY

SUNDAY, MAY 28, 1961

A large car park on the sea front immediately opposite the railway station will be reserved for visitors. The admission fee of 3/- per vehicle will include all occupants and also entry in the competition. A feature of the rally will be a Junk Sale for which no commission will be charged.

RALLY STATIONS

1·8 Mc/s—G3ANM/P 3·5 Mc/s—G3KPO/P
144 Mc/s—G3ARS/P

Organized by Peterborough and District Amateur Radio Society.

SOUTHERN COUNTIES MOBILE RALLY

Beaulieu Abbey, Beaulieu, New Forest, Hampshire

(on the B.3506 Lyndhurst-Beaulieu road)

SUNDAY, MAY 28, 1961

Attractions include Lord Montagu's Vintage Car Museum, and Beaulieu House (reduced admission). Boat excursions on the Solent and a Mobile Treasure Hunt. Reserved rally car park. Ample catering.

RALLY STATIONS

1880 kc/s—G3IVP/A 144·14 Mc/s—G3ION/A
will be on the air from 10.30 a.m.

The rally programme may be obtained by sending a s.a.e. to L. H. Daish (G2FGD), 7 Bracken Lane, Shirley, Southampton.

European " Fox Hunt " Championship

MEMBERS who wish to take part in the European " Fox Hunt " Championship Competition to be held in Stockholm on August 4-5, 1961, may obtain details from S.S.A., Enskede 7, Sweden. Applications must reach S.S.A. not later than May 15, 1961. Operation will be on 3·5-3·6 Mc/s and 144-146 Mc/s.

R.A.E.N. Notes and News

BY E. ARNOLD MATTHEWS (G3FZW) *

AT the first meeting of the R.A.E.N. Committee for 1961 Dr. A. C. Gee (G2UK), Mr. C. H. L. Edwards (G8TL) and Mr. E. A. Matthews (G3FZW) were re-elected Chairman, Deputy Chairman and Honorary Secretary respectively.

Council has recently approved in principle the holding of occasional meetings of R.A.E.N. officers and members of the R.A.E.N. Committee. This will give greatly increased opportunities for local organizers to meet one another to discuss matters of general interest and to discuss directly with members of the R.A.E.N. Committee various problems. The intention is to arrange meetings at places which will enable the maximum number of officers and deputies to attend, without the inconvenience of having to travel too far.

It will be remembered that a meeting held at Oxford some years ago was well attended despite rather inclement weather and a number of useful contacts were made and all who attended were given a very good idea of conditions existing in the South and South Midlands. Even now, some groups are operating in isolation, which is to no one's advantage, and it is hoped that the meetings now under consideration will help to remedy this.

Trunk Routes

Regular test schedules are being run by the E.C.T.R., messages being sent by both the 160 and 2m nets.

Development of the London-Hampshire extension is proceeding well, and with the anticipated completion of the Southern end of W.T.R. into Hampshire it will be possible to consider formation of a South Coast Trunk Route. W.T.R.'s change-over from 160 to 2m has necessitated the release of G3LBU, G8OY, G2BTX, G3JOU and G3BY, whose services on Top Band were much appreciated. New stations in are G3IRA, G3IER and G3BA, whilst the remaining stations were already equipped for 2m.

It is rather interesting to note that although both the present R.M.'s are very competent Morse operators, both have opted for R/T as a first choice. The R.A.E.N. Committee have no bias towards any particular mode or band, but feel that the controllers themselves should make the choice after consideration of all the factors involved. Admittedly, this has led to some lack of uniformity and difficulty associated with cross-band operation, but it has made it possible to form and maintain groups in areas which would otherwise still be without any R.A.E.N. It must be remembered that amateurs will either develop the equipment most suited to their purpose, or make the most efficient use of what they can afford, but controllers have to make decisions based on the total of equipment available, not on their own stations. The result may not be an ideal solution, but at least it will enable a net to be operated.

Personnel

F. C. Judd (G2BCX) has resigned his office of Area Controller and is succeeded by E. G. Augood (G3MML) 49 Parkstone Avenue, Hornchurch, Essex.

The appointment of C. M. Denny (G6DN) as Area Controller, Manchester, has been confirmed.

R.A.E.N. Rally 1960

ONCE again the R.A.E.N. Rally was a great success, with a very large number of entrants writing to say how much they enjoyed it. Almost everyone commented that it was more difficult than in previous years and the test phases were very difficult to pass, but this only added to the enjoyment. Conditions were poor and this lowered the scores to some extent, but made operators more careful in ensuring that they had received the test phases correctly, many of which were badly altered in transmission. The accuracy of passing of the distorted phrases was, however, good!

Several operators sent in excellent logs, but the outstanding one was without doubt that for G3MWD/P, certainly a picture of neatness.

Check logs from G3ELZ, G3FZW, G3HRK, G3ION, G3JOO and Miss K. Bell (Carlisle) are acknowledged with thanks.

RESULTS—R.A.E.N. RALLY 1960

Transmitting Section

Position	Call-sign	Points	Position	Call-sign	Points
1	G3JFH/P	90	28	G4XC	30
2	G3MWD/P	82	29	G2ATS	29
3	G3KLH	70	30	G3MOE	28
4	G3KAY	69	31	G3BEJ	27
5	G3MXY	67	32	G3LPB	25
6	G3MDC	64	33	G3NTV	23
	G3HIU	64		G3DWQ/M	22
8	G3NVO	58	34	G3LWQ	22
	G2FT	58		G2FQD	22
10	G3ISV/M	54	37	G3NVG	21
	G3JYH	54		G3NSI	21
12	G3LNN	50		G3EFA	19
13	G3GFU	46	39	G6ZG	19
14	G3OMA	45		G3NNZ	19
15	G3MDH	42		G3HPR	19
	G3HTI	41		G3NVN	17
16	G3KPU	41	43	G3MWV	17
	G2AMN/P	41		G3MC	17
19	G3BRE	40		G3AVE	17
20	G3LWK	39	47	G3OEP	16
21	G2TG	38	48	G2DQ/M	12
	G3OIT	38	49	G3LTU	10
23	G3KQU	36		G3NHU	10
	G3ERB	36	51	G6ZJ/M	9
25	G3NNX	34	52	G3AET	8
26	G2AO	33	53	G3JVD/M	6
27	G4IV	32			

Receiving Section

Posn.	Name	Pts.	Posn.	Name	Pts.
1	R. H. Crowley	315	7	M. E. Rentell	66
2	F. W. Nash	180	8	M. McClean	48
3	J. R. Briggs	90	9	M. Granville.	42
4	J. Woodham	87	10	V. W. Stewart	33
5	W. Devereux	78	11	R. C. Hunt	24
6	L. C. Haywood	72	12	D. A. Youngman	21

GB2RS SCHEDULE

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

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

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

Silent Keys

PETER APPLEBY (G3MBG)

With deep regret we record the death at the early age of 27 years of Peter Appleby (G3MBG) of Rugby, Warwickshire. Peter, who held a B.Sc. Degree from Bristol University, was Honorary Secretary of the A.E.I. (Rugby) Recreation Club Amateur Radio Section for two years, during which time his cheerfulness in spite of poor health did much to ensure the continued progress of the Section. He will be greatly missed by his many friends in Amateur Radio circles.

Sympathies are extended to his family.—D. M. H.

SYDNEY DAVISON (G6SO)

It is with regret that we record the death at the age of 42 of Sydney Davison (G6SO) of Scarborough, after a long illness. A member of Scarborough Amateur Radio Society, Mr. Davison was a keen QRP worker on 40m.

Condolences are extended to his family at this time. P. B. B.

* *1 Shortbutts Lane, Lichfield, Staffs.*

R.S.G.B. 21/28 Mc/s Telephony Contest 1960

G3NNT overall leader – OH5SM overseas winner

FOR the first time since this contest was introduced there has been a drop in the number of overseas entries received, although there was no reduction of interest in the British Isles. Of the 107 stations who entered, 62 were from overseas in 33 scoring areas, whilst the home stations included representatives of only 10 of the 17 country-numeral prefixes active during the contest.

Although conditions were not as good as in 1959, they were on the whole better than expected, with reasonable openings on 21 Mc/s to New Zealand and the Far East on both mornings and to North America on 28 Mc/s each afternoon. Some European countries experienced difficulty in working U.K. stations owing to the long skip and, as OZ5SQ put it, " there were times when more ZLs could be heard from the back of the beam than Gs " for which he was searching.

The struggle for supremacy has often resulted in the same half-dozen regulars sharing the first places, but this year S. J. Pilkington (G3NNT), with only one previous entry, emerged winner, with a score of 4,322, followed by last year's leader, D. L. Courtier-Dutton (G3FPQ) with 4266 and R. R. Yearwood (G3KGY), runner-up in 1958, with 4,258. G3FXB managed to retain fourth place, whilst G5HZ, runner up last year, was fifth.

Carola Tigerstedt (OH5SM) who led the overseas entrants with 2,585 points, is to be congratulated for being the first YL to hold this position. ZD2JKO, closely followed by SP5XM, were second and third, whilst last year's leading foreign competitor UR2BU, who could only operate for one day of the contest on this occasion, was fourth.

Scoring

As was to be expected the rate of scoring was not quite so high as in 1959, but G3NNT had 466 contacts, 99 of which counted for the bonus, whilst G3FPQ had 434 with 106 bearing the additional points. Both of these competitors had some homebuilt gear, G3NNT using a transmitter he had made himself, with 150 watts input to an 813 in the final, backed up by a Collins 51J2 receiver. G3FPQ used all home built equipment, his transmitter also having an 813 final, running at 140 watts, and his receiver 29 valves.

Equipment

Much commercial equipment was in evidence, with a noticeable increase in the number of " branded " aerials. Quads, traps of various types, and three element beams appeared to be the most popular, and were in approximately equal proportions. The AR88 easily held pride of place amongst the receivers, but as yet no transmitter has appeared on the market with such universal popularity.

As usual with all contests, there was a crop of last minute failures causing hard work and lost time for those unfortunates concerned. The weather, too, was unkind to some, G3FXB finding it impossible to turn his beam for 50 per cent of the time owing to an 80 m.p.h. gale, whilst the same winds rendered G3JAF's 21 Mc/s quad useless. EP2AT also suffered in this manner, his beam being blown down, necessitating the erection of a dipole on the morning of December 4. It was, however, apparent that the contest had proved as enjoyable as its predecessors, and that many are looking forward with keen anticipation to the next.

Logging

The general level of logging was exceptionally high, particularly amongst the European overseas entrants, and they too appeared to have mastered the scoring system. Unfortunately this high standard was not maintained in the scoring by *home* stations, some claiming correct scores per

The overall winner was S. J. Pilkington (G3NNT) of Ormskirk, Lancashire. The transmitter, on the left of the picture, has an 813 in the p.a. The aerial is a cubical quad for 14, 21 and 28 Mc/s.

Carola Tigerstedt (OH5SM), leader of the overseas entrants, in the station she shares with her husband, OH5NW. The wheel at the top left controls the 21 and 28 Mc/s beams.

Call-sign	Points	PLACINGS		Call-sign	Points	PLACINGS		Call-sign	Points	PLACINGS	
		Home Position	Over-seas Position			Home Position	Over-seas Position			Home Position	Over-seas Position
G3NNT *	4322	1		G3MTB	1363	23		WIQCO	695		35
G3FPQ *	4266	2		VE2AFC *	1257		15	WIYPT	670		36
G3KGY	4258	3		G2AJB	1218	24		G8QZ	650	36	
G3FXB	3603	4		GM3NPR	1208	25		VE3BMB	630		37
G5HZ	3385	5		GM3NFR	1206	26		W3POP	620		38
GB2SM†	3379	—		EA3LA *	1204		16	G3MWZ	600	37	
G3KFT	3256	6		SP9RF	1203		17	OK3UE *	595		39
OH5SM *	2585		1	IIZWY	1190		18	KP4AVQ *	535		40
G2QT	2510	7		G3LCH	1180	27		6O2GM *	520		41
G3NFV	2395	8		G3ILO	1168	28		SP9EC	491		42
G3LKB	2335	9		G3AGN	1165	29		GW3IJE *	480	38	
G2HDU	2245	10		G2FUU	1155	30		GM3HWN	470	39	
G3JAF	2165	11		OH3QM	1133		19	G8KV	445	40	
ZD2JKO *	2138		2	VP9AK *	1101		20	W2QKJ *	430		43
SP5XM *	2116		3	G3NNV	1095	31		ZE3JJ *	425		44
UR2BU *	1933		4	SM5BOU	1060		21	VE3AHU	410		45
HA9OZ *	1915		5	EA6AY *	1008		22	G3MGL	400	}41	
OH2EW	1880		6	IIBEG	995		23	G2AHL	400		
G3LHJ	1845	12		YUIAG *	993		24	VQ8AM *	398		46
VE3ENH *	1838		7	GC2CNC	970	32		G6CL	395	43	
VE1TG *	1806		8	LU8CW *	930		25	SM5AQI	388		47
G2HMG	1778	13		SM6AVM	920		26	OH3NY	385		48
GM3OEV *	1723	14		CT1PK *	903		27	DL3TJ *	363		49
G2JB	1660	15		G5FI	890	33		HP1AC *	360		} 50
SM5CHA *	1610		9	W3HQO *	888		28	EA6AR	360		
GC2AAO *	1600	16		G8TS	865	34		EA8CL *	353		52
G3JYB	1590	17		OH5PN	855		29	EP2AT *	351		53
UAICK *	1530		10	K1OCU	833		30	OZ5SQ *	325		} 54
G2DC	1510	18		IIHL	825		31	OH5OD	325		
G3LLK	1505	19		VE3CKP	806		32	G3JFD	320	44	
G3MA	1488	20		EA2CR	760		33	UA1AEF	305		56
IIANN *	1460		11	GI3NKQ *	760	35		G3KSH	305	45	
ZS6AJH *	1453		12	K8CFU *	750		34	SM7TV	295		57
IINE	1440		13					SM5MC	290		58
OK3KGI †	1435							W8KC	235		59
G3NAC	1425	21						ZS5PG *	185		60
WIFZ *	1411		14					WIRWU	170		61
G3NSV	1400	22						OZ7DX	110		62

* *Certificate winners.*

† *Club stations.*

contact but showing an incorrect total, whilst others used quite different systems necessitating the complete re-scoring of their entry. Thus some will find their published score differs considerably from that claimed, and may even be higher than they had expected! To forestall a regular query as to why the published scores are not always divisible by five it should be explained that points deducted for inaccuracies do not always amount to those allotted for the contact, part scores only being deducted for minor errors.

Rules

Certain ambiguities in the rules were detected and pointed out by ZD2JKO, and will be considered, as will all other comments and suggestions, when the Contests Committee meets to discuss the rules for the next event. It can, however, be mentioned at this stage that the suggestion that a similar event be held on 1·8 Mc/s could not be supported by the Committee owing to the interference that would be caused to other services using this shared band.

The results of the Receiving Contest are given on page 487.

* * *

The Contests Committee thanks the following stations for submitting check logs: K1KPZ, OH2KO, SM6RS, VE3AO, VO1BD, VP6AM, G3MWG, G3OEY and GC2FZC.

DX Contacts from Great Britain

DECEMBER 3			DECEMBER 4		
07.00	(21)	VQ4, VS9, ZD2, ZL3, 9G1.	07.00	(21)	ET, FQ8, VQ2, VQ4, VQ8, ZS, ZD2, 9G1, 9U5, 5A2.
08.00	(21)	JA, LU, AP, PY, ZD2, ZL.	08.00	(21)	EP, ET, FF7, FQ8, JA, VK, ZL, 9G1, 9U5, 5A2.
09.00	(21)	AP, KG6, KR6, PY, VK, VU, ZL.	09.00	(21)	PY, ZD2, ZL, ZS, 9K2.
	(28)	VK, ZS, ZL.		(28)	UA9, ZE, ZS.
10.00	(21)	LU, PY, VQ4, ZL.	10.00	(21)	ZE, EP, ZL, ZS.
	(28)	VP6.		(28)	VP6, ZD2, ZE, ZS, 5A2, 6O2, 9G1.
11.00	(21)	KP4, VE1.	11.00	(21)	EP, KP4, VP3, VP6, VK, PZ, W1, ZS, 5A2, 6O2.
	(28)	KP4, VP6, VQ4, ZE, ZS, 6O2, 9K2, UA9.		(28)	MP4, LU, VK, ZE.
12.00	(21)	HZ, KP4, VP6, VE1, W1, W2, W3, W4, W8, W9.	12.00	(21)	HV, VK, VQ4, W1, W2, W3, W8, EP, 6O2.
	(28)	KP4, OA, UA9, VP6, VQ8, W1, W2, W3, W4, 5A3.		(28)	MP4, CR7, W2, YV, 5A5, 6O2.
13.00	(21)	KP4, VE3, W1, W2, W3, W4, W8.	13.00	(21)	EP, HV, VE1, VE3, VQ8, VP5, W1, W2, W3, W4, W8, 6O2.
	(28)	KP4, PY, VE2, VE3, W1, W2, W3, W4, W8, ZD2.			
14.00	(28)	VE1, VE2, VE3, VP3, VP6, VQ2, VQ3, VQ4, VQ8, LU, W1, W2, W3, W4, W5, W8, W9, W0, ZD1, ZD2, ZE, ZS, 5A5.		(28)	VP9, VE1, VE2, VE3, W1, W2, W3, W4, W5, W8, W0, 5A2.
			14.00	(28)	KP4, HH, KZ5, LU, VE1, VE2, VE3, VE4, W1, W2, W3, W4, W5, W8, W9, W0, ZS, VP6, VP9.
15.00	(21)	CR6.	15.00	(21)	VQ8, 9K2.
	(28)	CR6, HP, LU, T1, VE2, VE3, W1, W2, W3, W4, W5, W8, W9, W0, ZD2, ZE, VP6.		(28)	CX, LU, VE2, VE3, VO, VP3, VP9, W1, W2, W3, W4, W5, W8, W9, W0, XE, 5A3.
16.00	(21)	VE5, VQ2, VQ3, W1, W9, ZD2, ZS.	16.00	(21)	KP4, VE1, VP9, W1, W2, W3, W6, W8, YV, ZS, ZE, ZE, 9Q5.
	(28)	CR6, CX, HP, KP4, T1, VE1, VE2, VE3, VP6, VP9, W1, W2, W3, W4, W8, W9, W0.		(28)	T1, VE1, VE2, VE3, VE4, W1, W2, W3, W4, W8, W9.
17.00	(21)	HP, KP4, KZ5, PY, VE2, VE3, VE4, VE5, W1, W2, W3, W8, W0, YV.	17.00	(21)	HK, KP4, VE1, VE2, VE3, VP2, VP3, VP9, VQ2, VO, W1, W2, W3, W4, W8.
	(28)	T1, KZ5, VE3, W1.		(28)	LU.
18.00	(21)	LU, PY, VE1, VE2, VE3, W1, W2, W4, W5, W8, W0, YV.	18.00	(21)	EL, HK, KP4, PJ, PY, VE1, VE3, VO, VP2, VP3, VP4, VP6, W1, W2, W3, W4, W8, W9, W0, 5A2.
19.00	(21)	CX, CE, PY, VE3, W1, ZP.			

Times shown are the period of one hour commencing at the time shown, e.g. a contact at 10.50 would appear as 10.00.

CONTEST NEWS

RESULTS — REPORTS — RULES

144 Mc/s C.W. Contest 1961

CONDITIONS could just possibly have been worse for the first contest this year, but not by very much, with full gales blowing in the South and West and many entrants commenting on the poor signals. The North-South path opened slightly during the morning, however, and West Country stations were audible in London during the late afternoon. Many contacts could not have been made on telephony and the results during this very bad spell amply justify c.w. only. With conditions so poor it could be expected that extra care would have been taken to ensure accuracy but no hint of this appears in the logs. Some of the scores which are not divisible by five are the results of penalties exacted for errors.

The leading entrant in the High Power Section was G. M. C. Stone (G3FZL), well known on the v.h.f.'s, but the leader in the Low Power Section was a newcomer on 144 Mc/s—P. V. Dutfield (G3OBD) working portable from a hilltop in Wiltshire in the most appalling weather.

Particular mention must be made of G3AYC, the B.B.C. Ariel Radio Club station operated by A. H. B. Bower (G3COJ), running a completely transistorized station with an input of 1·4 watts to the transmitter. His best contact was with G3OBD/P at about 95 miles.

No v.h.f. contest passes without some comment on the scoring system in use and it might clear the air a little if the proposed arrangements for the next year are given now. The January and March 144 Mc/s contests are scored on a "points per contact" basis with county and country bonuses. The two Field Days will be scored on "points per mile" while the September Contest which is not directly an R.S.G.B. concern is on "points per kilometre." The 70 Mc/s contest and the two 420 Mc/s contests will be on "points per mile."

The Contests Committee is always interested in practical scoring systems which are: (i) Obviously fair (otherwise a large section who feel unfairly handicapped will not enter); (ii) Easy for the entrant to calculate (two entrants misread the rules for the 144 Mc/s C.W. event!); (iii) Readily checkable (it is particularly useful if two stations in contact can claim the same points since the contest is then self checking); (iv) Free of loopholes (one serious loophole in the rules for the 144 Mc/s C.W. contest will be stopped next year).

Finally please read the rules for contests—no less than 12 entrants made errors on their cover sheets: three mentioned no section, five made no power declaration and four gave no county in their address.

Check logs from G2UJ, G3BPT and G5TZ are gratefully acknowledged.

HIGH POWER SECTION

Position	Call-sign	Contacts	Counties	Points
1	G3FZL	74	26	1369
2	G3HBW	71	26	1357
3	G2XV	59	23	1165
4	G3LTF	62	21	1113
5	G3KMT	42	25	1022
6	G4DC	56	18	1010
7	G2CIW	43	23	1005
8	G3EGK	44	22	980
9	G3BNL	40	23	975
10	G3CCH	39	21	915
11	G3JWQ	36	21	873
12	G3GOZ	48	15	855
13	G3HWR	47	15	842
14	G5DS	38	15	755
15	G3LTN	33	15	705
16	G5CP/A	23	14	580
17	G3INU	32	10	570
18	GW3MFY	22	14	523
19	G6SC	15	12	450
20	G5ZT	11	9	288
21	G5MR	7	6	220

LOW POWER SECTION

Position	Call-sign	Contacts	Counties	Points
1	G3OBD/P	48	22	1030
2	G6GN	44	23	1003
3	G3NNG	45	22	988
4	G3HRH	50	18	950
5	G3KPT	40	21	925
6	G3LAR	40	16	800
7	G5UM	36	14	710
8	G3FD	36	11	635
9	G5HZ	38	9	620
10	G2MR	30	12	600
11	G3JR	27	10	520
12	G3JTK	27	10	508
13	G3NNK	30	7	475
14	G3AYC	21	9	435
15	G3HS	16	10	410
16	G3IBI	19	8	390
17	G2DHV	20	7	375
18	G2WS	17	8	370
19	G3GHN	19	6	340
20	G8TS	18	6	330

London D/F Qualifying Event

THE assembly time for the London D/F Qualifying Event on April 30, 1961, will be 13.00 B.S.T. and not as shown on page 436 of the March issue of the BULLETIN.

D/F Qualifying Event

DETAILS of the South Manchester qualifying event are as follows:

Sunday, May 14.
Organizer: C. M. Denny (G6DN), 18 Willoughby Avenue, Didsbury, Manchester 20.
Frequency: 1820 kc/s.
Call-sign: G3FVA/P.
Map: Ordnance Survey, New Popular Edition, Sheet No. 101.
Assembly Point: South Manchester Radio Club Headquarters at The Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield, Manchester 14.
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer at least seven days in advance, stating the number of their party requiring tea.

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

THE results of the R.S.G.B. 21/28 Mc/s Telephony Receiving Contest, 1960, were as follows:

Posn.	Entrant	Points	Posn.	Entrant	Points
1	A.1495	2766	25	A.2327	1230
2	B.R.S.21008	2731 *	26	SM4-2825	1180 *
3	A.1902	2660	27	SM5-2735	1165
4	A.1629	2448	28	A.2524	1145
5	B.R.S.20570	2288	29	A.2179	1140
6	B.R.S.21624	2213	30	B.R.S.22426	1085
7	B.R.S.20249	2205	31	SM7-3123	1065
8	A.1859	2186	3	SM6-3144	1055
9	A.1623	2144		A.2204	1055
10	B.R.S.22100	2005	34	SM6-E82	940
11	A.2122	1990	35	B.R.S.22553	910
12	A.2143	1980	36	SM3-2991	905
13	B.R.S.22081	1900		A.2385	905
14	B.R.S.19682	1870	38	SM3-3112	900
15	B.R.S.22844	1770	39	A.2340	870
16	A.2106	1715	40	A.2111	850
17	A.2252	1690	41	B.R.S.21957	835
18	B.R.S.18876	1595	42	A.1657	715
19	B.R.S.18461	1490	43	11-10563	540
20	A.1543	1430	44	B.R.S.22527	475
21	J. Shankland	1420	45	J. Ingham	325
22	A.1980	1405	46	B.E.R.S.1036	275
23	B.R.S.22357	1240	47	C. Thorpe (VK4)	35
24	A.1954	1235		* Certificate winners.	

Incomplete, and therefore unclassified, entries were received from DL-8497 and A.1736.

Forthcoming Events

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

DATES FOR YOUR DIARY

April 23.—Region 1 O.R.M. at Blackpool.
April 30.—Region 3 O.R.M. at Trentham Gardens.
April 30.—North Midlands Mobile Rally, Trentham Gardens.
May 7.—Cheltenham Mobile Rally.
May 7.—Mid-Surrey Mobile Rally.
May 7.—Thanet Mobile Rally, Cliffsend, Ramsgate.
May 13.—Region 13 O.R.M. at Edinburgh.
May 14.—Grimsby A.R.S. Hamfest at Cleethorpes.
May 27.—International V.H.F./U.H.F. Convention, London.
May 28.—Hunstanton Mobile Rally.
May 28.—Northern Mobile Radio Rally.
May 28.—Southern Counties Mobile Rally.
June 11.—Harlow Mobile Rally.
June 18.—A.R.M.S. Rally at Barford St. John, near Banbury.
June 25.—Longleat Mobile Rally.
July 8-9.—South Birmingham Night Rally.
July 9.—South Shields Mobile Rally.
August 12-13.—Derby Mobile Rally and Hamfest.
August 23-September 2.—National Radio and Television Show, London.
September 3.—G6UT's "Ham Party."
September 10.—Region 11 O.R.M. at Prestatyn.
September 10.—National Mobile Rally at Woburn Abbey.
September 16.—Region 10 O.R.M. at Cardiff.
September 17.—Lincoln Mobile Rally and Hamfest.
October 21-22.—Scout Jamboree-on-the-Air.
November 22-25.—R.S.G.B. International Radio Hobbies Exhibition, London.

REGION 1

Ainsdale (A.R.C.).—Wednesdays, 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Squires Gate Holiday Camp.
Bury (B.R.S.).—May 9 ("Radio Control of Models" by Mr. Polaski), 8 p.m., The Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Crosby.—Tuesdays, 8.30 p.m., Colonsay, Crosby Road South, Waterloo.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft. April 18 ("D/F Equipment" by G3IQO), April 25 (Junk Sale), May 2 ("TVI Precautions" by G3LIS), May 16 (D/F Contest).
Macclesfield.—April 18, May 2, 16, 30, 42 Jordangate.
Manchester (M. & D.A.R.S.).—Wednesdays, 7.30 p.m., King George VI Club, North Road, Moston, Manchester 10. **(S.M.R.C.)**—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield 14.
Morecambe.—May 3, 125 Regent Road.
Preston (P.A.R.S.).—April 25, May 9, June 13, St. Paul's School, Pole Street.
Southport (S.R.S.).—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—April 26, May 10, 24, 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—April 19 (Report on DX-pedition to Carmarthenshire), May 3, 17, 7.45 p.m., The Castle Hotel, Ivy Street, Birkenhead.

REGION 2

Barnsley.—April 28 (Beginners Questions), May 12 ("Transistors" by J. A. Ward, G4JJ), 7.30 p.m., King George Hotel, Peel Street.
Bradford.—April 25 (Junk Sale), May 9 (Treasure Hunt), 66 Little Horton Lane.
Halifax.—June 6 ("Model Aircraft" by G3OGV), June 20, Sportsman Inn, Ogden.
Leeds (L.A.R.S.).—April 19 (Film Show), May 3 (Bring and Buy Sale), May 10 (N.F.D.), Swarthmore Education Centre, 3 Woodhouse Square, Leeds 3. April 26, visit to Fane Acoustics Ltd., Batley.
Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street, Scarborough.

REGION 3

Birmingham (Bournville).—April 21, May 5, 7.30 p.m., Cadbury's, Bournville. **(M.A.R.S.).**—April 18 ("S.S.B. Operating" by G3DO), April 28 ("Demonstration of Heathkit Stereo Equipment"), 7.30 p.m., Midland Institute, Paradise Street, Birmingham. **(Slade).**—April 21 (The TW Range of V.H.F. Equipment), April 28 (Whist Drive), May 5 ("Electronics in Industry," by W. & T. Avery Ltd.), Church House, High Street, Erdington. April 23, D/F Test (Harcourt Trophy). **(South).**—April 20 (Films by G3IBP), May 18 ("Electronic Brains" by J. C. Cluley), 7.30 p.m., Friends Meeting House, Moseley Road, Birmingham.
Cannock Chase.—May 4, 7.45 p.m., Bridgetown Inn, Walsall Road, Cannock.
Stourbridge.—May 2, 7.45 p.m., Foley College, Stourbridge.
Sutton Coldfield.—April 27 ("S.S.B. for Beginners" by John Symes), May 11 (Home-built Receiver Design—Discussion), 7.30 p.m., 92 The Parade, Sutton Coldfield.
Wolverhampton. — April 24 ("Receiver Design,") 8 p.m., Neachells Cottage, Stockwell End, Tettenhall.

REGION 4

Derby (D. & D.A.R.S.).—April 19 ("Two Metres" by T. Douglas, G3BA), April 22 (Founder Members' Dinner), April 27 (Open Night—Committee Meeting), May 3 (Surplus Sale), May 10 (D/F Practice Run), May 17 ("RTTY," by R. Tunney, G8DD), 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W. Exp. S.).**—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
Grimsby (A.R.S.).—April 27 (Film Show), May 11 (Lecture and Construction Night), May 25 (N.F.D. Discussion), 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Leicester (L.R.S.).—Mondays, 7.30 p.m. (Morse Tuition, 7.30-8.30 p.m.), Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (L.S.W.C.).—April 19 (Annual Dinner), April 26 (Talk by J. A. Porter, G3AQY), May 10 (N.F.D. Discussion), 7.30 p.m., Room No. 19, Technical College, Cathedral Street, Lincoln.
Melton Mowbray (A.R.C.).—April 27 ("Two Metres" by J. I. Warrington, G2FNW), 7.30 p.m., St. John Ambulance Hall, Asfordby Hill.
Nottingham (N.R.C.).—April 18 (R.S.G.B. Members' Night), April 25 (Discussion on RTTY), 7.30 p.m., Community Centre, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
Northampton (N.S.W.R.C.).—Thursdays, 7 p.m., Allen's Pram Works, Duke Street, Northampton.
Peterborough (P. & D.A.R.S.).—May 5 (T.R.F. Shortwave Receivers), 7 p.m., Peterborough Technical College.
Retford & Worksop (N.N.R.S.).—Tuesdays (Construction and Beginners), Thursdays, 7.30 p.m., Club Rooms, Victoria Hall, Eastgate, Worksop, Notts.

REGION 5

Cambridge. (C. and D.A.R.C.)—April 21 (Members' Equipment and lecturettes), May 19 (Sale of Surplus Equipment), 7.45 p.m., "Jolly Waterman," Chesterton Road, Cambridge.
Shefford (S. and D.A.R.S.).—April 20 (Film Show), April 27 (Wavemeters), May 4 (Aerial Discussion), May 11 (Quiz), May 18 N.F.D. Arrangements), 7.30 p.m., Digswell House.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street, Cheltenham.
High Wycombe (Chiltern A.R.C.).—April 27, 8 p.m., British Legion Hall, St. Mary Street, High Wycombe.
Stroud.—Wednesdays, 8 p.m., Subscription Rooms, Stroud.
Wolverton (W.D.R.C.).—Fridays, 7.30 p.m., Science and Arts Institute, Church Street. May 5, N.F.D. Preparations.

REGION 7

Acton, Brentford and Chiswick.—April 18 ("Power Generation" by G3GEH), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Barnet (B. & D.R.C.).—April 25 ("D/F Gear" by H. W. Pope, G3HT), May 30 ("Mobile Equipment" by V. A. Frisbee, G3KVF), 8 p.m., Red Lion Hotel, Barnet.
Bexleyheath (N.K.R.S.).—April 27, 8 p.m., Congregational Hall, Bexleyheath (nr. Clock Tower).
Croydon (S.R.C.C.).—May 9, 7.30 p.m., "Blacksmith Arms," South End, Croydon.
Dorking (D. & D.R.S.).—Second and fourth Tuesday in each month, 8 p.m., Star and Garter Hotel, Dorking.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East Ham.—April 18 and fortnightly, 8 p.m., 12 Leigh Road, East Ham.
East Molesey (T.V.A.R.T.S.).—May 3 ("Demonstration Mobile Equipment by G2CRD"), 8 p.m., Carnarvon Castle Hotel, Hampton Court.
Enfield and District.—April 27 ("Selenium and Silicon Rectifiers" by a representative of S.T.C.) 7.30 p.m., George Spicer School, Southbury Road, Enfield.
Harlow and District.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays (R.A.E. and Morse), 7 p.m., Fridays (Club), 7.30 p.m., Montem School, Hornsey Road, Holloway N.7.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (near Seven Kings Station).

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Friday, April 21, May 19 and June 16, 1961

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

Kingston.—Lectures alternate Thursdays, Theory and Morse Classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston (Morse at 2 Sunray Avenue, Tolworth).
New Cross (C.A.R.S.).—Fridays, 7.30 p.m. Sundays, 11.30 a.m., Wednesdays (Morse Practice), April 21 (D/F Lecture by G3HZI) May 5 (Junk Sale), 8 p.m., 225 New Cross Road, London, S.E.14.
Norwood and South London (C. P. & D.R.C.).—May 2 (Morse Class), 8 p.m., at G3FZL. April 15 ("RTTY for the Beginner" by E. W. Yeomanson, G3IIR), Windermere House Annexe, Westow Street, Crystal Palace.
Paddington (P. & D.A.R.S.).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.

Purley (P. & D.R.C.).—April 21 (N.F.D. Arrangements), 8 p.m., Railwaymen's Hall, Whytecliffe Road, Purley.
Romford (R. & D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Southgate.—May 11 (" RTTY " by Dr. Gee, G2UK), 8 p.m., Arnos School, Wilmer Way, N.14.
South Kensington (C.S.R.S.).—April 18 (Films and Recorded Lecture on Aerials by F. Charman, G6CJ), 6 p.m., Science Museum, South Kensington.
Sutton and Cheam (S. & C.R.S.).—April 18 (A.G.M.), " The Harrow," High Street, Cheam.
Welwyn Garden City.—May 11 (Briefing for Field Day), 8 p.m., Television School, Murphy Radio Ltd., Bessemer Road.

REGION 8

Crawley (C.A.R.C.).—April 26 (" V.H.F. Aerial Design " by G3OPR), 8 p.m., West Green Centre. May 10 (Informal), for venue contact G3FRV.
Tunbridge Wells (W.K.A.R.S.).—April 28 (" How to become a radio amateur " by G2UJ and G4IB), May 12 (Informal), May 26 (N.F.D. Arrangements), 7.30 p.m., Kent County Council Adult Centre, Culverden House, Culverden Park Road, Tunbridge Wells, Kent.

REGION 9

Bath.—April 17, 7.30 p.m., Committee Room, Bath Technical College.
Bideford.—First Thursday in each month, 7.30 p.m., alternately at T. G. Ward (G2FKO), 38 Clovelly Road ('phone: Bideford 964) and D. H. Jones (G3BO), Rosebank, Westcombe ('phone: Bideford 550).
Bristol.—April 21 (" K.W. Electronics S.S.B. Equipment " by R. G. Shears, G8KW), 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1. May 5, 7 p.m., Mullard Film Show, Grand Hotel, Broad Street, Bristol 1.
Exeter.—Second Thursday in each month, 8 p.m., Y.M.C.A., St. David's Hill, Exeter.
Falmouth.—First Wednesday in each month, Y.M.C.A., Falmouth.
Plymouth (P.R.C.).—Tuesdays, 7.30 p.m., Virginia House Settlement, St. Andrew's Cross. April 18 (Judging of entries for " Ernie Hillyard Trophy,") May 2 (Judging of entries for " G5ZT Trophy "), May 10 (" Round the Local Amateurs," illustrated with slides and recordings).
Torquay (T.A.R.S.).—Second Saturday in each month, 7.30 p.m., Y.M.C.A., The Castle, Torquay.
Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road.
Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Cardiff.—May 8 (N.F.D. Arrangements and display of home-built equipment), 7.30 p.m., T.A. Centre, Park Street, Cardiff.
Penarth.—April 24 (" Aerials "), May 29 (Final N.F.D. Arrangements), 7.30 p.m., R.A.F.A. Club, Windsor Road, Penarth.

REGION 11

Rhyl (F.R.S.).—April 24 (" Trip to Woomera," by G. Ralph, GW3LNZ, ex-VK5SX), May 29 (Final N.F.D. Arrangements), 7.30 p.m., Bee Hotel, Rhyl.

REGION 13

Edinburgh (L.R.S.).—April 27 (" R.A.E. Technique and Around the School Clubs "), May 11 (" Mobile Operation,") 7.30 p.m., Y.M.C.A. 14 St. Andrew Street, Edinburgh 2.

REGION 14

Glasgow.—Second Friday in each month, 7.30 p.m., Woodside Halls, Clarendon Street, N.W. (near St. George's Cross Underground).
Motherwell.—Third Friday in each month, 7.30 p.m., Carfin Hall, Motherwell.
Prestwick.—Third Sunday in each month, 7.15 p.m., Royal Hotel, Prestwick.

REGION 16

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

REGION 17

Portsmouth.—Tuesdays, 7.30 p.m., Scarrs, 183A Albert Road, Portsmouth.
Southampton.—First Saturday in each month, 7 p.m., Prospect House (back of Gas Board Showrooms), Above Bar.

Regional and Club News

Army Wireless Reserve Amateur Radio Society.—Members will be operating GB3AWR on the h.f. bands from Blandford, Dorset, from April 15-29. Contacts will be welcomed. *Hon. Secretary:* D. W. J. Haylock (G3ADZ), 3 Norris Gardens, Grange Estate, Havant, Hants.

Barnet and District Radio Club.—A dinner-dance will be held at the Red Lion Hotel, Barnet, on April 28. Tickets, price 21/- each, may be obtained from the *Hon. Secretary:* E. W. Brett, 28 Edward House, Edward Grove, New Barnet.

Bristol.—There was an attendance of 63 at the last meeting when a most entertaining lecture entitled " Electronics without tears " was given by E. C. Halliday (G3JMY). A return Skittles match with the Bristol Group of the Television Society at the Eastfield Inn, Westbury-on-Tyne was due to take place on March 27. The activities on the Swindle Table have been restarted, and members with surplus equipment to sell are asked to bring this along to the next meeting on April 21. *Hon. Secretary:* R. L. Shaddick (B.R.S.19727), 2 Shanklin Drive, Filton, Bristol.

Chester and District Radio Society.—At the A.G.M., the following were elected: *Chairman*—D. Wardle; *Vice-Chairman*—D. Rickers; *Hon. Treasurer*—J. Butler; *Hon. Secretary:* H. Morris (G3ATZ), 24 Kingsley Road, Boughton Heath, Chester. The Annual Dinner is due to take place on April 15. Meetings at the Y.M.C.A., Old Bishop's Palace, Chester, are arranged for April 18 (Junior Constructional Contest), April 25 (" Detector Circuits " by G3OPT), May 9 (" Operating Procedure ") and May 16 (Debate).

The Spen Valley Amateur Radio Society took part in the Brighouse Model Engineering Society's Exhibition held in Halifax during October, 1960. In this picture M. Firth (G3MMK) and M. Whitaker (G3IGW) are operating G3MMK/A.

Clifton Amateur Radio Society.—The first round of the inter-club quiz was won by Crystal Palace and District Radio Society by 83 points to 80. It is hoped to extend such events to other clubs in South London. *Hon. Secretary:* C. H. Bullivant (G3DIC), 25 St. Fillans Road, London, S.E.6.

Cornish Radio and Television Club.—At the March meeting, the Sheila Locke Shield for short wave listeners was presented to W. Gilbert, Jnr., and W1PFA's recorded talk on his visit to St. Pierre and Miquelon Islands played back. The A.G.M. was due to be held at the Redruth Brewery Hall on April 5. *Hon. Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn.

Derby and District Amateur Radio Society.—From April 20-22 members will be taking part in the Hobbies and Handicrafts Exhibition at the Centenary Hall, Heanor, during which period GB3ERD will be active on all bands. *Hon. Secretary:* F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover, Derby.

Harrow, Radio Society of.—The Annual Construction Contest for the Pykett Cup will be held on April 28. Meetings are held at 8 p.m. on Fridays at Roxeth Manor Secondary School, Eastcote Lane, South Harrow, and visitors are always welcome. Alternate Fridays are devoted to practical work, a new club transmitter being the present project. Morse classes are held regularly. *Hon. Secretary:* S. C. J. Phillips, 131 Belmont Road, Harrow Weald.

Mid-Lanarkshire R.S.G.B. Group.—This new group meets at the Carfin Hall, near Motherwell, on the third Friday in each month, commencing at 7.30 p.m. Visitors and prospective members are always welcome. Information on future activities may be obtained from Ian Swan (A.2421), Springfield, 50 Mouse Bank Road, Lanark.

Midland Amateur Radio Society.—The Society's TV Group gave a demonstration on March 2 of live television pictures transmitted by G3MXW/T five miles away. Others taking part were G3DFL and G3HAZ. There was an attendance of 60.

Paddington and District Amateur Radio Society.—Membership is growing rapidly and meetings are well attended. A Top Band rig is now available and some DX has been worked on the h.f. bands. Future plans include Morse instruction and talks on the interpretation of circuits and on construction practice. *Hon. Secretary:* N. Lambert (G3LVK), 22 Sunderland Terrace, Bayswater, London, W.2.

Peterborough and District Amateur Radio Society.—At the March

Members of Dunbarton Group, winners of the Scottish N.F.D. Trophy 1960, at the Glasgow Group's Dinner in December 1960. Those in the picture are GM3ITN, GM3KCY, GM3KBZ, GM3KTZ, GM3LAL and GM3LYS.

meeting, films of N.F.D., R.S.G.B. conventions, magnetism and shortwave communication were shown. It was reported that another boat had been offered for use at the summer rendezvous at Alwalton. *Hon. Secretary:* D. Byre (G3KPO), Jersey House, Eye, Peterborough.

Reading Amateur Radio Club.—At the Palmer Hall, West Street, on April 29 at 7.30 p.m., Mr. Kirkpatrick and Mr. Horsnell (G2YI) of the G.P.O. will discuss transmitting licence conditions. On May 27, A. M. Mills (G3NNF) is to give a talk entitled " Aerials in restricted spaces for 80 and 160m." *Hon. Secretary:* R. G. Nash (G3EJA), 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society.—Recent events have included a talk by G4ZU on the " Birdcage " aerial and a visit to the B.B.C. Monitoring Station at Tatsfield. On April 15, G3BCM is due to demonstrate his " Top to Ten " transceiver. Final N.F.D. arrangements will be discussed on May 13 and will be followed by a rehearsal the following day. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

Rotherham Radio Club.—G3OJG's recent talk on licence regulations was a useful refresher on some of the finer points and gave those aspiring to a licence an idea as to what is required of them. Other talks have been on test gear and transistorized equipment. Preparations for N.F.D. are going ahead. *Hon. Secretary:* S. J. Scarborough, 25 Crawshaw Avenue, Beauchief, Sheffield, 8.

Southend and District Radio Society.—Recent events have included a lecture and demonstration by Dr. A. C. Gee (G2UK) on " Amateur Radio Teleprinter Operation " and competitions for the Pocock and Hudson cups. Details of the fortnightly meetings may be obtained from the *Hon. Secretary:* Mrs. P. M. C. Collop, 53 Beedell Avenue, Westcliffe-on-Sea.

South Manchester Radio Club.—Details of activities may be obtained from the *Hon. Secretary*: F. Nicholls (G3MAX), 125 Rochdale Road, Manchester 4.

Stockport Radio Society.—At the A.G.M., the following officers were elected: *Chairman*—A. Evans; *Vice-Chairman*—J. Weaving (G3OWW); *Hon. Treasurer*—W. H. Banks (G2ARX); *Hon. Secretary*—G. R. Phillips (G3FYE), 7 Germans Buildings, Buxton Road, Stockport; *Assistant Hon. Secretary*—W. Shaw; *Committee Members*—A. Smith (G3AYT), E. Wigzell, I. MacArthur (G3NUQ), D. Allen (G3IPZ). The A.S.R. is R. Hobson (G3JRQ). On behalf of the International Scout Club of Manchester Mr. D. Rivers presented a shield expressing the appreciation of the Scout Movement for the work done by the society in connection with the Jamboree-on-the-Air using the call-sign GB3ISM. A competition is to be held to promote interest in 2m work. Forthcoming lectures will be on microwaves, s.s.b., power packs and aircraft radio.

Thames Valley Amateur Radio Transmitters Society.—At the March meeting the General Secretary of the R.S.G.B. gave a talk on the Geneva Radio Conference and its possible effects on the future of the amateur service. Mr. Clarricoats described the tremendous amount of work done at such conferences in defence of the amateur bands and expressed the opinion that for radio amateurs the next conference might prove to be even more difficult than its predecessors. *Hon. Secretary:* K. Rogers (G3AIU), 21 Links Road, Epsom.

Welwyn Garden City.—The " Stanley Harrison (G3EPK) " Trophy has been awarded to G. Cockrane (G3LLF) for his oscilloscope. Second and third places in the competition were taken by G3EPK himself with a transistor audio oscillator and G3BJC with a Monimatch s.w.r. indicator. The judges were Peter Kidd (G6FL) and Louis Driscoll of Murphy Radio Electronics Laboratory.

Representation

THE following are additions to the list of County Representatives published in the December 1960 issue:

REGION 10—MONMOUTHSHIRE

J. S. Hammond (GW3JBH), 23 Park End, Longstone, nr. Newport.

PEMBROKESHIRE, CARDIGANSHIRE AND CARMARTHENSHIRE

G. H. Price (GW3LXI), 41 Main Street, Pembroke.

* * *

The following are additions to the list of Town Representatives published in the December 1959 issue:

REGION 3—STAFFORDSHIRE

STOKE-ON-TRENT

V. J. Reynolds (G3COY), 90 Princes Road, Hartshill.

REGION 5—BEDFORDSHIRE

BEDFORD

B. E. Gee (G3LDG), 12 West Grove.

REGION 7—LONDON EAST

CHINGFORD

C. C. Olley (G3AIZ), 157 Wanstead Park Road, Ilford, Essex.

REGION 10—MONMOUTHSHIRE

PONTYPOOL

J. T. Phillips (GW3LDC), 19 Avondale Road, Pontrhydyrun, Cwmbran.

Affiliated Society Representatives

THE following are additions to the list published in the December 1960 issue:

HALIFAX AND DISTRICT AMATEUR RADIO SOCIETY: Roy Smith (G3NBI), 3 Hunter Hill Road, Mixenden, Halifax.

NEWBURY AND DISTRICT AMATEUR RADIO SOCIETY: J. A. Gale (G3LLK), " Wild Hedges," Crookham Common, nr. Newbury, Berks.

SOUTHEND RADIO SOCIETY: A. C. Wadsworth (G3NPF), 2 Edith Road, Prittlewell, Southend-on-Sea, Essex.

STOKE-ON-TRENT AMATEUR RADIO SOCIETY: V. J. Reynolds (G3COY), 90 Princes Road, Hartshill, Stoke-on-Trent, Staffs.

Can You Help?

● H. Beadle (G8UO), 12 Cartmel Road, Keighley, Yorkshire, who requires information on the U.S. Army Signal Corps BC906D Frequency Meter?

● D. Byrne (G3KPO), Jersey House, Eye, Peterborough, who requires any information on the Hallicrafters HT11 (or ex-U.S. Navy Transmitter-Receiver Type CHL-43056, a unit of model MT2 radio equipment)?

● R. W. Howe (B.R.S.22629), 162 Victoria Road, Wood Green, London, N.22, who requires the circuit diagram and working instructions for a D.C. Avo Meter (circa. 1936)?

● L. Mavropoulos (ZC4LM), c/o High Commercial Lyceum, Nicosia, Cyprus, who requires the instruction book for the No. 22 set, details of the 12 volt power supply and information on the use of the set from a.c. mains?

● R. Ridgard (B.C.R.S.1065), 1 Fisher Street, Hectorville, South Australia, who requires information on the prewar American Atwater Kent 55 and particularly the rectifier valve, a UX280 or CX380?

● B. M. Silverman (B.R.S.22996), 58 Fountain House, Park Lane, London, W.1, who requires the circuit diagram and any other information on the Pye PCR2 receiver? He particularly requires information on the addition of a b.f.o. to this receiver.

● G. Somerville (GM3KYI), 73 Balerno Street, Dundee, who requires a handwinch for use with a 36 ft. brass telescopic mast during N.F.D.?

● F. F. Whitehead (B.R.S.22761), 91 Blackpool Road, Ansdell, Lytham St. Anne's, Lancs., who requires the servicing manual for the R.206 Mk. I receiver? He would also like to hear from any member who has experience of aligning the b.f.o. in the R.206 receiver for s.s.b. reception.

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