R S G B

SEPTEMBER, 1958

BULLETIN

2/6 Monthly

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOL. 34, NO. 3

Volume 34 No. 3
September 1958

R.S.G.B. BULLETIN

CONTENTS

EDITOR:
John Clarricoats, O.B.E., G6CL

ASSISTANT EDITOR:
John A. Rouse, G2AHL

EDITORIAL OFFICE:
R.S.G.B. Headquarters, New Ruskin House, Little Russell Street, London W.C.1.
Telephone: HOLborn 7373

ADVERTISEMENT MANAGER:
Horace Freeman, The National Publicity Co. Ltd., 20-21 Red Lion Court, Fleet Street, London, E.C.4
Telephone: FLEet Street 0473-6

The R.S.G.B. Bulletin is published on or about the 15th of each month as its official Journal by the Radio Society of Great Britain and issued free to members. Closing date for copy is the 22nd of the month preceding publication.

Current Comment

discusses topics of the day

The R.A.E.

DURING the past few weeks more than 500 of the 700 candidates who sat for the City and Guilds of London Institute Radio Amateurs' Examination last May will have been receiving the congratulations of their friends on attaining a pass mark. The other 200 will be lamenting their fate and attempting to find a reason for their lack of success.

At the request of the R.S.G.B. the City and Guilds of London Institute have analysed the entries for the May examination with the result that it has been proved that a high proportion of the failures occurred among those candidates who did not attend courses of instruction.

It is unfortunate that in many parts of the United Kingdom no properly organised courses of instruction for the Radio Amateurs' Examination are offered. In some places courses are organised by the local R.S.G.B. Group or Affiliated Society—and how well many of them have done their job can be seen from the records—but the benefit of properly organised instruction classes under the control of the Local Education Authority cannot be denied.

L.E.A.'s will, as a general rule, offer a special course of instruction in almost any subject provided a reasonable entry can be assured—usually a dozen. Insufficient regard to this aspect of Further Education is being paid by local R.S.G.B. Groups and Affiliated Societies. T.R.s and A.S.R.s should make an approach to their Local Education Officers and explain to them the value and importance of Amateur Radio to the community as a whole. If a reasonable entry can be guaranteed and the names of qualified lecturers suggested, most Education Officers will be prepared to recommend the inclusion of an R.A.E. course of lectures in the next prospectus.

Candidates who failed to pass the last City and Guilds Examination would be well advised to study carefully the new syllabus of instruction that came into force a year ago. The syllabus, and of course the examination paper, placed great emphasis on the licence regulations and on the question of interference to broadcast and television receivers. The fact that a candidate for the R.A.E. is a qualified radio engineer counts for little these days unless he also knows the regulations. It is appropriate, therefore, that this issue of the Society's Journal should contain an article by David Deacon (G3BCM) which draws attention to those parts of the International Radio Regulations which affect directly or indirectly the Amateur Service. The article should be studied carefully by all who operate, or aspire to operate, an amateur transmitting station.—J.C.

Income—and Tax

HAS it ever occurred to you when you receive your salary cheque or wages envelope complete with its P.A.Y.E. Income Tax deduction that the R.S.G.B. also has to pay Income Tax?

On the Society's accounts which you receive each year will be found certain mysterious entries such as "Income Tax on Interest Received" and "Income Tax Recovered." You may well have wondered what these entries really meant.

The Society's income consists of three main groups: first, members' subscriptions, second, profit from the sales of publications and other items, and third, interest received from the Society's investments.

Of these groups only the first, members' subscriptions, is free from taxation. From the other two we are allowed to deduct a proportion of the expenses of running the Society; this proportion is arrived at by a complex calculation involving several factors, the main one being the ratio between the profit from "Sales of publications and other items" and "Subscriptions less the cost of the BULLETIN" (which is sent to members as part of their subscription). The result, after deducting expenses, is the taxable profit, or a loss, according to whether the income or expenditure is the greater amount.

The method adopted by the Inland Revenue to collect the Income Tax on this resultant profit (if any!) is to deduct it first from the interest from our investments before we receive it and then repay us the amount they do not require. Hence the various entries in the Annual Accounts.

But do not think this is unusual. It is one of the ways of taxing people and works out quite well in the end, except that the Inland Revenue have the use of some of the Society's money until it is repaid.—N.C.

PART 1.—HIGH QUALITY SYSTEM FOR STEREOPHONIC AND SINGLE CHANNEL REPRODUCTION

By F. C. JUDD (G2BCX)*

EXPERIMENTS were made as early as 1881 with two channel listening, but the development of high quality recording apparatus has made stereophonic reproduction practicable, and complete systems are in fact available for both recording and reproduction of stereo tapes and discs. Multi-channel sound has, of course, been adapted for films and anyone who has not seen *Cinerama Holiday* and *Round the World in 80 days* has missed some fine stereophonic sound produced by equipment with up to seven or eight sound channels and full frequency range. The B.B.C. recently made two stereo transmissions using two a.m. and two f.m. channels for left and right hand respectively.

In collaboration with the writer, J. H. Lepper (G3JHL) of Leytonstone recently made the first attempt to transmit stereo by Amateur Radio. Using two channels in the 1·8 to 2 Mc/s band (special permission having been obtained from the G.P.O.), G3JHL made a two channel, left- and right-hand transmission, which was received and recorded in stereo by G2BCX. The equipment shown in the photograph above comprises, from left to right, first playback amplifier, first recording amplifier, second playback amplifier, second recording amplifier and the radio receiver.

Spatial Sound

Stereo will reproduce the spatial distribution of the original sound source as well as its environment. The background of acoustic scenery is present and the reproduction has a sense of depth and width completely lacking in a single channel system. Listening to stereophonic sound for the first time is quite startling, almost uncanny, and it is difficult to appreciate even very high quality single channel reproduction after listening to it. This is because our hearing system is such that we are able to differentiate from, and ascertain the direction of, one particular sound from a number of others. When listening to an orchestra, for example, it is quite possible to focus attention on a particular instrument or group of instruments without losing the background of the orchestra. Without this faculty, conversation in a noisy environment would be impossible. We have, therefore, a hearing system quite capable of determining the direction of a sound, the approximate distance from which it comes, and the ability to isolate that sound when others are occurring at the same instant.

When listening to a complex number of sounds, via a monaural (single channel) reproducing system the effect of space and distance is lost completely as all the sound now emerges from a single aperture, leaving the reproduction with neither depth nor distinction. All sensation of the directivity of the various sounds is completely lost.

In actual fact, of course, the exact spatial reproduction of a large orchestra would require a comparatively large number of reproducing channels. *Cinerama Holiday*, mentioned earlier, proved most effective with its seven channel equipment, but naturally the cost of a system of this kind would be prohibitive and somewhat impracticable for use in the home. Over the last few years a number of manufacturers of high

* *152a Maybank Road, South Woodford, London, E.18*

fidelity sound equipment have been developing the two channel stereo system with attempts at producing three channel performance. Some of the latest work in this direction was demonstrated recently by E.M.I. engineers at an I.E.E. lecture while the theories supporting the design of the E.M.I. stereo recording technique have been explained in a recent article on the subject. [1]

To quote from an article by James Moir in *Hi-fi News*, " Each of the two ears receives two sound images, each ear being affected by both loudspeakers. The two sound images at one ear arrive with a small time difference due to the difference in path length between the two loudspeakers and the ear. Analysis shows that the ratio of the sum of the two loudspeaker signals at one ear, to the sum of the two signals at the other ear, is the measure of the position of the source relative to the two microphones." [4] (See Fig. 1).

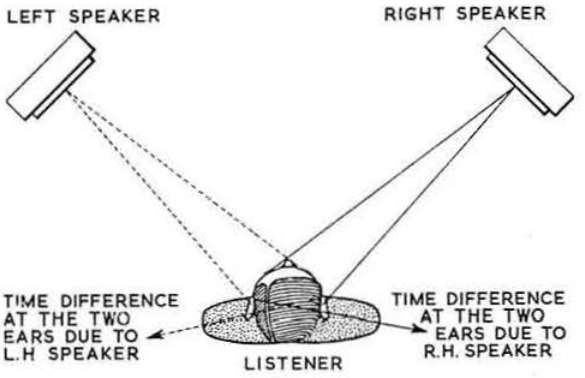


Fig. 1. Placement of left- and right-hand speakers in a stereophonic reproducing system.

Commercial Systems

To achieve the advantages suggested by mathematical analysis of the idea, E.M.I. engineers have developed some special circuits which cause the sound pressures at the two ears of the listener in front of the two loudspeakers to simulate, over a wide frequency range, the sound pressures which would occur by direct listening. Outputs from the special circuits are then fed to a standard twin track recorder, operated at 15 in. per second. This produces the master tape from which the release tapes are recorded. [1]

Considerable research has been carried out in the field of stereophony and techniques similar to the above have been developed specially to produce the high fidelity " Stereosonic " tape records that are now on sale to the general public. At the same time reproducing equipment has also become available and at recent London Audio Fairs a number of complete stereo equipments have made their debut; at least one manufacturer has demonstrated a stereophonic disc system. At the moment, of course, the cost of a complete equipment is somewhat beyond average means, but the appearance of component parts for stereo reproduction—tape decks, playback heads etc.—brings the possibility of stereo recording and reproduction within reach of the amateur.

Amateur Stereophonic System

It has been necessary to examine carefully all the available information [1], [2], [3], [4], [5] on stereophonic reproduction and expend some considerable time and effort on preliminary experimental work, the results of which are outlined in these articles. As a business proposition all new commercial equipments have to conform to certain standards which the amateur can, in many instances, ignore, neither is he faced with the high cost of research and development.

With stereophonic sound reproduction the chief consideration is performance and the main characteristics, similar to those required for any high quality reproducing system, are listed below together with the special modifications associated with two channel sound:

(i) The response of both recording and playback amplifiers must be equal over the entire audio frequency range. It is necessary, of course, for all amplifiers to be free from distortion and intermodulation.

(ii) The gain of each amplifier must be capable of adjustment to within one db or so throughout the system or reproduction will sound one sided. In professional equipment the gain control of each playback amplifier is ganged and provision is made for a small amount of adjustment on each to compensate for changes in valves etc.

It should be remembered that by listening only, it is difficult to determine small changes in gain, and therefore if individual controls are used, and this is quite practicable, each amplifier should be carefully calibrated, especially if commercial stereo tapes are to be used. For home recording and reproduction flexibility of control is useful providing the amplifier characteristics are known.

(iii) Reference to the block diagram (Fig. 2) will show the basic arrangement to be little more than the duplication of a single channel system. The tape deck may be a modified or rebuilt single channel unit, although there are now a number of twin channel decks on the market as well as two section " in line " recording/playback heads.

Use of ¼ in. Tape

At this point it is necessary to explain that stereo may be recorded on a standard ¼ in. tape in two ways. In either case both halves of the track are used so that two completely isolated recording/playback heads are necessary. These may be " in line " or " staggered." With an " in line " head the recordings are synchronised directly one above the other and therefore the recording heads are stacked. With " staggered " heads the recordings are synchronised for any given spacing between the two separate recording heads, and can only be replayed in synchronism if the playback heads have the same spacing as the recording heads. Some American concerns have issued " staggered head " recordings, whilst E.M.I. have adopted " in line " recording as a standard method. If interest is solely in home production of stereophonic sound the " staggered head " system might offer an easier and less costly approach to the problem of the tape deck by fitting an additional recording and erase head to work on the other half of the tape, assuming, of course, that

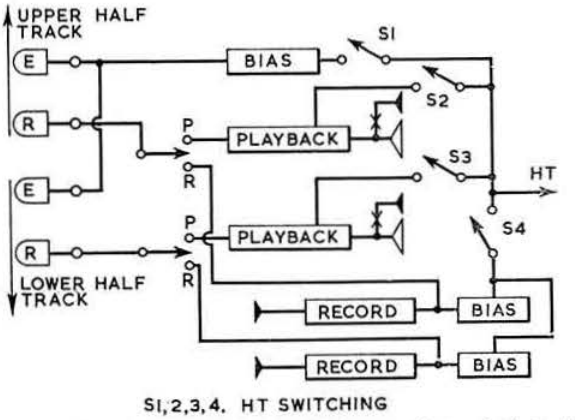


Fig. 2. Block diagram of a stereophonic recording and playback system.

the existing head is for half track recording. The writer first used this method and has since rebuilt the entire deck to accommodate twin erase and recording heads as well as a third playback head for monitoring and other purposes. A machine thus modified can, of course, still be used for single channel operation.

Requirements of a Complete Stereo System

It is now possible to tabulate the requirements for a complete stereo equipment.

(*a*) Duplicate or twin channel amplifiers for recording, each fitted with recording amplitude indicators and fully compensated for C.C.I.R. recording standards.

(*b*) Twin channel tape deck as outlined in the preceding paragraphs.

(*c*) Calibrated duplicate amplifiers for full frequency range reproduction. Gain plus or minus at most 2 db over the entire frequency range. (Commercial stereo playback amplifiers are calibrated to within one half to one db.)

(*d*) Duplicate loudspeaker systems: preferably wide frequency range units, consisting of bass and treble speakers with crossover networks.

Standardisation of the designation of the tracks has been recommended as follows: If the tape moves from left to right and with the active side facing away from the observer, the top track shall be designated No. 1 track and shall carry the recording for the left hand channel as viewed from the audience. The bottom track shall be designated No. 2 track and shall carry the recording of the right hand channel. [1]

It is permissible of course, to combine the recording and playback pre-amplifiers and in order to save valves combination amplifiers with switched record and playback equalising circuits will be referred to later in this series.

References

[1] "The Stereosonic Recording and Reproducing System," H. A. M. Clark, B.Sc. (Eng.), M.I.E.E., G. F. Dutton, Ph.D., B.Sc. (Eng.), A.M.I.E.E., P. B. Vanderlyn, A.M.I.E.E., *The Proceedings of the Institution of Electrical Engineers*, Vol. 104, Part B, No. 17, September 1957.

[2] "Design of Magnetic Recording and Reproducing Equipment for Domestic Use," N. B. Martin and D. L. A. Smith, B.Sc. (Eng.), *Journal Brit. I.R.E.*, February 1956.

[3] "Stereophonic Sound Reproduction," K. De Boer, *Philips Technical Review*, Vol. 5, No. 4, April 1940.

[4] "Stereophonic Sound," James Moir, *Hi-fi News*, April 1957.

[5] *High Fidelity Sound Reproduction*, George Newnes Ltd.

(*To be continued*)

Simple S.W.R. Indicator

By VIC SCOTT (GD3UB) *

SOME means of determining whether a transmitter is correctly matched to its load is essential in the amateur station if the best use is to be made of the r.f. power being generated. The construction of an extremely simple device for this purpose is shown in Fig. 1. The bridge is in effect a piece of co-axial cable in which it is possible to measure the magnitude of the reflected wave.

The materials required are a 4 in. length of $\frac{1}{4}$ in. diameter copper tube, two co-ax sockets, a 47 ohm carbon $\frac{1}{2}$ watt resistor (R1), a germanium diode and a 4 in. length of 16 s.w.g. wire. The various parts are assembled in a cycle repair outfit box. In addition, a piece of co-axial cable is required to connect a moving coil meter to the bridge for indication purposes.

Construction

First, the co-axial sockets should be fitted to the ends of the box and the $\frac{1}{4}$ in. copper tube soldered to the centre spigots of the sockets. A 4 in. piece of 16 s.w.g. wire is then arranged about $\frac{1}{16}$ in. from the copper tube and held in place by the germanium diode and R1.

Setting up and using the Bridge

To set up the bridge initially, co-ax socket 1 should be connected to the 80 ohm output of a transmitter and an 80 ohm dummy load of suitable rating connected to socket 2. If there is any reading on the meter when the transmitter is switched on, the tapping point for the diode should be moved along the 16 s.w.g. wire until a zero reading is obtained. When this has been done, the bridge is ready for use and the dummy load may be replaced by an aerial tuning unit such as the Z Match. The procedure, with an aerial connected, is then to tune the a.t.u. for *zero* reading on the s.w.r. meter (so indicating that the transmitter is "looking" into its correct load). Used in this manner, the device monitors the *reflected* power and can be left in circuit at all times, as it will handle up to 1 kW.

To read *forward* power, the transmitter should be connected to socket 2 and the aerial tuning unit to socket 1.

The germanium diode in this type of s.w.r. bridge sometimes causes TVI and the unit should therefore be inserted in the co-axial feeder on the transmitter side of the low pass filter if one is used.

Acknowledgements

The instrument is based on a design developed by the U.S. Naval Laboratories and is similar in construction to the Monimatch described by Lewis G. McCoy (W1ICP) in the October 1956 and February 1957 issues of *QST*.

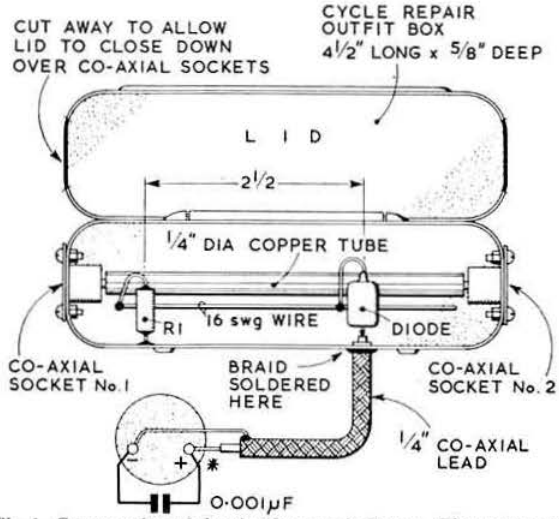


Fig. 1. Construction of the simple s.w.r. indicator. The meter used with the device should read 1 to 3mA f.s.d. If a more sensitive meter is used, a 2000 ohm carbon potentiometer should be inserted at point ★.

* *Beach Café, Port Moar, Ramsey, Isle of Man.*

A 72 Mc/s V.F.O. for 144 Mc/s Drive

Using the Kalitron Circuit for High Stability

By " OXO "*

THE unit to be described is the outcome of a successful attempt to avoid any possibility of generating harmonics falling in Bands I or III of the television spectrum when transmitting on frequencies in the 144 Mc/s amateur band. Many arguments for and against v.f.o. control are heard, each of which has its points, but so far as the writer is concerned its use is confined to the convenience of shifting

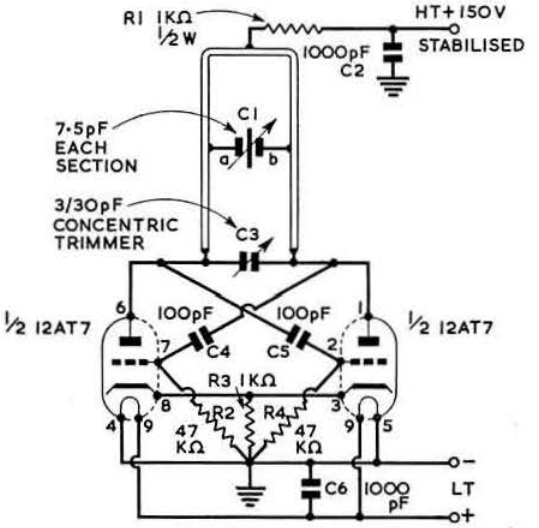


Fig. 1. The circuit diagram of the Kalitron v.f.o.

frequency in the event of another station operating on the chosen freqency. In addition, by monitoring the band prior to switching on the transmitter, it can be set up on a clear channel, thus avoiding the necessity of purchasing a number of crystals in the hope of achieving the same result. Finally, one has that sense of achievement which follows the design and construction of a v.f.o. for v.h.f. operation which is as stable as any of the lower frequency crystals used for controlling 144 Mc/s transmitters and better than some of them, judging by reports from various stations on which the utmost reliance can be placed.

For the purposes outlined above a maximum change of 100 kc/s either way is all that is necessary. The oscillator does, however, enable the whole of the two metre band to be covered.

In passing it should be mentioned that, prior to the construction of this v.f.o., a Clapp circuit with a fundamental frequency of 8 Mc/s was in use which was in operation only when transmitting. This had one disadvantage, however, as with its attendant multipliers a harmonic reared its ugly head on 194 Mc/s producing, of course, TVI on Band III. The harmonic was suppressed to the satisfaction of the G.P.O. engineer but not to the complete satisfaction of the writer. A Band III TV set working in the shack with transmitting and Band III aerials ten feet apart showed slight traces of cross hatching although it was not discernible on a television set next door.

It seemed, therefore, that it would be better to start at some frequency which even at the worst would not produce a harmonic in television bands at all, and 72-73 Mc/s was chosen for the following reasons:

(i) No possibility of harmonics in Band I;
(ii) No possibility of harmonics affecting i.f.'s of Band I or Band III receivers;
(iii) No possibility of a harmonic falling in Band III. (Third harmonic above 216 Mc/s).

The writer is indebted to G. W. Slack (G5KG) for suggesting the basic circuit of an oscillator which is reputed to have a high degree of stability. It is a twin triode push-pull circuit, very reminiscent of the multivibrator, and glories in the title Kalitron. It comprises very few components and is one of those delightful circuits which function not only in " breadboard " form but repeats the performance when re-engineered for final use.

The Circuit

As will be seen from the circuit diagram (Fig. 1) the valve used in the prototype is a 12AT7. The cathodes are strapped and biased by a 1000 ohm resistor which is not bypassed. This introduces negative feedback to assist stabilization. The anode tank circuit comprises a hairpin loop of 10 s.w.g. silver-plated copper wire (part of an ex-Service inductance). The band-set capacitor is a Philips concentric trimmer of 3 to 30 μF capacity and the band-spread capacitor a split-stator (also ex-Service) with two

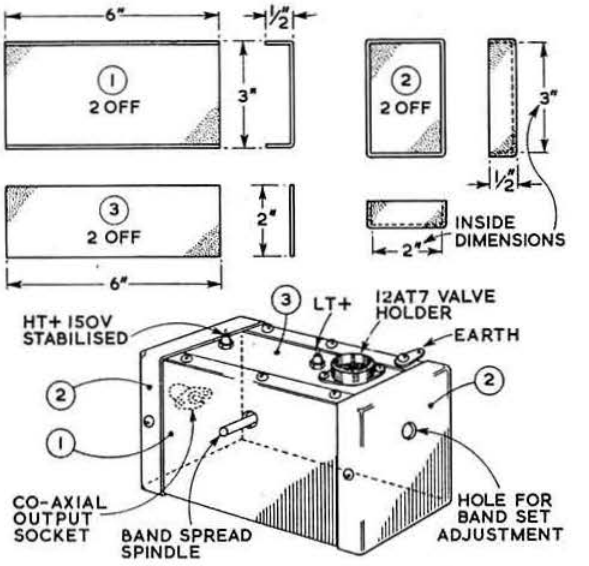


Fig. 2. Details of the construction of the copper or brass box. The thickness of the material may lie between 16 and 22 s.w.g.

* *G5OX, 111, Barberry Avenue, Chatham, Kent.*

stator and two rotor plates in each section giving an approximate capacity of 7·5 μF per section. The condenser is connected midway along the hairpin inductance. The rotor is not earthed.

Construction

The assembly is mounted rigidly in a copper box, one end of which has a Belling & Lee coaxial socket to which is connected a loop lying parallel to the cold end of the anode tank and about $\frac{1}{2}$ in. away from it. Details of the box are given in Figs. 2 and 3. The constructor may have other ideas on the design of a suitable box, but the one described was composed of odd pieces of material which happened to be available.

The various parts of the box are held together by PK self-tapping screws, and the valveholder, together with the feedthrough bypass capacitors, is mounted on the top

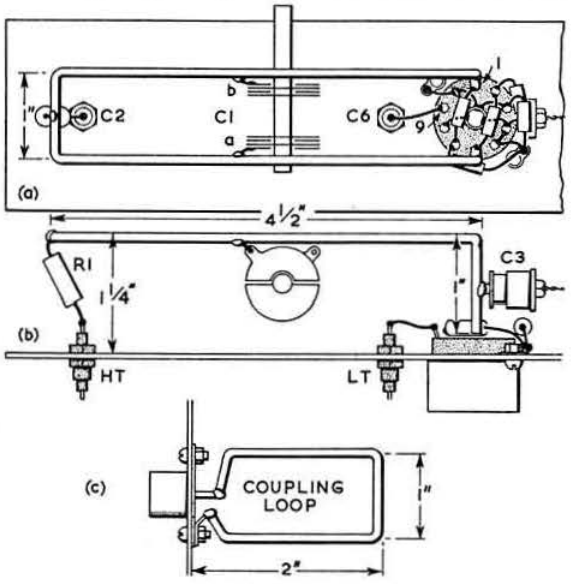


Fig. 3. Diagram (a) shows a view of the underside of the top plate of the box and (b) a side elevation. The coupling loop (c) is mounted approximately ½ inch underneath the tuned circuit.

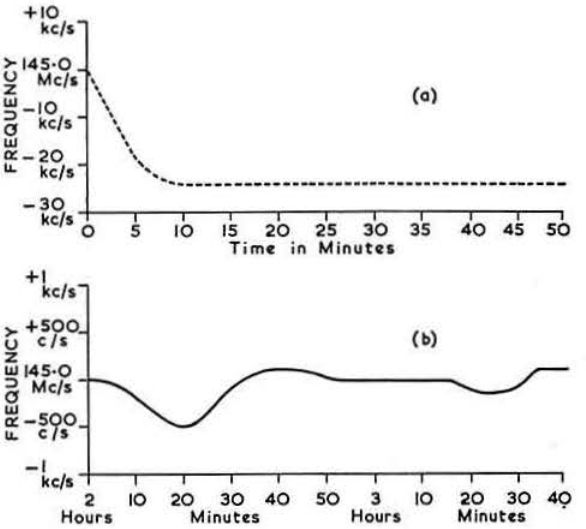


Fig. 4. (a) Initial warm-up drift measured at 145 Mc/s. The ambient temperature varied between 65° and 70° F. during the test. The h.t. supply was 150 volts stabilized by a VR150/30. (b) Variation in frequency after a two-hour run.

plate. (Fig. 3). All earth returns are made to this plate with the exception of the output link which is mounted on one end of the box as already described. The main point to bear in mind is rigid mounting of components with connecting wires as short as possible between these and valveholder contacts, etc.

The assembly of the items on the top plate is first completed, together with the bandspread capacitor. One side of the box is then fitted and the fixing screws inserted to fix the end plate of the capacitor. Then the base and remaining side and the ends are attached and the job is complete.

The connection for the h.t. negative and earthed side of the heater supply goes to a tag under one of the screws fixing the valveholder, which should be P.T.F.E. for optimum results. A screening can is provided for the valve.

A slow motion drive will be required and it is recom-

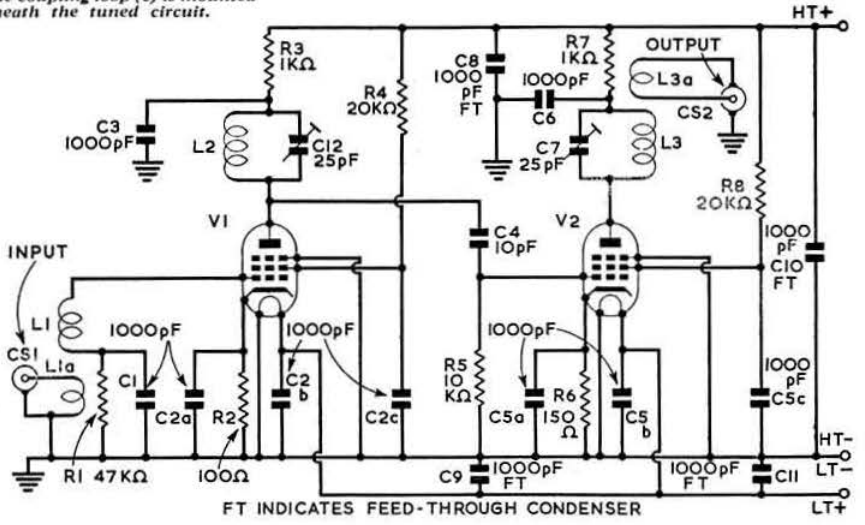


Fig. 5. Circuit diagram of the buffer amplifier for use with the 72 Mc/s Kalitron v.f.o. V1 and V2 are both EF50s. The physical layout used by the writer is shown in Fig. 6. The oscillator is connected to this unit by a short length of coaxial cable.

mended that this be coupled to the band-spread condenser by means of a flexible coupling.

Frequency Stability

Some idea of the order of frequency stability to be expected from the oscillator is given by the graphs in Fig. 4, from which it will be seen that (graph a) the frequency remained substantially constant after rather less than ten minutes from a cold start, l.t. and h.t. having been applied together 20 seconds before observations commenced.

Graph (b), drawn to a much larger scale, shows the random variations in frequency noted during a period of one hour 45 minutes after the oscillator had been in operation for two hours. The maximum deviation is minus 500 cycles with no tendency to depart permanently from the set frequency, and could well have been due to slight variations in the voltage of the l.t. supply. In both instances the measurements were made on the second harmonic of the oscillator at 145 Mc/s.

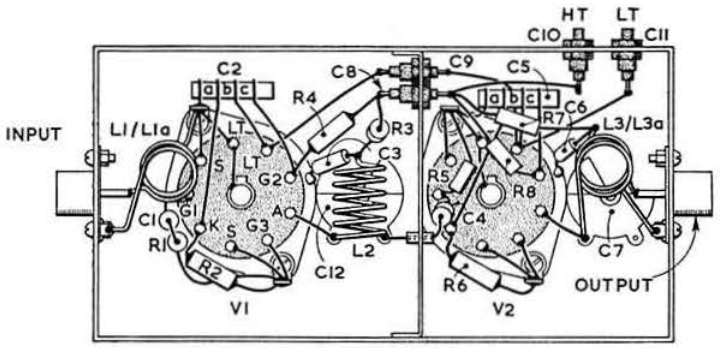


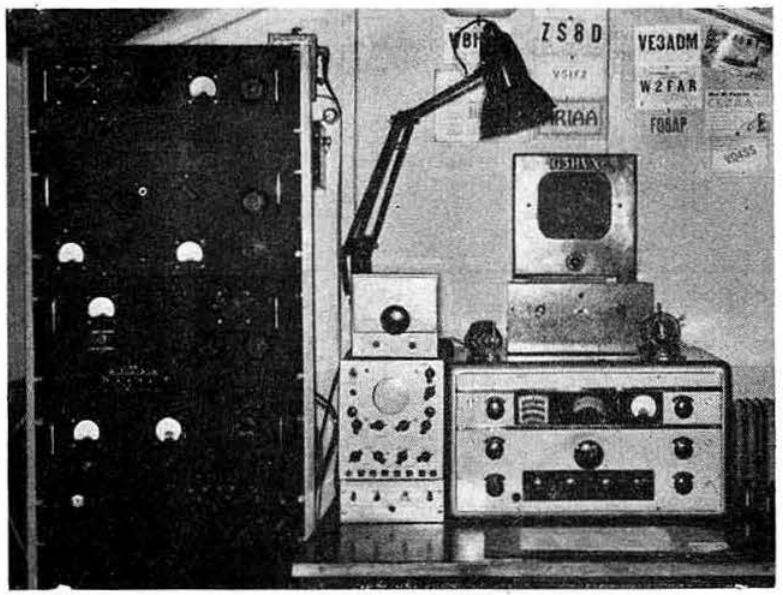
Fig. 6. Layout of the buffer amplifier. The copper or brass chassis measures 6 in. by 3 in. and has a bottom cover plate.

Buffer Amplifier

The 72 Mc/s oscillator is followed by a two-stage buffer amplifier. Mullard EF50s were used in the original but the constructor may use other types depending on the valves available. With 150 volts stabilized h.t. at 4 mA on the v.f.o. and 285 volts at 20 mA on the buffer stages a drive of 2mA is available at the grid of a 5763 which is used as a doubler to 144 Mc/s.

The buffer amplifier follows normal practice for v.h.f. amplification and the actual circuit in use is shown in Fig. 5, together with a component layout sketch in Fig. 6. The frequency of the oscillator may be changed by at least 100 kc/s in either direction without necessitating retuning of the buffer circuits or loss of drive but greater changes will call for readjustment of the tuned circuits of the amplifier. This slight disadvantage could, no doubt, be overcome by adding a further buffer amplifier stage and broad banding all tuned circuits but was not thought necessary for the writer's requirements.

The Station Behind The Call G3HVX



ILLUSTRATED in the photograph is the fine home-built station operated by W. H. Wells of Handsworth, Birmingham, under the call-sign G3HVX.

Two TVI-proof transmitters are in use, one for 3·5 to 30 Mc/s (150 watts input, c.w. only), the other for 1·8 Mc/s phone and c.w. The top unit in the rack is a phase and impedance detector similar to Antennamatch described by G6MB in the May and June 1955 issues of the BULLETIN, together with an all-band tuning unit matching 600 ohm line. The second panel carries the 813 band-switched p.a. for 3·5 to 30 Mc/s with pi-network output. Immediately below is a five band push-button exciter which itself has an output of 60 watts. The fourth panel is the 1·8 Mc/s transmitter, with built-in modulator, which uses an 807 in the p.a. and runs 10 watts input.

On the table is a home-made receiver built around an AR88D tuning unit. Standing on top of the receiver is a selective 50 kc/s i.f. amplifier consisting of 12 tuned circuits of the ferrox cor type with a bandwidth of only 100 c/s at 60db down.

Other equipment includes an oscilloscope (used mainly for monitoring incoming and outgoing signals) on which the v.f.o. stands. The latter unit comprises two separate oscillators (one for 1·8 Mc/s, the other for the high power final), each feeding into its own cathode follower.

A ground plane is used for 14 Mc/s—the favourite band—and a 240 ft. long wire for the other frequencies in use.

Further Improvement of the War-surplus HRO Receiver

By L. J. J. MORGAN (G2HNO)*

AN excellent BULLETIN article† by E. H. Trowell (G2HKU) described the modernisation of the HRO "front end" by providing two 6BA6 r.f. stages and a 6C4-6BE6 oscillator-mixer combination. Stabilized voltage for the oscillator anode was provided by a VR105/30 stabilizer.

It is thought that many HRO owners who have carried the improvement this far may be interested in completing the modernisation of the receiver. This article is intended to show how simple that task is and it may confidently be said that the finished product is an excellent receiver and well worth the trouble of the additional modifications.

Three comments may be permitted regarding G2HKU's front end conversion.

(i) It is suggested that voltage to the 6BE6 mixer screen (pin 6) be taken through a 2K ohms series resistance from the 105 volt regulated source.

(ii) It is possible to buy ready made adapter plates on which to mount B7G and B9A valveholders in the original chassis holes. The use of these plates simplifies the work and allows some of the new wiring to be completed before the new holders are mounted on the chassis.

(iii) There is just sufficient room between and slightly behind the mixer and oscillator valves to mount the VR105/30 stabilizer upright on the chassis in the normal manner.

original circuit; (c) The straightforward substitution of an EBF80 valve for the 6B7 detector—a.v.c.—first audio stage, and a 6AQ5 output valve in place of the type 42 pentode; (d) The incorporation of a series type noise limiter using a 6AL5 double diode; and (e) The addition of a band edge crystal marker.

The I.F. Stages

Fig. 1 shows the original HRO circuit, and Fig. 2 the new i.f. circuit using 6BA6 valves. As with the r.f. stages, B7G ceramic valveholders are mounted on adapter plates, and the centre pins and all by-pass condensers earthed as directly as possible. The crystal filter and interstage i.f. transformers are removed and new shielded grid leads led through the bottom of each can to the new valveholders. The same modification is carried out to the b.f.o. coil assembly in that stage of the work. This is not recommended for tidiness alone; it will provide a good opportunity to clean each

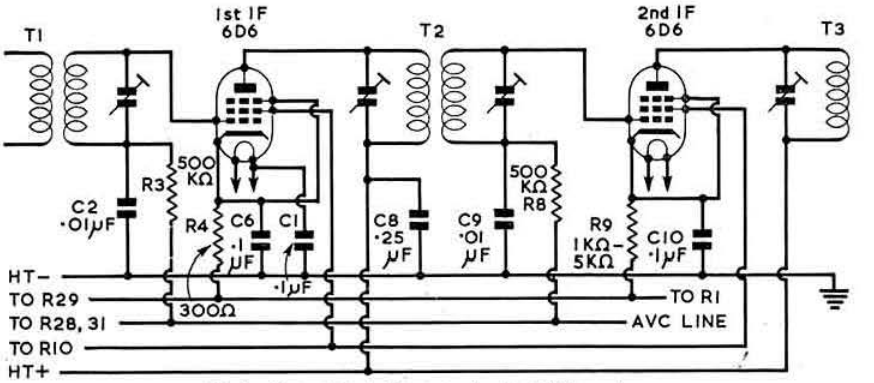


Fig. 1. The original i.f. stages in the HRO receiver.

assembly and to examine the coils for signs of damp and mildew. Care to avoid anode-grid coupling in these single ended stages is essential. Shielded grid leads must be used, and substantial cathode by-pass capacity in a high gain

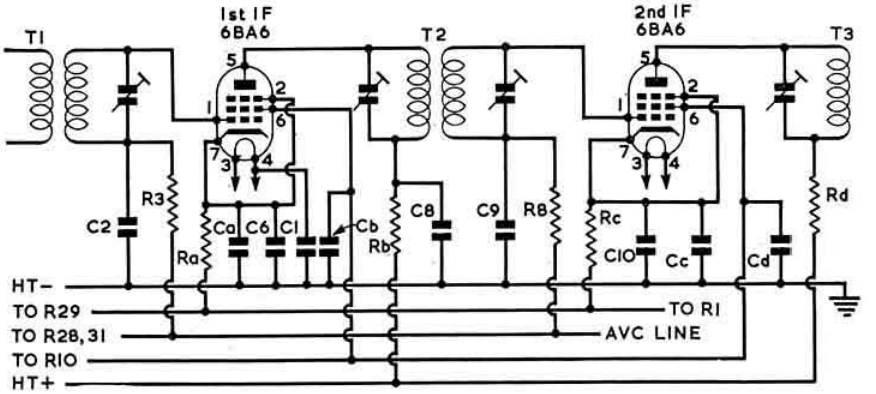


Fig. 2. The modified i.f. stages using 6BA6 valves. The numbered condensers and resistances have the same values as in Fig. 1. CA, B, C, D, 0.01μF disc ceramic; RA, C, 100 ohms (see text); RB, D, 2K ohms.

The completion of the HRO modernisation comprises five stages. (a) The substitution of 6BA6 valves for the existing 6D6 i.f. amplifiers; (b) The provision of a 6C4 voltage stabilized b.f.o. in place of the 6C6 valve in the 456 kc/s i.f. amplifier is most important. Some experiment may be needed to fix the value of the second i.f. cathode bias resistance. This should be as low as will avoid regeneration with the r.f. gain control fully advanced, but with care it will be possible to use the full gain of both stages.

The i.f. transformers will, of course, need realignment when the new valves have been fitted.

* *52 Seafield Road, Southbourne, Bournemouth.*

† *R.S.G.B. Bulletin, March 1957. Reprints are available from Headquarters, price 1s. each post paid.*

The B.f.o. Stage

The 105 volt stabilized source incorporated for the h.f. oscillator gives the opportunity of providing the refinement of a voltage regulated b.f.o. Fig. 3 shows the simple circuit of the new 6C4 b.f.o. stage. Coupling between the b.f.o. cathode and the detector diode is provided by a 2pF ceremic condenser. The original coupling condenser is discarded.

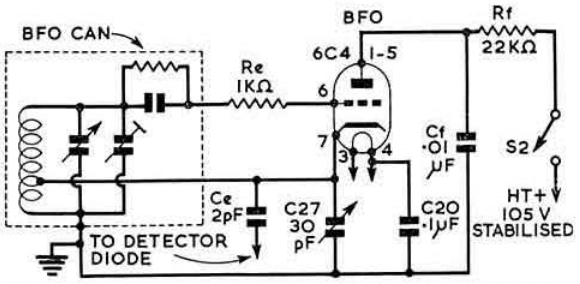


Fig. 3. The new b.f.o. for the HRO. C20, C27 and S2 (c.w. oscillator switch) are original components. CE is a 2pF ceramic condenser and CF a 0.01μF disc ceramic.

The Detector and Audio Stages

Here there is straightforward valve substitution without circuit changes of any kind. An EBF80 or 6N8, with a B9A base, replaces the 6B7, and a 6AQ5 (B7G base) does duty in place of the 42 output pentode. The value of making these last changes may be questioned, but the fact is that the new valves are obtainable more cheaply in the surplus market than the old and will continue to be freely available as current production types.

The Noise Limiter

The circuit adopted (Fig. 4) is a copy of the noise limiter used in the Collins 75A-4 receiver and uses a 6AL5 double diode. On the front left-hand side of the HRO chassis are three slots. The B7G valveholder for the limiter diode mounts very neatly midway along the centre slot. The on-off switch and the threshold control (a miniature 1 Megohm potentiometer) are mounted one above the other on the front panel to the right of the "S" meter. It will be seen from Fig. 4 that the limiter is inserted conventionally between the detector diode and the grid of the first audio stage. The connection between the junction of the two diode load resistances and the original 6B7 grid coupling condenser is broken. A twin shielded line is carried from these points to

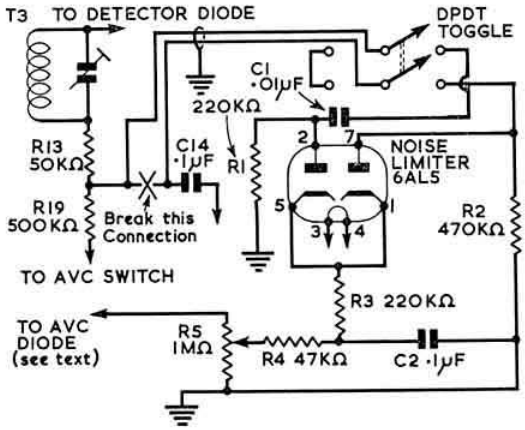


Fig. 4. The noise limiter circuit used by G2HNO, based on the arrangement used in the Collins 75A4. C14, R13 and R19 are original components.

the d.p.d.t. toggle switch on the panel. One position of this switch shorts the twin line and restores the original circuit. The other position switches in the limiter. Cathode bias for the 6AL5 is obtained from the a.v.c. diode, in fact from the "off" pole of the a.v.c. switch. This switch is, of course, conveniently close to the limiter valve.

Band Edge Crystal Marker

Finally a band edge crystal marker is constructed and incorporated in the receiver. It is built on a small plate mounted above the chassis immediately in front of the 6AQ5 output valve and behind the new noise limiter valve. The value of a reliable marker for the low frequency edge of each amateur band need not be stressed, particularly to the c.w. operator. It will also provide a stable signal source for alignment purposes. The circuit, using a 6AM6 valve, is shown in Fig. 5. Many other types of pentode valve will serve as well, and in place of the 7000 kc/s crystal, one cut to 500, 1000, 1750 or 3500 kc/s will serve an equally useful purpose. The h.t. line to this oscillator is controlled by a spring loaded toggle switch biased off so that the oscillator cannot be left running. The switch is mounted on the front panel above the new noise limiter controls. Some degree of coupling to the aerial input may be needed. If so, a low value

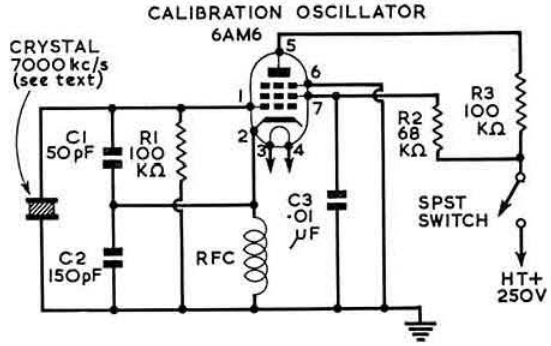


Fig. 5. A band edge crystal marker for the National HRO. For suggestions regarding the frequency of the crystal, see text.

ceramic condenser (say 2pF) is suitable to couple the anode of the 6AM6 to the aerial input.

It must be kept in mind that the total heater current of the receiver is now 3·15 amps and that there are two pilot lamp bulbs as well. Make sure that the receiver power supply is well capable of dealing with this load.

Two other minor improvements are suggested. The first is the provision of a coaxial aerial input socket and line. Secondly, it may be useful to replace the existing send-receive switch with a d.p.s.t. switch. The additional pair of contacts can be carried to a socket at the rear of the chassis and is then available for relay control of the station.

Conclusion

It is interesting to record that the cost of the conversion, "front end" included, is less than £5. A great advantage is that the work may be done stage by stage and the receiver kept in full use meanwhile. The performance of the modified HRO is really first-class and the owner of it will no longer look with envy on the glossy advertisements of new communications receivers.

21 Mc/s Bandspread Coils for the HRO

MEMBERS owning National HRO receivers will be interested to know that the construction of a 21 Mc/s bandspread coil for the HRO is described in an article by E. H. Trowell (G2HKU) in the August 1958 issue of the *Radio Constructor*.

Mobile Column

BY JOHN A. ROUSE (G2AHL/M) *

VIBRATORS and rotary converters are not very efficient methods of obtaining h.t. in mobile equipment, the power required to operate these devices even without load representing a considerable part of that available from the car battery. One way to use the battery to better advantage is to employ the new valves which do not require high voltages for their anode supplies.

R. F. Stevens (G2BVN) reports that the new valves have much to offer the mobile operator. The circuitry involved is simple as no cathode bias resistors or condensers are required, while fewer screen resistors and generally not more than two by-pass condensers are needed. The use of the same voltage source for both heater and anode circuits not only conserves battery power but also helps to reduce the noise level by eliminating the hash set up by vibrators and rotary converters.

The valves at present available in the Mullard series are:

(*a*) the type EF98, a pentode designed as a driver valve for a transistor output stage, but which when connected as a triode readily oscillates on frequencies up to 30 Mc/s when connected in a tuned grid circuit;

(*b*) the ECH83, a triode heptode intended for use as a frequency changer or combined r.f. and a.f. amplifier. For amateur band use the heptode section should be employed as a mixer in conjunction with a separate oscillator;

(*c*) the EBF83, a double diode variable–mu pentode, the pentode section of which may be used as a r.f. or i.f. amplifier, with the diode sections suitable for a.m. detection.

A valve which will be generally available in the near future is the EF97, a variable–mu pentode designed for use as an r.f. or i.f. amplifier, which provides useful gain on frequencies up to at least 30 Mc/s. This valve has a mutual conductance of 2mA/V and an anode impedance of 150,000 ohms. All the types mentioned draw heater currents of 300 mA.

A mobile converter has been constructed by G2BVN using the types EF97, ECH83 and EF98 and is designed to feed into a car radio at 1·5 Mc/s. Whilst the sensitivity is slightly inferior to a converter using conventional valves, the gain is ample for normal use, particularly in conditions of high ambient noise level. The gain of the EF97 r.f. stage at 3·5 Mc/s is at least 50 times, and at 28 Mc/s at least 25 times, with an anode voltage of 12 and the screen fed through a resistor of 3,300 ohms.

It has been found that in most cases resistance capacity filtering on the battery leads is sufficient and values of 100 μF and 47 ohms are suggested. Account must be taken of the earth polarity of the battery in a vehicle where equipment using these valves is to be used, and the design modified accordingly.

Derby Mobile Rally

Excellent weather favoured the first Derby Mobile Rally held at Rykneld School, Derby, on August 17. About 350 visitors in more than 150 cars, 83 of which were mobiles, attended the event, which was organised jointly by the Derby and District Amateur Radio Society, Derby Short Wave Experimental Society and the Unit Radio Club, 21st (NM) Corps Signal Regiment (TA).

The programme included a demonstration of radio controlled model aircraft by R. Cullen, a Junk Sale conducted by R.S.G.B. County Representative Tom Darn (G3FGY), a treasure hunt (won by Miss Susan Shaw and Miss Lynn Armstrong), an exhibition arranged by Norman Birkett Ltd. and two competitions for mobiles. The winner of the most meritorious mobile aerial contest, judged by Tom Douglas (G3BA), was Bob Palmer (G5PP) with A. G. Stormont (G3GWR) a close second. The other competition for the most " slap happy " station (in a kindly way), was won by B. Meadon (G3BHT) who was presented with an 813.

From G2CVV's report it certainly sounds as though the rally was a great success and no doubt there will be another in Derby next year.

Out and About

G3CTE and his wife G3EYO/M operated mobile while on holiday in Scotland and although band conditions were far from good had many contacts on 3·5 and 7 Mc/s every day. On July 6 they had an excellent four-way with GM3IBU/P, GI3IOS and GW3KY on 3·5 Mc/s. Other QSOs were made with stations as far apart as Pinner, Middlesex, Northwich, Cheshire, St. Albans, Plymouth, Co. Down, and Aberdeen. Provided the mobile was not in the shadow of high cliffs or in a ravine, very little variation in signal strength was noted. These experiences of G3YEO/M are particularly interesting when compared with G2CD/M's somewhat disheartening results whilst operating on Top Band in Scotland, as reported in the July *Mobile Column*.

It is generally assumed that most mobiles operate on either Top Band or two metres and it would be interesting therefore to have some reports from those who operate on other bands, particularly 14, 21 and 28 Mc/s.

G6SN/M had little luck while on holiday in North Devon until he announced his presence to GW8UH and G2ADZ who passed the news to GW3MFY and GW8SU that he was on 2 metres. Later G3AOS/M was also worked. As a result of his experiences, G6SN suggests that a list of mobiles should be published each month so that " locals " would know when to be on the lookout for them. G6SN is now using a half-wave dipole with a Clemens Match (R.S.G.B. BULLETIN, January 1957) for mobile work. G3BA is trying the same matching system on 70 cm. G6SN reports that Champion " X " plugs (the type with built-in suppressors) reduced the ignition interference in his car by about 90 per cent. They cost 6/- each, and have the letter X in front of the usual coding, i.e., the suppressed version of the L-10 plug is type XL-10.

C. F. Albecht (F.R.S. 289) of Newbury, has had his car radio modified by G3LLK for Top Band use. Are there any other listener mobiles?

* * *

Contributions to *Mobile Column* are always welcome, particularly those which contain hints and tips and descriptions of equipment and aerials. Reports should be addressed to the writer at R.S.G.B. Headquarters.

London Lecture Meeting

Friday, September 26, 1958

" Broadcasting Aerials "

by H. V. Sims, A.M.Brit.I.R.E., Assoc. I.E.E.

(Senior Lecturer, B.B.C. Engineering Training Dept., Wood Norton, Evesham)

The lecture will be illustrated throughout with the aid of demonstrations and slides.

To be given in the Lecture Theatre of the Electric Lamp Manufacturers' Association at the

Institution of Electrical Engineers

Savoy Place, Victoria Embankment

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

* *Assistant Editor, R.S.G.B. Bulletin*

Technical Topics

By PAT HAWKER (G3VA)

WHEN single-sideband transmissions began to emanate from amateur stations in 1947, there were many who doubted whether this technique would be more than a passing phase (no pun intended!). Today, few would question that, whether or not a.m. is ever completely ousted, s.s.b. is here to stay. In the United States, the commercial package unit now offers " sideband " even to those who would otherwise have played safe with a.m. For, despite the many simple and satisfactory designs that have appeared, the construction and alignment of an s.s.b. exciter is still not the sort of job to plunge into without a good deal of preliminary planning.

In the past 18 months or so, another transmission technique has been popularized in the United States: double-sideband (d.s.b.) or to give it its full title " double-sideband suppressed carrier." Although neither so elegant technically nor offering such an impressive power gain (at least when used in conjunction with a conventional receiver) as s.s.b., it has one overriding advantage to the busy amateur—it is simple and inexpensive to try out.

D.s.b. is not a new form of transmission even with amateurs but its present popularity dates from a series of articles by J. P. Costas (W2CRR) in *Proc. I.R.E.* (December,

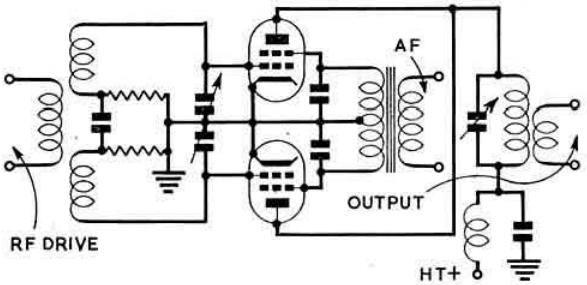


Fig. 1. Basic circuit of a screen grid balanced modulator (grids in push-pull, anodes in parallel).

1956; April, 1957) and *CQ* (January. 1957), followed by a flood of other articles in *CQ* (April, June, September, October, November 1957, March 1958). In theory there is no saving in frequency space over a.m. (the great advantage of s.s.b.), although in practice the reduction of the carrier tends to eliminate heterodyne interference, so that interference is much less troublesome. D.s.b. transmitters also lend themselves to voice-operated control (VOX) circuits and this in itself greatly improves the efficiency of communication.

It is well known that in s.s.b. the main difficulty is not that of suppressing the carrier—this is done fairly simply with a balanced modulator—but lies in the subsequent elimination of the unwanted sideband. It is this process, accomplished usually by crystal or mechanical filters at a relatively low frequency, or by the phase-shift system, that accounts for the complexity of s.s.b. exciters.

On d.s.b. the rig is similar to that of a.m. equipment except that the final amplifier is operated as a balanced modulator, usually with screen-grid modulation. Alternatively, the final stage of an exciter may be modulated and used to drive a linear amplifier. The balanced modulator often consists of a modified parallel or push-pull amplifier, with the r.f. drive applied to the grids in push-pull, a.f. applied to the screen-grids in push-pull, and the anodes in parallel, thus cancelling out the r.f. carrier. A conventional p.a. having two valves in parallel can readily be converted to a high-level balanced modulator, simply by changing the input circuit. Fig. 1 shows the basic circuit of the usual system.

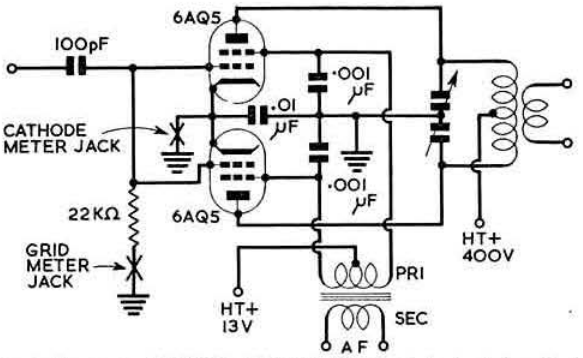


Fig. 2. P.a. stage of K2GZT's " Double Side-band Junior " described in the March-April 1958 issue of " G.E. Ham News " (U.S.A.).

Another arrangement is to have paralleled grids, with the anode circuits connected in push-pull, and an extremely neat 20 watt rig for 3·5 Mc/s using this system is fully described by K2GZT in the March/April, 1958 issue of *G.E. Ham News* (this journal's address is *Lighthouse Larry*, General Electric Company, Electronic Components Division, Building 267–2, Schenectady, N.Y.*). The p.a. comprises two 6AQ5 valves (the miniature 6V6G), modulated by one-half of a 12BH7A valve, the other half of which forms a crystal oscillator. A 12AU7 twin triode looks after the audio amplification and the circuit includes simple speech clipping and splatter suppression. The p.a. of this compact transmitter is shown in Fig. 2.

From the receiving end, the d.s.b. signals sound like s.s.b. and to render them intelligible the same tuning procedure and carrier re-insertion is necessary. In theory, an even greater degree of carrier injection stability and general receiver stability is required, but reports suggest that any receiver capable of giving good results on s.s.b. will hold stable d.s.b. signals without undue difficulty. The normal s.s.b. receiver will, of course, filter out one sideband and the power in this unused sideband will not contribute to the strength of the signal received. For this reason the ideal receiving arrangement is to use a synchronous detector which utilizes both sidebands (a synchronous detector adaptor for conventional receivers was described in *CQ*, June, 1957).

D.s.b. transmissions are " compatible " with s.s.b. and in fact many d.s.b. stations join in s.s.b. nets without the s.s.b. operators realizing that there is a " stranger " in their midst.

In summing up the technical features of d.s.b., *QST* (March 1957) stated: " It does not reduce the total bandwidth occupied by an a.m. signal, which is why we do not consider it an ultimate " competitor " of s.s.b. in the amateur field. Rather, it seems to us to be an intermediate step—in the right direction, certainly, since any system that leads to the eventual elimination of 'phone carriers will contribute to better conditions in the 'phone bands."

Cathode-ray Facsimile

Incidentally, yet another form of amateur transmission—cathode-ray facsimile—has been described in *QST* (August, September 1958) by W4ZII/2. By slowing down the scanning frequencies of a television system, the signals can be confined to a band-width no greater than for a.m. telephony. The equipment described is for 120 lines with a frame repetition rate of six seconds and a line frequency of 20 c/s. A cathode-ray tube with a long-persistence screen is used for viewing the still images. A conventional telephony transmitter and communications receiver can be used.

* Subscriptions are accepted by the International General Electric Co. of New York Ltd., Crown House, Aldwych, London, W.C.2.

Black Boxes

There are signs that many amateurs who for years have regarded communications receivers as mysterious " black boxes "—strictly not to be touched or built—are now sitting up and taking interest in home construction. The differing requirements for receivers for a.m., s.s.b., d.s.b. and c.w. and the rapid increase in U.S. activity have all played their part in setting more stringent needs than can

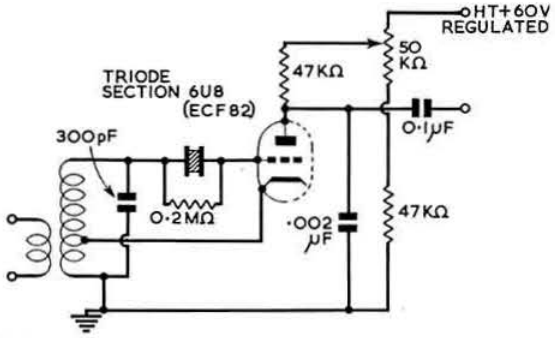


Fig. 3. Use of a quartz crystal in the grid circuit of the regenerative second detector in W5DF's simple c.w. receiver (CQ, July 1958).

readily be met by one of the war-time receivers with up to 20 years' continuous use. W5DF (see later) puts into words a thought which has become progressively clearer during recent years, that " in some point of time there is going to be a distinction made between 'phone and c.w. receivers " since, unless there is a duplication in at least the i.f. channels, detectors, and a.f. response curves, it is no longer possible to have the highest performance for both modes in the same set.

To judge by the correspondence columns, one of the most popular " full specification " receiver designs of recent years was W6TC's " HBR–14 " described in *QST*, July 1957. This was a 14-valve double conversion (i.f. 1600 and 75 kc/s) model using plug-in coils and a crystal-controlled second oscillator. The aim was to provide a high-performance receiver with reasonably simple and straightforward construction at moderate cost.

The HBR–14 used accepted design practice, but for those attracted towards more unorthodox ideas, some interesting ones are to be found in a simple four-valve c.w. receiver by W5DF in *CQ*, July 1958. This uses three quartz crystals, has a 1750 kc/s i.f. (home-wound i.f. coils) and covers 3·5, 7 and 14 Mc/s without any coil changing. The first crystal is used in a normal filter to remove the audio image; the second in a fixed tuned b.f.o.; and the third, which provides a high order of selectivity, is inserted in the grid circuit of a regenerative second detector (see Fig. 3). Another interesting feature is the home-built p.t.o. (permeability tuned oscillator) with a drive screw moving a slug into a coil form adjusted to produce a tuning rate of about 30 kc/s per revolution, permitting the dial to be calibrated in $\frac{1}{2}$ kc/s dial divisions. This particular design is primarily for 3·5 and 7 Mc/s (the absence of an r.f. stage would be a handicap on 14 Mc/s unless a pre-amplifier was used) but some of these features might find useful application in more ambitious designs.

Other receiver ideas crop up in "An 80-metre Tuner " by W6STA (*QST*, July 1958) which features good band-spreading and a high degree of oscillator stability (Clapp circuit) and which provides an output on 2215 kc/s. Other bands are received by means of crystal-controlled converters. In the same issue is a " Receiver for the 50 Mc/s Man " by W9LIJ, a single-conversion design built around a 9 Mc/s h.f. crystal lattice filter, commercially available in the United States.

But even the most avid home constructor would find it difficult to refuse one of the famous Collins receivers with their mechanical filters and high-stability p.t.o.s (more than 5 000 of the fabulous 75A–4s have been produced). A block outline of their latest receiver, the 75S–1 is given in Fig. 4.

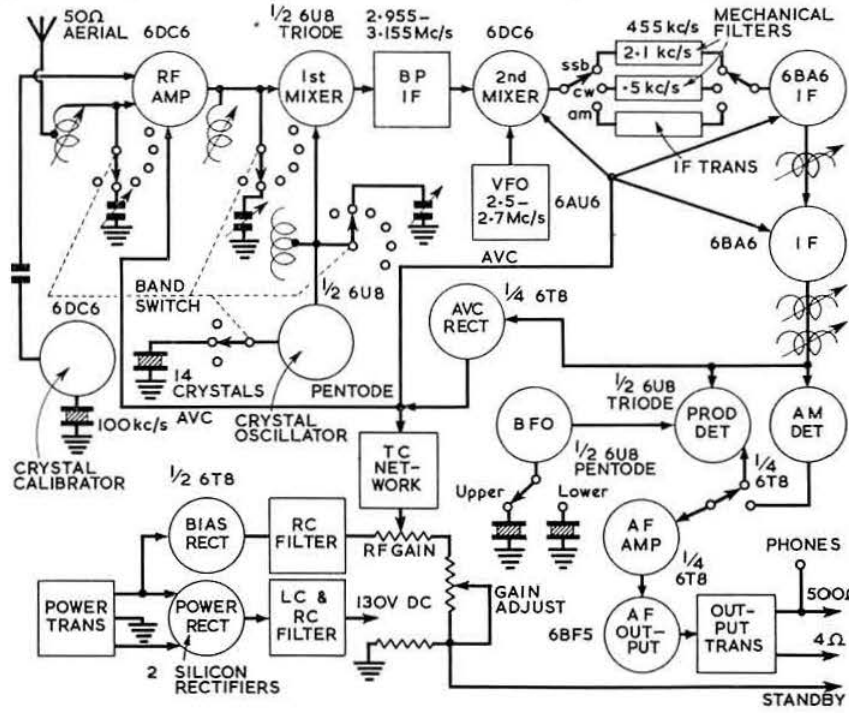


Fig. 4. Block diagram of the new Collins 75S–1 receiver which covers amateur bands from 3·5 to 29·7 Mc/s (plus 15 Mc/s for WWV) in thirteen 200 kc/s wide bands, giving a dial accuracy (electrical) of 300 c/s on each band with backlash of less than 50 c/s. A 2·1 kc/s wide mechanical filter is used for s.s.b. reception and a 0·5 kc/s mechanical filter for c.w. The v.f.o. can be used to control transmitter frequency for single-channel operation. All this is fitted into a 20 lb. package measuring 6⅞ in. high, 14½ in. wide and 11⅝ in. deep.

DO YOU KNOW THE RADIO REGULATIONS?

By DAVID DEACON (G3BCM)

"IGNORANCE is Bliss," may be the title of a well-known radio programme, but it is not the *modus operandi* tolerated under the regulations scheduled in a licence to operate wireless telegraphy equipment. It should be noted that the term wireless telegraphy has the meaning assigned to it under the 1949 Wireless Telegraphy Act, and includes *inter alia*, telegraphy, telephony, facsimile and television transmissions, etc., by means of Hertzian waves.

Reference to clauses 2 and 16 of the United Kingdom Amateur (Sound) Licence leave no doubt that the licensee is obliged to be familiar, and comply, with the International Radio Regulations currently in force.

As it is not an easy matter at this time to obtain copies of the Radio Regulations (the bulk of which concern the public correspondence, aeronautical and maritime radio services), an extract of those parts which affect the radio amateur may be found helpful, and a useful reference affording compliance with the terms and conditions prescribed in the amateur licences.

Radio Regulations

The present International Radio Regulations were originally published as an annexe to the Telecommunications Convention of Atlantic City 1947, under which Convention they were ratified by participating administrations, and brought into force. At the present time they are in force under the Telecommunications Convention of Buenos Aires 1952, which superseded the Atlantic City Convention. The next Convention takes place in Geneva towards the latter part of 1959.

Parts of seven chapters and four appendices in the International Radio Regulations are noteworthy and read as follows:

Chapter 1, Article 1.—Definitions

para. 5. Hertzian Waves.—Electromagnetic waves between 10 kc/s and 3,000,000 Mc/s.

para. 31. Amateur Service.—A service of self-training intercommunication and technical investigation carried on by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

para. 58. Bandwidth Occupied.—The band of frequencies comprising 99 per cent of the total radiated power, including any discrete frequency on which the power is 0·25 per cent of the total radiated power.

para. 59. Frequency Tolerance.—The frequency tolerance expressed as a percentage, or in cycles per second, is the maximum permitted deviation with respect to the reference frequency(1) of the corresponding characteristic frequency of an emission.

(1) A long footnote follows explaining reference frequency and carrier frequency when using single sideband, etc. . . .

para. 69. Harmful Interference.—Any radiation or any induction which endangers the functioning of a radionavigation service or of a safety service, or obstructs or repeatedly interrupts a radio service operating in accordance with these regulations.

Chapter 3, Article 5.—Frequency Allocation Table

para. 100. World Division.

Region I includes: Europe, Africa, Arabia, U.S.S.R., Mongolia, Turkey, Iran (part).

Region II includes: North and South America and Greenland.

Region III includes: The rest of the world not covered in the above.

para. 145, note 31. Region I.—In the band 1715-2000 kc/s, Austria, Ireland, Netherlands, Northern and Southern Rhodesia, Switzerland, Union of South Africa and the United Kingdom may assign up to 200 kc/s for the Amateur Service subject to non interference to authorized services of other countries and a maximum mean power of 10 watts.

para. 158, note 44. Region I.—The use of the band 7100-7150 kc/s by the Amateur Service is authorized, provided that no harmful interference is caused to the Broadcasting Service. In the Union of South Africa the band is exclusive to the Amateur Service.

para. 165, note 51. Region I.—In the U.S.S.R., 14,250-14,350 kc/s is allocated to the Fixed Service.

(Note.—In the United Kingdom the band 144-145 Mc/s is allocated on a shared basis in derogation of the Atlantic City Table, which shows it as exclusive to amateurs on a World-wide basis.—EDITOR.)

para. 210, note 96. Region I.—In the band 420-460 Mc/s the Aeronautical Radionavigation Service has priority. The other services are admitted to the band only on condition that harmful interference is not caused to the Aeronautical Service.

para. 220, note 106. United Kingdom.—The frequency 2450 Mc/s is for industrial, scientific and medical use, with band limits ±50 Mc/s. Radiocommunication services must accept any harmful interference experienced from I.S.M. equipment.

para. 228, note 114. United Kingdom.—The frequency 5850 Mc/s ±75 Mc/s, is subject to the same limitations as for 2450 Mc/s in para. 220 above.

Chapter 3, Article 7.—Use of Frequencies

para. 234.—Long Distance Characteristics.—5000 to 30,000 kc/s are particularly useful for long distance communication. Whenever frequencies in this band are used for short or medium distance communications the minimum power necessary shall be employed.

Chapter 5, Article 13.—Interference and Tests

para. 372.—Unnecessary transmissions and superfluous signals and correspondence are forbidden to all stations.

para. 373.—All stations shall radiate only as much power as is necessary to ensure a satisfactory service.

para. 374.—In order to avoid interference—radiation in unnecessary directions shall be minimized, where the nature of the service permits, by taking the maximum practical advantage of the properties of directional aerials.

para. 375.—Taking into account practical and technical considerations, as well as the service to be performed, the class of emissions making use of the narrowest band shall be employed.

para. 376.—If, while complying with the provisions of Article 17 (under), a transmitter causes harmful interference through the intensity of its harmonics or other non-essential emissions, special measures must be taken to eliminate such interference.

para. 383.—The transmission of signals without identification is forbidden to all stations.

para. 384.—In order that identification of stations may be as rapid as possible, stations provided with call-signs in accordance with Article 19 (under) must, unless the Regulations provide otherwise, transmit this call-sign during the course of their transmissions as frequently as is practicable and reasonable.

para. 385.—Any station carrying out emissions for tests, adjustments or experiments, must, whenever possible, transmit at slow speed its call-sign or, if necessary, its name, at frequent intervals during the course of these emissions.

Chapter 5, Article 15.—Reports of Infringements

para. 392.—Infringements of the Convention or Radio Regulations are reported by the control organization, station or inspectors detecting them.

para. 393.—In the case of a station committing serious infringements, representations relating to them must be made to the administrations of the country to which the station belongs, by the administrations which detect them.

Chapter 6, Article 16.—Choice of Apparatus

para. 395.—The choice of apparatus and devices to be used in a station shall be unrestricted, provided that the performance thereof, and the emissions therein, satisfy the provisions of these Regulations.

para. 396.—However, within the limits consistent with practical considerations, the choice of transmitting, receiving and measuring apparatus must be guided by the latest technical progress, particularly as indicated in the Recommendations of the C.C.I.R.

Chapter 6, Article 17.—Quality of Emissions

para. 397.—The station must conform to the Frequency Tolerances as specified in Appendix 3 (under).

para 398.—The bandwidth of emissions, level of radio frequency harmonics, and non-essential emissions must be kept at the lowest value which the state of technique and the nature of the service permits. Appendices 4 and 5 must be considered a guide until more recent Recommendations of the C.C.I.R. are published.

para. 399.—To ensure compliance with these Regulations, the administrations will take necessary steps for frequent checks to be made of the emissions of the stations under their jurisdiction; the technique of measurement being in accordance with the most recent Recommendations of the C.C.I.R.

Chapter 7, Article 19.—Call-Signs

para. 412.—All stations open to the international service of public correspondence, all amateur stations, and other stations which are capable of causing harmful interference beyond the boundaries of the country to which they belong, must have call-signs from the international series assigned to each country.

Chapter 10, Article 22.—Licences

para. 488.—No transmitting station may be established or operated by a private person or by any enterprise without a licence issued by the government of the country to which the station in question is subject.

para. 490.—The holder of a licence is required to preserve the secrecy of telecommunications as provided in Article 32 of the Convention. Moreover the licence must provide that if the station includes a receiver, the interception of radiocommunication correspondence, other than that which the station is authorized to receive, is forbidden, and that in the case where such correspondence is involuntarily received it must not be reproduced, nor communicated to third parties, nor used for any purpose, and even its existence must not be disclosed.

Chapter 16, Article 42.—Amateur Stations

para. 1000.—Radiocommunication between amateur stations of different countries shall be forbidden if the administration of one of the countries concerned has notified that it objects to such radiocommunication.

para. 1001.—When transmissions between amateur stations of different countries are permitted they must be in plain language and must be limited to messages of a technical nature relating to tests and to remarks of a personal character for which, by reason of their unimportance, recourse to the public telecommunications service is not justified. It is absolutely forbidden for amateur stations to be used for transmitting international communications on behalf of third parties.

para. 1002.—The proceeding provisions may be modified by special arrangements between the countries concerned.

para. 1003.—Any person operating the apparatus in an amateur station must have proved that he is able to transmit and to receive by ear, texts in Morse code signals. Administrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 1000 Mc/s. (The R.S.G.B. has proposed to the G.P.O. an amendment, substituting 400 Mc/s for 1000 Mc/s. The U.K. administration have proposed that the word " texts " shall be replaced by the phrase " plain language and figures." Both proposals will be discussed at the 1959 Administrative Radio Conference.—EDITOR.)

para. 1004.—Administrations shall take such measures as they judge necessary to verify the qualifications, from a technical point of view, of any person operating the apparatus of an amateur station.

para. 1005.—The maximum power of amateur stations shall be fixed by the administration concerned, having regard to the technical qualifications of the operators and to the conditions under which the stations must work.

para. 1006.—All the general rules of the Convention and of the present Regulations shall apply to amateur stations. In particular the transmitting frequency must be as constant and as free from harmonics as the state of technical development for stations of this nature permits.

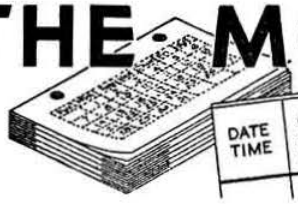
para. 1007.—During the course of their transmissions amateur stations must transmit their call-sign at short intervals.

Chapter 16, Article 43.—Experimental Stations

para. 1008.—An experimental station may enter into communication with an experimental station of another

(Continued on page 118)

THE MONTH ON THE AIR



By S. A. HERBERT (G3ATU)*

AS Summer (*sic!*) passes into Autumn, the nights grow longer, m.u.f.'s start to rise and radio conditions show signs of improvement, which is, after all, a very good thing. At least, as the fogs of Autumn roll noxiously over the country and the biting winds of Winter take over and do their worst, radio types can take refuge in their hobby, secure in the knowledge that DX will be around for at least some of the time!

In fact, recently, the bands have begun to take on something of an autumnal character and are holding more consistent DX than has been the case during the past three months. The two higher frequency bands particularly are livelier; indeed, ten metres should be open for " business as usual " once more as you read these notes.

Things, then, are improving, but before dealing with the bands in detail, we turn to the news from various quarters.

News from Far and Wide

Sudan: ST2AR (G4AR) has been mainly on 21 Mc/s, where the effects of solar outbursts were frequent, but on August 2, he caught a splendid opening and in forty-five minutes he worked stations in seven continents—only the Arctic was missing, but later on, SM8AQT/LA/P gave him that one, too. Eric's recent catches include VS9MA, VP2VB, FY7YF, LX1BG, ZK2AD and YA2AC, who said he was in Kandahar. This one has been around for quite a time. G3FPK heard him in March, giving the same QTH and asking for QSLs via the Pakistan Society, but whether he really is genuine is anybody's guess. Utah, Nebraska, Nevada and North Dakota are needed for W.A.S., while four more countries will complete the ST2AR E.DX.C., which Eric hopes to have ere proceeding on leave on October 1. At home, he will be at 119 Raeburn Avenue, Surbiton, Surrey, and he hopes to meet many chaps who are so far only dots and dashes!

U.S.A.: Bill Schneider, Jr. **(K2UYG)** passes the news that by order of the F.C.C., all W/K amateur privileges in the 27 Mc/s band will be discontinued as from September 11, 1958.

Australia: Ex-G3HCC is now signing **VK2HV**, from Bargo, N.S.W. After listening on 14, 21 and 28 Mc/s, he found a number of U.K. stations working the Ws and getting reports of RST559 or less, while the same Gs were RST579 in VK. Obviously a case has been made for more careful listening over here.

Singapore: VS1GZ is back on the air again with 25 watts or so. They hear that VS1JF will not now make the trip to the Maldives. Still, **VS9MA** is there and very much in evidence at the moment.

Northern Rhodesia: VQ2IE puts forward a c.w. man's plea to encroaching phones who are invading the c.w. end of the bands in large numbers. " Kindly," he says, " keep to your own part of the spectrum."

Denmark: Margaret Rasmussen, the English XYL of **OZ1PR**, remarks that a QSL from that station is invariably sent if required and normally via the E.D.R. Stations wanting a direct card or who do not want one should say so during the QSO. Listener's reports are welcomed and will be acknowledged.

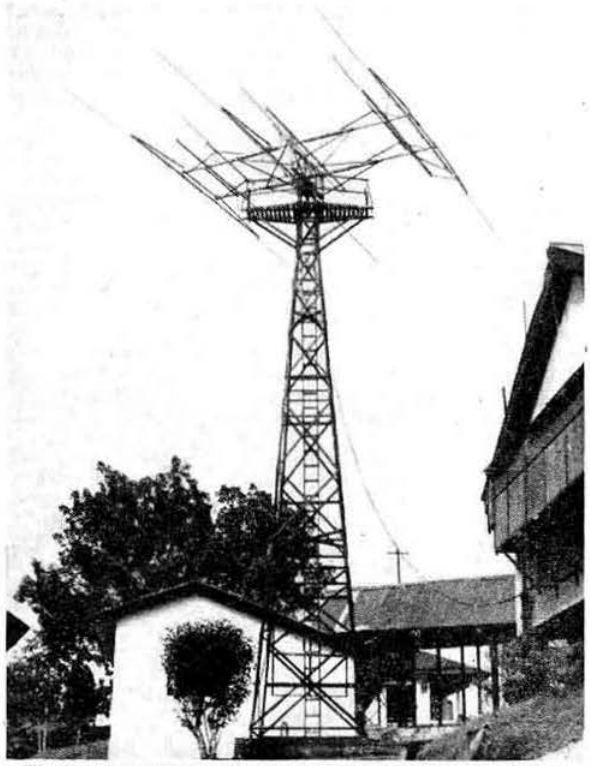
Monaco: Jack Tweedy **(G3ZY)** has now returned after a spell as 3A2CF, when he worked 452 stations in 46 countries in 70 hours on the air. Electrical QRN and high noise level made reception difficult, which, remarked 3A2BF, is normal at this time of the year, but Jack still enjoyed himself. Three weeks without rain is something, to begin with! The authorities were very helpful and a licence was issued without any fuss. Jack will acknowledge all 3A2CF QSOs in due course.

The Saar: ST2AR points out that the former 9S4s now sign DL8. 9S4AX, for instance, is now DL8AX.

PJ2AE, the new QSL Manager, reports that cards for amateur stations on the island of Aruba, should in future be sent to Aruba Amateur Radio Club QSL Bureau, P.O. Box 43, Seroe Colorado, Aruba, Netherlands Antilles.

Fifteen Metre DX

Fifteen is rapidly coming into its Autumn own and a variety of rare DX is again there among the jammers. **G6GH** (Boston) kept to c.w. and reports VP2VB (18.00), VS9MA (17.30) and ZD7SA " in the bag," though PJ2AL PZ1AG and ZP5 escaped through a hole in the bottom. **G8OJ** (Manchester) had phone talks with VP4MM, VP2IB (St. Lucia), TI2, CO and HK and he QSO'd 9G1CR, UA0AZ (Dickson Is), VP9AK/P, ST2AR, EL and JA on the key.



The beams at 9G1BF, visited by VQ4EO during his recent safari.

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

G3AAE (Barnet) paused in his gigantic task of filling in all those GC3AAE QSLs and worked VP2LB (23.00), VS9MA (17.45) and YN1CJ (06.30) on phone, while **G3EYN** (Macclesfield) used the key for chats with VP2VB, VS9MA (16.30), VS1FZ (19.30) ZD7SA (20.00), VS9AS, XE1PJ (20.00) and VKs. **G3KAA** (Luton) worked ZD7SA—a good signal at 22.00 and has his QSL for a previous 14 Mc/s QSO. He heard the ZD7 work a G up on 7 Mc/s, what's more. **G3FPK** (London, E.10), back from the Riviera, dug through commercial hash to work ST2AR, VP2VB, 3A2CF and a UP2, four new ones, making 71 on the band. Norman hears VS9MA (R.A.F. Gan Is.), B.F.P.O. 180, but no luck yet.

B.R.S.20317 (Bromley) sifted two entirely new ones from the ruck. C.w. made one, in KB6BJ (13.30, '050), with HS1C (17.00, '050), KR6HP, VK9DB and VP8CR besides, while on phone, VQ9GU (18.15, on s.s.b.) was the other, together with catches like HL9KT (15.00, '230), JZ0PB (14.00, '185) and VP2LB. Bill remarks that since he started listening only two months have failed to produce a new country! **B.R.S.20104** (South Harrow) had two new ones on phone when he logged VS9MA (Maldives) and VQ9GU (Seychelles). The latter is VQ4GU, who was on the island for a month, up to mid-August. VS9MA is an R.A.F. outfit with three operators and they are putting up a Vee beam on the U.K., which should help things somewhat. **B.R.S.18017** (Warwick) forsook the l.f. bands and heard VP8BT (South Shetlands), FE9AK, VQ3ES, HS1E and OA4IGY on phone. **B.R.S.21918** (Hayes) is a very new member of the Society and he occupied the month in logging VQ9GU, CE, ET2, HH, HI, VP2, '4, '5, '6, '9, ZD1, 9G1 and 9K2 on phone as his best.

A.1628 (Aberdeen) is another newcomer, though he has been listening for a year, hearing 143C, 37Z. Recent phone DX for fifteen-year-old Graham was JZ0PB, KZ5VR, TG7JD, OR4OR, '4VN, VE8NH, VQ9GU, VS9MA, XZ2SY and much besides. **B.R.S.20135** (Newport, I.o.W.) listened at odd times—summer is his busy season—and he mentions VS9AO, VS9MA, HI8GA, VP3HAG and VK5NO. **A.1437** (Bristol) is another new listener and he specifies KP4AHM, CP1HF and CR4AD, heard on a BC455 with an RF24 ahead of it.

B.R.S. 21431 (Tamworth) heard VQ9, TF2, W and K on s.s.b. while **B.R.S.20106** (Petts Wood) continued his investigation into the DX world and pulled in phone from VP2LE, VP2LB, HH2FB, VK9DB, VP1EE, CE7AQ, VR2AZ, HI8GA, FM7WR, ZD6RM, KV4BI, VS9MA and VQ9GU. On c.w., Norman heard VP2VB, ZS3AG, FB8XX, VS9AC, VS9AO *and* PX1YR. **A.1328** (London, W.1) has changed his 6SA7 into a four valve AVR-20 for the more efficient RF26 and Pye PCR-2 receiving arrangement. The RF26 was tricky to align with no g.d.o. available to help, but the combination is now working quite well, and 33C have QSLd out of 88 heard. Brian makes his reports as full as he can, but he has a sneaking feeling that some stations do not appreciate listener's reports, especially if the reports indicate bad reception!

B.R.S.2292 (Hounslow) found 05.30-06.00 and late evening to be the best times for DX; he logged HI8GA, MP4BCJ, OQ0PD, VP5RD, VQ3DQ and VQ3ES on phone and OQ0PA, VQ2AB, ZD7SA, W7CKY/KL7 and CR6CK on the key. Charles was pleased with QSLs from DU1RTI, VS9AP, W9KLD/KL7 (7 Mc/s) and from YU1JK, heard on Top Band. **B.R.S.21762** (Loughton) settled on CR4AS, HI8CM, HI8GA, HI8BE, KM6AR, KG4USA, HR2MT, VS9MA and VQ9GU as part of his phone programme.

Twenty Metres

Twenty has been better than for some time past though not as good as it can be, but rare ones still prefer the band and the latest appearance in that category is, or was, FO8AT on Clipperton, who caused a terrific stir (and not a little bad temper) for the period of his stay there.

G3EYN may have missed the FO8, but he did QSO ZK1AK (08.30), UH8KAA, FP8BA, VS6 VQ3, VQ5, VQ8AD, VP8CC and VK0TC. **G3FPK** had a fruitless time chasing ET2KY, F9QV/FC, FB8BS, OR4VN, VK0WT and UJ8, but he stood no nonsense from F2CB/FC and K0EPH (Colorado).

G3AAE successfully called HP1BR, VP2VB, XE1HC 08.00), XE1DT, VP1EE (06.45), YN and TG7SJ on phone, while he was equally successful on c.w. with ZD7SA (22.00), YV0AB, FP8BA (22.15) XE1RM (07.30) *and* FO8AT (07.00). **G8OJ** was another of the few to get across to Clipperton. **G3KAA** found VP2VB back on Tortola, with W3CXX at the key. Other QSOs were with FF8AC, LH1B/P (quite good and on Spitzbergen) and VP5BL, who was number 151. FM7WU (P.O. Box 61, Fort de France, Martinique), FG7XF and FO8AC (W6BYB at the key) were missed. **G3ENT** (North Kent Radio Society) operated GB3ENT at Erith recently and all their QSOs will be acknowledged with a special card.

B.R.S.20317 logged FO8AT and KS6AD (09.00, v.f.o.), plus KS6AG (10.30, '058) for new DX catches. He had a QSL from JZ0HA within seventeen days. Bill also logged ZC3AC (15.43, '053), getting no replies! VS9MA was heard on the band (18.00, '020). **B.R.S. 20104** is again full of DX news and he got KS6AG (the XYL of KS6AD, incidentally) for his very first KS6 in 11 years of searching. Her QSL was on the door-mat in 26 days, too. Goff heard ZK1AU around '340 at 06.30, on c.w. and VR2DA was being worked at 10.00 on '010 kc/s. **B.R.S.20106** logged KM6BK (12.30, '009), XW8AI, ZD1FG KS6AG (10.00), VK9RR and UA0KFG (Sakhalin) on c.w.

Do You Know the Radio Regulations? **(Continued from page 116)**

country only after it has been authorized to do so by its administration. Each administration notifies other administrations concerned when such authorizations are issued.

Appendix 3.—Table of Frequency Tolerances

Frequencies	Fixed stations		Land mobile stations
	Under 200 watts (per cent)	Over 200 watts (per cent)	
Up to 30 Mc/s	0·005	0·01	0·02
30 Mc/s to 100 Mc/s	0·02	0·02	0·02
100 Mc/s to 500 Mc/s	0·01	0·01	0·01
500 Mc/s to 10,500 Mc/s	0·75*	0·75*	0·75*

* Until C.C.I.R. publish new figures no closer tolerances can be specified.

Appendix 4.—Table of Tolerances for the Intensity of Harmonic and Parasitic Emissions.—10 to 30,000 kc/s. The power(2) of a harmonic emission must be at least 40db below the power of the fundamental and in no case shall it be above 200 milliwatts.

(2) The power here refers to power supplied to the aerial on the frequency of the harmonic or parasitic emission.

Appendix 5. Band of Frequencies Required for Certain Types of Radiocommunication.—There follows four pages of tables showing the make-up of bandwidths for all types of transmissions.

Appendix 9. Miscellaneous Abbreviations and Signals to be used in Radiocommunication.—This appendix lists the series of letter groups QRA to QUZ which are for use by all radio services.

Adventure in Alderney

By J. DOUGLAS KAY (G3AAE)*

AFTER last summer's casual jaunt in Jersey with a B2 transceiver, and the gratifying results obtained with 20 watts and a poor location, it was decided to try and organize a full scale DXpedition to one of the other Channel Islands in 1958. Alderney was chosen, as not only is it the smallest island possessing a.c. mains (3 square miles, population 1,500), but it is also without any Amateur Radio representation at the present time.

Leslie Morgan (G2HNO), who has operated from Alderney on Top Band in the past, was extremely helpful and informative about the island and also recommended Essex Castle as being the best location for Amateur Radio, being situated atop Essex Hill 300 feet above sea level on the south-east side of the island and with a clear take-off over sea in all directions except to the north-west.

It was decided that a complement of four operators would be required if the station was to be kept in continuous operation 24 hours a day for a period of 14 days, and a team comprised of Chas Lennox (G3BQR), Frank Bliss (G3IFB), Geoff Voller (G3JUL) and the writer was formed. At a preliminary meeting last January it was mutually agreed that the aim of the DXpedition would be to work as many stations as possible who wanted GC for the Empire DX Award, DX Century Club or other operating award and, as the greatest demand seemed likely to come from DX, it was decided to concentrate primarily on the h.f. bands.

Equipment Used

A flat having been rented in Essex Castle the next problem was to obtain the necessary transmitter and receiver. An approach was made to the Collins Radio Company and, although no suitable equipment was available at their U.K. factory, Arthur Collins generously offered to send a KWM-1 transceiver over specially from Cedar Rapids. This was better than we could have dared hope for, because not only does it cover 14, 21 and 28 Mc/s c.w. and s.s.b., but it also incorporates a receiver of the same standard as the 75A4, and a 150 watt transmitter complete with all power supplies. Full break-in on c.w. and VOX operation on s.s.b. is provided and the whole equipment is contained in two small cases which together weigh only 45 lb. The availability of this equipment also meant that GC could be put on the DX sideband map for the first time.

Doug Findlay (G3BZG), who had originally hoped to be able to join the party but was prevented due to pressure of business, kindly provided a G8KW multi-band trap aerial, and this was supplemented by a 1,000 ft. of wire and 500 ft. of co-axial cable for aerial construction on the spot. A B2 transceiver was also taken as an emergency stand-by and for possible occasional use on 3·5 and 7 Mc/s should propagation conditions on the higher frequency bands deteriorate so badly that a constant flow of contacts could not be maintained.

First Contacts

The team, together with two XYLs and one junior op., left Croydon Airport on the morning of May 16 and arrived in Alderney shortly after midday. A terrific gale was blowing which prevented any serious aerial erection on the first day, but the station was put on the air just before 21.00 G.M.T. using a temporarily sited aerial only 8 ft. from the ground at one end and 15 ft. from the ground at the other.

*18 Feirfield Way, Barnet, Herts.

Although Alderney is only 150 miles from London, Amateur Radio has raised it to the status of rare DX because it possesses a distinctive prefix.

The first contact made was with OH0NC on 14 Mc/s s.s.b. This was immediately followed by a QSO with W2VZV, whom it later transpired had taken the day off from work specially to work GC3AAE! He had actually heard us tuning up the transmitter prior to sending the first CQ call! S.s.b. contacts with OQ5IE, W1ADM, 5A2TZ, MP4BBW and VK3AEE followed. The station was thence on operated continuously except for a couple of hours the following day when the G8KW aerial was erected in a more favourable and permanent position. An aerial 1,000 ft. long was erected but did not prove a success. Aerial erection posed quite a problem as it was found impossible to use the castle to support both ends of the wire, while still keeping the aerial itself well out in the clear. Instead a 30 ft. pole was hired, and the aerial strung between it and a high point on the castle.

Set-backs Overcome

Operating on s.s.b. and c.w. alternately the station was kept on the air without incident until May 23, when a component in the power supply failed. This put us off the

The operators of GC3AAE. From left to right, G3BQR, G3IFB, G3AAE and G3JUL.

air for 18 hours, and could well have kept us off for a great while longer had it not been for the kindness of GC8DO who, in response to a telephone appeal for help, was able to locate a suitable replacement part and put it on the next aeroplane from Guernsey to Alderney. During this quiescent period the B2 was fired up on 7 Mc/s and a number of British and European stations worked.

A totally unexpected set-back occurred the following day when the Electricity Company decided to carry out line maintenance work and arbitrarily switched off the mains supply from dawn until dusk. Luckily this was a bright sunny day, and the team took full advantage of it to explore the more distant parts of the island and to indulge in a little cricket on the sands. Henceforth everything went smoothly and operation continued almost continuously until the big switch was pulled at 07.15 G.M.T. on May 30.

During the first week of operation, when the pile-ups were monumental, double staffing was employed for the evening and night shifts, but during the second week one man was able to cope with both the operating and log keeping. This was just as well as G3IFB had to leave us at the end of the first week so that the team was reduced to three operators for the second half of the DXpedition.

Results

Propagation conditions were, on the whole, very poor during the period May 16 to 30, and once again 14 Mc/s was found to be the best of the h.f. bands for sustained DX working.

More than 99 per cent of the stations worked replied to CQ calls as it had been decided to rely almost entirely on this method of operation to fulfil the aim of the DXpedition of having contacts with as many stations as wanted to work GC3AAE. It was quite surprising that so much rare DX was on the lookout for us, and showed that the advance publicity in overseas magazines had been well worth while. In all over 2,000 stations in 112 countries were worked, and the breakdown of these contacts into continents is as follows: Europe 884, North America 895, South America 46, Africa 59, Asia 104, Oceania 67. It is difficult to state the call-signs of the multitude of interesting DX worked, but the following are typical: VK0RO (Antarctica), YS1O, DU1RTI, ZK1BS, UA0IJ (Wrangel Island), ZK2AD, KR6AC, ZC5AL, FB8ZZ, CR4AH and OR4VN (Belgian Antarctica). With the exception of UM8 and Franz Josef Land all districts of the U.S.S.R. were contacted. On returning home it was found that over 100 cards and letters for GC3AAE had been delivered by the already long suffering postman.

There is no doubt that a greater number of stations could have been worked had more people realised that we were a DXpedition with only very limited operating time. Many operators (the W/K/VE boys were very quick to realize the correct drill) helped by just flashing the appropriate report and acknowledging receipt of our report to them, but many others insisted on giving their QTH (often in full), handle (horrid expression), weather and station equipment details, finishing a long-winded transmission with " pse dr ob your name, QTH and weather for my log." One station refused to give us a report until he had our name—he was still audible in the background asking for our name four QSOs later! Very little trouble was experienced from stations trying to break in on contacts already in progress, but quite a number were hearing the station being worked by us and tail-ended: done properly tail-ending can be most effective, without in any way offending against the basic principles of good operating.

This was indeed a holiday with a difference, but a very pleasant difference—the superb location and scenery, the excellent food, cigarettes at 20 for 1s. 7d., sherry at 10s. a bottle, the pleasure of working as a team, the excitement as we neared the 100 countries, the use of a very fine piece of amateur equipment, the thrill of the pile-ups and development of techniques to prevent them from disrupting the steady flow of contacts, the pleasure of being in demand at all—these things are experiences we shall long remember.

DXpeditions are not things to undertake every year—however indulgent the family may be, some sort of balance must be maintained—but this was such a pleasant experience and the results so justified all the preparations and expense, that we have high hopes of setting off in search of fresh fields and pastures new in 1960.

Frequency Predictions for October 1958

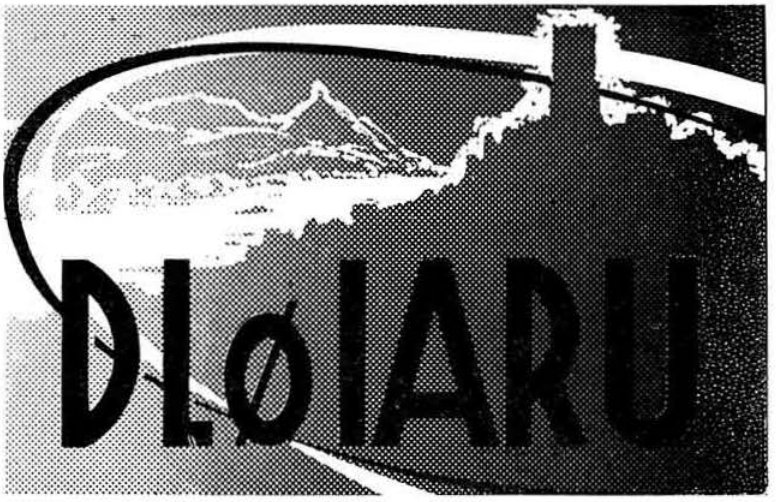
PREPARED BY J. DOUGLAS KAY (G3AAE)

BAND	NORTH AMERICA East Coast	NORTH AMERICA West Coast	CENTRAL AMERICA	SOUTH AMERICA	SOUTH AFRICA	NEAR EAST	MIDDLE EAST	FAR EAST	AUSTRALIA	ANT-ARCTICA
M.U.F.	33 Mc/s 1600	29 Mc/s 1800	42 Mc/s 1200	40 Mc/s 1145	39 Mc/s 1500	42 Mc/s 0930	42 Mc/s 1000	39 Mc/s 0900	34 Mc/s 0730 SP	36 Mc/s 1400
28 Mc/s	1200/2000	1700/1830	1030/2000	0930/2100	0730/1900	0730/1800	0730/1730	0730/1730	0630/1200 SP	0830/1830
21 Mc/s	1030/2200	1500/2045	0945/0000	0830/1200 1700/0300	0600/0900 1300/0030	0600/2100	0600/1900	1000/1900	0800/1100 LP 0800/1800 SP	1700/2330
14 Mc/s	0800/1200 2000/0600	0130/1530	2100/0930	2215/0900	1800/0430	1300/0900	1400/0400	1630/2330	1300/2130 SP	2030/0830
7 Mc/s	2330/0730	0400	2300/0700	2330/0700	1900/0300	1630/0730	1630/0200	1900/2230	1530/1900 SP	2300/0700
3·5 Mc/s	0400	0400	0400	0200/0300	0000	2000/0200	1900/2300	2000	1730	0330/0430

These predictions are based on information provided by the Engineer-in-Chief of the Post Office. All times are G.M.T.

Background to Bad Godesberg

By JOHN A. ROUSE, G2AHL
(Deputy General Secretary)



An Amateur Radio station was in operation under the call-sign DL0IARU from the Stadhalle, Bad Godesberg, during the Region I I.A.R.U. Conference in July. This is a reproduction of the special QSL card used to confirm contacts.

BEFORE the decisions reported in the August issue of the BULLETIN were made, discussions at the Region I I.A.R.U. Conference in Bad Godesberg had ranged over a wide variety of subjects. The discussions stemmed from written papers and from verbal reports. Of the latter, the most encouraging by far were made during the session in which the delegates of the various national societies reported on the progress made in gaining the support of their licensing authorities for the retention or extension of the present frequency allocations and in some cases the provision of new facilities.

When it is remembered that a few years ago many of these self-same societies had little or no contact with their own administrations the progress made is indeed tremendous. The Amateur Radio movement in Europe faces the Geneva Radio Conference of 1959 in far better order than it approached the Atlantic City Conference in 1947.

Public Relations

One of the most obvious ways to obtain public support for any idea, hobby or commercial product is by efficient public relations. A paper entitled " Publicity and Amateur Radio," prepared by Osmo A. Wiio (OH2TK) on behalf of the Finnish society, eloquently argued the case for a concerted effort to make Amateur Radio better known to the general public by all possible means: newspapers, magazines, television, radio, exhibitions and films. Introducing his paper, OH2TK emphasized that he was not suggesting that member-societies had not already done a great deal in this important field but he felt that much more could be accomplished by co-ordination of such efforts throughout Europe. The discussion which followed resulted in the Conference deciding to appoint a Region I P.R.O. and to recommend every member society to do likewise.

Emergency Networks

Dr. Jacques Simonnet (F9DW) presented a report on " The Amateur Emergency Networks " from which it is clear that most European societies now have recognized emergency services or are in the process of setting them up. Not surprisingly, it was agreed that this good work should be continued.

Rare Drugs

Consideration was given to the " rare drug " messages which were so common a few years ago and which still turn up occasionally. Dr. A. C. Gee (G2UK) who was present as an observer drew attention to the penalties involved for trying to get drugs across frontiers and suggested that radio amateurs particularly should be careful not to be a party to attempts to do so. Dr. Gee said that as a result of inquiries he had made, it appeared that most of the messages had been originated by " black market " dealers. Not only Amateur Radio had been involved: other international organizations of a hobby nature, such as philatelic, had received requests for drugs. Dr. Gee pointed out that proper arrangements for obtaining drugs exist in most countries and mentioned the International Red Cross, World Health Organization, religious societies and even governments themselves as being more appropriate channels through which drugs can be obtained by a physician.

Reciprocal Arrangements

Some progress has been made in the field of reciprocal licensing.

In Germany no citizenship clause is included in the amateur licensing conditions and any foreigner resident there can obtain a licence. The Spanish and Belgian authorities have indicated that they will grant licences to each other's nationals. Luxembourg will grant licences to foreigners provided the same facilities are offered to Luxembourg citizens in the applicant's country. Holland will also grant licences on reciprocal terms. In Norway there seems to be little hope except possibly in Spitzbergen. No progress has been made in Sweden. Foreigners visiting or resident in Yugoslavia may obtain licences.

The R.S.G.B. had, regretfully, to report that no progress has been made in the United Kingdom but the Australian observer (Douglas Bowie, VK3DU, of W.I.A.) reported that if a radio amateur holds a licence in his home country an Australian licence will generally be issued to him immediately on arrival.

The Social Sphere

The Yugoslav delegate presented a report on progress made in improving social contacts between radio amateurs and suggested that all member-societies should appoint liaison officers for this purpose. Arthur Milne (G2MI) suggested that one way would be for all societies to make a point of informing the Region I Bureau of all social activities they are organizing so that publicity can be given well in advance throughout the Region. (In the United Kingdom, social activities such as conventions, mobile rallies and the London Members' Luncheon Club offer facilities for amateurs to meet informally).

So far as the Conference was concerned, D.A.R.C. had arranged an excellent programme of social events which included trips on the Rhine, an informal banquet and various visits, one of which was to a wine cellar at Mayschoss in the Ayr valley. Delegates and observers had lunch together each day and this, too, provided plenty of opportunity to discuss every aspect of Amateur Radio.

D.A.R.C. exhibited its standard communications receiver and standard test in addition to a large display of excellent home-built equipment. A small exhibition of commercial products of interest to the amateur was arranged by Philips, Heathkits and Telefunken who presented a Nestler pocket slide rule to each delegate.

International " Fox Hunts "

Direction Finding contests are known as " Fox Hunts " in continental countries and the sport is becoming an increasingly popular branch of Amateur Radio. A paper prepared by the Swedish Society dealt with some of the problems of organizing fox hunts at an international level which might well lead to a European Championship.

ideologies and races, they are all very much alike wherever they may live.

The United Nations observer (Mr. W. Baumgarten, HB9SI) mentioned that there had been a United Nations amateur station at one time but the transmitter was now used as part of the U.N. Communications Service.

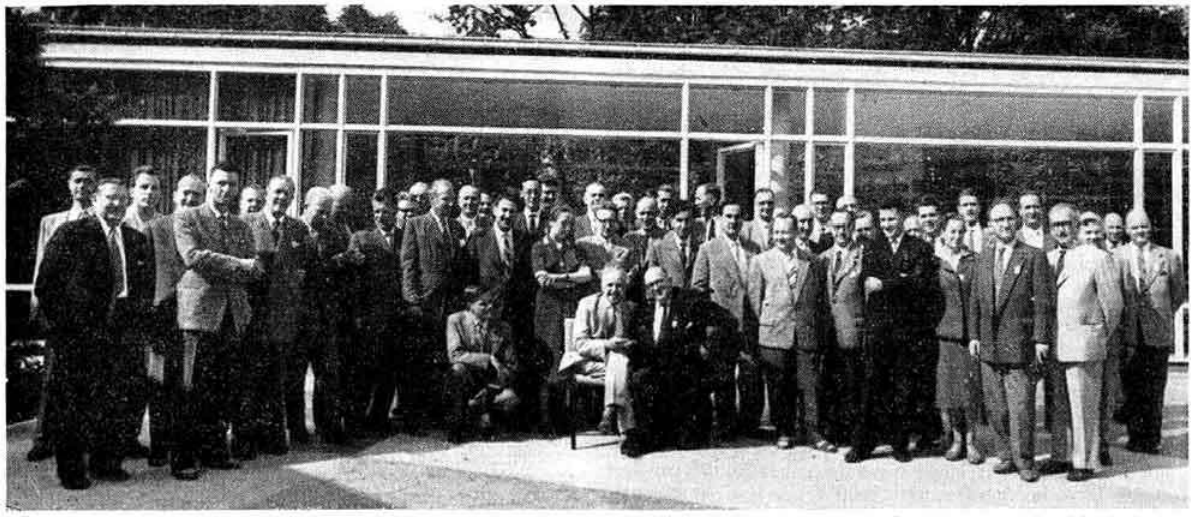
As a result of the discussion, it was agreed that I.A.R.U. Headquarters should be asked to urge the United Nations to give all possible support to the Amateur Radio movement.

" Intruders "

Since the Stresa Conference, most member-societies have taken steps to organize the reporting of intruders in the amateur bands. The systems used vary somewhat from country to country but all are achieving some measure of success.

Conference Organization

No report on the Bad Godesberg Conference would be complete without an expression of thanks to Dr. Karl Lickfield (DL3FM), the Congress Secretary, Herbert



Delegates and observers at the Region I I.A.R.U. Conference in Bad Godesberg assembled outside the Conference Hall for this picture. In the centre, seated, is Herr Rudolf Rapcke, DL1WA (President, D.A.R.C.) who was elected President of the Conference.

It will probably come as a surprise to D/F enthusiasts in this country that most fox hunts are carried out on either 80 metres or 2 metres, the preference being for 80 metres. Top Band is used only in Denmark and the United Kindgom. From the opinions expressed, it looks as though 80 metres is likely to prove the most suitable for international events.

Member-societies encourage the running of fox-hunts because these events help to promote interest in Amateur Radio amongst technically minded young people who often obtain amateur licences as a result. The hunts also produce good publicity material because they are regarded as sporting events.

Amateur Radio and the United Nations

Another paper, prepared by S.S.A. (Sweden), drew attention to the value of the world's 250,000 radio amateurs as ambassadors of goodwill and suggested that as such the movement should be encouraged by the United Nations. It was pointed out that no other hobby provides the same opportunities for getting to know all the peoples of the world in their own homes. It was emphasized that radio amateurs quickly find that in spite of different languages,

Picolin (DL3NE) and their two English-speaking secretaries for all their hard work in the organisational and paper-work side of the meeting and to the three interpreters from Philips of Eindhoven whose simultaneous translations helped to speed the proceedings. (G2AIW was secretary of the V.H.F. Committee and G2AHL secretary of the Administrative Committee. G6CL prepared the Minutes of the Finance Committee.—EDITOR.)

* * *

It seems safe to say that, in an age of international conferences, the Bad Godesberg Conference must be unique: it was attended by no foreigners. The discussions revealed that the delegates were just radio amateurs.

Car Badges

OVERSEAS members are asked to note that the price of the de luxe type car badge is now 21/-. The increase in price is due to the fact that it now costs 5/6 to post a de luxe type car badge to an overseas address.

FOUR METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

Meteor Scatter Signals Heard — Another Auroral Opening

THE I.A.R.U. Region I conference held in Bad Godesberg having come and gone, it now becomes the writer's pleasant task to record something of what transpired there from the point of view of v.h.f. enthusiasts. Of major importance is the fact that the *ad hoc* v.h.f. committee, set up in Stresa two years ago, has been replaced by a properly constituted committee known as Region I V.h.f. Committee. The committee consists of a chairman (DL3FM, re-elected), a secretary (G2AIW, elected at Bad Godesberg in succession to ON4BK, who did not stand again), and the v.h.f. managers of the member societies in Region I.

The executive committee of Region I has agreed to call into their deliberations a v.h.f. expert when v.h.f. matters are to be discussed. This is quite a step forward, and really puts the v.h.f.s on the international map. Regular meetings of the V.h.f. Committee will be held, probably annually, chiefly for the purpose of keeping the members up-to-date with the latest developments.

Among the decisions reached, which are of course recommendations to member societies, were the following:—

(1) The point-per-kilometre scoring system has been accepted for Region I v.h.f. contests. This is to apply to contests for 1959, and the matter will then be re-examined.

(2) All bands are to be scored separately in the contests; furthermore, the scores are the same for each band, 1 point per kilometre whether on 2m, 70cm, or 23cm.

With regard to suggestions put forward by the R.S.G.B. Contests Committee, it was agreed that only one contact on each band with a station, whether fixed, portable or mobile, should count for points. If two or more stations have the same score the result is a draw.

Some of the suggestions on logs were accepted but a suggestion that logs should be forwarded *unchecked* by v.h.f. managers to the society organizing the European v.h.f. contests was not accepted. It was the unanimous view that all logs should be checked by the v.h.f. manager in the country of origin and then forwarded to the organizing society's v.h.f. manager. In considering this point, it must be remembered that all v.h.f. managers, other than R.S.G.B., act as their own contest " committee " and make their own decisions in v.h.f. contest matters.

The May contest of 1959 is to be a c.w. only contest, to help to prevent the decline of c.w. on the v.h.f. bands.

It was agreed to recommend that F3 (n.b.f.m.) should be permitted in v.h.f. contests, and that crystal control be maintained on the bands. The use of super-regen equipment and s.e.o. transmitters was deplored as highly undesirable; v.f.o.s should be used only for " zeroing " and for breaking into QSOs when absolutely necessary. The operating frequency should be crystal controlled and this should be resumed as soon as possible.

It was interesting to hear that Swedish stations (who are already licensed for 500 watts) were interested in working on " high power " which turned out to be around 1 kW!

The question of BCI and TVI loomed large, and several representatives are looking for technical tips and articles to avoid blocking of receivers and interference to video between 63 and 180 Mc/s. They have their cures but are always interested in better ones.

Belgian amateurs, some of whom are in regions with four TV channels, have had to do something very special about TVI proofing. We are trying to get details.

Activity nights were discussed. Apart from the British ones, which are now well known, Sweden has Tuesday nights on 2m (with a contest once a month) from 18.00 to 24.00 G.M.T. Germany and Switzerland have Tuesday and Thursday nights from 21.00 G.M.T. while Holland and Belgium favour Monday at 17.30 G.M.T. onwards. Ireland, in the person of EI2W, is active nearly every night!

There is increasing interest in s.s.b. on 2m, and we are promised news from Holland regarding PA0KT's equipment very soon via *Electron*.

DL3WW (W3YHI) has introduced high power s.s.b. in Germany and the interest aroused there is so great that much construction and s.s.b. working is expected soon. A paper is to appear soon in *DL-QTC*, prepared by DL4WW and DL3FM.

It is a remarkable coincidence that a suggestion from **G3JR** that there should be c.w. only contests on 2m in Great Britain should have reached the writer immediately after his return from Bad Godesberg. This proposal has the backing of a large number of well-known operators, many of whom have written to G2AIW on the subject.

Meteor Scatter—U.K. Observations

G3HBW (Bushey) has been doing some intensive tests with SM4BIU, SM5BDQ and SM6BTT. Test skeds were arranged on five mornings (August 10/14) between 05.00 and 07.00 G.M.T., the tests being about $\frac{1}{2}$ to $\frac{3}{4}$ hour with each station in turn. As a result SM5BDQ, at 940 miles, was heard twice (almost a QSO on August 11, he was so strong) and SM6BTT was heard four times at 650 miles; once almost a QSO also. G3HBW has some good recordings of these tests. The longest burst was during a transmission from SM6BTT (nearly a minute) at S6/7. It is interesting that the SM5BDQ episodes, if confirmation is received, would be a new European record. Nothing was heard from SM4BIU. G3HBW points out that this monitoring is somewhat difficult as extremely accurate frequency measurement is necessary in the receiver—i.e., to within 1 kc/s—as the receiver must be " spot on " the signal frequency *before* the signal arrives—you cannot search for such signals! SM6BTT (144·120 Mc/s) also had skeds during the tests with EA3IX, F9AJ, HB9RG and OE6AP.

SM4BIU has recently heard OE6AP by meteor shower reflection. Reception was patchy but parts were quite readable. Swedish amateurs are having several contacts with Poland on 2m especially during Swedish activity nights (Tuesdays).

Seventy Centimetre News

A special position in the station reports must go to 70cm this month. **G2XV** (Cambridge) achieved one of his dearest wishes on August 8 by working **G3MED** (Northwich, Cheshire); as he puts it " The Pennines conquered at last! " G2XV's signals were also heard by G3HYH (Eccles,

*21 Bridge Way, Whitton, Twickenham, Middlesex.

Manchester) but no QSO resulted. As, however, G3JWQ (Ripley, Derbys) was also worked, the G2XV total is up by two to 31 counties on 70cm. Congratulations!

Just another reminder that there is a get-together of Home Counties and London area stations on 70cm every Saturday, from 19.00 to 20.00. Please "make your number" and see how many are really active!

GC2FZC is hoping to get on 70cm soon with co-operation from **G2ADZ** and **G3JGJ** who will also be on the band.

Scottish 70cm News

GM6WL went portable on August 17 to a site 600 ft. a.s.l. near Kilmacolm, 52 miles from GM3DDE; the phone signals were "terrific." GM6WL's carrier put GM3DDE's meter over to the stop, while GM3DDE could be heard by GM6WL with earphones only in the open air on the other side of the road. A good path, unobstructed for quite a distance which allows them to overcome the screening of Kirk o' Shotts TV which is 800 to 900 ft. high. GM3NG was also S9+. GM6WL regrets that so far no G station has been able to co-operate on 70cm tests in the north of England. Jock would go more than half way to meet any such, "literally and figuratively."

GM3GUO has built a special 25 Mc/s receiver for portable work with the crystal controlled 70cm converter and will be ready for some expeditions soon.

GI5AJ has a converter going on 70cm and has had some encouraging results crossband with GI3FWF.

Two Metre Station Reports

B.R.S.19162 (Dewsbury) was not able to listen all the time, but found generally that conditions were of the "usual 1958 summer variety"—weak signals with lots of QSB. As equipment and aerials improve, conditions seem to get worse! And the only good thing about it is that it tends to force some of the phone lads on to the key—how many times is this opinion being expressed nowadays! Half a dozen weak phone carriers spell bad conditions whereas the same working c.w. would probably be noted as good. **B.R.S.20133** (Melton Mowbray) however, found things much better, with high activity and his two locals (G5HB and G8CZ) putting in an appearance with the possibility of more activity. **G3FXP** has a converter working and will also doubtless appear soon. On August 15, B.R.S.20133 decided to have a late night listen and may have heard GM3EGW; frequency and direction were right, but only snatches were heard. Further efforts are envisaged. G3IRS (Locking) is a very powerful signal at 130 miles. He is apparently on most lunch times and frequently in the early evenings.

G2CZS (Chelmsford) is a welcome reporter after some lapse of time, with news of a new aerial (a wide-spaced five-element Yagi at 38 ft.). This aerial is of $\frac{3}{16}$ in. diameter duralumin tubing on a wooden boom and is fed by 150 ohm twin feeder. The great point is that this aerial has much less windage than the old three-over-three-over-three array.

G3AST (Yeovil) reports moving to Yeovil and is now back on 2m. The 45 ft. lattice tower, which used to overshadow Luton neighbours, is not yet up, but a four-element Yagi is being used in the roof space. Yeovil is somewhat quieter, but a good signal is delivered to G3IRS at R.A.F. Locking. An aerial consisting of two "city slickers" side by side, end fed as colinears, and spaced $\frac{1}{4}$ wave in front of a wire netting screen, should enable signals to reach Luton, Welwyn Garden City and Cambridge. **G3JZG** (Willenhall) found conditions good to very good, though an EDX opening is still patiently awaited. The best stations worked were G6XM/A (Co. Durham), GD3UB, GW2HIY (Anglesey) and GI3GXP. F8MX has been heard many times at S8 and EI2W, on July 8, was stronger than some locals. On the second Field Day, the motor cycle portable gear was taken to 1,700 ft. a.s.l. in Shropshire, but the tracks were muddy and the last 500 ft. had to be climbed on foot. With G3KFD's assistance, they were operating at 15.00 B.S.T. The little rig uses an EL91 p.a., the aerial being a three-element Yagi. The best QSO was with G3DIV/P at nearly 170 miles. G3JZG reports two auroral openings: the first on June 28, when G3KFD noted auroral signals at 22.00 G.M.T. (G3JZG didn't hear any auroral signals until 23.25 G.M.T. when GM2FHH was heard). Soon afterwards a QSO resulted; also one with GM3EGW. The aurora was still on at 01.22 when G3JZG went to bed. The second (and "super") aurora occurred during a time of excellent tropospheric conditions on July 8. It was first noted from the north-west on G2NY and by 21.50 G.M.T. it had swung to the north-east; the band was then a burbling noise. DL4WW, DL9ARA and DL6WUA were heard strongly about 22.00 G.M.T. but soon disappeared. At 23.15 the GMs showed up and GM4HR and GM3EGW were worked. At 00.30 G.M.T. the GMs were still coming through.

G5CP/M recently acquired a Hamobile transmitter/receiver and using a single halo aerial fixed to the rear of the Vanguard, a phone QSO was made with G4DC (Essex) from a hill five miles south of Chesterfield. During the second 144 Mc/s Field Day, using a double halo, 45 stations were worked from locations within a ten mile radius of Chesterfield, some of the best being: G4DC (Upminster), G3FKO/P (Devon), GW3MED/P (nr. Conway), G3ANB (Essex), G2JF (Kent), G3DIV/P (Sussex), G3GOP/P (Dorset), G3IRS (Somerset), G3JMA (Essex), G3JQN/P (Sussex).

G3DIV (Eastbourne) has been listening at sea level using a 33ft. centre fed all band aerial (tuned feeders) and can hear F8MX (St. Valery) at all times, strength varying enormously with conditions. G3BDQ (Hastings), a newcomer to the band, is also heard well. Otherwise, the best heard are G3JWQ and G5YV. The transmitter (35 watt) has been used on this aerial, and G3BDQ and F8MX have both been worked at good phone strength. G3DIV had a recent visit from G3EKX (Derby) who is equipped for mobile operation on 160, 80 and 2m. There ensued one or two interesting sessions on the top of Firle Beacon, Sussex, running $1\frac{1}{2}$ watts to a Z77 p.a. and a five-element Yagi temporarily erected at 30 ft. The first occasion was July 18 (21.15/00.30) when G3IRS and some stations around Derby were heard but not raised. QSOs were, however, made with G3IRA, G5NF, G3MPS, G3GZJ/M, F8MX and F9CQ. A second session, on July 20 was not so good, with high wind, but they talked G6HH/M (Hastings Club) to the site and both operated together. Contacts were mainly with London area stations and F8MX.

G8VZ (Princes Risboro') has worked GD3UB for a new country, raising the total to 8; GW2HIY (Anglesey) was contacted for a new county (thus completing Wales). Acquaintance has also been renewed with GI3GXP, EI2W, and GC3EBK. Furthermore a goodly number of portables was worked on Field Day. Lately conditions have been average to poor, and only sked contacts have been kept, with just a few other stations worked over 50 miles away. F8MC has been heard most evenings at varying strengths. A list of comparable strengths (1957-58) on the sked with G3JWQ shows that on the whole 1957 was far more consistent, which appears to be in line with the effects of the so-called summer of 1958! G8VZ has noticed a lot of cross-band (2m/70cm) work going on recently.

G5MA (Great Bookham) has a really nice bit of rare DX to report—a QSO with GM3GMX/P on Cairn o'Mount (Kincardine) on July 31 on c.w. There was much preparation and hard trying, but only on July 31 were the conditions right. The distance is 400 miles. GM3GMX/P was only using 20 watts to a modified SCR522 and four-

element Yagi. Signals were weak and the average strength RST339 with peaks to 439. Fading was prevalent, but a very satisfactory QSO lasting about half an hour was made. Cairn o'Mount is one of the finest accessible sites in Scotland and we remember the record breaking efforts of GM5KW/P and GM2FHH there a couple of years ago. G5MA is running a nightly sked with GD3UB and has now worked him 33 times and heard him ten times when a QSO was not possible. There have also been several QSOs with GW2HIY (who has put Anglesey on the 2m map) and a few QSOs with GI3GXP. All this shows that even in poor conditions, it's the position that counts!

G3JR (Barnes) heard some good DX during July with his indoor five-element quad. Contacts included GD3UB, EI2W, GM2FHH, and GM3EGW. The Scottish stations were heard via the aurora. F8MX/A was worked and F8GH called. On July 19 F8GH was heard at 559 but no QSO resulted. On August 8, between 23.30 and 01.00, conditions were really " something " to the north-west. GD3UB (339) was called at 23.58 and GI3GXP was increasing in strength all the while; by 00.53 GI3GXP was 559, steady, but went back to G8DR! At the end of this QSO GI3GXP was on the way out, and so G3JR got none! On August 10, G3IKW (Barrow-in-Furness) was called, and on the 12th, GW3MFY. G3JR suggests that some of the rarer birds (he cites G3MED, G3IKV and others) in the north might like to make " Friday night a c.w. night." The idea has started here and there in the south, says G3JR who exhorts the weak DX carriers to pull out the key and stick on it for just one night a week. A very good idea.

G5DW (Ashcott, Bridgewater) is now fully restored again, and is now back on the band, having missed most of the interesting periods lately. The sked with G2NY has been very good recently, sometimes S9 phone. Several other northern stations, e.g. G3IKW (Barrow-in-Furness), G3MED (Cheshire) and G3KYT have been heard. GI5AJ and G6XM/P (Durham) have also been heard recently, the latter on c.w. and phone. **G3JGJ** (Paignton) was receiving G6XM at RST549 on sked on July 10. On the 11th G4DC was heard at 05.39 G.M.T. at RST599. G3JGJ has been trying out a " surplus " Eddystone 440B transmitter (originally 85/95 Mc/s). By making the final RK34 into a doubler, these units operate quite well on 145 Mc/s. G4DC has been worked many times on this. It is a cheap and reliable equipment (with modulator) for anyone interested. G3JGJ is on 2m every evening from 18.00/19.30 looking for QSOs and S.W.L. reports from any distance. Recent QSOs have included G6SP/P (nr. St. Austell, Cornwall) on August 17, RS59 both ways and the same station at St. Agnes Beacon. **G8DA** is reported as about to leave Exeter for Bristol and hopes to be active again when he gets settled. **G3GAO** (Torquay) will be on again when the 6-over-6 slot is erected again (it was damaged in a gale).

From **DL4WW** via *PRP News* we learn that the following stations have been heard in Germany via aurora. GM3LAV was heard at 23.03 on July 8 but although called many times, did not respond. Some G stations near London were heard and worked (tropo) by DL3NQ (nr. Heidelberg); when the aurora arrived, all these faded out on direct path. DL3YBA worked many overseas stations including SM, OZ and ON4; GM3AVK was also heard.

Four Metres

This band seems to have reacted very speedily to its new year to year status and **G5KW** reports that August 10 marked a real opening, in that European stations were heard and worked; apart from French stations, this has not been the case hitherto. Apart from this, CN8CK was heard, although regrettably not worked, as so far he appears not to check the British band. This may have been put right for the future by a cable which G5KW sent him. Probably the first to hear CN8CK was G3CLW (Bromley), followed by G5MR and G5KW. In addition to this, FA9VN was again worked by G5KW and G3CLW. PA0WO (S9 + phone) was worked by G5KW for probably the first PA/G contact on this band. His frequency is 70·320 Mc/s. On the same day the band was full of French stations including F8GH who was on practically every day of early August. It is very cheering to hear that some of the original 4m operators are reappearing on the band, presumably as it now has a much more stable future!

G5MR (Hythe, Kent), also reports some very interesting doings. On July 25, FA9VN was worked again, and FA3JR. FA8BG, CN8CK and CN8MG were heard. On August 10 at about 10.00 G.M.T. F9BG (Toulon) was heard at S9+ phone in contact with G3CLW. G5MR afterwards raised F9BG for a good contact at S9+ both ways. Another contact with FA9VN followed. A little later, FA9VN was heard in contact with HB9RG and gave him G5MR's frequency, but regrettably G5MR could not find the HB. CN8CK was again heard the same morning. Other French stations recently heard for the first time on 4m were F3RA and F9CZ (Seine et Marne), and F9BI and F9NN (nr. Paris). G3IUL (Bedfont, Middx.) was a first QSO on August 17.

K2UOU (Landing, New Jersey) in a letter to G2MI asks us to pass along the news that he is using m.c.w. and phone on the following crystal frequencies: 50·04, 50·076, 50·298, 50·4, 51·0 and 52·25 Mc/s looking for G contacts, either direct from 52·5 Mc/s or crossband 28 to 30 Mc/s. If anyone wants a sked they should write to P.O. Box 421. K2UOU was formerly VU2BM/XZ, VQ4HGB, G3EBL and the original AC3SS.

Six Metres

G4LX has heard CT1CO on five different days since the last report. OH2HK is operating on 51 Mc/s phone and c.w. and a solid QSO was achieved on July 26 (G4LX was on 52·5 Mc/s of course). ZE2JV has not been heard during the month, but reports that on August 10 (exactly a year, to the day after 1957) he heard BBC-TV on 48·25 Mc/s. The m.u.f. is rising!

Irish V.h.f. News

The writer recently had an interesting and enjoyable visit to Ireland as the guest of EI2W when many personal QSOs formed a pleasant part of the proceedings (especially one with a large brown trout at a Galway stream, although EI2W was in contact!). It was a privilege to speak to an I.R.T.S. meeting in Dublin about v.h.f./u.h.f. matters, and it is hoped that many more EI amateurs will shortly come up on the v.h.f. bands. Dr. Folan (EI6W) of Salthill, Galway, who is the president of I.R.T.S., and whom we visited at Salthill, said that he hopes soon to be on 2m with s.s.b. equipment (EI6W only uses this mode). A visit was also paid to EI6A (Wicklow) who has worked many G stations by aurora and many more by tropospheric means. All send their warmest wishes to R.S.G.B. v.h.f. operators. **EI6A** said that on August 9 he heard GI3GXP working F8MX, so that this real DX, which first happened last year was not a flash in the pan. EI2W was quite grieved at this evidence of workable DX whilst he was not at home to partake of the benefits!

Welsh News

GW3MFY (Bridgend, Glam.) is on 2m from 19.00 to 20.30 B.S.T. most evenings and from 23.00 to 23.30 B.S.T., with 28 watts to an 832A and a G2IQ converter into an HRO. The aerial is a 5-over-5. Unfortunately the QTH is at the bottom of a hill in Bridgend—but anyhow, some of the QSOs are not all that bad, OM! GW3MFY asks for more beams to be turned on South Wales please!

Scottish News

GM3GUI (Friockheim, Angus) sends a red I.G.Y.

report which seems to show that activity and conditions in Scotland have been quite poor. Only GM2FHH and GM3HLH/A were worked during the period, although on one occasion there were very weak carriers from the south-west. The receiver is a R1392 and the transmitter a modified SCR522.

GM6WL (Glasgow) noted only moderate activity, due partly to holidays and partly to some changing of QTHs (which, he is glad to say, is better for v.h.f. in every case). GM2CHN, after such an operation, was able to hear GI5AJ for the first time (with an indoor aerial). His own signals are also noticeably stronger. GM6ZV should be settled in again within the next month. GM5VG has erected a new composite aerial about 16 ft. above the old ones. This comprises a 6-over-6 slot for 2m and an 8-over-8 for 70cm. The 70cm portion has been tested with GM3DDE with very gratifying results. A phone signal which previously sounded S8/9 (and hardly moved the meter) has developed into one of 110 microamps at GM3DDE. GM6WL himself has continued the sked with GI5AJ, the results of which have proved surprisingly consistent. In poorer conditions they can always make it on c.w. and on better days very good phone QSOs are achieved. The loan of a barograph has made some interesting observations possible and GM6WL sent a specimen weekly graph showing that GI5AJ was at good phone strength when the barometer was pretty low but rising. At a recent reading of 29·5 in. GI5AJ was 579 with very little fading. GI5AJ has started a new sked with G3CCH in addition to the one running with G2NY.

GM3HLH confirms that GM2FHH was the first to work LA7AE on July 6 for the first GM/LA contact. GM3HLH worked the LA later with GM2FHH's help.

Portable/Mobile Suffixes

There has been a lot of inquiry from time to time about portable/mobile/alternative address suffixes in other lands, and the writer went into this fully at Bad Godesberg. The list obtained is reproduced below and should be quite useful.

Country	*Portable*	*Mobile*	*Alternative*
Belgium	/P	/M	call unchanged
France	/P	/M	new call
Germany	/P	/M	/A
Holland	/M	/M	/A
Ireland	/P (Field Day only)	not permitted	/A
Italy	/P	not permitted	/P
Jugoslavia*	/P	/P	/P
Sweden	/number of new district	/number of new district	/number of new district
Switzerland	HB1	HB1	HB1

* It is probable that in Jugoslavia mobile operation will shortly be denoted by /M and the alternative address by suffixing to the call-sign the number of the republic in which operation is taking place.

Stations Lists

Particulars are required of as many active v.h.f. stations as possible with frequencies and modes of transmission. This was asked for by the v.h.f. managers at Bad Godesberg —interest in British operation is quite remarkable, and they want to know where to find us! Please send a post card to G2AIW.

Random Notes

A.1491 (Palmers Green N.13), who has been listening for eight months, compares the present time with the openings of 1955 and for the grand opening of the band in 1948 as reported in the BULLETIN at those times, and notes that very few of the stations operative then are still working on 2m and 70cm now. A.1491 thinks a new incentive is needed to combat present apathy and suggests a QRP contest, one point per QSO, the winner being the highest scorer of the year. A station may be worked once only during the period, but if worked /P, /M or /A or otherwise, each would also count. Any comment? Since January, A.1491 has heard 169 stations in 17 counties and two countries.

SM5MN, the S.S.A. v.h.f. manager, suggested at Bad Godesberg that auroral contacts should be reported as RS—(dash) as the T is non-existent.

G3FCQ (Crowborough) would welcome reports of his c.w. or m.c.w. signals received outside the normal service area of about 70 miles. Reports from either operators or B.R.S. listeners will be acknowledged 100 per cent.

G3KYT (Upholland, Wigan) is running 75 watts to a QQV06/40A. Since June 17 G3KYT has worked 50 stations including two French. Reports and QSOs from the south will be welcomed. His frequency is 144·3 Mc/s. The aerial is a five-element Yagi, 400 ft. a.s.l.

It was agreed at Bad Godesberg V.h.f. Conference that 1296/1300 Mc/s should be the operating frequency range on the 24cm band. The French delegation abstained from voting this time, and all others were in favour.

We appear to have been able to get several different angles together this month and hope you will find it interesting.

September 18 please, latest, for the next issue.

Auroral Opening

Auroral propagation was again in evidence on 144 Mc/s on the nights of September 3 and September 4-5. On the 3rd, GM3DIQ first noted the aurora—the strongest so far observed at Kilbarchan—at 22.20 G.M.T. with the beam heading north-west when G2NY was heard at S9+40db. G2NY was so strong that his 'phone signals could be followed although the readability was not 100 per cent. GM3DIQ worked G3CCH and G3KFD during the opening which ended abruptly at 22.55 G.M.T. during the final transmission from G3KFD.

On September 4, G5MA worked G4LX (Newcastle), GM4HR, GM3BOC/A, GM2FHH, GI5AJ and, in the early hours of September 5, PA0MX and DL1SN. Heard but not worked were GM3LAV, GM3NG, G3IOE (Newcastle), GM3EGW, DL6QS and ON4BZ. G5MA first observed the aurora between 21.00 and 22.00 G.M.T.

G5YV (Leeds) worked DM2ABK, 100 miles north of Nuremberg (East Germany) on September 4 and heard HB1RG (Chasseral) throughout the opening. LA7AE was also heard.

G2AIW, with the beam firing north-north-west, heard GM3LAV (RST54—) and G2NY (RST54—) soon after 23.00 G.M.T. on September 4, followed by GM2FHH (RST57—) at 23.22. GM3EGW (RST56—) was worked at 23.25 G.M.T. and G2NY (RST57—) at 23.42. Before the latter contact ended, G2NY's signals had improved to almost T9. GM3BOC/A (RST54—) in Brora, Sutherland, was heard working G5MA at 23.51. GM2FHH (RST55—) was worked at 00.02 on the 5th while GI5AJ (RST45—), who had also been heard working G5MA at 00.38, was contacted at 00.52. OZ3NH was worked by GM2FHH.

Society News and Proceedings

Dr. R. L. Smith-Rose

THE Council take pleasure in announcing that Dr. R. L. Smith-Rose, C.B.E., Director of Radio in the Department of Scientific and Industrial Research has accepted nomination for the office of President for the year 1959.

Dr. Smith-Rose was a member of the London Wireless Club in 1913 and a member of the Council of the Wireless Society of London (forerunner of the R.S.G.B.) shortly after the first World War. He was elected an Honorary Member of the R.S.G.B. on November 9, 1942.

Dr. Smith-Rose is the author of many important books and papers on radio subjects and is a leading authority on propagation problems. He has represented the United Kingdom at a number of international radio conferences and for the past few years he has been Chairman of two important C.C.I.R. Study Groups dealing with Ionospheric and Tropospheric Propagation.

Election of Council 1959

IN accordance with Article 55 of the Society's Articles of Association the Council have nominated the following Corporate Members to fill the vacancies in the Council which will occur on December 31 next:

Officers

President — Dr. R. L. Smith-Rose, C.B.E.

Ordinary Members — Mr. J. D. Kay (G3AAE)
Mr. G. M. C. Stone (G3FZL)

Not later than October 24 next any 10 Corporate Members may nominate any other Corporate Member to serve on the Council by delivering their nomination in writing in a single document to the Secretary, together with the written consent of such nominee to accept office if elected but each such nominator shall be debarred from nominating any other person for this election.

Zonal Representation

Not later than October 24 next any 10 Corporate Members resident in Zone A (Regions 1 and 2) may nominate any other duly qualified Corporate Member to serve as a Zonal Representative on the Council by delivering their nomination in writing in a single document to the Secretary together with the written consent of such nominee to accept office if elected, but each such moninator shall be debarred from nominating any other person for this election.

Candidates for Zonal Representative must be resident within the Zone for which they are nominated and the nominators must be resident in that Zone.

The present Zone A Representative (Mr. W. R. Metcalfe, G3DQ) took office as Executive Vice-President on January 1, 1958.

U.K. Licensees in Cyprus

MR. N. H. SEDGWICK (ZC4WV/G8WV) has been informed by the G.P.O. that if the holder of a United Kingdom Amateur (Sound) Licence is granted a Cyprus licence and in consequence cancels his United Kingdom licence, he will not be required to pass either the Radio Amateurs' Examination or the Post Office Morse Test before he can obtain a new United Kingdom licence provided that his current Cyprus Licence is forwarded with the application.

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

THE 1957-1958 edition of the *Call Book* is now out of print and Headquarters is no longer able to supply copies. It is expected that a revised edition will be available at the Radio Hobbies Exhibition in November.

Society Trophies

THE Council has made the following awards for 1958:

ROTAB Cup to Mr. S. Leslie Hill (G8KS) in recognition of his consistent work with Amateur Radio stations in the Falkland Islands and Antarctica over a period of several years.

Wortley Talbot Trophy to Mr. A. L. Mynett (G3HBW) in recognition of his outstanding experimental work on the v.h.f. and u.h.f. amateur bands.

Founders' Trophy to Mr. G. M. C. Stone (G3FZL) in recognition of his distinguished services to the Society as an I.G.Y. Co-ordinator.

Calcutta Key to Mr. George Partridge (G3CED) in recognition of his outstanding service to the cause of international friendship through the medium of Amateur Radio. (Mr. Partridge founded the Ham Hop Club.)

The Council has decided not to award the Courtenay Price trophy for the current year.

Bevan Swift Memorial Premium for 1958

ACTING on the advice of the Technical Committee the Council has decided to award the Bevan Swift Memorial Premium for 1958 to Mr. George Jessop (G6JP) for his contribution entitled " A Low Noise Crystal Controlled Converter for 144 Mc/s " published in the May 1958 issue of the R.S.G.B. BULLETIN. In the opinion of the Committee Mr. Jessop's article was the most meritorious contribution to Volume 33 of the R.S.G.B. BULLETIN.

Ostermeyer Trophy

ACTING on the advice of the Technical Committee the Council has decided to make the first award of the newly-donated Ostermeyer Trophy to S/Ldr. J. M. Railton (G8AB) for his description of a miniature high power lightweight transmitter published in the December 1957 issue of the R.S.G.B. BULLETIN. In the opinion of the Committee this piece of home constructed equipment was the most meritorious described in Volume 33 of the R.S.G.B. BULLETIN.

Norman Keith Adams Prize and Varney Trophy

THE Council, on the advice of the Technical Committee, has decided to make no awards in respect to the Norman Keith Adams Prize or the Varney Trophy for 1958. The Committee advised the Council that in their opinion no contribution published in Volume 33 of the R.S.G.B. BULLETIN was sufficiently original in conception to warrant the award of the Norman Keith Adams Prize. Likewise no contribution published in Volume 33 qualified for the Varney Trophy which is awarded for contributions dealing with interference problems.

Boy Scout Pan Pacific Jamboree

DURING the Boy Scouts Pan Pacific Jamboree to be held in Auckland, New Zealand, from January 3 to 10, 1959, N.Z.A.R.T. will be operating a special Amateur Radio station under the call-sign ZL1PPJ. It is expected that the transmitters will operate on all bands from 3·5 to 144 Mc/s from 21.00 to 09.00 G.M.T. daily.

Radio amateurs, particularly those connected with the Boy Scouts movement, are invited to make " skeds " with ZL1PPJ through ZL1 stations in Auckland or by writing to Jack Freeman (ZL1VA), President, New Zealand Association of Radio Transmitters, P.O. Box 9138, Auckland, S.E.1, New Zealand.

Election of County Representatives

IN accordance with established practice, an election of County Representatives is due to take place this year with effect from January 1, 1959.

Nominations

Not later than October 31 next, any ten Corporate Members resident in a particular County (or group of Counties, as the case may be) may nominate any other duly qualified Corporate Member resident in that County (or group of Counties) for the office of County Representative, by delivering their nomination in writing to the General Secretary, together with the written consent of such person to accept office if elected.

Period of Office

County Representatives will hold office for a period of two years as from January 1, 1959.

Confirmation of Appointment

County Representatives will only be confirmed in their appointment if the total membership in the County (or group of Counties) they propose to represent is in excess of 25.

Vacancies

In the event of no nomination being received prior to November 1, 1958, from the Corporate Members resident in a particular County (or group of Counties) the Council reserves the right to make an appointment.

Ballots

In the event of more than one person being nominated for a particular office a Ballot will be conducted, details of which will be published in the November 1958 issue of the R.S.G.B. BULLETIN.

Present County Representatives

All present County (or District) Representatives go out of office on December 31, 1958.

Old Timers' Dinner

PLANS are now well advanced for the Third Old Timers' Dinner which is to be held at the Horse Shoe Hotel, Tottenham Court Road, London, W.C.1, on Friday, October 10, 1958.

The Chair will be taken by the President of the R.S.G.B. (Mr. L. E. Newnham, G6NZ) who will have the support of Past Presidents Gerald Marcuse (G2NM), Vic. Desmond (G5VM), Herb. Bartlett (G5QA), Leslie Cooper (G5LC), Stan. Lewer (G6LJ), Ernest Gardner (G6GR), and Reg. Hammans (G2IG), and more than 60 other old timers.

Radio amateurs who have held a full licence issued by the United Kingdom Postmaster-General continuously, including the war years, since January 1, 1933, are eligible to attend. The cost of the dinner, including service, will be 25/-. Those who wish to attend should send a remittance for that amount, together with a stamped addressed envelope, to Mr. John Clarricoats, O.B.E. (G6CL), 16 Ashridge Gardens, Palmers Green, London, N.13. Mr. Clarricoats is arranging the dinner in his private capacity but with the approval of the President of the R.S.G.B.

The Horse Shoe Hotel was the venue chosen for the Second Old Timers' Dinner held in 1948.

Lounge suits will be worn.

Rubber Stamps

BECAUSE of a steep rise in production costs the retail price of rubber stamps bearing the emblem of the Society has been increased to 11/- post free.

North of Scotland Regional Meeting

SATURDAY, OCTOBER 25, 1958

ARDOE HOUSE HOTEL, ABERDEEN

Programme

Assemble	**2.00 p.m.**
Business Meeting	**2.30 p.m.**
Tea (informal)	**4.30 p.m.**
" On the Air " Demonstration of Three Band Quad Aerial	**5.00 p.m.**
Assemble for Dinner	**7.00 p.m.**
Dinner	**7.30 p.m.**

Tickets for dinner only (12/6 each) are available in advance from A. G. Anderson, GM3BCL, " Helford," Pitfodels, Aberdeen or G. M. Jamieson, GM3HTL, 93 Cragton Road, Aberdeen. The LAST DAY FOR APPLICATION FOR TICKETS IS SATURDAY, OCTOBER 18.

Representation

Vacancy

Mr. R. I. Richardson (G3KXT) has resigned as representative for the Croydon area. Nominations for his succesor should be made in the prescribed form and sent to reach the General Secretary by not later than October 31, 1958.

Changes of Address

The address of Mr. R. A. E. Fronius, G3MCW (Town Representative for Brentwood, Essex) is now 169 Coxtie Green Road.

The address of Mr. E. P. Essery (G3KFE), Area Representative for Southgate (London), is now 29 Oakwood Close, Southgate, London, N.14.

East of Scotland Regional Meeting

SUNDAY, OCTOBER 26, 1958

CARLTON HOTEL NORTH BRIDGE, EDINBURGH

Programme

Assemble	**2.30 p.m.**
Business Meeting	**3.0 p.m.**
High Tea and Informal Discussions	**5.0 p.m.**

Tickets for High Tea, price 10/6 each, are available from George Millar (GM3UM), 8 Plewlands Gardens, Edinburgh, 10, or from local representatives by not later than October 20, 1958.

The Council will be represented by Messrs. L. E. Newnham, G6NZ (President) and N. Caws, G3BVG (Honorary Treasurer).

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, July 14, 1958, at 6 p.m.

Present: The President (Mr. L. E. Newnham in the Chair), Messrs. N. Caws, C. H. L. Edwards, D. A. Findlay, W. J. Green, J. H. Hum, E. G. Ingram, W. R. Metcalfe, A. O. Milne, W. A. Scarr, A. C. Williams, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary) and John A. Rouse (Deputy General Secretary).

Apologies for Absence: Apologies for absence were received from Messrs. W. H. Allen, H. A. Bartlett, and F. Hicks-Arnold.

Absent: Messrs. R. H. Hammans and H. W. Mitchell.

* * *

Reports of Committees

Resolved

(i) to receive as Reports the Minutes of meetings of the Contests, Exhibition, R.A.E.N., G.P.O. Liaison, TVI/BCI and V.H.F. Committees and the Handbook Sub-Committee.

(ii) to accept recommendations of the Contests Committee in respect to the rules for the B.E.R.U. Contest 1959, the First 144 Mc/s Field Day 1958 and the 420 Mc/s Open Contest 1958.

(iii) to accept recommendations of the Exhibition Committee in respect to the payment of expenses for those doing stand duty at the Earls Court Radio Show.

(iv) to offer goods vouchers, drawn on exhibitors at the R.S.G.B. Radio Hobbies Exhibition, to the value of £10 and £5 respectively for the two best items of home constructed equipment submitted to that Exhibition by members resident outside Region 7.

(v) to accept a recommendation of the TVI/BCI Committee that the Society should write officially to the Engineer-in-Chief of the G.P.O. regarding TVI/BCI difficulties that had arisen in connection with a station located in South London.

(vi) to accept a recommendation of the TVI/BCI Committee that the Society should inform the G.P.O. that wired wireless television systems are causing trouble to radio amateurs, and that these systems are radiating free Hertzian space waves.

(vii) to accept a recommendation of the TVI/BCI Committee that the Society should seek to obtain from the G.P.O. a definition of, and technical standard applicable to, the words " any interference " as printed in Clause 4 (1)b of the Amateur (Sound) Licence.

O.A.R.C. Geneva, 1959

It was reported that a meeting had taken place between members of the G.P.O. Liaison Committee and representatives of the Steering Committee set up by the G.P.O. to prepare for the O.A.R.C. Geneva 1959. At that meeting the Society's representatives had formed the impression that the Steering Committee intended to propose that with minor exceptions the present amateur allocations for Region I should be continued.

Financial Matters

Resolved to receive and adopt the Cash Account for June, 1958, as prepared and submitted by the Secretary.

The Honorary Treasurer reported that the Society had finished the year to June 30, 1958, with a surplus of approximately £600.

Membership

(*a*) *Resolved* (i) to elect 97 Corporate Members and 16 Associates. (ii) to grant Corporate membership to 1 Associate.

(*b*) The Secretary reported that 106 of the 615 members whose subscriptions became due on April 1, 1958, became three months overdue on June 30, 1958, and that 33 of the members concerned had written to resign.

Applications for Affiliation

Resolved to grant Affiliation to the following Societies and Clubs: Bradford Amateur Radio Society, Huddersfield South Methodist Radio Club, R.A.F. Watton Amateur Radio Club, R.A.F. Wyton Amateur Radio Club, Sutton Coldfield Radio Society.

Empire or Commonwealth

Consideration was given to a suggestion contained in a letter from a member resident in Malaya that the Society should drop the word " Empire " from the title of Society Contests and Awards and also from correspondence, substituting the word " Commonwealth."

The Secretary reminded the Council that the title of the Most Excellent Order of the British Empire has not been changed, neither has the title of the Royal Empire Society. A great many other organisations have retained the words " British Empire " in their title. The Athletics meeting held in Wales was described as " The British Empire Games."

Resolved to retain the words " British Empire " in the title of appropriate Society Contests and Awards, and in correspondence.

Region 1 Meeting Report

The report of a meeting of representatives resident in Region 1 was submitted.

Arising from the Report it was

Resolved (i) to authorise the Region 1 Representative to hold a Regional Meeting in Blackpool on April 12, 1959, and to appoint representatives in due time. (ii) not to agree to the suggestion that advance copies of Résumés of Council Meetings be again sent to the Regional and County Representatives.

London Lecture Meetings

The Secretary submitted for approval a programme of technical lectures to be given at the Institution of Electrical Engineers during the session 1958-59.

Resolved to approve the programme.

O.R.M.s

Reports were submitted on the O.R.M.s held in Cambridge (Region 5) and Exeter (Region 9) on June 29, 1958.

Membership Drive

It was reported that during the two years ended June 30, 1958, Mr. J. D. Kay (G3AAE) had recruited 182 new members.

The Band 70.2-70.4 Mc/s

It was reported that the G.P.O. had agreed to the continued use by amateurs of the band 70.2-70.4 Mc/s on a basis of non-interference to other services and subject to annual review.

The G.P.O. had also indicated that they would be glad to write to Professor Bernard Lovell of the Jodrell Bank Observatory asking him to allow members of the Society to carry out tests aimed at reducing the present radius of restricted operation. (At the moment amateurs may not operate on 4m within 50 miles of the Jodrell Bank Observatory —EDITOR).

Projected DX Convention

The Secretary reported that he had advised Mullard Ltd. of the difficulties which had arisen in finding suitable accommodation in the West Central area of London on a Saturday evening for the projected DX Convention Dinner.

The meeting terminated at 8.50 *p.m.*

R.S.G.B. Affiliated Societies

THE following are additions to the list published in the May issue:

Barnet and District Radio Club: J. Douglas Kay (G3AAE), 18 Fairfield Way, Barnet, Herts.

Bradford Amateur Radio Society: David M. Pratt (G3KEP), 27 Woodlands Grove, Cottingley, Bingley, Yorks.

Huddersfield South Methodist Radio Club (G3LQK): Rev. Arthur W. Shepherd, 11 Station Lane, Berry Brow, Huddersfield, Yorks.

Norwich & District Radio Club (G3JGI): O. F. Simkin (G3HYJ), 15 Hillside Road, Thorpe, Norwich.

North Kent Radio Society (G3ENT): D. W. Wooderson, 39 Woolwich Road, Bexleyheath, Kent.

Purley & District Radio Club: E. R. Honeywood (G3GKF), 105 Whytecliffe Road, Purley, Surrey.

R.A.F. (Yatesbury) Amateur Radio Society (G3HWF): P/O H. Allerston, Officer i/c Amateur Radio Society, R.A.F. Yatesbury, Nr. Calne, Wilts.

R.A.F. (Watton) Amateur Radio Society: G. Metcalfe (G3JDC), R.A.F. Station, Watton, Thetford, Norfolk.

R.A.F. (Wyton) Amateur Radio Club: P/O E. A. Le Baigue, R.A.F. Station, Wyton, Huntingdon, Hunts.

South Bay Amateur Radio Society: 237 "H" Street, Chula Vista, California, U.S.A.

Sutton Coldfield Radio Society: K. H. Varney (G3DMV), 149 Whitehouse Common Road, Sutton Coldfield, Warwicks.

Silent Key

W. H. WINCHCOMBE (G6ZH)

With regret we record the death on August 17, 1958 of Mr. W. H. Winchcombe (G6ZH) of Devizes. A member of the Society for more than 30 years and an active amateur since 1926, G6ZH was an early winner of the 1930 Committee Cup for Top Band work. He served in the R.F.C. and R.A.F. during the First World War during which he was awarded the Meritorious Service Medal. He was in the G.P.O. shipping radio service at Devizes and Highbridge until 1926 when he opened a radio business in Swindon. Six years later he moved to Devizes. During the Second World War he served as a civilian supervisor at R.A.F. Yatesbury. He was a stickler for safety and for good engineering and operating practices.

He became ill in 1945 since when he turned to scientific studies taking the first three years of the City and Guilds Radio Examinations in one sitting at the age of 56 years. He coached many young people in their studies with never ending patience despite the fact that it was an effort for him to sit erect.

Mr. Winchcombe was an expert rifle shot and was chosen to represent England at Bisley in 1938.

His son Tom, who was licensed in 1947 as G3BCW, now operates from Germany as DL2MU. To him and to his mother and brother we offer our sympathy in their great loss.—J. C.

R.A.E.N. Notes and News

By E. ARNOLD MATTHEWS (G3FZW)*

HOLIDAY time, it seems, has not been responsible for any marked recession of activity of Network members and there has been an interesting month's post to deal with. New membership registrations have been very encouraging, and the number of Controllers now exceeds 80.

Whilst discussing recruiting it might be opportune to comment on the doubtless well-intentioned reply given by some amateurs to a C.C. who had hoped they would join the Network. " Don't worry, old chap, if anything happens we'll be right over to give you all the help you need." The Network will always be grateful for any assistance, but one wonders whether help offered under these conditions is really help at all. Unless operators have some knowledge of the routine of the group and of procedure their " help " could embarrass the controller and slow down the working of the net in emergency. In the county concerned an added complication arises. The police have stated that R.A.E.N. members going into a disaster area will be required to produce membership cards when passing the police cordon. Therefore non-members assisting would possibly cause delay and unnecessary work in getting their *bona-fides* established. Let's face it, being willing and being able are two different things! The cost of making sure of ability is little enough, a signature on a registration form and a willingness to serve the community with good heart. The return in benefits to the community, to Amateur Radio, and to the individual is great. It is appreciated that prospective members may feel that they may not have the time available to permit their full participation in the routine activity of their local group, in which case it is suggested that they avail themselves of the " limited membership " scheme.

Around the Groups

Mobile rallies provide a useful opportunity to gain new members and **Ripley** A.C., G3FGY, went to the recent Derby Rally suitably armed with publicity material. By the time this appears in print, the **Notts. and Derbyshire** Group will have held another meeting at Sutton-in-Ashfield. The **Retford** section of the group is in effective liaison with their local St.J.A.B.

Having completed his mobile H.Q. vehicle, the **Birmingham** C.C., G3CNV, has turned his attention to the need for an effective call-out plan, and hopes to test the final product after holding a group meeting to settle details. Controllers considering call-out systems should bear in mind the following points: two schemes are needed, one for day and one for night; there must be no reliance on radio or telephone; the messengers should return to H.Q. as soon as possible after completing the call-out to report the number of members available.

At **Sutton Coldfield** R.A.E.N. members participated in an exercise devised by S.C.R.S. to explore the local mobiles' capabilities. Press observers were present and useful publicity for S.C.R.S. and R.A.E.N. was given in the *Sutton Coldfield News*.

Worcester Group held a meeting on August 22 to discuss administrative matters. The **Cheshire** C.C., G3ERB, picking up the threads after a trip to the United States reports that the **Northwich** A.C., G3GYV, is conducting a recruiting drive.

It is evident from a request made by the Chief Constable of **Buckinghamshire** that more members will be required in in that county. C.C. G3HIU will be pleased to hear from prospective members. In **Cornwall,** G3AET reports that activity will probably be conducted on 80 metres. Another report from the **Belfast** A.C., GI3HXV, gives details of two exercises, held on July 26 and August 6, and it is quite evident that the group has worked up a very effective liaison with both St.J.A.B. and B.R.C.S. and can put up to eight portable stations into the field regularly with about 15 members actively engaged. **London** C.C., G3IIR, held a meeting of the group at B.R.C.S. H.Q. on July 18. A " Vanguard " transmitter is now under construction for use in the National H.Q. station. The London area is to be split into three districts for R.A.E.N. purposes, with an A.C. for each.

On July 23 G3FZW took an opportunity to meet members of the **Norfolk** Group at Snetterton and was much impressed by their enthusiasm. He was " homed " in by G3IJU, with with whom contact was held from the border of Norfolk until reaching the destination. This group's nightly net should receive special mention for its effectiveness. On a number of occasions G3FZW has called G3HRK, the C.C., and has never failed to establish contact with him or some other member of the group. .

Western Trunk Route

The scheme for operation of this route has been submitted to R.A.E.N. Committee by the Route Manager, G2AO. It is hoped to enrol link stations in Northern Ireland in the near future. The following have undertaken to act as section managers: Cumberland to Cheshire inclusive: G. Lancefield (G3DWQ), 35 Brixton Road, Frenchwood, Preston, Lancs. Gloucestershire to Hampshire inclusive: W. E. D. Parker (G6BY), " Kaygor," Worlibury Park, Weston-super-Mare, Somerset.

Net Schedules

Birmingham Mobile Net, each weekday from 13.25 to 14.00 B.S.T. on 1900 kc/s approximately.

Personnel

Amendments to the list of officers published in the April 1958 BULLETIN are as follows.

The undermentioned have been appointed Area Controllers:

J. N. Watson (G3AET) 24 St. John's Terrace, Devoran, Truro, Cornwall; L. E. Flint (G3DMN), 187 Humber Doucy Lane, Ipswich, Suffolk; G. L. Fish (G3ADJ), 358 Peppard Road, Caversham, Reading, Berks.

The undermentioned has resigned as Area Controller for Ipswich: W. E. H. Harris (G3DPH).

R.A.E.N. Rally

If you intend to enter, and haven't applied for your test phrase, write to G3FZW without delay!

London Lecture Meeting
Friday, October 24, 1958
" Radio Signals From Earth Satellites "
by A. W. Nichol
(Cavendish Laboratory, Cambridge)
Institution of Electrical Engineers
Savoy Place, Victoria Embankment
Buffet Tea 6 p.m. **Lecture 6.30 p.m.**

---

* *1 Shortbutts Lane, Lichfield, Staffs.*

Tests and Contests

Low Power Contest 1958

THE rules for the Low Power Contest on October 4 and 5 are the same as in previous years but circuit diagrams of the equipment used are no longer required.

When: 18.00 G.M.T. to 23.00 G.M.T. on October 4 and 08.00 G.M.T. to 20.00 G.M.T. on October 5, 1958.
Eligible Entrants: All fully paid-up Corporate members of the R.S.G.B. resident in Europe.
Contacts: Must be made on c.w. (A1) only between 3500 and 3600 kc/s.
Scoring: Points will be scored on the following basis:

Watts input to p.a. stage	Up to 0·5	To 1	To 2	To 3	To 4	To 5
Points per contact ...	20	10	5	3	2	1

A bonus of 20 points may be claimed for the first contact with each different county code area listed below.

Contest Exchanges: RST reports followed by the contact number starting at 001 and the county code number, e.g. 559001 Nr 17.
Logs: (a) Must be tabulated in columns headed (in this order) " Date/Time (G.M.T.)," " Input Power," " Call-sign of Station Contacted," " My report on His Signals and Serial Number Sent," " His Report on My Signals and Serial Number Received," " County Code No." " Points Claimed."
(b) The cover sheet must be made out in accordance with R.S.G.B. Contests Rule 5 and the declaration signed.
(c) Details of the transmitter and power supply must be given, but circuit diagrams are no longer required.
(d) Entries must be postmarked not later than **October 20, 1958.**
Awards: At the discretion of the Council, the *1930 Committee* Cup will be awarded to the winner and certificates of merit to the runner-up and to the non-transmitting member submitting the best check log in the opinion of the Contests Committee.

The General Rules for R.S.G.B. Contests published on page 437 of the March 1958 *Bulletin* apply to this contest.

COUNTY CODE NUMBERS

England (G).

1.	Bedford	15.	Hereford	28.	Nottingham
2.	Berkshire	16.	Hertford	29.	Oxford
3.	Bucks	17.	Huntingdon	30.	Rutland
4.	Cambridge	18.	Kent	31.	Shropshire
5.	Cheshire	19.	Lancashire	32.	Somerset
6.	Cornwall	20.	Leicester	33.	Stafford
7.	Cumberland	21.	Lincoln	34.	Suffolk
8.	Derby	22.	London (Postal Districts)	35.	Surrey
9.	Devon			36.	Sussex
10.	Dorset	23.	Middlesex	37.	Warwick
11.	Durham	24.	Monmouth	38.	Westmorland
12.	Essex	25.	Norfolk	39.	Wiltshire
13.	Gloucester	26.	Northampton	40.	Worcester
14.	Hampshire	27.	Northumberland	41.	Yorkshire

Scotland (GM).

42.	Aberdeen	54.	Fife	66.	Renfrew
43.	Angus	55.	Inverness	67.	Ross & Cromarty
44.	Argyll	56.	Kincardine	68.	Roxburgh
45.	Ayr	57.	Kinross	69.	Selkirk
46.	Banff	58.	Kirkcudbright	70.	Shetland
47.	Berwick	59.	Lanark	71.	Stirling
48.	Bute	60.	Mid-Lothian	72.	Sutherland
49.	Caithness	61.	Moray	73.	West Lothian
50.	Clackmannan	62.	Nairn	74.	Wigtown
51.	Dumbarton	63.	Orkney		
52.	Dumfries	64.	Peebles		
53.	East Lothian	65.	Perth		

Wales (GW).

75.	Anglesey	79.	Caernarvon	83.	Merioneth
76.	Brecknock	80.	Denbigh	84.	Montgomery
77.	Cardigan	81.	Flint	85.	Pembroke
78.	Carmarthen	82.	Glamorgan	86.	Radnor

Northern Ireland (GI).

87.	Antrim	89.	Down	91.	Londonderry
88.	Armagh	90.	Fermanagh	92.	Tyrone

Channel Islands (GC).

93.	Alderney	95.	Jersey	96.	Sark
94.	Guernsey				

97. Isle of Man (GD). 98. All Stations outside the United Kingdom.

R.S.G.B. 21/28 Mc/s Telephony Contest 1957.

IN the results of the R.S.G.B. Telephony Contest 1957 published in the May 1958 issue of the R.S.G.B. BULLETIN, the score made by OH5QY should have been shown as 2,065 points. This places OH5QY second amongst the overseas contestants.

CQ World-wide DX Contest 1958

THE operating periods for the *CQ* World-wide DX Contest are as follows:

Phone Section: 02.00 G.M.T., October 25 to 02.00 G.M.T., October 27.
C.w. Section: 02.00 G.M.T., November 29, to 02.00 G.M.T., December 1.

Serial numbers to be exchanged will consist of the RST (or RS) report followed by the number of the Zone in which the competitor is located. Stations in Zones 1 to 9 will prefix their Zone numbers with zero, i.e., 01, 02, etc.

Contacts may be made in any band from 1·8 to 28 Mc/s. Three points will be scored for contacts between stations in different continents and one point for contacts with stations in the same continent. Contacts between stations in the same country score no contact points but may be made for the purpose of Zone and/or country multipliers. Only one contact with the same station on one band counts for points. A multiplier of one is allowed for each Zone contacted on each band and a multiplier of one for each country worked on each band.

The contest will be divided into the following sections: (*a*) Single operator phone; (*b*) Multi-operator phone; (*c*) Single operator c.w.; (*d*) Multi-operator c.w.; (e) Novice c.w. There will also be an inter-club competition in which the club scores will be the combined scores of members participating.

Single operator contestants must show a minimum of twelve hours operating time to be eligible for an award. Multi-operator stations must show a minimum of 24 hours operating time.

Entries, which must be postmarked not later than **December 1, 1958, for the Phone Section** and **January 15, 1959 for the C.w. Section,** should be sent to the Contest Committee, *CQ Magazine*, 300 West 43rd Street, New York 36, N.Y., U.S.A.

NATIONAL FIELD DAY 1958

The full results and a report on N.F.D. will appear in the October issue of the *R.S.G.B. Bulletin.*

Contacts with Japan

THE Japanese Section of the B.B.C., which broadcasts a science programme every week, wishes to hear from British amateurs who have worked Japanese stations. Letters should be addressed to M. Tomioka, Japanese Section, B.B.C., Bush House, Strand, London, W.C.2.

Visitors Welcomed

RADIO amateurs who visit Copenhagen will be made very welcome at the home of Paul Rasmussen (OZ1PR), and his English wife Margaret, provided they first ascertain by letter or telephone that the date of the proposed visit is convenient.

Mr. and Mrs. Rasmussen live at Aurikelvej 8 St.tv. Valby, Copenhagen, Denmark.

Contests Diary

1958

September 20-21	- *CQ* WAS S.S.B. Contest[1]
September 28	- R.A.E.N. Rally[2]
October 4-5	- Low Power Contest[3]
October 4-5	- VK/ZL DX Contest (Phone Section)[4]
October 11-12	- VK/ZL DX Contest (C.W. Section)[4]
October 25-26	- *CQ* World Wide DX Contest (Phone Section)[5]
November 8-9	- Second 1·8 Mc/s Contest
November 15-16	- Second 70 Mc/s Contest
November 22-23	- 21-28 Mc/s Telephony Contest[6]
November 29-30	- *CQ* World Wide DX Contest (C.W. Section)[5]

[1] For details, see *CQ* Magazine, August 1958.
[2] For rules, see page 87, R.S.G.B. Bulletin, August 1958.
[3] For rules, see this page.
[4] For details, see page 87, R.S.G.B. Bulletin, August 1958.
[5] For details, see above.
[6] Rules to be published in R.S.G.B. Bulletin, October 1958.

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.

R.S.G.B. Telephony Contest

DEAR SIR,—In the May 1958 issue of the BULLETIN, I learned to my surprise and pleasure that I am to be the holder of the Metcalfe Trophy for the next year. When I looked a little deeper into the November 1957 21/28 Mc/s Telephony Contest results and reports, I discovered that only *four* non-licensed members of the R.S.G.B. had entered a check log for the aforesaid contest. This lack of support certainly rubbed the edge off my delight as I had previously imagined the competition would be very keen. I took this view from the fact that every month in *M.O.T.A.*, numerous B.R.S. and Associates report their findings on the h.f. bands. I felt this contest would be a " must " with them and an opportunity to hear a little of the DX that was almost bound to be competing.

Naturally at the time of writing I have no knowledge as to whether the R.S.G.B. will be offering the Trophy in a similar way for next November's Contest. I sincerely hope so and will certainly compete again, trusting that this will bring forth a few more of the non-licensed fraternity on November 22-23. Also may I suggest to the Contests Committee that if the response is better next time, a point-scoring competition could be formed for listeners in the following year?

Yours faithfully,

Sutton, Surrey. M. HARRINGTON (B.R.S. 20249).

Radiations from Outer Space

DEAR SIR,—I was interested in the comments of Mr. W. H. Matthews, following my article on *Radiations from Outer Space*. At the time of writing, I had forgotten about the claims of Velikovsky that Venus was a newcomer to the solar system and possibly in a disturbed, molten or gaseous condition. This would certainly help to explain the generation of unusual radiations. Jupiter, another source of radio signals, is sufficiently large to be in a disturbed molten state, also. Further interesting observations have been made on the Jupiter emissions at the Boulder Laboratories of the National Bureau of Standards (see *Electrical Engineering*, vol. 76, page 650, July 1957). It is found that the emissions from each source, at a specific frequency, come through a cone of transmission radiating out from the source. The waves in the cone, therefore, appear to be penetrating an ionosphere, while the more oblique waves are reflected back. The cone is found to be wider on 20 Mc/s than on 18 Mc/s, and furthermore, the cones had smaller angles in 1957 than in 1956, apparently due to the increased solar activity increasing the ionisation of Jupiter's upper atmosphere. The evidence for an ionosphere on another planet, also subject to the variations of the solar cycle, is very fascinating.

Yours faithfully,

G. ELLIOTT (G3FMO).

Tilehurst, Reading.

Round the World the Hard Way

DEAR SIR,—I recently received a letter from W0UIM of Davenport, Iowa, confirming a contact which took place on 28 Mc/s 'phone on January 8, 1958 at 19.28 G.M.T., in which he put forward a rather surprising suggestion that our signals had travelled completely round the world during this contact. The distance suggested is 30,500 miles made up by the distance round the world, some 28,800 miles, plus the distance between our stations. He bases his assumption on the fact that at the time of our contact his beam was pointing at South Africa and my beam was pointing north-northwest, I quote:

" To reiterate, I had my beam in the South East, pointed at South Africa, and you stated to my query, that your beam was pointed North West. So that would put our beams end to end, which would be a definite null point. While you were transmitting, I did rotate my beam towards England, and your signal dropped way down, but bringing my beam South East again your signal built up to a peak of 20db over 9. And after working you, I did look for other G stations and did not hear any on the band."

He was using a three-element close-spaced beam and my beam is a G4ZU.

I am wondering if other readers have observations to make concerning this suggestion and I shall welcome comments from any one with specialized knowledge covering propagation.

Yours faithfully,

Wingerworth, Near Chesterfield, Derbys. C. R. PLANT (G5CP).

Do we want two N.F.D. weekends?

DEAR SIR,—During a recent group discussion on " N.F.D.," unanimous support was given to the idea put forward from York of two N.F.D. weekends—one group of frequencies per weekend, with the selection of frequencies according to preference, as provided for in the present N.F.D. rules—our reason being, that the smaller groups would have the same chance as the larger ones, inasmuch as they would be able to take part on *all* the selected frequencies without being shorthanded.

Many groups find it difficult to run two N.F.D. stations owing to the inadequate number of personnel available, but with a two weekend N.F.D. the situation would be simplified.

Nevertheless, despite difficulties, we all enjoyed Field Day, and looking forward to next year's event once more.

Yours sincerely,

C. T. MALKIN (G5IV),

Barnsley, Yorks. (T.R. Barnsley.)

Pirates and Publicity

DEAR SIR,—It is with much interest that I have, over the past two or three issues of the BULLETIN, read accounts of amateurs assisting the G.P.O. to catch " pirates." However, I feel I must point out that secrecy while doing this sort of work, and after operations are completed, is *most essential*. We in this area (which is not a thousand miles from Essex) have smashed two large groups of " pirates " and sundry odd ones here and there; the exact total is not definite, but is believed to be around twenty. I do not wish to be cynical, or to imply " sour grapes," but I think the Essex boys should be informed that they are most definitely not alone in this fight to keep " pirates " off the air. We have decided to keep under cover, as opposed to getting ourselves known through the medium of the printed word, for the simple reason that after our first great coup, we could have not repeated it a second time had we been known. Time alone will tell whether the publicity afforded the Essex affair will cramp the style of those concerned on any future occasion.

Yours faithfully,

NILES NADGPOLE.

Editor's Note.—While it is not normal practice for the BULLETIN to publish letters under a *nom de plume*, the request accompanying this letter seemed reasonable. The member's name, address and call-sign were supplied in a covering note.

Against Radio Teletype for Amateurs

DEAR SIR,—Surely the answer to G2UK's query as to why s.s.b., but not RTTY, is encouraged by the Society is simple. S.s.b. utilizes one-half of the band-width required for ordinary a.m. phone, whereas RTTY—which, apparently, necessitates the use of frequency-shift keying—requires a band-width many times greater than that required for c.w. operation. Any amateur who has experience of trying to copy c.w. through the commercial " jingle-bells " on 3·5 Mc/s must surely be opposed to amateur RTTY on any band at present used for c.w.

In any case, does not the regulation that messages must be in plain language effectively prohibit transmission of signals requiring a machine to decipher?

Yours faithfully,

WILLIAM H. BORLAND,

London, S.W.19. (GM3EFS).

Amateur Licences
Are the Post Office Being Logical?

DEAR SIR,—It was reported in the BULLETIN for July, that at a recent R.S.G.B. Council Meeting, the Southampton Group, R.S.G.B., proposed a protest be sent to the G.P.O. regarding the stringent regulation which became effective from May 9, requiring all Amateur Sound licensees, who had not passed a G.P.O. Morse test and/or R.A.E., and who had allowed their licences to lapse, to pass these tests before the licence would be re-issued. The protest was in regard to hardship which might be caused to those who may have been sick and unable to renew and others who may have been sent temporarily overseas. In reply the Secretary stated that he had reason to believe that the G.P.O. would relax the regulation in such cases.

A letter received by me from the G.P.O. on August 8, in reply to a query regarding my own licence during a forthcoming absence abroad, states that if I turn in my licence now, the call-sign will be reserved for me, but that I must pass the Morse test and R.A.E. before it will be issued again. The alternative is for me to renew the subscription annually whilst I am away, as though I were still keeping the station operative. I fail to see, if the regulation can be circumvented in this manner, the purpose of such a regulation. As a Service radio operator with 22 years' operating experience I am not likely to be unable to read Morse at 12w.p.m. and with 10 years' radio and radar maintenance experience plus four years' active amateur operating and constructional experience, solving of BCI and TVI problems, the R.A.E. would present only an inconvenience. Why then should it be necessary that re-examination take place before re-issue of my licence?

Yours faithfully,
H. DEAN (G3KDK)

Plymton, Devon.

Editorial Note. *A copy of Mr. Dean's letter was sent to the G.P.O. with an invitation to submit for publication in the same issue of the* BULLETIN *a letter or statement explaining why Mr. Dean will be required, unless he continues to pay his renewal fee each year whilst abroad, to pass the Morse Test and Radio Amateurs' Examination on his return to the United Kingdom.*

The following is a copy of a letter received from the Radio Services Department of the G.P.O.

Dear Mr. Clarricoats,

I am replying to your letter of 15th August, with which you enclosed a copy of Mr. H. Dean's letter of the 13th August, about the position of United Kingdom Amateur (Sound) Licence holders who go abroad for a period.

Clause 12 of the Amateur (Sound) Licence provides that the Licence shall continue in force for one year from the date of issue and thereafter so long as the Licensee pays each year, on or before the anniversary of the date of issue of the Licence, the renewal fee prescribed in regulations made under the Wireless Telegraphy Act, 1949. If, therefore, a Licence holder does not pay the renewal fee when it becomes due, whether or not he goes abroad, his Licence ceases to be in force, and if he subsequently wishes to operate in the United Kingdom in the amateur service he must obtain a new licence.

As you know, the International Radio Regulations annexed to the International Telecommunication Convention to which the United Kingdom is a party, require Administrations to verify the technical and Morse qualifications of any person operating the apparatus of an amateur station. As the system of exempting qualifications was discontinued on the 9th May, 1958, the Postmaster General now requires every applicant for an Amateur (Sound) Licence to pass the Radio Amateur Examination and the Post Office Morse Test. The Postmaster General has not, so far, found it necessary to require holders of licences issued before 9th May, 1958, who were granted exemption from taking the examination and test, to pass them before their licences are renewed, and those licences will therefore continue in force so long as the renewal fee is paid. You will, I am sure, appreciate that this decision represents a concession,

The Postmaster General cannot go into the reasons why a particular amateur relinquishes his licence and apart from the arrangements indicated below for licensees who go abroad, no exception can be made to the arrangements set out in our letter of 19th March for dealing with applications from former licence holders. Briefly, these are that if the applicant has not previously passed the Radio Amateur Examination and the Post Office Morse Test he will be required to do so, and an applicant who has previously passed the Morse Test will be required to take that test again if his former licence was cancelled more than twelve months prior to his application for a new licence. However, if any United Kingdom amateur obtains a Commonwealth licence, cancels his United Kingdom licence, and applies for a new United Kingdom licence on his return, the Postmaster General would be prepared, in view of the "unbroken amateur service," to grant a licence without examination or test provided that the application is accompanied by the current Commonwealth licence.

Yours sincerely,
(Miss) E. M. PERRY.

Radio Services Dept.,
General Post Office.

Walkie-Talkie Sets

DEAR SIR,—It is apparent from inquiries received by the Post Office from persons wishing to use Government surplus transmission equipment, especially "Walkie-Talkie" sets, that there is uncertainty among both prospective users and radio dealers about the need for licences. I hope the information given below will be helpful to your readers.

Section 1 of the Wireless Telegraphy Act, 1949, provides that "no person shall establish or use any station for wireless telegraphy or instal or use any apparatus for wireless telegraphy without a licence in that behalf granted by the Postmaster General." Any person who does so is guilty of an offence under that Act.

Any person who intends to use Government surplus transmission equipment must, therefore, obtain a licence. I am afraid that in the majority of cases the technical characteristic of the equipment, including the frequency bands in which it works, are such that the Postmaster General would not be able to grant one.

Yours faithfully,
J. EVANS,
Deputy Public Relations Officer.

G.P.O. London, E.C.1.

Ham Hospitality

DEAR SIR,—Every year a considerable number of amateurs from overseas visit this country, and the majority of them appear to spend part of their time in London or its environs.

During the past few years I have made a point of inviting many of these visiting amateurs—most of whom have been met at London Members' Luncheon Club meetings—to my home. There they have sampled my wife's cooking, seen my station and enjoyed an evening discussing our mutual hobby.

Without exception, my offers of hospitality have been accepted and in nearly all cases it has been found that, had it not been for my invitation, these visiting amateurs would have left this country without ever having seen even one of the thousand or so amateur stations in the London area.

Undoubtedly many visiting amateurs either call at R.S.G.B. Headquarters in person or contact it by telephone, and I would like to suggest that it would be a good thing if Headquarters kept a list of members willing to extend hospitality. If even only moderate support for such a scheme is forthcoming it would probably mean that the number of visitors a member is asked to entertain need not exceed two or three each year. Members volunteering could, in fact, indicate how often they would welcome visitors, and if they also state their main line of interest in the hobby (v.h.f., DX, s.s.b., aerials, contruction, etc.) Headquarters could, without any trouble, put them in touch with members with similar interests.

Yours faithfully,
J. DOUGLAS KAY (G3AAE).

Barnet, Herts.

(*A ham hospitality scheme on similar lines to that suggested by Mr. Kay operated successfully during and just after the last war. Attempts to revive it later were not entirely successful. The latest appeal may meet with a better fate.*—EDITOR.)

LONDON MEMBERS' LUNCHEON CLUB
will meet at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road,
at 12.30 p.m. on Friday, September 19 and October 17, 1958
Telephone table reservations to HOL 7373 prior to day of luncheon.
Visiting amateurs especially welcome.

Intruders in the Amateur Bands

DEAR SIR.—Some eighteen months ago a few members of the R.S.G.B. offered to form an Intruder Watch. By devoting a period of their operating time each month to listening and reporting, the members of the Watch have already made a valuable contribution to the Amateur Radio movement all over the world. Whilst it is impossible to give recognition to individuals I hope the publication of this letter will bring their work to the notice of the membership as a whole.

Unfortunately, many users of radio (including broadcasters), seem to regard even the exclusively amateur bands as fair game for activities they are unable to fit into their proper allocations (if any). In the shared bands full advantage is taken of the fact that the amateur is there "subject to non-interference with other services." To some extent we have ourselves to blame, by reason of the fact that complaints from amateurs have been too few and too late, and most important of all, not made to the right place. More and more publicity should be given to the fact that amateurs are helping to look after their own bands. It is possible to identify most intruders and reports from Amateur Radio stations are fully investigated.

As we cannot hope to clear all the trouble at once we have to work to a long-term policy. Nevertheless several intruding stations have been quietly removed to frequencies *outside* the amateur bands.

We have now reached the stage where some more active help is wanted. One hour a week is enough; more is excellent. No correspondence is involved, other than sending me quarterly monitor log sheets covering the periods ending March 31, June 30, September 30 and December 31 each year. Reports are wanted on all non-amateur transmissions in exclusive amateur bands. Time (G.M.T.), frequency, call-sign and/or type of transmission, example of traffic or type of broadcast must be given. Each sheet must be dated and must give the type of receiver and its i.f., the type of aerial in use as well as the location of the observer. Frequency should be measured as accurately as possible.

I appeal for the help of more members not just for a few weeks, but for continued assistance perhaps for a good many years to come.

Yours faithfully,

Havant, Hants. D. W. J. HAYLOCK (G3ADZ).

(Major Haylock is the leader of the "Intruder Watch"—EDITOR.)

The "G8ON" Top Band Aerial

DEAR SIR.—Since the description of my aerial system appeared in the September 1957 issue of the BULLETIN, I have been trying to gather data on its performance from the few stations I know to be using it. While its properties, at what on 1·8 Mc/s rates as medium DX, appear to have given fair satisfaction, it is clear from comments that this aerial may prove very disappointing at ranges of say, 30 miles by day and 80 miles by night. I had found this myself, and had noticed that on occasions the daytime signal at 30 miles was reported weaker than at about the same time at 60 miles range.

In the original description I mentioned that G6CJ had suggested fanning the lower horizontal, but both a two-wire and three-wire fan were tried with no clear improvement. When the additional wires were taken down, it was decided to try "doubling" the vertical section, C-D in the diagram (Fig. 1), and an additional wire was fixed from the top to the bottom horizontal at a distance of three inches from C-D. This gave a fair improvement of the semi-local signal, and two more such wires have since been added. While it is not easy accurately to evaluate the improvement, it seems that the signal at 30 miles (daylight) is about two "S" points better. As the chief use of Top Band at this station is for R.A.E.N. purposes, this improvement has been of great value.

The effect of this alteration on longer distance work at night appears to be negligible. The effect on the working of the system on 3·5 Mc/s seems to be precisely nil.

It seems probable that even better results would follow from the use of copper braid or tape for the vertical section C-D.

Yours faithfully,

Worksop, Notts. H. S. CHADWICK (G8ON).

The T2FD Aerial

DEAR SIR,—Pat Hawker (G3VA) mentions this three-quarter wave radiator in his *Technical Topics* for July, 1958. May I be allowed to add for the benefit of readers who may wish to try it out that the 40-metre version given on page 24 (Fig. 3a) will radiate on ALL bands from 3·5 to 28 Mc/s? Moreover, if the dimensions are increasd to those of the 80-metre version (94 ft. with 3 ft. spacing) the Top Band is brought in. In fact this aperiodic aerial will, within reason, radiate on any frequency fed to it. The terminating resistor may conveniently be a wire-wound one, of the same ohmic value as the feeder in use (i.e., 600–300–72 ohms respectively for 600 ohm open wire line, 300 ohm flat ribbon or tubular and 72 ohm coax). The angle of tilt is best at about 30°.

Yours faithfully,

N. P. SPOONER (G2NS)

Southbourne
Bournemouth, Hants.

In Support of QSL's

DEAR SIR,—It would be a very sad day for Amateur Radio if we all took the attitude of G3CMJ about QSL cards. I have QSL cards going back over the years, and would not part with them. To me, and most of us, the QSL is the final courtesy of a QSO, using one's common sense, who to QSL and not to QSL.

Yours faithfully,

F. ROSE (G2DRT).

High Wycombe, Bucks.

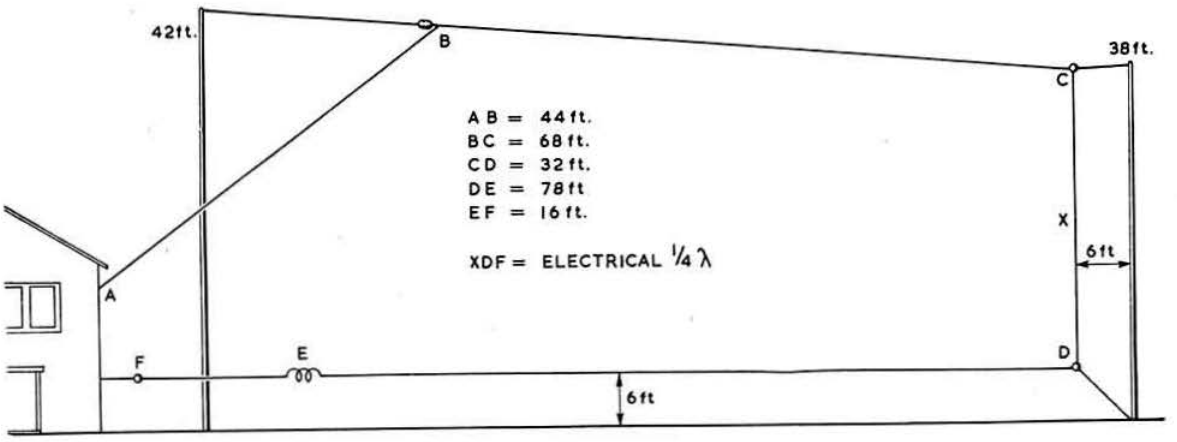


Fig. 1. The G8ON Top Band Special as originally described in the September 1957 Bulletin. The modifications are described in the accompanying letter from Mr. Chadwick.

Regional and Club News

Aldershot and District Radio Society.—Members are at present completing equipment to be entered in the competition for the " Frost Award " for the best piece of home-built equipment. *Hon. Secretary:* S. E. Hume, 25 Kingsway, Aldershot.

Bristol.—About 45 members were present at the August meeting when K. J. Creamer (B.R.S. 10167) gave a talk entitled " The Art of QSL'ing." Mr. Creamer also described a simple " S " meter circuit suitable for use with any type of communications receiver. The leaders in the Listening Contest held on July 20 were: A.1426 and B.R.S. 20779 with 67 points each, B.R.S. 21806 with 51 points (using three bands). On 7 Mc/s only, A.1473 scored 33 points, B.R.S. 19638 and A.1658 scored 30 points each and A.1437 29 points. *Hon. Secretary:* D. F. Davies (G3RQ), 51 Theresa Avenue, Bishopston, Bristol 7.

Cornish Radio and Television Club.—At the August meeting in Falmouth, G3AET (County Controller) gave a talk on R.A.E.N., G3CZZ described his new 2 metre transmitter and G3LPB gave a talk entitled " Electronics and Music." At the October meeting at the Y.M.C.A., Falmouth, the lecture will be given by a speaker from the Marconi Marine Radio Co. *Hon. Secretary:* J. Brown (G3LPB), Marlborough Farm, Falmouth.

Gravesend Amateur Radio Society.—Meetings are held on Thursdays at the Old Sun, Crete Hall Road, Northfleet, commencing at 7.30 p.m. Seven members took the recent R.A.E. and all passed. The instructor was E. Woods (G3FST). *Hon. Secretary:* L. C. Bodycombe, 21 Grieves Road, Northfleet, Gravesend.

Halifax and District Amateur Radio Society.—The first meeting of this new club was held on August 5 when it was decided to hold future meetings on the first Tuesday in each month at the Sportsman Inn, Bradshaw. The society's headquarters will be open for informal meetings at other times. The *Chairman* is H. Makin (G3FDC) and the *Hon. Secretary* is A. Robinson (G3MDW), Candy Cabin, Ogden, Halifax, from whom further information may be obtained.

Leeds Amateur Radio Society.—The first meeting of the new session will be held on September 24 at Swarthmore Educational Centre, 4 Woodhouse Square, Leeds 3, commencing at 7.45 p.m. Details of the society's programme which includes film shows, lectures, demonstrations, junk sales and visits to places of interest may be obtained from the *Hon. Secretary:* J. R. Hey, 40 Richmond Avenue, Headingley, Leeds 6.

London Members' Luncheon Club.—Visitors to the August meeting included the Society's President, L. E. Newnham (G6NZ) while overseas visitors were 11YCZ, VK3AEL, VK6MM, VR2BC and ZL2AGW. In the absence of the Chairman, S. E. Vanstone (G2AYC), the chair was taken by Arthur Milne (G2MI). The club will meet again on September 19 at 12.30 p.m. at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, London, W.1. Visitors will be most welcome. Those intending to be present are asked to book, if at all possible, 24 hours in advance by telephoning G2FUX (RUIslip 2763) or R.S.G.B. Headquarters (HOLborn 7373).

Newbury and District Amateur Radio Society.—Mobile visitors will be particularly welcome at this year's Hamfest which is to be held at Elliotts of Newbury Canteen, West Street, Newbury, on October 19 commencing at 3 p.m. A talk-in station, G3IPR/A, will be in operation on Top Band. Tickets will be available from the *Hon. Secretary:* J. A. Gale, " Wild Hedges," Crookham Common, near Newbury.

Norwich and District Radio Club.—The club issues an excellent newsletter entitled *Forward Gain.* The July issue contained articles on aerial gain and an improved cubical quad in addition to local news. A " Bucket and Spade " Party was due to be held at Hunstanton on August 31. *Hon. Secretary:* O. Simpkin (G3HYJ), 15 Hillside, Thorpe, Norwich.

Scarborough Amateur Radio Society.—Meetings are held at the society's headquarters in Chadwicks Yard, North Street, every Thursday evening, when visitors, especially those on holiday, will be most welcome. Mobiles can be guided in on most bands. *Hon. Secretary:* P. B. Briscombe (G8KU), " Roseacre," Irton, near Scarborough.

Lincoln Hamfest and Mobile Rally

A Hamfest and Mobile Rally is being organized by the Lincoln Short Wave Club at the Technical College, Lincoln on September 21. Attractions include a lecture on transistors by a member of B.T.-H., a tour of historic Lincoln, high tea, a junk sale and a competition for the best home-built mobile installation. Tickets, price 8/- and s.a.e. from: R. W. Sadler, 14 Hainton Road, Lincoln.

New Book

RADIO VALVE DATA. Characteristics of 3,000 Valves, Transistors, Rectifiers and C.R. Tubes. Compiled by " Wireless World." Sixth Edition. Published by Iliffe & Sons Limited. Price 5s. net (postage 9d.) from R.S.G.B. Headquarters. Size 11 in. × 8½ in. 136 pages.

The latest edition of this widely used reference book has been enlarged and made easier to use. It now contains operating data on over 3,000 British and American radio valves, transistors and rectifiers and cathode-ray tubes.

A new feature is that the valve base connection codes have been included in the index, as well as being retained in the main tables. The index also includes a list of equivalents, which has been revised and expanded.

The main tables first classify the valves by function (frequency changers, efficiency diodes, etc.), then by manufacturers' names and finally into current, replacement or obsolete types, as recommended by the makers. Within each section the valves are listed in order of their heater voltages.

More than 100 members and friends attended the Region 9 Meeting held in Exeter on June 29, 1958.

Forthcoming Events

Details for inclusion in this feature should reach the appropriate Regional Representatives not later than the 18th of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted MUST include the date, time, venue of meeting, name of lecturer or details of any other special event being arranged.

REGION 1

Bury (B.R.S.).—October 14, 8 p.m., George Hotel, Kay Gardens (Lecture and film show arranged by Mullard Ltd.).

Manchester (M. & D.R.S.).—October 6, (" Basic Bottles " by A. Langfield, G3IOA); November 3 (" Mobile Construction " by A. Brennan, G2AUC), 7.30 p.m., Brunswick Hotel, Piccadilly, Manchester.

Wirral (W.A.R.S.).—September 19 (Discussion on Frequency Measurement); October 3 (Annual General Meeting), 7.45 p.m., No. 4, Hamilton Square, Birkenhead.

REGION 2

Middlesbrough (T-S.A.R.C.).—October 10 ("Frequency Checking " by G3JMO), October 25 (Pie Supper), 8 p.m., Settlement House, Newport Road.

REGION 3

Birmingham (M.A.R.S.).—September 16, 7.15 p.m., Midland Institute, Paradise Street. (Annual General Meeting).

Coventry.—September 26, 7.30 p.m., Vine Street School. (Formal Meeting).

Stourbridge.—September 26, 8 p.m., " White Horse," Amblecote. (Annual Dinner). October 7, 8 p.m., Brotherhood Hall, Scotts Road, (Talk or Discussion).

REGION 4

Derby (D. & D.A.R.S.).—September 24 (" Simple Equipment for Servicing "); October 1 (" Useful Items Sale "); October 8 (R.S.G.B. Tape Recorded Lecture); October 15 (Open Evening), 7.30 p.m., Room 4, 119 Green Lane, Derby.

Lincoln (L.S.W.C.).—September 21, 1.30 p.m., Hamfest and Mobile Rally at the Technical College, Cathedral Street.

REGION 5

Cambridge (C. & D.A.R.C.).—September 19, 7.45 p.m., " Jolly Waterman," Chesterton Road. (" A TVI-proof 28 Mc/s Transmitter," G. A. Jeapes, G2XV).

REGION 6

High Wycombe.—October 22, 7.30 p.m., G2RL " Denewood," Totteridge Road, High Wycombe. (Ragchew).

REGION 7

Acton, Brentford & Chiswick.—October 21, 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick. (" Low Power Contest Working " by G5LQ).

Barnet (B.D.R.C.).—September 30, 7.30 p.m., No. 1374 Squadron, Air Training Corps., Gloucester Road, New Barnet. (A.G.M.).

Bexleyheath (N.K.R.S.).—September 25, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath. (Film: "The Principles of the Transistor.")

East Molesey (T.V.A.R.T.S.).—October 8, Carnarvon Castle Hotel, Hampton Court. (Talk by Automobile Association, Radio Communications Dept.).

Holloway (G.R.S.).—September 22 (R.A.E. and Morse Classes commence). Montem School, Hornsey Road, Holloway, N.7.

Slough.—October 6, 8 p.m. (" The Newcomer to Amateur Radio "—a discussion), Stag Hotel, Wexham Street.

REGION 8

Brighton (B. & D.R.C.).—September 16 (Recorded lecture on " Aerials " by F. Charman, G6CJ); September 23 (Club transmitter construction); September 30 (Record lecture entitled " Disc and Tape Recording " by H. A. M. Clark, M.I.E.E., G6OT); October 7 (Film Show); October 14 (" Valve Amplifiers." by H. R. Henly), 8 p.m., " The Eagle Inn," Gloucester Road, Brighton 1.

REGION 9

Bath.—October 6, 7.30 p.m., 12 James Street West (" Crystal Controlled Converter for 21 and 28 Mc/s," G3FBA).

Bristol.—September 26 (" Printed Circuits," F. Hicks-Arnold, G6MB); October 17 (TVI and Its Suppression, P. W. Crouch, G3GBK), 7.15 p.m., Carwardine's Restaurant, Baldwin Street.

Exeter.—September 16, 7.30 p.m., Heavitree Social Centre, Fore Street. (Annual General Meeting).

Torquay.—October 11, 7.30 p.m., Y.M.C.A., Castle Road. (" 12 cm. Transmission and Reception—Part 1, W. Sydenham, G5SY).

REGION 10

Port Talbot.—October 7 (A.G.M.); October 21 (R.A.E. Lecture and Morse Instruction); November 4 (Inquest on N.F.D. 1959), 7.30 p.m., Talbot Hotel, Taibach, Port Talbot.

REGION 12

Aberdeen (A.A.R.S.).—September 19 (" Mullard Film Show "); September 26 (Visit to Granitehill TV Link Station), 7.30 p.m., 6 Blenheim Lane.

REGION 14

Glasgow.—September 26, 7.30 p.m., Christian Institute, 70 Bothwell Street, Glasgow, C.2. (" Theory and Practice of Stereophonic Sound," Live Demonstration by R. T. Frost, GM6FT of Pye Ltd., Cambridge).

REGION 15

Belfast.—September 22, 7.45 p.m., Toc H, 73 Lisburn Road. (N.F.D. Film and Talk).

DATES FOR YOUR DIARY

1958

September 21.—Bridlington O.R.M.
September 21.—Lincoln Mobile Rally.
September 26.—London Lecture Meeting at I.E.E.
October 10.—Old Timers' Dinner, The Horseshoe Hotel, Tottenham Court Road, London, W.C.1.
October 24.—London Lecture Meeting at I.E.E.
October 25.—Aberdeen O.R.M.
October 26.—Edinburgh O.R.M.
November 14.—London Lecture Meeting at I.E.E.
November 26-29.—Radio Hobbies Exhibition, Royal Horticultural Society's Old Hall, London.
December 12.—Annual General Meeting.

1959

January 23.—Presidential Address.
February 27.—London Lecture Meeting at I.E.E.
March 20.—London Lecture Meeting at I.E.E.
April 26.—North Midlands Mobile Rally.

R.S.G.B. RADIO HOBBIES EXHIBITION

ROYAL HORTICULTURAL SOCIETY'S OLD HALL, VINCENT SQUARE, LONDON, S.W.1

November 26-29, 1958

The Exhibition Committee invites members all over the country to offer for display equipment of every type from gadgets to complete transmitters and receivers. A Silver Plaque will again be presented in connection with the Constructors' Competition. Prizes value £10 and £5 will be awarded in connection with equipment exhibited by members living outside Region 7. **Offers *only* in the first instance should reach R.S.G.B. Headquarters by September 30, 1958.** Offers to do stand duty at the Exhibition should be sent direct to G. W. Norris (G3ICI), 134 Meads Lane, Ilford, Essex.

Enquiries regarding stand space should be addressed to the Exhibition Organizer, P. A. Thorogood (G4KD), 35 Gibbs Green, Edgeware, Middlesex.

North Eastern Regional Meeting and Mobile Rally

SUNDAY, SEPTEMBER 21, 1958

SPA ROYAL HALL, BRIDLINGTON, EAST YORKSHIRE

Programme

Assemble - - - -	**1.30 p.m.**
Business Meeting - -	**2.30 p.m.**
Ladies' and Children's Tour	**2.30 p.m.**
Tea, followed by Draw -	**5.0 p.m.**

Prizes will be awarded for the best mobile installations. G3GBH/A will be in operation on Top Band and 80 metres. Accommodation for the week-end (Saturday and Sunday) can be arranged at prices from 35/- per person. Tickets, price 6/6 each (including Tea and Draw), may be obtained from Arthur Dunn (G2ACD), 57 The Promenade, Bridlington. Further information from Cliffe Metcalfe (G3DQ), 12 Cliff Street, Bridlington. (Telephone: Bridlington 4872 (day) or 5180 (night). The Council will be represented by Messrs. L. E. Newnham, G6NZ (President), W. R. Metcalfe, G3DQ (Executive Vice-President and Zone A Representative) and John Clarricoats, G6CL (General Secretary).

NEW CALLS

THE following calls have been issued by the Post Office since the 1957-58 Edition of the *R.S.G.B. Amateur Radio Call Book* closed for press last autumn. Further additions to the Call Sign Record will be published from time to time under this heading. In the meantime the Society extends a warm welcome to all who have recently been licensed.

England

G3MKO A. J. Long, Hyde Farm, Wareham, Dorset.
G3MKP L. S. Phillips, 84 Cedar Road, Romford, Essex.
G3MKQ W. F. Matthews, 12 Bruce Road, Southsea, Hants.
G3MKR B. Haywood, "Penarty Cottage," 15 Tunnicliffe Street, Macclesfield, Cheshire.
G3MKS J. R. Blackman, 163 Urmston Lane, Stretford, Manchester.
G3MKT N. M. Hooks, 40 Briscoe Drive, Moreton, Wirral, Cheshire.
G3MKU A. F. Bower, 17 Lower Street, Dartmouth, Devon.
G3MKV C. Curtis, 23 Winslow Road, Wingrave, Aylesbury, Bucks.
G3MKW F/Lt. W. J. Rider 108 Brooklands Road, Hall Green, Birmingham 28.
G3MKX No. 2229 Sqn. Air Training Corps, A.T.C. H.Q., Tatmarsh, Bridge Street, Loughborough, Leics.
G3MKY M. P. Francis, 18 Salt Lane, Salisbury, Wilts.
G3MKZ D. W. Freeman, 1 Fairfield Close, Isham, Kettering, Northants.
G3MLA J. C. Woodhouse, 22 Derbyshire Road, Fleetwood, Lancs.
G3MLB T. H. Shephard, 12 Inworth Walk, Monkwick, Colchester, Essex.
G3MLC K. B. Pearse, 48 Barry Road, East Dulwich, London, S.E.22.
G3MLD K. W. Darby, 74 Milstead Road, Birmingham 26.
G3MLE/T B. R. Timms, 14 Russell Garden Mews, London, W.14.
G3MLF R. G. Fry, 24 Aldbanks, Dunstable, Beds.
G3MLG Dr. R. F. Jones, Manor House, Tamworth, Staffs.
G3MLH D. Yeoell, 30 Queens Road, Lipson, Plymouth, Devon.
G3MLL D. Hinchcliffe, 37 Wakefield Crescent, Dewsbury, Yorkshire.
G3MLJ F. P. Rowell, 8 Wilson Street, Lincoln.
G3MLK B. M. Dorer, 47 Friars Avenue, Friern Barnet, London, N.20.
G3MLL E. G. Corlett, 93 Victoria Avenue, Barrow-in-Furness, Lancs.
G3MLM D. Parker, 30 Somme Lines, Catterick Camp, Yorkshire.
G3MLN B. Pettman, 28 Glenfield Crescent, Bitterne, Southampton.
G3MLO P. W. Weatherall, 35 Vauxhall Avenue, Canterbury, Kent.
G3MLP B. C. Poole, 10 Roberts Street, Rushden, Northants.
G3MLQ S. H. Blundell, 75 Peak Hill, Sydenham, London, S.E.26.
G3MLS D. Nappin, 20 Balmoral Road, South Harrow, Middlesex.
G3MLT R. J. Killick, Brock Cottage, Willbrow Road, Esher, Surrey.
G3MLV J. P. S. Brown, "Red Lodge," 1 Park Avenue, Dover, Kent.
G3MLX J. Bourne, 184 Albert Avenue, Hull, Yorkshire.
G3MLY I. R. Dodd, 36 Blenheim Street, Princes Avenue, Hull, Yorks.
G3MLZ North West Dist. Sigs. Regt. T.A., T.A. Centre, Everton Road, Liverpool, Lancs.
G3MMA D. W. Mayes, 13 Waldringfield, Basildon, Essex.
G3MMC R. H. Smart, 7 Brook Gardens, Chingford ,London E.4.
G3MMD R. E. J. Staples, 38 Rosemont Road, Mossley Hill, Liverpool 17.
G3MME P. A. Whitford, 26 Frederick Street, Accrington, Lancs.
G3MMG D. Noon, 43 Endway, Tolworth, Surbiton, Surrey.
G3MMH R.A.F. Wyton Amateur Radio Club, Building No. 239, R.A.F. Wyton, Hunts.
G3MMI G. Cole, 6 Devonshire Gardens, Winchmore Hill, London N.21.
G3MMJ G. R. Browne, The Vicarage Flat, Flamstead, St. Albans, Herts.
G3MMK M. Firth, 48 East Street, Lightcliffe, Halifax, Yorkshire.
G3MML E. G. Augood, 33 Parkstone Avenue, Hornchurch, Eseex.
G3MMM S. Marriott, The Cottage, The Street, Kennington, Ashford, Kent.
G3MMN B. J. Newman, "Meadowlead," Clap Hill, Aldington, Ashford, Kent.
G3MMO D. J. Hiscock, Signal Training Wing, R.M.B. Eastney, Portsmouth, Hants.
G3MMP R. J. Arthy, 28 Rosecroft Walk, Pinner, Middlesex.
G3MMQ J. A. Hedges, 35 Ferrymead Avenue, Greenford, Middlesex.
G3MMR H. P. Bradley, 488 Binley Road, Coventry, Warwickshire.
G3MMS G. A. Whiting, 5 Council Houses, New Leake, Boston, Lincs.
G3MMT Flt./Lt. L. John, 24 O.M.Q., Romsly Road, R.A.F. Boscombe Down, Amesbury, Wilts.
G3MMV J. B. McGuire, 754 Windmill Lane, Denton, Manchester.
G3MMW G. W. Ilbury, Kedros Flat, 90 Wells Road, Malvern, Worcs.
G3MMX/T E. W. Lawley, R.A.F. Locking, Weston-super-Mare, Somerset.
G3MMY B. A. M. Ross, "Holmleigh," Battlebarrow, Appleby, Westmoreland.
G3MMZ N. J. M. Lawson, 148 Bellemoor Road, Southampton, Hants.
G3MNB H. J. Benjamin, 23 Norwich Road, Forest Gate, London E.7.
G3MNC G. A. Weston, 52 East Avenue, Talbot Woods, Bournemouth, Hants.
G3MND C. B. Wells, 56 Central Avenue, Beverley, East Yorkshire.
G3MNE C. E. Stevenson, 25 Boundary Road, Barking, Essex.
G3MNF G. H. Salter, 74 Moss Lane, Litherland, Liverpool 21.
G3MNG C. Churm, 16 Halton Road, A.M.Q., R.A.F. Watton, Thetford, Norfolk.
G3MNH J. P. Butler, 78 Throxen Lane, Newby Scarborough, Yorks.
G3MNI L. R. Tremlett, 3 Kerry Crescent, Calne, Wiltshire.
G3MNJ J. C. Yates, 5 Middlehurst Road, Grappenhall, Warrington, Lancs.
G3MNK E. D. Turpin, 7 Brook Gardens, South Chingford, London E.4.
G3MNL G. W. Lamb, 110 Boundary Road, Carlisle, Cumberland.
G3MNM G. R. Baines, Hawthorne Cottage, Top Road, Kingsley, Via Warrington, Cheshire.
G3MNN T. G. Kelly, 4 Vincent Square, Biggin Hill, Westerham, Kent.
G3MNO D. L. Lisney, 17 Picketts Croft, Stanmore, Middlesex.
G3MNP E. W. Wilson, Sgts. Mess, R.A.F., Stafford, Staffs.
G3MNQ G. E. Goodwin, Lynton, Bunny Hill, Costack, Loughborough, Leics.
G3MNR R. L. Stanford, 20 Strathleven Road, Brixton, London, S.W.2.
G3MNS I. Swan, 44 Main Road, Gedling, Notts.
G3MNT G. A. Farrall, 94 Cheadle Old Road, Edgeley Park, Stockport, Ches.
G3MNU J. I. Hurst, 51 Loughborough Road, Mountsorrel, Loughborough, Leics.
G3MNV P. W. F. Darragh, 9 Rectory Park Avenue, Sutton Coldfield, Warwickshire.
G3MNW F. H. G. Halfacre, Oakmead, Minley Road, Farnborough, Hants.
G3MNX E. D. Walker, 153 Argyll Avenue, Luton, Beds.
G3MNY G. W. Tyrrell, 70 Middlefield, Ormsgill, Barrow-in-Furness, Lancs.
G3MNZ B. J. Welch, 16 Balkwell Avenue, North Shields, Northumberland.
G3MOA J. H. Ruff, Wood Farm, Hanslope, Wolverton, Bucks.
G3MOB F. G. Bartlett, 54 Brockley Crescent, Collier Row, Romford, Essex.
G3MOC G. G. Messer, 38 Martin Lane, Bawtry, Doncaster, Yorks.
G3MOD P. D. Jones, 213 Airfield Estate, Honington, Bury St. Edmunds, Suffolk.
G3MOE J. H. Moxey, 27 Fairhaven Road, Cheltenham, Glos.
G3MOF C. T. H. Hazell, Signal Wing, Royal Marines, R.M.B. Eastney, Portsmouth, Hants.
G3MOG C. H. Graham, 19 South Crescent, Thirsk, Yorkshire.
G3MOH Sgt. T. Gunn, Sgts. Mess, R.A.F., Watton, Thetford, Norfolk.
G3MOI F/Sgt. H. C. Willkore, Signals Section, R.A.F. Hornchurch, Essex.
G3MOJ A. R. W. Cake, 31 Ackerman Road, Dorchester.
G3MOK T. Kelly, 47 Cutthorpe Road, Upper Newbold, Chesterfield, Derbys.
G3MOL/M J. Lixenburg, 16 Cranwich Road, London, N.16.
G3MOM K. C. Davies, 37 Oak Tree Close, Bearley, Stratford-on-Avon, Warwickshire.
G3MON D. W. C. Gent, 3 Adur Villas, High Street, Upper Beeding, Steyning, Sussex.
G3MOS Wigan Technical College, Physics Dept., Library Street, Wigan, Lancs.
G3MOT C. J. Lambert, 327 The Parkway, Iver Heath, Iver, Bucks.
G3MOU G. F. Morrison, 21 Gardiner Road, Grindon, Sunderland.
G3MOW E. W. Wardrop, 16 Florence Road, Bromley, Kent.
G3MOX B. W. G. Blatchly, 27 Westleigh Avenue, Leigh-on-Sea, Essex.
G3MOY/M J. D. Cooper, "Sunway," Carters Corner, Hailsham, Sussex.
G3MOZ R. G. Dearsley, Spring Cottage, 4 Station Row, Shalford, Guildford, Surrey.
G3MPA T. A. Sheen, 16 Winchester Close, Boscombe Down, Amesbury, Wilts.
G3MPB A. R. Smith, 8 Quarry Road, Tupsley, Hereford.
G3MPC A. Wills, 21 Manor Road, Rushden, Northants.
G3MPE A. Duguid, 68 Wimbledon Road, Sherwood, Nottingham.
G3MPF C. F. Smith, 44 Ashfield, Liverpool 15, Lancs.
G3MPG Sgt. H. A. Stubbs, Sgts. Mess, R.A.F. Watton, Norfolk.
G3MPH N. G. Sykes, 14 Villiers Road, Southsea, Hants.
G3MPJ Ft./Lt. K. A. Bennett, 2 North Close, R.A.F. Medmenham, Marlow, Bucks.

G3MPK Sqdn. Ldr. H. O. Stephens, No. 8 O.M.Q. R.A.F. Sandwich, Kent.

G3MPL J. H. Robertshaw, 56 Tilling Crescent, Micklefield, High Wycombe, Bucks.

G3MPM D. C. Jewell, 65 Meadow Road. Earley, Reading, Berks.

G3MPN D. E. Johnson, Melton Road, Hethersett, Norwich, Norfolk.

G3MPO L. J. Robinson, 62 Church Road, Malvern Link, Worcs.

G3MPP G. C. Price, Garregwen, 36 Park Crescent, Abergavenny, Mon.

G3MPQ G. Balfe, 56 Beechcroft Avenue, New Malden, Surrey.

G3MPR T. Riley, R.A.F. Wyton, Huntingdon.

G3MPS D. Pack, 26 Lansdowne Road, Aldershot, Hants.

G3MPT B. Robinson, Signals Section, R.A.F. Hornchurch, Essex.

G3MPU A. Knight, 122 Powder Mill Lane, Tunbridge Wells, Kent.

G3MPV R. Thoburn, 9 Walton Road, Slatyford Estate, Newcastle-on-Tyne, 5.

G3MPW A. S. Walker, 100 Buckingham Avenue, Scunthorpe, Lincs.

G3MPX J. H. F. Wilshaw, 4 Station Road, Bromley, Kent.

G3MPY W. S. Carruthers, The Cottage, 4 Addison Road, London, W.14.

G3MPZ C. J. Brabbins, 14 Cranbrook Road, Queens Park, Northampton.

G3MQC/T J. O. Wilkinson, 3 Sqdn. U.K. Comcan Sig. Regt. Weald, Bampton, Oxon.

G3MQD P. T. Greed, 3 Salisbury Street, Devizes, Wilts.

G3MQF C. A. Blackmore, 19 Forest Close, Baughurst, Basingstoke, Hants.

G3MQG D. I. Gordt, 43 Heathfield Road, Hitchin, Herts.

G3MQH J. Richardson, 448 Manchester Road, Sudden, Rochdale, Lancs.

G3MQI 18th Bradford, South Clayton, Heights Tryhards, Boy Scout Group, Rear of Council Offices, Albert Road, Queensbury, Bradford, Yorks.

G3MQJ J. F. Macauley, 22 Ryfold Road, Wimbledon Park, London, S.W.19.

G3MQK J. T. Hough, 55 Victoria Street, Lytham, Lancs.

G3MQM P./O. P. J. McCann, H.Q. 1366 (City of Chester Sqdn.) A.T.C. Corp., Old Wrexham Road, Chester.

G3MQN E. G. Johnson, 25 Littleham Road, Exmouth, Devon.

G3MQO G. K. Oleson, Sgts. Mess, R.A.F. Colerne, Chippenham, Wilts.

G3MQQ C. Reed, 12 Knowle Lane, Wookey, Wells, Somerset.

G3MQR D. J. Robinson, 5 Martindale Avenue, Laindon, Basildon, Essex.

G3MQS M. R. Ricketts, 3 Diamond Terrace, W. Greenwich, London, S.E.10.

G3MQT W. E. Thompson, 8 Coventry Road, St. Leonards-on-Sea, Sussex.

G3MQU R. M. W. Rash, Grey Gables, Wortham, Diss, Norfolk.

G3MQV Corby Technical College, George Street, Corby, Northants.

G3MQW D. O. Wyllie, 3 West Ring, Cardinals, Tongham, Farnham, Surrey.

G3MQX P. Lane, 45 Ridge Road, Kempston, Bedford.

G3MQY D. I. Mitchell, Sgts. Mess, R.A.F. St. Eval, Wadebridge, Cornwall.

G3MQZ P. J. Metcalfe, Amateur Radio Club, R.A.F. Stradishall, Newmarket, Suffolk.

G3MRA M. G. Campbell, 50 Chessel Avenue, Bitterne, Southampton.

G3MRB T. L. W. Puryer, 78 Wolverton Road, Haversham, Wolverton, Bucks.

G3MRC B. J. Poole, 53 The Walronds, Tiverton, Devon.

G3MRD Kingston-upon-Hull College of Technology, College of Technology Queens Gardens, Kingston-upon-Hull, Yorks.

G3MRE P./O. P. J. Holmes, R.A.F. Lyneham, Chippenham, Wilts.

G3MRF T. Kilmartin, No. 1 Mill Flats, Trusthorpe, Mablethorpe, Lincs.

G3MRG R. D. Greebfield, 12 Grove Wood Hill, Coulsdon, Surrey.

G3MRH M. W. Cook, R.A.F. Waddington, Lincoln.

G3MRJ A. Dean, 62 Long Grove, Baughurst, Basingstoke, Hants.

G3MRL L.A.C., B. A. Clarke, R.A.F. St. Mawgan, Newquay, Cornwall.

G3MRN G. L. Driver, Watsons Lane, Little Thetford, Ely, Cambs.

G3MRO D. P. Heath, 4 Baalbec Road, Highbury, London, N.5.

G3MRP S. J. Butlin, 148 Yew Tree Lane, South Yardley, Birmingham 26.

G3MRQ D. L. Byne, 195 Brighton Road, Lancing, Sussex.

G3MRS D. R. A. Pontet, 81 A.M.Q. Gatenby, Northallerton, Yorks.

G3MRT R. A. Strafford, 24 Gledwood Avenue, Hayes, Middlesex.

G3MRU R. C. Rand, 11 Castle Close, Tatternhoe, Dunstable, Beds.

G3MRX J. D. Hobbs, 40 Eden Way, Eden Park, Beckenham, Kent.

G3MRZ/T M. A. Crutchley, 75 Drummond Road, Bordesley Green, Birmingham 9.

G3MSA E. J. Oatley, Signals Club, Sig. Trg. Wing, Royal Marines Barracks, Eastney, Southsea, Hants.

G3MSB Sgt. H. Holmes, 69 Crosby Avenue, Scunthorpe, Lincs.

G3MSC G. Forrester, Diplomatic Wireless Service, Bletchley Park, Bletchley, Bucks.

G3MSD F/.O. C. V. Burkard, Officers Mess, R.A.F. Scampton, Lincoln.

G3MSE N. Dunwell, 118 Humphrey Road, Old Trafford, Manchester 16.

G3MSF C. B. J. Hughes, 55 Tentelow Lane, Southall, Middlesex.

G3MSH A. L. Putman, 321 Micklefield Road, High Wycombe, Bucks.

G3MSI D. P. Giddens, 60 Welsh Walls, Oswestry, Shropshire.

G3MSJ A. S. Hebb, Hut 112, B. Squad., Wing 3, R.A.F. Locking, Weston Super Mare, Somerset.

G3MSK V. H. C. Davis, 24 Trinity Road, Gillingham, Kent.

G3MSL R. J. Ives, 30 Blossom Waye, Heston, Middlesex.

G3MSM W. F. Thomson, "Ross" 1 The Gardens, Brookhams Park, Hatfield, Herts.

G3MSN/T S. L. Crouch, 30 Largewood Avenue, Tolworth, Surbiton, Surrey.

G3MSO E. K. Tunstall, 35 Loomsway, Irby, Heswall, Birkenhead, Ches.

G3MSP H. J. B. Western, Sgts. Mess, R.A.F. Watton, Thetford, Norfolk.

G3MSR E. F. Willett, 16 Windsor Road, Saltney, Chester.

G3MST/T P. N. Truss, 12 Newdigate Road, Sutton Coldfield, Warwickshire.

G3MSU Sgt. B. E. R. Street, Flat 2, 49 Partridge Road, St. Albans, Herts.

G3MSV A. D. Bishop, Yew Farm Cottage, Hollington, Woolton Hill, Newbury, Berks.

G3MSW K. Ashcroft, 36 Windermere Road, Fulwood, Preston, Lancs.

G3MSX Sgt. D. N. Crouch, 80 Shorton Valley Road, Paignton, Devon.

G3MSZ R.A.F. Watton Amateur Radio Club, Sgts. Mess, R.A.F. Watton, Thetford, Norfolk.

G3MTA P. A. Fields, 53 Jackson Avenue, Ponteland, Newcastle-on-Tyne.

G3MTB G. W. B. Parish, 2A Pasture Road, Barton-on-Humber, Lincs.

G3MTC R. Jones, 466 Marine Road, East, Bare, Morecambe, Lancs.

G3MTD B. V. Kissack, 7 Water Road, Stalybridge, Cheshire.

G3MTE A. N. Mackay, 23 Ellesmere Avenue, Mill Hill, London, N.W.7.

G3MTF J. D. Adams, 42 Dunbar Avenue, Norbury, London, S.W.16.

G3MTG R. A. Prior, 41 Rockside Drive, Henleaze, Bristol.

G3MTH J. McGill, Hut 376E, "C" Sqdn., R.A.F. Compton Bassett, Calne, Wilts.

G3MTI A. D. Smith, "Hillstone" 42 Wyche Road, Great Malvern, Worcs.

G3MTJ R. V. Skoyles, 84 Beech Avenue, Northampton.

G3MTK J. F. Knight, 45 Lancaster Drive, Scampton, Lincoln.

G3MTM T. W. Pawley, 81 Avondale Road, South Croydon, Surrey.

G3MTN B. W. J. Pannett, G.E.C. Apprentices Hostel, Coombe Abbey, Binley, Coventry.

G3MTO D. J. Adhimar, Appley Farm, Marlborough Road, Ryde, I.O.W.

G3MTP P. G. Gadsden, 135 Sutton Court Road, Hillingdon, Uxbridge, Middlesex.

G3MTQ B. H. Price, 69 Pershore Road, Edgbaston, Birmingham 5.

G3MTR B. S. Wolfe, Officers Mess, R.A.F. Lindholme, Doncaster, Yorks.

G3MTT A. W. Marsh, 7 Queens Road, Malvern Worcs.

G3MTU D. V. King, The Dingle, Ham Lane, Pedmore, Stourbridge, Worcs.

G3MTV/T N. E. Thornthwaite, 9 Thirlmere Street, Currock, Carlisle, Cumberland.

G3MTW C. I. Wolstencroft, 26 Football, Yeadon, Leeds, Yorkshire.

G3MTX A. C. Pointon, 2 Holmesdale Road, Bexhill-on-Sea, Sussex.

G3MTZ G. T. Obee, Purley Hall Flat, Purley, Reading, Berks.

G3MUA P. J. Lawlor, 33 St. Andrews Drive, Stanmore, Middlesex.

G3MUB/T T. W. Luxford, 90 Endlebury Road, Chingford, London, E.4.

G3MUC B. E. G. Lewis, 22 Ambleside Avenue, Streatham, London, S.W.16.

G3MUD G. K. Drummond, 1 Victoria Street, Gosport, Hants.

G3MUF J. J. Owens, 26 Gladwell Road, Hornsey, London, N.8.

G3MUG M. S. Gilbert, 3 Oak Tree Terrace, Andover, Hants.

G3MUH P. L. Smith, 35 Cambridge Road, Hove 2, Sussex.

G3MUI D. J. Durrant, " Revenda," 23 Leon Avenue, Bletchley, Bucks.

G3MUJ H. R. Morris, 47 Waldron Thorns, Heathfield, E. Sussex.

G3MUK N. Y. Bennett, 68 Harrow Avenue, Oldham, Lancs.

G3MUL/T F. C. Lathwood, 40 Grange Crescent, Lincoln.

G3MUM P. S. Odell, 20 St. John's Grove, Redcar, Yorkshire.

G3MUN E. B. Ellam, Arnold Flats, 5 London Road, Old Stratford, Wolverton, Bucks.

G3MUO G. F. Gott, 87 Church Road, Skegness, Lincs.

G3MUP Sqdn. Ldr. G. K. Larney, R.A.F. Flying College, Manby, Louth, Lincs.

G3MUR/T B. N. Wade, 408 High Road, Chilwell, Nottingham.

G3MUT C. G. Tomkinson, 367 Chester Road, Hartford, Northwich, Cheshire.

G3MUU G. E. Hathaway, Yolander, The Street, Kennington, Ashford, Kent.

G3MUV J. E. Macdonald, The Bungalow, Greengarth Hall, Holmrook, Cumberland.

G3MUW Major P. J. C. Ratcliffe, " Wayside," Burrow Hill, Chobham, Surrey.

G3MUX C. E. H. Benson, Flat 1, Tern Hill Hall, Tern Hill, Market Drayton, Shropshire.

Isle of Man

GD3MRK D. E. Kaighin, 32 Christian Road, Douglas.

Northern Ireland

GI3MLR S. A. Faulkner, Kantara Hotel, Ramore Avenue, Portrush, Co. Antrim.

GI3MMF B. W. McAleer, 42 Woodvale Avenue, Belfast.

GI3MOO Ft./Sgt. J. L. Franklin, 8 Andover Avenue, R.A.F. M.Q's, R.A.F. Aldergrove, Co. Antrim.

GI3MOQ F./O. S. D. Burgess, R.A.F. Ballykelly, Limavady, Co. Derry.

GI3MPD F. C. Higgins, 118 Canmore Street, Shankill Road, Belfast.

GI3MQA S.A.C., 4200149, J. J. Keenan, 41 Lady Street, Belfast.

GI3MQB P. R. Botterill, Culmore House, Culmore Upper, Limavady, Co. Derry.

GI3MQE Sgt. H. O. Clarke, 34 Catherine Street, Limavady, Co. Derry.

GI3MRW J. W. Paterson, Sgts. Mess, R.A.F. Ballykelly, Limavady, Co. Derry.

GI3MRY S. F. Howard, "Iris".Marino, Co. Down.

GI3MUE A. F. Kelly, Sgts. Mess, R.A.F. Ballykelly, Co. Derry, N.I.

GI3MUS W. A. R. Bell, 13 Geeragh Place, Finaghy, Belfast, N.I.

Scotland

GM3MLW W. R. Cook, 6 Balderston Gardens, Edinburgh 9.
GM3MMB G. Kinnaird, 52 Hillend Road, Clarkston, Glasgow.
GM3MNA C. G. Martin, 452 Holburn Street, Aberdeen.
GM3MOR R. Webster, Meric, Lower Woodmuir Terrace, West Newport-on-Tay, Fife.
GM3MPI G. W. Anderson, 35 Craigie Avenue, Kilmarnock, Ayrshire.
GM3MQL G. J. K. Mackintosh, 10 Culduthel Gardens, Inverness.
GM3MQP D. C. Sherlow, Downton, 112 Strathmartine Road, Dundee, Angus.
GM3MRM S. Murray, 86 Crosslee Street, Glasgow S.W.2.
GM3MRV G. W. Carrick, "Derwent" Sprouston Road, Kelso, Roxburghshire.
GM3MSG J. C. Carmichael, 5 The Roundel, Largs, Ayrshire.
GM3MSQ H. J. M. Warren, O.W.S. Base, Greenock, Renfrewshire.
GM3MTS A. B. Wylie, 7 Garrioch Street, Kirkwall, Orkney.
GM3MUQ J. Bradford, "Dalkey," 7 Wellpark Place, Kilmarnock, Ayrshire, Scotland.
GM3MUY N. G. Cox, 191 Maxwell Avenue, Westerton, Bearsden, Glasgow.
GM3MUZ J. M. Morrison, Decca Navigator Station, Lionel Machair, Port-of-Ness, Isle of Lewis, Scotland.

Wales

GW3MLU J. S. Jones, "Ashton Villa," Grove Road, Colwyn Bay, Denbighshire.
GW3MMU P. M. Fulton, 102 Lewis Street, Abergoed, Bargoed, Glamorgan.
GW3MOP L. D. Watts, 110 Dunvant Road, Killay, Swansea, Glam.
GW3MOV C. L. Smith, 56 Old Church Road, Whitchurch, Cardiff, Glam.
GW3MRI D. C. J. Green, 36 St. Augustine Road, Heath, Cardiff.
GW3MSY A. C. Davies, Warren House, Pentyrch, Cardiff.
GW3MTL R. J. Parsons, 25 Fairwater Grove, West, Llandaff, Cardiff.
GW3MTY J. R. Howe, 85 Cardiff Road, Abercynon, Mountain Ash, Glam.

New Members

THE following were elected to membership at the July 1958 meeting of the Council.

Corporate Members, Home (Licensed)

G2AMN E. W. Rogers, 17 Eccleshall Road, Stone, Staffs.
G2DQU B. Rix, York House, Roedean Crescent, Roehampton, London, S.W.15.
G2YH †C. E. Hobden, 6 School Lane, Orsett, Essex.
G3ALD G. W. Spivey, 157 Barham Road, Bilton Grange, Hull, E. Yorks.
G3BXY T. Murnane, Building D3, A.W.R.E., Aldermaston, Berks.
G3EFV †H. F. Haynes, 58 The Ridgeway, Enfield, Middx.
G3IHY †J. Burrow, 110 Upper Moulsham Street, Chelmsford, Essex.
G3LJK C. Kenny, 32 Westbourne Villas, Hove 3, Sussex.
G3LWN R. Q. Clark, 7 Queens Avenue, Dover, Kent.
G3MIA C. W. Bennett, 77 Charter Street, Gillingham, Kent.
G3MIE R. Brunskill, 20 Palatine Road, Blackburn, Lancs.
G3MJQ F/Lt. M. A. Noble, Burdens Cottage, All Cannings, Devizes, Wilts.
G3MMJ G. R. Browne, Vicarage Flat, Flamstead, St. Albans, Herts.
G3MMM S. T. Marriott, The Cottage, The Street, Kennington, Ashford, Kent.
G3MPY W. S. Carruthers, The Cottage, 4 Addison Road, London, W.14.
G3MQM P/O P. J. McCann, 85 Maple Grove, Hoole, Chester.
G3MUX C. E. H. Benson, Flat 1, Tern Hill Hall, Tern Hill, Nr. Market Drayton, Shropshire.
G4JA †A. D. Stenning, New Inn, Bagchurch, Nr. Shrewsbury, Shropshire.
G4OZ D. E. Burgess, 8 Bangers Oborne, Sherborne, Dorset.
G5GT †R. A. Napper, 43 Albemarle Road, Taunton, Som.
G5TT †T. Caldicott, Post Office, East Bridgford, Notts.
G8TR †S. Allen, 25 Bruche Drive, Padgate, Lancs.
GC2AAO †A. A. S. Hordern, La Preference Farm, St. Martin, Jersey, Channel Isles.
GM3MUQ J. Bradford, 7 Wellpark Place, Kilmarnock, Ayrshire, Scotland.
GW3MIM I. F. Riemer, 96 Wenallt Road, Rhiwbina, Cardiff, Glam., S. Wales.
GW3MOV *C. L. Smith, 56 Old Church Road, Whitchurch, Cardiff.

Corporate Members, Overseas (Licensed)

EL1K C. E. Hoyt, Firestone Plantations Co., Harbel, Liberia.
FL8AC G. M. Malosse, P.O. Box 121, Djibouti, French Somaliland.
K6CYY R. C. Akers, 56 W. Market Street, Long Beach 5, Calif., U.S.A.
PY2AUC J. Vicente, Caixa Postal 764, Campinas, Est Sao Paulo, Brazil.
VE5DR J. M. Kendall, 125 Avenue "H" North, Saskatoon, Sask., Canada.
VE5GF A. W. E. Stronach, Craik, Sask., Canada.
VE5JV A. Chesworth, 1085 Algoma Avenue, Moose Jaw, Sask., Canada.
VE5KG J. G. Little, 379 Stadacona Street East, Moose Jaw, Sask., Canada.
VE5LM L. A. Myers, 214 29th Street West, Sasktaoon, Sask., Canada.
VE5VL V. Leroi, Sub No. 1, Saskatoon, Sask., Canada.
VQ2BK †B. J. Killick, P.O. Box 256, Lusaka, N. Rhodesia.
VK5MO †E. P. McGrath, 5 Blythwood Road, West Mitcham, South Australia.
VP1HA L. H. Alpuche, P.O. Box 1, El Cayo, British Honduras.
VQ4FO †W. H. Plant, P.O. Box 30021, c/o Drawing Office, Nairobi, Kenya.
VR3Q C. F. Gleeson, Decca Navigator Co. Ltd., B.F.P.O. 170.
VS9AS 3520487 S.A.C. Smith, B.A., Salt Pans, R.A.F. Khormaksar, B.F.P.O. 69.
VS9AT W. A. R. Bell, 419B A.M.Q., R.A.F. Khormaksar, Aden.
W2KKY C. J. Martin, Nunda, New York, U.S.A.
W4EPA C. H. Merrell, 40 East Ridge Place, Newport, Kentucky, U.S.A.
W4IYC M. T. Steffy, 1236 Westminster Avenue, Richmond 27, Virginia, U.S.A.
W6CEI J. R. Nakken, 17 East Keystone Avenue, Woodland, Calif., U.S.A.
W6EQG C. Breen, 3930 Penniman Avenue, Oakland, Calif., U.S.A.
W6TJ H. H. Crawford, 5458 Brockton Avenue, Riverside, Calif., U.S.A.
W6UOV R. I. Sutherland, 4040 Fernwood Street, San Mateo, Calif., U.S.A.
W6ZEN F. McPherson, 395 Corsicana Drive, Oxnard, Calif., U.S.A.
W7FZA R. N. Schoepflin, 2127 S.E. Tacoma Street, Portland 2, Oregon, U.S.A.
W7YKQ R. W. Elkins, 1254 Cashman Drive, Las Vegas, Nevada, U.S.A.
W8JIN J. W. Ringland, 8705 Batavia Pike, Cincinnatti 44, Ohio, U.S.A.
W0MLY G. R. McKercher, Box 185, Perry, Iowa, U.S.A.
ZB1DG A. Farrugia, 16 Castle Hill, Victoria, Gozo, Malta.
ZB1TC A. Cefai, 102 St. George's Street, Victoria, Gozo, Malta.
ZE1JN P. Berry, P.O. Box 340, Umtali, S. Rhodesia.
ZE1JV H. C. De Wet, c/o Rothbury Farm, P.O. Jumbo, S. Rhodesia.
ZE2JB R. M. McDonald, Box 27, Que Que, S. Rhodesia.
ZL1OA M. C. Jack, 2 Tweed Street, Herne Bay, Auckland W.1., New Zealand.
4S7MA †R. F. M. Andree, Com. EL (R) Officer, R. Cy. N. Royal Naval Barracks, Devonport, Devon.
4X4CX A. Kashtan, c/o Embassy of Israel, 173 Avenue de Wagram, Paris 17o, France.
5A1TY J. F. Waterman, No. 1 Forces Broadcasting Service, British Forces Post Office 57.

Corporate Members, Home (British Receiving Stations)

4168 †G. W. Reeves, 5 Willow Grove, Malton Road, York.
19872 †A. D. Paxton, 93 The Avenue, Sunbury on Thames, Middx.
21908 J. L. Isles, 142 Duke Road, Chiswick, London, W.4.
21909 C. W. Nicholls, 542 Chester Road South, Kidderminster, Worcs.
21910 I. Cooper, 124 Groveley Lane, West Heath, Birmingham 31, Warwicks.
21911 W. R. Risk, 4 Raphael Avenue, Tilbury, Essex.
21912 N. W. Jones, 22 Chapel Way, Tattenham Corner, Epsom Downs, Surrey.
21913 H. E. W. Nicholls, 1 Alford Road, Brislington, Bristol 4.
21914 C. W. Best, 11 Hayburn Way, Hornchurch, Essex.
21915 F. Liebetruth, 370 Firs Lane, Palmers Green, London, N.13.
21916 H. Seed, 154 New Hall Lane, Preston, Lancs.
21917 D. A. Tweedale, 13 Hartley Street, Passmonds, Rochdale, Lancs.
21918 P. N. Baker, 51 Seaton Road, Hayes, Middx.
21920 V. Kuppusamy, 8 Lower Mardley Hill, Welwyn, Herts.
21921 G. A. Whitbread, The Oaks, 46 Silvester Road, Cowplain, Hants.
21922 R. Gibson, Bush House, Dungannon, Co. Tyrone, N. Ireland.
21923 F. C. Herod, 102 Belmont Park Road, Leyton, London, E.10.
21924 C. D. Phillips, 61 Jevington Way, Lee, London, S.E.12.
21925 S. J. Boston, 117 Cecily Road, Cheylesmore, Coventry, Warwicks.
21926 J. C. Baily, 12 Cleveland Avenue, Mumbles, Swansea, Glam., S. Wales.
21927 C. J. Myler, 4 Coronation Avenue, Huntingdon, Hunts.
21928 D. H. Goldsmith, 25 Osborne Road, Hounslow, Middx.
21929 J. R. Shewan, 31 Panmure Street, Arbroath, Angus, Scotland.
21930 R. Harris, 12 Courtfield Gardens, London, S.W.5.
21931 S. T. Lis, 13 Clifton Avenue, Wembley, Middx.

Corporate Members, Overseas (British Empire Receiving Stations)

987 †I. H. Drysdale, Box 13, Sandringham, Victoria, Australia.
988 N. P. Nicolaides, Athens Avenue No. 80, Ktima, Paphos, Cyprus.
989 23368190 Cpl. J. E. Taylor, Workshop Troop, 43 Field Park Squadron R.E., B.F.P.O. 33.

Associates

1665 M. Stroud, 81 Heaton Road, Canterbury, Kent.
1666 H. Morton, 51 Sweetcroft Lane, Hillingdon, Middx.
1667 R. Williams, The Wool Shop, 40 High Road, Swaythling, Southampton, Hants.
1668 I. J. Corbett, 121 Brian Road, Chadwell Heath, Romford, Essex.
1669 M. W. Cross, 2 Lynton Crescent, Ilford, Essex.
1670 C. N. Cross, 15 Waverley Avenue, Thornton Hill, Exeter, Devon.

Corrections

B.R.S. 21898 was issued in error to Mr. H. Morton, 51 Sweetcroft Lane, Hillingdon, Middx. Mr. Morton is an Associate.

The address of G3MTR, P/O B. S. Wolfe, is R.A.F. Station, Lindholme, Doncaster, Yorks and not Undholme, as published in the July issue. He has not previously been a member.

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

HENRY'S
(RADIO LTD)

5 Harrow Road, Paddington, W.2

Opposite Edgware Road Station

PADdington 1008/9

OPEN MONDAY to SAT. 9—6. THURS. 1 o'clock

Send 6d. for 28-page Catalogue.

New free: Quartz Crystal list available

QUARTZ CRYSTALS

FT243 Fundamentals

80 Types 5706·667 kc/s to 8340 kc/s. (In steps of 33·333 kc/s).
120 Types 5675 kc/s to 8650 kc/s. (In steps of 25 kc/s).
(*Excluding Types 7000/7300 and 8000/8300*). **5/-** EACH

Complete Sets of 80 Crystals	**£6 0 0**
Complete Sets of 120 Crystals	**£7 10 0**

7000 kc/s. to 7300 kc/s. in steps of 25 kc/s.
8000 kc/s. to 8300 kc/s. in steps of 25 kc/s. **7/6** each

T.C.S. CRYSTALS, 3-PIN TYPE 249, IN KILOCYCLES

1572.5	1700	2070.3	2105	2667.5
1665.5	1962.5	2072.5	2410	2865

at **7/6** each.

FT241A 72nd HARMONIC CRYSTALS IN MEGACYCLES

32.5	32.7	36.4	36.6	at **5/-** each
32.6	36.3	36.5	36.7	

TYPE FT 241A 465 Kc/s 2 pin **12/6** each.

FT241A—54th HARMONIC

78 Types 20 Mc/s to 27·9 Mc/s. (In steps of 100 kc/s).
(Excluding 24/25·9 Mc/s. and 27 Mc/s.) at **7/6** each

5/- EACH — Complete Set of 78 Crystals, **£6**

100 Kc/s.	Gold Plated D.T. Cut	**15/-**
100 Kc/s.	Three Pin UX	**15/-**
150 Kc/s.	Two Pin Round	**12/6**
160 Kc/s.	Two Pin 10X	**12/6**
200 Kc/s.	FT241A	**10/-**
500 Kc/s.	FT241A	**7/6**
500 Kc/s.	Two Pin 10X	**15/-**
500 Kc/s.	Brook's	**15/-**
2500 Kc/s.	Octal	**12/6**
5000 Kc/s.	Piezo 2-Pin Holder	**12/6**

P.O. TYPE 4B CERAMIC — **15/-** EACH
1000 Kc/s. 163·9 Kc/s. 819·6 Kc/s.

10 Mc/s Type 7a, 1½ inch Round. **12/6** EACH

CERAMIC 2-PIN BANANA PLUG

15,010 Kc/s.; 16,135 Kc/s.; 16,435 Kc/s.; 18,025 Kc/s;
15,110 Kc/s.; 16,335 Kc/s.; 16,700 Kc/s.; 18,125 Kc/s.
7/6 EACH

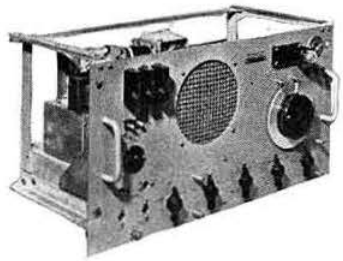
MARCONI, S.T.C. 2 PIN 10X FUNDAMENTALS IN KILOCYCLES

1183	1674.9	2261	10,433	11,751
1205	1680	2295	10,445	11,788
1324.5	1680.5	2312	10,488	11,814
1352.5	1700	2315	10,501	11,851
1384	1727	2430	10,511	11,876
1405	1740	3270	10,534	12,685
1408.5	1764.5	3310	10,545	
1550.62	1775	3317.5	10,557	
1554.4	1780	3390	10,567	
1561.1	1815	3440	10,622	**7/6**
1565.62	1875	3630	10,755	
1655.75	1930	3850	10,767	EACH
1570	1981	3920	10,800	
1570.75	2055	4210	10,823	
1572.5	2065.75	4860	10,856	
1575	2067.5	10,166	10,878	
1588.68	2087.5	10,189	11,437	
1613.25	2089	10,233	11,501	
1650	2118.25	10,245	11,526	
1668.2	2196	10,300	11,587	

SHORT-WAVE COMMUNICATION RECEIVER

10-60 Mc/s. (5-30 Metres) RECEPTION SET TYPE 208

INTERMEDIATE FREQUENCY 2 MC/S.



Complete with 6 valves, 2-6K8G, 2-EF39, 6Q7G and 6V6G. Internal mains and 6v. vibrator pack. Built-in 6½" P.M. speaker. Muirhead slow motion drive. B.F.O. and R.F. stage. Provision for 'Phones and Muting and 600 ohms line. Input, 100/250v. A.C. or 6v. D.C. All sets in new condition and air tested.

£6. 19. 6

Carr. 15/6

Size: 24 x 18 x 12. Weight 80 lbs. (including Transit Case)

WALKIE/TALKIE TYPE 38 TRANSMITTER RECEIVER

Complete with 5 valves In new condition. With circuit. These Sets are sold without Guarantee, but are serviceable. **22/6** p.p. 2/6

H/Phones **7/6** pair. Junction Box, **2/6.** Throat Mike, **4/6.** Canvas Bag, **4/-.** Aerial Rod, **2/6.** A few available air tested, **65/-** complete, less batteries.

TRANSMITTER/RECEIVER, Army Type 17 Mk. II

Complete with Valves, High Resistance Headphones, Handmike and Instruction Book and circuit. Frequency Range 44.0 to 61 Mc/s. Range Approximately 3 to 8 miles. Power requirements: Standard 120v. H.T. and 2v. L.T. Ideal for Civil Defence and communications.

BRAND NEW **59/6**

Calibrated Wavemeter for same 10/- extra. (may be purchased separately)

TEST EQUIPMENT. U.S.A.

R.F. WATTMETER TS/87/AP

3 position 0-10/15/30 watts

Complete with photo-cell, 2 spare lamps and leads, with transit case.

BRAND NEW **£10/10/0.** P.P. 7/6.

WAVE-GUIDE WATTMETER

Type W8921 10 cm. Complete in transit case. BRAND NEW, **£5/10/-.** P.P. 7/6.

CRYSTAL MIC INSERTS

¾ in. Square, **3/6** each. ACOS ¾ in. Round, **5/6** each. 1 in. Round, **7/6** each. 2½ in. Round, **12/6** each. **BRAND NEW.** Moulded hand microphone case to fit any of the above inserts, only **2/6.**

PYE 45 Mc/s STRIP — **TYPE 3583** — **39/6**

Complete with 12 valves: 10 EF50, 1 EB34 and 1 EA50. Including modification data. New condition. **ABSOLUTE BARGAIN!**

RF UNITS — **TYPE 25 Switched** — **10/-**

Tuning 20 to 30 Mc/s. Includes 3 SP61's. Carriage 2/6.

TYPE 26: Variable tuning, 50 to 65 Mc/s. Including 2 EF54's and 1 EC52. Carriage 2/6. Circuits 9d. each. **25/-**

INDICATOR UNIT TYPE 247

R.F. POWER WATTMETER. Complete with large 1 MA Meter, Magic Eye Indicator; 2 EF50 diodes and rectifiers. Inputs:—12v.; 80v. D.C. or 100/240v. A.C., 50 c/s. BARGAIN **£3. 19. 6**

EVERSHED WEE MEGGERS

500v. Brand New with leather case **£12. 10. 0**

100v. New Condition with case **£6. 0. 0**

NEW BARGAIN! MIXER UNIT TYPE 79

Frequency Range 172 to 190 Mc/s.

Comprising:—VCR 139A tube; 7, EF50; EF55; 4, EA50; 5U4; VU120; EC52 and 2, EB91. Standard mains input 200-250 volts, 50 c/s. **£5. 10. 0**

Carriage 5/-

"373" MINIATURE 9·72 Mc/s I.F. STRIP. The ideal FM Conversion Unit as described in P.W. April/May 1957. Complete with 6 valves: 3-EF91, 2-EF92 and EB91. I.F.T.s, etc., in absolutely new condition. With circuit and conversion data.

12/6 (less valves) **42/6** (with valves)

Postage 2/6 on either type.

EXCHANGE AND MART SECTION

ADVERTISEMENT RATES. Members' Private Advertisements 3d per word, minimum charge 5s. Trade Advertisements 9d. per word minimum charge 12s. All capitals 1s. per word, minimum charge 18s. Write clearly. No responsibility accepted for errors. Use of Box number 1s. 6d. extra. Send copy and remittance to National Publicity Co. Ltd., 20-21 Red Lion Court, Fleet Street, London, E.C.4, by 22nd of month preceding date of issue.

ALL types of valves required for cash. State quantity and condition.—Radio Facilities Ltd., 38 Chalcot Road, N.W.1. (PRImrose 9090.) (236

AMATEUR requires British Colonial stamps in bulk from overseas in exchange for credit. Details contact, Irving, G3IJX, Kidside, Milnthorpe, Westmorland. (738

BENDIX TA12G for sale. Very good condition. 80 and 40 metres. £7 or offer. G3LOL, 1, Chestnut Avenue, R.A.F. Topcliffe, Thirsk, Yorks. (735

BULLETINS FOR SALE. 11 Volumes July 1947—June 1958 complete. Any offers. Must sell—Peachey (B.R.S. 15408) 61A Niton Street, Fulham, London, S.W.6. (739

FB CABINET, Table Top, containing secondhand Tiger 60BTX recently supplied by Tiger Radio Ltd. as new, in mint condition. Ideal for experimenter, £45.—G3HEZ, c/o 11 Shafto Road, Ipswich. (751

EDDYSTONE S.640 Receiver, excellent condition, little used, £16 o.n.o.—G3ENQ, 3 Cray Avenue, Orpington. (748

FOR SALE, Amplifier type 6, WS18, R208, R107, many other small items. Best offers secure, s.a.e. for details. Box 740, The National Publicity Co. Ltd., 20/21, Red Lion Court, Fleet Street, London, E.C.4. (740

FOR SALE.—All-band transmitter 160-10M band switched, pair 807s, 75 watts. Complete with power supplies. Modulator 807s, UM2 transformer in three-tier rack, £35 o.n.o.—Box 750, The National Publicity Co., Ltd., 20/21 Red Lion Court, Fleet Street, London, E.C.4. (750

G3CGD QSLs. Fixed and mobile samples on request. Printing inquiries welcomed.—30 St. Luke's Road, Cheltenham. (442

HALLICRAFTER'S SX28 (£32) and/or CR 100 (£15) in good condition. Graham, 31, High Street, Wick, Caithness. (747

HALLICRAFTERS S40, new condition £25. Eddystone 640, Nice order £16. HRO and 24 unit. Excellent performance. No cabinet £11. All carr. paid. Exchange any above for Panda Cub or w.h.y. cash adjustment. GM3BQA, 19, Edinburgh Road, Cockenzie. (745

HAMS! Why not enjoy your hobby with other enthusiasts? Operators and mechanics required. HF (voice and telegraphy) VHF (voice and carrier) or maintaining duties. Tough but paid hobby. HAM facilities could be provided. 2 (LONDON) Signal Regiment TA, Lytton Grove, S.W.15. Putney 3495 (736

METALWORK.—All types cabinets, chassis, racks, etc., to your own specifications.—Philpott's Metalworks Ltd. (G4BI), Chapman Street, Loughborough. (99

PATENTS and Trade Marks. Booklet on request. King's Patent Agency Ltd. (B. T. King, G5TA, Mem. R.S.G.B. Reg. Pat. Agent).—146A Queen Victoria Street, London, E.C.4. Phone: City 6161. 60 years' refs. (372

QSL cards, G.P.O. approved. Log books, cheapest, best, prompt delivery. Samples—Atkinson Bros., Printers, Looe, Cornwall. (206

SALE complete station G2XS (deceased) 2 metre transmitter 5 stages 829 p.a., 350, 500 p.p. Vortexian Amplifier, as new. Eddystone 640 receiver, 1000, 750 volt p.p. and rectifiers. Small rack transmitter c.c. 3·5, 7, 14, Mc/s RD20 push pull. Various M/c meters, Resistances, Condensers, Valves, etc., S.a.e. list, Mrs. Sadler, 13, Lichfield Avenue, Mansfield, Notts. (741

S.S.B. Audio Phase Shift Networks Octal base. Built with 1 per cent high stability components, 52/6d.—Reidhill Electronics, 55 Nithsdale Drive, Glasgow. (699

URGENT disposal of certain equipment necessary, including complete transmitter, Double 5 ft. racks, valves, converters, accessories, v.h.f. gear, mast sections, capable of 72 ft. with guys. —G2AJ. (Phone: Hatch End 2093). Moving September 30. (753

WANTED urgently for Bush Fire Emergency Network Panadaptor for Eddystone 680X Receiver. Details and price to G3AWZ, " Lamorna," Jubilee Road, Street, Somerset for VK5AB. (737

WANTED SX28 RME69 with preselector or similar; also Panda transmitter or similar good condition. London area. Box 743, The National Publicity Co. Ltd., 20/21, Red Lion Court, Fleet Street, London, E.C.4. (743

WANTED. B2 Transmitter section with 3·5 Mc/s coil, or would consider complete outfit. G8UA, 406, High Brunshaw, Burnley, Lancs. (746

WANTED.—All types of communications receivers, test equipment, tape recorders, amplifiers, etc. Prompt cash payment.—Details to R. T. & I. Service, 254 Grove Green Road, Leytonstone, London, E.11. (LEYton 4986.)

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

WANTED for Cash: good, clean Communication Receivers and SSB equipment.—Short Wave (Hull) Radio, 30/32 Princes Avenue, Hull. (Telephone No. 18953.) (688

WANTED.—Woden UM3. For sale Woden UM1, £2.—GM3HMU, " Rosslyn," 15 Pearson Drive, Renfrew, Scotland. (749

WANTED.—Booklet *Inexpensive Television* containing instructions for conversion of 62a Indicator Unit. Price to ZL1AQD, 11 Dunkirk Street, Tauranga, New Zealand. (752

APPOINTMENTS SECTION *(Situations Vacant)*

TECHNICAL ASSISTANT reqd. in Service Dept., with a good working knowledge of radio and allied subjects. Duties include the handling of technical correspondence, preparation of literature and liaison between dept. and factories. Should have a wide knowledge of English and good appearance. Education to ONC or equivalent. Permanent staff position with good prospects. Apply Siemens Edison Swan Ltd., Ref./JAR, 155, Charing Cross Road, W.C.2. (744

WAR DEPARTMENT: BROADCASTING Technical Assistant required for temporary post in London for operation and maintenance of studio and recording equipment. Quals. Radio II of C. & G. or equiv. normally required. Sal. £510–£770 p.a., starting point according to age and exp. Apply to any Employment Exchange quoting Westminster 3278. (742

INDEX TO ADVERTISERS

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

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, W.C.1

IF UNDELIVERED Return to:— R.S.G.B., NEW RUSKIN HOUSE, LITTLE RUSSELL STREET, W.C.1