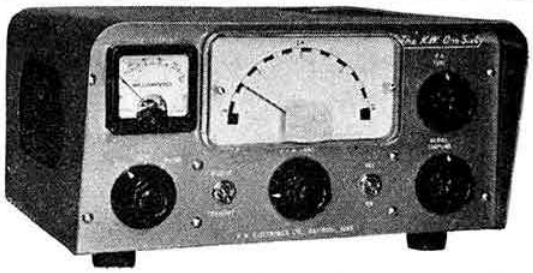
FEBRUARY, 1961

RSGB BULLETIN

VOL. 36, No. 8



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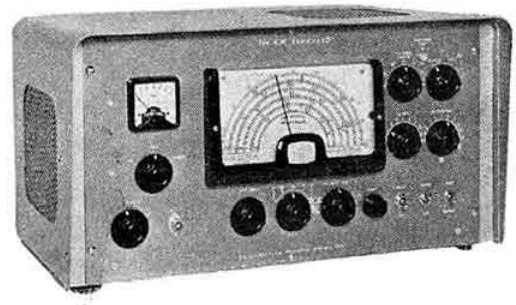

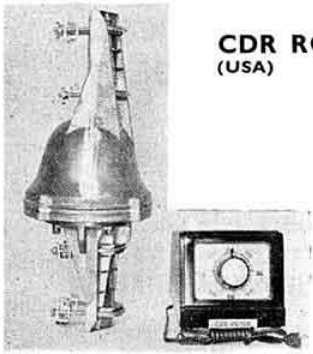

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Volume 36 No. 8

February 1961

2/6 Monthly

R.S.G.B. BULLETIN

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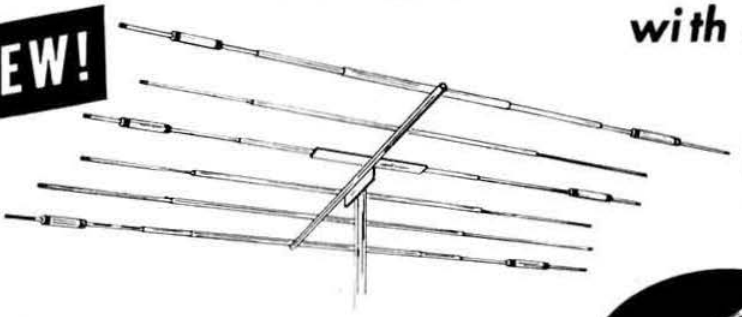

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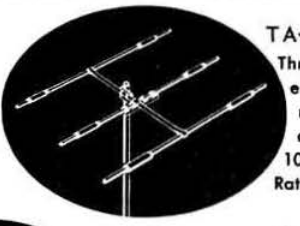

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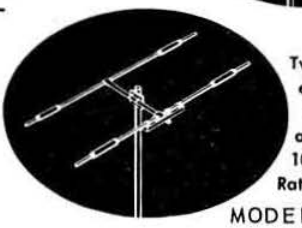

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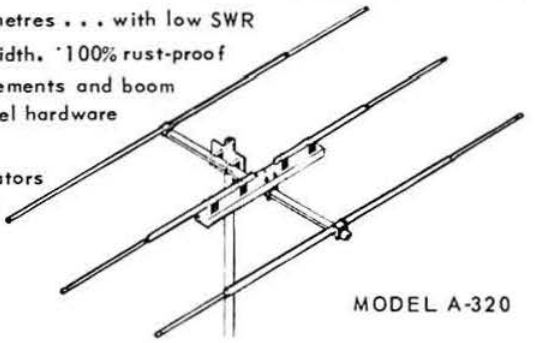

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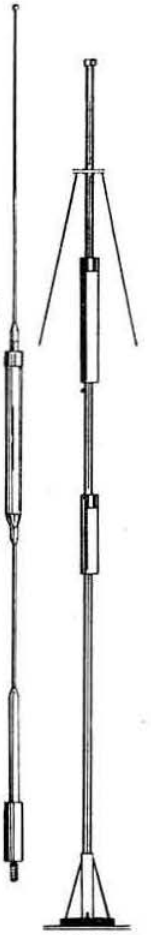

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O. J. Russell, G3BHJ, Manager

Current Comment

discusses topics of the day

Bulletin Nears the Century Mark

EVER since the very early days, radio amateurs all over the world have assessed their operating prowess by the number of countries they have worked. In more recent times, counties and prefixes have been added to the basic yardstick. And quite often one hears that two amateurs have worked each other so many thousand times or that a v.h.f. enthusiast has had contacts with so many continentals. But the most widely recognized of all operating awards is the DX Century Club issued by the American Radio Relay League. Although there are certificates now more difficult to obtain, the idea of working stations in 100 countries is still the aim of many of us. Indeed to have made one's century in terms of QSL cards is one of the signs of a real DX man on the high frequency amateur bands.

Magazines are somewhat like radio amateurs: in their case, one yardstick of success is the number of copies printed each month. At a time, therefore, when the membership of the Society is steadily rising, it is worth placing on record that the BULLETIN itself is reaching the century mark in the number of countries it is delivered to each month—far and away wider distribution than any other British magazine in the same field. From Aden to Alaska, Basutoland to Borneo, Bulgaria to U.S.A., Venezuela to Papua, Iceland to India, New Guinea to New Zealand, amateurs have made the "BULL" part of their radio lives.

Circulation, as even the man-in-the-street knows, is the lifeblood of every periodical, for upon this depend economic life. As the BULLETIN reaches more and more readers in more and more countries every month, so does its worth as an advertising medium increase for all who sell to the expanding Amateur Radio market.

A recent BULLETIN survey revealed, amongst a host of interesting facts which will be referred to on another occasion, that 94 per cent of readers find advertisement columns of interest, not least those in the private section of the classifieds.

The BULLETIN provides advertisers with an unexcelled opportunity to advertise their products to the most enthusiastic and worthwhile readership—in nearly 100 countries! J. A. R.

R.S.G.B. Book Shop

THIS month a new edition of Margaret Mills' most valuable little booklet *The Morse Code for Radio Amateurs* makes its appearance. The first edition of 5,000 copies disappeared in quick time. The new edition—containing many new exercises—comes along at a crucial time in the year for all who are striving to qualify for a transmitting licence. In keeping with the policy of the Society *The Morse Code for Radio Amateurs* is being offered at a price which will place it within the reach of even the youngest enthusiast.

The Society's *Guide to Amateur Radio*—now in its 8th Edition—and the Society's *Amateur Radio Call Book* are now firmly established as part of the stock in trade of countless newsagents and booksellers. We commend *The Morse Code for Radio Amateurs* as a worthy addition to their bookshelves.

Incidentally, yet another new R.S.G.B. publication is now well and truly on the stocks. Entitled *The Radio Amateurs' Examination Manual* this eagerly awaited text book is due to appear in April. It will sell at 5/- post free. Place your order now. J. C.

No Two Minds . . . All the People

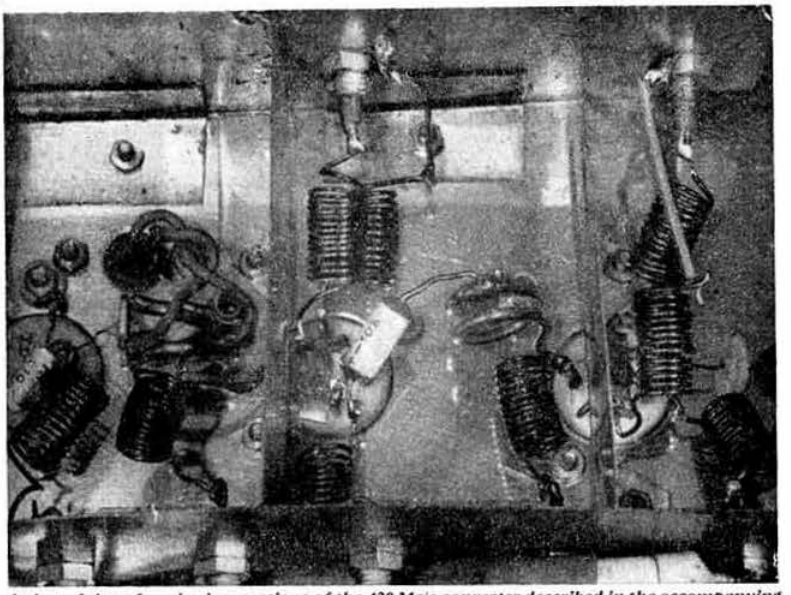
THE recent correspondence in the BULLETIN on the question of 420 Mc/s Contests has once more brought to light one of the major difficulties which are constantly before the Contests Committee. The members of this Committee are very conscious of the fact that they are required basically to give the membership the contests it wants. Unfortunately, in this context particularly, the old adage " no two minds think alike " is very true, and this places the Committee in an unenviable position: for they are also very conscious of minority rights in a Society like ours.

The year is very short, containing only 52 weekends, and with the removal of Bank Holidays, summer holidays and similar periods when contests of any nature will receive virtually no support, the number of possible " contest week-ends " is reduced to about 40. This, inevitably, gives rise to a very crowded calendar, and we have now reached the position when, unless some of the less popular contests are better supported, they will have to give way to the more popular events. Popularity is the yardstick in these matters and it is incumbent upon the v.h.f. enthusiasts and the DX enthusiasts alike to encourage their fellow amateurs to participate in the contests and to submit entries. Rarely does a contest occur in which more than 60 per cent of the known active stations actually submit an entry.

The Committee cannot please " all the people all the time " but guided by the enthusiasm of contestants will always endeavour to give everybody a fair portion of what he wants. R. C. H.

A Converter for 420 Mc/s

By J. O. BROWN (G3DVV)*



A view of the r.f. and mixer sections of the 420 Mc/s converter described in the accompanying article. The mixer is on the left, the second r.f. stage in the centre and the first r.f. stage on the right.

AFTER spending 250 hours on a converter using a trough line front end and a trough line crystal mixer, the author decided that plumbing was for plumbers, that crystal mixers were capable of making even the remotest possibility of a spurious response into an S9 signal, and that the completed job was not much smaller than a battleship.

* 21 Great Tattenhams, Epsom Downs, Surrey.

With the excellent v.h.f. valves now available from G.E.C., the use of radar type front ends usually associated with 420 Mc/s would not appear to be necessary until the 1296 Mc/s band is reached. The converter to be described consists of two r.f. stages, the first using a 417A, followed by an A.2521, with a further A.2521 as a mixer (Fig. 1). The i.f. signal is amplified by a 6AK5 and coupled into the main communication receiver via a 6C4 cathode follower. The

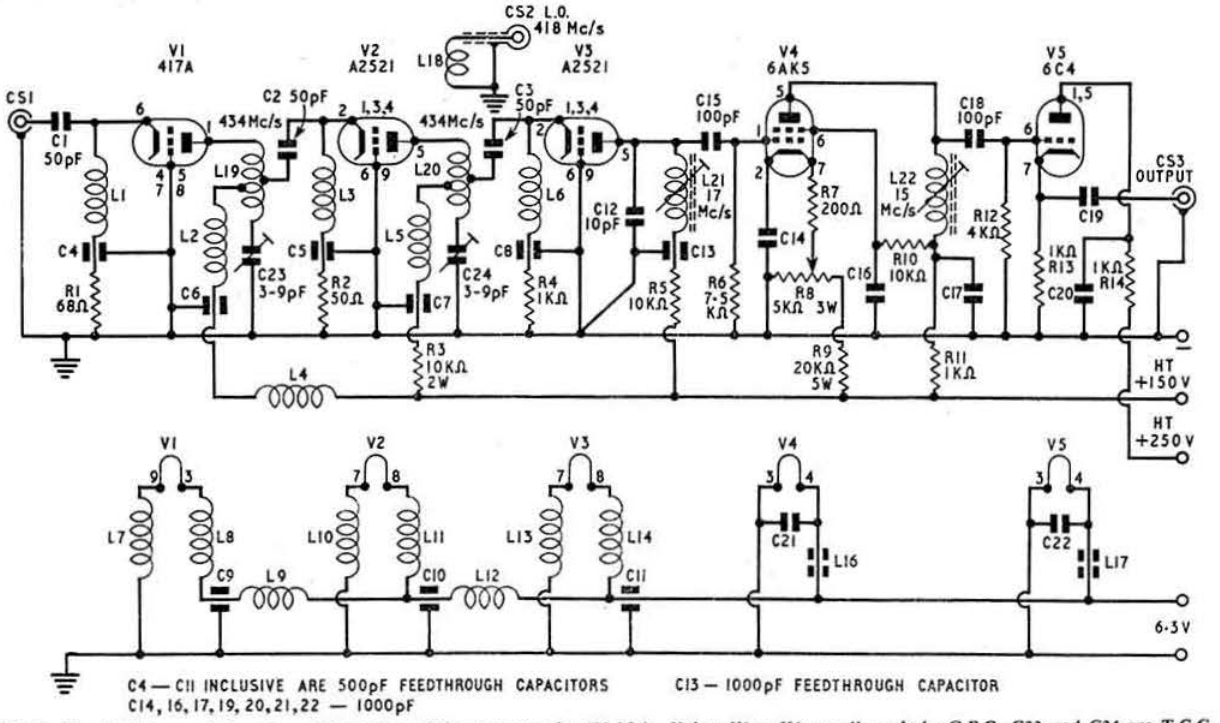


Fig. 1. Circuit diagram of the r.f. and i.f. section of the converter for 420 Mc/s. Valves V1 to V4 are all made by G.E.C. C23 and C24 are T.C.C. type CC159N.

crystal controlled local oscillator chain (Fig. 2) comprises a pair of 6J6s.

No more care has been taken with the construction of this converter than with one for 144 Mc/s. An aluminium chassis is used with tin plate for screening. In spite of this a noise factor of 6·5db was measured using an A.2087 noise diode, care being taken to ensure linear readings. In fact only the tuning arrangements need to be slightly changed for the unit to be an orthodox 144 Mc/s converter.

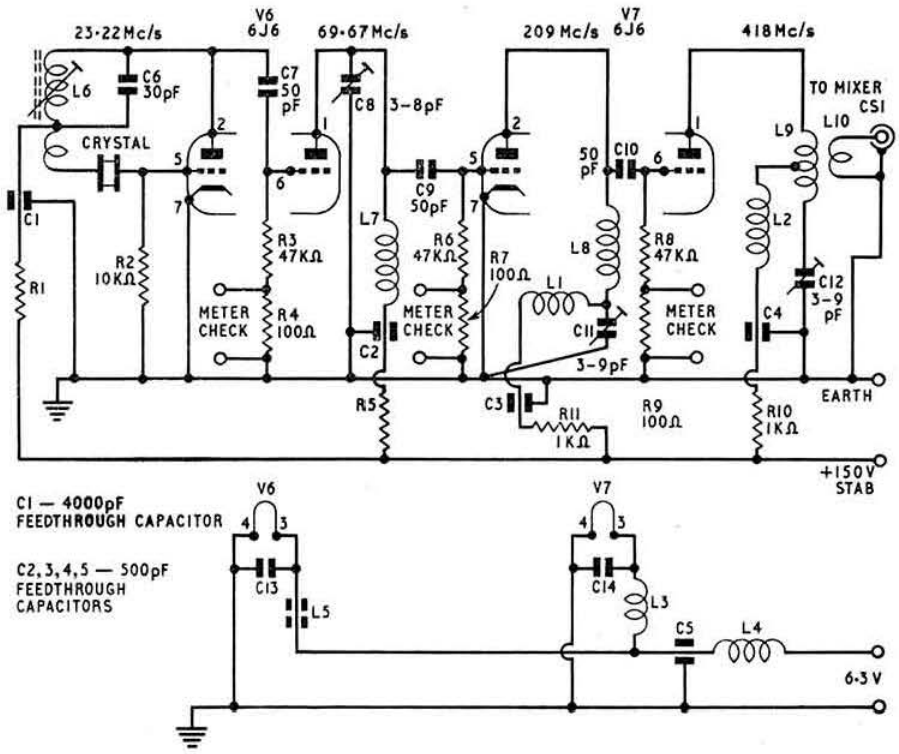


Fig. 2. The crystal controlled local oscillator—multiplier chain. C11 and C12 are T.C.C. type CC159N. C13 and C14 are 1000pF. R1 and R5 are both 1000 ohms. The frequency of the crystal is 7740 kc/s.

R.F. Stages

An attempt was made to tune the input stage using a strip of copper to prevent i.f. signals leaking through, but this was not successful, probably owing to the input capacity of the 417A being 9 pF. However, no trace of i.f. breakthrough has been heard, but this may be because the BC348 used with the converter is ready to receive its pension. According to the text books the tuning of the input stage is not justified owing to the low impedances involved.

All the valveholders are p.t.f.e., the one for the 417A having pin no. 2 removed. The screening partition is placed behind the anode pin and connected to the valve base centre lug by a strip of tin plate. A similar screen is placed behind the A.2521 (V2) anode, care being taken to avoid the other pins by a little judicious bending. The grid pins are bent over to the centre lug and soldered thereto. The anode coil of V1 (417A) consists of two turns of 12 s.w.g. silver-plated copper wire, with a $\frac{1}{8}$ in. lead to the anode pin, the turns being spaced one wire diameter, and connections made thereto using Arax solder. The tuning capacitors, obtained from Webbs' Radio, are tunable from above the chassis. This is easier than the usual method of using a " magic wand " and pruning. In fact the capacitors tune as though the frequency were 4·34 Mc/s and not 434 Mc/s.

Although silver-plated wire has been used for L19 and L20 an earlier version had unplated wire, with no measurable difference in the noise factor. Lecher line tuning was also tried but this had the inconvenience of the valve bases being in the wrong position after the lines were pruned.

Liberal use has been made of 500 pF feed-through capacitors which also make convenient tag points. They are obtainable from Charles Britain (Radio) Ltd. at a reasonable price. Liberal use is also made of r.f. chokes but as these are so easily made this is no difficulty. The fixed capacitors are good quality ceramics and the resistors high stability types.

Mixer

The anode coil of the first A.2521 is also silver plated and consists of $2\frac{1}{2}$ turns of 12 s.w.g. spaced one wire diameter. The lead to the tuning capacitor is $\frac{1}{4}$ in. long. The anode lead is only $\frac{1}{16}$ in. long. The r.f. choke to this coil, as with the 417A coil, is connected to the physical centre. It is very difficult to try to find the null point of the coil exactly, and in fact the position of the h.t. positive connection appears to have no effect on performance.

The l.o. signal is brought in from the coaxial socket on twisted hook-up wire and pushed right into the coil between the tuning capacitor and the r.f. choke point. No drive was obtained until the diameter of the injection coil was made slightly larger than L20. A little fiddling will probably be found necessary here. Without any drive the mixer current is about 3 mA. With drive the reading becomes 4·5 mA. However, it was found that provided the current was increased to at least 3·8 mA, the noise factor was not affected, but the gain increased with increased drive.

The anode of the mixer is decoupled with a 10 pF capacitor, instability creeping in with lower values.

I.F. Stage

Little need be said about the low frequency portion of the converter. The tuned circuits are broad banded and a cathode follower output is used, as the writer has never been able to obtain efficient link coil coupling from broad banded circuits. The i.f. gain control is set so that noise from the converter just overrides receiver noise.

Local Oscillator Chain

The l.o. chain is straightforward and the setting up of the circuits is a good deal easier than trying to get stability from a tunable fundamental frequency oscillator. This stage is built on a separate chassis measuring 4 × 4 in. The drive to the frequency multipliers can be checked with a meter across the 100 ohm resistances in the grid leads. The grid current from the doubler was found to be at least twice the standing current obtained when no drive was applied. The 418 Mc/s coil was wound from 16 s.w.g. tin-plated wire while the coupling coil is a piece of twisted hook-up wire pushed tightly home and connected to a " sawn-off " lug of a coaxial socket. The oscillator signal is transferred to the converter proper through a length of coaxial cable.

There is quite a lot of subharmonic (209 Mc/s) signal and attention must be kept on the possibility of this beating with

television signals. The addition of a base plate to the l.o. chassis was found to be very effective in removing spurious responses of this sort. A hi-*Q* break is not necessary as the two r.f. stages govern the noise factor and remove the unwanted frequencies.

Precise details are not given for this part of the circuit as many readers will vary the frequency depending on what is being used as an i.f. strip. In any event the circuit is in no way critical. Many excellent articles on this section have already been published. [1]

Noise Factor

The noise factor of the converter, provided that the circuit is otherwise functioning correctly, depends on the position of the cathode taps on L19 and L20. For both L19 and L20, this was found to be a one half turn from the tuning capacitor. With the tap at the tuning capacitor or anode, the circuit is heavily damped and the tuning is flat; with the tap too near the r.f. choke feed point, the stage oscillates freely. Other adjustments tried included varying C1 but provided that this was more than 30 pF the value was not critical. Slight variation of h.t. voltages to V1, V2, and V3 had no effect but the current taken by the 417A should be at least 20 mA. This valve, incidentally, runs hot and does not therefore have a screening can on it. As the whole performance of the converter depends on the position of the cathode taps, too much attention cannot be paid to experimenting with these. A variation of 1 mm makes a difference!

Construction

The converter was constructed on one of the excellent chassis obtainable from Home Radio (Mitcham) Ltd. These chassis are supplied in separate parts, so any unfortunate mistakes can be corrected by replacing parts concerned. A detailed diagram of the layout is not given but the position of the main components is indicated in Fig. 3. It is considered that v.h.f. enthusiasts do not need to be shown exactly where components should be placed.

Before the coaxial sockets are mounted, the lugs should be cut short, as they are rather long for 420 Mc/s. The valve screens across V1 and V2 are not put into position until the wiring is completed. As the r.f. chokes keep the r.f. where it should be (apart from radiation) the position of the screens for carrying the feed-through capacitors is not important.

Alignment

Coils L21 and L22 should be checked with a grid dip meter but the parallel resistances should be first removed to obtain a dip. The use of a grid-dip meter at 420 Mc/s is a liability as there is a large difference between readings obtained when the converter is working and when it is off. Care must be taken not to tune to the image frequency and in the absence of a signal generator, the third harmonic from a 144 Mc/s transmitter could be used. Lack of activity on 420 Mc/s is also a problem at times but a Saturday evening can be relied on for signals. Ignition noise, just as bad as on 144 Mc/s, is also of use when setting up. In the author's case, 3 ft. of hook-up wire stuck into J1 has brought in many stations within 50 miles, but this is probably due to a favourable v.h.f. location. Some stations will also be heard working on 144 Mc/s.

In spite of what has been said about 144 Mc/s techniques used for construction, it must be admitted that probably a better noise factor would have been obtained if silver-plated brass had been used instead of aluminium and tin plate, and cavity circuits used for tuning. A figure of 4-5db has been quoted for the 417A at this frequency.[2]

Finally no indication has been shown for muting the receiver when transmitting. The arrangement used at G3DVV consists of a double pole switch breaking the cathode circuit of the 417A and breaking the 150 volt line to the first four valves. Care must be taken to see that the switch in the 417A cathode circuit really is a dead short when closed and not 10 ohms variable, as this can ruin the noise factor.

COIL TABLE

Fig. 1

L1-L15	14 turns 28 s.w.g. enam. wound on 8 mm dust-iron core, pitch 1·25 mm.
L16, L17	Ferrite bead (15-100 Mc/s type) slipped over the connecting wire.
L18	1 turn of hook-up wire slightly more than ½ in. i.d.
L19	2 turns 12 s.w.g. silver-plated wire, ⅛ in. leads, wound on ¼ in. diam. drill as mandril.
L20	2½ turns 12 s.w.g. silver-plated wire, $\frac{1}{16}$ in. and ¼ in. leads, wound on ¼ in. diam. drill as mandril.
L21, L22	26 turns 33 s.w.g. enam. wound on Neosid former (type Drg. 0·450), 0·415 mm in diam., slug tuned.

Fig. 2

L1, L2, L3, L4,	r.f. chokes comprising 14 turns 28 s.w.g. enam. wound on dust-iron core from Neosid former (0·415 in. diam.).
L5	Ferrite bead (15-100 Mc/s type).
L6	15 turns 22 s.w.g. enam. close wound on Neosid former (0·415 in. diam. with dust iron core), tapped 3 turns from crystal end.
L7	7 turns 20 s.w.g. spaced one wire diameter on ¼ in. drill as mandril.
L8	6 turns 20 s.w.g. spaced one wire diameter, wound on ¼ in. drill as mandril.
L9	2 turns 16 s.w.g. spaced one wire diameter, wound on ¼ in. drill as mandril.

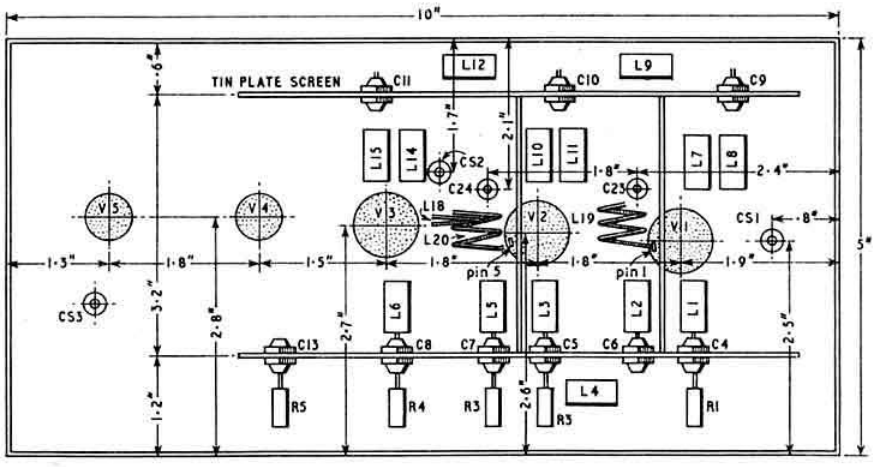


Fig. 3. Arrangement of the principal components on the r.f./i.f. chassis.

References

[1] *QST*, January 1954, page 24.

[2] *V.H.F. Handbook*, page 156.

TECHNICAL TOPICS By PAT HAWKER (G3VA)

Designing for Reliable Performance · The VXO · High-stability L-C Oscillators
Variable Voltage Power Units · Hum · Multiband Aerials using Twin-feeder Stubs

"THE desirable basis of a really first class receiver or transmitter design is to provide more stages than are strictly necessary and to run each stage well within its maximum signal handling capabilities." This sentence from G2DAF's excellent series on modern receiver design (surely compulsory reading for all who do not wish to lay down several hundred pounds for a factory-built set with a real nineteen-sixties outlook) is worth careful study, if only because it reflects something of a revolution in amateur thinking.

In the old days, when valves and their associated power supplies were harder to come by, the amateur prided himself on making each valve contribute the maximum possible amplification: one notable example was the detector with velvet-smooth regeneration. But today in both receivers and transmitters there is usually no difficulty in achieving more than sufficient overall gain, and there are very sound reasons for letting each valve "loaf along." Many of these reasons are bound up with fundamental questions of valve and component reliability as well as the changes which occur with age, and raise design points of interest to all who want their equipment to function effectively over a long period rather than just to give satisfactory results at first but then to enter into a gradual decline.

Consider what happens when a valve grows old. A new valve has a mutual conductance or slope close to the figure given in the data tables and on which design calculations will usually be based: but that is no guarantee that two years later it will have the same slope. In fact, from the moment it is put into use the cathode will begin to lose a little of its emissive powers—not surprising when one remembers that a current of 10 mA means that some one-hundred-sixteen-million-million electrons leave the cathode every second. Even the best cathode materials get tired eventually and so the mutual conductance falls. The average valve tester, in fact, is basically a device for measuring mutual conductance and automatically comparing this with the list figure. As the slope falls, in many applications this means that in order to restore the gain, bias is reduced—automatically or manually—and current rises. This increases the rate of cathode deterioration and may also introduce further harmful effects due to the heat liberating the traces of gas which inevitably remain "bound" to the internal metallic parts of the valve, producing positive ions which can cause reverse grid current or may bombard or poison the cathode. In a hot running power valve, electrolysis may occur in the valve pinch, eventually causing insulation breakdown.

All this, of course, adds up to what we know from experience: valves have a limited life and give less gain as they grow old. But the important point to note is that the harder the valve is run, the faster will be the rate of deterioration and the quicker will the slope drop well below the maker's figures. Valves in television tuners in fringe areas are said to require replacement much more often than in good signal areas.

Apart from the slope of the valve, voltage gain depends upon the dynamic impedance of the load into which it is working. In receivers and transmitters, r.f. or i.f. stage gain can be raised well above conventional values by increasing the "L" component of an "L-C" load. For instance, if an i.f. transformer is designed to function with a low fixed capacitance across it, amplification will usually be much greater than with larger capacitances. But extra gain achieved in this way will generally be at considerable cost in stability, introducing greater regenerative effects by adding to the positive feedback, and also resulting in a greater degree of misalignment when strong signals bring about a change in the operating point of the valve by a.g.c. action. It will also make serious misalignment more likely when the valve is replaced.

Thus although modern valves and components can be made to give us very high stage gains, for long-term performance stability it is wise to keep at least some of this gain in reserve: the extra valve, that at first may appear to add little to results, will probably be pulling its full weight in two or three years' time.

This is not to deny that there will be times when an amateur designer may with advantage ignore these arguments and decide to run a valve even beyond its ratings. But where this is done, it should be clearly recognized that a life of over-dissipation is likely to be a short one.

Variable Frequency Crystal Oscillators

Recently there has been a marked revival of interest in the variable frequency crystal oscillator or—as it is often now termed—the VXO (from *V*ariable *X*tal *O*scillator). There is nothing new about the idea of a "rubber" crystal, as any old-timer who has wandered in and out of the bands with a "Goyder lock" will confirm. Later, in the 'thirties, the variable air gap crystal holder enjoyed some popularity as it made possible a frequency shift sufficient to dodge a station causing QRM. It is said that impecunious types would hurriedly insert a cigarette paper into an open type holder or even pencil over the crystal for this purpose. But post-war "netting" and improved v.f.o. circuits brought about a temporary eclipse of the variable crystal, though we have always made use of the ability to shift a crystal frequency slightly when trimming 100 kc/s oscillators for zero beat on Droitwich.

So a year or two back, despite the pressure for improved frequency stability, few would have a hazarded the guess that the time was ripe for a major comeback of the VXO. But such now appears possible. W3KXI in *QST* (November, 1960) describes a simple VXO for the v.h.f. operator, providing a swing of about 100 to 500 kc/s in the 144 Mc/s band even with standard "surplus" 8 or 12 Mc/s crystals. (See Fig. 1). DL7AP in *DL-QTC* (December, 1960) incorporates a VXO into a filter-type s.s.b. rig.

The present revival of interest largely dates from W3BWK's article "VXO—A variable crystal oscillator" in *QST* (January, 1958) which showed how the addition of a coil shunted with a resistor and in series with a crystal could be used to lower appreciably the series-resonant frequency of the combination. But W3BWK presented a design for a fairly complex VXO-mixer type unit which produced a shift of about 100 kc/s with an A-cut 20 Mc/s crystal and then converted this to cover the full 3500-4000 kc/s U.S. band with the aid of five fixed heterodyning crystal oscillators—a design which could not readily be duplicated at low cost.

In practice, s.s.b., v.h.f., c.w. and even a.m. operators do not always really require to operate over the whole of a band but want a high-stability oscillator which can be readily

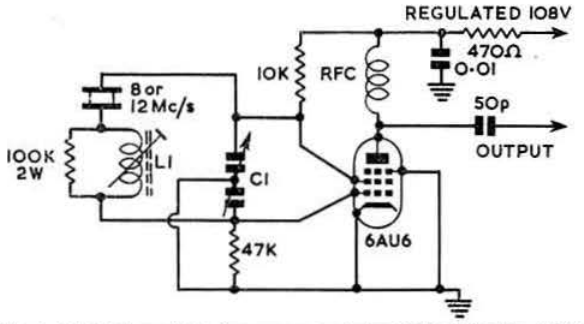


Fig. 1. W3KX1's variable-frequency crystal oscillator for the v.h.f. operator. L1 is listed as no. 26 (U.S.) enam. close-wound on ¼ in. former with h.f. iron slug, winding length 1 in. and C1 as 50pF per section. DL7AP's circuit is basically similar but uses a 6SJ7 valve and gives a shift of 20 to 25 kc/s with an 8 Mc/s crystal using a 15pF per section tuning capacitor.

shifted over a reasonable segment of it; for these the simplified designs now appearing would seem to fill a definite need. It should, however, be clearly recognized that the stability of this type of VXO is affected by the construction of the series coil, which becomes part of the frequency-determining circuit; although as it only forms a small percentage of the total inductance, its effect is much less than in a v.f.o. The coil should therefore be built along the lines usually advocated for v.f.o. designs.

The tuning range possible with a VXO depends upon the value of the series coil which lowers the series resonance frequency and increases the tuning range of the capacitor. The maximum practical value of L will be determined largely by the type and activity of the crystal and some experimenting may be necessary; in the interests of stability it is advisable not to attempt to operate the circuit right up to the maximum possible frequency shift. It is claimed that even with surplus crystals worthwhile frequency shifts can be obtained with good stability.

High-stability L-C Oscillators

The general trend towards higher orders of frequency stability applies to commercial as well as to amateur transmitters, and it is not surprising that new forms of v.f.o. continue to appear. An interesting review by YU1FR of modern oscillator circuits developed in Europe appeared in *CQ* (December 1960). These include the Czech Tesla circuit already described in the BULLETIN (March, 1956) and the German Telefunken "Clapp Franklin." Also given were details of a design developed by R. Radoslav, combining some of the properties of the e.c.o. with the Clapp-Gouriet.

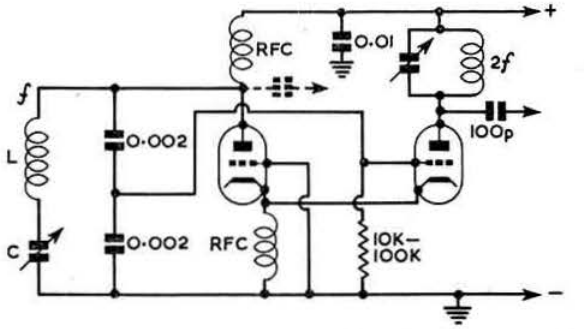


Fig. 2. Triode version of the Radoslav oscillator circuit. Output at the fundamental frequency, f, may be taken from the anode of the first triode or from the second triode by substituting a r.f. choke for the tuned circuit.

One version of the Radoslav circuit, using triodes, is shown in Fig. 2; YU1FR also provided details of a design using pentodes.

Variable Voltage Power Packs

A useful accessory for the shack is a power supply which can readily be adjusted to give different voltage outputs without greatly increasing the source impedance by the use of series resistors. Several simple but ingenious circuits have appeared lately.

Fig. 3 shows a voltage-control-cum-regulator circuit which can easily be added to a normal small power pack to provide a variable supply of about 75 to 300 volts. Voltage regulation will be quite good on low voltages, but falls off as the voltage is increased. This circuit (which is basically similar to that given in *T.T.* December 1960 for screen supplies) comes from an article by W6WTU in *Western Radio Amateur* of June 30, 1960—kindly passed along by G2BVN.

Another useful small unit (from *Radio-Electronics*,

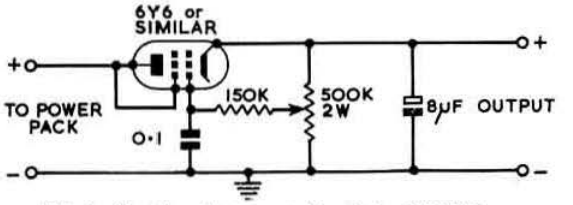


Fig. 3. Simple voltage control unit by W6WTU.

December 1960) is shown in Fig. 4. This makes use of an increasingly popular form of voltage doubler, sometimes referred to as the half-wave cascade doubler. With rectifier 1 only connected, the h.t. circuit is that of a conventional half-wave rectifier, but when rectifier 2 is switched in, it becomes a voltage doubler arrangement, providing a d.c. output approximately twice that of the transformer winding. Because the ripple voltage in these circuits is mainly 50 c/s, compared with 100 c/s of a full-wave rectifier, it is necessary to use a good smoothing filter. Included in this circuit is provision for a low voltage d.c. output obtained from a 6·3 volt heater winding and using two small germanium crystal diodes in a second voltage doubler of this type; in this case with the d.c. output controlled by a potentiometer, providing a convenient supply for bias or transistor applications.

A huskier variable supply unit, Fig. 5, was given by K0HVK in *CQ* (November 1960); in this the regulator valves also act as full-wave rectifiers to provide a supply which can be varied from about 80 to 520 volts. The 1619 valves used by K0HVK are a larger version of the 6L6 and could be replaced by almost any large output types such as

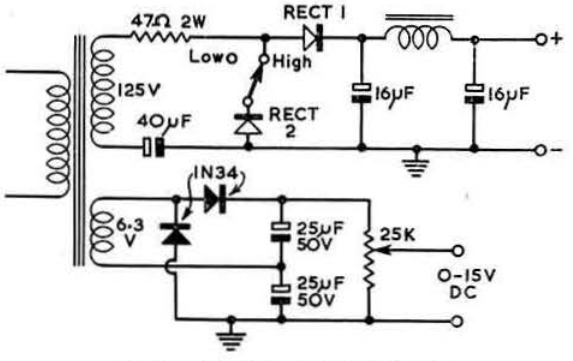


Fig. 4. Double doubler power supply.

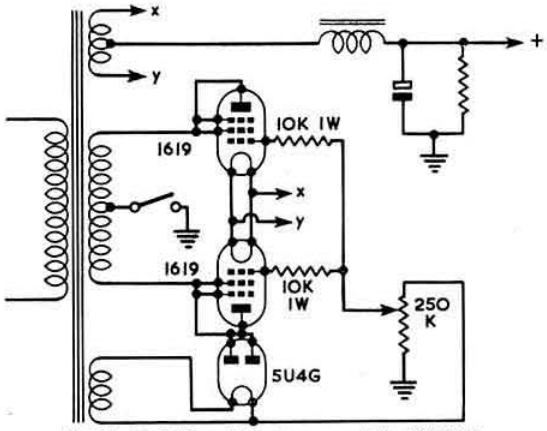


Fig. 5. Variable voltage power unit by K0HVK.

807, 1625, etc. The 5U4G rectifier which provides the grid control voltage could be replaced by a suitable metal rectifier if an isolated heater supply is not available.

Hum

The complete suppression of mains hum in high-gain equipment is a problem which we all encounter some time or other (G3VA once spent over a year working in a small hut miles from anywhere mainly because someone was convinced that communications receivers should never be operated from or near a.c. mains!). But only rarely does the subject crop up in radio journals. Norman Crowhurst's " Hum Chasing is Engineering?" in *Audio* (December 1960) is concerned with the difficulties in tracing hum in prototype a.f. and high fidelity amplifiers, but many of his suggestions apply to other equipment such as high gain speech amplifiers and receivers. A major difficulty in tracing hum in new designs is that it may be arising from several different causes, so that changes which reduce hum from one source may have little effect on others. It is also very easy to produce misleading symptoms: for example clipping on extra smoothing capacitors may actually cause the hum level to rise because incorrect earthing of the capacitor may inject some of the ripple current into a signal circuit—but this would not indicate that the unit had excessive smoothing! Smoothing capacitor connections to the earth " bus " line are in fact important and should be the mirror image of the h.t. positive distribution system (for this reason common earth connections in multiple section capacitors are sometimes to be avoided).

The importance of using twisted leads for a.c. heater wiring is well known but a fairly common fault is shown in Fig. 6. It is also necessary to watch that twisted leads, sensibly routed, are used for pilot lamps and a.c. primary wiring. While a.c. leakage from the heater circuit usually produces 50 c/s hum as opposed to the 100 c/s hum from full-wave h.t. ripple, it is worth noting that electronic conduction between cathode and heater, due to the heater acting as an " anode "

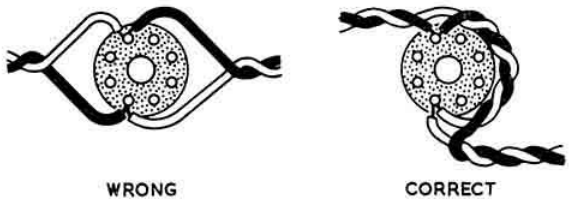


Fig. 6. How incorrect heater wiring can leave a loop under the valve holder. The correct method is shown on the right.

with low applied a.c. potentials (the heater voltage), can cause either 50 or 100 c/s hum. The remedy for this type of hum (it has come up several times in *QST*) is to put a positive bias of about 50 volts on the heater line, provided that the cathode/heater insulation will stand this. The bias potential saturates the electronic conduction.

Where equipment develops hum after being in use for some time, it can usually be traced to defective valve inter-electrode insulation, dried-out electrolytics or transformer field leakage.

Multiband Aerials using Stubs

A clever way of using shorted quarter wave stubs for multiband aerials was patented some ten years ago by W4JRW, but received little publicity until details were given in *QST* (December 1960). An attractive feature of his system is the convenient form of construction, requiring simply the insertion of a section of 300 ohm twin feeder into the actual dipole (alternatively the entire dipole can be made from 300 ohm line by paralleling the wires where not needed for the stub). The idea is to separate off part of a dipole used on a lower frequency band by inserting the stub to form an electronic insulator on the higher frequency band only (as with the trap system). In this way, a two-band dipole is formed and the process can be repeated to form multi-band aerials. The length of the stub section will be governed by the velocity factor of the cable, the stub length (ft.) being equal to 246 times the velocity factor divided by the frequency (Mc/s). Since the inclusion of the stub tends to shorten the overall length on the lower frequency band, it is necessary

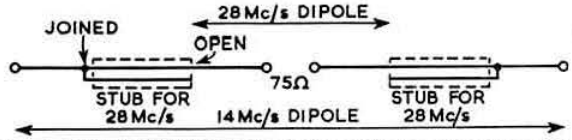


Fig. 7. W4JRW's 14/28 Mc/s dipole using 300 ohm decoupling stubs. The 28 Mc/s stub sections form part of the dipole on 14 Mc/s.

for operation on two adjacent harmonically related bands to use a cable with a fairly low velocity factor as otherwise the h.f. dipole plus stub length might come to more than the l.f. dipole length; W4JRW recommends tubular 300 ohm line which has a velocity factor of 0·8. Overall length on 14 Mc/s (for a 14/28 Mc/s arrangement) is quoted as about 29 ft. 10 in. though it would be advisable to check this with a grid dip meter.

The arrangement is illustrated in Fig. 7.

Also Noted

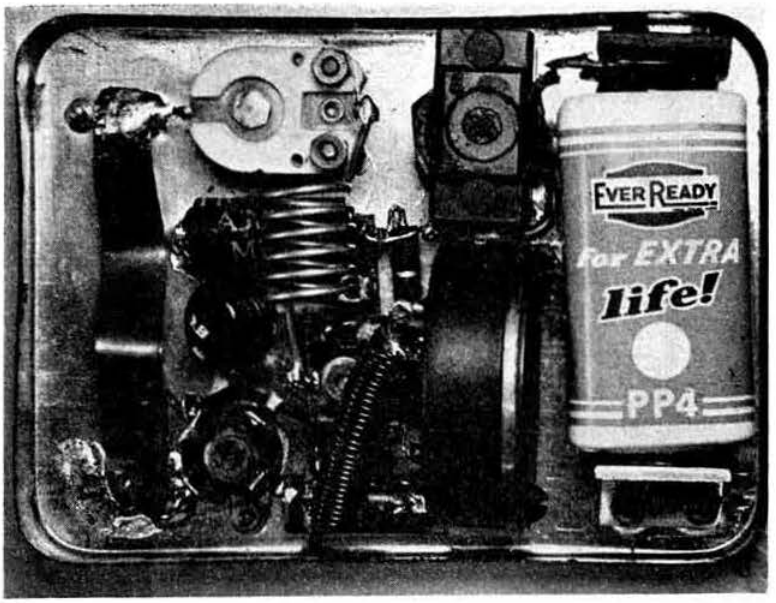
Of considerable technical ingenuity is W4DFR's combined electronic key, valve keyer and side-tone monitor (*QST*, December 1960) completely free of relays. The dots and dashes are formed by a multivibrator which is held steady by synchronising it with an audio oscillator which also serves to provide a sidetone. The complete unit has five triode sections plus a 6CL6 valve keyer but since the parts are mostly standard, cost can be kept low. A single speed control permits rapid adjustment of keying speed once the correct dot/space/dash ratio has been set up.

The apparently conflicting statements often heard on the efficiency of class B amplifiers used in a.m. rigs (35 per cent. or 65 per cent.?) are explained in " Calculating the Efficiency of Class B Linears " by W6EUM in *CQ* (November 1960).

The BC453 Command receiver with 85 kc/s i.f. has long been firmly established well up the top twenty list of surplus buys and many conversion articles have appeared. A fresh batch appear in the G.E. *Ham News* (September-October issue, 1960) including two fixed/mobile crystal controlled converters for single and multi-band use; a 5 watt a.f. amplifier with push-pull output; a fast-acting a.g.c./S meter circuit; and a simple sideband selector switch, as well as other hints on making the best use of these receivers.

A Transistorized Band Edge and Centre Marker for Two Metres

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



An interior view of the band edge and centre marker.

ALTHOUGH many ex-Government frequency meters will provide harmonics in the 2m band, the output is generally extremely low and considerable confusion can arise from multiple beats due to the many harmonics of the crystal oscillator in the converter and the variable oscillator in the main receiver. Many of these undesirable effects can be eliminated by having a circuit tuned to 2m in the output stage of the meter to peak the desired signals; if the strip line coupling arrangement described by W. H. Allen (G2UJ) is adopted, the fundamental and lower order harmonics of the crystal oscillator are attenuated and the 2m harmonics enhanced.

It is not an easy job, however, to modify a piece of ex-Government equipment and an external filter to extract the required harmonics is rather inconvenient and bulky, especially when intended for portable use.

The actual requirements for a suitable device are so simple (a 1 Mc/s crystal oscillator and a 145 Mc/s tuned circuit) that it is far more satisfactory to build the device specially. If a transistor is used in the oscillator stage the instrument can be of very small dimensions and can be carried in the pocket. The unit to be described measures only 4 in. × 3 in. × 2 in.

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

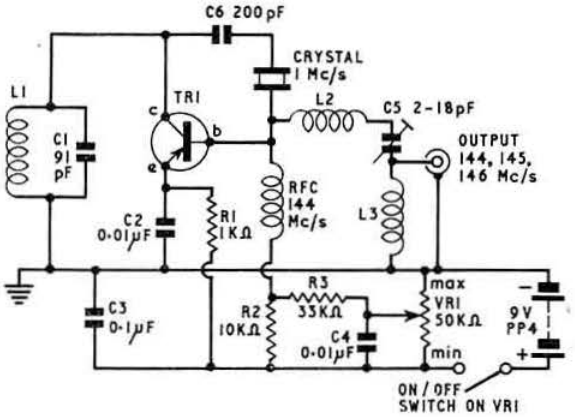


Fig. 1. Circuit diagram of the transistorized band edge and centre marker for the 2m band. The transistor may be any type capable of oscillating at 1 Mc/s such as the XA101, OC44 or OC45. The coils are constructed as follows: L1, 120 turns 30 s.w.g. pile wound on ¼ in. dia. slug tuned former (1 Mc/s); L2, 5¾ turns 18 s.w.g. tinned copper ⅜ in. dia. ⅜ in. long, self supporting; L3, 20 s.w.g. brass strip 3½ in. long by ⅜ in. wide, suitably bent to fit into the container; RFC, 19 in. 26 s.w.g. ¼ in. dia. 1¼ in. long.

The Circuit

An Ediswan XA101 r.f. transistor is used as a 1 Mc/s crystal controlled oscillator (Fig. 1), using the crystal in a parallel mode of oscillation between the collector and the base, similar to the Pierce oscillator used in valve circuitry, though a tuned circuit is used in place of an r.f. choke in the collector circuit. The bias on the base, and thus the output, is varied by the potentiometer VR1 which does tend to vary the frequency about 500 c/s at 145 Mc/s. It could be omitted if the device were to be used only as a marker: the 33 K ohms resistor R3 could then be taken direct to chassis and C4 omitted.

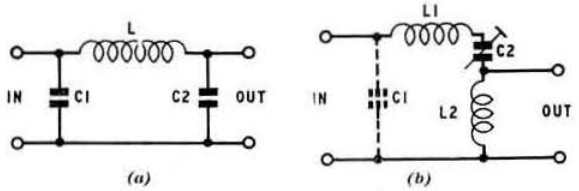


Fig. 2. (a) Pi-network in which the impedance ratio is controlled by the ratio of C1 to C2. (b) Strip line network for 144 Mc/s in which impedance matching is controlled by the relationship of C1 to C2 and L1 to L2. C1 is the stray and internal capacitance of the valve or transistor and L2 the strip line (low inductance).

Harmonics are generated by the diode action between the base and emitter of the XA101 and the required 144 Mc/s content is selected by the network L2, C5 and L3. Any

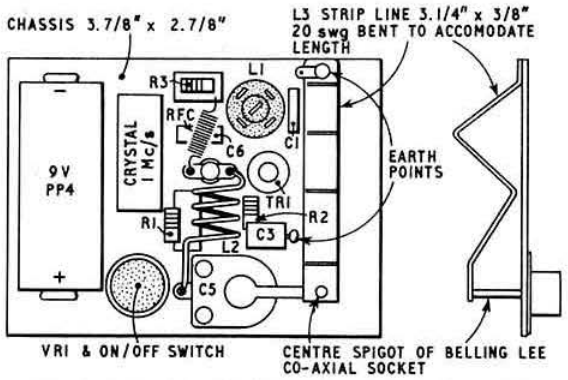


Fig. 3. Layout of the components in the band edge marker.

transistor capable of oscillating at 1 Mc/s will be found suitable.

L3 is a strip line made of 20 s.w.g. brass 3¼ in × ⅜ in. and has sufficient inductance at 144 Mc/s to match into a 80 ohm line. The circuit is a derivation of the pi-network (Fig. 2) using a low value of inductance in lieu of a large value of capacitance at the output end. At 144 Mc/s it is difficult to obtain a non-inductive capacitance, whereas a low inductance can easily be made from brass or copper strip. A further advantage is that the strip is virtually a short circuit at lower frequencies and gives far more attenuation of the fundamental and low order harmonics than would a normal parallel tuned circuit and output coupling loop. The arrangement was described by W. H. Allen, M.B.E. (G2UJ) in his article " An Earthed Grid Triode Preamplifier for the 2m Band " in the R.S.G.B. BULLETIN for April 1951.

The principle is similar to that used by B. R. Arnold (G3FP) in " The Poor Man's Signal Generator for 70 cm " described in the *Proceedings of the London U.H.F. Group* some years ago and employs the transistor modification developed by D. W. Furby (G3EOH) who has achieved useful output at 1296 Mc/s by using an 8 Mc/s crystal and suitable tuned circuitry.

The layout is shown in Fig. 3.

Spot Frequency Marker

The writer has found that if multiplication ratios of less than 30 are used an output tuned circuit is not necessary for the production of detectable signals in the 144 Mc/s band. In fact a version (Fig. 4) using 6900 kc/s crystal has been built which when connected to the receiver produces an S9 + 50db signal on 144·9 Mc/s across an 80 ohm resistance although the output on 434·7 Mc/s cannot be detected. A suitable co-axial output circuit would, however, probably extend its use to that band.

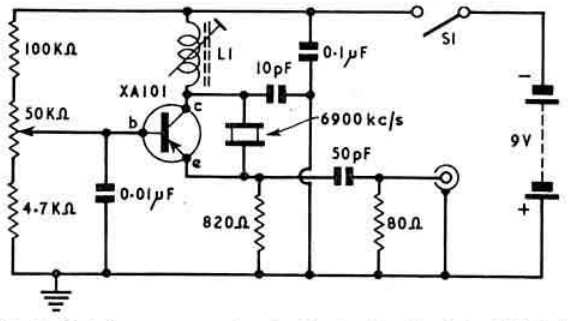


Fig. 4. Spot frequency marker for the 2m band using a 6900 kc/s crystal. L1 is 15 turns 30 s.w.g. wound on a ¼ in. dia. slug tuned former.

London Meeting
Friday, March 24, 1961

" Mobile Operation and its Problems "
By N. A. S. Fitch (G3FPK)
(Hon. Secretary, Amateur Radio Mobile Society)

at the

Institution of Electrical Engineers, Savoy Place, Victoria Embankment

Buffet Tea 6 p.m. **Lecture 6.30 p.m.**

ZMT Award

THE Czechoslovak National Amateur Radio Society (C.A.V.) have established a new award—known as ZMT—which is offered to those who contact stations in the Eastern bloc as well as Yugoslavia.

The Yugoslav National Amateur Radio Society (S.R.J.) has informed the R.S.G.B. and all other I.A.R.U. Region I Societies that it was not consulted about the rules for this award which it considers are of a restrictive nature.

It seems clear that the amateurs of Yugoslavia do not wish to be bracketed with the amateurs of the Eastern bloc in matters which have a tendency to be political.

CONTESTS DIARY

February 18-19	-	A.R.R.L. DX Contest (C.W. Section)
February 25-26	-	First 1·8 Mc/s Contest (For details, see page 340, January 1961)
March 4-5	-	A.R.R.L. DX Contest (Phone Section)
March 4-5	-	144 Mc/s Open Contest * (For details see page 340, January 1961)
March 4-5	-	Listeners' V.H.F. Contest (For details see page 340, January 1961)
March 11-12	-	B.E.R.U. Contests (For details, see pages 290/291, December 1960)
March 18-19	-	A.R.R.L. DX Contest (C.W. Section)
April 8-9	-	Low Power Contest
April 16	-	D/F Qualifying Event
April 23	-	First 420 Mc/s Open Contest
April 30	-	D/F Qualifying Event (London)
May 7	-	First 144 Mc/s Field Day *
May 14	-	D/F Qualifying Event (South Manchester)
May 28	-	D/F Qualifying Event
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

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

Single Sideband

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

AMATEUR Radio is a rather wonderful hobby. However wide the diversity of taste, there is always some facet of the common interest that will appeal. Whether the amateur be a novice or a dyed in the wool old timer, he can always find some aspect that will stimulate his enthusiasm and satisfy his personal wants.

A glance at the BULLETIN any month will show quite well that the Editor has a rather difficult job—to say the least—to maintain a reasonable balance and to try to cater within the allowable space for all the likes and dislikes of the more than 10,000 individuals who make up the membership of our Society—the R.S.G.B.

To name just a few: there is the Top Band across town natterer, the mobile enthusiast, the brass pounder, the 2m operator, the u.h.f. man, the s.s.b. operator, the man who values above all the experimental and constructional side of the hobby; and last, but by no means least, the DX enthusiast. Just a few of the individual likes and dislikes, but never mind —Amateur Radio caters for them all.

The writer's best friend would hardly call him a DX chaser but even G2DAF admits to the peculiar thrill and satisfaction of a solid contact with those stations who only appear under favourable band conditions and often for perhaps only a few weeks in the year.

Eighty Metre Sideband DX

Congratulations then to those operators who found it well worth while to get up a little earlier than usual during December and January and managed to work the DX that has been appearing on 80m sideband very consistently between 07.00 and 08.30 G.M.T. Here are reports from two of the early birds.

On December 22, G3FPQ raised ZL1ACG at 07.50 and TG5HC on December 30 at 08.10 G.M.T. Reports from both stations RS55.

A most impressive log is that of G2HX. The aerial is two half waves in phase, centre fed, and during December G2HX worked W1, 2, 3, 4, 5, 6 and 7 and also VE, and in addition KH6SHC, K6CKN, KH6DHI, ZL1ACG, ZL1AIX, ZL3ST, ZL2API, K7KLE/7, YV5ANS. On the morning of January 1, G2HX went to town with the W stations and worked 10 of them in 20 minutes. Reports in the main varied from 3 and 3 at the beginning of the month, gradually improving to 5 and 5 and 5 and 6 towards the end of December.

A number of European stations have been heard calling American amateurs on their transmitting frequency, apparently unaware of the fact that the American phone band extends from 3·8 to 4·0 Mc/s. The U.K. 80m amateur allocation is from 3·5 to 3·8 Mc/s, therefore any G station calling a W on the latter's frequency is operating outside the band and is violating his licence conditions. Aside from out of band operation it is a complete waste of time to call in this manner because the American stations do not listen on their own frequencies. They transmit between 3·8 and 3·85 Mc/s and search for European stations between 3·75 and 3·8 Mc/s.

Coils and Coil Formers

Most amateurs will have had the experience some time or other of building a piece of equipment to a circuit design known to be good and failing to obtain the expected results. Alternately, of building an exciter and failing to get the required drive, or if valve voltmeter figures have been given in the constructional article, not being able to get anything like the figures quoted by the author. These circumstances can lead to a great deal of time being wasted in checking component values, repeated attempts at re-alignment and in general trying to find a non-existent fault.

It is never wise in radio to generalise, but when these factors apply it is a 99 per cent. certainty that the trouble is in the coils. Many constructors do not appreciate that the coils are in fact the very heart of the equipment, and that their Q or goodness factor determines the voltage available across the tuned circuit and therefore the drive into the following valve. This becomes increasingly important in a piece of apparatus with many stages such as a multi-band sideband transmitter. Any loss of circuit magnification is cumulative. Ten per cent. down in one or two stages would not matter a lot, but 10 per cent. down in three mixers, the following amplifier and the driver grid circuit can add up to an output voltage that is half of what it should be.

During the 1930's the writer was asked to diagnose the trouble with a famous make of domestic superhet receiver that after a few years' use was coming into the Service Department with complaints of lack of sensitivity and general poor performance. All tests of components values, coil continuity, circuit alignment, valves and supply voltages were in accordance with the makers' service manual: no fault could be found and these receivers had in fact completely defied all the efforts of the dealers' service engineers to bring them back to the original performance.

Have you guessed the answer? Yes, loss of Q in the i.f. transformers. These were for 110 kc/s and the can contained two bobbins with 1,100 turns of double cotton covered wire on each, layer wound without wax impregnation, which was standard practice in those days. The coils looked alright—they were not corroded or physically damaged in any way, but if the cotton covering was unwound it could be seen that the wire surface was dull and oxidized. Obvicusly over the years climatic humidity had had its effect. It is hardly likely that the oxidization itself could have been the culprit—there is little r.f. skin effect at 110 kc/s—more likely it had brought about a chemical change in the cotton covering and there was leakage of r.f. across the turns. The moral however is plain—the oxidization would certainly have had an adverse effect on the higher frequencies that amateurs are now using, so do not use cotton or silk covered wire for coil winding. Make sure it is enamelled, clean and in good condition, and if tinned copper is to be used for the 10 and 15m bands and for the pi tank coil, that the tinning is bright and clean throughout its length. If it is dull and oxidized throw it away and save yourself much time and tribulation.

Finally just a few pointers: (i) Remember the coils (this includes all the i.f.t.'s) are vitally important and require correct winding and good quality wire and formers—not rubbish from the junk box. (ii) In the case of switched coils used in the final output stages, too close proximity to each other or to screening or to the chassis sides, can seriously lower the Q. Do not reduce the chassis size or the original layout unless you are experienced and know exactly what you are doing. (iii) The winding detail given by the author of an article is only a guide—it cannot allow for the differences in core material used by different manufacturers. These have varying permeativity therefore even coil formers of identical size to those used in the original exciter may be a different make with more, or less core effect on the coil inductance and the turns may have to be altered accordingly. (iv) A dust core should resonate the coil at *two* positions: the first when it is going into the winding, and the second when it is coming out of the winding on the other side (i.e., the core is screwed right through the winding). If there are not these *two* resonant points then the inductance is too small and the coil *must* require either more turns or else an increase in the value of the fixed shunt capacity across it. This is a most important test—just to screw the core in and

(*Continued on page 375*)

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The MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)*

DURING the month under review conditions have been very much as before and periods of low activity have been followed by shorter spells of reasonable conditions. This has been particularly noticeable on 21 and 28 Mc/s. The 14 Mc/s band has been productive at most times although the early mornings have often been devoid of any Pacific stations, with also some very blank evening periods. Both 7 and 3.5 Mc/s have been busy with evening and late night activity and the former band can produce worthwhile second layer DX at any time, and as an indication of anticipated happenings VE7ZM has erected a full size three element beam for 7 Mc/s. MP4BBW has accepted a challenge to work 100 countries on s.s.b. on this band between June 1961 and June 1962 and considers that this will not present too many problems. Both North and South American and Pacific stations have been worked on c.w. and s.s.b. on 3·5 Mc/s as late as 08.30. Trans-Atlantic QSOs are reported on 1·8 Mc/s and signals from ZC4AK have been heard on the west coast of North America.

With the advent of longer days it may reasonably be anticipated that the h.f. bands, and 21 Mc/s in particular, will be open into the evening hours, which will be most welcome to those whose bread and butter activities prevent them from being on the air during the daytime.

QSLs

No excuse is made for returning to the subject of QSLs which assumes paramount importance with a large number of operators. Whilst this is understandable it is urged that the acquisition of cards should be approached in a balanced manner. How *not* to do it can best be illustrated by the experiences of a well-known operator as personally related to the writer. This operator had for some time been resident in a very DXotic location, and now, some years after his transfer, cards are still arriving, usually for alleged QSOs of recent date and most carrying the remarks " sorry lost you in the QRM." Others, having had a genuine QSO with the amateur in his present location make no bones about it but ask for a QSL as from the rare place. These are not isolated occurrences but relate to a collection of several dozen unwanted QSLs, and if continued could bring the whole system into disrepute. Fortunately, such practices are completely foreign to the majority of operators.

As an indication of the interest in the collection of cards the following figures relative to the DXCC award, and given by W1WPO of A.R.R.L. to K6CQM of *The Dxer*, are quoted:

	1957	*1958*	*1959*
Total number of new applications	794	1,022	1,051
Total number of endorsements	1,867	2,260	3,232
Total number of cards submitted and checked ..	113,381	142,931	162,220

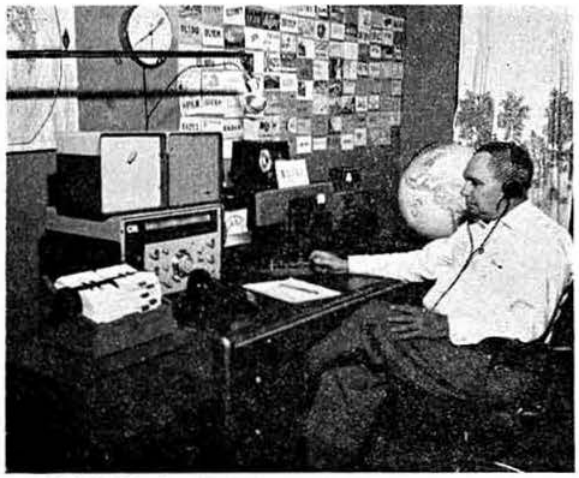
These figures prove, if nothing else, that the printers and postal administrations extract considerable sums of money from the Amateur Radio movement!

News from Overseas

ZD2KHK/NC operating from Mubi in the **North Cameroons** is endeavouring to work as many G stations as possible, but he reports that QRM is very heavy and many operators call him when he is already in QSO, all of which adds up to very difficult conditions. Please call 5 kc/s on either side of the ZD2 operating frequency. The result of the plebiscite will not be ratified until July 1 so that the /NC activity will be maintained for some time yet. There is an urgent need at ZD2KHK for a 230 volt a.c. 600 watt generator so that operating hours may be extended and also cover s.s.b. operation, but so far this piece of equipment has been impossible to locate.

VQ5 is producing a crop of pirates these days, and amongst the calls for which QSLs will never be received are VQ5GS, VQ5JJ, VQ5MA, VQ5PZ, VQ5TF, VQ5WR and VQ5YQ. At present there are only five stations active in Uganda, viz. VQ5's AU, EK, FS, GJ and IB, with the possibility of three more VQ51? licences in the near future. VQ5AU mentions that owing to the impossibility of notifying each station all QSLs for the non-existent calls will be destroyed. It seems unlikely that few, if any, of the pirate stations are located in Uganda, but they are bringing into disrepute the genuine amateurs.

W8OLJ/PK is the present call of the s.s. *Hope*, which, at the time of writing, is anchored in Bali harbour. This vessel, a former U.S. Navy hospital ship, sailed from San Francisco in September for the South Pacific area. On board are doctors, dentists and nurses whose job it is to promote health knowledge amongst the less fortunate nations. The ship was made available from the U.S. Navy mothball fleet but all running costs must be raised by the supporters of the project which



Carl E. Moseley, W0FQY, operating his amateur station.

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

is not government sponsored. The Hallicrafters Company donated a 1 kW amateur station which will be operating primarily on s.s.b. A special QSL is available showing the s.s. *Hope* and cards should be sent to Project Hope, P.O. Box 9808, Washington 15, D.C., U.S.A. ZL2GX has been heard assisting W8OLJ in the pile-ups which usually develop when the s.s. *Hope* comes on the air.

5N2IJS has moved recently and his new address will be found in *QTH Corner*. 'IJS is at present operating on 14 Mc/s and promises activity on 21 and 28 Mc/s as soon as he has settled in.

G3III/A from R.A.F. Colerne, took the opportunity of visiting **VS9MB**, where the operators are keen to make many more G QSOs, particularly on 14 Mc/s. They comment that there seems to be much Continental activity but they rarely hear U.K. stations. The gear at present in use is a DX100 and and AR88. Unfortunately G3III found no one at home at 5A2CV.

Baja Neuvo (HK0AA) is a new DXCC country.

DXpeditions

MP4BBW and VE7ZM hope to appear as **VR1W** and **VR1Z** respectively from Canton Is. (British Phoenix Is.) on March 25 for approximately one week. Activity will be on s.s.b. and c.w.

A 150 watt s.s.b. rig constructed by the Moscow Radio Club is destined for **UA0KYA** in Tagil City, Tannu Tuva, which lies in Zone 23. After a spell of operation from this location the rig will be sent to UM8, UJ8 and UI8 and other DXotic republics of the U.S.S.R. The date of commencement of this activity is not definitely known but it should have materialized by the time this is being read.

Since the above was written Zone 23 s.s.b. activity has materialized in the shape of **UA3FE/0**, who has been worked on 14 Mc/s by a number of European stations. Signals heard so far between 08.00 and 09.00 have been of poor strength. Further operation with a /UM8 suffix is anticipated.

Unfortunately VU2NR could not make the trip to the **Laccadive Is.** owing to lack of shipping accommodation, but it is now hoped that Raju will be able to secure transport in early March.

The trip to **Malpelo Is.** under the call **HK0TU** has been postponed until the middle of March to allow more operators and gear to be assembled. It is hoped that the Colombian Navy will provide transport. Details of frequencies and modes will be given next month.

ZC4CT mentions that he and ZC4AK hope to be able to make a trip to **Jordan,** and more information will be available later.

From K2UYG it is learnt that UA0OM might provide further activity from Tannu Tuva, this time on a.m., and the call used would be **UA0OM/0.**

There is a possibility that CR9AH will be able to obtain permission to operate from **Portuguese Timor.** This would be most welcome activity as CR10AA is no longer interested in Amateur Radio.

The **Transvaal World Safari** commenced their two and a half year world journey in December 1960, and so far have been heard operating from ZE, VQ2 and VQ3 under the calls **ZS6TWS/ZE**, etc., on 14 Mc/s s.s.b. They plan to be in the U.K. during May 1961.

Kure Island will be represented by KH6ECD during the weekends of the Phone and C.W. Sections of the A.R.R.L. DX Contest. Operating frequencies will be 14,050 and 21,050 kc/s (c.w.), 14,300 and 21,400 kc/s (s.s.b.). QSLs should be sent via KM6BE.

Gus, W4BPD, is back in the U.S.A. after his long trip, and hopes to be able to visit those places which were missed last time. Apparently one drawback is a debt of some $3,000! Financial difficulties are also again troubling the *Yasme* organisation which promises further Clipperton activity in due course. (Thanks, K2UYG.)

QTH Corner

AC4AX	D. S. Seal, W.O., Consulate General of India, c/o Political Officer in Sikkim, Gangtok, Sikkim, via Siliguri, Calcutta, India.
EA8BA	W4MXL.
FF4AH	P.O. Box 100, Agboville, Ivory Coast Republic.
HA9OZ	P.O. Box 185, Budapest 4, Hungary.
HMIAA/HMIAB	P.O. Box 1088, Seoul, S. Korea.
HMIAD	P.O. Box 162, Seoul, S. Korea.
HPIHC	P.O. Box 4623, Panama City, Rep. of Panama.
K4SPV/VO2	CFLA Television Station, APO 677, N.Y., N.Y., U.S.A.
K6CQV/KS6	Box 307, Pago Pago, American Samoa.
KG1GD	FEC, DYE2, APO 121, c/o P.M., N.Y., N.Y., U.S.A.
PZ1BW	P.O. Box 981, Paramaribo, Surinam.
VP2LS	L. Ellis, Box 171, Castries, St. Lucia, W. Indies Federation.
VP2MB	J. Burke, Box 219, Montserrat, W. Indies Federation.
VP8EZ	via G2RF.
VQ9JER	via W5RHW.
ZD9AM	via W2CTN.
ZE4JN/MM	via W5RHW.
5N2IJS	J. F. Stratfull, The Audit Office, P.O. Box 196, Maiduguri, N. Nigeria.
5N2PJB	W/K via W7VEU; others via R.S.G.B.
6O1MT	Box 397, Mogadiscio, Somalia Republic.
9N1CJ	c/o U.S.O.M., Kathmandu, Nepal.

I.R.T.S. QSL Bureau: 24 Wicklow Street, Dublin, Eire.

* * *

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

Contests

The first weekend of the c.w. section of the **A.R.R.L. International DX Competition** will take place from February 17 to 19, and the second weekend of the phone section from March 3 to 5.

The c.w. section of the **1961 French Contest** will take place from 14.00 on February 25 to 22.00 on February 26. The code to be exchanged consists of RST plus the number of the QSO. One point will be scored for each QSO with F stations. There is a multiplier of 1 for each different French department or each country in the D.U.F. list worked on each band. The total score consists of the number of points multiplied by the total number of multipliers defined above. Logs should be sent to: R.E.F., B.P. 42-01, Paris R.P., France.

ST2AR reports he made 805,070 points in the c.w. section of the *CQ* contest. This score would have earned him second

ZS5JY keeps a sked with his wife ZS5PI during a visit to KH6DLF. The two boxes above the receiver contain the three 4CX-250As used in the kilowatt p.a.

place in the world last year, and accounted for 96 countries in 34 Zones. Of the countries 86 were worked on 14 Mc/s. The country total at ST2AR is now up to 235.

The **CQ 160m C.W. Contest** will be held from 02.00 on February 24 to 14.00 February 26. An attractive certificate will be awarded to the top station in each country.

G2BVN will be pleased to receive details of the claimed scores of stations that participated in the **CQ SSB Contest** on January 28-29.

Last but not least there is **BERU** which will be held during the weekend of March 11-12. Full details were given in the December 1960 BULLETIN.

Awards

The **" Ex-G Net,"** consisting of members born in the U.K. and at present living in the U.S.A. or Canada, now offers a very attractive certificate, available to stations who submit six QSLs and a list of relevant details, showing contacts with members in four different call areas in the U.S.A. and Canada. Commencing date for the award is October 1, 1960, and only QSOs after that date will be valid. Operators in the U.K. and Europe should submit their claim to L. Hill (G8KS), Rivenhall, Holwood Park Avenue, Farnborough, Kent. In the case of U.K. amateurs the claim should be accompanied by a s.a.e. and three I.R.C. European stations should send an addressed envelope and five I.R.C.

The President of the " Ex-G Net " is W3HQO, and the Hon. Secretary, K5QWZ, 3732 N.W. 59th Street, Oklahoma City, Oklahoma, U.S.A. The present members are: W1QNC, WA2EVH, W3HQO, K5QWZ, K6CKM, K6PAK, WA6GLF, W6UBU, WA6HOH, W7IYW, K7EQM, W0OYP, K0YYW, K0SWB, VO1EX, VE3BPY, VE3ENH, VE3BQP, VW3BWY, VE3AYE, VE3CDM, VE3CWB/W6 and VE3DZQ/W6. The net at present meets every Sunday at 21.00 on 21,445 kc/s, which under existing conditions may not always be suitable for Trans-Atlantic contacts. G8KS is the recipient of Certificate No. 1 which he says is very well worth having.

The Yugoslav National Society say that several requests for a YU-100 certificate have reached them recently but that such an award is *not* issued by them. The only Yugoslav awards are the WAYUR issued by the Society and the Zagreb award granted by the Zagreb Radio Club.

The **W.A.GI certificate** has been inaugurated to promote contacts with Northern Ireland stations. Full details are available from GI3KVQ of 63 Union Place, Dungannon, Co. Tyrone, Northern Ireland. European stations are required to submit 10 cards, two from stations in each of the following counties: Co. Antrim, Co. Armagh, Co. Derry, Co. Down and two from either Co. Tyrone or Co. Fermanagh. Belfast is divided by the River Lagan into Counties Down and Antrim. All QSOs after January 1, 1959, are valid, and operation may be on any band or any mode.

DX Briefs

Logs for **VS1BB/ZC5** are held by G3CCN who will be pleased to issue QSLs for recorded QSOs. Please enclose a s.a.e.

LA0B who claims to be on Bouvet Is. has been reported by G6XL and others. This station works on 14 Mc/s with a T4 note, and asks for QSLs via the Norwegian Bureau.

Cards for **ZS6IF/ZS9** were recently received from the printers and will be in the mail shortly. (Thanks, G6XL.)

Any station requiring a card from **VE2AIG/SU** should send pertinent QSO data and I.R.C. to VE2AFC at Box 382, Quebec, Canada.

Stations signing **UA1ZEA** and **UA1ZEC** are said to be in Franz Josef Land.

From K2UYG it is learnt that there is at present no activity from the **Mali** Republic.

ZD9AM is usually to be heard on Tuesdays around 19.30 on the low end of 14 Mc/s. ZS1RM and ZS1OU often assist in the regulation of the queue. ZD9AM now asks for QSLs via W2CTN.

Both **LA1NG/P** and **LA2NG/P** are active from Jan Mayen Is., the name of the latter operator being Hildor, often to be heard on 14 Mc/s c.w. QSLs should go via the Norwegian Bureau.

UA2AO from Kaliningradsk (a " new " A.R.R.L. country) has been worked on the high end of 14 Mc/s, and has said that he hopes to be active on s.s.b. in the near future.

F9QV/FC promised s.s.b. operation with a crystal controlled rig sent to him by HB9TL. Stations are particularly asked to call off the crystal frequencies of 14,294, '304 and '314 kc/s.

Another new country on s.s.b. is Byelorussia from where **UC2AA** has been putting in good signals with a transmitter running 5 watts p.e.p.

5N2PJB, hitherto the sole s.s.b. representative in Nigeria will be on leave in the U.K. in April 1961, but **5N2AMS**, shortly returning from leave, will now have gear to dispense A3a QSOs. It is hoped later to provide s.s.b. operation from FD8.

From **VQ8AD** (via G3AAE) it is learnt that he hopes to be on the air with the W6UOU " Argonaut " s.s.b. rig and a beam aerial in the near future.

Band Reports

The L. F. Bands

Conditions are rapidly improving on **1·8 Mc/s** and **B.R.S.20317** (Bromley) lists W1, 2, 3 and 8 on c.w. at times between 05.40 and 07.45 with W2FYT an outstanding signal on 1825 kc/s. All the W stations logged were on frequencies between 1815 and 1825 kc/s. **B.R.S.22795** (Kingston) reports W1 and 2 and ZC4AK at 23.25.

ZC4AK, the station of the R.A.F. Akrotiri Amateur Radio Club, is generally operating on the 1·8 Mc/s band every Saturday evening from 21.00 on about 1820 kc/s with an input of 150 watts to a long wire. Due to the high noise level, and the low power used by European stations, it is often very difficult to resolve incoming signals, although ZC4AK is being heard at good strength in the U.K. Generally G3BMY acts as a liaison station.

On the night of January 15/16 conditions were good and 23 stations in eight countries and four continents were worked. These included DL1VU, G3BMY, HB9T, OD5LX, OK1SV, W1PPN, W1ME, W1BB/1 and 5A2CV. Prior to this evening there had only been one previous QSO between ZC4 and W. Other QSOs include UB5WF and EP5X, and the 1·8 Mc/s countries score is now 12.

On **3·5 Mc/s G3NOF** (Yeovil) QSOd VO1EX (00.37, 3798), ZC4AK (21.46, 3790) and 4X4DK (21.35, 3790). G3NOF reports hearing ZL1AIX (07.30, 3820) and ZL1HY (0.45, 3805), all on s.s.b. **VE3BWY** (Toronto) using a vertical trap aerial reports improving conditions and contacts with G5WP and ZL3FZ.

Our listeners report: **01.00** UL7BM; **06.00** KC4AXU; **07.00** HC2KU, KH6DHI, TG5HC, W1, 4, 5, 6, 8, 9 and 0, YN1TAT, YV5ANS, ZL1BY, ZL2API; **08.00** PY3AVA, VE2AUU, VP2LY, W3, 4, 5, 0, ZL3JT, ZL4AV; **16.00** UO5AM; **18.00** UL7HB, UI8AP; **19.00** UA9SH, OY7ML;

DXotic Showcase

Call-sign	kc/s	Mode	G.M.T.	Country
EA0AF	14,032	c.w.	19.05	Spanish Guinea
ZD2KHK/NC	14,030	c.w.	16.30	N. Cameroons
ZD9AM	14,030	c.w.	19.50	Gough Is.
KX6BQ	14,310	s.s.b.	09.00	Marshall Is.
UA0LA	14,285	s.s.b.	08.30	U.S.S.R. Zone 19
UA3FE/0	14,300	s.s.b.	11.30	U.S.S.R. Zone 23
VK9HX	7,045	c.w.	00.02	Cocos Is.
VQ9HB	7,020	c.w.	20.05	Seychelles Is.

20.00 ZC4AK, 5A2FA; **21.00** FA3DU; **00.00** OD5CT, VE1AV (a.m.), VE1EX, VE0NA/MM (a.m.), W3. All stations were using c.w. or s.s.b. except where indicated. The reporters were B.R.S.20317, B.R.S.22013, A.1859, A.1930, A.2111 and A.2457.

Referring to **7 Mc/s G3LET** (Westcliff-on-Sea) mentions that a number of stations previously heard on the h.f. bands are now on this band but that in his opinion conditions have not greatly improved from the corresponding period of last year. G3LET reports c.w. QSOs with HC1JU (04.30), HZ1HZ (18.20), PY7SO (18.15), UA1KAE (20.15, Antarctic), VK9HX (00.02, Cocos Is. using 9 watts), VQ9HB (20.05, 7020), VS1FW (19.05), VS9AAC (20.10), 5N2JM (21.30), 9M2DW (23.15). **ZC4CT** (Cyprus) worked K1MMB (22.58), JA3AIS (22.32), OD5CT (08.00), W1CUL (22.00), 4X4MR (08.15). **VE3BWY** mentions contacts with CN8MB, EL4A, IS1MM, VK7MZ, 7G1A and numerous Europeans. VR2DK was heard, also W stations calling VR6TC.

B.R.S.20317, B.R.S.22013, B.R.S.22795, A.1543, A.1859 and A.1930 report hearing: **01.00** PY2CAW, UL7FA; **06.00** CT2DZ, SV0WZ (Crete), YV5HM; **08.00** ZL2/3, VK7MZ; **16.00** UO5BG; **17.00** VQ2CZ, UN1AZ; **19.00** JA3AIS, VK2QL, VQ4AQ; **20.00** FB8XX, LA8FG/P, VS1FW, VS9AAC; **22.00** FM7WZ, KV4CI, SV1AB, UO5KAN, 5A2TD (a.m.); **23.00** EA9EJ (a.m.), VE4RO, VP2AE (a.m.), VP2GV (a.m.), VP4LQ, ZC4CT, 9M2DW; **00.00** HK2NF, VP2AD, ZS6APT. All the above are on c.w. except where a.m. is noted.

An excellent 7 Mc/s report was made by B.R.S.20317 who mentions that North American stations have been audible as late as 10.15 with very good openings to W6 around 15/16.00. From the Pacific area ZL3GU and JA3CD were heard in QSO at 09.15 and no doubt the declining sunspot activity will attract even more DX to this band.

14 Mc/s

C.W.

G3YF (Chingford) worked BV1US (12.00), FB8XX (16.30), FB8ZZ (16.20), FF8CY (19.00), FQ8s CW, HP, HD, HO, HW (14.30-17.00), KH6IJ (18.20), SM6BXC/9Q5 (17.00), UM8FZ (11.45), UA0KUV (04.10), VQ8BC (16.35), VQ9HB (17.05), W8OLJ/PK (13.45), ZD2KHK/NC (16.30), ZD9AM (19.50), 7G1A (16.45). **G8PL** (Hampstead) follows with early morning DX in the shape of KW6DG, LA2NG/P, SV0WZ, ST2AR, UL7FA, UI8KAA, UA0AG, 4X4s, 5N2GUP, and SM5BUG/9Q5 (Katanga). The "got aways" include EP1AD, JAs, KL7s, OY2H, SU1IM, TA5EE, UM8HZ, UA0s, VP8DK and 9G1CW, all of which is respectable DX on an indoor aerial. **G6XL** (Leeds) worked ZD2KHK/NC (17.20) and UA2KAE (14.15). **G3MBN** (Bath) reports QSOs with FB8ZZ (15.59), KV4AA (19.00), OR4TZ (18.35), TF6GI (18.21), VQ3HV (16.36), VQ8BM (18.55), VR2DK (09.08), and 3V8CA (16.20). **G8KS** (Farnborough) keyed with CN9CF (18.00), UA1KAE (18.30), VQ8BC (17.00), ZD9AM (19.30, '107), and 7G1A (17.00). **GM3OEV** (Kinloss) QSOd several of the above plus FF8CW (18.35), KH6DQ (16.40), KL7KG (23.21), MP4QAQ (21.25), VP2LD (19.25) and 3A2CM (a.m., 16.00). **ZC4CT** mentions EP2AF (13.55), EQ5X (05.40), VS9AAC (04.45) and 5A3TN (16.50). **ST2AR** (Khartoum) picks out FQ8HD (17.35, Congo), JZ0PO (13.10), PZ1AP (05.00), SV0WO (21.00, Crete), UW3TE (20.10, for WPX), VP8EZ (19.45, Halley Bay). ST2AR promises activity on 3·5 and 7 Mc/s with a fixed W8JK aerial directed to Europe and North America.

The following lists of stations heard has been compiled from the reports of F.R.S.309, B.R.S.22013, B.R.S.22795, A.2122, A.2132 and A.2230: **08.00** EP3RO (a.m.), KA2YA (a.m.); **10.00** UA0RM (a.m.); **14.00** UC2AR, UO5BM; **16.00** EL4A, OY7ML, UP2AL, VS9ARP, 9K2AI; **17.00** FB8CE, FQ8HW, 5N2IJS; **18.00** OA1TK, VK0JC (a.m.);

YV5FK operates this neat set-up in Caracas, Venezuela.

20.00 FF8CY, ZS3B (a.m.), **22.00** JA8AH; **23.00** CE1AD, ZP5AY; **00.00** CR4AX.

S.S.B.

G6UT (Gt. Hallingbury) worked CT3AV (14.15), HA9OZ (12.20), JA2JW (09.20), KA2MM (09.29), LZ1WD (11.35), UN1AB (13.22), VP6WD (10.47), VQ9JER (14.35), and ZC4AK (16.20). **G4CP** (Walsall), reporting for the first time on this mode, has worked 71 countries in 25 days amongst them being CT2AH (19.15), FF8CW (18.40), KR6FA (09.15), KX6BQ (09.00), KV4BQ (11.00), OA4CV (08.45), UL7JA (12.30), UA0LA (08.30), VK9NT (09.00), VU2NR (16.15), ZS7P (18.45), ZS6TWS/VQ2 (19.10), 7G1A (19.00), 9N1SM (16.40) and 9Q5AG (17.30). **G3NOF** QSOd several of the above and CN2WH (12.40), KG1FR (18.08), ZS5QV (17.49) and 4X4AU (16.46). From **MP4BBW** (Bahrain) comes the following: AP2CR, CX2AX, EA8CT, EI5AI, EP1A, HC1FG, HR1KS, HS2A, KC4USB, KH6DEL, KM6BI, 'BV, 'BU, KW6CV, OA4J, PZ1AX, SP5PO, SV0WV, TG9AD, TI3CS, VK8TB, VQ2AB, VQ9TED, UA9CM, UA9OI, YN1TAT, ZD9AM, ZS2MI, ZS6TWS/ZE, 3V8CA, 5N2PJB and 9M2DB. Ian mentions that short path openings to Europe and the States have been extremely poor but that much of the Pacific and South American DX has been worked via the long path. During the year the MP4BBW country score has risen to 226, and two-way sideband QSOs have been made with 196 countries. **ZC4AK** is the only s.s.b. station at present active from Cyprus, the gear in use being a DX100 with an SB10. Stations worked include: EP2AG (07.00), ET2US (17.30), HV1CN (13.30), HZ1TA (15.45), KG1FR (16.19), W4ARH/KL7 (14.13), PZ1AX (12.10), and TI2HP (13.00).

Contributors to the following list are A.1543, A.1859, A.2111, A.2122, A.2457, B.R.S.22013, B.R.S.22795 and B.R.S.22844. **07.00** HV1CN, PI1LS/MM; **08.00** KA2RJ, KG6AJB, UA0LA, VK9NT; **09.00** KR6IZ, UC2AA, UN1AB, UR2KAA; **11.00** UL7JA; **12.00** TF2WFN; **14.00** EP5X, OD5CT, OY7ML, UP2CG, VK5AB; **16.00** KL7DOS, VE5MK/SU, W7QMU/VE8, VQ5FS; **17.00** CT2AH, ZS7P; **18.00** EA8CT, KG1BX, TI2AV; **19.00** HH2JT, PZ1BF; **20.00** CT3AV, CX2DO, VP6WD, **21.00** EL2Q.

21 Mc/s

G3NOF used A3a to contact EA8CT (13.11), FF8CW (16.48), HC1KA (13.19), HR2HA (13.05), HZ1AB (13.34), KP4AVQ (15.01), and PY2QT (18.21) whilst on a.m. QSOs were completed with EP2AT (11.18), FF4AH (10.05), FF8BL (10.40), PZ1BW (16.27), and 9G1CC (13.15). **G8KS** conversed via the upper sideband with KR6LO (13.00), KZ5BA (17.10), K4SPV/VO2 (17.25), and VP7PB (17.15). **ZC4CT** keyed with MP4BCV (13.10), VK2/3 (12.00), VU2RN (12.05), ZE3JO (14.35), ZL1AFW (12.05), and ZS1RM (16.50).

G8DL (Christchurch) uses a 7 watt c.w. rig with a 5763 p.a. and a quad aerial, and during the past 18 months 1600 stations have been worked in 136 countries and 38 zones. Recent QSOs include CP3CN (22.20), EL4A (09.07), HV1CN (12.30), KG4AO (20.25), K0SLD/KW6 (12.01), OY2AB (10.40), UA0GF (10.15), UA0SK (09.10), VP4BO (17.27), VP8CC (20.39), VQ1SC (18.40), VR1B (12.30), YA1BW (09.45), YN1CAA (12.40), ZE3JO/ZD6 (18.10), and 6O2GM (18.15).

Stations heard were **08.00** EP2AT, ET3MA, 9G1CC, 9U5VS; **09.00** OY2AB (c.w.), UR2BU, 6O2GM; **10.00** FF4AF, FF7AB, VS6CL; **11.00** EA8CM, HK3LX; **12.00** CR5AR (c.w.), EA6AR, VP8DW; **13.00** CT2AC, OH0NF (c.w.); **14.00** VP3MC, VP9DC; **15.00** HI8JSM, UC2AX, UR2KAE, ZD6DT, 9Q5HF; **17.00** FF7AB, PZ1BW. This list, which except where otherwise mentioned, contains a.m. stations, was furnished by A.1543, A.2122, A.2132, F.R.S.309, B.R.S.18876, B.R.S.22013, B.R.S.22357, B.R.S. 22795 and B.R.S.22844.

28 Mc/s

GM3OEV reports a.m. QSOs with FF7AP (13.40), HC1AM (18.45), MP4BDC (12.15) and PJ3AJ (16.25).

G3MBN keyed with KP4CC (14.33), VQ2EW (14.20), VQ8BC (10.55) and ZE2KL (13.59). **G3NOF** used A3 to speak with KG4AT (14.01), KP4AEB (14.44), ZE6JL (16.11), ZS1BV (15.53) and 5N2DPD (11.50).

Listener reports come from A.1543, A.1930, A.2122, A.2132, A.2230, F.R.S.309, B.R.S.22357, B.R.S.22844, B.R.S.22795 and mention the following a.m. stations: **10.00** UA2AAA, UR2CX, 5N2ATU; **12.00** KG4UA, PZ1AY, VP6HR, VP9AK, 5A3CAA; **14.00** CO8JK, CZ4CS, TI2OE, VP5BB, VQ2BK; **15.00** CR7EI, EL1D, FF8AP, TG9VK, TI2EMD, YS1IM; **16.00** HC1DL, PJ3AJ, VO1FS, VP6AM, YV1DH; **17.00** TI2OE, VP3MC, XE3AF.

The Commonwealth Competition

The final scores for 1960 are given in the accompanying table and all participants are thanked for their interest. Our congratulations go to VE3BWY and B.R.S.20317 for outstanding performances. It should be mentioned that VE3BWY is a multi-operator station which leaves G3BHW as the leading single operator and U.K. station. G3AAE, the originator of the Competition, retained his position as highest scorer on 28 Mc/s despite a period of inactivity. The highest score on 14 Mc/s, obtained by MP4BBW, refers to s.s.b. contacts only. G3LET finished head and shoulders above the other competitors on 7 Mc/s and showed just what can be achieved on this band. No comment is necessary in so far as B.R.S.20317 is concerned for his scores show the excellence of his performance.

There has been little demand for a new competition but several operators have expressed preference for a table again referring to Commonwealth countries. It has been suggested this could refer to Commonwealth prefixes worked on (i) c.w., (ii) a.m. and (iii) s.s.b. Comments would be appreciated.

* * *

Acknowledgment is made to the *DX'press*, *The DXer* and the *West Gulf DX Bulletin* for news items. Please send reports for the March issue to arrive at R.S.G.B. Headquarters by February 20.

Commonwealth Competition 1960

Final Placings

	28 Mc/s	21 Mc/s	14 Mc/s	7 Mc/s	3.5 Mc/s	Total
VE3BWY	38	47	72	42	30	229
G3BHW	46	66	65	20	6	203
ZD2JKO	35	57	46	32	6	176
G3AAE	51	52	56	14	—	173
G5VU	26	40	49	16	12	143
G8KP	21	35	39	28	18	141
VE7KX	14	38	29	32	27	140
GB2SM	33	35	19	16	12	115
MP4BBW	1	20	73	—	—	94
VQ4HE	26	14	23	14	9	86
G3LET	—	—	—	84	—	84
G8DI	14	13	21	14	18	80
VO2NA	7	10	24	14	6	61
G3MGL	8	2	6	4	—	20
G3JFD	1	6	1	—	—	8

Band Leaders

28 Mc/s—G3AAE
21 Mc/s—G3BHW
14 Mc/s—MP4BBW
7 Mc/s—G3LET
3.5 Mc/s—VE3BWY

	28 Mc/s	21 Mc/s	14 Mc/s	7 Mc/s	3.5 Mc/s	Total
B.R.S.20317	44	68	73	86	42	313
A.1859	52	81	65	14	18	230
B.R.S.18876	33	131	57	—	—	221
B.R.S.22013	30	59	73	28	6	196
B.R.S.22249	32	64	46	26	9	177
B.R.S.21008	38	58	48	4	—	148
A.1792	40	54	46	—	—	140
A.1583	25	62	28	—	3	118
A.1965	17	54	24	2	3	100
B.E.R.S.195	—	—	47	30	12	89
A.1980	31	37	8	—	—	76

Band Leaders

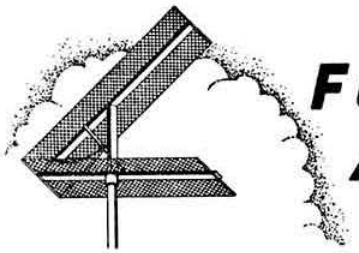
28 Mc/s—A.1859
21 Mc/s—B.R.S.18876
14 Mc/s—B.R.S.20317, B.R.S.22013
7 Mc/s—B.R.S.20317
3.5 Mc/s—B.R.S.20317

Oe.V.S.V. QSL Bureau

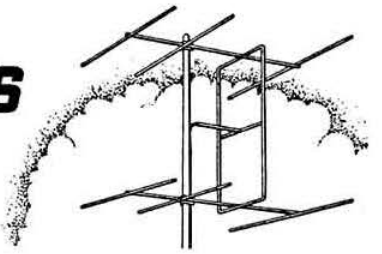
THE new address of the Oe.V.S.V. QSL Bureau is Postbox 999, Vienna I/9, Austria.

Single Sideband (Continued from page 370)

find that the circuits tunes is not good enough. If you have any reason to think that in any of your tuned circuits the core is in fact right in the centre of the winding—then the circuit may not be properly resonant and the voltage developed is less than it should be. Correct tuning of the circuit is most important when it is in the anode of a mixer valve. Mis-alignment means less of the required output frequency and more of the unwanted mixer product and may mean that following stages are amplifing a spurious product that should not be there. (v) Use a low loss coil dope made by a reputable manufacturer. Highly recommended is the polystyrene cement obtainable from Denco (Clacton) Ltd.



FOUR METRES AND DOWN



By F. G. LAMBETH (G2AIW) *

IT has been suggested that this feature is prone to place undue emphasis on auroral openings between U.K. and European stations and, one supposes, this criticism may soon extend to meteor scatter operations. This state of affairs is assumed to reflect adversely on the reporting of the activities of low power stations in Britain which are said to be of the greatest interest to the majority of operators. The writer does not altogether share this view but realizes that his opinion may not be supported by others. On the other hand it can be stated that no report of activity, however commonplace, is ever knowingly ignored; but it must also be said that the chronicling of low power (or any other) v.h.f. activity is governed by the substance of the reports which are sent in. The fact that the better known stations are fairly regularly covered is due largely to the fact that they report periodically.

Remember, as has been stated many times before; this is *your* column and you are its backbone. Harking back to the auroral question, it should be noted that auroral contacts are possible to all (QRP or otherwise) who can turn a beam to the north.

Midland News

G3BA (Sutton Coldfield) sends a fine survey of Midland v.h.f. activity. G3DFL (Smethwick)—very active on n.b.f.m. —is helping G3MXW/T with his 70cm transmissions. G3DFL is making transistor mobile equipment for the summer. G2HDT, a newcomer from Burton-on-Trent, using QRP and a poor aerial, is getting out quite well locally. G3BA says he gave a lecture on v.h.f. (with tape recordings) at Burton recently and the old glint was beginning to show in their eyes again! G6SN is active from his new QTH, particularly on Sundays. There is a strong possibility of mobile expeditions in North Yorkshire during the summer. G3ENY (Bridgnorth) is on most nights with a good remote controlled transmission. He is an authority on satellites and has tapes on most of these astral bodies!

G3NBQ (Coventry) is using n.b.f.m. with the G3DFL circuit. G8VN (Leicester), who has nearly been persuaded to fit an outside aerial, has QSOs with G5JU on Sunday mornings, and is building a v.f.o. to get out of G3BA's way! Two stacked Yagis in the loft are used at present. A near neighbour, G3CKQ, is also active. G3IUK (Belper) is heard at odd times. G3AQX (Somercoats, Derby), who puts out a good signal with low power from a QQV03/10, has a neighbour, G3OPW, who has been deeply bitten by the 2m bug and is re-siting his aerials in better places. G3KFD (Wolverhampton) is on s.s.b. with a good clear signal. G3NQA (Erdington) has a S440 and Yagi aerial in a poor location but is getting out locally. G3GUD and G3NZL are both on from Leicester. G3ORY (Handsworth) came on the band recently with an SCR522 and a dipole—G3MVT nearby certainly feels the " draught " when he is on. G3MVT's cheerful voice is heard most weekends, and he is still active in R.A.E.N. G3HXN (Gloucester) has put in an appearance again. G3MTI (Malvern Hill) is a very keen R.A.E.N. man and works " press to talk " which is a refreshing change! From Rugby, both G3IKL and G3MDC are heard occasionally. GW3MDY (Flint) is active on many evenings. G3NAP (Coventry) has been heard recently as well as G3AYJ (Perry Barr), mainly at the weekends.

G3NAS (Sutton Coldfield) is putting out a solid signal with a 522 and is modifying another for G3NAV (Birmingham). G3GWL has a mobile/portable rig ready for the summer. G3EJO holds lunchtime skeds with G3BA. GW3LJP (Radnor) can generally be raised via G3MTI (Malvern) in the evenings. G3LAY (Erdington) has an s.s.b. rig and works G3GGR, also on s.s.b. most weekends. G3TP (Paleworth) is trying 2m instead of Top Band—the results are encouraging in some directions. G3KMT is also active and G2DCI (Sutton Coldfield) should be on ere long.

In Coventry, G5PP, G3KEF and G3LHA are all active, with G5ML on from Leamington Spa.

G3BA himself has just completed some converters for 70, 144 and 420 Mc/s and the transmitter to match is in the hole punching stage. For 2m, a W2AZL converter with A2521s in the cascode stage is being used. The present transmitter uses a QQV03/20A at 50W on n.b.f.m. from a mixer type v.f.o. with its output on 24 Mc/s. The f.m. is obtained by use of a SX761 capacitance diode across the Clapp v.f.o. on 5 Mc/s and is extremely simple to get going.

G3BA's score since January 1, 1961, is 23 counties and three countries (G, GW and DL). He is president of the Midland Amateur Radio Society which has a big bias in favour of v.h.f./u.h.f. The society station G3MAR/P will be on the air again this year on all v.h.f. Field Days while individual members will support as many of the R.S.G.B. v.h.f. contests as possible. Local events are run in conjunction with Coventry A.R.S. and Bristol Group and these should include v.h.f. to try to encourage activity. It is hoped to have plenty of v.h.f. and TV interest to show the visitors to the Trentham Gardens Mobile Rally on April 30. (After this fine lot of information, it occurs to me that G3BA has beautifully covered the criticism mentioned at the beginning of this article—G2AIW.)

Reflections from " Echo " Satellites

On the subject of possible amateur contacts by reflection from *Echo* type satellites, we can do no better than to draw readers' attention to the following extract from " The World Above 50 Mc/s " by Sam Harris (W1FZJ) in *QST* for October 1960.

" *Project Moon Bounce and Echo 1*

We have received numerous reports on the reception of signals purported to have been reflected from *Echo 1*. Unfortunately, *Echo 1* was launched during the peak of the Perseids meteor shower and the majority of reports received are directly attributable to meteor reflection. The likelihood of stray reception of amateur signals reflected from *Echo 1* is very small. In fact, the path-loss for *Echo 1* is approximately 5db greater than the path-loss for a moon-bounce transmission. For amateur type communication, reflection from *Echo 1* offers no advantages over the moon and has several disadvantages. The prime one of these is the rapidity

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

of transit which introduces considerable Doppler shift as well as very difficult aiming problems. It is certainly safe to say that if you cannot receive moon-reflections, you will not be able to receive *Echo I* reflections."

G4LX's Auroral Report

Apart from the personal observations of G4LX, the only report for December came from SM6PU. In Sweden, December 1 brought auroral signals from DL1RX, DL1PS DJ5HG, SP5PRG, UR2BU, OZ7IGY and numerous SM stations. On December 6, QSOs were made between Norway and Sweden. On December 15, DL6QS, LA4YG, LA4RD, LA9T, OZ7WA, OZ7BR, OZ7IGY and the usual SMs made contact. December 18 brought OH1NL working into LA and SM. On December 27 the French nuclear test took place in the Sahara. Readers may recollect that immediately after the previous nuclear test on February 13, 1960, there was an auroral opening. Again immediately after the explosion on December 27, auroral QSOs were made between SM6PU and G5YV, GM2FHH, GM3GUI, LA4YG, LA4RD, LA3AA, LA9T, UR2BU and OZ7IGY. G4LX found that auroral conditions were apparent on December 1, 15, 18, 21 and 27. No 144 Mc/s signals were heard until 18.15 G.M.T. on December 27 when LA3AA appeared. He was followed by LA9T and GM2FHH.

LA9T (Moss, Oslo) noted aurora on December 15, 18 and 27 when SMs and DLs were worked by Norwegian stations. LA9T heard G5YV on December 27.

GM2FHH worked OK2VCG during the Geminids meteor shower on December 12/13 at S26, with occasional S9. Some of the contact was recorded on tape and the QSO has been confirmed meantime. December 12 was best with continuous bursts for over an hour during the period 21.00-22.00. GM2FHH thinks it would be a good thing if people started publishing frequencies again—his is 145·780 Mc/s.

Four Metres and Down Certificates

Apropos the new *Four Metres and Down* operating awards, **G3NWG** (Earlsfield, S.W.18) thinks that there should be a separate certificate for c.w. work. An endorsement on an existing certificate is not thought to be enough (so far, the only criticisms have been two of this kind—are there any others?). Operation at Earlsfield for the past few months has been with an indoor aerial only and many carriers have been quite readable on c.w. but numerous CQ calls on the key have brought no results, which is a great pity. A new local station in the band is G3OGL (Southfields).

By the time this issue is published the January 144 Mc/s C.W. Contest will have come and gone, bringing with it an opportunity to work some of the more elusive counties. The ordinary 2m award will be within the reach of all as soon as the first major opening occurs and now is the time to clock up the counties nearer home.

Who will earn certificate No. 1? It could be you.

Two Metre News and Views

G3FCY (Hull), who reports for the first time, remarks on the " appalling " lack of activity on 2m. After being on the band for two and a half years G3FCY has found that the number of stations operating gradually gets less. Although some allowance has to be made for adverse conditions, it is not thought to be the entire cause. A sked with G3JMA almost each evening over the last nine months has only failed on about half a dozen times. Some stations which have been " coaxed " on to the band have left it again owing to lack of signals. The only signal heard on a recent evening was GB3VHF at 579.

G5YV (Morley, Leeds) worked Bill James (G6XM) now DL2XM, in a fair tropo opening on January 17. This was apparently DL2XM's first U.K. contact. Also worked by G5YV were DL3FM, DJ5WC, DL3NI and DJ4OB. Several PA stations were heard, including PA0WAR, with DJ1VK, DJ6BB, DL3VJ, DJ2FS and DL1PS also logged. There was nothing much else during the month except a small auroral opening on January 9 from 18.10-19.20 G.M.T. and from 22.30-23.15. However, only GM2FHH and GM3GUI were audible on each occasion, yet strangely enough G5YV has had four listener reports; two from Norway and two from Sweden for the second period. During the aurora of December 27 (18.30-19.45) four GMs and SM6PU were worked. The band was open for tropospheric propagation on the night of January 16 but all signals were weak apart from DL1PS who was peaking S8 and gave G5YV S9 but even his signals had faded out by 19.30 G.M.T.

G2XV (Cambridge) says that December 30/31 produced quite a bit of activity on 2m and G2DZH, with an indoor aerial, provided a nice QSO from Welling (Kent) with surprising signal levels. Several " old timers " have appeared on the band of late including G5TZ, G2DQ and others. A new 2m converter at G2XV incorporating a 6AM4 g.g. stage followed by a 6BQ7A cascode and 6AK5 mixer is showing good promise. G3IIT lost his 8-over-8 during the December gales but has a temporary pair of slots erected and still " keeps an eye " on the band.

G3LTN (near Andover) has changed QTH but only a mile to the s.e. of the old one. Activity seems very low on 2m but on January 11 G5YV was heard at 539 and a QSO was started but failed owing to a fuse fault at G5YV. The QSO was completed on January 12 when G5YV was peaking 559. G2NY (Preston) was also heard and G2CIW worked on c.w. as was G6GN on phone. G5YV reported that GB3VHF was peaking at S7 on that evening.

G3LTF (Galleywood) had bad luck with HB9RG during the meteor scatter skeds on December 22, 1960. Each station heard several bursts from the other but still not quite enough for a QSO. G3LTF is disappointed at the apparent lack of interest of so many stations abroad about m.s. skeds and remarks that it is a pity that after spending a lot of time on building a crystal calibrator, automatic sender using photo transistor and oven controlled transmitter that very few skeds are on offer! However, the barometer started climbing on January 11 and the skeds with GW3MFY and G3ILX picked up, with peak signals of 589. On January 12, F stations appeared, and F9II (Paris), F9MZ and F3NG were worked. On January 13 and 14 some F and ON stations were heard. With a slight barometer drop on the 15th German signals came in and DL1PS, DJ6BN and DJ4OB were worked. The skip effect appeared obvious, as no PAs at all came through—only DLs at good strength. Apparently G stations further inland were getting the DLs sometimes stronger and also working PAs, which seems to prove the

LONDON U.H.F. GROUP

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

at 7.30 p.m. on Thursday, March 2, 1961

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

Note the new venue!

V.H.F. QSY

Members who wish to acquire or dispose of crystals in connection with the British Isles Two Metre Band Plan are invited to send details to " V.H.F. QSY," R.S.G.B. *Bulletin*.

Crystals Offered

By GW3ACF, 22 Smallwood Road, Baglan, Port Talbot, Glamorgan. 8036, 8061, 8093, 8094, 8098 kc/s (FT243 type).

Crystals Required

By GW3ACF, as above. FT243 type between 8014 and 8027 kc/s (two or three on same nominal frequency acceptable).

point. January 16 brought northern G-DX, G3ILX being the best on phone.

G3CCH (Scunthorpe) reports that " just for a change " he was on during the tropo opening on January 15. Quite a few DL stations were heard, mostly on c.w., with DL3FM as the best whilst DL3VJ was a really good signal on phone. Although much time was spent listening, no s.s.b. stations were heard.

During the Quadrantids meteor shower of January 2/3 skeds were observed with OH1NL and OE3SE. This resulted in a complete QSO with OH1NL on the 3rd. The noticeable thing about this contact is that it was completed *after* setting time. The sked started at 17.00 G.M.T. and at first there were quite a number of pings, then long blank periods but finally one long burst which contained all the necessary information and later the acknowledgment. Signals from OE3SE (sked 04.30/07.30 G.M.T.) were rather weak but he was positively identified.

G3CCH is shortly going into the parametric amplifier field and will report when he gets one working satisfactorily. He would also like to hear from any station interested in a m.s. sked using s.s.b. instead of c.w.

G5MR (Hythe) makes a welcome return and reports that on January 12 he was able to present F2ZD with his first G contact. This is the station of the Mont-Valerien Radio Club and is 600 ft. up on the western outskirts of Paris (frequency, 145·102 Mc/s). F2ZD is now looking for more British stations. Several F stations are on 2m *daily* between 10.00 and 11.00 G.M.T. as well as in the evenings.

GW3MFY (Bridgend) received a report from G2NY on January 4 but no confirmation of his report. G2NY was peaking 559 at the time. On January 11 G3LAR and G6OX were worked, with G3KDG (Edgware) and G3BLP (Selsdon) on January 12. Those contacts coincided with an anti-cyclone. On January 16, G3ILD (Co. Durham) was heard calling CQ peaking 559 but was not raised in spite of several calls. G2DQ (Danbury, Essex) was also heard on phone at S7.

The International V.H.F. Society's Trophy has been awarded this year to Geoff Stone (G3FZL). The Millan Trophy goes to Dr. Hans Lauber (HB9RG) for his outstanding v.h.f./u.h.f. performance during the past year.

Two Metre News from Scotland

GM2FHH (Aberdeen) worked G2CIW, G5YV, GI5AJ and GW2HIY on December 27 (18.30-19.30 G.M.T.) by auroral scatter. On January 8 (18.00-19.00) GM3GUI and GI5AJ were worked by aurora and G3MED heard on s.s.b. The latter was fully readable but despite many calls there was no QSO! January 9 (18.50-19.10) brought a QSO with G5YV (aurora again) with GM3GUI and GM3LAV heard. Later (22.40-23.30) GM3GUI and G3ILD were also worked via the aurora.

GM3GUI (Friockheim) found 2m at rock bottom as far as tropo was concerned and no station was heard outside Scotland. The auroral position, however, was somewhat better. On December 27 (18.00-19.50 G.M.T.) stations heard were SM6PU (worked), G3KPT, SM7ZN, G5YV, G6NB, G2CIW (worked) and GI5AJ. The second auroral opening was on January 8 from 18.00 to 18.50 G.M.T., when GM2FHH, GM4HR, GM3HLH/A, SM6PU, GM3BCD and GM3LAV were all heard. The third was on January 9 (17.50-20.10 G.M.T.) which was rather poor. GM3DIQ was worked and GM3FMD, GM4HR, GM3LAV, GM2FHH and G5YV heard.

GM2CHN (Glasgow) reports that the cold weather seems to have kept most of the GMs out of their chilly attic shacks and activity has been low. However, ten of them checked into the net which ushered in the first hour of the New Year and one or two others showed up later in the day. At a get-together at GM5VG's home on January 5, 14 active v.h.f. men assembled and discussed among other things the Scottish V.H.F. Convention to be held in Edinburgh on March 11. GM2CHN is planning a talk on v.h.f. receivers for the local R.S.G.B. meeting in February, and hopes it will sustain the growing interest.

After a long absence **GM2DPW** has made his re-appearance on 2m.

SCOTTISH V.H.F. CONVENTION
Carlton Hotel, Edinburgh

MARCH 11, 1961

Lectures—Demonstrations—Dinner—Raffle

Tickets, including tea and six-course dinner, may be obtained, price 21/- *each, from* W. C. Bradford, GM3DIQ, 6 Langside Park, Kilbarchan, Renfrewshire, or from L. F. Benzies, GM3DDE, 78 Hillview Road, Corstorphine, Edinburgh 12.

Seventy Centimetre Notes

G2XV reports that G2DQ has been receiving good signals from him and is now busily engaged in preparing a transmitter for the band.

G3LTF (Galleywood) worked G3LQR/T (near Colchester) for a new one on January 9. **G3FIJ** is again active, so it would be worth while for some of the South London stations to look Essex-wards.

G3CCH (Scunthorpe) has been building up slow scan TV equipment and has been able to make, record and play back his own pictures. Now a 70cm converter is being constructed. G3MED is also preparing, and they hope to have " on the air " tests soon.

F2ZD (near Paris) is looking for Gs on 70cm.

G3MXW (Smethwick) is putting out TV every night between 20.00 and 21.00 G.M.T., aided by G3DFL.

G3KFD (Wolverhampton) is on 70cm if anyone wants a signal! **G2CIK/T** is active on TV from Yardley (Birmingham) with a 4X150 final. Several of the Birmingham and Wolverhampton 70cm phone and TV men are heard by him. **G3HXN** (Gloucester) is interested in 70cm if someone will co-operate.

GW3MDY (Flint) is a very keen TV enthusiast and has 70cm transmitting gear. He wants to get a good converter to work c.w. or phone, as the APS13 is not so hot!

Don't forget **G2CIW** when looking for QSOs. He is very active as is G3KPT (West Bromwich). **G3HAZ** does not miss much on this band (or 2m) and has just built a TV transmitter.

Twenty-three Centimetres

G3KPT has a beautiful 23cm p.a. and is looking for a collaborator with a 23cm receiver.

G3HAZ is working on an " all band " transmitter for /P and other work (covering 28-1300 Mc/s, believe it or not!).

Four Metres

GM2FHH will be back on 4m during February and March. G2AYJ (Perry Barr) is active on the same band, mostly at weekends, as is G3MNQ (Nottingham) who has a new aerial.

G3KPT, G3LZN, G3LZH are all active.

Can You Help?

● E. W. Elliott (G3BYY), " High Curley," Staines Road, Wraysbury, Staines, Middlesex, who requires information regarding the size and measurements of the inductance for the 150-300 Mc/s range of the Marconi type 51 signal generator TF517E?

Society News

Major-General Eric Cole Installed as President

AT the meeting held on Friday, January 20, 1961, at the Institution of Electrical Engineers, London, W.C.2, Major-General E. S. Cole, C.B., C.B.E., was installed as the 27th President of the Society.

Prior to the installation ceremony (performed by the Penultimate Past President, Dr. R. L. Smith-Rose, C.B.E.), Major-General Cole delivered an Address on the subject of Military Communications. The Address will be published in an early issue of the BULLETIN.

Among those present at the meeting were Past Presidents S. K. Lewer, B.Sc. (G6LJ), F. J. H. Charman, B.E.M. (G6CJ), L. Cooper (G5LC), A. O. Milne (G2MI), D. A. Findlay, D.F.C. (G3BZG), L. E. Newnham, B.Sc. (G6NZ), Vice-Presidents W. H. Allen, M.B.E. (G2UJ), H. A. M. Clark, B.Sc.(Eng.) (G6OT) and J. W. Mathews (G6LL). Members of the Council present in addition to Past-Presidents Milne, Newnham and Smith-Rose were E. G. Ingram (GM6IZ) (Executive Vice-President), K. E. S. Ellis (G5KW), R. C. Hills, B.Sc.(Eng.) (G3HRH), J. D. Kay (G3AAE), G. M. C. Stone (G3FZL) and E. W. Yeomanson (G3IIR).

A vote of thanks to the President was proposed by Major K. E. S. Ellis (G5KW).

At the opening of the proceedings Dr. Smith-Rose referred to the death on Christmas Day of the Society's then President (the late W. R. Metcalfe, G3DQ), after which members stood in silence as a tribute to his memory.

Committees of the Council 1961

THE following members have been appointed to serve on the committees of the Council for 1961:

Contests. *Council Members:* K. E. S. Ellis (G5KW), R. C. Hills (G3HRH); *Non-Council Members:* D. A. Findlay (G3BZG), M. Harrington (B.R.S.20249), W. H. Matthews (G2CD), H. W. Rees (G3HWR), A. W. W. Timme (G3CWW), F. E. Woodhouse (G3DC).

Exhibition. *Council Members:* C. H. L. Edwards (G8TL), G. M. C. Stone (G3FZL), E. W. Yeomanson (G3IIR); *Non-Council Members:* G. W. Norris (G3ICI), F. F. Ruth (G2BRH), C. Waterman (G3NKX), A. J. Worrall (G3IWA).

Finance and Staff. *Council Members:* N. Caws (G3BVG), K. E. S. Ellis (G5KW), E. G. Ingram (GM6IZ), L. E. Newnham (G6NZ), P. H. Wade (G2BPJ).

G.P.O. Liaison. *Council Members:* J. Douglas Kay (G3AAE), A. O. Milne (G2MI), L. E. Newnham (G6NZ); *Non-Council Members:* H. A. M. Clark (G6OT), D. Deacon (G3BCM).

Membership and Representation. *Council Members:* E. G. Ingram (GM6IZ), J. Douglas Kay (G3AAE), F. K. Parker (G3FUR), F. A. Russell (G3BHS), P. H. Wade (G2BPJ), A. C. Williams (GW5VX), E. W. Yeomanson (G3IIR).

Mobile. *Council Members:* C. H. L. Edwards (G8TL), A. O. Milne (G2MI), E. W. Yeomanson (G3IIR).

R.A.E.N. *Council Members:* C. H. L. Edwards (G8TL), L. E. Newnham (G6NZ), E. W. Yeomanson (G3IIR); *Non-Council Members:* G. A. Allcock (G3ION), C. L. Fenton (G3ABB), A. C. Gee (G2UK), E. A. Matthews (G3FZW).

Scientific Studies. *Council Members:* R. C. Hills (G3HRH), G. M. C. Stone (G3FZL); *Non-Council Members:* W. H. Allen (G2UJ), G. R. Jessop (G6JP), J. W. Mathews (G6LL), C. E. Newton (G2FKZ).

Technical. *Council Members:* R. C. Hills (G3HRH), G. M. C. Stone (G3FZL); *Non-Council Members:* H. A. M. Clark (G6OT), D. N. Corfield (G5CD), D. Deacon (G3BCM), G. C. Fox (G3AEX), J. W. Mathews (G6LL), R. F. Stevens (G2BVN).

TVI/BCI. *Council Members:* J. Douglas Kay (G3AAE) E. W. Yeomanson (G3IIR); *Non-Council Members:* D. Deacon (G3BCM), J. W. Mathews (G6LL).

V.H.F. *Council Members:* N. Caws (G3BVG), K. E. S. Ellis (G5KW), R. C. Hills (G3HRH), G. M. C. Stone (G3FZL). *Non-Council Members:* W. H. Allen (G2UJ), J. H. Hum (G5UM), F. G. Lambeth (G2AIW), A. L. Mynett (G3HBW).

Golden Jubilee Celebrations

THE President (Major-General E. S. Cole), Dr. R. L. Smith-Rose (Penultimate Past President), Mr. N. Caws (Hon. Treasurer), Mr. E. G. Ingram (Executive Vice-President) and Mr. J. Douglas Kay have been appointed to serve on a special Committee to make plans for the Golden Jubilee celebrations of the Society during 1963.

Trentham Gardens will be Venue for R.S.G.B. O.R.M. and Mobile Rally

AS an experiment, and with the approval of the Council, an R.S.G.B. Official Regional Meeting is to be held at the same place and on the same date as a Mobile Rally. Trentham Gardens, near Stoke-on-Trent, was the venue for highly successful Mobile Rallies during 1959 and 1960 with attendances approaching the 500 mark. The organizers of the 1961 Rally (Midland Amateur Radio Society and Stoke-on-Trent Radio Society) which is to be held on Sunday, April 30, have offered to provide facilities for the holding of an R.S.G.B. O.R.M. during the early afternoon (2 p.m. to 3.45 p.m.). It is anticipated that the Lord Mayor of Stoke will formally open the proceedings at about midday.

Admission to the Rally and O.R.M. will be free but a nominal charge will be made by the authorities at the entrance to Trentham Gardens. Catering at the Gardens is readily available.

Further information about the Rally and O.R.M. will appear in the April issue of the R.S.G.B. BULLETIN.

The late W. R. Metcalfe (G3DQ)

THE President and Council wish to thank all those who sent messages of condolence on the occasion of the death of Mr. W. R. Metcalfe (G3DQ). Among the many messages were several from prominent European radio amateurs who met Mr. Metcalfe at the I.A.R.U. Region I Conference in Folkestone last June.

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**

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

Full details of both events will be published next month. Advance information available from the Region 1 Representative (Mr. B. O'Brien, G2AMV) 1 Waterpark Road, Prenton, Birkenhead, Cheshire.

The Maurice Child Collection of Antique Radio Equipment

MR. MAURICE CHILD recently presented to the Society a unique collection of antique radio equipment dating back to the very early days of wireless. At present, the equipment is being stored but it is the Council's hope that at some future date it will be found possible to arrange for it to be suitably displayed for members' inspection. Mr. Child has provided the Society with a description of each piece of equipment.

The Maurice Child collection comprises a coherer built by Mr. Child, an early Marconi key, a Siemens type c.w. transmitter key, a high voltage key by Mr. Child, a Marconi magnetic key, a double current P.O. pattern key, an early absorption wavemeter made by Mr. Child (1909), a Mark 3 Tuner (World War I vintage), a Marconi balanced crystal receiver, a Marconi magnetic detector, a Marconi coherer receiver, a Marconi multiple tuner, a Fleming Cymometer, a three-coil tuner, a long wave receiving inductance, a Siemens iron pyrites crystal detector, a quenched spark gap, a non-synchronous spark gap, a Telefunken lap-wound inductance, a Telefunken shunted buzzer, a specimen of high frequency flexible conductor, a three-quarter turn h.f. cable, a power buzzer (Admiralty pattern), an early type of induction coil, an S. G. Brown telephone relay type A and a mechanical model for demonstrating valve characteristics.

Mr. Child is a vice-president of the Society and one of its earliest members.

London Lecture Meeting
Mobile Amateur Radio and its Problems

AT the meeting of the Society to be held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, on Friday, March 24, 1961, Mr. Norman Fitch (G3FPK), Hon. Secretary of the Amateur Radio Mobile Society, will give a lecture on " Mobile Amateur Radio and its Problems." The meeting will commence at 6.30 p.m. with buffet tea from 6 p.m.

The main theme of the lecture will be safety in mobile operation and in the installation of mobile equipment. Mr. Fitch will also deal in general terms with the design of mobile gear and aerial systems for 2-160m.

Operating techniques based upon the A.R.M.S. " Mobile Safety Standards " for both telephony (a.m. and s.s.b.) and telegraphy will be discussed and colour slides of typical installations shown.

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.

Radio Amateurs' Examination

ANY member who wishes to sit for the Radio Amateurs' Examination, to be held on Friday, May 5, 1961, should apply without delay to his local technical college who will make the necessary arrangements with the City and Guilds of London Institute. The closing date for making such arrangements is **February 24** but in exceptional circumstances entries may be accepted, subject to a late fee of £1, up to March 22, 1961. In cases of difficulty candidates should apply to the Director of Education for the county concerned.

The fee for the examination is £1, plus, in some cases, a small local accommodation fee.

Radio Amateur Old Timers' Association

THE Third Annual Reunion of the members of the Radio Amateur Old Timers' Association will take place at The Horse Shoe Hotel, Tottenham Court Road, London, W.C.1, on Friday, April 7, 1961. The cost, including service, will be 25/-. The chief guest of honour will be the President of the R.S.G.B. (Major-General Eric Cole, C.B., C.B.E.).

Radio amateurs who have held a full licence issued by the United Kingdom Postmaster-General continuously, including the war years, for at least 25 years are eligible to apply for membership of R.A.O.T.A. and to attend the Reunion. The life membership subscription of the Association is 21/-. In addition members are invited to contribute to the Association's Benevolent Fund.

An application form for membership can be obtained by sending a stamped and addressed envelope to the Founder-Secretary of the Association. Mr. John Clarricoats, O.B.E. (G6CL), 16 Ashridge Gardens, London, N.13.

The Association has 100 members including a number of past presidents of the R.S.G.B. Members receive a specially designed lapel badge.

Lists of New Members

IN order to provide more space in the Society's Journal for technical articles the Council has decided, as an experiment, to discontinue the practice of publishing lists of new members.

At the present time the lists occupy about one page of type per month but if they have to be held over due to pressure on the space available then the resulting back-log is very considerable.

The Council appreciates that the lists enable T.R.s to glean knowledge of new members in their towns but as Headquarters provide the R.R.s with details of all new members this information can readily be obtained by the T.R.s.

Harry Wilson (EI2W) now I.R.T.S. President

AT the Annual General Meeting of the Irish Radio Transmitters' Society held on January 28 in Dublin, Mr. Harry Wilson, P.C. (EI2W) of Foxrock, Co. Dublin, was elected President for the year 1961.

Harry Wilson, who was Vice-President during 1960, represented the I.R.T.S. at the I.A.R.U. Region I Conference in Folkestone last June and also at the Bad Godesberg Conference in 1958. He has for many years been the V.H.F. Manager of his Society and he was the founder and first President of the International V.H.F. Society.

His pioneer work on the v.h.f. bands has earned him much recognition including the award in 1955 of the Wortley Talbot Trophy. Mr. Wilson's many friends in the R.S.G.B., of which Society he has been a member since 1948, will wish to congratulate him on his well deserved honour.

The Intruder Watch

THE member who wrote to the Hon. Organizer of the Society's Intruder Watch in December 1960 offering assistance but has received no reply is asked to write again to D. W. J. Haylock (G3ADZ), 3 Norris Gardens, Grange Estate, Havant, Hants, as his letter was lost during the Christmas rush.

" Bud " has Retired

ARTHUR L. BUDLONG (W1BUD), Secretary and General Manager of the American Radio Relay League and Editor of *QST*, retired at the end of 1960 after a period of service spanning 37 of the League's 47 years of existence. In an unprecedented action, the League's Board of Directors, has specified that he be designated as Secretary and General Manager *emeritus*.

Bud has seen the League grow from 16,000 members to 100,000; its Headquarter's staff from 19 to 65; its operating gross from $150,000 annually to ten times that figure. A large part of this progress took place under his own supervision as Secretary and General Manager. Bud succeeded the late Kenneth B. Warner in those offices in September 1948.

Although constantly supervising the general activities of the League and its Headquarters, Bud's extra special field has been international regulation of radio and frequency allocations. He has been involved, one way or another, in every international radio conference since the opening of the short waves in the middle 1920s and was a member of the U.S. Government delegation to the Atlantic City and Geneva Radio Conferences.

On the death of Ken Warner, Bud became Secretary of the International Amateur Radio Union and it was in that capacity he attended the I.A.R.U. Region I Conferences held in Stresa, Bad Godesberg and Folkestone.

The amateurs of the United Kingdom acknowledge with gratitude the tremendous contributions Bud has made to the cause of Amateur Radio and they wish him a happy retirement.

Mr. Budlong is succeeded in the dual offices of Secretary and General Manager of the A.R.R.L. and as editor of *QST* by Mr. John Huntoon (W1LVQ) who has been his deputy for several years. J. C.

More Pirates Fined

AT Newcastle (Staffs.) Magistrates' Court on December 8, 1960, David Bowers, of 271 Crackley Bank, Chesterton, pleaded guilty to a charge of using wireless telegraphy apparatus without a licence contrary to Section 1 of the Wireless Telegraphy Act, 1949, and was fined £5.

At Huddersfield Borough Court on January 11, 1961, Ivor Smith of 46 Cow Heys, Dalton, Huddersfield, pleaded guilty to a charge of using wireless telegraphy apparatus without a licence contrary to Section 1 of the Wireless Telegraphy Act 1949. He was fined £20 and ordered to pay £5 5s. costs.

Professor G. G. Blake

THE death occurred in Sydney, Australia, on January 16, 1961 of Professor George Gascoigne Blake. Mr. Blake was a very early member of the Wireless Society of London and served for some years as a member of the Council. He was a frequent lecturer to the Society on a variety of subjects. Mr. Blake moved to Australia some 20 years ago and was at the time of his death on the academic staff of Sydney University.

Headquarters Address

WHEN writing by name to members of the Headquarters staff, correspondents are asked to ensure that the name of the Society is included in the address on the envelope. New Ruskin House is an office building and is occupied by a number of other organizations in addition to the R.S.G.B.

International Astronomical Union

THE International Astronomical Union, with headquarters at Hailsham, Sussex, has been admitted to participate, in an advisory capacity, in the activities of the International Radio Consultative Committee (C.C.I.R.).

From Mrs. Eileen Metcalfe.

Dear Mr. Clarricoats,

Would you be good enough to allow me, through the medium of the BULLETIN, *to express my heartfelt appreciation to all the radio amateurs who have been so kind and sympathetic over the loss of my husband, G3DQ?*

Amateur Radio and the Society played such an important part in Cliffe's life. He was a very keen business man but other things were rarely permitted to interfere with his duties as a member of the Council.

I know that his appointment as President was regarded by him as a very great honour and although his health was failing fast during his term of office, the Council's kindness in persuading him to carry on gave him one of the happiest years of his life.

My two sons and I were deeply moved by the large number of beautiful floral tributes sent by radio amateurs from all parts of the country, for the way in which so many of you came to Flamborough to be with him on his last sad journey and for the very many kind and generous letters we have received from many parts of the world.

Particularly I would like to thank you and Miss Gadsden for the time you devoted during the Christmas holiday period to the task of advising people of our great loss, and to Lt.-Col. Arthur Dunn (G2ACD) who with kindness and sympathetic generosity did everything possible to lighten my burden during that very sad time.

Reading your Silent Key *tribute to Cliffe's memory in the January* BULLETIN *has made me very proud to have been his XYL.*

Yours very sincerely,
Eileen Metcalfe

Flamborough, January 24, 1961

European V.H.F./U.H.F. Conference

AT the invitation of the Swedish Government a Conference is to be held at the Malmer Hotel, Stockholm, from May 26 to June 22, 1961, to examine the present situation in respect to V.H.F. Broadcasting in the European Area and to take such steps which, in the light of that examination, prove to be essential or necessary as a result of the entry into force on May 1, 1961, of the Geneva Radio Regulations. The Conference will also seek to establish agreements and associated plans for the use of U.H.F. Broadcasting in the European Area.

A meeting of experts to prepare for the Conference is to be held in Cannes from February 28 to March 14, 1961.

L.C.R.A.

LUIS CAICEDO (HK3AO) was recently elected President of Liga Colombiana De Radio-Aficiionados, the National Amateur Radio Society in Colombia, South America. Other officers elected were Hernando Melani, HK3TS (Vice-President) and Carlos J. Muller, HK3VV (Secretary).

I.R.T.S. QSL Bureau

THE new address of the I.R.T.S. QSL Bureau is 24 Wicklow Street, Dublin. The words " I.R.T.S. QSL Bureau " must always be used as part of the address because several business firms occupy the premises.

Until recently the work of the I.R.T.S. QSL Bureau was handled by the Rev. Father J. Stone (EI4Q). Increased parochial duties now prevent him from carrying on the duties of QSL Manager for the I.R.T.S.

Council Proceedings

OCTOBER 1960 MEETING

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 Saturday, October 15, 1960, at 1.30 p.m.

Present: The President (Mr. W. R. Metcalfe in the Chair), Messrs. H. A. Bartlett, N. Caws, D. Deacon, C. H. L. Edwards, R. C. Hills, E. G. Ingram, L. E. Newnham, F. A. Russell, G. M. C. Stone, P. H. Wade, A. C. Williams and John Clarricoats (General Secretary).

Apologies for absence were submitted on behalf of Messrs. K. E. S. Ellis, J. D. Kay, A. O. Milne, F. K. Parker, R. L. Smith-Rose and E. W. Yeomanson.

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Audited Annual Accounts

The Honorary Treasurer submitted a printed copy of the audited annual accounts for the year to June 30, 1960.

Resolved (i) that the audited accounts as submitted by the Honorary Treasurer be approved for printing and subsequent presentation to the members at the Annual General Meeting on December 16, 1960; (ii) that the appropriate officers shall sign a printed copy of the accounts.

The Honorary Treasurer read to the meeting a copy of his Report to the membership.

The President, on behalf of the Council, congratulated Mr. Caws on the excellence of the Report.

Membership

Resolved (i) to elect 62 Corporate members and 14 Associates; (ii) to grant Corporate membership to four Associates who had applied for transfer.

Application for Affiliation

Resolved to grant affiliation to S.T.C. (Harlow) Athletic and Social Club Radio Section.

News Bulletin Service

Resolved (i) to extend the News Bulletin Service to the North-East of Scotland and to accept an offer made by Messrs. Sherrit (GM3EOJ) and Anderson (GM3BCL) to act as news readers; (ii) to accept an offer made by Mr. G. D. Roe (G3NGS) to join the team of 2 metre news readers.

Golden Jubilee Celebrations

Resolved to consider at the January 1961 meeting of the Council a proposal to set up a special Committee to prepare for the Society's Golden Jubilee celebrations during 1963.

Mobile Section

Resolved to constitute at the January 1961 meeting of the Council a Mobile Committee and to define its terms of reference at that meeting.

Weymouth O.R.M.

The delegates appointed by the Council to attend the O.R.M. held in Weymouth on October 2, 1960, reported upon the matters discussed at the business meeting and on the excellence of the arrangements made by the organizing committee headed by the R.R. (Mr. R. E. Griffin, G5UH) and the Dorset C.R. (Mr. A. A. Barrett, G5UF).

O.R.M.s

Resolved that in future when Council delegates attend an O.R.M. one member shall be required to submit a Report to the Council.

It was agreed to record that in general the person submitting the Report shall be the Zonal Representative for the Zone in which the meeting is held.

Tape Library

It was agreed that in special circumstances the Honorary Curator of the Society's Library of recorded lectures shall at his discretion allow a member who is blind to borrow tape recorded lectures from the library.

R.S.G.B. Amateur Radio Call Book 1961 Edition

The Secretary reported that the 1961 edition of the *Call Book* would record more than 1850 amendments and additions to the 1960 edition.

I.A.R.U. Calendar

Resolved to record an " aye " vote in favour of the election to membership of the I.A.R.U. of the Salvador National Radio Society (C.R.A.S.).

Exhibition Committee

The Minutes of a meeting of the Exhibition Committee held on September 30, 1960, were received as a Report.

R.R.'s Conference

A member suggested that the time was opportune to consider arranging another R.R.'s Conference.

It was pointed out that the Finance and Staff Committee had looked into the suggestion earlier in the year and had reached the conclusion that the Society would not be justified in spending probably £350 on such a Conference.

The Secretary informed the Council that the cost of the 1954 Conference was £182 for an attendance of 30. Today the attendance would be of the order of 40 (18 Council Members, 17 R.R.'s and 3 staff).

It was agreed that the Finance & Staff Committee should again give consideration to the suggestion and report thereon to the Council.

I.T.V. Play

A member drew attention to a play entitled *No Hiding Place* screened on October 14, 1960, by I.T.A. The play made reference to the work of radio amateurs, but unfortunately, the amateur was shown in an unfavourable light.

It was agreed to write a letter of protest to the responsible operating company.

The meeting terminated at 5.5 p.m.

NOVEMBER 1960 MEETING

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, November 21, 1960, at 6 p.m.

Present: The President (Mr. W. R. Metcalfe in the Chair), Messrs. N. Caws, D. Deacon, 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, F. A. Russell, 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 Messrs. H. A. Bartlett, R. L. Smith-Rose and A. C. Williams.

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I.T.V. Play

A letter was read from Associated Rediffusion in which regret was expressed for any displeasure caused by the portrayal of a radio amateur in a recent episode of *No Hiding Place*.

Cambridge Convention

The Honorary Treasurer reported that because the attendance at Convention fell much below expectations expenditure had exceeded income by about £160.

Membership

Resolved (i) to elect 104 Corporate Members and 37 Associates; (ii) to grant Corporate membership to one Associate who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to the following societies: Bishop Rawstorne Secondary School Radio Society; Cannock Chase Amateur Radio Society; Royal Naval Amateur Radio Society; S.B.D. (Post Office) Radio and Television Society.

Harmful Interference on 10m

Resolved to write to the Federation of Soviet Radio Amateurs about the poor quality of telephony transmissions radiated by certain Soviet amateurs who operate in the 10m band.

The Amateur Radio Handbook

Mr. Milne, on behalf of the Handbook Editorial Panel, presented an up-to-date progress report.

Resolved to purchase the copyright of completed chapters now in galley form at the rate of £2 2s. per 1,000 words.

It was agreed that the target date for publishing the *Handbook* should be the opening day of the 1961 Radio Hobbies Exhibition.

Official Observers

It was decided to take no action on a suggestion made by a County Representative that the Council should appoint Official Observers to monitor the amateur bands.

Mullard Radio Observatory

Correspondence was submitted from the Region 5 Representative (Mr. T. A. T. Davies, G2ALL) regarding proposals made to the Cambridgeshire County Council by the Head of the Cavendish Laboratory, Cambridge (Dr. Mott), the effect of which would be, if accepted, to prohibit the installation of radio transmitters (including amateur transmitters) within prescribed distances of the Mullard Radio Astronomy Observatory except with the approval of the Observatory. The proposals were intended to protect the Observatory from interference.

It was reported that the Radio Services Department of the G.P.O. had been advised of the correspondence and were looking into the matter.

Trans-Tronic Kit Sets

The Secretary drew attention to advertisements which had appeared in the national Press in which a kit set of parts was offered at £5 4s. 8d. The kit was reputed to be capable of producing " four different receivers for the medium- and long-wave bands and three kinds of short range transmitters " using a 3 volt battery.

The Radio Services Department of the G.P.O. had been advised of the advertisements and had informed the Society that the Engineering Department were in touch with the manufacturers. It appeared from inquiries that the transmitters operated in the medium wave broadcast band.

Reports of Committees

The Minutes of meetings of the V.H.F., Contests, Finance and Staff (*ad hoc*), Exhibition and TVI/BCI Committees were submitted as Reports.

Resolved to receive the Reports and to adopt recommendations relating to certain contest matters.

It was agreed that recommendations of the Finance and Staff (*ad hoc*) Committee (relating to proposed amendments to the Society's Articles of Association) should lie on the table until the Committee is in a position to submit detailed proposals to the Council in respect to the Articles of Association.

Council Elections

It was agreed that in future when the names of the persons nominated to serve on the Council for the ensuing year are published in the R.S.G.B. BULLETIN a reference shall also be made to the names of the members due to retire on December 31 following.

The meeting terminated at 9.55 p.m.

DECEMBER, 1960 MEETING

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 Thursday, December 15, 1960, at 6 p.m.

Present: The President (Mr. W. R. Metcalfe in the Chair), Messrs. H. A. Bartlett, N. Caws, D. Deacon, 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, F. A. Russell, G. M. C. Stone, P. H. Wade, A. C. Williams and E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

An apology for absence was submitted on behalf of Dr. R. L. Smith-Rose.

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Membership

Resolved (i) to elect 162 Corporate members and 59 Associates; (ii) to grant Corporate membership to eight Associates who had applied for transfer.

Applications for Affiliation

Resolved to grant affiliation to the following clubs: Dollis Hill Radio Club, 205 Signal Squadron Amateur Radio Club.

Amateur Radio Handbook

A progress report was submitted together with a list of recommendations in respect to payments to contributors.

Resolved (i) to purchase the copyright of material contributed by eight members to the *Amateur Radio Handbook*; (ii) to authorize payment of a total sum of £202 13s. to the eight members concerned.

QSL Honoraria

Resolved to award honoraria in the total sum of £93 9s. to 10 of the Society's QSL Sub-Managers.

Christmas Boxes

Resolved, as a token of goodwill, to award Christmas Boxes in the total sum of approximately £17 17s. to the seven members of the Society's staff.

Junior Members

It was agreed to write to a number of members who are schoolmasters asking them for their views on a suggestion that the Society should inaugurate a Junior Section.

Horace Freeman Trophy

Resolved to accept with grateful thanks an offer made by Mr. Horace Freeman (Hon. Vice-President) to donate to the Society a trophy for annual competition and to suggest to Mr. Freeman that the trophy be awarded for some specific purpose in connection with R.S.G.B. Exhibitions.

Proposed Morse Code Proficiency Transmissions

It was reported that the recently formed Royal Naval Amateur Radio Society had written to the G.P.O. for permission to inaugurate a series of Morse Code proficiency transmissions sending a copy of their request to the R.S.G.B.

Resolved (i) to advise the G.P.O. that the R.S.G.B. has no objection to the proposals of the R.N.A.R.S.; (ii) to inform the R.N.A.R.S. that the R.S.G.B. supports the proposals; (iii) to enquire of the R.N.A.R.S. whether the R.S.G.B. can assist that society with the preparation and issue of certificates.

Region 3 O.R.M.

Resolved to inform the Region 3 Representative that the Council has decided to authorize him to proceed with his plans to hold an O.R.M. at Trentham Gardens, near Stoke on Trent during the morning of Sunday, April 30, 1961. (The meeting will now take place during the afternoon. —EDITOR.)

It was reported that a Mobile Rally would be held at Trentham Gardens on the same day.

Resolved to inform the Region 3 Representative that (i) the Council will reimburse the Rally organizers in respect to the hiring of accommodation; (ii) the President, General Secretary, Mr. R. C. Hills and Mr. G. M. C. Stone will represent the Council at the meeting.

Reports of Committees

Resolved to receive as Reports the Minutes of meetings of the Scientific Studies, Exhibition, Technical, Contests, and V.H.F. Committees and to accept certain of the recommendations contained therein.

The recommendations related to the preparation of a Technical Data Manual and various contest matters. A recommendation of the Contest Committee in respect to the Wrotham v.h.f. station was referred to the V.H.F. Committee.

Resolved to adopt a suggestion of the Contests Committee that the winners of contests shall be notified before publication of the results in the R.S.G.B. BULLETIN.

Retiring Members of Council

Cordial votes of thanks were recorded to the retiring members of Council (Mr. H. A. Bartlett and Mr. D. Deacon).

The meeting terminated at 10.10 p.m.

Enquiries Regarding Bulletin Articles

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

Silent Keys

KEN CATON (G2FVD)

It is with deep regret that we have to record the death, at a comparatively early age, of Mr. Ken Caton (G2FVD) after a short illness. He was an engineer attached to the B.B.C. Television Outside Broadcasts Department. As an amateur he was principally active on 28 and 144 Mc/s, though some of his last contacts, due to the good offices of a member of the Mitcham and District Amateur Radio Society, were on Top Band from the King Edward VII Sanatorium.

Our sincerest sympathy goes to his widow and family on the loss of a fine man and a truly great amateur.

G6CB.

ARCHIE McBURNEY (GI3HJH)

It was with deep regret that the amateurs of Northern Ireland generally and Co. Down in particular learned of the death of Archie McBurney (GI3HJH) of Ballykeel, Ballymartin, Co. Down, in the early hours of January 4, 1961, after a prolonged illness.

Archie was an old seafaring operator and confined his amateur activities mostly to 80m c.w. on which mode he was considered an expert. After his retirement from the sea he carried on a business at Ballymartin and any amateur who called on him was made to feel most welcome. His son followed in his father's footsteps and is at present a radio operator in Antartica.

To his widow, son and other members of the family we extend our deepest sympathy.

GI3OAU.

W. SCOTT-HAY (GM2FV)

His many friends in both Scotland and England will be grieved to learn of the passing on December 26, 1960, of W. Scott-Hay (GM2FV). "Scottie" had been unwell for some years but it had been hoped that when he returned to Scotland last September, after a period in Watford, that his health would improve.

"Scottie" was a member of the Radio Amateur Old Timers' Association having been licensed in 1927.

Sympathies are extended to his widow in her great loss. Mrs. Scott-Hay is now living in Newton Mearns, Glasgow.

JOHN W. WOODFIELD (G3HZK)

It is with very deep regret that we record the death of John Weston Woodfield (G3HZK), of Bushey, Herts., on October 26, 1960, as a result of a helicopter accident in Brazil while making a survey in connection with a nuclear power station.

Born in London, John moved in his childhood to Wilmslow, Cheshire, from where he was later active on the DX bands. After he became interested in v.h.f., he operated extensively on 2m. He took a keen interest in mobile work and attended many rallies. His other interests included fishing, riding and music.

His untimely death has brought a promising career in one of the newest branches of engineering to a tragic end. His passing will be mourned by all who knew him.

A. L. M.

Book Review

THE A.R.R.L. ANTENNA BOOK. (Ninth Edition, 1960) written by the H.Q. Staff of the A.R.R.L. 320 pages and many illustrations. *QST* format. Obtainable from R.S.G.B. Bookshop, 28 Little Russell Street, London, W.C.1. Price 19s. post paid.

The aerial is a supremely important part of any amateur station but one which is probably more restricted by circumstances in a town than is any other item in the station. Lucky is he who may design an aerial system on purely technical considerations. All the more reason, then, that aerials should be studied carefully and, in any situation, the very best done which can be done. This needs also an intelligent appreciation of the fundamentals of propagation and the technique of feeding the power out to the radiating system. This book gives an excellent treatment of both subjects in the first two chapters, and then deals with the performance characteristic of directional aerial systems. In subsequent chapters, complete design data are given for aerials for amateur bands and a very practical treatment is given of mechanical construction of aerials, both rotary and fixed. Another section deals with mobile aerials.

This book is an investment rather than a purchase for the active and intelligent amateur.—T. P. A.

Can You Help?

- D. Austin (B.R.S.22676), 81A Castle Street, Canterbury, Kent, who requires information on the conversion of the R.1392 receiver to tune 144-146 Mc/s?
- F/Sgt. E. Briggs (G3IJU, ZB1EB, 9M2EB), Sgts.' Mess, R.A.F. Upavon, Wiltshire, who wishes to borrow a calibration book for the LM14 wavemeter in order to calibrate his own LM14?

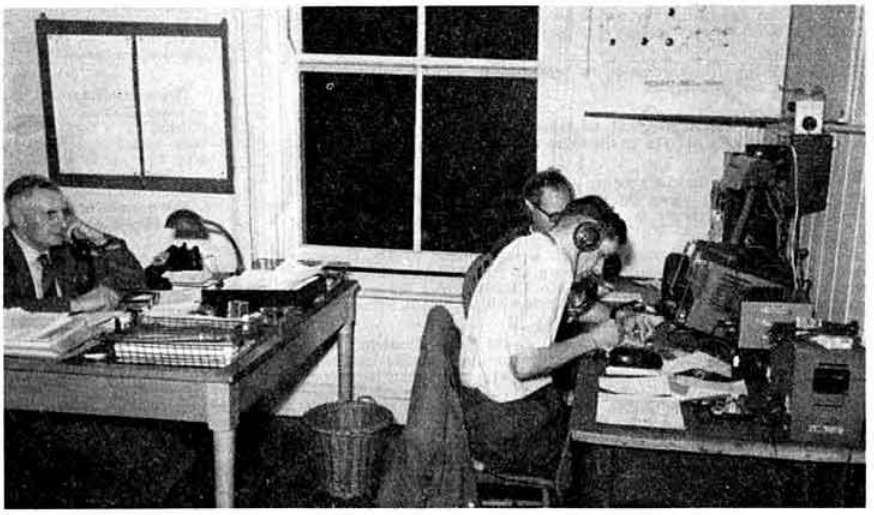
R.A.E.N. Notes and News

BY E. ARNOLD MATTHEWS (G3FZW) *

"WE have an excellent opportunity of doing work of value to the community which I for one did not realise fully until the matter was raised with the Police . . ." says Mark Denny (G6DN), the newly-appointed A.C. for the **Manchester** district, who has for some time been exploring the possibility of forming a group.

There is a general view amongst amateurs living in some larger cities that R.A.E.N. can serve no useful purpose in such areas. Consequently, wrong decisions are made concerning the formation of groups because the true facts have not been ascertained. The problem is not always an easy one, for the local user services are all, to some extent, autonomous. For example, where one user service would accept the idea of encouraging the formation of a group another would be prepared to work only with a well-established, well-trained group. The advice given to controllers has often been, " Get a group going and trained to the extent that you can put on a good demonstration to the user services before you make contact," but since this is often " the hard way " of going about the job we are very pleased to report that G6DN sought an interview with Manchester City Police at an early stage and together with the Cheshire C.C., G3ERB, met Chief Inspector Pye on December 16, 1960. It seems that Chief Inspector Pye outlined several ways in which R.A.E.N. can help Police communications in emergency, and was enthusiastic about certain R.A.E.N. capabilities.

G6DN's next task is to get a team together and he will be contacting local amateurs individually, and through local radio societies, in order that they are properly acquainted with these facts.



This picture shows R.A.E.N. personnel in action at Police Headquarters in Norwich during Norfolk Group's Exercise " Bluebottle." Left, Insp. Dodds (G2AQO) of Norfolk County Police; right, R. J. Lang (G3KAY) in foreground and E. D. Greebe (G3LFU) at rear.
(Photo by courtesy of Norfolk Constabulary, Norwich)

Developments on Surrey/Hampshire Border

For the ordinary member R.A.E.N. problems are usually centred on actual communications, and it is not always appreciated that controllers have to spend much time on the problems of organizing. This state of affairs is always increased when a group starts to spread well away from the original centre, and we have such a case in the Aldershot/Farnham district, where the independent efforts of G3VK, G3FKO and G3ION have produced an area of interest in R.A.E.N. which overlaps county boundaries. As a result it has become necessary for the controllers to consider the possibility of forming an independent group, and to explore the ways of satisfactorily tying it in to the user services' arbitrary boundaries. This must be effected with maximum simplicity so that in the event of " crash action " a call-out can be effected without any delay.

Around the Groups

It is hoped that following the appointment of GW2OP as C.C. for Carmarthen, Cardigan, and Pembrokeshire, and GW3LXI as an C.C. there will be an increase in activity in South Wales. They have been interested in R.A.E.N. for some years and have an excellent knowledge of the propagation conditions in the area, having carried out many mobile tests in what must surely be one of the worst areas for mobile operations.

At 20.00 G.M.T. on December 14 **Suffolk** group were called out by East Suffolk County Police to participate in Exercise " Surprise," which, as the name suggests, was a surprise test the date of which was not known to R.A.E.N. members. It is very pleasing to report that four out of every five stations alerted were operational within 30 minutes of call-out. G3KUM who operated the control station at Ipswich is singled out for special mention in the C.C.'s report for his feat in cycling from Rushmere to Ipswich; having the station on the air by 20.15 and establishing contact either direct or by relay with nine other stations by 20.30. He was assisted by S.W.L. J. Podd.

Some difficulty was experienced by mobile operators owing to equipment not being 100 per cent serviceable, and no doubt this will serve to bring home the necessity of maintaining both sets and batteries at full efficiency over long periods. In these days of small capacity car batteries it cannot be repeated too frequently that the average mobile has a very limited operational endurance and steps should be taken to increase this.

The **Bournemouth** A.C., G3HLW, and C.C., G3ION, met the Assistant Chief Constable of Bournemouth on January 12 and discussed incorporation of R.A.E.N. into the local police crash scheme.

Trunk Routes

Reports from G2AO indicate that the complete reorganisation of W.T.R. on 2m is now well under way, stations covering at least half the route have been nominated, and the prospect looks much brighter than the previous 160m scheme. The 2m duplicate E.C.T.R. now extends from London into Norfolk, and it is hoped to have it extended into Lincolnshire very shortly.

The South Coast Trunk Route is making steady progress and it is almost certain that this will operate v.h.f. RTTY from London to Hampshire.

Personnel

The nominal roll of officers dated October 30, 1960 should be amended as follows:

Mr. T. Kennedy (G6UC) has resigned from the office of A.C., Berwick-on-Tweed. Mr. T. Darn (G3FGY) has been appointed County Controller, Derbyshire. Mr. G. C. Price (GW2OP) has been appointed County Controller, Pembrokeshire, Cardiganshire and Carmarthenshire.

The following have been appointed acting Area Controllers: Mr. C. M. Denny (G6DN), 18 Willoughby Avenue, Didsbury, Manchester 20. Mr. G. H. Price (GW3LXI), 41 Main Street, Pembroke. Mr. S. Swindell (G3NGV), Ingleby Avenue, Derby.

Can You Help?

● W. Hartley (G8UY), 21 Heath Grove, Harrogate, Yorkshire, who requires the alignment instructions and circuit diagram for the Hallicrafters Super Skyrider receiver tuning up to 60 Mc/s ?

● R. V. Moore (G3LWB), 30 Abbey Crescent, Beauchief, Sheffield 7, who requires the manual for the DST100 receiver?

* *1 Shortbutts Lane, Lichfield, Staffs.*

Letters to the Editor . . .

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

Intruder Watch Still Need D/F Receiver

DEAR SIR,—In the November 1960 BULLETIN an appeal was published for the loan of a D/F receiver covering the 7, 14, 21 and 28 Mc/s amateur bands. This instrument is urgently needed by the R.S.G.B. Intruder Watch. Unfortunately the request has not been met.

May I repeat the appeal? We now have a watch-keeper in ZC4 who is able to co-operate with one of the U.K. watchers by provision of accurate R.D.F. bearings. Use of this service can help us to locate certain intruders, at least to a country, and thus provide the G.P.O. with extra information when they are able to make representation on our behalf.

Yours faithfully,

3 Norris Gardens, Grange Estate, Havant, Hants. — D. W. J. HAYLOCK (G3ADZ), *Hon. Organizer, R.S.G.B. Intruder Watch.*

No Wonder Piracy is Rife

DEAR SIR,—A few weeks ago a small boy at the school at which I teach came to me and enquired why his type 38 set would not transmit for more than a quarter of a mile.

Having enquired what frequency he was using " Oh, about 8 Mc/s—I think " I launched into a kind explanation of the facts of radio life and just to make sure I wrote to the boy's parents who were amazed to find that their son was breaking the law because they had been told by the person who " lifted " their money that no licence was required. With this in mind I took special notice of what was going on around the surplus shops just after Christmas.

I am left wondering how many of the five W.S.18 and the three W.S.38 sets I saw sold in less than one hour are now being used by " wireless mad " owners. Since these equipments function in the aircraft-to-ground long distance communication part of the radio frequency spectrum the presence of so many unlicensed equipments seems as dangerous as it is illegal.

Surely this, and the general " anti-law and order " aspects of the situation, are so wrong as to be obvious to the most meagre intellects in high places. Do we *have* to wait for some vital information from an aircraft in trouble over the Atlantic to be lost at a land based receiving point because some young fellow is co-channelling with a W.S.19 in a nearby house? The resulting tragedy will surely be laid at the door of radio amateurs.

I know the Society has raised this matter with the authorities many times. May I now suggest that steps be taken to canvass Society opinion in the form of a petition to the effect that " No radio transmitting equipment shall be sold to any person unless he is in possession of a current Amateur (Sound) licence." I am sure most licensed amateurs would sign such a petition and then perhaps some form of legislation could be introduced. (At least one M.P. is an amateur.)

I realize that the above proposal would not deal with the thousands of sets already sold. However, one usually plugs a hole in a dyke before pumping out the polder.

Yours faithfully,

Canterbury, Kent. — D. BRADFORD (G3LCK).

Unlicensed Operation

DEAR SIR,—I am not able to agree with the views expressed by Mr. Holman (G2DTM) in the November 1960 BULLETIN about unlicensed operation. Most of the offenders apprehended recently have been well above the teenage group and they have had no interest in true Amateur Radio whatsoever. In this matter of illegal operation the authorities do not help by permitting the sale of ex-service transmitters to any one.

The only road to a call-sign is an apprenticeship of short wave listening, combined with a course in radio theory which can be obtained at most night schools.

Yours faithfully,

High Wycombe, Bucks. — F. ROSE (G2DRT).

Trans-Tronic Super-60 Kits of Radio Parts

DEAR SIR,—The statement on this subject in the January issue surely makes out a case to cause the purchaser of radio equipment capable of transmitting to produce a Post Office transmitting licence, details of which should be entered on the sale invoice or cash bill.

Kits of radio components with transistors will interest boys and may be the beginning of careers in electronics, but such kits should be designed within the radio industry who can provide many interesting circuits to build without transmitting facilities and thus avoid meetings between boys and Post Office inspectors.

Yours faithfully,

Sheffield. — G. W. BAGSHAW (G8KD).

Reciprocity

DEAR SIR,—I read in G3FPK's letter in the June BULLETIN that licences will only be granted to British subjects in this country, but I was under the impression that foreign nationals could obtain a licence here if their own Government approached ours first and undertook a reciprocal licensing agreement.

However, this would not alter in any way the position of United States amateurs over here, for their Government absolutely forbids any foreign person from operating in the U.S. excepting, perhaps, Canadians. Recent copies of *QST* and *CQ* have dealt with this subject in detail, and only an amendment to an Act of Congress can alter matters for them. Which is a pity, because closer co-operation with U.S. personnel stationed in the U.K. would, I believe, do good, and our own amateur movement would benefit in several ways.

At the present time we have the edge on our U.S. friends because a licensed British amateur can obtain a Canadian licence and then operate in the United States under a /W call as someone has recently done.

Yours faithfully,

Acklam, Middlesbrough, Yorks. — ALLAN L. TAYLOR (G3JMO).

Station Operating

DEAR SIR,—The views expressed by G2HR (January 1961 BULLETIN) regarding Temporary Alternative Address Licence regulations are probably held by most licensed amateurs throughout the United Kingdom. What possible difference can it make who owns the equipment providing it is only operated by a licensed operator? Many short wave listeners are better qualified to build a transmitter than licensed amateurs having just sufficient knowledge to pass the R.A.E.

It is surely time that a new definition of " operating the station " be made. How the simple act of speaking into a microphone can be termed " operating the station " is completely beyond normal reasoning. Surely if a licensed operator has control of the transmitter power and frequency he is operating the station.

Obviously the licence regulations must be adhered to but a little common sense where their interpretation is concerned is surely not asking too much.

Yours faithfully,

Mitcham, Surrey. — M. PHARAOH (G3LCH), *Hon. Secretary, Mitcham & District Radio Society.*

DEAR SIR,—This talk of third party messages, " noble causes" and all the rest is all very well, but there is to my mind an even more niggling restriction.

A /MM operator sails into London, has to close down the station when in the docks, gets on a bus and pays me a visit. He holds a commercial ticket and has a W call from way back, but he must not even recite " baa baa black sheep " into the microphone while I hold it. To those people who would throw their hands up and say " Where will it all end if we allow it? " I say that *their* arguments could be used to make a good case against amateur licences at all.

As for third party traffic, pure and simple, I fail to see why one should be restricted to Top Band and 2m which is what R.A.E.N. implies. I don't *want* to be noble, but I do want to let my next-door neighbour speak to his brother in Canada, as a small measure of compensation for the herringbone patterns that I occasionally put on his TV screen.

Yours faithfully,

Ilford, Essex. — R. F. FLAUM (G3BDH).

Crystal Erosion—A Warning

DEAR SIR,—I was most interested in the article on crystal erosion by Mr. Jack Hum in the July 1960 BULLETIN and the subsequent letters. Only one letter (October 1960) has given anything approaching adequate warning of the dangers of the process.

The process uses ammonium bifluoride, NH_4HF_2, which is unstable and decomposes giving hydrogen fluoride, HF, and ammonium fluoride, NH_4F, according to the reaction,

$$NH_4HF_2 \leftrightharpoons NH_4F + HF$$

The hydrogen fluoride so formed then reacts with the quartz, which is an allotropic modification of silica, SiO_2, according to the reaction,

$$SiO_2 + 4\ HF \rightarrow SiF_4 + 2\ H_2O$$

Hydrogen fluoride, also known as hydrofluoric acid, is *extremely dangerous:* it is the most dangerous acid used in industrial laboratories. The maximum strength obtainable is a 40 per cent solution of HF in water. It is supplied in special small polythene dispensers which should only be manipulated when wearing rubber gloves and which should not be stored at a height greater than 3 ft. above the floor as one spot spilled in the eye will cause permanent blindness. If any is spilled on the skin, it immediately diffuses through the flesh and attacks the bones forming calcium fluoride—immediate hospital treatment is necessary. A further danger is that it does not cause any sensation for a considerable time, unlike most acids which one can feel almost immediately.

A flesh wound caused by hydrogen fluoride remains raw for a considerable time. During a chemical manipulation recently, the writer spilled one spot of a 2 per cent solution on his hand. The resulting wound took six months to heal and the scar did not disappear for several months after this.

Any fluoride is a potential source of hydrogen fluoride and the industrial practice is to keep fluoride solutions alkaline as hydrogen fluoride is only formed in acid solution.

The etching method is, however, the best method to use, so it is desirable to devise a method in which the hydrogen fluoride is not formed until it is actually required for the etching. A suitable method would be to make up a 30 per cent solution of potassium fluoride in water, maintained alkaline by the addition of a little Rochelle salt (sodium potassium tartarate). Both these chemicals are cheap and readily available and they have the advantage that they are not dangerous. On the addition of this solution to acid, hydrogen fluoride is formed. Probably the most readily available and cheapest acid for this purpose is sulphuric acid.

The best method of using this is to thoroughly degrease the crystal to be etched with carbon tetrachloride or trichloroethylene (no smoking!) then dip it in the etching solution with nickel crucible tongs. The etching solution should be warmed to promote the formation of hydrogen fluoride. A suitable container is a glass beaker (preferably Pyrex), the inside of which will become frosted by the HF. Each crystal should be treated separately as etching times differ for different crystals, and on removal from the etching solution (with tongs!) should be thoroughly washed. This method is much safer than the ammonium bifluoride method though it is not a bad idea to wear rubber gloves. The sulphuric acid will not affect the quartz as this is only attacked by hydrogen fluoride.

It will be seen that the writer has used the word " etch " rather than erode because the process dissolves the quartz in the acid and if this is not etching, what is? Also one etches metallurgical specimens to remove the surface layer of metal and here one is doing exactly that with quartz.

In conclusion the prospective user of the process is again warned that hydrogen fluoride is the most dangerous acid in normal use, so BE CAREFUL, FINGERS ARE NOT REPLACEABLE! If you are not sure of the process, don't use it.

If any further details of the alternative method of etching are required I can supply them though the details should be obvious to anyone who is safe to use it.

Yours faithfully,

Upper Colwyn Bay, North Wales. J. R. TILSLEY (B.R.S.22360).

DEAR SIR,—After reading the interesting article in the July issue by G5UM on crystal erosion, and the letter by G3MLD in the November issue, my own experiences in this field might be of interest.

This has shown that the rate of erosion depends not only on the strength of the ammonium bifluoride solution but also on its working temperature and upon whether or not the solution is agitated during the process. The rate for any crystal is non-linear and I found a marked difference in the time required to shift two identical FT243 type crystals of 6650 kc/s to the required frequency of 6666·66 kc/s. In one case little over an hour did the job, and in the second case five times that period was required for the same frequency shift of 16·66 kc/s! At every stage the process is under complete control and with regular checks there seems little likelihood of " overshoot." I would certainly recommend this method as there appears to be no danger of loss of crystal activity, as can occur in the more familiar grinding process.

One further point that should be adequately stressed is that all soluble fluorides are *intensely poisonous*, and under no circumstances should the solution be allowed to come into contact with the skin as sufficient absorption can occur to produce toxic symptoms. Contrary to popular belief, hydrofluoric acid is a relatively weak acid and has only gained its evil notoriety by its inherent ability to dissolve glass and other silicates.

Yours faithfully,

F. W. HATTEMORE (B.R.S.21476).

Penarth, Glam. *T. R., Penarth Group.*

DEAR SIR,—Like K. W. Darby (G3MLD) in his letter in the November 1960 issue, I also thought Jack Hum's (G5UM) approach to crystal etching in his note in the July 1960 BULLETIN was too casual. Ammonium bifluoride is a dangerous acid and should always be handled with care and precision. I strongly support the attention Ralph Taylor (G2HCJ) invited to this and other points in the October BULLETIN.

Crystal etching is an extremely useful and simple technique and those interested should refer back to an article under my name published in the September 1950 BULLETIN (pages 94-96). The subject was covered in some detail and although written over a decade ago it is still right up-to-date.

I note G5UM prefers to say " erosion." My dictionary says " erosion " comes from the latin " rodere " which means " to gnaw." Etching is derived from the German " ätzen "—meaning to eat away with acid so I make no apology for sticking to the established expression for the technique of crystal " etching."

Yours faithfully,

Stanmore, Middlesex. H. E. BENNETT, M.B.E. (G8PF).

Communication Receiver Design Considerations

DEAR SIR,—I agree with M. J. Faulkner (G3IZJ) in the November 1960 issue and likewise wish to express my thanks and appreciation to Mr. Thornley (G2DAF) for his helpful and most interesting articles on receiver design. Like the American in Tennessee, I too have delayed receiver construction to await the completion of Mr. Thornley's articles.

My present receiver ought to have been placed on the retired list many years since, but I hated to part with such a good and proven piece of gear. Then old age reared its head and I had to consider building a new receiver, but to design and construct a receiver, covering all modern requirements, is not something that one rushes!!

While I was contemplating a design, Mr. Thornley came along with his articles in the R.S.G.B. BULLETIN, and now I await the arrival of the BULLETIN each month with great anticipation. Need I add that the 20th-21st of each month are the days I am most interested in seeing the postman arrive at my door!

Thank you, Mr. Thornley, and also my thanks to the BULLETIN; such articles are always stimulating, even to those of us who have had 21 or more years as radio amateurs, thank you very much indeed.

Yours sincerely,

Valby, Copenhagen, Denmark. PAUL RASMUSSEN (OZ1PR).

(The first part of an article describing the construction of the G2DAF receiver will appear in the March BULLETIN.—EDITOR.)

The European Band Plan and 7 Mc/s

DEAR SIR,—As an exclusively 'phone' operator and one who has, on occasion, used the lower end of 40m for a phone QSO, I would like to reply to the points raised by the letter from members of the Leeds University Union, published in your January issue.

Since the c.w. station requires less bandwidth than the phone station, it would seem to me that the allocation as it stands is

grossly unfair, with 50 kc/s to each mode and a doubtful share of a further 50 kc/s (shortly to be lost anyway) for the phone man. Even so, it is by no means unusual to hear a c.w. station on the shared portion while frequencies are vacant in their exclusive allocation, and while this state of affairs persists no one can blame the phone man for using that vacant space.

A look at the European Band Plan will show that the c.w. fraternity have a total of no less than 600 kc/s of exclusive band space, while the phone man has *none*, unless one counts the portion of the 80m band that is riddled with commercial traffic, which in any case brings the total to one-third of that enjoyed by the c.w. operators.

With the aid of an audio filter one can quite easily read a c.w. transmission through a phone QSO, and there is, to my mind, a good case to be made out for the ending of the exclusive A1 allocations altogether.

No one can imagine, surely (with the exception of the DX Editor of a sister magazine), that the present allocations on 40m *can* hold good when the shared 50 kc/s portion of the band is taken from us this year, or for that matter, that the remainder of the band will not be used by the broadcast stations?

The c.w. stations are free to work anywhere within a total of 3·050 Mc/s on the 80 to 10m bands, and 600 kc/s exclusive! The only thing left for me to say is that if the fact that I am a member of the R.S.G.B. implies that I agree to abide by this shockingly biassed agreement then I must, regretfully, cease to be a member, since it seems that I must otherwise face the criticism that I am breaking a " gentleman's agreement " to which I would never, under any circumstances, have given my support.

May I also take the opportunity of saying that I find it difficult to understand why the R.S.G.B. should regard the outcome of the recent conference at Geneva with regard to 40m as " not disastrous." The position is that while the majority of the amateur stations of the world have retained 300 kc/s on that band, we are reduced to 100 kc/s, and even on that small portion, Pakistan reserved the right to broadcast, and are in fact doing so. The outcome of the conference, and the previous one, has been nothing short of " disastrous," and was a catastrophic failure on the only band where a serious fight had to be conducted.

Yours faithfully,

Derby. H. J. BALLINGER (G3NAJ).

(*There will always be a few odd men out. The European Band Plan has been accepted and adopted by the vast majority of amateurs in Europe.*—EDITOR.)

Can You Help?

● Brian C. Smith (B.R.S.22369), c/o 135 Harrowdene Road, Wembley, Middlesex, who wishes to know a source of supply of the MCR1 midget receiver or any other shortwave receiver or transmitter-receiver used during the last war by Resistance Groups?

● R. C. Mense (B.R.S.23133), 14 Oakcroft Road, London, S.E.13, who requires the circuit diagram and any other information regarding the ex-Government transmitter W.5736. E.D.B.

Slow Morse Practice Transmissions

Time	Call-sign	kc/s	Town
Sundays			
09.00	G3BHS	1810	Southampton
09.30	G3HNJ, G3HNJ, G3OFP	1980	Doncaster
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3HZM	1860	Manchester
12.00	G3LP	1850	Cheltenham
12.00	GI5UR	1860	Belfast
18.00	G3OGO	1925	Croydon
20.00	G3MRA	1915	Southampton
20.30	G3HTA	1850	Exeter
Mondays			
18.30	G3NC	1825	Swindon
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
20.00	G3BMY	1838	Birmingham
20.00	G3GZE	1840	Blackburn
20.00	G3MDH	1915	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3MXI	1910	Derby
21.30 †	G3IRM, G3MWO	1981	Bury St. Edmunds
21.30 †	G3LGK, G3MXI	1980	Ilkeston, Derbys. West Hallam, Derbys.
21.30	G3NOE	1900	Bradford
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
19.30	G3IAG	1930	Littleport, Cambs.
20.00	G2FCI	1850	Exeter
20.00	G3IBI	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MEH	1900	Sutton, Surrey
20.30	G3NKX	1875	Loughton
21.00	G3EFA	1855	Southport
21.00	G3LSC, G3MKN, G3NUN	1875	Poole
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
22.00	G2CZU	1900	Bath
Wednesdays			
19.00 †	G3MCJ, G3FLK, G2FCI, G3HTA	1845	Exeter
19.00	G3LZC	1830	Heanor, Derby
19.00	G8RQ	1850	Chesterfield
19.30	G2BSQ	1930	Ashtead, Surrey
19.30	G3IAG	1930	Littleport, Cambs.
19.30	G3NQR	1875	Harrow Weald
19.45	G3KFE	1950	Stevenage
20.00	G3BHS	1915	Southampton

Time	Call-sign	kc/s	Town
Wednesdays			
20.00	G3GZE	1840	Blackburn
20.00 †	G2FYT, G2HDR, G3IZM, G3OLB	1910	Bristol
20.00	G3INZ, G3KRR, G3LSK, G3MGH	1920	High Wycombe
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MXI	1910	Derby
21.00	G3LSC, G3MKN, G3MXF	1875	Poole
21.00	G3AGX	1920	Hull
22.00			
21.30	G3HNJ	1980	Doncaster
21.30	G3NOE	1900	Bradford
22.00 †	G3LGK, G3MXI	1980	Ilkeston, Derbys. West Hallam, Derbys
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
19.30	G3IAG	1930	Littleport, Cambs.
20.00	G3NBV	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
21.30	G3HMY	1850	Exeter
21.30 †	G3IRM, G3MWO	1981	Bury St. Edmunds
22.00	G2CZU	1900	Bath
Fridays			
18.30	G3DMN, G3FVP	1880	Ipswich
19.00	G3JKY	1900	Beckenham
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3IAG	1930	Littleport, Cambs.
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	G3JQS	1915	Totton
20.00	G3NYB, G3NXZ	1980	Doncaster
20.00	G3INZ, G3KRR, G3LSK, G3MGH	1920	High Wycombe
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.30 †	G3NPO, G3KSS	1900	Bradford
22.00 †	G3LGK, G3MXI	1980 1980	Ilkeston, Derbys. West Hallam, Derbys.
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
20.00	G3MCL	1915	Southampton

† *Alternately*

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives. 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 copy in the style used below. Standing instructions for more than three months ahead cannot be accepted.

DATES FOR YOUR DIARY

March 24.—Lecture Meeting at I.E.E., London. Speaker: N. A. S. Fitch (G3FPK).
April 7.—R.A.O.T.A. Reunion, London.
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 13.—Region 13 O.R.M. at Edinburgh.
May 14.—Harwell Hamfest and Mobile Rally.
May 27.—International V.H.F./U.H.F. Convention, London.
May 28.—Northern Mobile Radio Rally.
May 28.—Southern Counties Mobile Rally.
May 28.—West Wycombe Mobile Rally.
June 18.—A.R.M.S. Rally at Barford St. John, near Banbury.
June 25.—Longleat Mobile Rally.
July 7-8.—South Birmingham Mobile Event.
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 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, Stockport.
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.).—March 14 (Lecture by G2HW), 8 p.m., The George 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. February 21 (Junk Sale), February 28 ("D/F Equipment" by G3JPJ and G3IQO).
Macclesfield.—February 21, March 7, 21., 42 Jordangate.
Manchester (M. & D.A.R.S.).—Wednesdays, 7.30 p.m., King George VI Club, North Road, Moston, Manchester 10.
Manchester (S.M.R.C.).—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield, Manchester 14.
Morecambe.—March 1.—125 Regent Road.
Preston (P.A.R.S.).—February 28, March 14, 28, 7.30 p.m., St. Paul's School, Pole Street.
Southport (S.R.S.).—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—February 15, March 1, 15, 29, 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—February 17, March 3, 17, Room 4, Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Bradford (B.A.R.S.).—February 28 (Informal), March 14 (Display of Members' Gear), March 28 (A.G.M.), 7.30 p.m., Cambridge House, Little Horton Lane, Bradford 5.
Bridlington.—February 20 (Any Questions), February 27 (Recorded Lecture on Tibet by AC3SS), March 6 (Film: "Ultra Sonic Waves"), March 13 ("Safety in the Shack," by H. Jones, G3GBH), 7.30 p.m., B.R. Sports Room, Station Buildings.
Cleckheaton (S.V.A.R.S.).—February 15, Visit to Fane Acoustics Ltd., Batley.
Halifax.—March 7 (N.F.D. Arrangements), March 21 (Ragchew), Sportsman Inn, Ogden, Halifax.
Leeds (L.A.R.S.).—February 19, 10 a.m., Visit to Odeon Theatre. February 21, Mullard Film Show at Hotel Metropole. March 1 ("Subscriber Trunk Dialling," by H. E. Hulbert, G3BDR), March 8 (Ragchew), March 15 (Transmitting Evening), March 22 ("Radar Systems Illustrated," by M. Scargill), Swarthmore Education Centre, 3 Woodhouse Square, Leeds 3.
Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street.

REGION 3

Birmingham (Bournville).—February 24 (Films: "Manufacture of Radio Valves" and "Special Quality Valves"), March 10 (Film on transistors), 7.30 p.m., Lecture Room, Cadbury Bros., Bournville. **(M.A.R.S.).**—February 21 (Lecture/Demonstration on "Direction Finding"), March 2 ("S.S.B. Equipment"), 7.30 p.m., Midland Institute, Paradise Street, Birmingham. **(Slade).**—February 24 (Sale of Surplus Equipment), 7.45 p.m., The Church House, High Street, Erdington. March 10, Midland Film Meeting, 7.45 p.m., Bennett Hall, Y.M.C.A., Snow Hill, Birmingham. (Admission by ticket only.) **(South).**—February 16 ("D/F"), March 16, 7.30 p.m., Friends' Institute, Moseley Road, Birmingham. February 20, 8.30 p.m., Club Night on Top Band.
Cannock.—March 2, 7.30 p.m., "Castle Inn," Bridgetown, near Cannock.
Coventry (C.A.R.S.).—February 20 ("Practical Construction" by P. Yardley), February 27 ("International Ham Hop Club" by G3CZS), March 13, 7.30 p.m., 9 Queens Road, Coventry.
Stourbridge.—March 7 (A.G.M. and Film Show), 8 p.m., Foley College, Stourbridge.
Sutton Coldfield.—February 23 ("Crystal Grinding and Etching," by John Symes), March 9 (Club Station Night), 7.30 p.m., Conservative Committee Room, 92 The Parade, Sutton Coldfield.
Wolverhampton.—February 20 ("Two Metre Converter Construction" by R. J. Thomas), February 27, 8 p.m., Neachells Cottage, Stockwell End, Tettenhall.

REGION 4

Derby (D. & D.A.R.S.).—February 22 ("TVI and BCI"), March 1 (Surplus Sale), March 8 (Review of early receivers), March 15 (Visit of Burton Radio Club), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.
Derby (D.S.W. Exp. Soc.).—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Club Rooms, Nunsfield House, Boulton Lane, Alvaston, Derby.
Grimsby (A.R.S.).—March 2, 16, 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.).—February 15 (A.G.M.), March 1 (Semi-conductors), March 15 (S.s.b. Working), R.A.E. Classes every Thursday evening, 7 p.m., meetings 7.30 p.m., Room No. 19, Technical College, Cathedral Street, Lincoln.
Melton Mowbray (A.R.C.).—March 2 ("Telephone Trunk Dialling," J. L. Bowley, G3FXP), 7.30 p.m., St. John Ambulance Hall, Asfordby Hill.
Newark (Magnus G.S.).—February 24 ("The Receiving Station," R. Clayton), February 28 ("Amplifiers," A. Hall), March 3 (Film Show), March 7 (Practical), March 10 (Visit), March 14 ("Radio & Television Interference," by B. Shortland, G3DJL), Junior Physics Lab.
Nottingham (A.R.C.).—Tuesdays, Thursdays (R.A.E. Class by A. Davies, G3LXL), 7.30 p.m., Community Centre, Woodthorpe House, Mansfield Road, Sherwood, Nottingham.
Peterborough (P. & D.A.R.S.).—March 3, R.A.E. Classes, Tuesdays and Thursdays, 7 p.m., Peterborough Technical College.
Northampton (N.S.W.R.C.).—Thursdays, 7 p.m., Allens' Pram Works, Duke Street, Northampton.
Retford & Worksop (N.N.R.S.).—Tuesdays (Construction and Beginners' Night, including Morse Tuition), Thursdays, 7.30 p.m., Club Room, Victoria Hall, Eastgate, Worksop, Notts.
Wellingborough (W.R.C.).—February 23, March 2 ("Digital Computer Techniques," B. Parker), March 9, March 16 (Mullard Films), 7.30 p.m., Silver Street Club Rooms over W.I.C.S. Fruit Shop.

REGION 5

Cambridge (C. & D.A.R.C.).—February 24 ("America Revisited," by R. F. G. Thurlow, G3WW), 7.30 p.m., "The Jolly Waterman," Chesterton Road, Cambridge.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
High Wycombe.—February 22, 7.30 p.m., G3DQC, 218 Totteridge Road, High Wycombe. **(Chiltern A.R.C.).**—February 23 (Informal), 8 p.m., British Legion Hall, St. Mary Street, High Wycombe.
Stroud.—Wednesdays, 8 p.m., Subscription Rooms, Stroud.

REGION 7

Acton, Brentford and Chiswick.—February 21 ("H.F. Application of Transistors," by D. E. Harvey of A.E.I. Ltd.), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.
Barnet (B. & D.R.C.).—February 28 (Technical Discussion and Junk Sale), March 28 ("Aerials" by R. C. Hills, G3HRH), 8 p.m., Red Lion Hotel, Barnet.
Bexleyheath (N.K.R.S.).—February 23 ("Valves for the Amateur" by R. W. Waldron of M.O. Valve Co.), March 9, 8 p.m., Congregational Hall, Bexleyheath (nr. Clock Tower).
Croydon (S.R.C.C.).—March 14, 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.—February 21 and fortnightly, 8 p.m., 12 Leigh Road, East Ham.
East London.—February 19 ("Demonstration of Hi-Fi and Stereo" by E. A. Rule, G3FEW), March 12 ("Aerials,") by "Dud" Charman, G6CJ), 3 p.m., Town Hall, Ilford.
Enfield and District.—February 23 ("Acos Products" by R. S. Wells), 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), Fridays (Club), 7 p.m., Montem School, Hornsey Road, N.7.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (near Seven Kings Station).
Kingston.—Lectures alternate Thursdays, Theory and Morse Classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston. (Morse at 2 Sunray Avenue, Tolworth).

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Friday, February 17, March 17 and April 21, 1961

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

Mitcham (M. & D.R.S.).—February 24 (A.G.M.), 8 p.m., "The Cannons," Madeira Road, Mitcham.
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., Sundays, 11.30 a.m., Wednesdays (Morse Practice), 8 p.m., February 24 ("International Radio Regulations" by D. Deacon, G3BCM), 225 New Cross Road, London, S.E.14.
Norwood and South London (C.P. & D.R.C.).—February 18 ("A.G.M."), 8 p.m., March 7

(" Morse Class and Practical Work,") 8 p.m., Windermere House Annexe, Westow Street, Crystal Palace.

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

South Kensington (C.S.R.S.).—February 21 (Films and Tape Recorded Lecture on " World Wide Telecommunications,") 6 p.m., Science Museum, South Kensington.

Sutton and Cheam (S. & C.R.S.).—February 21 (" Home Construction " by G3NFA), March 7 (Annual Constructional Contest), " The Harrow," High Street, Cheam.

Welwyn Garden City.—March 9 (Constructors' Competition and Professional V.H.F. Symposium), 8 p.m., Television School, Murphy Radio Ltd., Bessemer Road.

REGION 8

Crawley (C.A.R.C.).—February 23 (" The History of Radio," by G5CS), March 9 (Informal), 8 p.m., " The Brewery Shades," Crawley High Street.

Tunbridge Wells (W.K.A.R.S.).—February 23, Visit to Crawley Amateur Radio Club (see above), March 10 (Informal), March 24 (N.F.D. Planning), 7.30 p.m., Kent County Council Adult Centre, Culverden House, Culverden Park Road, Tunbridge Wells.

REGION 9

Bath.—March 13, 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.—February 17 (" Building the G2DAF Single-Sideband Transmitter," by W. P. Lewis, G3IFV), 7.15 p.m., Carwardine's Restaurant, Baldwin 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 the " Ernie Hillyard Trophy."

Torquay (T.A.R.S.).—Saturday, March 4, Annual Dinner and Social, Abbey Lawn Hotel, Scarborough Road, Torquay. Meetings, second Saturday in each month, 7.30 p.m., Y.M.C.A., The Castle, Torquay.

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

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

REGION 10

Cardiff.—March 13 (Recorded talk on Tibet by Bob Ford, AC3SS, AC4RF), 7.30 p.m., T.A. Centre, Park Street, Cardiff.

Penarth.—February 27 (" Application of Photographic Techniques to Amateur Radio," by Mr. Weale), 7.30 p.m., R.A.F.A. Club, Windsor Road, Penarth.

Port Talbot.—March 14, 7.30 p.m., Railway and Transport Working Men's Club and Institute, Port Talbot.

REGION 13

Edinburgh (L.R.S.).—February 23 (" Aerials," R.S.G.B. Tape Recording), March 9 (Bring and Buy Sale), 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).

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.

Norwich.—Second Friday in each month, 8 p.m., " Golden Lion," St. John Maddermarket (near City Hall), Norwich. **(N. & D.R.C.).**—Fridays, 8 p.m., " Golden Lion," St. John Maddermarket.

REGION 17

Newbury (N. & D.A.R.S.).—February 24 (Discussion), March 24 (A.G.M.), 7.30 p.m., Elliotts' Canteen, West Street, Newbury.

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

Acton, Brentford and Chiswick Radio Club.—On February 21, Mr. D. E. A. Harvey (A.E.I. Ltd. Applications Laboratory) will give a lecture, illustrated with slides, on " The H.F. Application of Transistors." The meeting, which will commence at 7.30 p.m., will be held at the A.E.U. Club, 66 High Street, Chiswick, W.4. Visitors will be most welcome. *Hon. Secretary:* W. G. Dyer (G3GEH), 188 Gunnersbury Avenue, Acton, London, W.3.

Army Wireless Reserve Amateur Radio Society.—The Amateur Radio Club of 205 Signal Squadron is now affiliated to the R.S.G.B. The possibility of forming a national society for the Army, on the lines of the R.A.F.A.R.S., is being investigated and interested clubs and individuals are invited to communicate with the *Hon. Secretary:* Major D. W. J. Haylock (G3ADZ), 3 Norris Gardens, Havant, Hants. The society publishes a newsletter entitled *Broadcast*, the winter edition of which has recently been issued.

This picture was taken at the first dinner of the British Amateur Radio Teleprinter Group held at the Royal Horticultural Society's New Hall, London, on November 26, 1960. The Hon. Secretary of the Group is Dr. A. C. Gee, G2UK, and the Chairman Mr. L. E. Newnham, G6NZ, seen here on Dr. Gee's left. Cutting the Group's first birthday cake is Mrs. Gee. (Photo by G3IIR)

Barnet and District Radio Club.—A most successful Christmas Party brought the 1960 programme to a close. Plans are being made to hold a club dinner in the spring. All interested in electronics are invited to attend meetings, details of which are given in *Forthcoming Events* for Region 7. *Hon. Secretary:* E. W. Brett, 28 Edward House, Edward Grove, Barnet.

Bradford Amateur Radio Society.—Recent talks have included one on transistors by G. N. Patchett, Ph.D., M.I.E.E., M.Brit.I.R.E., M.I.R.E., and on amateur receiver alignment by D. Millard (G3OGV). A lecture entitled " Transistors, Pirates and D/F " was due to be given by A. R. Bailey, M.Sc. (G3IBN) on February 14. Future meetings at Cambridge House, 66 Little Horton Lane, Bradford 5, are arranged for 7.30 p.m. on February 28, March 14 (Display of Members' Gear) and March 28 (A.G.M.). Meetings are preceded by Morse Practice classes. Further information may be obtained from the *Hon. Secretary:* M. T. Powell (G3NNO), 28 Gledhow Avenue, Roundhay, Leeds 8.

Bristol.—About 60 members and visitors were present at the January meeting when a talk on " Amateur Television " was given by Senior Technician G. B. Rogers (R.A.F.) and J. E. Tanner (G3NDT/T). Various items of equipment were displayed, including a camera, monitor and flying-spot scanner. It was announced during the meeting that the Bristol Group had won the contest against the Midland Amateur Radio Society held on October 30, 1960. A talk on " Building the G2DAF Single Sideband Transmitter " will be given by W. P. Lewis (G3IFV) on February 17. The following members have been elected to serve on the local committee: C. R. Baldwin (B.R.S. 18165), G. T. Colbourne (A.1473), K. J. Creamer (B.R.S.10167) and R. A. Prior (G3MTG). D. F. Davies (G3RQ) and R. E. Griffin (G5UH) have been re-elected Hon. Treasurer and Hon. Auditor respectively; R. L. Shaddick (B.R.S.19727) has been elected Hon. Secretary and W. J. Dear (B.R.S.19985) Assistant Hon. Secretary. *Hon. Secretary:* R. L. Shaddick (B.R.S.19727), 2 Shanklin Drive, Filton, Bristol.

Cambridge and District Amateur Radio Club.—F. A. E. Porter gave the third in the series of talks on Simple Test Equipment at the December meeting. The talk was entitled " Bridges for *C* and *R*." The club meets every four weeks on Friday at " The Jolly Waterman," Chesterton Road, Cambridge, commencing at 7.30 p.m. On February 24, R. F. G. Thurlow (G3WW) will give a talk entitled " America Revisited." The A.G.M. will be held during March. Further details may be obtained from the *Hon. Secretary:* A. H. G. Waton (G3GGJ), " Arkengarthdale," New Road, Barton, Cambridge.

Cheltenham.—An attendance of more than 50 was recorded on

January 18 when an on-the-air demonstration of Hallicrafters s.s.b. equipment took place. Following a short description of the gear by Dick Herries, G2HX, G2HDU, G6VX and G6ZQ took part in a lively discussion on s.s.b. topics. *Town Representative:* J. J. Yeend (G3CGD), 30 St. Lukes Road, Cheltenham.

Civil Service Radio Society.—On March 7, a representative of the G.P.O. will talk about ship-to-shore radio. Informal meetings held on the third Tuesday in each month continue to be well attended. Recently, considerable interest was aroused by the display of the latest award gained by GB2SM—the Certificate Hunters' Certificate, the first awarded to a European station. Visitors and prospective members will be welcome at meetings. Further details may be obtained from the *Hon. Secretary:* G. Lloyd-Dalton, 2 Honister Heights, Purley, Surrey.

Clifton Amateur Radio Society.—In December G3IWL gave an illustrated talk on G.P.O. equipment. The club station, G3GHN, was due to be active during the 144 Mc/s C.W. and Affiliated Societies' contests. Plans are being made to hold four D/F contests and two transmitting field days during 1961. Details of meetings will be found in *Forthcoming Events* for Region 7. *Hon. Secretary:* C. H. Bullivant, 25 St. Fillans Road, London, S.E.6.

Cornish Radio and Television Club.—At the January meeting G3CZZ described his 2m transceiver. Details of future activities may be obtained from the *Hon. Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn.

Crawley Amateur Radio Club.—At the A.G.M. the following were elected: *Chairman*—A. V. Bryant (G3NVB); *Hon. Treasurer*—J. Parsons; *Hon. Secretary*—R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley; *Committee Members*—Messrs. Fautley (G3ASG), Franklyn (G3JKF) and Mauchel. At "The Brewery Shades," Crawley High Street, on February 23, G. Garrett (G5CS) of the Science Museum will lecture on "The History of Radio."

Crystal Palace and District Radio Club.—The A.G.M. is to be held in the Windemere House Annexe on February 18. *Hon. Secretary:* G. M. C. Stone (G3FZL), 10 Liphook Crescent, Forest Hill, London, S.E.23.

East Kent Radio Society.—At the A.G.M. the following were elected: *Chairman*—J. Lewis (G3NFS); *Hon. Secretary*—D. Williams (G3MDO), "Llandogo," Bridge, near Canterbury; *Committee Members*—J. Foster (G2JF), J. Court; *Activities Manager*—D. Bradford (G3LCK); *Publicity Manager*—B. Rous (A.1410). Plans are being made for participation in N.F.D. Members recently visited the Thanet Society to hear GM3GQT lecture on the Hallicrafters SX101A and SX111.

Eccles and District Radio Society.—An effort is being made to re-form this society and a meeting for this purpose will be held at the Cross Keys Hotel, Church Street, Eccles, on February 21 at 8 p.m. All local radio amateurs and short wave listeners are invited to attend. Further information may be obtained from N. B. Lomas (G3OGN), 26 Tweedale Avenue, Hr. Blackley, Manchester 9.

Halifax and District Amateur Radio Society.—On March 7, Field Day arrangements will be discussed while March 21 is described as Ragchew Night. New call-signs amongst members include G3OKS, G3OMM and G3ONQ. *Hon. Secretary:* A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

Harrow, Radio Society of.—At the recent A.G.M. it was reported that the society had had a very good year, both as regards new membership and finances. Much of the success was as a result of the various new activities instituted in 1960. Construction of the new transmitter is proceeding on Practical Nights, and a programme of events for the coming months is being arranged by the newly elected Committee. Meetings are held on Fridays at 8 p.m. at Roxeth Manor Secondary School, Eastcote Lane, South Harrow. *Hon. Secretary:* S. C. J. Phillips, 131 Belmont Road, Harrow Weald.

Magnus Grammar School Radio Society.—The society celebrated its first successful year by a Birthday Party at the home of G3JNK. Practical work, Morse instruction, direction finding, instruction in basic radio, films and talks have all been on the programme. Outstanding events were D/F contests in conjunction with the Newark and District Amateur Radio Society, a film evening showing *This is the B.B.C.* and a demonstration of mobile radio by the Notts County Police. Library and workshop facilities are now available and the setting up of a Radio Room is well in hand. *Hon. Secretary:* D. W. Selby, 90 Balderton Lane, Coddington, Newark.

Mitcham and District Radio Society.—Preparations for N.F.D. are well under way and several discussions have already taken place. The society took part in the Affiliated Societies' Contest on February 4-5. The A.G.M. is to be held at "The Canons,"

Members of the Spen Valley Amateur Radio Society at the Birkenshaw Agricultural Show. From left to right, L. A. Metcalfe (Hon. Treasurer), M. Eskdale (G2SU), C. Longman (G2DYY), J. Charlesworth (G2IJC), Miss I. Charlesworth, G. Crossley (G2CGR), F. L. Varley (G2FCP), W. H. Binks, M. Firth (G3MMK, President) and Norman Pride (Hon. Secretary).

Madeira Road, Mitcham, at 8 p.m. on February 24. *Hon. Secretary:* M. Pharaoh (G3LCH), 1 Madeira Road, Mitcham.

Paddington and District Amateur Radio Society.—The following have been elected to serve on the committee of this new society during 1961: *Chairman*—W. Bailin (G3NOZ); *Hon. Treasurer*—S. W. Legg (G3KNL); *Hon. Secretary*—N. Lambert (G3LVK), 22 Sunderland Terrace, Bayswater, London W.2; *Committee Members*—Messrs. R. Howard (G2CFS) and J. E. Alban (G3JEA). Meetings are held on Wednesdays at 7.30 p.m. at the Beauchamp Lodge Settlement, 2 Warwick Crescent, Harrow Road, London, W.2, from where the society hopes soon to be on the air under the call-sign G3PAD. Visitors and prospective members will be most welcome (Trolleybus No. 662 and Bus No. 18b pass the door).

Peterborough and District Amateur Radio Society.—Despite seasonal weather conditions, over 60 attended the mid-winter rally held in Peterborough Technical College on January 6—one keen type even travelled down from Yorkshire for the occasion. The talk-in stations were G3ARS/A on 2m and G3KPO/A on Top Band. The highlight of the rally was a working demonstration of Hallicrafters transmitters and receivers by James Scott Ltd., of Glasgow, using a tri-band beam and dipoles above the College roof (incidentally, this was of solid copper). Particular interest was shown in single sideband operation and many interesting s.s.b. contacts were made.

Purley and District Radio Club.—Fortnightly meetings are held at The Railwaymen's Hall, Whytecliffe Road, Purley, the next being on February 17 when there will be a discussion on a proposed DXpedition to Radnor in March. More information on this and other activities may be obtained from the *Hon. Secretary:* E. R. Honeywood (G3GKF), 105 Whytecliffe Road, Purley.

Reigate Amateur Transmitting Society.—The following officers were re-elected at the A.G.M. on January 21: *Chairman*—P. D. Lucas (G3JDN); *Hon. Treasurer*—G. E. Mac'Krell (G3KAX); *Hon. Secretary*—F. D. Thom (G3NKT), 12 Willow Road, Redhill; *Contests Secretary*—K. J. Wheatley (G3BBR). Messrs. J. Duckworth (G3FM), C. Cowan (B.R.S.22458) and P. Mellett were elected *Committee Members.* Plans are under way for N.F.D. There will be a Radio Quiz at the meeting at The Tower, Redhill, on February 18 at 7.30 p.m.

Rotherham Radio Club.—The following officers were elected at the A.G.M. *Chairman*—K. Webster (G3LLE); *Hon. Treasurer*—J. H. Johnson (G3GCV); *Hon. Secretary*—S. J. Scarborough (G3MBQ), 25 Crawshaw Avenue, Sheffield, 8. The G3KUH Memorial Plaque for the best piece of home-built equipment displayed at the competition on December 21, 1960, has been presented to G3NXZ. Meetings are held on the first three

Wednesdays in each month at The Crofts, Rotherham, where the club has its own station (G3OAM) equipped with a DX40 transmitter. A full programme of lectures, R.A.E. and Morse instruction and other activities is being planned.

Slade Radio Society.—Meetings at The Church House, High Street, Erdington, have been arranged for February 24 (Sale of Surplus Equipment) and March 24 (" My Visit to Moscow," by D. Wilson, illustrated with slides). On March 10, at 7.45 p.m. there will be a Mullard Film Show in the Bennett Hall, Y.M.C.A., Snow Hill, Birmingham. Tickets for this special meeting may be obtained from M. D. Fowler, 25 Crossway Lane, Birmingham 22B. Particulars of the society and its activities may be obtained from the *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

Southgate, Finchley and District Group.—R. J. Pedder (G3NEE), 6 Greenall Close, Cheshunt, Herts, is now *Honorary Secretary* of the Group.

South Manchester Radio Club.—New headquarters have been acquired at The Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield, Manchester 14, where meetings are held on Friday evenings at 8 p.m. The accommodation for lectures and other activities is excellent. A permanent club station and store is to be installed in a separate building in the grounds in which there is also ample private free car parking. Details of activities may be obtained from the *Hon. Secretary:* J. A. Elliott, 2 Pennine Close, Blackley, Manchester 9.

Stockport Radio Society.—" Record Manufacture " by Bob Auger of Granada TV, " A Transistor Communications Receiver " by R. H. Hammans (G2IG) and " Disadvantages of A.M." by Bert Smith (G3AYT) were subjects of recent lectures. Future talks will be on such subjects as tape recording, transistors and power packs. Social activities have included a hot pot supper and the annual dinner-dance. The A.G.M. will be held on March 15 when the new Committee will be elected. *Hon. Secretary:* G. R. Phillips (G3FYE), 7 Germans Buildings, Buxton Road, Stockport, Cheshire.

Sutton Coldfield Radio Society.—At the A.G.M. held recently, the following were elected: *Chairman*—K. Varney (G3DMV); *Vice-Chairman*—M. Capewell (G3FZR); *Hon. Treasurer*—J. Symes (G3LNN); *Hon. Secretary*—L. Hall (G3IGI), 24 Calthorpe Road, Walsall.

Thames Valley Amateur Radio Transmitters Society.—At the A.G.M. the President (Leslie Cooper, G5LC) reported that the year had been a satisfactory one. A lecture programme was being arranged and it was also proposed to arrange several visits, a mobile rally and possibly a river trip. A Junior Section has been formed to help younger members to obtain their transmitting licences. All the officers were re-elected. Meetings are held at the Carnarvon Castle Hotel, East Molesey (Hampton Court station) at 7.30 p.m. on the first Wednesday in each month. A Top Band net on Tuesdays at 8 p.m. is well supported. *Hon. Secretary:* K. Rogers (G3AIU), 21 Links Road, Epsom.

Torbay Amateur Radio Society.—At the January meeting the Chairman, F. D. Cawley (G2GM) paid tribute to the late George Western (G3LFL) who died suddenly on December 26, 1960. He has been succeeded as *Hon. Secretary* by his widow, Mrs. Western (G3NQD). A course of lectures in preparation for the R.A.E. are being given by G3ABU on Tuesdays at 8 p.m. at the Headquarters, Belgrave Road, Torquay, where meetings are held on Tuesdays and Fridays from 7.30-10 p.m. The club station (G3HJA) is active on 80 and 160m.

University of Nottingham Radio Society.—Activity is again on the increase. A programme to include lectures, film shows and visits is being planned. At present activities are confined to the 80m band on Sundays but work is being carried out on a 70cm television transmitter. It is hoped to hold an " Open Day " during February when visitors will be most welcome to inspect the new shack located high up in the University grounds. *Hon. Secretary:* G. Coates, Radio Society's Room, The University, Nottingham.

Wanstead and Woodford Radio Society.—The Junior Section meets on Tuesdays and the Senior on Wednesdays. The club rooms are being re-equipped and will offer facilities for constructional work. An extensive technical library is available. Further details may be obtained from the *Hon. Secretary:* J. R. Seaman, 67 Beattyville Gardens, Ilford.

Welwyn Garden City.—Three dozen members and their womenfolk enjoyed a social evening out on January 5 when a coach party was organized for the Victoria Palace, taking in supper at Oddi's on the way up. On the following Thursday, a capacity meeting attended a lecture and demonstration on " Tapes and Tape-recording " by Geoff Watts of the Electronics Lab. of Murphy Radio Ltd.

West Kent Amateur Radio Society.—Activity sessions are held on 80m at noon on Sundays and on 2m (144·85 Mc/s) from 8.30 p.m. on Wednesdays. An excellent party was held at the house of G4IB on December 21. Details of future activities are given in *Forthcoming Events* (Region 8). *Hon. Secretary:* H. F. Richards, 17 Reynolds Lane, Tunbridge Wells, Kent.

Wirral Amateur Radio Society.—The Annual Dinner will be held at " The Coach and Horses," Moreton, on February 24. A DXpedition to Carmarthenshire is planned for April 7. No new meeting place has yet been found but on February 17, N. Kendrick (G3CSG) will give a talk on operating procedure—venue from the *Hon. Secretary:* A. Seed (G3FOO), 31 Withert Avenue, Bebington, Wirral.

Correction

The call-sign of the Aldershot and District Radio Society is G3OBR and not as stated on page 295 of the December issue of the BULLETIN. The call-sign G3OBK is held by Mr. N. Goad of Farnworth, near Bolton.

Affiliated Society Representatives

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

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

MIDLAND AMATEUR RADIO SOCIETY: M. A. Brett (G3HBE), 55 Chestnut Drive, Erdington, Birmingham 24.

SOUTH BIRMINGHAM RADIO SOCIETY: G. E. Simonite (G3JAO), 19 Wistaria Close, Northfield, Birmingham 31.

STOCKPORT RADIO SOCIETY: R. Hobson (G3JRQ), 8 Peter Street, Hazel Grove, nr. Stockport, Cheshire.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the October 1960 issue:

CANNOCK CHASE AMATEUR RADIO SOCIETY
c/o J. R. Ellison, 166 High Mount Street, Hednesford, Staffs.

DOLLIS HILL RADIO CLUB
c/o G. Bird, P.O. Research Station, Dollis Hill, London, N.W.2.

ROTHERHAM AND DISTRICT RADIO CLUB
c/o K. Webster, 28 Athelstan Road, Handsworth, Sheffield 13.

205 AMATEUR RADIO CLUB
205 Signal Squadron (Infantry Brigade Group), B.F.P.O. 24.

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The following are amendments to the list published in the October issue:

BURY RADIO SOCIETY
c/o Ian G. Winter, 269 Lever Street, Radcliffe, Lancs.

DORKING AND DISTRICT RADIO SOCIETY
c/o J. Greenwell, Wigmore Lodge, Beare Green, nr. Dorking, Surrey.

MARCONI APPRENTICES AMATEUR RADIO CLUB
c/o D. A. Hills, Education Office, Marconi's Wireless Telegraph Co. Ltd., Chelmsford, Essex.

Representation

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

REGION 9—SOMERSET
J. Etherington (G5UG), 32 Worlebury Park Road, Weston-super-Mare.

DEVON
F. Wadman (G2GK), 106 Warbro Road, Torquay.

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

REGION 2—YORKSHIRE EAST
HULL
C. S. Norman (G3FCY), 30 Oldstead Avenue, Inglemire Lane.

REGION 14—LANARKSHIRE
MOTHERWELL AND DISTRICT
D. Menteith (GM3IWU), 20 Linksview Road, Motherwell.

New Members

THE following have been elected to membership.

JUNE, 1960

Corporate Members, Home (Licensed)

G3FMW †J. Stockley, 8 Trinity Road, Scarborough, Yorks.
G3IMO E. D. Shepard, 122 Folkestone Road, East Ham, London, E.6.
G3ITF †B. S. Freeman, 289 Kempshott Lane, Basingstoke, Hants.
G3KQV J. E. Ryley, 71 Repton Road, Wigston Fields, Leicester.
G3NAN R. W. Henderson, 8 Claremont Avenue, Leeds 3, Yorks.
G3NBF D. V. Wrigley, Moonrakers, Poole End Close, Tytherington, Macclesfield, Cheshire.
G3LNV R. J. Campbell, 30 Rotten Row, Lichfield, Staffs.
G3NNH †P. A. Sharp, 15 Downs Road, Folkestone, Kent.
G3NYS C. J. Whiteley, 52 Brockenhurst Avenue, Worcester Park, Surrey.
G3OBK N. Goad, 363 Plodder Lane, Farnworth, Bolton, Lancs.
G3OBZ M. R. Birkett, 105 Surgey's Lane, Arnold, Notts.
G3OCL *M. Gay, 19 Uley Road, Dursley, Glos.
G3ODY R. L. Field, 15 Burntwood Close, Caterham, Surrey.
G3OEX *M. G. Henstock, 58 Cassiobury Drive, Watford, Herts.
G3OEZ *G. A. G. Passmore, Dartmouth, Bridge Road, Bursledon, nr. Southampton, Hants.
G3OFA *D. J. Lee, 6 Fairfax Avenue, Ewell, Surrey.
GI3MUS W. A. R. Bell, 78 Orangefield Avenue, Bloomfield, Belfast 5, Northern Ireland.
GI3NSM R. E. McHenry, 54 Orby Road, Belfast 5, Northern Ireland.
GM3NVU G. A. MacLauchlan, c/o 14 Mannfield Avenue, Bonnybridge, Stirlingshire, Scotland.

Corporate Members, Overseas (Licensed)

K1IAP A. E. Allard, 37 Park Street, Central Falls, Rhode Island, U.S.A.
K1JPQ F. J. Augustine, 130 Chestnut Street, Central Falls, Rhode Island, U.S.A.
K2AUU M. Singer, 143 Glenview Road, South Orange, New Jersey, U.S.A.
K4AGK J. H. Wilhelm, 1008 Willowbrook Drive, Greensboro, North Carolina, U.S.A.
K8IUZ J. L. Leeson, 330 Macomb Street, Manchester, Michigan, U.S.A.
LZ1AF D. K. Petrov, P.O. Box 412, Sofia, Bulgaria.
VE3CCB †K. B. Orton, 1593 Dale Street, London, Ontario, Canada.
W1PFA/FP8BH W. C. Loeffler, Box 88, Salem, New Hampshire, U.S.A.
W8FDI A. G. Beatty, 2090 Manchester, Birmingham, Michigan, U.S.A.
ZD2BRG B. R. Gibbs, c/o 31 Elizabethan Way, Stanwell, Middx.
ZD2RFB R. F. Brown, H.Q., Electricity Corporation of Nigeria, 13 Broad Street, P.M.B. 2030, Lagos, Nigeria.

Corporate Member, Overseas (British Empire Receiving Station)

1056 F. Shannon, c/o Officers Mess, R.C.A.F. Station, Bagotville, Quebec, Canada.

Corporate Member, Overseas (Foreign Receiving Station)

316 E. F. Burger, The Causeway, Marlow, Bucks.

Corporate Members, Home (British Receiving Stations)

22835 R. C. Beadle, 38 St. Johns Avenue, Scarborough, Yorks.
22836 L. R. Skelton, 87 Riddons Road, Grove Park, London, S.E.12.
22837 R. E. George, 117 Woodlands Park, Woodlands Lane, Almondsbury, nr. Bristol.
22838 W. Johnson, Denton, Hordle Lane, Hordle, Lymington, Hants.
22839 A. E. Griffiths, 104 Long Road, Mangotsfield, nr. Bristol.
22840 F. W. Clark, Moorclose Farm, Blyton Carr, Gainsborough, Lincs.
22841 N. C. Priest, 114 Charlton Road, Westbury-on-Trym, Bristol.
22842 J. R. Wixon, 34 Lime Road, Hanham, Bristol.
22843 M. Parkin, 17 East Road, East Dene, Rotherham, Yorks.
22844 D. G. Rumsby, 17 Rookwood Avenue, Wallington, Surrey.
22845 K. V. Turner, 47 Watkin Street, Huntingdon Street, Nottingham.
22846 N. Mason, White Haven, Aldridge Road, Little Aston, Sutton Coldfield, Warwicks.
22847 G. D. Hodgkinson, 47 Station Road, Smallford, nr. St. Albans, Herts.
22848 D. Leyden, 13 Cambridge Road, Seven Kings, Ilford, Essex.
22849 J. Chetcuti, 94 Donald Street, Roath Park, Cardiff, South Wales.
22850 H. Beevers, 57 Sivilla Road, Kilnhurst, nr. Rotherham, Yorks.
22851 W. G. D. Orsler, 9 Pembroke Road, Erith, Kent.
22852 G. R. Pascoe, 18 Victoria Square, Truro, Cornwall.
22853 L. Russell, 193 Wolverhampton Road, Pelsall, nr. Walsall, Staffs.
22854 J. N. Reid, 24 Kennoway Drive, Glasgow, W.1.
22855 H. G. Jackson, 5 Machin Close, Henbury, Bristol.
22856 C. Ashmore, 127 Cuckoo Road, Birmingham 7, Warwicks.
22857 R. D. Gregory, Cippenham House, Slough, Bucks.
22858 P. S. G. Cadman, 13 Alderwick Drive, Hounslow, Middx.
22859 A. Cook, 45 Highfield Crescent, Aberbargoed, Bargoed, Glam.
22860 W. A. Phillimore, 37 Perth Road, London, E.13.
22861 R. Hooper, 2 Chestnut Road, Peverell, Plymouth, Devon.
10152 †F. C. Palmer, 17 Margaret Avenue, St. Austell, Cornwall.

Associates

2360 N. R. Taylor, Three Firs, Bridge Hill, Belper, Derbys.
2361 L. Arnold, 24 Albert Road, Stechford, Birmingham 33.
2362 K. R. Trollope, 105 Vale Road, Worcester Park, Surrey.
2363 K. F. P. Tomsett, 60 Palace View, Bromley, Kent.
2364 L. Bryant, 76 Fordham Road, New Barnet, Herts.
2365 R. E. Newman, 429 Green Street, Upton Park, London, E.13.
2366 A/A C. J. Dickenson, 685947, Hut 244, "D" Sqdn., 1 Wing, R.A.F. Locking, Weston-super-Mare, Somerset.
2367 A. Davies, 2 Abernant Road, Markham, nr. Blackwood, Mon.
2368 R. F. Smart, 192 Westgate End, Wakefield, Yorks.
2369 J. M. Nye, 51 Faversham Avenue, Enfield, Middx.
2370 J. R. A. Fleming, Throstle Nest Farm, Cottingley, Bingley, Yorks.
2371 M. S. Maisey, 31 Western Way, Alverstoke, Gosport, Hants.
2372 M. Hancocks, 50 Foxley Lane, Purley, Surrey.
2373 M. J. T. Smith, 6 York Road, Selsdon, S. Croydon, Surrey.
2374 A. J. M. Baker, 18 Tomline Road, Felixstowe, Suffolk.
2375 A. K. Sumesar-Rai, 20-24 Ruth Avenue-Les Efforts, West San Fernando, Trinidad, West Indies.
2376 B. D. Wesby, 5 Upper Moorfield Road, Woodbridge, Suffolk.

JULY 1960

Corporate Members, Home (Licensed)

G3BLB †M. Johnston, 16 Walford Place, Rugby, Warwicks.
G3GEV †S. C. Hollingshurst, 47 Bastion Road, Abbey Wood, London, S.E.2.
G3FUI C. A. Sargent, 12 Bramber Drive, Walkhouse Farm Estate, Wombourn, Staffs.
G3HWB †F. V. Greenleaves, 97 Lowton Road, Golborne, nr. Warrington, Lancs.
G3IUV †G. S. Loveday, 16 Stanbury Road, Victoria Park, Bristol 3.
G3JIL H. A. Johnson, 17 Williams Avenue, Wyke Regis, Weymouth, Dorset.
G3KIW G. W. Jenner, 27 Lyttleton Court, Lyttleton Road, London, N.2.
G3KMA R. Balister, 9 Warwick Close, Hampton, Middx.
G3NQY L. R. E. Case, 319 Ansty Road, Wyken, Coventry, Warwicks.
G3NST W. Taylor, 22 Sutton Road, Moxley Est., Darlaston, Staffs.
G3OCY S. Wearmouth, 56 Lumley Crescent, Ferryhill, Co. Durham.
G3ODU B. P. Carter, 4 Woodbastwick Road, Sydenham, London, S.E.26.
G3OET R. V. H. Tunstill, 21 Chaucer Road, Chelmsford, Essex.
G3OFC *D. H. M. Reekie, 29 Spath Road, Didsbury, Manchester 20, Lancs.
G3OFU C. D. Hyde, Glendale, Bollinway, Prestbury, Cheshire.
G5IW †F. E. Barlow, Flat 8, Shottery Hall, Shottery, Stratford-on-Avon, Warwicks.
G5UG †J. Etherington, 32 Worlebury Park Road, Weston-super-Mare, Somerset.
G8AW R. C. Warne, 16 Western Place, Penryn, Cornwall.
GM3ODN D. A. Fyfe, 25 Ava Street, Kirkcaldy, Fife.

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EI7AH M. P. Power, 53 Morrissons Road, Waterford, Eire.
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K2KIB J. Petroski, 470 South 17th Street, Newark 3, New Jersey, U.S.A.
K5VQN G. W. Craig, 314 Lindenwood Drive, Houston 24, Texas, U.S.A.
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SV1AI A. Kypraios, 4 Korai Street, Athens, Greece.
VE1OC A. D. Solomon, 8 Crichton Park Road, Dartmouth, Nova Scotia, Canada.
W1TQS G. A. Bowley, 12 Center Street, Provincetown, Mass., U.S.A.
W5LWS J. P. Allen, P.O. Box 218, Fayette, Miss., U.S.A.
ZS6IK G. Levien, 77 Mons Road Observatory, Johannesburg, South Africa.

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22862 D. Scott, Flat 1, "Valdana," Newton Reigny, nr. Penrith, Cumberland.
22863 †S. Tinker, 37 Gillett Avenue, East Ham, London, E.6.
22864 N. Burnitt, 16 North Road, East Boldon, Co. Durham.
22865 †L. Bodman, 68 Terrace Road, Elvington, Dover, Kent.
22866 A. E. Bennett, 10 Halewood Close, Gateacre, Woolton, Liverpool.
22867 W. L. Griffiths, 47 Park Street, Bridgend, Glam.
22868 R. E. Penn, 2 Denfield, Dorking, Surrey.
22869 G. Frost, 40 Kings Avenue, Woodford Green, Essex.
22870 G. Cashman, 33 Claude Road, Cardiff.
22871 A. A. Jones, 26 Belgrave Road, Bingley, Yorks.
22873 V. H. Sellwood, 18 Uplands Road, Drayton, Portsmouth, Hants.
22874 J. W. G. Snowdon, 36 Grimstone Road, Little Wymondley, Hitchin, Herts.

22875 D. B. Green, 12 Tapton Way, Calow, Chesterfield, Derbys.
22876 E. J. Walke, 13 Southbrook Place, Micheldever, Winchester, Hants.
22877 S. R. Gibbs, 43 The Vineyard, Richmond, Surrey.
22878 R. L. Hoare, 160 Eastcombe Avenue, London, S.E.7.
22879 A. R. Bond, 28 Bowes Avenue, Margate, Kent.
22880 J. J. Ward, 47 Fallowfield, Bandley Hill, Stevenage, Herts.
22881 S. J. Harden, 33 Whitedown Road, Tadley, Basingstoke, Hants.
22882 D. Grigg, Whiteness Manor, Kingsgate, Broadstairs, Kent.
22883 J. R. Clarke, 206 Queens Drive, Bedford.
22884 A. Perella, 14A St. Catherines Road, Littlehampton, Sussex.
22885 J. Harper, South View, Rose View Crescent, Kinmel Bay, Rhyl, Flints.
22886 K. L. Garraway, Lynden Cottage, Southview Road, Marlow, Bucks.
22887 S. J. Slatter, 49 Trotsworth Avenue, Virginia Water, Surrey.
22888 K. Depledge, 27 Mountfield Avenue, Waterloo, Huddersfield, Yorks.
22889 W. Taylor, 17 Peter Street, Blackpool, Lancs.
22890 L. Smith, 25 Shorncliffe Crescent, Folkestone, Kent.
22891 J. McQuillan, 57 Bath Street, Walker, Newcastle-on-Tyne, Northumberland.
22892 *G. Hurley, 2 Abingdon Street, Burnham-on-Sea, Somerset.
22893 *J. N. R. Wiles, 24 Delamere Road, Southsea, Hants.
22894 R. A. Bell, 21 Vining Street, Brixton, London, S.W.9.
22895 N. W. Borrill, 65 Musgrave Street, Penrith, Cumberland.
22896 A. E. Scott, 39 Clark Road, Wolverhampton, Staffs.

Corporate Member, Overseas (British Empire Receiving Station)

1057 M. P. Thompson, P.O. Box 913, Nassau N.P., Bahamas.

* * *

Associates

2377 P. H. Saben, 68 Warriner Gardens, Battersea, London, S.W.11.
2378 D. A. Evans, 6 Sutherland Road, Ealing, London, W.13.
2379 P. J. McGoldrick, 23 Glenshiel Road, London, S.E.9.
2380 B. Tinton, 4 Talbot Road, Winton, Bournemouth, Hants.
2381 M. J. Goodrick, 21 Acacia Avenue, Eastcote, Ruislip, Middlesex.
2382 S. Gregory, 167 Barley Lane, Goodmayes, Ilford, Essex.
2383 J. C. Dolan, 108 Bodley Road, New Malden, Surrey.
2384 A. Craddock, 5 Castle Grove, Kenilworth, Warwicks.
2385 R. B. Spokes, 59 Five Mile Drive, Oxford.
2386 P. M. Hunt, 23 Farm Way, Northwood, Middlesex.
2387 J. B. Williams, 24 Trebarwith Crescent, Newquay, Cornwall.
2388 B. Otter, 9 Otters Cottages, Newark Road, Lincoln.
2389 D. R. C. Myddleton-Evans, Leas House, Kingsley Way, London, N.2.
2390 I. R. Hickling, The Old Rectory, Bradden, Towcester, Northants.
2391 A. J. Varney, 2 Farmhouse, College Road, Hextable, nr. Swanley, Kent.
2392 G. T. A. Squier, Anderley, Tullybrannigan Road, Newcastle, Co. Down, Northern Ireland.
2393 T. S. D. Kewell, c/o D.H.Q. The Army Kinema Corporation, Minden, B.F.P.O.29.
2394 D. Murray, 203 Queensway, Whitchurch, Shropshire.
2395 W. McCulloch, Elgin Villa, Crosshill, nr. Maybole, Ayrshire.

AUGUST 1960

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G2RO †Wm. A. Roberts, 61 Lowbrook Lane, Tidbury Green, Solihull, Warwicks.
G3ZC †H. E. Cockrem, The Bakery, Stoke-in-Teignhead, Newton Abbot, Devon.
G3CIW †J. W. Underwood, Weston, Hollis Road, Up Hatherley, Cheltenham, Glos.
G3GIW D. W. Birt, 99 Stoddens Road, Burnham-on-Sea, Somerset.
G3IFL †J. H. P. Pridmore, 1 Elm Walk, Royston, Herts.
G3IVU D. B. Coleman, 189 Edge Hill, Darrashall, Ponteland, Newcastle-on-Tyne, Northumberland.
G3KKZ †P. Champion, 7 Leonard Road, Streatham Vale, London, S.W.16.
G3LGR M. A. Hooles, 97 Ealing Road, Wembley, Middx.
G3LXY W. Rogerson, 1 James Street, Thornton, Bradford, Yorks.
G3MAE A. E. Wilson, 2 Hyde Park, Mill Street, Norton, Malton, Yorks.
G3MSO E. K. Tunstall, Flat 7, Northampton Chambers, 2 New Street, Daventry, Northants.
G3NAH E. H. Taylor, 32 Ledgard Drive, Durkar, nr. Wakefield, Yorks.
G3NAX C. F. Walters, 42 Primrose Street, Astley Bridge, Bolton, Lancs.
G3NNY J. H. W. Bolter, 25 Cades Close, Luton, Beds.
G3NOE P. A. Dennison, 11 Briarfield Close, Highfield Road, Idle, Bradford, Yorks.
G3NOU W. S. Dunning, 4 Southland Avenue, West Hartlepool, Co. Durham.
G3NPG E. Godwin, 147 Houghton Road, Woodchurch, Birkenhead, Cheshire.
G3NSZ D. Roberts, 18 Alexandra Drive, Rock Ferry, Cheshire.
G3NUR W. H. Tucker, 62 Middle Field Road, Northfield, Birmingham 31.
G3NYE A. J. Taylor, 22 Wilcott Road, Gatley, Cheadle, Cheshire.
G3OAZ J. Akehurst, 14 Victoria Gardens, Eastbourne, Sussex.
G3OBJ R. Coulson, 106 Salterford Road, Hucknall, Nottingham.
G3OEE T. S. Harrison, 75 Parkway, Trentham, Stoke-on-Trent, Staffs.
G3OFN *S. J. Taylor, 6 Rosevean Road, Penzance, Cornwall.
G3OFZ *R. J. G. Jones, Morden Park Sound Studios, London Road, Morden, Surrey.
G3OGE *J. Rose, 63 Broomfield Road, Beckenham, Kent.
G3OGF *M. J. Farndale, 71 Monks Orchard Road, Beckenham, Kent.
G3OGK G. R. Kennedy, 17 Southbourne, Hayes, Bromley, Kent.
G3OGN N. B. Lomas, 26 Tweedale Avenue, Higher Blackley, Manchester 9.
G3OGV D. Millard, 39 Mary Street, Saltaire, Yorks.
G3OGY S. H. Andrews, Oakwood Cottage, Radcliffe Park Road, Salford 6, Lancs.
G3OGZ M. S. Beer, 13 North Park Avenue, Roundhay, Leeds 8.
G3OHB Miss E. Bottomley, St. Teresa's (Cheshire Home), Long Rock, Penzance, Cornwall.
G3OHY R. J. Bennett, 185 Bewley Drive, Southdene, Kirkby, nr. Liverpool, Lancs.
GM3NXA P. Gordon, 2 Kintillo Road, Bridge of Earn, Perthshire.
GM3NYC A. Fielding, 3 Hilary Drive, Garrowhill, Baillieston, Glasgow.
GM3OAV D. G. Varney, 17 Avenel Road, Knightswood, Glasgow.
GW3BOS †J. W. Alexander, 29 Heol Coedcae, Whitchurch, Cardiff, Glam.
GW3OAY *R. N. Graham, 23 The Rise, Llanishen, Cardiff, Glam.
GW3ODI G. N. Partington, Gaythorne, Hafodty Lane, Upper Colwyn Bay, Denbighshire.

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OE6MY K. E. Mayr, Birkfelderstr. 408, Weiz/Styria, Austria.
OZ5S S. A. Johansen, 54 Jansvej, Copenhagen, S, Denmark.
OZ1BC O. Jeppesen, Indre Ringvej 1, Fredericia, Denmark.
W2KOY E. P. Simon, 1740 Front Street, East Meadow, Long Island, New York, U.S.A.
W4IMI K. A. Cole, 6424 S.W.14 St. West Hollywood, Florida, U.S.A.
W5PM J. A. Swanson, Jr., 9015 Linkmeadow Lane, Houston 25, Texas, U.S.A.
W6CG C. F. Schultz, 5226 North Willmonte Avenue, Temple City, Calif., U.S.A.
ZD2JM J. Macintyre, Tingha, The Glebe, Easter Aberdour, Fife.
ZL2AMR J. H. Mowtell, 55 Pembridge Villas, London, W.11.
ZS1LA F. Anderson, 4 Palm Avenue, Worcester, South Africa.

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16749 †I. A. Brown, 21 Beechcroft Road, Grantham, Lincs.
21486 †S. A. Hemes, The Dept. of Pharmacology, Instrumentation Laboratory, University of Blackpool, Ashton Street, Liverpool 3.
22897 S. W. Rawson, 40 Rossetti Avenue, Burnley, Lancs.
22898 R. Foster, 84 Cedar Street, Accrington, Lancs.
22899 R. Browne, 12 Charnwood Close, Peterborough, Northants.
22900 D. H. Squires, 90 Archway Street, Barnes, London, S.W.13.
22901 G. A. Cosgrave, 162 Maysoule Road, Battersea, London, S.W.11.
22902 E. W. Sankey, 9 Broadoak Avenue, Penketh, nr. Warrington, Lancs.
22903 J. W. Woods, 40 Woodcock Avenue, Naphill, High Wycombe, Bucks.
22904 J. W. Nisbet, 177 Randolph Drive, Clarkston, Glasgow.
22905 L. M. Baker, 23 Devon Drive, Ainsworth, Bolton, Lancs.
22906 R. Moore, 5 Douglas Street, Selby, Yorks.
22907 G. B. Coman, 102 Bullard Road, Catton Grove, Norwich, Norfolk. NOR. 31N.
22908 B. Clegg, 20 Greenfields, Caton, nr. Lancaster.
22909 F. R. Renshaw, 64 Queens Road, Hale, Cheshire.
22910 M. W. Humphrey, The Old Palace Brenchley, nr. Tonbridge, Kent.
22911 D. E. Walters, 22 The Vale, South Ruislip, Middx.
22912 H. Flatters, 16 Highbank Cottages, Moor Head Lane, Shipley Yorks.
22913 J. A. Carter, c/o Robertson, 38 Prosen Street, Tollcross, Glasgow, E.2.
22914 F. J. Hart, Stamford Park Post Office, Altrincham, Cheshire.
22915 Dr. D. Doyle, Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W.1.
22916 J. Greaves, 8 Holdings Road, Sheffield 2, Yorks.
22917 L. Buckley, 131 Astley Street, Dukinfield, Cheshire.
22918 J. A. Maltby, 16 Hillside, Ware, Herts.
22919 P. E. Morrison, "Sherika," Fair Mead, Lower Cam, Dursley, Glos.
22920 J. Barnard, 29a High Street, Ross-on-Wye, Herefordshire.
22921 D. G. Wright, 85 Meadway Road, Bridgend, Stonehouse, Glos.
22922 A. O. M. Nethercot, 14 Fountains Crescent London, N.14.
22923 W. F. Evans, 7 Castle Street, Clackmannan, Scotland.
22924 D. MacIntyre, 31 Chapman Crescent, Kenton, Harrow, Middx.
22925 M. A. Thorp, 1 Coppins Road, Clacton-on-Sea, Essex.
22926 R. G. Lloyd-Owen, Plas Newydd, Hellesvean, St. Ives, Cornwall.
22927 R. Ridgard, 19 Quantock Road, Bridgwater, Somerset.

22928 W. G. Carpenter, 32 Shophouse Road, Bath, Somerset.
22929 N. G. G. Turner, 67 Pine Hill, Epsom, Surrey.
22930 R. H. Hawkes, 121 Eversley Avenue, Barneshurst, Kent.
22931 J. A. Brighting, 15 Ash Tree Close, Croydon, Surrey.
22932 G. W. Young, 35 Westmead, Windsor, Berks.
22933 A. J. J. C. Stimpson, Montpelier Lodge, Royal Baths, Harrogate, Yorks.
22934 J. E. Barton, 31 Scourfield Street, Edge Hill, Liverpool 7.
22935 G. T. Barrow, 21 Christian Fields Avenue, Gravesend, Kent.
22936 A. C. Jenkinson, 23 The Cottages, Peabody Estate, Hammersmith, London, W.6.
22937 *A. Richards, 30 Well Place, Cwmbach, Aberdare, Glam.
22938 †J. R. Hutcheon, 1 Haddfoot Wynd, Anstruther, Fife.
22939 *J. A. Nye, 90 Helredale Road, Whitby, Yorks.
22940 †J. S. Allen, 59 Kings Mede, Horndean, Hants.

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1059 D. W. F. Betsworth, c/o Barclays Bank D.C.O., P.O. Box 103, Lindi, Tanganyika, East Africa.
1060 B. C. Jenney, c/o 154-158 Sussex Street, Sydney, N.S.W., Australia.

Associates

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2397 C. W. Fay, 21 Cyprus Park, Belfast 5.
2398 D. A. Withers, 104 Stevens Road, Dagenham, Essex.
2399 D. A. White, 34 Market Street, Watford, Herts.
2400 D. R. Coltart, 58 Fairfax Road, Old Woking, Surrey.
2401 B. S. Bunce, 57 Beechcroft Avenue, Croxley Green, Rickmansworth, Herts.
2402 K. R. McLoughlin, 11 South Street, Portadown, Northern Ireland.
2403 P. Wilkinson, 40 Oakdale Avenue, Southfields, Peterborough, Northants.
2404 R. Hart, 10a Stretford Road, Urmston, nr. Manchester.
2405 I. H. Keyser, 36 The Ridgeway, Ruislip, Middx.
2406 J. R. Brooks, 193 Stoke Lane, Westbury-on-Trym, Bristol.
2407 R. A. Bygrave, 34 Addison Road, Banbury, Oxon.
2408 R. G. Dubery, 5 Oakview Grove, Shirley, Croydon, Surrey.
2409 D. A. Dunn, 21 Milton Crescent, Portobello, Edinburgh 15.
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2412 G. W. Stevens, 29 Pine Hill, Epsom, Surrey.
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2415 C. T. W. Ogden, East Lodge, Kinfauns, Perthshire.
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2417 P. Adams, 145 Crofton Park Road, Brockley, London, S.E.4.
2418 C. J. Harmer, Spring Corner, Rockness Hill, Nailsworth, Glos.
2419 P. J. Vincent, 20 Cromer Road, Eastville, Bristol 5.
2420 N. Harris, 115 Langton Way, Blackheath, London, S.E.3.
2421 I. G. Swan, 50 Mouse Bank Road, Lanarks.
2422 J. M. Charles, 130 Hainton Avenue, Grimsby, Lincs.
2423 K. M. Duggan, The Croft, Swinton, Malton, Yorks.
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2425 R. E. Challis, 48 Harlech Road, Southgate, London, N.14.
2426 J. W. Wybourn, 25 Albany Road, Rayleigh, Essex.
2427 W. L. Price, 141 Woodford Avenue, Ilford, Essex.

SEPTEMBER 1960

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G2AZW C. V. Knight, 151 Creek Road, Deptford, London, S.E.8.
G3ADY F. W. Kirk, 142 St. Stephens Road, Hounslow, Middx.
G3AZO †C. J. Veale, 4 Oxford Gardens, Mutley, Plymouth, Devon.
G3BNU †A. D. Allen, c/o 61 Bath Road, Cheltenham, Glos.
G3BOD †C. D. Jones, 25 Chetwynd Road, Wolverhampton, Staffs.
G3BUX M. Faraday, 46 Queenswood Court, King's Avenue, London, S.W.4.
G3CVF D. Pidgeon, Palmori, Frome Avenue, Wool, Dorset.
G3FEW E. A. Rule, 58 Courtland Avenue, N. Chingford, London, E.4.
G3GNA †D. Macmillan, 14 Silverdale Road, Bushey, Watford, Herts.
G3HLM W. E. Harris, 58 Church Street, Heaton Norris, Stockport, Cheshire.
G3JEY †W. A. Crute, 81 Roker Avenue, Roker, Sunderland, Co. Durham.
G3KFV †W.O.II P. A. Davis, 3 Sqdn., 14 Signal Regt., Weald, Bampton, Oxon.
G3KZQ G. Goddard, 12 Crook Street, Hyde, Cheshire.
G3LWH G. Twist, Seekew, Baroncroft Road, Woolton, Liverpool.
G3MAK R. Roberts, 3 Clarendon Grove, St. Paul's Cray, Orpington, Kent.
G3MOU G. F. Morrison, 21 Gardiner Road, Grindon, Sunderland, Co. Durham.
G3MXJ D. J. Andrews, 42 The Fairway, Gravesend, Kent.
G3NJX R. D. Geeson, Snowdrop Cottage, Quarndon, Derby.
G3NOR R. P. D. Ryder, 39 West Street, Selsey, Sussex.
G3NPV A. W. Green, 110 Rowley Lane, Lepton, Huddersfield, Yorks.
G3NRH B. N. Perrin, 16 Walkford Way, Walkford, Christchurch, Hants.
G3NSU B. G. Ellis, 27 Oldfield Street, Wortley, Leeds 12.
G3NZM B. E. Jackson, 88 Clovelly Road, Glenfield, Leicester.
G3OAI/T S. J. Harris, Chimneys Tall, Ruskin Avenue, Moordown, Bournemouth, Hants.
G3OBD P. V. Dutfield, 20 Stokes Avenue, Poole, Dorset.
G3OCK L. W. Hodgetts, 164 Probert Road, Oxley, Wolverhampton, Staffs.
G3ODL B. Everard, 7 Lord Roberts Street, Walney, Barrow-in-Furness, Lancs.
G3ODR D. J. Beaven, 43 Muirfield Road, South Oxhey, Watford, Herts.
G3OEF *R. M. G. Maule, 3 Brockham Warren, Box Hill Road, Tadworth, Surrey.
G3OFF P. C. Hunter, 109A London Road, Morden, Surrey.
G3OGC C. W. Parsons, 79 Welford Gardens, Abingdon, Berks.
G3OGM J. C. Moore, Wellingore, Dean Wood Road, Jordans, Bucks.
G3OGT G. Thomas, St. Teresa's, Long Rock, Penzance, Cornwall.
G3OGX *J. H. G. Allsop, 100 Belmont Park Road, London, E.10.
G3OHA D. Calvert, 56 Oakleigh Road, Hillingdon, Middx.
G3OHC G. C. Badger, 24 Wood Green Road, Winson Green, Birmingham 18.
G3OHE W. M. Frost, 14 Wynnstay Gardens, West Hartlepool, Co. Durham.
G3OHH *R. A. Hargreaves, Wych Cottage, Adlington, nr. Macclesfield, Cheshire.
G3OHO J. E. Fisher, 58 Springfield Road, Gorleston, Great Yarmouth, Norfolk.
G3OHP M. J. Winter, 47 Watling Street, Strood, Rochester, Kent.
G3OHX *I. Jackson, 4 The Croft, Whittingham, Alnwick, Northumberland.
G3OIB K. A. J. Younger, Read Grammar School, Drax, nr. Selby, Yorks.
G3OID R. D. Josephy, 8 Weetwood Park Drive, Leeds 16.
G3OII L. Stevenson, 73 Morden Road, Mitcham, Surrey.
G3OIP P. M. Holker, Fairacre, The Glen, Saltford, Somerset.
G3OKP R. T. Axtell, Robert H. Ray Geophysics Inc., P.O. Box 638, Tripoli, Libya.
G3OLE C. E. J. Parker, 65 Granville Road, Wood Green, London, N.22.
G3OLV A. S. Coombes, 120 Palace Road, London, S.W.2.
G3OMN T. Jonsen, 2 Sterndale Road, Hammersmith, London, W.14.
G3WY †R. V. Beekar, 4 Quarry Road, Tupsley, Hereford.
G8BD G. W. Hayward, 19 Alsford Road, Purbrook, Portsmouth, Hants.
G8UY †W. Hartley, 21 Heath Grove, Harrogate, Yorks.
GI3OJO Dr. J. F. Breach, 1 Massey Park, Belfast.
GM3NRP P. Mc.C. Daniels, 6 Wishawhill Street, Wishaw, Lanarks.
GW2BFD †C. Pritchard, 12 St. Agnes Road, Heath, Cardiff, Glam.
GW3OJB C. F. D. Smith, 42 Front Street, Pembroke Dock.

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K4JQV William H. Watts, Lorac Support Team No. 3, c/o Fleet Post Office, New York City, N.Y., U.S.A.
K4TLG William U. Clyburn, Box 38, Kershaw, S.C., U.S.A.
K6TQR Walter J. Thompson, 421 Country Club Drive, San Francisco, 27, Calif., U.S.A.
K8JLA Jack D. Conklin, 409 Benton Street, Oak Harbor, Ohio, U.S.A.
PAOWX G. J. Kooyman, 2 Wilgenlaan, Amstelveen, Netherlands.
VE2CB †J. C. Sunderland, 1491 Crawford Bridge Avenue, Verdun, Montreal 19, Quebec, Canada.
VK2AIP †R. G. Thorburn, c/o 22 Glenn Avenue, Purley, Surrey.
VP8BN J. B. Booth, P.O. Box 207, Port Stanley, Falkland Islands, South Atlantic, via Montevideo.
W6EKZ R. M. Rothschild, 10434 Wyton Drive, Los Angeles 24, Calif., U.S.A.
W7AGJ David C. Axe, 4307 East 57, Seattle 5, Wash., U.S.A.
W9VZK J. F. Toschik, 2414 N.54 St., Milwaukee 10, Wis., U.S.A.
ZD2KHK †D. P. Connolly, Nigerian V.H.F. Maintenance Service, P.O. Box 2217, Lagos, Nigeria.
ZE6JC T. H. Blackburn, P.O. Box 822, Gwelo, Southern Rhodesia.
ZS5KA H. B. Sink, 11 Camborne Road, Durban, South Africa.
ZS5QV/G2QV †T. E. T. Shanks, P.O. Box 53, Hillcrest, Natal, South Africa.
ZS7C W. Van Rensburg, P.O. Box 1, Goedgegun, Swaziland.
4X4IX Abraham Nagel, Beth Charsina, Rechov Hakeshet, Herzlia, Israel.
5A5TR N. F. C. Moss, 7535 Perry Road, Bell Gardens, Calif., U.S.A.

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22943 N. J. Forrester, The Caravan Site, Burton Hill, Malmesbury, Wilts.
22944 F. W. Bath, Murray House, Ottershaw, nr. Chertsey, Surrey.
22945 †C. V. M. Bamsey, 74 Lammas Avenue, Mitcham, Surrey.
22946 N. J. Carter, 4 Green Man Court, Green Man Lane, Feltham, Middx.
22947 R. H. W. Gealy, 21 Newholme Drive, Wilford, Nottingham.
22948 J. Taylor, 68 Mauritius Road, East Greenwich, London, S.E.10.
22949 G. Leet, Woodlands Manor Farm, Woodlands, Nr. Sevenoaks, Kent.

22950 P. Atkinson, Hillside Café, Lindale, Grange-over-Sands, Lancs.
22951 G. van Raalte, 17 Brunswick Square, Hove Sussex.
22952 L. W. George, 40 Hawarden Grove, London, S.E.24.
22953 R. V. Axten, 28 Pratt Road, Rushden, Northants.
22954 D. J. T. Burrell, 6 Treverbyn Road, St. Ives, Cornwall.
22955 A. T. H. Rackley, Bide-a-Wee, Windsor Road, Bray, Maidenhead, Berks.
22956 M. Hubbard, 151 Coulsdon Road, Old Coulsdon, Surrey.
22957 C. S. Husk, Penylan, Upper Wellsway, Bath, Som.
22958 E. J. Bath, 24 Craneswater, Bath Road, Hayes, Middx.
22959 R. J. Ward, 20 Wickham Road, Studley, Warwickshire.
22960 S. Sandrasegaram, 3 Clanricarde Gardens, London, W.2.
22961 R. S. Devlin, 37 Teehey Close, Higher Bebington, Ches.
22962 P. Coot, 23 Briars Lane, Hatfield, Herts.
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Correction

The call-sign of Mr. F. Huggins, 8 Albert Road, Colne, Lancs., should be G3NNJ, not G3NNH as shown on page 519 of the May issue. The address of Mr. L. Wilkes (G3KJK) on page 520 should have read 7 Heath Close, *Watchet* Lane, Hazlemere, High Wycombe.

The name of EI4AE is Mr. J. *Martin* and not as given on page 521 of the May issue.

*Denotes transfer to Corporate Grade. †Denotes previously a member.

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