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R.S.G.B. Bulletin

DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

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In this Issue

Could you use an R.A.F. receiver at home?

Can you receive Morse at 20 words a minute? Can you operate a radio receiver and carry out minor servicing? Would you like to use an R.A.F. set at home? Then you're just the man the R.A.F. Voluntary Radio Service is looking for.

This Service is designed to enable *you* to keep your hand in, and to provide the R.A.F. signals organisation with a reserve in time of war. And except for an evening meeting once every three or four months, all this part-time service is done at home.

It works like this. If you are between 18 and 45 and have no other reserve or auxiliary training obligation, you are enlisted in the R.A.F.V.R. If for some reason you are unable to join as a service member but are still keen to give a hand, you can join as a civilian member—and the upper age limit does not apply. In either case the work involved is a programme of 16 one-hourly periods each month, for which the R.A.F. loans you a receiver. Both service members and civilians receive an allowance to cover the cost of upkeep of the set, and in addition, R.A.F.V.R. members receive an annual bounty. The initial period of service is five years with the prospect of future re-engagement.

If you're a 20-word-a-minute-man and keen to keep your hand in during your spare time, write for details of the R.A.F. Voluntary Radio Service to:

Air Officer Commanding-in-Chief,
H.Q. Home Command (P.15(c)),
Royal Air Force, White Waltham,
Nr. Maidenhead, Berks.

VOLUNTEERS, WHO MUST BE BRITISH SUBJECTS, ARE REQUIRED IN ALL AREAS OF ENGLAND, SCOTLAND AND WALES, BUT EXCLUDING ISLE OF MAN.

CURRENT COMMENT

What Readers Want

ANY enquiry among a typical cross-section of readers of this magazine as to their requirements in the way of articles will disclose two outstanding "wants." One is "plenty of constructional articles"—which seems to be a requirement of amateurs at all levels of experience; and secondly, there is a quiet but insistent request for more elementary instructional articles for the newer-comers to Amateur Radio who are still more or less in the *ab initio* stage.

The first of these requirements is being met all the time in the BULLETIN, but it may be modestly asserted that in the last dozen or so months it has been met in even fuller terms than usual. Such outstanding contributions as those of Messrs. Allen, Varney and Jessop—it hardly seems fair to single out three, but these come immediately to mind—will be well remembered. Readers can rest assured that the accent on "do it yourself" will continue to be marked.

It will be readily conceded that many constructional articles are more for the experienced amateur than for the newcomer. This is an inevitable trend now that constructional practice is compelled to maintain a high standard by reason of such diverse factors as TVI prevention, radiation of a good signal, and so forth. It is important for the newer generation of radio amateurs not to be disheartened by this trend, and if anything can be done to "lead them on gradually" then that will be a very good thing.

Few members are better equipped to apply this process than Mr. Lorin Knight whose series of articles for the newly licensed amateur begin in the present issue. His admirable exposition of how transistors work, surely one of the most lucid articles yet written about this fascinating new branch of radio, was almost a magnum opus. It seems safe to predict that his new "Introduction to Amateur Transmitting" series now starting will be equally valuable.—J.H.

The "Mobile" Season

WITHIN a few weeks the mobile season will be in full swing. The coming spring and summer will certainly see a large increase in the numbers of transmitting amateurs making full use of the brand new form of licence for "operation while driving" which became available last year.

Hitherto operation outside the home station has been confined to portable work or, with less satisfaction, to "alternative address" work—the latter naturally never having that particular excitement which comes of setting up station and operating in unfamiliar surroundings and conditions.

The new "stroke M" permit opens up a wide new field for the British radio amateur—and the phrase can be used in the technical as well as the literal sense. There will of course be many members in search of all the information they can secure towards the job of "going mobile." Already much available data has been printed in our "Mobile Column." More would be most welcome.

Those who are already "on the road with radio" will, if they keep the BULLETIN informed of their equipment and activities, be assisting others to follow suit, and so increase the overall level of this almost unexplored branch of Amateur Radio in this country.—J.H.

"Free Service"

THE appearance elsewhere in the present issue of the list of members who will serve on Committees of Council for 1955 suggests that now is an appropriate moment to make some recognition in print of the enormous amount of unpaid work which is done for the Society by members in one capacity or another.

There are, of course, the Council members themselves. Reporting to them are the members of the numerous committees that lend their attention to such specialized matters as contests, technical development and a dozen others. And out in the country at large are those who as Town Representatives through to Regional Representatives constitute the "Scheme of Representation." Without them local activities would not flourish to the extent that they do.

Many of these members serve for years at a stretch. Others serve for shorter periods and then hand on their knowledge to the next comer—sometimes with a feeling of relief after experience of the arduousness which office-bearing entails!

These are not by any means the sole instances where voluntary assistance is given. For example, mention ought certainly to be made of a regular contributor to the BULLETIN who has refused any payment or honorarium for his work; and, in another context, there was the member who rendered numerous services at the last Amateur Radio Exhibition by providing transport for a great deal of equipment at what must have been a considerable loss to himself. It is very nice to think that there are countless others who, helping in various ways, have the best interests of the Society at heart.

The phrase "free service" is sometimes seen on the shop fronts of radio dealers who surely can hardly mean what they say when they say it! In business very little comes free, and it is an old axiom of economics that "you gets what you pays for." But in a co-operative, largely voluntary organization like this Society, many of "the best things in life are free"; and a habit of voluntary service gives the movement added strength.

—J. H.

*Presidential Address**

The Rebirth of Amateur Radio

By H. A. BARTLETT (G5QA)

IT is a tradition for each new President to deliver an Address to the membership at the first meeting of the Society held in the Lecture Theatre of the Institution of Electrical Engineers, London, after taking office. In past years the retiring President has installed his successor with a few appropriate words and handed to him a special lapel badge. This year for the first time my predecessor has been able to invest me with the very beautiful Chain of Office which was so recently presented to the Society by Mr. Wilfred Butler of Sutton Coldfield. I am indeed proud to wear this insignia, an insignia which will be a source of inspiration to me throughout my year of office. I shall be ever reminded, as I look at the names of those early Past Presidents recorded thereon, of the work they did to see that the Society's foundations were well and truly laid.

I am deeply grateful to my colleagues of the 1954 Council for their confidence in nominating me as President for the year 1955, and to the membership at large for accepting my nomination without question or demur. I assure you that I shall do my best during the year which lies ahead to serve the Society to the very best of my ability.

In thinking about this Address and the form it should take I turned for inspiration and guidance to the Addresses which were delivered by my three predecessors in office. Last year Arthur Milne spoke with great authority on the International aspects of Amateur Radio. A year earlier Leslie Cooper chose as his theme "The Amateur Code," whilst in 1952 "Dud" Charman broke away from the ordinary to talk about a *Century* of Amateur Radio. All widely different subjects, but running throughout each Address was the same thought—what can I do to further the cause of Amateur Radio? It is with that thought in mind that I have chosen for the title of my Address "The Rebirth of Amateur Radio" because I feel deep down that there are some things that must be born again if we are to maintain our prestige.

Ham Spirit

Twenty-five years ago, when I was, in very truth, a newcomer to Amateur Radio, it was a common practice among us to meet regularly in one another's homes. We argued and we disagreed with one another; we pulled the other chap's transmitter to bits; we criticised his haywire aerial and his chemical rectifier. We envied him his new DET.1 and we wished that his signal was not quite so potent as it was reputed to be on the West Coast but there was in all our banter a spirit of real comradeship. We called it Ham Spirit. Where is it today? Oftimes I read through back issues of the BULLETIN and picture in my mind's eye the events behind the printed word. I recall with pleasure those exciting Conventions of pre-war days at Pinoli's and the Florence. I remember, too, the happy moments we spent at Conventionettes and Hamfests.

Last September in Bristol, for the first time since the war, there was recaptured at Convention something of the real Ham Spirit that permeated Conventions of long ago. It was there from the start.

It is not difficult to understand why there has been a falling off in the habit of inter-station visiting. War-time restrictions on travel, food rationing and the problems of accommodation all left their mark on our social life. But those difficulties are passing. With their passing then let us look forward to a resurgence of the true Spirit of Friendship which was so much in evidence prior to and during the war.

Mr. H. A. Bartlett (G5QA), President 1955.

I am firmly convinced that a very large number of members would derive much greater benefit from their membership if they would only take a more active part in the running of the Society. At the present time it is left to one or two enthusiasts in each town to organise visits and arrange lectures. There is room, I am quite sure, for a much wider extension of these aspects of our work. Many members fight shy of attending R.S.G.B. functions because they do not wish to become involved in local politics and domestic arguments. Recent experience has shown that the greatest success comes to those groups that relegate business and local politics to a back seat.

Convention last September was voted an unqualified success and one of the most potent reasons advanced for its success was that the organisers kept "business" out of the programme.

During my year as President I shall look forward to meeting a great many members at local gatherings and over the air.

Membership

It should have been apparent to all who stopped to think that the Society's membership would fall when subscription rates were increased. That fall has taken place and is still continuing but I am quite convinced that within a short space of time the progress of the descending curve will be arrested. The curve will probably show no spectacular climb for some long time to come but we shall at least know when the descent stops that members are then ready to play a full part in building up the Society and in upholding all its glorious traditions.

"Current Comment" in the December, 1954, issue of

**Delivered at a meeting of the Society held at the Institution of Electrical Engineers, London, W.C.1, on January 28, 1955.*

the BULLETIN suggested that every member should do his best to obtain at least one new member during 1955. There are today many keen young radio enthusiasts who plough a lonely furrow and who know little or nothing about our work. It should be our ambition to bring them into the Society and to show them how valuable is the Corporate life which membership confers.

Those youngsters are the radio amateurs of the future —the men who will carry on the traditions we have helped to create and are even now creating.

If it were possible I should like every one of those new members to read the full story of the last big International Radio Conference which took place nearly eight years ago in Atlantic City. They would then realise that unless the Radio Society of Great Britain had kept going during the war years it would not have been possible for the Council to send two delegates to that Conference. If the R.S.G.B. had not sent representatives it is practically certain that there would today be no Top Band allocation in the United Kingdom, whilst our 80 metre band would probably have been much narrower. These are important points for us all to ponder upon.

Within the next two or three years another big International Radio Conference will loom large on the horizon. No one can foreshadow the outcome of that Conference but it is a foregone conclusion that the things we as amateurs are doing today will come under the most critical survey when that Conference takes place. Bad operating practices, in particular, are likely to weigh heavily against the Amateur Service. Perhaps even more important though will be the examination which will assuredly be given to the use we have been making of the very high and ultra high frequency bands since the last Conference.

It is pleasing to know that among the newer generation of licensed amateurs a high proportion of them are interested in v.h.f. work but let us not lose sight of the fact that in any critical examination of our bands that may occur in the future it will not be sufficient just to say that we need a two megacycles allocation around 144 Mc/s; we must show that we can use it effectively.

During my year of office I hope many more of our members will turn their attention to the higher frequencies, thereby helping to relieve the congestion on the lower frequencies.

Towards Better DX Conditions

Already there are signs that better DX conditions are on the way. When the peak arrives, as it must do within the next two or three years, we shall have golden opportunities once again of improving our relationships with friends abroad. It has always been one of my ambitions to see a real revival of interest in the B.E.R.U. Contest. In pre-war days that Contest was the most eagerly looked for event in the whole of our year. We planned for it with even greater care than we now plan for N.F.D.

Representation

For a number of years I have been privileged to act as a Regional Representative, therefore I have some knowledge of the problems that confront the Society's representatives. The greatest difficulty we all have to contend with is that of apathy. Unfortunately there are always people ready to criticise and grumble but never willing to undertake a job of work themselves.

If the Society is to continue to make real progress its representatives must be prepared to break down the apathy that exists and to show to the membership at large that their support is really needed for local events.

This year for the first time Zonal Representatives have been elected to serve on the Council. Their presence on the Governing Body should ensure that the provincial viewpoint is fully represented. But neither they nor the Regional Representatives can perform their tasks properly unless they have the support of the whole membership.

As we look ahead into the future it is not easy to predict how International Amateur Radio will fare in the face of the intense competition which is inevitable from other users of the frequency spectrum, but I am confident that so long as our own Society maintains its good relations with the Post Office, the Services and with the Radio Industry the amateurs of Great Britain will receive a square deal.

For many years now the Amateur Radio Societies in Europe have looked to the R.S.G.B. for guidance in international affairs. The trust reposed in us will not be neglected, because those of us who are privileged to act as leaders of the Amateur Radio movement in Great Britain will spare no pains in our efforts to see that the rights and privileges of all amateurs are safeguarded.

In concluding this Address I should like to extend to Members at home and abroad my best wishes for the New Year, and to express the hope that they will continue to give the Society their support.

May the rebirth of Amateur Radio lead to a strengthening of the ties of friendship between us all.

Mr. C. H. L. Edwards, G8TL

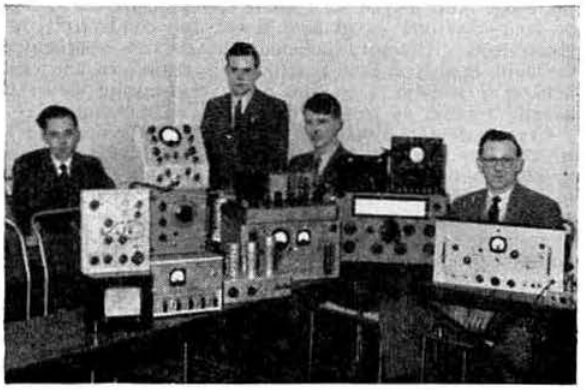
MEMBERS generally will be sorry to learn that Council Member C. H. L. Edwards, A.M.I.E.E. (G8TL). has been ordered by his doctor to take a fairly prolonged rest. Mr. Edwards is in the Oak Ward, St. Margaret's Hospital, Epping, Essex, at which address he will be glad to hear from old friends.

Mr. Edwards has been Chairman of the Exhibition (Home Constructor's Section) Committee for the past two years and was Honorary Secretary of the Society until that office ceased to exist at the end of last year. He was Honorary Administrator of the R.S.G.B. Prisoner of War Fund during the 1939-45 war.

We wish him a speedy recovery.

R.S.G.B. Amateur Radio Exhibition

IN the review of the R.S.G.B. Amateur Radio Exhibition on page 337 of the January issue of the BULLETIN, the crystal microphone mentioned was in fact built by G3HCK and not B.R.S.19773 as stated. The oscilloscope should have been credited to G3JSE and not to G3JSF.



Equipment constructed by members is shown in this photograph taken at a recent meeting of the Leeds Amateur Radio Society. From left to right, Messrs. G. N. Brown, J. M. Gale (G3JMG), Boyd and G. Roberts.

Crystal Valve Receivers

Their Design and Operation

By A. STEAD, B.ENG. (G2FCO)*

THE availability of crystal triodes (transistors) makes possible the construction of battery operated receivers with extremely low power consumption, although the present cost of such valves is somewhat higher than that of corresponding thermionic types. In many cases, this is, however, offset by the small size and low power requirements of the transistors. A typical example is the portable receiver which can be made very light in weight and cheap to operate.

Crystal Valves

The action of crystal valves is fundamentally different from that of the familiar thermionic valves and depends on a group of materials known as semi-conductors, of which germanium and silicon are the most satisfactory. Semi-conductors in pure form would be insulators at absolute zero temperature but due to the non-zero temperature and the presence of impurities, the conductivity is not zero. The phenomenon known as transistor operation depends on impurity-induced conductivity, impurities being introduced in carefully controlled amounts. Two distinct types of impurity are used, these being generally known as *n*-forming and *p*-forming, the resulting semi-conductors being *n*-type and *p*-type respectively. The *n*-type of conduction depends on excess or free electrons as in metals but the conductivity is much lower. Electron deficiencies are the conduction elements in *p*-type semi-conductors; as these deficiencies behave in a manner so like positive electrons they are usually treated as real particles and called "holes".

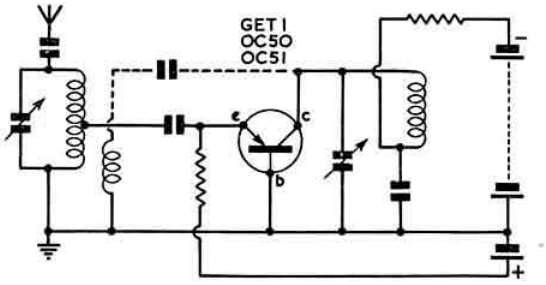


Fig. 1. Common base, point contact r.f. amplifier.

Crystal diodes consist of either a point contact (cat's whisker) on a piece of *n*- or *p*-type semi-conductor or a junction between *n*- and *p*-type sections. This results in a two terminal device which will pass current more readily in one direction than the other. The now familiar crystal diode is a point contact diode, usually *n*-type germanium, although the silicon diodes used as radar receiver mixers are *p*-type silicon. The *n-p* junction diode is now coming into service and although it is superior in many respects to the point contact type, it is at present unsuitable for use at the higher radio frequencies.

The addition of another point contact, or a further *n* or *p* section, results in a three terminal unit known as a transistor or crystal triode. The two point contacts, or the two outer *p* or *n* sections of a junction triode, are called the emitter and collector. The piece of semi-conductor, or the central zone of the junction triode, is the base.

If a voltage of the proper polarity is applied between base and collector, a small current known as the zero signal collector current, I_{co}, will flow. Now, if a voltage of the opposite polarity is applied between base and emitter, a current I_e will flow in this circuit but it is found that the presence of this emitter current causes an increase in collector current of an amount $\propto I_e$ where $\propto$ is the current gain of the triode. It is this control of one current by another that enables the crystal triode or transistor to function as an amplifier. Typical values of $\propto$ are 2 to 3 for point contact and 0.9 to 0.99 for junction types.

Amplifier Circuits

Many transistor amplifier circuits have been devised to cover a wide range of applications. Those most likely to be used in radio receivers are the common base and the common emitter circuits. In the former, the signal is applied between emitter and base and the output taken between collector and base. The current gain is as defined above, the input impedance is low and the output impedance high. The circuit is stable so long as the load is not very low. The current gain $\propto^1$ of the common emitter circuit is different, as in this case the signal is applied between base and emitter and the output taken between collector and emitter. It can be shown that $\propto^1$ is equal to $\frac{\propto}{1-\propto}$. The input impedance is somewhat higher and the output impedance somewhat lower than in the common base arrangement. The common emitter circuit is only conditionally stable with point contact triodes and so is rarely used with them. The junction triode on the other hand is stable in this circuit and is very much used.

R.F. Amplifiers

One of the major disadvantages of transistors is their poor high frequency performance compared with thermionic valves. Junction types are worst in this respect and consequently common base point contact triodes are usually employed in r.f. stages. A typical circuit is shown in Fig. 1.

Because the input resistance is low, the emitter is tapped well down the input coil in order to avoid heavy loading of the tuned circuit. Regeneration may be applied by the connections shown dotted and is advan-

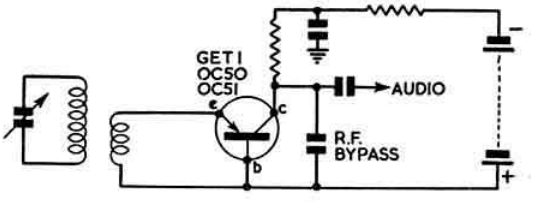


Fig. 2. Common base emitter bend detector.

* 77 *Brendon Way, Southend-on-Sea, Essex.*

tageous in improving gain and selectivity. The decoupling resistance, if made variable, makes a good feedback control. Emitter bias current is shown parallel fed but series feed may be used if desired.

Transistors at present available in Great Britain cannot be relied on to work satisfactorily above about 2 Mc/s although particular samples may be better. The receivers to be described in the present article have not, therefore, been tested at higher frequencies.

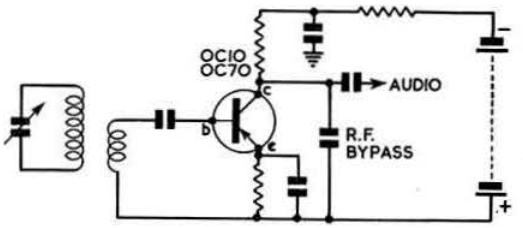


Fig. 3. Common emitter, emitter bend detector.

Detectors

Detectors may be either conventional diode circuits using point contact or junction diodes, or triode detector-amplifiers. The latter make use of the curvature of the emitter voltage/emitter current characteristic, being in effect a detector followed by an audio amplifier. Fig. 2 shows such a circuit which has been used successfully, mainly with point contact triodes. The common emitter junction triode can, under proper conditions of bias, be employed as a satisfactory detector-amplifier and has quite good gain. A suitable circuit is shown in Fig. 3. There is no d.c. return for the base, being unnecessary except as a means of fixing the bias current. In the circuit illustrated there is no base bias current, a condition well suited to detector operation.

Audio Amplifiers

Point contact and junction triodes have both been used as audio amplifiers but the junction type has been found superior as its characteristics are much more linear. The common emitter junction amplifier gives considerable gain and the quality is very good indeed. The complete circuit of such a stage is shown in Fig. 4. The purpose of the resistors R1, R2 and R3 is to supply the transistor with a stable value of bias current, the easiest way to determine the values being as follows:

First choose values of collector current I_c and emitter to collector voltage, V_{ce}, adding about three volts to arrive at the total battery voltage. Then choose R1 and R2 so that, neglecting any current taken by the transistor, the voltage across R1 is equal to the required value of V_{ce}. It is important that the current flowing in R1R2 should be three or four times the base current which is $\frac{I_c}{\alpha^1} = \frac{I_c\ (1-\alpha)}{\alpha}$. The base to emitter voltage is very low so about three volts have to be dropped across R3, the value of which can be calculated with knowledge of I_e (for this purpose to be taken as equal to I_c). Values of V_{ce} and I_c depend on whether the amplifier is to be an intermediate or output stage. For intermediate stages, V_{ce} can be three volts and I_c 500μA. Output stages require about three volts and 2 mA. Whether the figures given can be exceeded with safety is in some doubt, at any rate with British types. At the moment, owing to insufficient experience, the manufacturers recommend caution until the results of a number of long term tests, now being made, are known.

However, a common emitter stage operating with V_{ce} of three volts and an I_c of 2 mA gives enough undistorted output to drive a loudspeaker at a level adequate for a small room. This remarkable fact is largely due to the more linear characteristics of the junction triode compared with a thermionic valve.

Complete Receivers

The first successful receiver made by the writer used three GET1s in an r.f., detector and a.f. circuit. This set provided enough loudspeaker output from B.B.C. stations for normal use in a small room but the quality was rather poor. However, its design brought out a number of differences between crystal and thermionic valve circuits. The most marked is that, because of the low input impedance of crystal amplifier stages, coupling, and sometimes decoupling, condensers need to have very high capacitances compared with those in thermionic valve circuits. For example, emitter coupling condensers, even in r.f. stages, should have a capacity of at least 0.01 μF and preferably larger. Audio coupling condensers are about 4 μF capacity and special low voltage electrolytic types have been developed for this purpose. The circuit diagram of this receiver is shown in Fig. 5. The r.f. stage emitter tap is about one quarter of the way up the main coil and the feedback winding has a similar number of turns. Ferroxcube pot cores were used for the coils but are of course unnecessary unless space is restricted and coil Qs must be high.

Replacement of the GET1 audio stage by one using an OC12 junction triode in a common emitter circuit

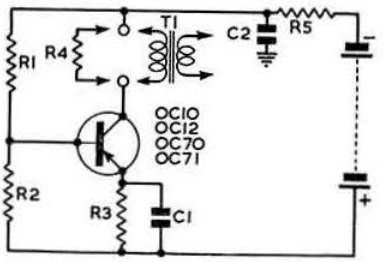


Fig. 4. Common emitter audio amplifier.

resulted in much improved quality and a noticeable increase in sensitivity. The circuit of a much more successful receiver is shown in Fig. 6. This employs a crystal diode detector followed by two junction triode audio stages and preceded by a common base point contact r.f. stage. Resistance capacity coupling is used between the audio stages, and although this reduces the gain of the first stage a little, the greater simplicity justifies its use.

In the latest receiver, the diode detector has been replaced by the type of detector shown in Fig. 3. This modification gives greater sensitivity but noise is beginning to be noticeable.

As mentioned earlier the receivers have not been used at frequencies higher than 2 Mc/s. If attempts are made to work on 3.5 Mc/s, the use of higher collector voltages for the r.f. stage will help considerably as the frequency response improves with higher collector voltage. Voltages in excess of 20 should be used with caution and care taken to restrict collector dissipation to 100 mW.

Conclusion

The aerials used with the receivers described were all less than 50ft long and 10ft high, the best results being achieved with a 30ft aerial, the greater part of which was 8ft high. The indoor and downlead portions were

kept at a minimum as is important when a receiver is only of moderate sensitivity.

Although the receiver shown in Fig. 5 required 7 mA at 27 volts, the one illustrated in Fig. 6 needed only 4 mA at 9 volts—the improvement being largely due to the use of junction triode audio stages and an OC51 in the r.f. stage. The latter works better at the lower voltage than a GET1.

So far the writer has not attempted to produce a superhet but this type of receiver will probably be well worthwhile when transistors become more common. A suggested mixer would be a point contact emitter bend detector. Point contact triodes would probably be successful in the i.f. stages.

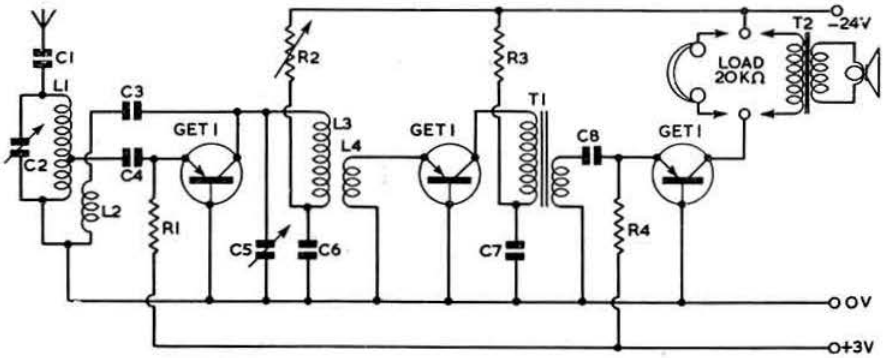


Fig. 5. Complete receiver using point contact triodes. C1, 300 $\mu\mu$F; C2, 500 $\mu\mu$F; C3, 33$\mu\mu$F; C4, 0.1 μF; C5, 500 $\mu\mu$F; C6, 0.1 μF; C7, 8, 4 μF; L1, L2, as required; R1, 15,000 ohms; R2, 10,000 ohms; R3, 2,200 ohms; R4, 3,900 ohms; T1, audio transformer, ratio 6:1, T2, output transformer.

The use of crystal valves in receivers is new and there is no doubt that the circuits described could be improved upon. Constructive criticism will be most welcome.

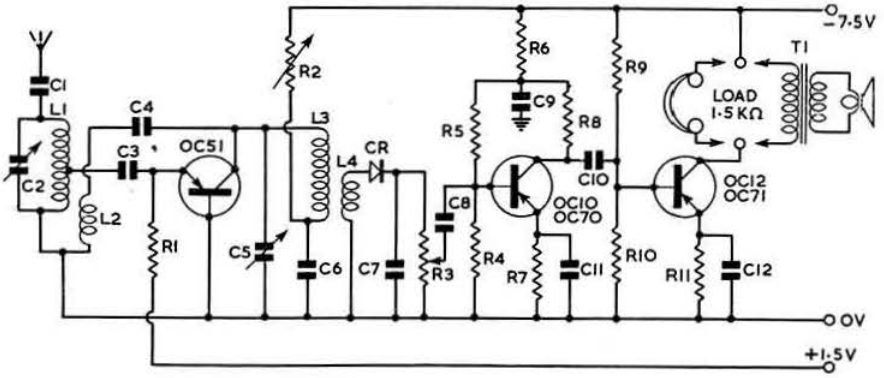


Fig. 6. Receiver employing point contact and junction triodes. C1, 300 $\mu\mu$F; C2, 500 $\mu\mu$F; C3, 0.1 μF; C4, 33 $\mu\mu$F; C5, 500 $\mu\mu$F; C6, 0.1 μF; C7, 1,000 $\mu\mu$F; C8, 9, 10, 4 μF; C11, 12, 25 μF; CR, crystal diode; L1, 2, 3, 4, as required; R1, 8,200 ohms; R2, 25,000 ohms; R3, 25,000 ohms; R4, 39,000 ohms; R5, 56,000 ohms; R6, 1,000 ohms; R7, 8,200 ohms; R8, 6,800 ohms; R9, 10,000 ohms; R10, 15,000 ohms; R11, 2,200 ohms; T1, output transformer.

Talking Book Library

THE Sound Recording Board of Directors of the Royal National Institute for the Blind record their warmest thanks to those members of the R.S.G.B. who have rendered service to the blind members of their Talking Book Library. The help given by Society members has enabled a great many blind people to have the benefit of Talking Book Machines whereas otherwise they might have been deprived of them for a considerable time whilst they were away being repaired.

Worthing Hamfest

AN informal meeting of radio amateurs, organised by Worthing and District Amateur Radio Club, is to be held at the Thomas A'Becket Hotel, Worthing, on the main Brighton-Littlehampton road, at 7.30 p.m., on February 25.

No definite programme has been arranged and there will be no fund-raising raffles. The main purpose of the meeting is to provide a venue for a ragchew. Tickets, price 2s. each to cover the cost of the running buffet and the hire of the room, may be obtained from J. F. Wells, "Atickwa," Salvington Gardens, Worthing.

British Amateur Helps Danish Ship

JUST after finishing a contact at 2 a.m. on November 27, 1954, George Green (G3JNX) of Urmston, Lancashire, picked up a distress call from the Dutch *M.V. Grans-Burgen* which was on the rocks off Fishguard. As the coast station did not reply to the distress call, G3JNX telephoned the local police who passed the message on to the coastguards at Formby.

Visit Abroad Proposed

MEMBERS interested in joining a party to visit Austria, Switzerland or Denmark during the last two weeks in July are asked to communicate with Mr. F. G. Hoare, G2DP, 6 Dunheved Close, Thornton Heath, Surrey.

Yet Another !

THE "Worked All Sicilian Provinces" certificate will be awarded to those who can prove they have had two-way communication with stations in at least five Sicilian provinces using phone only or c.w. only. Claims, accompanied by four International Reply Coupons, should be sent to IT1TAI, P.O. Box 300, Palermo, Sicily.

An Introduction to Amateur Transmitting

Part 1—The Master Oscillator

By LORIN KNIGHT, A.M.I.E.E. (G2DXK)*

As the title implies, this new series is intended primarily for those who have just obtained their licences or hope to do so soon. Older licensees, however, will also find the author's lucid explanations of considerable value as an authoritative refresher course in the fundamentals of the art which is our hobby.
The series is characterised by its down-to-earth approach to the many practical problems of amateur transmitting.

TO start this series it is intended to go straight to the heart of the transmitter, the master oscillator. Before delving into actual circuits, however, let us refresh our memories about the working of the parallel tuned circuit shown in Fig. 1.

In the figure it is assumed that the capacitor has just been charged. There is a surplus of electrons (or a negative charge) on the upper plate and a corresponding deficit of electrons (a positive charge) on the lower plate. Now the coil possesses inductance which tries to stop the current through it changing. Thus there will not be an immediate avalanche of electrons from the upper plate through the coil to the lower one. The electron flow will instead gradually increase in intensity.

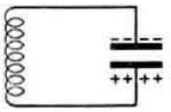


Fig. 1. The parallel tuned circuit.

Eventually the charge on the capacitor will be reduced to zero but by now the electron current will be quite strong and the inductance will not allow it to stop suddenly. In consequence, the capacitor will begin to charge up in the opposite direction. As it charges up the current will gradually diminish and eventually cease. The direction of current flow will then reverse and start to discharge the capacitor again. This cycle of events will continue, the voltage across the capacitor periodically alternating from positive to negative. The current through the coil will alternate also, being at a maximum when the voltage is zero and being zero when the voltage is at a maximum. The frequency of these oscillations, that is to say, the number of complete cycles per second, is governed by the inductance of the coil and by the capacitance. By choosing suitable values, oscillations can be obtained at any frequency.

If there were no losses anywhere the oscillation would continue indefinitely. In practice, of course, there will be a loss of energy, the main cause being the dissipation of heat by the resistance of the coil. If the circuit is to be kept in oscillation the lost energy must be replaced.

We can think of the tuned circuit as rather like an electrical equivalent of the pendulum. Just as a pendulum needs a small mechanical push now and then to keep it going, so the tuned circuit needs a small electrical push now and then. Most of the oscillator circuits which we use in Amateur Radio are, in spite of their fancy names, only different ways of providing pushes to a tuned circuit.

*28a Glebe Road, Letchworth, Herts.

The Electron-Coupled Oscillator

For a transmitter it is extremely important that the frequency should be stable and thus the choice of an oscillator circuit must be guided by this criterion. A circuit which has proved very useful in this respect is the electron-coupled oscillator, a typical version of which is given in Fig. 2. L1 and C1 form the tuned circuit and the alternating voltage across it is fed *via* C3 to the grid of a pentode. The consequent alternating cathode current

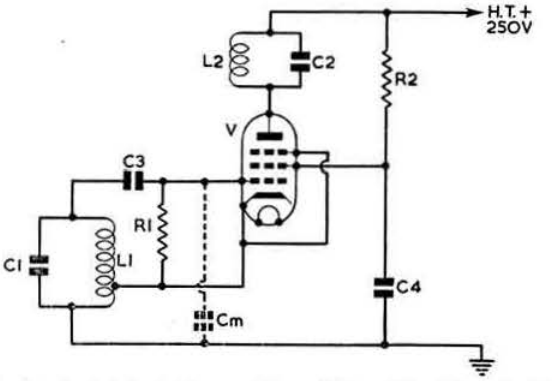


Fig. 2. A typical electron-coupled oscillator. C3, 100 $\mu\mu$F; C4, 0.005 μF; R1, 100,000 ohms; R2, 47,000 ohms; V, 6AC7 or EF50.

flowing through the lower part of the coil gives the required energy reinforcement to maintain oscillation. The great advantage of this circuit is that, due to the screen grid being virtually earthed at radio frequencies by the capacitor C4, the anode is screened from the control grid. Thus we can load up the anode without worrying about the effect this will have on the grid circuit.

The most obvious way of developing the output voltage is to tune L2C2 to the fundamental frequency, *i.e.*, to the frequency of the L1C1. The anode current, which alternates in sympathy with the grid voltage, will then maintain an oscillating current in L2C2. Since the anode circuit is being driven by the valve the frequency of the oscillation there will be locked to that of the grid circuit. Off-tuning the anode circuit will cause the natural oscillation to be partially cancelled by the anode current; this will reduce the amplitude and change the phase relative to the grid but it will not affect the frequency.

In practice this does not work out quite as perfectly due to the small stray capacitance between anode and grid, which causes a small feedback current to be injected into the grid circuit. This feedback current will not be exactly in phase with the natural oscillatory current in the grid circuit and will normally try to slow the oscillation down.

It is, in fact, as if a small capacitance Cm has been added between grid and earth. This would not matter if the value of this capacitance were constant. Unfor-

tunately, slight changes in the tuning of the anode circuit near to resonance cause appreciable changes in the phase of the feedback current and consequent changes in the value of Cm. With valves having a very low anode-grid capacitance the effect of Cm can be made quite small but it is still safest not to tune the anode to the fundamental frequency.

One solution is to use an untuned anode load consisting of a resistor but a better method is to tune the anode to twice the fundamental frequency. The grid circuit is then practically unaffected by the anode circuit; the value of Cm is consequently much smaller and is more constant. The anode circuit now only receives one push per two cycles but this is quite sufficient to maintain a strong oscillatory current. The output frequency is exactly twice that of the fundamental oscillation and if, for example, the desired output frequency was 3.8 Mc/s L1C1 would have to be tuned to 1.9 Mc/s.

Having seen how the effect of the output circuit can be reduced let us look at the grid itself and the cathode. Each of these imposes a small capacitance across the tuned circuit and these capacitances are liable to vary. Their effect, together with the effect of Cm, can be minimised by tapping the grid and cathode as far down the coil as possible. The coil, it must be remembered, is an auto-transformer and any impedance placed across a tap is equivalent to a smaller impedance placed across the whole. With a grid capacitance of 10$\mu\mu$F, for example, and assuming a perfect coil, tapping the grid half way up the coil would only impose $(\frac{1}{2})^2 \times 10$ $\mu\mu$F, or 2.5 $\mu\mu$F, across the coil. Tapping the grid one third up would only impose $(\frac{1}{3})^2 \times 10$ $\mu\mu$F, or 1.1 $\mu\mu$F.

We can see now that it is advantageous to have a low loss tuned circuit or, as it is usually expressed, one with a high Q factor, for the higher the Q the less reinforcement will be required from the valve and the lower the taps can be. In order therefore, to keep the losses in the coil low we can (a) wind the wire in a single layer on a circular former of as large a diameter as practicable; (b) use good quality enamel covered wire of such a gauge that the length of the coil is about $1\frac{1}{2}$ times its diameter; (c) use a former made of a low-loss material such as polystyrene, "frequelex" or "mycalex"; (d) keep the coil at least one diameter away from any other metal. To keep the size of the oscillator within reasonable dimensions the maximum practical coil diameter will usually be about $\frac{3}{4}$in. to 1in.

The effect of the grid and the cathode can be further reduced by choosing a large value for C1 so that the stray capacitances are only a small percentage of the total. This cannot be carried too far because decreasing the ratio L/C also reduces the Q. In an oscillator whose fundamental frequency is 1.9 Mc/s the optimum value of C1 might be about 300 $\mu\mu$F.

We can also help to make the taps low by using a valve with a high mutual conductance. Types such as the 6AC7, 6AG7 and EF50 are particularly suitable because they also have low anode-grid capacitances and have metal exteriors which completely screen the electrodes from any external circuits.

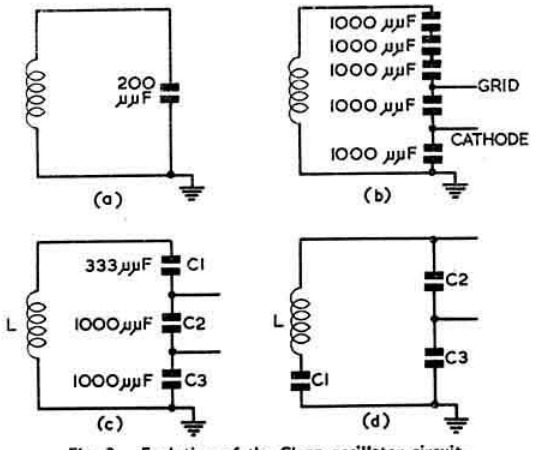


Fig. 3. Evolution of the Clapp oscillator circuit.

The Clapp Oscillator

It is not very convenient to experiment with tapping points on a coil and in any case the finished result is not usually very elegant. An alternative which has come into favour is to tap the capacitance instead. Taking the tuned circuit in Fig. 3(a) the 200 $\mu\mu$F capacitor can be considered as consisting of five 1000 $\mu\mu$F units in series. It is therefore possible to tap into the capacitance as in Fig. 3(b). Simplifying this we get (c).

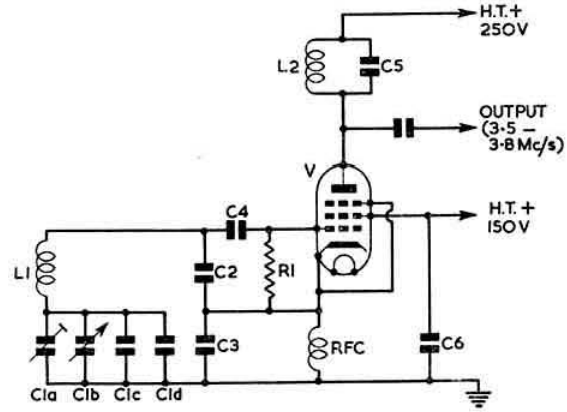


Fig. 4. Typical Clapp oscillator. C1a, 50 $\mu\mu$F preset; C1b, 100 $\mu\mu$F (tuning); C1c, 200 $\mu\mu$F silver mica; C1d, 20 $\mu\mu$F neg. temp. coeff. type; C2, 2,000 $\mu\mu$F silver mica; C3, 3,000 $\mu\mu$F silver mica; C4, 100 $\mu\mu$F; C6, 0.005 μF; L1, 46 turns, 26 s.w.g. enam. on 1 in. diam. former; L2C5, tuned to 3.5 Mc/s band; R1, 100,000 ohms; RFC, 1 mH; V, 6AC7.

If the frequency of the oscillator is to be varied we must have some facility for varying the total capacitance. C2 and C3 will only have minor effects on the total and it is better to vary C1. This would be inconvenient with neither side of C1 earthed and so it must change positions with L as in Fig. 3(d).

This arrangement is used in what is commonly known as the Clapp oscillator, an electron-coupled version of which is given in Fig. 4. C1a is used to set the lowest frequency to 1.75 Mc/s. C1b then allows the oscillator to be tuned from 1.75 Mc/s to 1.9 Mc/s and the resulting output frequency is 3.5 Mc/s to 3.8 Mc/s. Note that an r.f. choke has been included between cathode and earth to provide the necessary d.c. connection. Having a relatively high inductance it will pass very little r.f. current and thus have very little effect on the tuned circuit.

Practical Considerations

The fact that we have chosen a good circuit is not in itself a guarantee that we are going to have a stable oscillator. Our efforts will all be in vain unless care is taken with the physical construction. We have seen how by suitable techniques the frequency can be made almost entirely dependent on the actual oscillator tuned circuit.

The main consideration, therefore, must be to ensure that this itself is stable.

All the components comprising the tuned circuit should be housed in a metal box to prevent any coupling from external circuits. The valve holder can be mounted on the box so that the valve is outside the box. The mounting and the wiring of all the critical components must be rigid so that the frequency is unaffected by mechanical vibration. The tuning capacitor should preferably have ceramic insulation and should have good bearings at either end.

To enable the oscillator to be accurately reset to a given frequency the tuning scale should have as large a diameter as possible and a slow motion drive which is free from backlash. It is advisable to use a flexible coupler between the drive and the capacitor to prevent any undue strain on the bearings of either due to imperfect alignment.

Fixed capacitors in the actual oscillator tuned circuit must have high stability and little better can be done than to use silvered mica types. *Paper dielectric, high-K ceramic and the normal moulded mica types should certainly be avoided.*

The use of a coil former having a low coefficient of expansion will be helpful in making the inductance less dependent on temperature. To ensure that the coil really

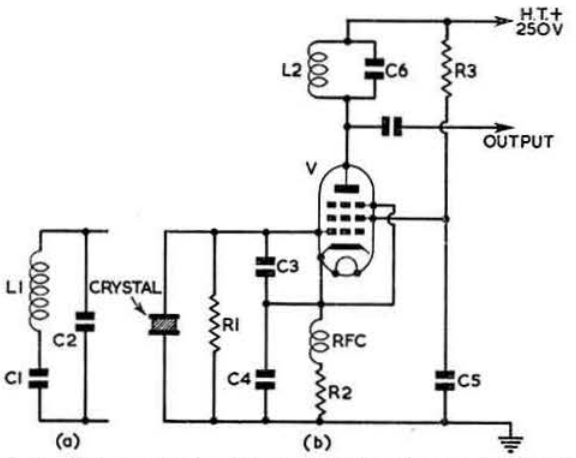


Fig. 5. Crystal oscillator. (a) Approximate equivalent of 1.9 Mc/s crystal. C1, 0.004 $\mu\mu$F; C2, 5 $\mu\mu$F; L1, 2 H. (b) Typical crystal oscillator for 1.9 Mc/s. C3, 75 $\mu\mu$F; C4, 250 $\mu\mu$F; C5, 0.005 $\mu\mu$F; R1, 25,000 ohms; R2, 250 ohms; R3, 47,000 ohms; V, 6AG7.

takes the dimensions of the former the wire can be shrunk on, the wire being heated (by passing a current through it) as it is wound.

Even when all precautions have been taken it is usually found that the frequency decreases slightly for the first half-hour or so after switching on as the components warm up. If desired some improvement can be obtained by using a capacitor with a negative temperature coefficient, *i.e.* one whose capacitance decreases with an increase in temperature. With a little experimenting it is usually possible to find an optimum combination of these and silvered mica types. It is not possible to obtain complete cancellation of drift by this means because not all the components contributing to the drift will warm up at the same rate.

If we are using an electron-coupled type of oscillator it must not be forgotten that we are taking advantage of the fact that the anode-grid capacitance is small and we must ensure that the grid and anode circuits are shielded from each other. Our efforts in choosing a valve with 0.005 $\mu\mu$F grid-anode capacitance will be wasted if we introduce 0.05 $\mu\mu$F in the wiring.

The effective values of the grid and cathode capacitances are influenced by the anode and the screen voltages. With electron-coupled oscillators there is usually an optimum value for the screen voltage which gives minimum frequency change for a change in h.t. voltage but for maximum stability it is advisable to stabilise the anode and screen voltages.

It must be appreciated that the percentage of frequency drift which can be tolerated depends on the output frequency of the transmitter. A drift of 0.05 per cent., for example, is equivalent to 0.9 kc/s at 1.8 Mc/s and, provided that the rate of drift was slow, might be acceptable. At 28 Mc/s, however, it is equivalent to 14 kc/s and much more serious.

Tuning

The following table gives a rough guide to the values of inductance and capacitance required to tune to various amateur bands.

Band	*L* (μH) x *C* ($\mu\mu$F).
1.8 Mc/s	7000
3.5 Mc/s	1900
7 Mc/s	500
14 Mc/s	130
21 Mc/s	55
28 Mc/s	30

The approximate inductance of a single layer coil is given by:—

$$L = \frac{a^2N^2}{9a + 10l}$$

where a = *radius of former + radius of wire (in inches)*
N = *number of turns*
l = *length of winding (in inches)*

The Crystal Oscillator

A simpler method of obtaining a stable source of one spot frequency is to use a quartz crystal instead of a tuned circuit. Quartz is said to be piezo-electric. This means that when an electrical potential is placed across a suitably cut plate of quartz the plate will be deformed and, conversely, if the plate is deformed an electrical potential will be produced across the two faces.

Thus if a mechanical vibration is set up within the quartz a corresponding alternating electrical voltage will appear across the two faces. Normally this vibration would soon die out but, by using a valve to supply suitably timed electrical impulses to the plates, the oscillation can be maintained. In behaviour, therefore, the crystal behaves somewhat similarly to an LC circuit but the frequency is almost entirely dependent on the physical dimensions of the quartz.

The electrical equivalent of a 1.9 Mc/s crystal is something like that in Fig. 5(a). A circuit such as Fig. 5(b) is usually recommended for modern crystals. The anode may be tuned to either the crystal frequency or to the second harmonic, *i.e.*, twice the crystal frequency. It will be realised that this circuit is virtually the same as that in Fig. 3. The crystal, however, has a Q very many times greater than could be obtained by a practical LC circuit and the effective capacitance tap is so low down that the external circuits have very little effect on frequency.

For 144 Mc/s and higher, where a frequency stability of something like one part in a million is desirable, crystal control is almost essential. Crystals for frequencies above 10 Mc/s, however, become exceedingly thin

(*Continued on page* 387)

Balance to Unbalance Networks

By R. G. CHRISTIAN, Grad. I.E.E., Grad. Brit. I.R.E. (G3GKS)*

IT is frequently necessary to feed a balanced system from an unbalanced one or *vice versa*, but unless some form of balancing device is used, the balanced system, which may for example be a 300 ohm twin feeder, will become unbalanced and radiate.

This article gives details of networks which are suitable for maintaining balance, at the same time providing correct matching from one system to the other. While it is possible to match any form of unbalanced system to any form of balanced system, the only cases we shall consider here are the two of greatest interest to the amateur: 75 ohm unbalanced to 300 ohms balanced and 75 ohm unbalanced to 600 ohms balanced.

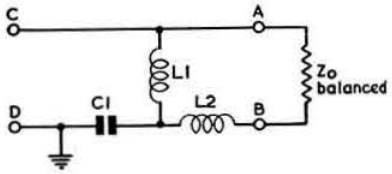


Fig. 1. Basic balancing network.

The Balancing Network

Fig. 1 shows the balancing circuit to which the balanced system is connected by terminals A and B, and the unbalanced system by terminals C and D, the latter being at earth potential.

The condition for balance is that the potential from A to earth must be equal and opposite to the potential from B to earth. This condition is satisfied when

$$\omega^2 L1C1 = \omega^2 L2C1 = 2$$

$$i.e., \text{ when } \omega L1 = \omega L2 = \frac{2}{\omega c}$$

$$\text{where } \omega = 2\pi \times frequency$$

Thus, any convenient values of inductance and capacitance may be chosen such that at the operating frequency the inductive reactance is equal to twice the capacitive reactance.

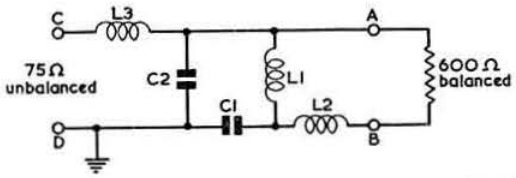


Fig. 2. Balancing network with matching for 75 ohms to 600 ohms.

This circuit, while providing perfect balance-to-unbalance transformation, will not reflect a purely resistive load such as a correctly terminated 300 ohm line or a folded dipole; the impedance looking into terminals C and D would not be purely resistive but would be made up of some resistance and reactance. Since this would, in general, be unsuitable for terminating the unbalanced system (which may be a 75 ohm co-axial cable, or the unbalanced output socket of a transmitter) some means of correct matching must be provided.

* 17 Orton Road, Liverpool, 16

Matching 75 ohm to 600 ohm Line

Fig. 2 is Fig. 1 re-drawn with the necessary matching network. The circuit now provides transformation and correct matching from 75 ohm unbalanced line to 600 ohm balanced line. The necessary additions are an inductance L3 and a capacitance C2 which necessitate some modification of the choice of components for the balancing network L1, L2 and C1.

Design formulæ for the components are as follows:—

$$L1 = L2 = \frac{150}{\pi f}\mu H$$

$$L3 = \frac{75}{2\pi f}\mu H = \frac{L1}{4}$$

$$C1 = \frac{10^6}{300\pi f}\ \mu\mu F$$

$$C2 = \frac{10^6}{150\pi f}\ \mu\mu F$$

where f = frequency in Mc/s.

For convenience, these components have been calculated for five of the amateur bands and are shown in Table I. The condensers should preferably be variable to

TABLE I

BAND Mc/s	L1 μH	L2 μH	L3 μH	C1 μμF	C2 μμF
3·5	14	14	3·5	300	600
7	7	7	1·8	150	300
14	3·5	3·5	0·9	75	150
21	2·2	2·2	0·55	50	100
28	1·8	1·8	0·45	37·5	75

make it possible to cancel stray capacitances and to adjust for correct balance. One side of each capacitor—the rotor—should be connected to earth, thus making the spindle "earthy" and so eliminating hand capacity effects.

Matching 75 ohms to 300 ohms

The network for this case is somewhat simpler in that L3 is absent and C1=C2 as shown in Fig. 3. The condition for balance and matching is again $\omega^2 L1C1 = 2$, L1=L2 and C1=C2 so that any values of inductance and capacitance which satisfy the above expression may be used. For convenience values in Table II have been calculated to agree with those in Table I but these need not be adhered to. If the reader has a particular pair of inductances available these may be used in conjunction with suitable capacitors. Since C1=C2, they may be combined as a two-gang condenser, the frame of which is connected to earth.

This network is more convenient to construct and use than that for 75 ohm to 600 ohms and is particularly

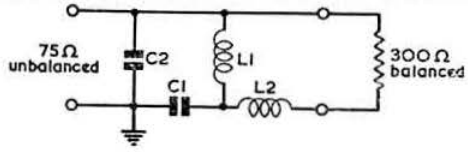


Fig. 3. Balancing network with matching for 75 ohms to 300 ohms.

applicable to feeding a receiver having an unbalanced input, which is usually the case, from a folded dipole.

Since the network transforms any balanced load *Zo* to an unbalanced load of *Zo/4* it can be used for any value of *Zo*. The values of inductance and capacitance are independent of *Zo* and depend only upon frequency, as defined by $\omega^2 L1C1=2$. In the case of the 75 ohm to 600 ohm network, while this will provide balancing and matching from any value of *Zo* to *Zo/8*, the values of inductance and capacitance are dependent upon the value of *Zo*.

TABLE II

BAND Mc/s	C1 = C2 μμF	L1 = L2 μH
3·5	300	14
7	150	7
14	75	3·5
21	50	2·2
28	37·5	1·8

THE CAPACITANCE VALUES SHOULD BE MADE LARGER AND VARIABLE

Balance Indication

If required the balance may be set experimentally by using a balance indicator, the circuit of which is shown in Fig. 4. The indicator is essentially a crystal detector with a moving coil meter which will show a deflection when the circuit is tuned to resonance. The two small trimmers are for zero balancing which is carried out by connecting the terminals to either side of the balanced

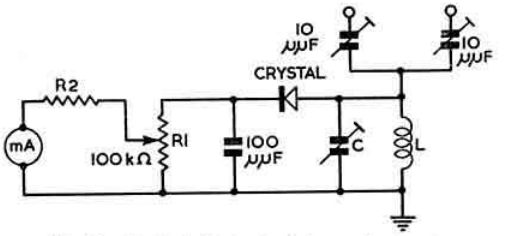


Fig. 4. Simple indicator for balance adjustment.

network or line in turn. The trimmers are adjusted to give equal deflections of the meter. R1 serves as a sensitivity control and to prevent overloading the meter. In use the terminals are connected across the feeder and the balancing network adjusted to give zero or minimum indication on the meter. When this is achieved the network is correctly balanced.

An alternative method of adjusting for balance would be to use thermocouple ammeters in each arm of the balanced output or line and to adjust the balancing network to give equal currents through them. As two meters are often incorporated in aerial tuning units these will indicate balance if the unit is used in conjunction with the balancing network.

TECHNICAL ARTICLES
ARE
URGENTLY REQUIRED

The Leaky Grid Detector

By W. F. Wilson (B.R.S.2317)*

LEAKY grid detection has fallen from favour in recent years but it is worth remembering that its low circuit noise and high sensitivity, particularly with regeneration, make it useful to the newcomer and also where an economical and relatively inexpensive receiver is required for low power, stand-by or portable operation.

As in many circuits, it is often worthwhile experimenting with the values of the various components. Although the normal capacity of the grid condenser (50 to 100μμF) theoretically gives the maximum gain, it can be reduced to about one-tenth of this value before the decrease in sensitivity becomes noticeable. Since a smaller capacity in series with the valve capacity effectively taps the grid down the tuning coil, a higher anode voltage is necessary to produce the same amount of oscillation, but the

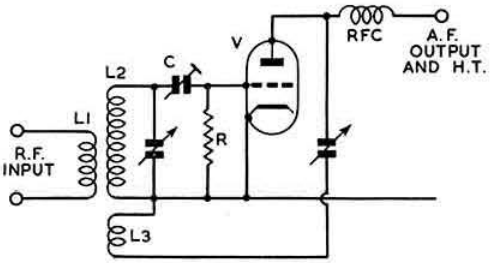


Fig. 1. The leaky grid detector. C, 3-30 μμF trimmer; L1, 2, 3, Eddystone 6 pin plug-in coils; R, 2 Megohms; V, 955.

increased voltage allows the valve to operate more efficiently. Another advantage is that the capacity across the tuning circuit is reduced, enabling higher frequencies to be tuned with a given coil. For example, with an Eddystone 6B coil in the circuit of Fig. 1, changing to the smaller grid condenser raises the upper frequency limit from 27 to 34 Mc/s.

Reducing the capacity of the grid condenser also reduces the time constant of the circuit so that smaller

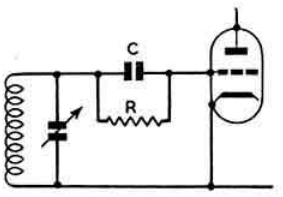


Fig. 2. The conventional connection of the grid leak (R) across the grid condenser (C). The arrangement shown in Fig. 1 is to be preferred for the reasons given in the text.

and more rapid impulses are fed to the grid of the valve. This avoids the choking effect of very strong signals when operating near the point of oscillation, decreases the shot effect of heavy atmospherics, etc., and increases the readability of extremely weak signals.

It will be seen that the grid leak is connected from the grid of the valve direct to the cathode. With the usual connection (Fig. 2) the strength of weak modulated signals drops appreciably as regeneration is reduced through the point of oscillation. The effect disappears if the resistor is connected as shown in Fig. 1.

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Mobile Aerial for Top Band

By E. B. GRIST (G3GJX)*

FORMATION of the Radio Amateur Emergency Network and interest in mobile operation has created a need for a mobile aerial for Top Band use and it is the aim of this article to describe one such arrangement. Many variations are possible, of course, but it is hoped to give some pointers in design which may be helpful to those constructing similar aerials.

The only practicable choice for operation on Top Band from a moving vehicle is a loaded whip. Bottom-loading is constructionally the simplest but electrically poorest, whilst top-loading, electrically most efficient, is very difficult to arrange from the point of view of construction. Centre-loading forms probably the best compromise solution. Practical considerations limit the length of such a whip and a maximum height of 9ft 6in. was therefore chosen so that when mounted on the boot-lid of a car the overall height is about 12ft—low enough to preclude trouble with trolley bus and telephone wires and the majority of bridges.

Bearing in mind the needs of R.A.E.N. it was very necessary that the aerial should be mechanically strong, entirely waterproof, electrically efficient, and, furthermore, capable of being quickly erected and put into operation under the worst conditions of wind, rain and darkness. Several methods of construction and design were tried, that described being the outcome of those experiments.

Theory of Operation

The device is loaded with inductance at the centre so that it acts as a simulated quarter wave aerial operating against the car body in ground-plane fashion. The size of the loading inductance is proportioned so that, with the self-capacitance of the upper section of the whip, it resonates as a quarter wavelength at the frequency in use. It is most important that this consideration be understood as if the centre-loaded whip is separated from the car body and checked with a grid dip oscillator by itself it will show resonance nearer 3.5 Mc/s where it will be acting as a half wavelength.

Working against a car body which is, after all, small compared with the wavelength, is rather removed from the theoretical case of a true ground-plane aerial. Accordingly, it is not sufficient to calculate the inductance on this basis, even if the capacitance of the upper section of the whip is known. For experimental purposes it is better to make the loading coil larger than required and to remove turns carefully.

The base impedance of a true quarter wave ground-plane aerial is of the order of 35 ohms but, owing to the variations mentioned, this is unlikely to hold in the present arrangement. One simple solution to this problem, and the one adopted by the writer, is to provide the transmitter with a pi-section coupler feeding the aerial at the base *via* standard 75 ohm coaxial cable. Any variation of the impedance is virtually taken care of in this way as the coaxial cable acts as an "extension" of the pi-section loading condenser. The usual TV coax has a capacitance in the region of 35 $\mu\mu$F per foot and reasonably short lengths introduce very little loss when used in this way at these low frequencies.

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Construction

The design shown in Fig. 1 uses two rods, each four feet in length, with the loading coil at the centre. These rods are the lower sections of a standard "surplus" three-section tapered whip aerial made of copper plated steel tubing with push-in or screw-in joints. The coil former, which forms the junction of the upper and lower sections, is made from a piece of wooden dowelling 2in. in diameter and 4½in. long with holes drilled in the centre of each end to accept the rods. The upper rod is made a tight fit whilst the lower one is made a comfortable force-fit to enable the aerial to be broken down into two parts and stowed away in the luggage compartment of the car when not in use. The holes should be made as deep as possible to provide strength without, at the same time, approaching one another in the middle of the coil former nearer than about ½in.

The loading coil, which is wound over the middle portion of the wooden former, consists of 100 turns of

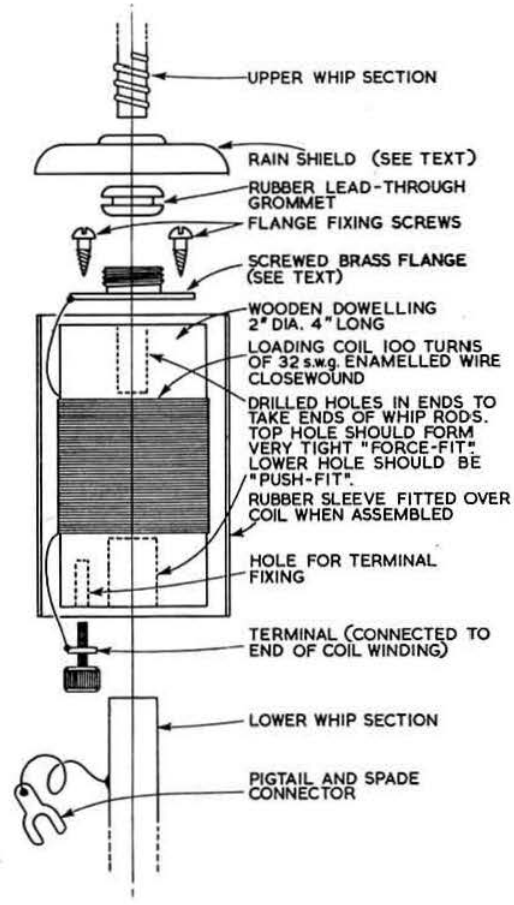


Fig. 1. This "exploded" sketch shows the method of constructing the loading coil and connecting the rods to it.

32 s.w.g. enamelled copper wire, close wound. In order to provide a low resistance joint the lower end of the coil winding is taken to a terminal fitted to the lower end of the former. The top end of the lower rod is provided with a flexible pigtail and spade connector so that a connection may be made when the whip is assembled. This is better than relying on sliding joints or push-in arrangements.

Parts of a domestic lighting tumbler switch are pressed into service for the rain shield and fixing bush, the round bakelite cover forming the actual shield. By filing off the fixing rivets it is generally possible to remove the threaded brass collar assembly from the tumbler switch. Then by pressing out its hinge pin the dolly can be removed and the remaining collar and mounting flange secured to the top of the wooden coil former with two wood screws. To make the rain shield fixing watertight, a rubber grommet is slid down the upper rod before screwing the shield down the collar thread. A soldered connection is then made between the foot of the upper rod and the top of the winding. The coil former and coil are dipped in molten paraffin wax, and a rubber sleeve made from a length of rubber tubing, such as that fitted around cricket bat handles, is stretched over both to make a thoroughly protective covering.

The top adjustment for tuning (Fig. 2b) is made by fitting a narrower length of rod into the top section and crimping the end to get a tight sliding fit.

Mounting of the whip can take several forms, one of the best being to use a standard " surplus " solid rubber aerial base of the type used in the Services for whip aerials of 12ft and over.

Adjustment

Owing to the relatively high Q of the whip it will be found that some adjustment to the resonance point will be necessary to secure efficient operation over the whole band and the upper telescopic section provides an increased or decreased capacitance in the upper rod for this purpose. The rod is marked with nicks (made with a fine hacksaw) to represent the correct points of extension for each 25 kc/s of the band, so that when erecting the aerial in darkness it is merely a matter of counting off the marks from one end of the band or the other until the correct point for the frequency to be used is found.

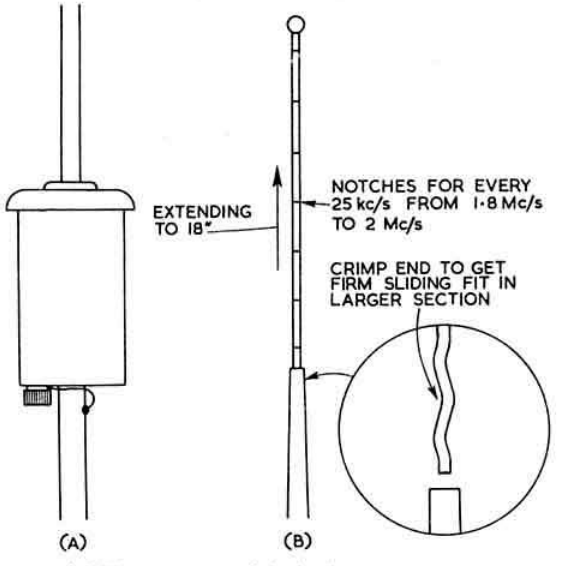


Fig. 2. (a) The appearance of the loading coil when assembled. (b) The adjustable top section of the aerial with (inset) the crimped end which slides into the main rod.

Determination of resonance is best carried out by watching the loading placed on the transmitter. The coupling to the p.a. should be slackened off and as the whip is brought to resonance at the frequency in use the loading will peak up quite sharply. If the transmitter is fitted with a v.f.o. it is a simple matter to resonate the aerial at frequencies 25 kc/s apart and mark the tuning extension. Having established the resonant condition for any desired frequency the transmitter loading may then be increased until the required anode current is being drawn by the p.a.

Results

The centre-loaded whip described has been in use for some months and has given excellent results, on both transmission and reception, using 4.5 watts input for 'phone operation whilst fully mobile. Reports during mobile contacts with stations as far distant as 20 miles have averaged S7-8 on journeys through quite low lying country. In heavily built-up areas with many steel framed buildings there are large variations of signal strength but even under these conditions stations up to 12 miles distance give reports of S9 peaking to 20 db over S9. Communication distances are, of course, increased when mobile over country of high altitude, but at night the QRM usually sets the limit of the useful range.

When passing along roads crossed by National Grid high tension wires a very strong hiss is apparent on the mobile receiver as the vehicle passes underneath but there is no indication that these wires have any effect on the signal strength at a distant point when transmitting. Low railway bridges, on the other hand, produce a complete wipe out of signals whether transmitting or receiving.

Owing to the flexible nature of the whip no damage is likely to result from the aerial striking overhanging trees and at high vehicle speeds the aerial leans back somewhat, although remaining absolutely safe; no variation can be detected in either received or transmitted signals.

R.S.G.B. Amateur Radio Exhibition

IN the account published last month of the Eighth Annual Amateur Radio Exhibition, no reference was made to the generous gift of 500 QSL cards donated by Mr. Eric Martin (G6MN) for use in connection with the activities of GB3RS. We regret the omission.

An Introduction to Amateur Transmitting

(continued from page 383)

or are made of materials other than quartz. In either case their performance is not very satisfactory. For higher frequencies it is therefore common practice to operate with a crystal in the 5-10 Mc/s range and use a number of frequency multiplying stages to obtain the desired frequency. By using suitable circuits some of the necessary multiplication can be performed by the oscillator itself. Transmitters for 144 Mc/s, for example, often have an oscillator which gives 24 Mc/s output from an 8 Mc/s crystal operating on its third overtone.

The characteristics of crystals differ widely, dependent on how the quartz is cut and how the crystal is manufactured. It is always advisable, therefore, to use the oscillator circuit recommended by the manufacturer.

(To be continued)

TWO METRES AND DOWN

By F. G. LAMBETH (G2AIW)*

THE many unexpected and sometimes quite novel happenings on any amateur band never cease to surprise the active participant. The DX which comes "out of the blue" and the friend who reappears after a protracted interval are among the occasions known to all of us—they, and many others like them, are of the spice of Amateur Radio. These pleasant episodes can equally well be (and are) experienced on 2 m, and on 70 cm. It is true that a great number of our friends still favour the lower frequencies, and it is right they should, for we are jealous of the allocations maintained in those bands by much negotiation, but a plea for more operation on 2 m, and to even greater extent on 70 cm and above cannot be out of place. The 2 m band, especially, has shown us lately what it can provide; the openings which have occurred (sometimes apparently quite against the book) give promise of much better things to come, quite apart from the excellence of the band for local communication. Most of these remarks also apply to 70 cm; it would be appreciated by all the regular operators on both bands if the populations could be greatly increased. Much has already been done in this direction, but an earnest appeal to those who have thought about it, but have, so far, taken no active steps, is, we think, in order.

Now is the time to prepare for the coming season, when there is every reason to hope that the work involved in putting a station on the air will be amply repaid. We are quite certain that those who do answer this appeal will not regret their labours.

There must be many stations in all regions who are able to come on the bands; it is hard to believe that there are only one or two operators in some large areas. What about it ? It is common knowledge that much can be done on v.h.f./u.h.f. with small powers and efficient aerial systems.

Stations regularly operative have had a reasonably pleasant, if patchy, time lately, even allowing for the considerable number forcibly QRT by reason of the gale damage, but it is heartening to know how many of them have risen above their difficulties and come back into circulation so quickly. This enthusiasm is, or should be, an example to us all. One further plea to all v.h.f./u.h.f. operators: get your name and address in the next *R.S.G.B. Call Book*. Do it now! There are many who do not appear there and a postcard to G2QI, 174, The Drive, Ilford, Essex, would have the desired result.

The London U.H.F. Group and the International V.H.F. Society are to hold a Convention in London on Saturday May 7, when it is hoped that many Continental amateurs may also be able to take part. Further details will be published as the programme becomes more definite. Phil Thorogood (G4KD) is in charge of arrangements.

Conditions on the 2 m band during the period under review have been relatively good for the time of the year, and judging from the reports received, some stations have experienced very interesting QSOs, but the incidence of wintry conditions during part of the time, bringing with it aerial damage, has had some effect on the skeds: G5BD/GM3EGW has been held up, but it is hoped to resume soon; G5CP/G5MA still continues apace, although it has been difficult sometimes; G6LI/PE1PL has been carried on with a few gaps, and some interesting information has been obtained. **'6LI** informs us that one of the points under research has been proved, *i.e.* that good conditions to the Continent during any evening would tend to produce peak results soon after dawn next day. This condition occurred on the evening of December 30 and was followed by S8 signals both ways at 08.00 on December 31. The signal from PE1PL was of a consistency and strength never before experienced by '6LI. It is said to be completely confirmed that flutter-fading only occurs on rising pressure, especially if anti-cyclonic. When temperature and pressure are even over the path signals are adversely affected—in conditions where temperature differences existed, barometric pressure could have been, within reason, anything, but communication was easy. The general result of the month's skeds is that signals were a little better than in the previous period. It is expected they will be at least not worse during January and February.

Station Reports—2 m

G8PX (Oxford) has his 829B p.a. running very well, but he is awaiting a fine week-end for the erection of a pair of slots. **G6TA** (Streatham) has sent a very long list of stations worked using 20 watts to an 832 and a 4-over-4 aerial. The London area doesn't seem to contain many 2 m stations, and '6TA has been very popular, giving many operators their first actual London QSO. Conditions were fairly good and approximated to those of last summer. A new p.a. (829B) is now in use.

GM3EGW (Dunfermline) regrets that the sked with G5BD has been temporarily halted. His own beam has lost some elements and that of G5BD is reported at present permanently facing east! '3EGW's first QSO for 1955 was with GI5AJ (Bangor, Co. Down) who is regularly active, as also is GI3FZQ (Belfast). This possibility of working GI will cause some Southern Sassenach envy. Incidentally, we shall be glad to have some news from Northern Ireland on 2 m and 70 cm activities. G5YV (Leeds) has been well heard in Dunfermline lately, calling CQ to the South!

B.R.S.6327 (Earlsfield) says January 8 was very good for the North of England, stations being heard as far away as Liverpool at S8-9. (See "Calls Worked and Heard".)

G6XM (York) had a fair month although conditions deteriorated towards the end of the period. Now working on 144.14 Mc/s because of alleged interference, he wonders if there is a pirate on 144.36? It may be necessary for '6XM to go above 145 Mc/s in order to be in the "exclusive" amateur portion of the band—

* *21 Bridge Way, Whitton, Twickenham, Middlesex*

he regrets it, but at present he can see no alternative if he is to continue operating. Apropos the G6LI/PE1PL sked, '6XM says he thinks the early morning transmissions are much more reliable than those at 13.00. Usually the difference is about 2 "S" points. The Dutch station is occasionally worked but as '6XM is not always available, no sked is possible.

G5CP (Chesterfield) says he still hears PE1PL occasionally—very weakly—but no QSOs have resulted. Otherwise the only point of interest is the G5CP/5MA "marathon"—68 up to January 1. '5MA is always heard even if only 229, but Bob is not always so successful in hearing '5CP.

G8VN (Rugby) worked G3GPT (Preston), '3FAN (Ryde) and '3DQQ (Bury, Lancs) on December 29. Conditions were fair on January 8-9 and '8VN worked '6TA (first time) and G3ISA (indoor aerials both ends). Since the 9th conditions have not been good, but there has been reasonable Midlands activity in the evenings.

G5MR (Hythe) confirms the good period on December 18-19 when several stations were worked for the first time—G3HHY (Solihull), F8NU (Cholet, Nantes), F9FB (North of Paris) and F9CQ (Paris). On January 8-9 conditions were also good but '5MR has not been able to make full use of the band recently. He expected to be on regularly after the end of January. **G6XX** (Howden, E. Yorks) worked G3ITF (Basingstoke) at the turn of the year, and says '3FAN is usually heard in the evenings working with '2HCG. PE1PL was heard on January 5 at 569 but generally activity has been low.

GM6WL (Glasgow) says the big December opening did not appear to affect Scotland; at least he has heard nothing of it. '6WL was very pleased to work his old friend GI5AJ (Bangor, Co. Down) on New Year's Day. Otherwise 2 m has been purely local or "inter-GM." The following are active on 2 m in Glasgow and district: GM2CHN, '2CQI, '3NG, '3DYC, '3FOW, '3GAB, '3IBV, '3INK, '3JFJ, '4HX, '6KH, '6WL and '6ZV.

G5KW/P (Well Hill, Wrotham) was out in the openings at the end of 1954. His contacts ranged from G6XM (York) to GW8UH (Cardiff) and really seem to have been satisfactory in all directions. **G3HHY** (Solihull) spent the last days of the old year working as many old friends as possible owing to imminent departure for London. As a result, he was sometimes the only signal to be heard from the Midlands and always at reasonable strength. On December 29 many stations were raised to the south and south east, with more on the 30th. **G3WW** (Wimblington) missed the early part of December 29 but came on the band at 23.26 and worked 14 stations all over the country from Lancashire to Kent with GM3GWA (Wrexham) for good measure. '3WW is much bothered by "frying" noises from overhead h.t. lines which sometimes make reception extremely difficult. This however does not stop him, and on New Year's Eve and New Year's Day the good work was continued. Stations to the west and south were well received. G3WW now has a new pair of skeleton slots in use and is very gratified by an evident amelioration of signal strength. At the first effort, with the array on Beaconsfield, he heard G4OT, '3HXS, '3FAN and '2HCG; later '6XM was RS53 off the back of the beam. QSOs with G6AG, '2CZS, '6TA and a long first one with G3BII (Beaconsfield), all at good strength, ensued.

G2CZS (Chelmsford) worked 6 new stations on December 29-30, including G3ITF, '3DKF, '3BA and '5BM. Conditions were good to the Midlands, the west and the south coast. Two French stations were heard in contact and a number of British stations were called, without success. Some were at good strength, but

Regional V.H.F. Ladder

TWO METRE BAND

Psn.	Call & Location	Worked: Regions	Worked: Stations	Worked: Countries
1.	G5YV *Leeds, Yorks.*	15	219	9
2.	G3IUD *Wilmslow, Ches.*	14	114	6
3.	G2FJR *Sutton Bridge, Lincs.*	13	108	6
4.	G6XX *Goole, Yorks.*	13	94	6
5.	G3CCH *Scunthorpe, Lincs.*	13	80	5
6.	G3DO *Sutton Coldfield, Warks.*	11	47	3
7.	G8VN *Rugby, Warks.*	10	90	3
8.	G3BW *Whitehaven, Cumbs.*	10	20	5
9.	G6TA *Streatham, London*	10	137	2
10.	G5MR *Hythe, Kent*	8	71	5
11.	G2CZS *Chelmsford, Essex*	7	108	4

'2CZS's 80 watts did not seem to make itself felt. QRM on the frequency or "one way propagation" are suspected. **G3JGJ** (Plympton) has been practically inactive except for beam repairs. He is building a steel tower and is not yet certain whether to raise it to 48 or 60 ft. In the meantime, using a folded dipole, only G3AUS (Torquay) has been heard. It is reported that G2BAT (Falmouth) is still out of action, by reason of beam damage.

GW8UH (Penylan, Cardiff) mentions December 29 when a number of London stations were worked, the best signals being from G6TA and G5KW/P, both S9+. Propagation appeared to be west/east, very little being heard from north or north east. G3HHY was the only QSO from that direction at low QRK both ways. **G2AIW** was in the Year End party for a little of the time and, *inter alia*, worked G3CCH (Scunthorpe) the latter using s.s.b., his longest DX contact with the system up to that time. It appears to be quite effective, and was at comfortable strength and readability. The band was at times wide open for distant British stations and no real effort seemed to be required to work them. Very few appeared however other than the "regulars."

G3EPW (Bury, Lancs) has had aerial trouble which has curtailed his operating, but he managed to raise some new stations on December 30 including G6XA (Leamington Spa) and G3GHU (Northampton). G2UJ (Tunbridge Wells) was heard for the first time ever! On January 8 conditions were reasonable enough for QSOs with G3FW, '6TA and '3GHO. '3EPW thinks that some of the north west operators may be coming out of hibernation soon. Everybody will certainly be glad if they do!

G5YV (Leeds) has worked some new stations on the temporary Yagi and thinks it superior to the stack if conditions are good. When conditions are really poor, however, the stack comes into its own. '5YV always hears G5MA 100 per cent. copy and can sometimes give him 4 "S" points better than G5CP. So much for locality! When testing the Yagi indoors prior to erection, it gave a reading 8 db above noise with a certain station which is on 24 hour service; when raised to 65ft on the tower the comparative reading was 51 db! G3IOE (Newcastle) is putting in strong signals to '5YV since his new beam (two 5-over-5s side by side) was erected.

G2FJR (Sutton Bridge) has sent a new "Ladder" score to allay the qualms of those who thought he had "fallen off." He is still quite active on c.w. **G2AHL** (Guildford) worked his first GW (GW8UH) at the end of December, and judging by his list of calls heard and worked he has been getting on quite comfortably. G6OX (Hampton Court), a newcomer to the band, has been worked and G2BDP (Guildford) is expected on 2 m soon. Both are using converted 1143 transmitters. **G3FIH** (Bath) says conditions varied during the period from very good to very bad (much the same as with all of us) and deplores what is almost a cessation of activity during TV hours.

G2ADZ (Woolacombe) worked one of 4 Torquay stations heard recently—the other 3 closed down. EI4E lost his beams but they will soon be up again when the sked will be resumed. The hoped-for QSO with G6XM has not yet materialised, but '2ADZ worked GI3CWY (co. Antrim) on January 22.

Our old friend **EI2W** (Dublin) writes that he has been unable to give much time to 2 m lately but that he has "managed to get together" a 24 element beam. This is ready for testing and EI2W hoped to be on the band again early in February. Frequency as usual 144.1 Mc/s. Activity on 70 cm is also foreshadowed. EI2W hopes to be at the V.H.F. Dinner to be held in Scotland this Spring when the International V.H.F. Society's trophy is to be presented to Jock Kyle (GM6WL).

A late report from **G3WW** mentions several excellent QSOs on January 23. (See "Calls Heard and Worked".) The band was open for G-DX practically all day with stations from Yorkshire to the south west being audible. To the Cambridge direction all stations were much above average—S9 reports were commonplace. **G2PU**, with a new 32 element aerial (16-over-16 all driven, in a zig-zag pattern, reputed gain 17 db) was putting an excellent signal into the London area and also further afield. **G3AUS** (Torquay) was heard by '2AIW just before midnight working '5YV! There is no definite news of Continental working although it is reported, but unconfirmed, that G3ANB (Brightlingsea) worked ON4BZ. Home Counties and London activity was unprecedented—it is a long time since so many stations were on, and very pleasant to hear. There was even heterodyning on the band!

G5KW/P and /M was operative between 17.00 on January 28 and 01.00 on the 29th in and between Huntingdon and Rutland. From 17.00-19.30 on the 29th he was working from High Rock, Bridgnorth (Shropshire) and then proceeded /M to Wolverhampton. On January 30 '5KW was again /M on the return journey to London. Those worked from Alconbury Hill, Hunts., included G3WW, '6TA, '6XM and '8KW, and from a hill 2 m west of Uppingham, Rutland, G2ATK, '2COP, '3WW, '3HAZ, '3HZF, '5YV, '6NB and '8KW. During the weekend of February 25-27, G5KW will be visiting Wales.

Station Reports—70 cm

G2ADZ (Woolacombe) is looking for QSOs and listener reports. **G2DDD** (Littlehampton) says there is nothing special to report except construction. On January 8, however, things were considerably above average, and two solid contacts were made, one with G2DD (phone), the other with G3IRW (c.w.) for a first QSO. G3FP (Thornton Heath) was worked for the first time since the 1954 70 cm contest.

G3JHM (Worthing) is active at the weekends, and G3DSP and '2DDD on Wednesday, Saturday and Sunday evenings at 19.00; also Sundays at 12 noon.

G3HBW (Wembley) is engaged on 2 skeds to the South Coast: with G2DDD and with G3JHM. These have continued reasonably well, with some breaks now and then. G2DSP (Bognor Regis) is also worked on occasions, and seems to have improved his signal with a new tripler.

G2RD (Wallington) sends the current activity list which is shorter than usual but always welcome: G2AIH, '2DD, '2DDD, '2DSP, '2FKZ, '2HDY, '2RD, '2WJ, '2XV, '3EGV, '3EYV, '3FD, '3FP, '3HBW, '3IRW, '3JHM, '3JQN, '4KD, '5CD, '5DT, '5KH, '5RD, '5UM, '6NF, '6YP and '8SK.

News From Scotland

From **GM6WL** (Glasgow) we hear that much 70 cm activity and construction is going on; GM6KH has worked '3NG, '3INK, '3FOW and '6WL. All these stations have in fact been working or hearing each other, so that there is a compact little group in being, which has lately been augmented by the arrival of GM3FOW. In spite of the weather since New Year, activity has been maintained and aerials and feeders are standing up to it.

GM3EGW is testing a G3BKQ converter on which he has heard 70 cm harmonics from GM3FYB (local) and '3DDE (Edinburgh); the indoor aerials are probably not as efficient as outdoor ones would be, but it is a start anyhow.

Czech 1250 Mc/s Record

We have had a translation made of the report which appeared in *Amaterské Radio*, the gist of which is that the record was achieved during a Field Day last September between stations at Klinovic (in Western Bohemia) and Cerna Hora (Krknose, Black Mountains) reports being 589 both ways. The participating stations were OK1KRC and OK1KAX and the distance 200 km (125 miles). "Lighthouse" valves were used with co-ax resonators; the aerials were dipoles with half-wave reflectors. It is understood that the Czechs are very interested in results in the U.K. and would like to exchange views. We have not yet heard from the Czech Society (C.A.V.) however.

Another Major Opening

As a fitting climax to the month's news here is a brief report on activities on the evening of January 24 when the 2 m band was again wide open to the Continent and for some G-DX. PE1PL was audible early at S9 and was worked by G5TZ, G3JXN and G2AIW, among others. G5TZ (I.o.W.) had a very full session, and was still going strong after midnight. Stations worked included: DL1FF (Kiel), DL3VJ (near Hanover), ON4BZ, ON4HN, PA0DOK, PA0FB, PE1PL, F3JN, F8HA, F9NW and many other Continentals. OZ9AA was also heard but could not be raised. Some of these stations were worked by other Gs, but not all could hear the DL stations. '5TZ also worked G2ADZ (Woolacombe). G3IJB (Burnham) worked PA0FB as did G8KW, whilst G6TA worked F3JN (Paris). ON4BZ himself said he could not hear northern G stations but to east, south and south west from Brussels conditions were above average. He worked (apart from many nearer G stations) G3AUS (Torquay) and G3FIH (Bath). G2AIW had QSOs with PE1PL, ON4BZ, ON4HN, G4GR (Marshfield, Mon.), G3FIH and G5TZ, the last mentioned making much of this item possible. Late on January 25, DL3VJ worked G2BMZ (Torquay) and G2AIW. His phone signals were RS57-8, peaking to S9.

* * *

Reports for the March issue by February 21 please.

Worked and Heard on Two

G2AHL (Guildford) December 25-January 23.
Worked: G2AHP, '2AHY, '2AIW, '3FIH, '3GKZ, '3HHY, '3GHO, '3JEP, '3JFR, '4KD, '4SA, '5KW/P, '5TZ, '6OX, '6TA, '8RW, GW8UH. *Heard:* G2PU, '2YB, '3GNJ, '4GT, '5DF, '6XM.

G2AIW (Twickenham) December 17-January 17.
Worked: G2AHL, '3BA, '3BII, '3CCH, '3FYY, '3HHY, '3IJB, '3IOO, '3JXN, '3WW, '4RO, '5CP, '5KW/P, '5MA, '5UM, '5YH, '5YV, '6AG, '6NB, '6XM, GW3GWA. (January 23): G2PU, '3FAN, **'3IIT**, '3WW, '4OT, '5JO, '8KZ. *Heard* (January 23): G2HCG, '2XV, '3ANB, '3AUS, '5BD, GW8UH.

G2CZS (Chelmsford) December 18-January 15.
Worked: G2HCG, '2WS, '3ANB, '3BA, '3CVO, '3DKF, '3DOV, '3FYY, '3IEX, '3IIT, '3ITF, '3JXN, '4GT, '5BM, '5KW, '6XM, '8KW, '8LN.
Heard (December 29): G2FNW, '3CRH, '3EGV, '3FAN, '3FIH, '3HHY, '3HVO, '3JEP, '5YV, GW5BI, GW8UH.

G3FIH (Bath) December 19-January 17.
Worked: G2AHL, '3DJX, '3FKO, '3GMN, '3GNJ, '3HHY, '3HXS, '3IER, '4AJ, '5BM, '5KW/P, '5MA, '6AG, '6FK, '8BP, '8KW, '8WI, GW5BI, '8UH. *Heard:* G2ADZ, '2HCG, '3AUS, '3FAN, '3ISA, '5YV, '6XM.

G3HHY (Solihull) December 29-30.
Worked: G2AHL, '2AIW, '2MV, '2XV, '3EGV, '3EPW, '3FAN, '3FIH, '3FQS, '3GSE, '3HXJ, '3HXS, '3HZF, '3IIT, '3ISA, '3WS, '3WW, '5KW/P, '8KI.. *Heard:* G3CCH, '5YV, '6XM.

G3WW (Wimblington) December 29 onwards.
Worked: G2AIW, '2ATK, '2CVO, '2FQP, '2YV, '3BSU, '3DQQ, '3EGV, '3FAN, '3GGJ, '3GNJ, '3GPT, '3GXG, '3HHY, '3HTY, '3HVO, '3IAM, '3IOO, '5KW/P, '5ML, '5YV, '6FK, '6TA, GW3GWA. *Heard:* G2HCG, '3EPW, '6NB, '6XM, '6XX.
Worked (January 23 only): G2ABD, '2AIW, '2BVW, '2PU, '3APY, '3BSU, '3DOV, '3FUL, '3GDR, '3IUK, '3JZF, '5JU, '5YV, '6XH '6XM, '6XX, '8BP. *Heard* (January 23 only): G3CHR, '3EPW, '3FAN, '3IOO, '3IWJ, '4SA, '5JO, '5ML, '5TZ, '6AG, '6NB.

G5KW/P (Wrotham) December 29-30.
Worked: G3FIH, '3GKZ, '3HHY, '3IER, '5BM, '6FK, '6XM, '6XX, GW8UH.

G5MR (Hythe) December 17, 18, 19, 29, and January 8, 9, only.
Worked: F3JN, '8GH, '8NU, '9CQ, '9EA, '9FB, '9NW, '9TV, G3FYY, '3HHY, '3ISA, '3VI. *Heard:* F3CA, '3ND, '8AA, '8OB, G2HCG, '2HDZ, '2UN, '2XV, '3BII, '3BSU, '3ENS, '3FIH, '3HBW, '3JXN, '4AJ, '4MW, '5KW, '5KW/P, '5YV, '6AG, '6NB, '6RH, '8BJ, '8KW.

G6TA (Streatham) December 18-January 18.
Worked: G2AHL, '2AHP, '2ATK, '2BRR, '2COP, '2CVD, '2DUV, '2DVD, '2FSY, '2HCG, '2PU, '2WS, '2YB, '3AGA, '3AGR, '3ARL, '3BA, '3BII, '3CGE, '3CRH, '3DF, '3DJX, '3DKF, '3ENY, '3EOH, '3EPW, '3FAN, '3FIH, '3FMO, '3FQS., '3FSD, '3FUH, '3FUL, '3FYY, '3GHO, '3GHU, '3GKZ, '3GNJ, '3GSM, '3GZM, '3HAK, '3HCU, '3HHY, '3HTY, '3HXS, '3HZJ, '3IER, '3IES, '3IOB, '3IOO, '3IRA, '3ISA, '3ITF, '3IUD, '3IVF, '3IWJ, '3JFR, '3JJH, '3JXN, '3ML, '3QV, '3WW, '4GT, '4OT, '5BM, '5CP, '5KW, '5LO, '5MA, '5ML, '5TP, '5YH, '5YV, '6AG, '6FK, '6KD, '6LL, '6NB, '6OU, '6XH, '6XX, '6YU, '8GD, '8VN, '8WI, GW5BI, GW8UH.

G6XM (York) December 25-January 15.
Worked: G2KO, '2MV, '2XV, '2YB, '2ACD, '2AIW, '2AOK, '2ATK, '2COP, '2CZS, '2DJM, '2FNW, '2HCJ, '2HOP, '3BA, '3FW, '3NL, '3ARX, '3CCH, '3CUZ, '3DKF, '3EGG, '3EGV, '3EJO, '3FAN, '3FUL, '3GHU, '3GSE, '3HBW, '3HHY, '3HTY, '3HZF, '3IER, '3IIT, '3IOO, '3ITF, '3IWJ, '3JJX, '4JJ, '4SA, '5AU, '5BM, '5CP, '5KW/P, '5MA, '5ML, '5UM, '5VN/A, '5YV, '6FK, '6KK, '6NB, '6TA, '6XA, '6XX, '8BP, GW3GWA, PE1PL.

G8VN (Rugby) December 14-January 14.
Heard: G2AHP, '2AIW, '2ATK, '2BVW, '2COP, '2CZS, '2FNW, '2HDP, '2XV, '2YB, '3BA, '3BJQ, '3CKQ, '3CRH, '3DKF, '3DO, '3DQQ, '3EGV, '3EJO, '3FAN, '3FGT, '3FIH, '3FMI, '3FUW, '3GHO, '3GHU, '3GKZ, '3GNJ, '3GPT, '3HHY, '3HXS, '3HZF, '3IOO, '3ISA, '3ITF, '3IUD, '3IVF, '4SA, '5AU, '5BM, '5CP, '5JU, '5KW/P, '5MA, '5ML, '5NO, '5YV, '6AG, '6PO, '6RH, '6TA, '6UJ, '6XM, '6XX, '6YU, '8KL.

GW5BI (Cardiff) December 21-January 19.
Heard: G2XV, '3WW, '3FAN, '3HZF, '6TA.

GW8UH (Cardiff) December 21-January 19.
Heard: G2ADZ, '2AHL, '2BMZ, '2HZF, '3FD, '3FAN, '3FIH, '3HHY, '3IER, '3ITF, '4RO, '5KW/P, '6TA, '8WI, GW2ACW, '8SU.

B.R.S.6327 (Earlsfield).
Heard: G2ABD, '2AHP, '2AHY, '2AIH, '2AIW, '2BZ, '2BPC, '2COP, '2DJM, '2DP, '2DTO, '2DUV, '2DVD, '2HCD, '2HCG, '2MB, '2RD, '2TP, '2WS, '2YB, '2YV, '3BNC, '3DF, '3DJX, '3EPW, '3EYV, '3FAN, '3FIH, '3FQS, '3FSD, '3FTS, '3FYO, '3FYY, '3GCO, '3GHI, '3GHU, '3GMJ, '3GSM/A, '3HCU, '3HWJ, '3HXS, '3IAI, '3IAM, '3IER, '3IOO, '3IRA, '3ISA, '3IWJ, '3JFR, '3JXN, '3ZI, '4AJ, '4GT, '4KD, '4MA, G5BM, '5CP, '5KW, '5KW/M, '5LO, '5MA, '5UM, '5YH, '6FR, '6JK, '6KD, '6NB, '6TA, '6TP, '6XH, '8GD, '8RW, '8WI.

B.R.S.19162 (Dewsbury) December 20-January 17.
Heard: G2ATK, '2FNW, '2FJR, '2HOP, G3CCH, '3DOV, '3ENS, '3HHY, '3IVF, '3WW, '4SA, '5AU, '5ML, '6FK, '6LI, '6NB.

Slow Morse Practice Transmissions

G.M.T.	Call	kc/s	Town
Sundays			
09.00	G3GYV	1900	Whitley, near Warrington
09.30	G3BKE	1900	Newcastle-on-Tyne
10.00	G6MH	1990	Southend-on-Sea
10.30	G3DGN	1920	New Barnet
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3GZA	1837.5	Bristol
12.00	G3LP	1850	Cheltenham
12.00	G3JBU	1850	Northampton
12.00	G15UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
23.30	G13CFI	1900	Coleraine, N.I.
Mondays			
19.00	G3NC	1825	Swindon
19.00	G3JBU	1850	Northampton
19.15	G2FRX	1850	Plymouth
21.00	G3BLN	1900	Bournemouth
21.00	G3FSM	1900	Brentwood
22.15	G2BRH	1900	Ilford
Tuesdays			
18.30	G2FXA	1900	Stockton-on-Tees
18.30	G3JMP	1875	Bristol
20.30	G3GDZ	1905	Kingsbury, N.W.9
21.00	G3EFA	1855	Southport
23.30	G13CFI	1900	Coleraine, N.I.
Wednesdays			
19.00	G3GZA	1837.5	Bristol
19.00	G3HUB/A	1902	Chelmsford
22.30	G3FBA	1910	Bath
23.30	G13CFI	1900	Coleraine, N.I.
Thursdays			
19.00	G3NC	1825	Swindon
19.15	G2FRX	1850	Plymouth
20.00†	G2CPS, G2CNX, G3GWT	1910	Hull, Yorks.
20.30	G3DGN	1920	New Barnet
20.30	G3JQM	1878	Barwick, Yeovil
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
23.30	G13CFI	1900	Coleraine, N.I.
Fridays			
18.00	G3GEN	1900	Gloucester
19.00	G3BLN	1900	Bournemouth
20.00	G3IIH	1900	Wirral
20.30	G3IMP	1920	Romford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees

† *Alternately.*

Slow Morse transmissions are organised by Mr. C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex. Members using the service are requested to send listener-reports to the stations concerned.

London Lecture Meeting **Friday, February 25, 1955**

RADIO ASTRONOMY AND THE RADIO AMATEUR

By

Dr. R. C. Jennison

(University of Manchester Jodrell Bank Experimental Station)

at the

Institution of Electrical Engineers, Savoy Place, Victoria Embankment

Buffet Tea 5.30 p.m. **Lecture 6.30 p.m.**

Society News

Mr. H. A. Bartlett Installed as President

ABOUT 100 members were present in the Lecture Theatre of the Institution of Electrical Engineers, London, on Friday, January 28, 1955, when the Immediate Past President (Mr. Arthur Milne, G2MI) invested Mr. H. A. Bartlett with the President's Chain of Office and installed him in the President's Chair.

Following the installation, Mr. Bartlett delivered his Address to the membership. (The Address appears elsewhere in this issue—Ed.)

Among those present at the ceremony were Past Presidents A. D. Gay, G6NF, S. K. Lewer, B.Sc., G6LJ, W. A. Scarr, M.A., G2WS and L. Cooper, G5LC; Vice-Presidents J. W. Mathews, Assoc. Brit. I.R.E., G6LL, and D. N. Corfield, D.L.C. (Hons.), G5CD, and Council Members W. H. Allen, M.B.E., G2UJ, J. H. Hum, G5UM, W. H. Matthews, G2CD, and R. L. Varney, A.M.I.E.E., G5RV.

London Lecture Meeting

COUNCIL Member Frank Hicks-Arnold (G6MB) was the lecturer at the London Meeting, held at the Institution of Electrical Engineers, London, on Friday, January 28, 1955.

Mr. Hicks-Arnold described and demonstrated "The Antenna-match" a device which provides near perfect matching between transmitter and aerial systems. The lecture was illustrated by slides and a film loaned by the Air Ministry through the good offices of Wing Commander W. E. Dunn, O.B.E. (G2LR). A description of "The Antenna-match" will be published in an early issue of the BULLETIN.

Messrs. R. L. Varney (G5RV), B. Davis (G2BZ), and A. O. Milne (G2MI) took part in the discussion and a vote of thanks to the lecturer was proposed by Mr. Davis.

Radio Amateurs' Examination

CANDIDATES who wish to sit for the Radio Amateurs' Examination, set by the City and Guilds of London Institute, to be held on Friday, May 6, 1955, from 6.30 to 9.30 p.m., should apply without delay to their local technical college who will make the necessary arrangements with the Institute. The closing date for such arrangements is March 1. In cases of difficulty, candidates should apply to the Director of Education for the county concerned.

The fee for the examination is 15/-.

Our New Printers

THIS issue of the BULLETIN has been printed by The Haycock Press, Ltd., of Camberwell, London, S.E.5, an old-established firm with a high reputation in the printing industry.

The Editorial staff take this opportunity of thanking the Managing Director of The Haycock Press, Ltd. (Mr. W. J. Dudley Bennett) and those associated with him, for their valued assistance in enabling the change-over from the previous firm of printers to take place without a hitch.

The Editorial staff much regret the inconvenience which was caused to readers and advertisers alike as a result of the late publication of the December, 1954, and January, 1955, issues. The delays were due to circumstances outside the control of Headquarters.

As from the current issue the BULLETIN will be published regularly on or about the 15th day of each month.

Committees of the Council 1955

THE following members have been appointed to serve on the Committees of the Council for the year 1955:—

Contests.—Council Members: Messrs. F. Hicks-Arnold, G6MB; W. H. Matthews, G2CD. Non-Council Members: Messrs. E. S. G. Fish, G2HCZ; S. E. Fryer, G3ERO; J. P. Hawker, G3VA; T. L. Herdman, G6HD; A. Roy-Smith, G3ISA.

Exhibition (Home Constructor's Section).—Council Members: Messrs. W. H. Allen, G2UJ; C. H. L. Edwards, G8TL. Non-Council Members: Messrs. D. C. Jardine, G5DJ; F. G. Lambeth, G2AIW; H. F. Knott, G3CU; C. E. Newton, G2FKZ; G. W. Norris, G3ICI; R. L. Royle, G2WJ; F. S. Ruth, G2BRH; M. Wallace, B.R.S.18241; E. W. Yeomanson, G3IIR.

Finance and Staff.—Council Members: Messrs. L. Cooper, G5LC; C. H. L. Edwards, G8TL; D. A. Findlay, G3BZG; R. H. Hammans, G2IG; J. H. Hum, G5UM; A. O. Milne, G2MI; W. A. Scarr, G2WS.

G.P.O. Liaison.—Council Members: Messrs. R. H. Hammans, G2IG; A. O. Milne, G2MI; W. A. Scarr, G2WS.

Membership and Representation.—Council Members: Messrs. A. C. Gee, G2UK; R. G. Lane, G2BYA; W. R. Metcalfe, G3DQ; H. W. Mitchell, G2AMG.

R.A.E.N.—Council Members: Messrs. L. Cooper, G5LC; C. H. L. Edwards, G8TL; A. C. Gee, G2UK. Non-Council Members: Messrs. A. C. Dunn, G2ACD; C. L. Fenton, G3ABB; L. E. Newnham, G6NZ; W. J. Ridley, G2AJF; C. T. Wakeman, G4FN; D. F. Willies, G3HRK.

Technical.—Council Members: Messrs. W. H. Allen, G2UJ; C. H. L. Edwards, G8TL; R. H. Hammans, G2IG; J. H. Hum, G5UM; F. Hicks-Arnold, G6MB; R. L. Varney, G5RV. Non-Council Members: Messrs. F. Charman, G6CJ; H. A. M. Clark, G6OT; D. N. Corfield, G5CD; A. H. Koster, G3ECA; S. K. Lewer, G6LJ; J. W. Mathews, G6LL.

The President (Mr. H. A. Bartlett) is an ex-officio Member of all Committees of the Council.

R.S.G.B. Operating Certificates and Awards

ACTING on the advice of the Contests Committee the Council has recently approved slight amendments to the list of British Commonwealth and Colonial Empire Call Areas, which is used as a basis for judging claims for R.S.G.B. Operating Certificates and Awards.

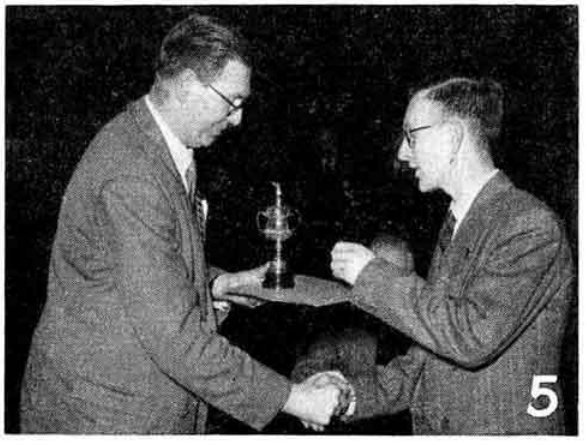
In future those who wish to apply for R.S.G.B. Certificates and Awards will be required to make formal application and to submit a check list.

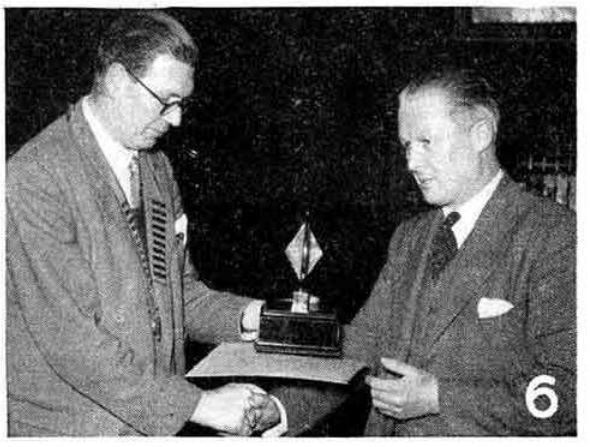
A new leaflet which embodies the amended list of Call Areas and sets out the rules and conditions governing the issue of R.S.G.B. Certificates and Awards may be obtained on application to Headquarters. The leaflet also includes a Form of Application and Power Declaration.

"Electronic Engineering"

HEADQUARTERS are anxious to complete their files of *Electronic Engineering* from 1943 onwards and will be pleased to hear from members willing to donate any of the following issues: January to July 1943, August and September 1945, September and October 1948, March 1952, and March 1953.

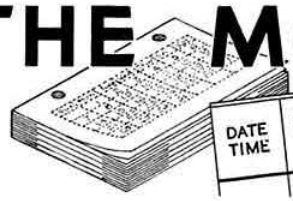
Presentations at the Annual General Meeting





(1) For the third year in succession, Mr. Roy Poeton (G3CTN), on behalf of Bristol Group, received the National Field Day Shield. (2) The President, Mr. Arthur O. Milne (G2MI), presented the 1930 Committee Trophy to Mr. J. Hunter (G3AZ), winner of the Low Power Contest. (3) Mr. W. A. Scarr, M.A. (G2WS) who donated the trophy to the Society, presented the Calcutta Key to Mr. John Clarricoats (G6CL), to whom it had been awarded for " outstanding service to the cause of International Friendship through the medium of Amateur Radio." (4) The President presented the B.E.R.U. Receiving Rose Bowl to S/Ldr. A. R. Gilding (ex-G3GZP), winner of the B.E.R.U. Receiving Contest. (5) The Arthur Watts Trophy was awarded to Mr. A. L. Mynett (G3HBW) in connection with the 70 cm Tests. (6) Mr. G. T. Peck (B.R.S.15402), winner of the D/F National Final, received the 1950 Council Trophy. *(Photos by G3IIR)*

THE MONTH ON THE AIR



By S. A. HERBERT (G3ATU)*

JANUARY is usually a quiet month from a DX point of view and January, 1955, did nothing to alter this state of affairs. However, there were openings on all bands except—as usual—ten metres. But by the end of this month we can expect an improvement. Things are usually brighter in February and March: although any printed optimism on the subject of conditions usually seems to result in a super fade-out!

Twenty Metre News

The band has attracted much less attention than usual, probably because for most of the time it has been full of strong Ws, with little else audible. As the month wore on, however, there were a number of interesting openings for those lucky enough to be on at the right time.

G3AAE (Barnet) put out his first ever A3 transmission last December, since when he has worked 50 countries on 'phone, helped recently by M1B (QSL received promptly), ET2US and VP2KM. However, Douglas is a c.w. man at heart and proved it by working KR6AZ, HZ1AB, ZP5AY, KA2 and CE7ZU (Base O'Higgins). **G3JFF** (Kingswear) could manage only a couple of evenings on the band, but contacted VE6VK, VE7GI, W6GIZ and W7HQC in short order. **G8PL** (Hampstead) was surprised to have a reply from UB5KBE (Box 74, Odessa), who also worked OH and FA and seems quite genuine.

B.R.S.20106 (Petts Wood) comments that results so far are slightly down on last January, when he logged 110 countries, as against 97 this year. One bright patch produced KC6CG and KA0IJ in QSO on 'phone, both clear signals. Other A3 transmissions of interest were VP2DN, VP2KM, ZD2RRW, YS1MS, HC1FG and ZL2ASQ. On c.w., Norman heard VK, ZL, JA, EL5B, ET3S, ET3GB (both in Ethiopia), ZD6BX, ZD6EF, CE2RE and ZS7D. **J. L. Hall** (Beckenham) pulled in FB8BR (Madagascar), FK8AO, plus "the usual" JA/KA, etc! **B.R.S.20249** (Sutton), who uses an R1155 and an R103 with a 66ft wire, heard EA9AR, SV0WK, YS1MS, VP2KM and ZD3BFC on 'phone—the latter, as usual, being called by all and sundry while in QSO. **A1290** (Blackheath) logged ET2US, HH3DL, KA, TF3EA, FF8, MD5, SU, as well as the more usual 'phone DX. **A1291** (Ashtead) eavesdropped on W1MCW, who was discussing such exotic calls as VS4HK, CE0AD, FR7ZA, TI9AA, AC4NC (rumoured to be back in Tibet) and Dutch New Guinea's JZ0KF. 'Phone DX heard in Ashtead included KL7WY, FB8BC, VS2DQ, KR6KS, CT2AG, TI2RMA, KG6GE, VE5DR, VE6FI, W1KZH/VE8, EL2D, YI2AM and MP4KAC.

Choice ones heard by **R. J. R. Crocker** (Plymouth) include KR6AZ, KC6US (0900), KR6AF, KR6ABN, VE6NX, MP4BBL, KA and numerous W7s. **G3ATU** worked VK1DY (Heard Is.—1640) and was somewhat shaken when a CQ call produced a reply from FG7XB (14050 kc/s at 1810). MP4BBL has it from SV0WK and others that DL4OR has permission to operate HV1OR from the Vatican and will do so on 7 and 14 Mc/s during the periods February 16-17, February 28-29 and March 1-2. (Time will tell about this one. Official policy has so far been against allowing amateur operation within the Vatican City.) Recent c.w. activity has been noted from FP8AP, FM7WP, ZP5GM, ZD9AC (14005 kc/s at 1745), FI8BA, FI8BG, FY7YC (1800), VP2GW (Grenada), KG6FAA (1030), HH3L (1600), EL5B (c/o P.A.A., Roberts Field), QSL ZD9AC via Box 3037, Cape Town. W3IM/M3, who caused momentary head-scratching, turned out to be in a car, travelling through Allentown, Pa. SV1AZ gives his QTH as Box 15, Candia. We wonder how many people, tuning around the low end of 14 Mc/s one recent Sunday morning, feared their receivers had contracted a bad case of second-channel interference? The morning in question was apparently the occasion of a Russian 'phone contest. Quaintly enough, although the band below 14.1 Mc/s was full to overflowing, there didn't appear to be a single Russian 'phone station above that frequency!

Forty Metres

The 40 m band is becoming increasingly jammed with odds and ends which might be anything at all. In addition, the volume of inter-European traffic makes it hard enough to hear DX, let alone work it. All the more credit then to the few with the necessary skill and patience to dig into the horrid mess and pull out something good. **G4CP** (Dudley) should encourage the faint-hearts for he succeeded in working VP6AM (6 watts—0830), ZD2DCP, CR4AL (Raul Fernandes, Aeroporto, Do Sal), FF8JC, DU7SV (1500) and VS6CT (1700). Ron was unlucky with FG7XB (2300, S3), VK9WZ (1400, S3), KR6KS (1700, S8), KX6PR (1650, S6), KG6GX (0915, S7) and VS2CR (1700, S6). An interesting one among the long-path W6s and W7s is W6GAL/7 (Arizona). **J. L. Hall** also heard good ones, logging CR6AI, OQ5RU, VQ3FN, VQ4RF and '4BNU, W7KBM/KL7, KR6OY and KR6KS.

B.R.S.20106 also heard some choice c.w. including YS1O, FG7XB, VP9BV, CO, KZ5, YI2AM, W5CAY, '5DMP, '5ABY, '5QKZ, W7PQE, W7WYD and UA0KKB. **G3AAE** raised some new ones in VP7NX (who is W6RRG when at home), LU5AQ, W7WYD, YV1AD and F9YP/FC. **G3JFF** called KR6KS (1800), OX3PW (1745) and CT3AB with no success, but did manage OY7ML, **G3ATU** called EL2X, VQ2HR (2340), KG4AV, FM7WD, ZS and sundry VQ4s unsuccessfully.

Fifteen Metres

Fifteen metres continues to be very much a week-end band on the whole, although it has been opening up rather more frequently of late. 'Phone remains the favoured medium. **B.R.S.20106** logged VK, VU, CE, CR6, ZS, ZE, VQ2, EL and HC1FS that way, with W5MET, W5KC, a VE3 and EL5B on c.w. **A1290** heard VK2AVW (1130) for a good one on 'phone and logged KZ5FL, OQ0GJ (1615), HK5ER, CO2CY and mobiles W2DIM and W2KTV. **A1291** stuck to 'phone and heard VU2ET, VK, 4S7LB, EL10A, HP3FL, ZD4BL, ZE and W1 to W0. **R. J. R. Crocker** amassed large numbers of

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

Ws. including some of the floating variety—MMs W2DUM, K6CQU, W5YMB (*U.S.S. Northampton*), W2ZXM (off Crete) and W2MWF (25°N, 62°W), for example. Other DX includes KV4BD, ZP5IB, YV5EC, HC1FK, HC1FS, ZS, VQ4, VK2AKV and VK5JW.

Eighty Metres

Eighty could never be called a "popular" band for the DX-hunting majority, but the few reports that do come in invariably show what is to be found under the layers of interference. **J. L. Hall** dug out UA9DH, ZL1CI, ZL3OP, W6VBY, W6ZAT, W6GAL/7, W7BSU/7, W7PQE. The Ws were all heard between 0745-0815 and sometimes peaked S7. John heard TF5TP saying that the TFs are expecting to be permitted to use the band in the near future. **A1290** logged W1BCR and W3QLZ, both on 'phone around 2230, while **B.R.S.20106** tuned the c.w. end to hear HB1MX/HE, ZC4MS, W5COU, W6DFY, W9AVJ, W9HZF, W9LI, W0VMN, W0LMM, YV5BJ and CR4AB.

VS6CZ on 80

VS6CZ (G5DZ, ex-VS7MB, MD3MB) was on 80 m from December 23 to January 3 when he worked SM5AQW, SM5AHK, OZ7BG, SP3AN and OH2MQ, all between 2300-2400 local time. He also heard G5VB, '5BJ, '5CR, '6UF, '3FGX/A, GM3JDR, GD3UB, PA0VB, '0FZ, '0NOL, '0QU, '0TAU, SM5AOV, '5BPJ, '4APZ. Strengths were from S7-S3, but mostly R3 "owing to the horrible noises which appear" (sounds just like home!). A later list adds G3GLW, '2FWS, '5RS, '2LA, SM4AWG, '2AGL, DL1HK, DM2ABL, OH1SW and YU3CST. '6CZ passed on the list of Europeans heard since Christmas by **VS6CQ.** He mentions some of those heard by '6CZ and adds G6YQ, G3BDI, '4CT, '8QZ, '3IMX, '2FT, SM5BCS, '7CYD, OZ5PA, '4HF, OH2YV, YU3IY, SU1RG, LA1FD, DL1FF and W1IJU. VS6CZ uses all bands from 1.8 to 28 Mc/s to a long wire.

Top Band DX

Top Band has been good in patches, but has not yet provided quite as good an opening to W/VE as it did last year. However, there's plenty of time yet. In the meantime, activity is good and when an opening does occur, there are stations ready to exploit it. **KP4KD** wrote to G2MI with the good news that he broke the one-sixty ice on January 2, working EI9J, G5RI and G5JU. Then, on January 9, he worked G5JU again, G3BKF, G3JVI, G2PU and G2PL. He uses 100 watts to a quarter-wave aerial. He has now worked EI9J and G2PL on six bands and G5RI on five! **J. L. Hall** was surprised to hear PA0s on the band, but QSLs explain that they were engaged in a flood emergency session. They are, in fact, allowed to use the band only for such emergency matters. As to DX, John heard plenty, with W1, 2, 3, 4, 8, 9, VE3AAZ, KP4CC, '4DV, '4KD, KV4AA, ZC4GF, '4JA, '4RX, VP7NG (S5-0630; he operates between 1823 and 1835 kc/s) and OD5LX, peaking S8 around 0450. YV5DE is on 1831 kc/s and TI2BX is usually on 1835 kc/s, but neither has yet been heard in the U.K.

G3JFF, now on his way to Jamaica, proposes to listen on the band. Special efforts were to be made on January 30 (at sea) and on February 13 (when he was due in Jamaica).

B.R.S.20106 heard W1, 2, 3, 4, 8 and 9, three KP4s, KV4AA, VO3X and W8GDQ (S7 to 8) on 'phone. Norman is still looking for VP4LZ, LU, etc., but finds that splatter from the ship-shore fraternity around 1821 kc/s just about puts paid to DX reception in the London area. (Not only in London, either, be it known!) Norman has since received a letter from VP4LZ, whose activity has been curtailed owing to changed flight schedules with P.A.A. He was on the band on December 28, but nothing was heard. VP4LZ now has an 1830 kc/s crystal, which he intends trying out towards the end of February. If his signals do break through, we appeal to all G stations to keep well clear of that frequency.

Overseas News

News from **W4CEN,** passed on by G3GGO, confirms that W6MHB sailed for Cocos Is. (TI9) with other members of a treasure-seeking expedition. During their stay, W6MHB will be active on all bands from 1.8 to 28 Mc/s. Operation was due to start around February 1. **W4QCW** writes regarding the recent Navassa Is. Expedition. For some reason, many cards from U.K. amateurs who worked **KC4AB** have not yet been received. They should be sent to J. R. Eshleman (W4QCW), Parkview, Harrisonburg, Va. U.S.A. **DL2VO** (Herford) was a club station, active from October 1954 to February 1955. All QSOs and listener reports will be acknowledged and cards should go c/o B.R.S.19682. **DL2WM** (R.A.F. Butzweilerhof), who is G3JQJ when at home, works mostly on 14 and 21 Mc/s. On 14, he added some new ones in CR7, FF8AJ, KL7ADR and 4S7NG, but missed FB8, CR6, EL, KA and ET3.

G8RP, who is on a spell of duty with the U.S. survey ship *M/V Sonic* at Bahrain Is., has been allotted the call **MP4BBS** and is to be found most nights on 14320 kc/s, working from the ship with a BC610. Also on the staff is W5EVW, who hopes to get a call-sign. Both will QSL—G8RP after his return to the U.K. at the end of March. MP4QAG, also with the company, is at Doha. **ZC4FB,** now in the U.K., would welcome news of congenial accommodation in the Leicester/Loughborough area. Final ZC4 news from Ted is that as G3FQX is due in Cyprus shortly, activity on the island will therefore be down only one as a result of 4FB's departure. *The DX Bulletin* of **The West Gulf DX Club** has been plundered for the following newsworthy items. FL8AI is active daily on 14150 kc/s-1800. W8BKP heard ZC3AC (14156) and VU2AL on 'phone, talking to CR8AB (not audible). W6AOA says KD6AT will count as a new country. The operator will QSL in February or March. He cannot yet reveal his location. EL2X said FE8AE would definitely be on 14 Mc/s c.w. as from January 20.

B.E.R.U. Contest Flash

"Dud" Charman, **G6CJ,** reports that conditions during the B.E.R.U. Contest (January 29-30) were excellent with 21 open and conditions on 14 exceptionally good. A ZL and several South Americans were heard on 21. Owing to the low noise level, conditions on both 3.5 and 7 Mc/s were also good. Though the latter Band was spoilt by Russians calling WSEM, Canada and Newfoundland were workable as early as 1800 G.M.T. G6CJ comments that it was a pity contacts on Top Band did not count because KP4KD and YV5DE were as loud as Gs on the Sunday morning.

VS9XZ was operated by SU5XZ on a B.E.R.U. expedition whilst ZC4XA concealed the identity of old timer Tich Emary, G5GH—ex-VS6AX.

DX stations worked by G6CJ included VS1FE, VS2CR, VS6AE and VU2JP on 21 and VP1AA, VP7NM, VP9BL, VQ4AQ, ZD2DCP, ZS2A, ZS6R and ZS5U on 3.5 Mc/s.

* * *

Reports for March *M.O.T.A.* should reach G3ATU by February 20 and, for the April issue, by March 20.

Good hunting and 73.

The Story of G3AAT/OX

By the Signals Officer, British North Greenland Expedition.

WHEN the writer joined the British North Greenland Expedition in May, 1952, it was found that the Danish authorities had forbidden foreign amateur stations to operate in Greenland because the privilege had been abused in the past by traffic handling. However, the G.P.O. arranged for amateur facilities to be granted, using the call-sign G3AAT/OX. As the Expedition was due to sail in July, and I had work to do in Stockholm and The Hague, there was no time to collect any suitable equipment, consequently the Expedition radio had to be used for amateur as well as official work.

On arrival in Greenland, amateur contacts were made between spells of unloading the ship and flying up to Base at Britannia Lake. For these contacts, either a T.1154 transmitter and R.1155 receiver, loaned by the R.A.F., or an Army Wireless Set 52 were used. Most amateurs worked around that time were under the impression that we were a new form of pirate station; in fact some discontinued the contact on being told where we were located!

The First Year

During the first year at Base there was not much time for Amateur Radio nor did the power supply position permit it. In the process of unloading a Sunderland flying boat, a pontoon containing one of the Diesel generators and an Army Wireless Set 53 had capsized, thus making the power situation even more precarious. Shortly afterwards the remaining Diesel gave trouble and could only be run for schedules with the Admiralty using the Type 53 set. The Naval Type 612 and Army W.S. Type 52 were available, battery state permitting, for occasional amateur use.

Meanwhile, an ice-cap station at 78°N, 38°W had been set up and called Northice. The wireless operator there was soon having long regular contacts on 3.5 Mc/s with amateurs in the Canadian Arctic and with the M.A.R.S. station at Thule. Base and Northice were in contact every evening on 3800 kc/s using the call-signs XPN and XPN1. European amateur stations were heard occasionally but never worked.

Spring, 1953

The following spring the writer travelled around the ice-cap on a Weasel tracked snow tractor which was equipped with a W.S. 19 H.P. and R209 receiver for communication purposes. Amateurs in Greenland and Norway were contacted during this trip and one British station, G2DZ (Daventry) was worked on 7 Mc/s under very difficult conditions.

Winter, 1953-4

The winter of 1953-4 was a period of considerable amateur activity; a new Diesel generator had arrived at Base, whilst the position at Northice was more settled. Both stations were using rhombic aerials beamed on Great Britain as well as dipoles and long wires. At Northice the W.S. 52 was in use, while at Base a W.S. 52 and W.S. 53 were available for amateur work. Nearly all members of the Expedition took an interest and many learned Morse and the elements of "ham" jargon. Regular contacts between Northice and GM3DHD were made on 14 Mc/s telephony, thus giving the three members of the Expedition who wintered there a chance to talk to someone in addition to themselves. Besides this schedule, Northice worked Canadian Arctic stations on 3.5 Mc/s and many North Americans.

At Base, during the nightly firewatch periods, the W.S. 52 and an HRO were used for 3.5 Mc/s work. As a result, we got to know the various operators and their stations intimately. At weekends the writer generally managed to work GM3WO on the key but unfortunately pressure of work prevented me from operating as often as I should have liked. In the spring, when we went our various ways, amateur activity practically ceased.

After spring had gone it was time to pack up prior to returning to the U.K. This put further Amateur Radio operation out of the question, save for a few days in July when we were waiting for the R.A.F. Sunderlands to fly the Expedition out. The last contact was made with G3IEW on July 29, 1954. Contacts made after that date were not genuine.

QSL Cards

QSLs verifying contacts with the Expedition have already been despatched and it is hoped that all stations who gave us the pleasure of a QSO have now received their much sought cards. Verifications for listeners' reports have also been despatched.

Some letters received by airdrop mail expressed concern that although QSL cards had been sent to the Expedition none had been received in return. Since we were a completely isolated party of explorers, it would, of course, have been quite impossible to send out cards, even if they had been available.

The members of the Expedition returned home on August 11, 1954, most of them with feelings of regret at leaving the Arctic, offset by the pleasure of being home. Several are applying for amateur licences. The writer is trying to go on further Polar Expeditions. If successful, readers may rest assured that he will endeavour to obtain permission to operate an amateur station.

Pye Communications Receiver

PYE Telecommunications, Ltd., are now manufacturing a high-grade, wide frequency-range, communications type receiver for marine purposes. The frequency range is 60 kc/s to 31 Mc/s in 8 bands, which are all individually visible on a large directly calibrated tuning dial.

Of robust construction, the instrument measures 10½in. high, 13½in. wide and 14in. deep (Weight 44lb). The power supply—a separate unit—weighs 25lb.

The valve line-up is as follows:—6BA6 r.f. amplifier; ECH81 first mixer and optional crystal controlled local oscillator; ECH81 second mixer and second oscillator; two EF92 i.f. amplifiers; EB91 detector and a.v.c. rectifier; EB91 series shunt noise limiter; EF92 a.f. amplifier; 6CH6 a.f. output; 6C4 tunable local oscillator; QS150/45 voltage stabiliser and EF92 b.f.o. The receiver acts as a single or double superhet depending on the frequency in use; a crystal filter is incorporated.

The receiver, known as type CAT, was designed in collaboration with the Admiralty.

British Instrument Industries Exhibition

THE third British Instrument Industries Exhibition will be held at Earl's Court, London, from June 28 to July 9, 1955. Scientific and electrical instruments, industrial meters, automatic controls, and scientific glassware will be shown.

Broadcast Receiving Licences

DURING December, 1954, the number of television licences increased by 156,365. The total number of licences in force is now 13,872,633, of which 4,155,989 are for television and 253,169 for car radios.

Mobile Column

By JOHN A. ROUSE (G2AHL)*

WITH the second British mobile season already looming on the Amateur Radio horizon, it would perhaps be useful to review briefly current activity for the benefit of those who would like to "go mobile" but for one reason or another have so far hesitated to take the plunge. At the moment, activity seems to be principally on three bands—1.8, 3.5 and 144 Mc/s, although operation has been reported on 14, 21 and 28 Mc/s as well.

On Top Band, power as low as ½ watt has proved to give excellent results on phone up to ranges of 20 miles. The main drawback appears to be the size of the aerial required and the very high level of QRM after dark. Much the same considerations apply to 3.5 Mc/s, although most operators use transmitters in the region of 10 watts input. Higher powers are in use but generally battery drain is the limiting factor. Contacts on this band up to 30 miles or so are possible with longer distances under favourable conditions. Skywave contacts are difficult, although not impossible, as reported below.

The 144 Mc/s band has much to commend it, the lack of QRM making low power satisfactory. In addition, the aerial system can be small and unobtrusive, a 19in. whip giving excellent results up to 20 or 30 miles at almost any time with considerably greater ranges under good conditions. On the debit side, both transmitter and receiver tend to be slightly more complex than those for the lower frequencies, but by adopting modern techniques and valves it is possible to produce very compact equipment for the band.

Ideally, mobile gear should be physically small enough to mount in the glove compartment or on the parcels tray, although some operators favour the installation of the transmitter and power supplies in the boot, remotely controlled. Whatever arrangement is decided upon, it will assuredly repay the effort involved.

For those who still hesitate to prepare for the coming season, let it be said that the problems of this type of amateur work can all be overcome: they all add up to the fact that mobile is *FUN!* Try it and see.

British Mobile Record

What is probably a record for 3.5 Mc/s mobile operation in the U.K. is claimed by **G3ATL/M** (Hugglescote, Leics.) who worked GM3IWU (near Glasgow) and G4FO (Oadby, Leics.) while travelling at between 40 and 50 m.p.h. from Kibworth (Leics.) to Corby (Northants.) on December 8, 1954. GM3IWU reported G3ATL/M's signals RS56-8, G4FO giving RS58. On reception, G3ATL/M gave these stations similar reports. The equipment, all of which is mounted on shock mounts in the boot of a Ford Consul, comprises a modified Command transmitter running 45 watts input and a BC454B receiver. A small control panel is fitted under the dash, the receiver being tuned by a 14ft Bowden cable. Power is derived from 24 volt batteries charged by the car generator. G8RY assisted in assembling the station.

G5KW/M

Ken Ellis, who became famous for his many exotic overseas calls, including one he used when operating mobile from a train, is fast becoming one of the most active mobile amateurs in this country. During the last weekend of January, he made a 440 mile round trip to Huntingdon, Rutland (where he operated portable from two sites), Bridgnorth and Wolverhampton. During the journey he had contacts with many 2m stations including G6NB, G4SA, G6OU, G2YB, G8KW, G3XC and G3ISA, some at S9+ while travelling at 50 m.p.h. Travelling through Cirencester, G6TA (Streatham, London) was worked—a distance of about 80 miles. G5KW uses a combined transmitter-receiver, the input being 14 watts on 'phone. The line-up of the transmitter is 6AM6-6F17-6F17-QV04/7, modulated by push-pull 6BW6s. The receiver is a double superhet comprising r.f. amplifier (6AK5), two mixers (6AK5s), tunable oscillator, second oscillator and the usual i.f. amplifier, detector and a.v.c. rectifier, noise limiter and a.f. amplifier. The modulator valves act as the a.f. output stage on "receive." H.T. to the oscillators is stabilised by a QS150/15. The same equipment gained G5KW the highest British score in the 1954 European V.H.F. Contest.

Mobile Rally

Douglas Walters (**G5CV**), who operates mobile on 3.5 Mc/s, has suggested that a Mobile Rally should be held during the coming season at some convenient and attractive rendezvous, preferably one able to cater for those attending. The idea has considerable possibilities and mobile operators are invited to submit their suggestions as to a suitable location, date and programme. The latter should include items of interest to both amateurs and their families.

New Zealand ZC1 Mk. II

Readers of the advertising pages of the BULLETIN will have seen that quantities of brand-new New Zealand ZC1 transmitter-receivers have recently appeared on the surplus market at very reasonable prices. Apart from being rather larger than most mobile rigs—they measure 22in. x 10in. x 10in.—these units are ideal for use in cars with 12 volt electrical systems. The battery drain is only 4.9 A on telephony, 4.4 A on c.w., 3.8 A on "receive" with the transmitter heaters on and 2.8 A with transmitter heaters off. A built-in vibrator unit supplies h.t. Although the equipment may be used as purchased, **G3IIR** and **G3JHL** have found that certain minor modifications are desirable. The modulation level can be advantageously raised by substituting a Mullard EF37A for the original 6U7G (V1G) speech amplifier and increasing the value of R21A, in series with the heater, to 30 ohms. The anode load resistor should be changed to 220,000 ohms and the screen resistor to 680,000 ohms. Alternatively, a 12K7 may be used in place of the 6U7G, R21A being short circuited. In this case, the anode load should be 250,000 ohms and screen resistor 1 Megohm. Further gain can be obtained by reducing the bias on the 6V6 modulator valve. This is most easily done by wiring a third 1000 ohm resistor in parallel with the existing cathode bias resistors.

Considerable vibrator ripple is introduced into the speech amplifier as the 12 volt switch line operating the changeover relay is in the same cable as the microphone. The trouble may be overcome by making up a new lead consisting of two unscreened leads and one screened, the outer braiding of which should be earthed at one end only. Extra smoothing from the junction of L20A and L9B (8μF) and an additional 16 μF in parallel with C1BC and C1BD in the vibrator unit is also helpful.

As supplied, the equipment is not suitable for use in cars in which the battery positive is earthed. However, the necessary modifications are quite simple and consist of reversing the wires on the back of the battery input socket and reversing the h.t. positive and h.t. negative

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

wires from the vibrator unit (these wires are the right-hand pair which come through a small grommet under the vibrator pack). The polarity of C19A and C19B must also be reversed.

After these modifications have been made the meter will read backwards when the push switch is pressed to read l.t. However, if it is re-wired as shown in Fig. 1 the meter will read in a forward direction.

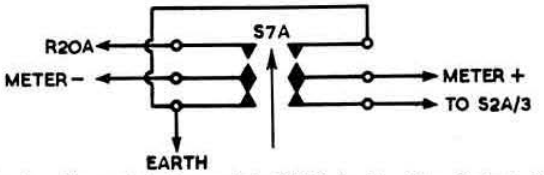


Fig. 1. The push-button switch (S7A) in the New Zealand ZC1 Mk. II transmitter-receiver should be rewired as shown in this diagram if the equipment is to be used in a vehicle in which the battery positive is earthed.

Licence Matters

G5KW reminds mobile operators that they should carry their Amateur (Sound Mobile) Licence with them. On a number of occasions he has been stopped by the police and asked to show his authority for operating mobile. Obviously the police are fully aware of the position.

Articles and Photographs

Articles describing all types of mobile equipment are urgently needed. Those willing to contribute are invited to send for a copy of "Hints to Contributors."

Photographs of mobile equipment are also required.

* * *

Items for inclusion in the next "Mobile Column," which will appear in the March issue of the BULLETIN, should be sent to arrive not later than February 20. Grateful acknowledgment is made to those who contributed this month.

Sergeant Frank Johnstone on Empire DX Tour

FRIENDS of Sergeant Frank Johnstone (G3IDC), Chief Operator of the Royal Aair Force Amateur Radio Society Headquarters Station G8FC (Locking, Somerset), will be interested to learn that he is now on a comprehensive tour of Royal Air Force, Royal Australian Air Force and Royal New Zealand Air Force stations, accompanying the R.A.F. Inspector of Radio Services as second operator of the famous Hastings aircraft "Iris." Whilst abroad Sergeant Johnstone hopes to meet many other radio amateurs serving in the R.A.F., R.A.A.F., and R.N.Z.A.F., and tentative arrangements have been made which it is hoped will enable him to operate on the 14 and 21 Mc/s amateur bands, using a special mobile rig which he has constructed.

His itinerary will be as follows:—Aden (February 16-23), Penang (March 3-8), Hong Kong (March 9-15), Singapore (March 16-21), New Zealand (March 25-April 2), Australia (April 4-14), Singapore (April 17-21), Mauripur, Pakistan (April 23-26).

It is anticipated that Sergeant Johnstone will use his United Kingdom personal call G3IDC, followed by an oblique stroke and the prefix of the country in which he is temporarily located.

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Friday, February 18th and March 18th, 1955.

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

Bands Available

THE following is a summary of the bands in which amateur operation is permitted. The table also shows the maximum power input and types of emission allowed to holders of Amateur (Sound) Licences. It should be noted, however, that operation on frequencies below 420 Mc/s is restricted to A1 (c.w. telegraphy) during the first year. Holders of Amateur (Sound Mobile) Licences are permitted to operate under the same conditions.

Frequency in Mc/s	Maximum d.c. input (Watts)	Types of Emission
1.8–2.0	10	A1, A2, A3, A3a, F1, F2 and F3
3.5–3.8	150	A1, A2, A3, A3a, F1, F2 and F3
7.0–7.3	150	A1, A2, A3, A3a, F1, F2 and F3
14.0–14.35	150	A1, A2, A3, A3a, F1, F2 and F3
21.0–21.45	150	A1, A2, A3, A3a, F1, F2 and F3
28.0–30.0	150	A1, A2, A3, A3a, F1, F2 and F3
144.0–144.5	150	A1, A2, A3 and A3a
144.5–145.5	150	A1, A2, A3, A3a, F1, F2 and F3
145.5–146.0	150	A1, A2, A3 and A3a
420–460	150	A1, A2, A3, A3a, F1, F2 and F3
1215–1300	150	A1, A2, A3, A3a, F1, F2 and F3
2300–2450	150	A1, A2, A3, A3a, F1, F2 and F3
2350–2400	25 (mean) and 2.5 kW peak	P1, P2d, P2e, P3d and P3e
5650–5850	150	A1, A2, A3, A3a, F1, F2 and F3
5700–5800	25 (mean) and 2.5 kW peak	P1, P2d, P2e, P3d and P3e
10000–10500	150	A1, A2, A3, A3a, F1, F2 and F3
10050–10450	25 (mean) and 2.5 kW peak	P1, P2d, P2e, P3d and P3e

Types of Emission

IN accordance with regulations drawn up at the Atlantic City Radio Conference in 1947 all emissions are designated according to their classification and the width of the frequency band occupied by them and are classified and symbolised according to the following characteristics: (1) Type of modulation. (2) Type of transmission. (3) Supplementary characteristics.

	Symbol
Types of Modulation	
(a) Amplitude	A
(b) Frequency (or Phase)	F
(c) Pulse	P
Types of Tranmission	
(a) Absence of any modulation intended to carry information	0
(b) Telegraphy without the use of modulating audio frequency	1
(c) Telegraphy by the keying of a modulating audio frequency or audio frequencies or by the keying of the modulated emission (special case: an unkeyed modulation emission)	2
(d) Telephony	3
(e) Facsimile	4
(f) Television	5
(g) Composite transmissions and cases not covered by the above	9
Supplementary Characteristics	
(a) Double sideband, full carrier	(none)
(b) Single sideband, reduced carrier	a
(c) Two independent sidebands, reduced carrier	b
(d) Other emissions, reduced carrier	c
(e) Pulse, amplitude modulated	d
(f) Pulse, width modulated	e
(g) Pulse, phase (or position) modulated	f
As an exception to the above principles, damped waves are designated by	B

Types of Emission Available to U.K. Amateurs

From the above information, the meanings of the various types of emission available to British radio amateurs may be ascertained. Examples are as follows:—

A1	Telegraphy without the use of modulating audio frequency (on-off keying).
A3	Amplitude modulated telephony, double sideband, full carrier.
A3a	Amplitude modulated telephony, single sideband, reduced carrier.
F3	Frequency modulated telephony.
P1	Pulse modulated telegraphy without the use of modulating audio frequency.

The R.S.G.B. in Retrospect

1947

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

Membership Still Rising

THE second post-war year, 1947, opened under the Presidency of Mr. S. K. Lewer, B.Sc. (G6LJ) with membership at 12,576, an increase of 2924 over the past 12 months. The BULLETIN still only contained 16 pages owing to the continuation of paper rationing. For the first time, warning was given by the then Hon. Treasurer, Mr. Alec Watson (G2YD), that subscriptions might have to be increased because of rising costs. Up to this period in the Society's history, all articles contributed to the BULLETIN had been given gratuitously, in fact it had always been considered an honour for a member to have a contribution published. Because of changed circumstances the Council decided during 1947 to purchase the copyright of all technical articles published—a practice that has continued to date—but it is a fact that certain members still decline to accept payment.

During 1947 a specially designed 300 watt transmitter was presented to the Society by Sir Ernest Fisk, Managing Director of Electric & Musical Industries, Ltd. The transmitter was installed in the Council Room at New Ruskin House, and operated as a frequency marker in the 3·5 Mc/s band using the call-sign GB1RS. Further gifts to the Society for the Headquarters' station were made by Stratton & Co., Ltd., and Radiovision, Ltd., who presented receivers.

The first London Members' Ladies' Night took place during the year at the Victoria Rooms, Bloomsbury Square. Of the 230 present, approximately half were ladies.

The Society was asked by the G.P.O. to make recommendations regarding the type of emissions which should be permitted in the various bands allocated to U.K. amateurs. The recommendations were accepted by the G.P.O. and published in the February, 1947, BULLETIN. After a long and protracted discussion, the Ministry of Supply finally decided to sell surplus Army and Royal Air Force transmitters to bona fide experimenters. The Ministry explained that their hands were tied by a Post Office instruction that no transmitters should be sold to persons other than those permitted to use them. This instruction prevented the sale of the transmitters to dealers who were at the time purchasing much of the worthwhile equipment. As the R.S.G.B. by its Articles of Association could not engage in trade two members of the Council (Messrs. C. H. L. Edwards, G8TL, and Dr. G. Bloomfield, G2NR) agreed to establish a scheme whereby these surplus transmitters could be purchased by members. Dumps were visited, prices agreed, and the first of the M.O.S. Surplus Transmitter Schemes was soon under way.

During the summer a new type of contest for Direction Finding enthusiasts was sponsored by the Society. In June, the first post-war N.F.D. took place with nearly 200 portable stations in operation and 3,000 members participating. The pre-war idea of four stations per District was changed to allow two stations to operate from each town, hence the far larger number of portables in operation. The number of licences issued up to the end of January totalled 4,400, of which more than 50 per cent were new ones.

As the continued paper shortage rendered impossible any further increase in the size of the BULLETIN, a supplementary publication known as *The Proceedings of the R.S.G.B.* was issued free to members once a quarter. The *Proceedings* contained technical papers read at meetings of the Society held at the Institution of Electrical Engineers, London. The first issue was received with acclamation by the membership.

A large number of Regional Meetings were arranged during the year. These allowed provincial members to meet representatives of the Council and Headquarters' staff, and to ask questions concerning the work of the Society.

During the summer a further supply of surplus transmitters became available for distribution, preference being given in the first instance to those who had not been successful in obtaining items from the earlier issue. Only one transmitter per person was permitted.

Vital Atlantic City

Early in 1947 the G.P.O. invited the Council to state a case for the amateurs in preparation for the next International Telecommunications Union Conference. It became clear that if certain of the proposals which had been formulated at a preparatory Conference in Moscow were adopted, many of the amateur frequencies would be in jeopardy. In order to safeguard the amateur position the Council agreed to appoint two Delegates to attend the Conference. The two Delegates were the President (Mr. S. K. Lewer, B.Sc., G6LJ) and the General Secretary (Mr. John Clarricoats, G6CL) both of whom were fully conversant with amateur matters generally. Because only international bodies are recognised at I.T.U. Conferences the R.S.G.B. delegates were attached to the I.A.R.U. Delegation. The Conference duly took place in Atlantic City, New Jersey, U.S.A. There was considerable surprise in R.S.G.B. circles when it was discovered that the two leading delegates of the A.R.R.L., who it had been assumed would join the I.A.R.U. delegation, had been appointed members of the official U.S.A. Government delegation, thus leaving the R.S.G.B. delegates to shoulder the main responsibilities of I.A.R.U. Representation. The going was hard, as the demand for frequencies by every country was great. The Society's delegates spent much time lobbying Government delegates of other countries in an endeavour to solicit their support for the amateur cause. Eventually after nearly six months of really hard work, many of the amateur allocations which had looked like disappearing were retained. It is safe to say that had the R.S.G.B. not been represented at the Conference, U.K. amateurs would have lost the Top Band. In that connection the British Post Office agreed, after discussions with the R.S.G.B. delegates, to put forward a proposal which would permit administrations in Region I (Europe and Africa) to assign up to 200 kc/s to the Amateur Service in the band 1715-2000 kc/s. It is therefore worth remembering that subscriptions are paid not only for the purpose of providing a BULLETIN and QSL service, but also for representation at International Conferences. The cost of R.S.G.B. representation at the Atlantic City Conference was £1,412.

After further negotiations with the M.O.S. the Society was able to arrange for a third issue of surplus transmitters to members. The second issue had been heavily over-subscribed, with the result that only 50 per cent of those who placed orders were successful in obtaining equipment. In all, more than 5,000 transmitters were purchased, and more than £10,000 paid to the Government. It is worth noting that all incidental expenses incurred in operating the three schemes—no mean amount—were met by the Society out of current assets, *i.e.* out of members' subscriptions.

*28 Morgan Crescent, Theydon Bois, Essex.

A committee was set up to consider what changes should be made to the Society's Articles of Association, and in April a D.R.s Conference was held in Birmingham to discuss the new Regional Scheme. At that Conference it was decided that in future R.R.s would be elected by the membership. Previously they had been nominated by Council. It was also decided that in future all Representatives would hold office for two years at a time.

As a result of representations made by the Society, the G.P.O. agreed to permit a very small number of U.K. amateurs to operate on frequencies in the 50-54 Mc/s band, for some special trans-Atlantic tests on 6 metres. As a result of this concession the first two-way trans-Atlantic contacts took place on that band.

The First R.S.G.B. Amateur Radio Exhibition

The first Amateur Radio Exhibition sponsored by the R.S.G.B. took place at the Royal Hotel, Woburn Place, during November, 1947, and was an outstanding success, more than 5,000 visitors attending. That it fulfilled its purpose none who visited the Exhibition will deny, for it provided the radio industry with a unique opportunity for displaying its productions to a keenly critical and well-informed public under ideal conditions. The Exhibition was opened by Sir Stanley Angwin, K.B.E., D.S.O., T.D., who, in his speech, referred to the recent Atlantic City Conference. He said he hesitated to think what would have happened at that and the preceding I.T.U. Conference if the Amateur Radio movement had not been fully represented. (Sir Stanley Angwin was Head of the U.K. delegation in Atlantic City—Ed.). Entrance was by catalogue issued free to all members. Although this Exhibition ran at a loss it provided a valuable service to members. Thus ended 1947, one of the busiest and most eventful years in the history of the Society.

(To be continued)

Band III TV Transmissions in April

FOR industry purposes only, a vision signal on a commercial television frequency is to be radiated from a temporary mast on the I.T.A. site near Croydon some months in advance of the opening of commercial television.

The transmissions will be carried out by Belling & Lee, Ltd., who, working in close co-operation with the industry and the I.T.A., are to be given permission by the G.P.O. to radiate a 1 kW Band III, Channel 9, vertically-polarised vision signal, such as a test pattern.

It is expected that the low-power transmissions will start about April 1. Details regarding times of transmission will be announced later.

The purpose of this signal will be mainly to supplement, by practical means, the aerial manufacturers' technical appreciation of the problems of Band III reception.

It will also provide useful additional data for receiver manufacturers.

Electrical Engineers' Exhibition

THE Electrical Engineers' Exhibition organised by the Association of Supervising Electrical Engineers will be held at Earl's Court, London, from March 15 to 19 inclusive. The Exhibition will open at 10 a.m. and close at 7 p.m. daily except on Wednesday, March 16, when the closing time will be 9 p.m.

Members of the R.S.G.B. will be admitted without charge on showing their badges. Season tickets may be obtained on request from Mr. P. A. Thorogood (G4KD) who is General Manager of Electrical Engineers (A.S.E.E.) Exhibition, Ltd., 23 Bloomsbury Square, London, W.C.1.

"Propagation on 144 and 420 Mc/s"

From Dr. R. L. Smith-Rose,
Director of Radio Research,
Department of Scientific and Industrial Research,
Radio Research Station,
Ditton Park,
Slough, Bucks.

Dear Mr. Clarricoats,

Some time ago you drew my attention to an article entitled "Propagation on 144 and 420 Mc/s" in the November issue of the BULLETIN. We here have found this article quite interesting and, I should judge, well suited to introduce members of your Society to the relation between meteorological conditions and radio propagation on frequencies in the v.h.f. and u.h.f. bands.

The authors have obviously made some useful study of meteorological conditions, which is essential if a proper understanding of the radio phenomena is to be obtained. Probably one of the most interesting sections of the article is that entitled "Practical Method of Estimating Conditions" in which it is suggested that propagation phenomena can be forecast from a knowledge of the trend of water vapour pressure as determined in an open and exposed place shortly after sunset each day. This suggestion, while having some substance in it in an elementary way, requires a good deal of confirmation in a manner which I think amateurs interested in making serious scientific observations could play an important part. As the authors point out, the prevailing humidity can be determined from observations with wet and dry bulb thermometers, and if these are made regularly and studied in association with the daily meteorological weather chart, some useful deductions could probably be made. In order to forecast radio propagation conditions, however, it is essential to take note, not only of the conditions prevailing at one end of the circuit, but also of the trend of events across the circuit as displayed by the daily weather chart.

It is to be noted with satisfaction that the authors of the article in question have clearly made an intelligent search of the relevant literature, and if they and other amateurs continue on these lines they would be in a good position to make a useful contribution to our general knowledge of the phenomena of tropospheric wave propagation. Finally, I might point out that in so far as meteorological conditions vary in different parts of the world, the study of this subject could usefully be taken up on these lines by amateurs in different countries.

I trust that this letter may be found of some help and encouragement to those of your members who are desirous of making a serious study in this field.

Yours sincerely
(Signed) R. L. SMITH-ROSE.

LONDON LECTURE MEETINGS

February 25, 1955: **Dr. R. C. Jennison.**
(Jodrell Bank Experimental Station)
"RADIO ASTRONOMY AND THE RADIO AMATEUR."

March 25, 1955: **Mr. Maurice Child.**
"THE HISTORICAL DEVELOPMENT OF WIRELESS COMMUNICATION"
(with demonstration of early apparatus).

All meetings are held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2. Buffet Tea from 5.30 p.m. Meetings commence at 6.30 p.m.

CQ Single Sideband

By H. F. KNOTT (G3CU)*

THE new regulations relating to the power measurement of single sideband transmitters, details of which appeared in the December, 1954, issue of the BULLETIN, have been received with much satisfaction by s.s.b. enthusiasts everywhere. The concession, hard won by the Society's Technical Committee, permits a maximum peak power output comparable to that of a 150 watt double sideband transmitter with carrier. It also shows that the G.P.O. is well aware of the advantages of s.s.b. and is prepared to encourage its use, as well as accepting the amateur's ability to build and operate single sideband equipment.

To take advantage of the new regulations there is no short cut. It is necessary to have a sine wave oscillator and a simple oscilloscope for monitoring purposes, for the onus is on the operator to show proof that the maximum permitted power is not being exceeded.

Although s.s.b. has always given a good account of itself compared with other systems of telephony transmission, all that has been claimed for it will now be justified and the theoretical 9 db improvement in signal-to-noise ratio realised in practice.

Japanese Activity

Several Japanese Nationals are using single sideband, according to a letter received from JA1ACB (Tokyo), a 20 year old student who was the first JA to use the system on 14 Mc/s. JA1VX and JA1DA are on 7 and 50 Mc/s respectively. Haryo Yoneda, ex-J2NG, is building s.s.b. equipment and will be active shortly as JA1ANG.

JA1ACB has been planning s.s.b. operation since 1951 and is now using a two section crystal filter rig driving a 6AG7 to 9 watts peak. A phasing type exciter was first envisaged but the networks are difficult to obtain and the prices of components prohibitive compared with those for crystals. Until recently the receiver in use was 1-V-2 regenerative type but a BC312 has now been installed. Two-way s.s.b. contacts have been made with DU1JI, KR6OJ, ZL2GL, ZL4FO, ZL3IA, VK2ZF and VK3AEE. Others called but not worked include AP2CR, G2IG, HB9FU and OZ7T. JA1ACB asks that allowances should be made if no answer is heard from his part of the world as the power limit is 10 watts. Future plans are for operation on 21, 14 and 3.5 Mc/s where he will be looking for European contacts.

Notes and News

According to reports, it seems that there are about 1,000 s.s.b. stations active on the various bands. In Europe, DL4SV and DL4WH are now on 14 Mc/s while G3JPE is active on 3.7 Mc/s with a half-lattice filter rig running 2 watts peak power at the moment but a pair of class AB2 807s with 1,200 volts on the anodes will be added later. G2CDM (London), who uses a "Phasemaster" exciter, has a suitable linear amplifier under construction.

Other newcomers to 3.7 Mc/s include PA0IF, G3ECN, G3CCH, G3IXL and G8JC. G3ILI (Dulwich) who regularly operates on 3795 kc/s has completed a linear amplifier to cope more easily with the new regulations. It consists of an 813 in class AB1 with 2,500 volts on the anode and a no signal standing current of 30 mA. Other potentials are 800 volts on the screen, 100 volts bias. No neutralising was found necessary. A 20,000 ohms swamping resistor across the grid circuit of the driver stage (a 6CH6) minimises any unwanted loading effects.

Reports from Poland *via* G3EFP and PA0KC confirm that SP5QO will be active on s.s.b. soon. Unfortunately, operation will be confined to 7 Mc/s as 3.5 Mc/s is not available to Polish amateurs.

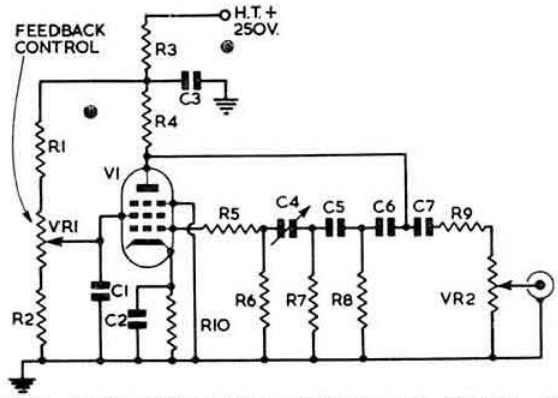


Fig. 1. A phase shift oscillator suitable for s.s.b. alignment. C1, 1 $\mu\mu$F; C2, 25 μF; C3, 8 μF; C4, 500 $\mu\mu$F + 100 $\mu\mu$F variable; C5, 6, 500 $\mu\mu$F; C7, 1000 $\mu\mu$F; R1, 6, 7, 8, 100,000 ohms; R2, 22,000 ohms; R3, 5,000 ohms; R4, 50,000 ohms; R5, 560,000 ohms; R9, 1 Megohm; R10, 150 ohms; VR1, 30,000 ohms; VR2, 470,000 ohms; V1, EF50 or EF91.

Technical Topics

For aligning a single sideband transmitter a sine wave oscillator is essential, but for tuning up or adjusting amplifiers a simple circuit such as that shown in Fig. 1 is adequate. The phase-shift oscillator, which uses a single valve, comprises a three stage delay network connected between the output and the input of the amplifier valve, and is so proportioned that the total phase-shift between anode and grid is 180° at the frequency of oscillation. The values shown are those used by G2NX, and give an output frequency of approximately 1000 c/s. When the circuit is adjusted by means of VR1 to a point where oscillation is barely maintained, almost pure sine wave output is obtained with good frequency stability. Adjustment of C4 varies the frequency by a few cycles.

* * *

The writer wishes to take this opportunity of thanking those who sent him Christmas greetings; they were very much appreciated.

Contests Diary

1955

February 25–27	-	A.R.R.L. DX Contest (c.w.)
March 11–13	-	A.R.R.L. DX Contest (Phone)
March 25–27	-	A.R.R.L. DX Contest (c.w.)
May 1	-	Two Metre Field Day (No. 1)
May 21–22	-	420 Mc/s Contest (No. 1)
June 4–5	-	N.F.D.
July 2–3	-	Two Metre Open
August 7	-	Two Metre Field Day (No. 2)
September 4	-	Low Power Field Day
September 10–11		420 Mc/s Contest (No. 2)
September 24–25		420 Mc/s Contest (No. 2)
October 1–2	-	Low Power
November 12–13		Top Band (No. 2)

*5 Kevington Drive, St. Paul's Cray, Orpington, Kent.

Radio Amateur Emergency Network

WE make no apology for again reminding R.A.E.N. members that E.C.O.s are urgently required for certain parts of London and Manchester and for Devon and Cornwall. Membership in all these areas is good but without E.C.O.s to co-ordinate individual efforts little can be accomplished. Members willing to undertake the duties of E.C.O. are asked to write to the Honorary Secretary, R.A.E.N. Committee (Mr. C. L. Fenton, G3ABB).

News from the Groups

Norwich group continues to make progress and has the support of important local organisations. Contact is maintained with stations on the coast as well as with a number further inland. Early in January when there was danger of flooding the group stood by with portable equipment in case of need. Activity is principally on Top Band and 144 Mc/s. During a flood emergency at Fleetwood, **Blackpool** group stood by and later received a letter of appreciation from the Chief Constable of Lancashire. Members of **Holt (Norfolk)** group are carrying out tests with 3.5 Mc/s walkie-talkies. G3FZW, the E.C.O. for **South Staffs.,** is one of those who has discovered the merits of the New Zealand transmitter-receiver type ZC1 Mk. II which has recently appeared on the surplus market. It covers part of Top Band, 3.5 and 7 Mc/s, and gives excellent results.

A practice net is held on Sundays at 10.00 G.M.T. in the **Bath** area, the control changing each week in order to provide practice for all stations. The calling frequency is 1980 kc/s; at 10.05 G.M.T. the net changes to a suitable channel. Tests are also carried out on 28 Mc/s. Further details may be obtained from Mr. R. G. Blackmore, G3FKO (Telephone Bath 61412). **Chelmsford** group has decided to concentrate on Top Band and 28 Mc/s equipment, although it is intended that the lower frequency gear should also be usable on 3.5 Mc/s. A practice net takes place on Top Band on Sunday evenings and stations outside the immediate area are encouraged to join in. **Portsmouth** group continues to be prepared, despite the fact that the local public services are already well equipped with portable and mobile stations. **Berwick-on-Tweed's** Border Net is in operation on Sunday mornings, Top Band being found most satisfactory. Two mobile stations generally take part.

The **Middlesbrough** group recently participated in an exercise arranged by No. 2 Squadron, 50th Divisional Royal Signals, particular care being taken to see that the conditions of the amateur licence were not infringed. The Army provided secondary batteries and a lorry to carry refreshments for the R.A.E.N. operators. The group learned so much from this practice that a live exercise is to be held about once a month. GW3ASW, E.C.O. for **Glamorgan,** is due to give a talk to members of the **Neath and Port Talbot Club.** He has completed a 5-25 watt mobile transmitter for Top Band and 3.5 Mc/s which is run from a slightly modified 19 set power unit. A home-built car radio receiver has also been built. G3COY, E.C.O. for **North Staffs.,** keeps in personal contact with members of the group with visits by road, an idea that might well be copied, particularly by those with mobile rigs, as the round of the visits could then be arranged as a useful mobile-to-fixed station exercise. Constructional work on 3.5 and 144 Mc/s equipment continues. G3FEX who is getting an R.A.E.N. group together in the **Steyning, Brighton and Worthing** area of Sussex, recently lectured to **Worthing Radio Club** and demonstrated 144 Mc/s mobile equipment. G3ERB (E.C.O., **Wirral**) reports on a meeting with G3FZW (South Staffs.) at which the need for a group around Crewe became evident from the discussions. G3HIV reports very little success in forming an active group in the **Wolverton,** Bucks., area and appeals for volunteers.

Exercise High Tide

G2ACD, County Controller for the **East Riding** of Yorkshire, reports that groups in his area were asked to stand by during recent floods, in one case for three days in succession.

In co-operation with the Kingston-upon-Hull City Police and East Riding Constabulary, a R.A.E.N. exercise was held on January 23, the object being to prove that lines of communication could, in an emergency, be quickly established to supplement normal services, with or without the use of public electricity supplies. The control stations—G4LH/P (mains operated) and G2ABR/P (battery operated)—were set up at Police Headquarters, Kingston-upon-Hull, with area controls at Beverley, Leven and Bridlington, whilst the County Control station (G2ACD) operated from Hornsea. Other stations taking part were G2CPS, '3DQ, '5GX, '2DPA, '3GWT, '3JHD, '6OS, '6XX, '3ALD, '3JOH, '3JXG, '3CC, '2CNX, '6WJ, '2YS. '2FVW, '3GAW, '6UJ and '2KO.

R.A.E.N. Membership Cards

The R.A.E.N. Committee has decided that membership cards will, in future, be re-issued through E.C.O.s. In areas where there is at present no E.C.O., members are requested to apply to the Hon. Secretary (C. L. Fenton, G3ABB), "Niarbyl," Gay Bowers Road, Gay Bowers, Danbury, Essex, enclosing a stamped addressed envelope.

E.C.O. Appointments

Mr. R. Ferguson (G4VF), 57 Roxwell Road, Chelmsford, Essex, has been appointed Acting E.C.O. in succession to Mr. R. L. Varney (G5RV) who has resigned. Mr. Fenton will act as Deputy E.C.O. for Chelmsford.

R.A.E.N. News Feature

In future, news of the activities of the Radio Amateur Emergency Network will appear in alternate issues of the BULLETIN. Reports intended for use in the April issue should reach the Hon. Secretary not later than March 15.

* * *

G3ABB listens on Top Band from approximately 18.45 to 20.00 G.M.T. most evenings and will answer any calls heard, 'phone or c.w., on 1980 kc/s.

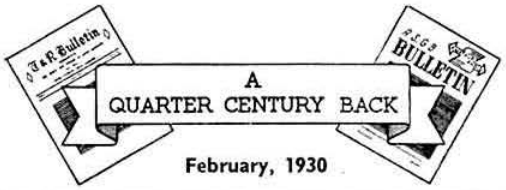
Emergency Calling Frequencies for R.A.E.N.

The following calling frequencies will be used by R.A.E.N. stations in the event of an emergency:

1980 kc/s	14100 kc/s
3600 kc/s	21150 kc/s
7050 kc/s	28200 kc/s

145 Mc/s

These frequencies are published as calling frequencies for use in emergency only. Stations will call CQ QRRR DE G..... and QSY to a mutually agreed frequency immediately after establishing contact. Contacts should not be continued on emergency calling frequencies. All frequencies should be monitored as much as possible.



THE forthcoming 28 Mc/s Tests were the subject for discussion in the Editorial. "One of the chief aims in these tests is an attempt to investigate the conditions prevailing during periods of the day at present regarded as useless for communication on this frequency. Each Sunday probably finds more stations in this country listening and transmitting on 28 Mc/s. Perhaps some of the newcomers during this winter have been lucky in picking a good day for their *debut* on this band; others may have been unlucky. The 28 Mc/s band holds more surprises and disappointments than all the other bands put together. The forthcoming tests are planned in an attempt to probe some of the mysteries of this frequency."

* * *

Writing under the title "Preparing for the 1770 kc/s Tests" J. Hum (G5UM) outlined his views on the type of equipment to use during the April tests. On the receiving side "a conventional 0-V-1 set is most satisfactory but naturally a screened-grid h.f. stage would add materially to the efficiency of the receiver from a DX point of view." On the transmitting side "a valve of high impedance and amplification factor must be obtained for the c.o., suitable types being the DE5B or LS5B. The crystal should be operated on its fundamental frequency, as one with a fundamental of 338 metres gives rather a wide harmonic in the 160 metre band. The best types of (grid h.f.) chokes are the standard broadcast chokes of the 'Polar' people; 'Trix,' 'Lewcos' and 'R.I.' also being very good. Among the best oscillator valves for use with 10 watts on 160 metres may be mentioned the DE5, LS5, CT25X, P625 and P650."

* * *

"Guy Wire" described the station of Alan Smith (G6VP) of Yiewsley, Middlesex. The station "is capable of communication with even the remotest parts of the globe and has a claim to over 4,000 trans-Oceanic contacts" (all on 14 Mc/s). "After much experimenting the aerial finally adopted is an old type voltage-fed Hertz operated below the fundamental and using a single wire feeder. The top span is 70.2 feet suspended between two wooden poles. It is 52 feet high at the free (East) end and 35 feet at the home (West) end. The feeder is tapped about one-third the way along and the point is very critical."

* * *

Other contributors to this issue were E. T. Somerset (G2DT) "Low Tension from Direct Current Mains" and A. M. Houston Fergus (G2ZC) "Monitor as Frequency Meter."

* * *

The U.S. Ambassador to Great Britain (General Dawes) thanked the Society for its offer to arrange for members to continue to maintain a watch for any signals transmitted from the Byrd Antarctic Expedition.

Members were invited to write to Headquarters claiming first contacts with countries abroad. Rules governing the issue of W.B.E. Certificates were published.

* * *

"Television—Photo Telegraphy Experimental Apparatus constructed to drawings. Scanning discs supplied. John Salter (Established 1896). Member R.G.S.G. and Television Society. . . ." (*Small Advertisement.*)

Ham Spirit with a Vengeance!

A VERY despicable robbery was perpetrated early one morning just before Christmas on the tobacconist's premises run by a sightless amateur, Mr. Leslie Knight (G5LK) of Redhill, Surrey. Stock to the value of over £200 was stolen, and as a result Mr. Knight was placed in an almost impossible position, the goods being uninsured.

Several amateurs on hearing the circumstances, decided there was a case for concerted (and individual) action, and accordingly other friends were approached to ascertain how they could help. The response was immediate and magnificent. Within two weeks Leslie Knight had received a sum in excess of £100, with promise of more, and it is probable that by the time this appears in print his loss will have been largely made good.

All members who rallied to his aid showed, without any doubt, that the true "Ham Spirit" is by no means dying out—on the contrary, when the need arises it is as lively as it ever was. Grateful thanks to all concerned.

—G2AIW

Dear Mr. Lambeth,

You will be pleased to know that we have now recovered 75 per cent of our loss and we are very grateful to everyone concerned. We thank you too for all your work in connection with the fund to help us.

Yours sincerely,
Leslie and Gladys Knight

Redhill, Surrey.
January 21, 1955.

"Mobile Radio"

MOBILE RADIO is the title of the official organ of the Mobile Radio Users' Association, Buckingham Court, Buckingham Gate, London, S.W.1. The first issue —dated January, 1955—contains a Foreword by the President of the Association (Sir Robert Renwick, Bart, K.B.E.) in which he reveals that today there are 10,000 radio-equipped vehicles operating throughout Britain; that ten manufacturers make and market mobile equipment; that more than 1,000 firms use mobile equipment.

G. H. Russell, Assoc.Brit.I.R.E., contributes an important article on the subject of frequencies.

The objects of the Mobile Radio Users' Association are to promote the use of mobile radio, to protect the interest of users, to receive justice for users and to represent them in negotiations with the P.M.G.

Full details of the Association and a specimen copy of *Mobile Radio* can be obtained on application to the Secretary at the address quoted above.

Transistor for 440 Mc/s

ACCORDING to a report in *Radio and Television News*, Bell Telephone Laboratories have developed a new transistor capable of operation on 440 Mc/s. In the new transistor, known as an "intrinsic barrier" type, a fourth layer of intrinsically pure germanium has been added to the standard *p-n-p* junction. Theoretically, the device is usable up to 3000 Mc/s.

G3CRB Honoured

IN the New Year Honours List, Mr. H. L. Peddle (G3CRB) of Iver Heath, Bucks, was appointed a Member of the Most Excellent Order of the British Empire (M.B.E.).

Tests and Contests

Second Top Band Contest, 1954

THERE was a small but welcome increase in the number of entries received for the Top Band Contest which took place in November last. It is a pity, however, that many of the stations taking part did not send in their results.

Leading Stations

P. G. Day (G6PD), of Knebworth, Herts. is to be congratulated on taking first place with 173 scoring contacts. He used a v.f.o.-b.a.-p.a. transmitter with an 807 to feed a half wave aerial, and a BC348 receiver. W. T. Pickard (G8KP) of Wakefield, Yorks, and I. T. Cashmore (G3BMY) of Blackheath, Birmingham, took second and third places.

European and DX Signals

Only two extra-European signals were reported. ZC4RX was worked by G3DTG and heard by G5TN and OH2YV. W4ZQ was heard by G5TO.

A fair number of European stations were active, and thanks are due to Emil Hlom (OK1AEH) and V. John Velamo (OH2YV) for sending in logs. They respectively presented 66 and 49 British stations with three points apiece. HB9CM, HB9T, OH7OH, OK2VV and OK3KFF were worked by a number of entrants. Several other OK signals were heard, but most of them seemed to be too busy with a test of their own to worry about G stations.

Equipment

The HRO remains the most popular receiver, followed by the CR100 and the AR88. Only four home-constructed receivers appear in the station descriptions, one of these being a straight 1-v-1. Nearly twice as many transmitters use 807 finals as any other single type. Next in popularity are the 6L6, 6V6 and TT11 in almost equal numbers. Nearly half the aerials used were at least 200ft long. Of the remainder, 65 per cent were 132ft long, and only 12 per cent less than 100ft long.

Comments

A few entrants criticised the length of the contest, and would prefer it to end at 0400 or 0500. Others, including high scorers, expressed the hope that the event would not be shortened. Many enjoy the last couple of hours, and appreciate the efforts of those who get up early on the Sunday mornings to distribute points at high speed.

Criticism is again levelled at operators who send BK instead of call-signs. Confusion is certainly caused when several stations answer a CQ, and the called station replies with "BK de ———"!

In the words of many entrants "another most enjoyable Top Band Contest."

Results: Second Top Band Contest, 1954

Posn.	Call Sign	Points	Posn.	Call Sign	Points
1	G6PD	187	42	G3AZ	97
2	G8KP	174	43	G2KK	96
3	G3BMY	171		G3HIW	96
4	G6BQ	167	45	G3JKO	91
5	G5TN	164	46	G3FCU	90
	G8GF	164	47	G3ILO	89
7	G6HD	154		GM3EHI	89
8	G3DTG	152	49	G3FZC	88
	G3IAS	152	50	GM6IZ	86
*	G3HVX	152	51	G3JWB	84
10	G3IGW	147	52	G3FVW	82
11	G3IEW	145		G3HII	82
12	G3ERN	144	54	G3IZM	81
13	G3IVH	140	55	G2HCZ	79
14	G3IAF	138	56	G2JB	78
15	G3DYQ	137	57	G2JF	77
16	G3GZB	134		G3DIR	77
17	GM6RI	133	59	G2ZR	75
18	G3ELZ	131	60	GM3ALZ	73
	G3HOI	131		G3IPL	73
20	G5TO	128	62	G3GDW	72
21	G3JEQ	127	63	G2HDZ	71
22	G3AID	126	64	GM3IGY	69
23	G3ITH	121	65	G3GJX	68
24	G4DH	119		G3JBK	68
25	G5MR	117	67	G3FFH	65
26	G3HQQ	116	68	G3IRL	63
	G6VC	116	†	G2AOL	63
28	G3JII	115	69	G3IXA	61
29	G3IRU	112	70	G3GOX	60
30	G3HTI	111	71	G3BHT	59
31	G3IOR	110		G3GFD	59
32	G3JML	109	73	G3HDQ	58
33	G2MJ	108	†	G2AKK	58
	G2QT	108	74	G3JJG	57
35	G3BKE	107	75	G3BGP	54
36	G3JSK	105	76	G3FAS	49
37	G3DGN	102	‡	G3HKO	35
	G3GFG	102	77	G8KU	27
39	G4CM	101			
40	G3HQX	98			
	G3IWC	98			

* *Entry Invalid—No station details.* † *Entry Invalid—Late entry.*
‡ *Entry Invalid—No reports.*

Check logs

Thanks for check logs are due to: G2IM, '2ZZ, '2FTK, '2HDU, '3SB, '3ESP, '3ISA, '6CJ, '6QM, GI3IVJ, GM3EFS, OH2YV and OK1AEH.

European V.H.F. Contest, 1954

FROM HB9LE, who is V.H.F. Contests Manager for U.S.K.A., we learn that the winner of the 1954 European V.H.F. Contest, which took place on August 28-29, was Paul Erdmann (F3EM/P) who scored 890 points. Ten British stations competed, their scores being as follows: G5KW/P, 339; G5YV, 309; G6LI, 212; G5MR, 197; G3CGQ, 129; G5CP, 36; G4LX/P, 36; G2DHV, 18; GM3EGW, 158; GM3BDA, 114. EI2W, the only Irish entrant, scored 382 points.

Conditions during the event were poor throughout Europe, the best DX being a 'phone contact between G5KW/P and DL3VJ over a distance of 620 km (387 miles). In all, G5KW/P worked 18 continentals on 'phone using his 12 watt mobile transmitter-receiver from a fixed site.

From HB9LE's report it appears that some competitors made a mistake over the time; G5YV suffered the loss of more than 200 points as a result of this mistake.

F8GH, who scored 562 points, was the leading fixed station.

A.R.R.L. DX Contest, 1955

WITH the exception of one small modification, the rules for this popular event are the same as last year. In order to encourage overseas amateurs to work as many States and Canadian Provinces as possible, U.S. and Canadian amateurs will send the RS or RST report followed by the name of their State or Province (for example, W1AW will send 579CONN.). All other competitors will send the RS or RST report followed by an indication of their power.

The first part of the Phone Section of the Contest took place on February 12-13. The second part will take place during the period March 12-13. The Telegraphy Section will take place during the weekends of February 26-27 and March 26-27. Each section of the contest will begin at 0001 G.M.T. on the first date mentioned and will end 48 hours later.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Thursday, December 16, 1954, at 6 p.m.

Present.—The President (Mr. A. O. Milne in the Chair), Messrs. H. A. Bartlett, L. Cooper, C. H. L. Edwards, R. H. Hammans, F. Hicks-Arnold, J. H. Hum, L. E. Newnham, R. L. Varney and John Clarricoats (General Secretary).

Apologies.—Apologies for absence were submitted on behalf of Messrs. I. D. Auchterlonie, D. A. Findlay and A. C. Gee.

* * *

Membership

Resolved (a) to elect 65 Corporate Members and 6 Associates; (b) to grant Corporate Membership to 24 Associates who had applied for transfer, including 5 whose original application for membership had not been proposed by a Corporate Member or supported by references.

The Secretary reported that of the 887 members whose subscription became due on September 1, 1954, 144 became overdue on November 30, 1954.

The Secretary submitted details of the reasons given by the 31 members who had written to resign during the four weeks ended December 11, 1954. Only 6 had resigned on financial grounds. Of the remainder 11 had lost interest, 7 gave no reason and 7 gave miscellaneous reasons.

Blind Members

The Secretary submitted a letter from a C.R. in which he asked whether it was the intention of the Council to waive the subscription of all blind members.

Resolved to inform the C.R. in question that any application for a subscription to be waived should come from the blind member concerned or from someone acting for him.

The Secretary was instructed to explain to the C.R. concerned that the Council knows that certain blind members would not wish the Council to waive their subscription.

R.S.G.B. Bulletin—New Contract

Resolved to accept an estimate submitted by The Haycock Press, Ltd., for printing the R.S.G.B. BULLETIN as from the February, 1955, issue.

R.S.G.B. Bulletin—December, 1954, issue

The Secretary reported that publication of the December issue had been seriously delayed. Headquarters staff had taken every possible step to ensure that the issue appeared to time but due to circumstances entirely outside their control their efforts had not been successful.

Maitland Trophy

Resolved to accept and adopt the Rules for the Maitland Trophy.

Bristol Trophy

It was reported that the Bristol Group desired to mark the occasion of having won National Field Day for the third year running by donating to the Society a special trophy to be known as the Bristol Trophy.

Resolved (a) to accept the offer made by the Bristol Group; (b) to accept and adopt the Rules for the Bristol Trophy.

Thanet Radio Society

Resolved to authorise the General Secretary to accept the invitation extended to him and to Mrs. Clarricoats to attend the annual Dinner-Dance of the Thanet Radio Society, on March 5, 1955.

Affiliated Societies and National Field Day

A letter was submitted from the Worthing and District Amateur Radio Club in which it was suggested that either affiliated societies should be permitted to participate in National Field Day or a special National Field Day event should be organised for them.

It was agreed to refer the letter to the Contests Committee for their views, at the same time intimating to the Committee that the Council looks favourably on the suggestion to allow affiliated societies to take part in National Field Day.

B.E.R.U. Receiving Contests

After considering a letter from a B.E.R.S. member concerning the decision of the Contests Committee to discontinue the B.E.R.U. Receiving Contest it was

Resolved to request the Contests Committee to clarify the rules for B.E.R.U. Receiving Contests with a view to reviving the Contest in 1956.

Bristol Convention Account

After careful consideration of the Bristol Convention Account it was *Resolved* to transfer the undermentioned items of expenditure to other Accounts.

Item	*Amount*	*Transferred to*
Printing Blocks ...	3 11 5	BULLETIN
Photographs ...	6 0 0	Sundries
Entertaining Special Guests	17 7 6	General Entertainment
Films	24 0 0	Sundries
Printing Application Forms and Stickers	30 5 4	BULLETIN
Travelling and Entertainment ...	75 0 0	Council Members' Travelling and Entertainment
	102 18 7	General Travelling and Entertainment

It was reported that the Excess of Income over Expenditure after making the above transfers would be £5 19s. 10d.

Amateur Radio Exhibition—1954

It was reported that the paid attendance was 2,510 compared with 2,746 in 1953 and 2,707 in 1952. A total of £284 12s. 9d. was taken on the R.S.G.B. stand including £99 17s. 6d. from the sale of the new edition of the *Call Book*. A big disappointment was the almost negligible interest shown in the new R.A.E.N. Message Pads.

Resolved to write a letter of thanks, over the President's signature, to those members who had performed outstanding service to the Society whilst assisting at the Amateur Radio Exhibition.

QSL Bureau

Resolved to award honoraria amounting in total to £70 7s. to 13 QSL Sub-Managers in recognition of their outstanding service to the Society during the past year.

Call Book Editor

Resolved to award an honorarium in the sum of £5 5s. to Mr. and Mrs. J. P. P. Tyndall in recognition of their services to the Society during the past year in connection with the *R.S.G.B. Amateur Radio Call Book.*

False S.O.S.

It was reported that a member had drawn attention to a paragraph published in the *Daily Mirror* dated December 3, 1954, in which the Commander-in-Chief, Home Fleet, was alleged to have stated that an amateur wireless operator may have been responsible for sending a false S.O.S., the effect of which was to cause ships of the Home Fleet to steam off-course for 24 hours at a cost to the country in fuel alone of more than £300.

The President read to the meeting a copy of the letter which he had drafted and which was sent to the Commander-in-Chief over the Secretary's signature. The letter protested against the suggestion that an amateur was responsible for the false distress call. No reply had yet been received.

Ballot Papers

The Secretary reported that a member of Council had written to enquire why no advice was given to members regarding the signing of Ballot Papers.

The Secretary informed the Council that he had advised the member in question that (i) the draft of the Council Ballot Paper was approved by the President and seen by Messrs. Findlay and Cooper; (ii) the new Articles of Association do not require the Ballot to be secret; (iii) the Articles do not state that a Ballot Paper shall be rejected if it is sent in in two sections; (iv) the wording of the Ballot Paper was submitted to and approved by the Society's legal advisers; (v) the Council at its October meeting resolved to leave the final arrangements for the Ballot in the hands of the President and Secretary; (vi) no member had written or spoken to the President or himself in criticism of the Ballot Paper. The Secretary stated that only eight members out of some 1,400 who voted had sent in their Ballot Paper in two sections.

Call Book

It was reported that several members had complained that their new address was not recorded in the 1954 Edition of the *Call Book.*

The Secretary explained that there had been some misunderstanding in the office in dealing with changes of address. The staff had assumed that as Mr. Tyndall is now permitted to see the Post Office Call Sign Record (which had hitherto been regarded as a confidential document) he had automatically taken note of all changes of address. In actual fact a great many members had notified Mr. Tyndall direct of their new addresses. The Secretary stated that as from July, 1955, Mr. Tyndall would be free to make full use of the Post Office Call Sign Record, except where a licensee had specifically requested that no publicity be given to his name, address and call sign. Until that time arrives Headquarters would provide Mr. Tyndall with a copy of the monthly list of changes of address, etc., which is at present sent to the R.R.s.

Presentation to Miss May Gadsden

Resolved that a present of £25 be made to Miss May Gadsden in recognition of her loyal and devoted service to the Society over a period of 25 years.

The President, on behalf of his colleagues, thanked Miss Gadsden for her past services to the Society and informed her of the decision of the Council. Miss Gadsden thanked the President and Council for their kindness.

Reports of Committees

R.A.E.N.

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the R.A.E.N. Committee which met on November 6, 1954, and to accept and adopt the recommendations contained therein. (The recommendations concerned a proposal to arrange a meeting in Birmingham to discuss R.A.E.N. and other matters of mutual interest.)

Finance and Staff

Resolved to receive, and adopt as a Report, the Minutes of a Meeting of the Finance and Staff Committee which met on November 18, 1954, and to accept the recommendation contained therein. (The recommendation dealt with the placing of a contract with The Haycock Press, Ltd., for printing the R.S.G.B. BULLETIN.)

Contests

The Secretary submitted as a Report the Minutes of Meetings of the Contests Committee held on October 13 (adjourned until October 20) and November 11, 1954.

Resolved (a) to accept a recommendation of the committee relating to Commonwealth and Colonial Call Areas as they apply to R.S.G.B. Certificates; (b) not to accept a recommendation of the Committee to the effect that " Letters to the Editor " relating to Contests should first be submitted to the Contests Committee for their comments so that a reply can be published in the same issue. It was agreed to place on record that the responsibility for publishing " Letters to the Editor " rests with the Editor who, as a matter of policy, would refer any contentious matter either to the President or to the Council.

Resolved to accept a recommendation to the effect that the 420 Mc/s Tests should be discontinued.

Exhibition (Home Constructors' Section)

Resolved to receive, and adopt as Reports, the Minutes of Meetings of the Exhibition (Home Constructors' Section) Committee which met on November 8 and 17, 1954. The Reports contained no recommendations.

The Secretary submitted a Report which had been received from the Chairman of the Committee dealing with the recently held Amateur Radio Exhibition.

Resolved to accept the Report and to place on record the thanks of the Council to Mr. Edwards for his outstanding services to the Society as Chairman of the Exhibition (Home Constructors' Section) Committee.

Cash Account

Resolved to accept and adopt the Cash Account for the month ended November 30, 1954, as prepared and submitted by the General Secretary.

Other Business

Mr. Newnham (a retiring member of the Council) thanked the President and his colleagues for the help and guidance which he had received from them during the two years he had served on the Governing Body.

The President thanked Mr. Newnham for his remarks and expressed his personal regret that he (Mr. Newnham) had lost his seat on the Council. Mr. Milne then paid a warm tribute to the Council and members of Headquarters' staff for their loyal and devoted services during the year. Mr. Milne expressed the hope that Mr. Bartlett would enjoy a successful year of office as President. Mr. Bartlett thanked Mr. Milne in suitable terms for his good wishes.

The Meeting terminated at 9.20 *p.m.*

Forthcoming Events

REGION 1

Blackpool (B. & F.A.R.S.).—February 22, 7.30 p.m., 33 Clarence Avenue, Blackpool.
Bury.—March 10, 7.30 p.m., 52 The Drive, Seedfield, Bury.
Chester (C. & D.A.R.S.).—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Isle of Man (I.O.M.A.R.S.).—February 16, March 2, 16, Manor Guest House, Victoria Road, Douglas.
Lancaster (L. & D.A.R.S.).—March 2, 7.30 p.m., George Hotel, Torrisholme.
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., St. Barnabas Hall, Penny Lane, Liverpool, 15. **(M.R.S.).**—February 23, March 9, 23, 8 p.m., Larkhill Mansion House, Queens Drive, Liverpool, 13.
Manchester (M. & D.R.S.).—March 7, 7.30 p.m. Brunswick Hotel, Piccadilly, Manchester.
Preston.—February 25, March 11, 25, 7.45 p.m., St. Saviour's Parish Hall, Manchester Road, Preston.
Rochdale (R.R.T.S.).—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester (S.M.R.C.).—Fridays, 7.45 p.m., Ladybarn House, Mauldeth Road, Manchester, 14.
Southport.—Thursdays, 8 p.m., Y.M.C.A., off Eastbank Street, Southport.
Stockport (S.R.S.).—February 16, March 2, 16, 8 p.m., The Blossoms Hotel, Buxton Road, Stockport.
Warrington (W. & D.A.R.S.).—February 17, March 3, 17, 7.30 p.m., Kings Head Hotel, Winwick Street, Warrington.
Wirral (W.A.R.S.).—February 16, March 2, 16, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—February 25, March 11, 7.30 p.m., "King George Hotel," Peel Street.
Bradford.—February 22, March 8, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Catterick.—Wednesdays, 7 p.m., Loos Lines, Catterick Camp.
Darlington.—Thursdays, 7.30 p.m., 129 Woodlands Road.
Doncaster.—March 9, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics Institute, 7 Whitehall Road.
Hull.—February 22, March 8, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., Swarthmore Educational Centre, Woodhouse Square.
Middlesbrough.—Thursdays, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Pontefract.—February 17, March 3, 8 p.m., "Fox Inn," Knottingley Road.
Rotherham.—Wednesdays, 7 p.m., "Cutler's Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—February 23, 8 p.m., "Dog and Partridge," Trippet Lane. March 16, 8 p.m., Albreda Works, Lydgate Lane.
Spenborough.—February 22, March 9 (A.G.M.), 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Wednesdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—March 7, 7.30 p.m., Friends Hall, Watford Road, Cotteridge. **(M.A.R.S.).**—February 15, 6.45 p.m., Midland Institute. **(Slade).**—February 18, March 4, 7.45 p.m., Church House, High Street, Erdington.
Coventry.—February 25, 7.30 p.m., Priory High School, Wheatley Street. **(C.A.R.S.).**—February 28, March 3, 7.30 p.m., 9 Queens Road.
Kenilworth, Warwick and Leamington.—February 17, 7.30 p.m., Dalehouse Lane.
Malvern.—March 7, 8 p.m., Foley Arms.
Redditch.—February 22, 8 p.m., Scale and Compasses, Birchfield Road. March 10, 8 p.m. 10 Woodland Road.
Rugby.—March 3, 7.30 p.m., B.T.H. Recreation Club, Hillmorton Road.
Solihull.—February 18, March 4, 7.30 p.m., Royal Oak Hotel, Solihull.
Stoke.—February 23, 8 p.m., Lions Head, John Street, Hanley.
Stourbridge.—March 8, 8 p.m., King Edward VI School.
Walsall.—February 23, March 9, 8 p.m., Technical College, Bradford Place.
Wolverhampton.—February 28, 8 p.m., Stockwell End, Tettenhall.
Wrekin.—March 7, 8 p.m. (for details please contact G. Myatt, 12 Swan Street, Broseley).

REGION 4

Alvaston.—Tuesdays, Thursdays, 7.30 p.m., Sundays, 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, nr. Derby.
Chesterfield.—Tuesdays, 7.30 p.m., Bradbury Hall, Chatsworth Road.
Derby (D. & D.A.R.S.).—Wednesdays, 7.30 p.m., Derby College Arts and Crafts Sub-basement, Green Lane. February 18, 7 p.m., Annual Dinner and Social, Iron Gates Grill.
Ilkeston (I. & D.A.R.S.).—Thursdays, 7 p.m., Ilkeston College of Further Education, Field Road.
Leicester (L.R.S.).—February 21, March 7, 7.30 p.m., Holly Bush Hotel, Belgrave Gate.
Lincoln (L.S.W.C.).—March 2, 7.30 p.m., Technical College, Cathedral Street.
Newark.—March 6, 7 p.m., Northern Hotel, Appleton Gate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., March 4, 6 p.m. Clubroom, 8 Duke Street.
Nottingham.—February 18, March 18, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—March 2, 7.30 p.m., 21 Hankey Street.
Retford.—March 7, 7 p.m., Sun Inn, Cannon Square.

REGION 5

Chelmsford.—March 1, 7.30 p.m., Marconi College, Arbour Lane.
Lowestoft and Beccles (L. & B.A.R.C.).—February 23, March 9, 7.30 p.m., Y.M.C.A., Lowestoft.

REGION 6

Cheltenham.—March 3, 8 p.m., Great Western Hotel, Clarence Street.
Gloucester (G.R.C.).—Thursdays, 7.30 p.m., "The Cedars," 83 Hucclecote Road, Gloucester.
High Wycombe.—February 22, 7.30 p.m., G5WW, "Nethercote," Totteridge Lane, High Wycombe.
Oxford (O. & D.A.R.S.).—February 23, March 10, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth (P. & D.R.S.).—Tuesdays, 7.30 p.m., British Legion Club, Queen's Crescent, Southsea (Clubroom open every evening).
Southampton.—March 5, 7 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford and Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 Chiswick High Road, W.4.
Barnes, Putney and Richmond.—March 4, 337 Upper Richmond Road, S.W.14.
Bexleyheath.—February 24, March 10, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—March 4, 8 p.m., Shortlands Hotel, Station Road, Shortlands, Kent.
Chingford.—February 25, March 11, 8 p.m., Venue from G4GA (SIL 5635) or B.R.S.19765 (SIL 6055).
Chislehurst and Sidcup.—March 9, "Seven Stars," High Street, Footscray.
Croydon.—March 8, 7.30 p.m., Blacksmiths Arms, 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road.
East Ham.—Tuesdays, 8 p.m., 12 Leigh Road.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
East London.—March 20, 2.30 p.m., Town Hall, Ilford.
Enfield.—February 20, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—February 15, March 15, 7.30 p.m., 16 Albion Road, Stoke Newington, N.16.
Guildford and Woking.—February 27, 3 p.m., Royal Arms Hotel, North Street, Guildford.
Hendon and Edgware.—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill.
Hoddesdon.—March 3, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—Mondays and Fridays, 7 p.m., Grafton School, Eburne Road, London, N.7.
Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road.
Kingston (K. & D.R.S.).—Alternate Wednesdays, 7.45 p.m., Penrhyn House, Penrhyn Road.
Lewisham (R.A.R.C.).—Wednesdays, 8 p.m., Durham Hill School, Downham.
London (L.M.L.C.).—February 18, March 18, 12.30 p.m., Bedford Corner Hotel, Bayley Street, off Tottenham Court Road, W.C.1.
London (R.S.G.B.).—February 25, 6.30 p.m., I.E.E., Savoy Place, Victoria Embankment, W.C.2. ("Radio Astronomy and the radio amateur": Dr. R. C. Jennison, Jodrell Bank Experimental Station).
London (U.H.F. Group).—March 3, 7.30 p.m., Bedford Corner Hotel, Bayley Street, off Tottenham Court Road, W.C.1.
Norwood.—February 19, March 19, Windermere House, Weston Street, Crystal Palace.
Southgate and Finchley.—March 10, 7.30 p.m., Arnos School, Wilmer Way.
Slough.—March 1, Venue from G2HOX or G3BTP, 13 Quaves Road, Slough.
Sutton and Cheam (S. & C.R.S.).—February 15, March 15, "The Harrow," Cheam Village.
Welwyn Garden City.—March 1, 8 p.m. (Constructors' Exhibition for Harrison Trophy: judging by G2AIW, R.R.), Council Offices, Welwyn Garden City, Herts.

REGION 8

Brighton (B.D.R.C.).—Tuesday, 7.30 p.m., Eagle Arms, Gloucester Road.
Chatham (M.A.R.T.S.).—February 28, March 14, 28, 7.30 p.m., Services Rendered Club, 14 High Street, Brompton, Chatham.
Hastings (H. & D.R.C.).—March 1, 15, 29, 7.30 p.m., Saxons Café, Denmark Place.

(Continued on page 408)

Regional & Club News

BARNSLEY & DISTRICT AMATEUR RADIO CLUB.—The Annual Dinner at the King George Hotel was attended by a large number of members and their friends. At the lecture on February 25 at the same hotel, J. Noble (G3JZJ) will give a talk on Tape Recording. Further details of the club's meetings may be obtained from the *Hon. Secretary:* P. Carbutt (G2AFV), 33 Woodstock Road, Barnsley.

BRISTOL.—At the January meeting, A. H. Radford (G6YA) demonstrated recent developments in Sound Reproduction by playing a number of modern high fidelity disc and tape recordings and a stereophonic recording on twin-channel tape. The film of the 1954 Convention was also shown. Those elected to the Committee for 1955 are: G. W. Allen (G3IUO), C. N. Chapman (B.R.S.20047), W. J. Dear (B.R.S.19985), G. V. Farrance (BR.S.20255), B. J. Gainard (B.R.S.19881), R. G. Lane (G2BYA), R. M. Sharp (G3GON), and F. J. W. Walters (B.R.S.9864) together with the C. R., R. T. Poeton (G3CTN), the T. R., F. H. Chambers (G2FYT), the Hon. Secretary, D. F. Davies (G3RQ) and the R.A.E.N, E.C.O., S. T. Crowther (G3JMP).

COVENTRY AMATEUR RADIO SOCIETY.—The Society's Annual Dinner will be held at the Barras House Hotel on February 25. Meetings are arranged for February 28 (Lecture), March 3 (" Night on the Air "), and 14 (" Radio Aids to Navigation," G3RF).

LEICESTER RADIO SOCIETY.—Meetings will be held in the Club Room at the Holly Bush Hotel, Belgrave Gate, at 7.30 p.m. on February 28 (" Grid Dip Oscillator," G3DVP), March 14 (Discussion by local R.S.G.B. members of plans for N.F.D.), March 28 (" Radio Frequency Heating "). The Transistor Group is experimenting with magnetic bias to extend the frequency range of transistor equipment and a 28 Mc/s transmitter has already been built. *Hon. Secretary:* W. N. Wibberley, 21 Pauline Avenue, Belgrave, Leicester.

MEDWAY AMATEUR RECEIVING AND TRANSMITTING SOCIETY.—The lecturer at the meeting on March 14 will be Mr. Whitenstall, A.M.Brit.I.R.E., Grad.I.E.E., M.S.R.E. (Multibroadcasts, Ltd., Chatham). There will be a colour film show, arranged by the South Eastern Electricity Board, on March 28. *Hon Secretary:* D. Brett, 14 Connaught Road, Chatham.

NORTH KENT RADIO SOCIETY.—At the A.G.M. the following officers were elected: *President:* L. Clinch; *Chairman:* H. Duthie (G3JBK); *Hon. Secretary:* A. Wills (G3KCN), 42 Anne of Cleves Road, Dartford. A visit to a local railway signal box proved most interesting.

NORTH WEST KENT AMATEUR RADIO SOCIETY.—Those who attended the January meeting were well rewarded by Reg. Hamman's (G2IG) talk on matching aerials. His system is a masterpiece of simplicity and ingenuity.

SHEFFIELD AMATEUR RADIO CLUB.—At the recent Annual Dinner, held at the Arcade Restaurant, John Bell was presented with the Hallam Trophy (a model rotary beam) for the best home-built equipment shown at the club's annual exhibition.

SLADE RADIO SOCIETY.—At the A.G.M., W. E. Chilvers was re-elected *President;* others elected included G. C. Simmonds, *Chairman;* L. A. Griffiths, *Vice-Chairman;* and A. S. Page, *Hon. Treasurer.* On February 18, R. Rew (G3HAZ) will lecture on " Equipment for 70 cm." Members' apparatus will be displayed on March 4. The club station at Church House, High Street, Erdington, is now complete and is open every day of the week. Meetings commence at 7.45 p.m. *Hon. Secretary:* C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.

SOUTHEND & DISTRICT RADIO SOCIETY.—Recent events have included the A.G.M. at which the Society's progress in its 35th year was noted; a demonstration of a high grade 12 valve receiver by C. L. Burnard of the Ekco Research Department, and a visit to Barking Power Station. *Hon. Secretary:* J. H. Barrance, M.B.E. (G3BUJ), 49 Swanage Road, Southend-on-Sea.

TORBAY AMATEUR RADIO SOCIETY.—At the January meeting —which was attended by the Torbay Society's President, old-timer Walter Sydenham, G5SY—G2CWR gave a very interesting talk on " Communications in the Middle East during the war." On February 19, at 7.30 p.m., in the Y.M.C.A., Torquay, the speaker will be John Hawke (G3FUT) and his subject " Audio Amplifiers." *Hon, Secretary:* L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

Representation

THE following is an amendment to the list of Regional Representatives published in the December, 1953, issue:—

Region 12

B. McK. Davidson (GM3ALZ), 42 Smithfield Drive, Aberdeen.

Result of Ballot:—B. McK. Davidson, 10 votes, G. Jamieson, 6 votes.

* * *

THE following are additions to the list of County (or District) Representatives published in the December, 1954, issue:—

Region 1—Lancashire West.

F. H. P. Cawson (G2ART), 113 Waterloo Road, Southport.

Region 3—Shropshire

G. Myatt (G3FRM), 12 Swan Street, Broseley.

Herefordshire

P. Buchan (G3INR), 123 Hinton Road, Hereford.

Region 7—London South

W. D. Gilmour (G2VB), 35 Grangecliffe Gardens, S.E.25.

Region 13—Berwick, Selkirk, Roxburgh and Peebles.

J. Forrester (GM3IPU), 14 Spylaw Park, Kelso, Roxburghshire.

* * *

THE following are additions or amendments to the list of Town Representatives published in the December, 1953, issue:—

Region 7—London South-East.

Bexley Area. Lieut. H. E. Duthie, R.N.V.R. (G3JBK), Whitehill Cottage, Fairway, Bexleyheath, Kent.

Region 14—Stirlingshire

Falkirk

A. Rennie (GM3HQN), 20 Gibsongray Street.

Channel Islands

Jersey

E. Banks (GC2CNC), 1 La Mabonnerie, States Experimental Farm, Trinity.

* * *

Vacancies

Messrs. D. W. Robinson (G3FMT) and W. Gilmour (GM3FPX) have resigned as representatives for the towns of Barnes, Putney and Richmond, and Glasgow respectively.

Messrs. R. A. Parsonson (G3IZY) and S. A. Howell (GW5FN) have resigned as representatives for the towns of Danbury and Cardiff respectively.

Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by not later than March 31, 1955.

Forthcoming Events (Contd. from page 407)

REGION 8 (continued)

Isle of Thanet (I.o.T.R.S.).—Fridays, 7.30 p.m., Hilderstone House, Broadstairs.

Maidstone (M.K.A.R.S.).—Tuesdays, 7.30 p.m., Elms School, London Road.

Worthing (W. & D.R.C.).—March 14, 7.30 p.m., Adult Education Centre, Hawley Street.

REGION 9

Bristol.—February 18, March 18, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol.

Exeter.—March 4, 7 p.m., Y.M.C.A., St. David's Hill.

Falmouth (W.C.R.C.).—February 17, March 3, 17, " The Fifteen Balls," Penryn.

North Devon.—March 3, G2FKO, 38 Clovelly Road, Bideford.

Plymouth.—February 19, March 19, 7 p.m., Tothill Community Centre, Tothill Park, Knighton Road, St. Jude's.

Torquay.—February 19, March 19, 7.30 p.m., Y.M.C.A., Castle Road.

Weston-super-Mare.—March 1, 7.30 p.m., Y.M.C.A.

Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—March 14, 7.30 p.m., " The British Volunteer," The Hayes, Cardiff.

Neath and Port Talbot.—March 9, 7.30 p.m., Royal Dock Hotel, Briton Ferry.

REGION 13

Dunfermline (D.R.S.).—Thursdays, 7.30 p.m., behind 34 Viewfield Terrace.

REGION 14

Falkirk.—February 25, March 11, 7.30 p.m., Temperance Cafe, High Street, Falkirk.

Glasgow.—February 25, 7 p.m., Christian Institute, 70 Bothwell Street, Glasgow C.2. (" Electronics in Research," by J. Sey, GM8MJ).

Letters to the Editor

Radio Amateur Emergency Network

An Appeal to the Inland Areas

DEAR SIR,—Those of us closely engaged in the organisation of R.A.E.N. may perhaps be forgiven for being a little discouraged at times by the lack of enthusiasm shown by radio amateurs in some of the "inland areas."

Maybe it is because they are remote from raging seas, and thus lacking the sense of urgency, that prompts them to make such remarks as "Oh, it's alright for you chaps on the coast but I fail to see what we, inland, can do," or "I'm not going to bother just now—I'll be there if I'm wanted."

I can only say that in my view every willing hand is wanted *now*. As was proved two years ago during the disastrous East Coast floods, it is the first few vital hours that count.

In times of disaster those living inland may well picture people on the coast standing at the end of a pier or at the edge of a cliff, watching ships fighting their way to port or, if radio amateurs, sitting in the shack taking down SOS messages as fast as they can write. Be that as it may, there are other urgent, essential, if less heroic, jobs to be done. When the sea came over in 1953 thousands were made homeless in a matter of seconds—stranded in their night attire, wet through and shivering, in a snow storm with the temperature below freezing. Telephone wires were down and there was no R.A.E.N. in existence. The help needed then was from *inland* and gravely urgent.

The first need was for food, clothing, bedding, accommodation and medical aid—the sea wall had to wait. Messages had to be sent by *road* to the nearest telephone thus overloading existing means of communication. Delays were inevitable and caused much hardship and suffering.

I went to a town in Essex and one of my first jobs was to try to get in touch with inland relatives of the homeless and ask them if they would take them in. I often had to wait hours, sometimes days, for confirmation, because the towns with which I had to communicate were widely scattered over the whole country. What a fine job R.A.E.N. *could* have done, for this was going on up and down the coast from Yorkshire to Kent.

To perform a task, worthy of the traditions of Amateur Radio, R.A.E.N. *must* provide nation-wide coverage with no holes in the net. I therefore appeal to all radio amateurs—particularly those living inland—to join R.A.E.N. and give a hand.

Yours faithfully,

A. C. DUNN (G2ACD),
Lt.-Col. (Retd.), County Controller for the East Riding of Yorkshire, R.A.E.N.

Hornsea, Yorks.

R.A.E.N. Procedure and Some War-time Recollections

DEAR SIR,—While in no way wishing to enter into the controversy regarding R.A.E.N. procedure, I feel I must comment on one point in Mr. Yeend's letter in the December BULLETIN, Mr. Yeend says that "the majority of service links used QRO transmitters on reasonably clear channels."

My own wartime experience does not confirm this opinion. I spent most of the war being responsible for the operation of a number of low-powered No. 19 Sets (input about 10 watts) in mobile communications. The channels were far from clear. In one battle, for instance, my Command Group on 'phone shared the frequency with an R.A.F. Group, a German Group and an Italian Group, all on 'phone, as well as several Groups on c.w.

Later in the war, as troop concentrations grew greater, the QRM became more intense. I remember at one time calculating that on the basis of the available channels, more than three Groups would have to share each frequency, and this did not, of course, include the broadcasting stations, the press radio links, or the very large number of enemy communications also using those frequencies. In fact, I have the most vivid recollections of QRM being our major difficulty with the low-powered mobile communications with which I spent most of the war.

The QRM at a weekend on the 14 Mc/s band is very reminiscent of that experienced on the frequencies which I had to use during the war. At least in amateur communications the 'phone and c.w. stations are more or less kept apart in the band. This was, of course, not the case during the war.

Yours faithfully,

E. M. WAGNER (G3BID).

Two Metre Open Contest

DEAR SIR,—In the December, 1954, issue of the BULLETIN, there was a letter from Mr. A. W. W. Timme, Hon. Secretary of the Contests Committee, giving information which, had it been known by two previous correspondents, would have removed the necessity for their letters, for the most part.

However, it is good that these letters should appear in public for they must be of value to a great number of members, but of course it would have been better if query and answer had appeared in juxtaposition.

Immediately following Mr. Timme's letter is one from Mr. H. W. Parker (G2ADZ), and as this cannot follow immediately it would be an advantage to the reader if he would refer to the December BULLETIN for the points raised.

1. Mr. Parker is correct, not only for two metres but for every other contest as well. Even D/F contests have an element of luck where otherwise success depends firstly upon the man and secondly upon his equipment. The latter must, because of its portability, reduce the differential found in other contests where location, aerials and power are important considerations.

2. This is generally true, unfortunately due to very common human characteristics. It appears to reduce contests from the position of genuine sport to that of common business, where you don't buy unless you can sell at a profit. The write-up is also necessary: many are interested in results and conditions, seeing their score position and those of others whilst it also advertises the events and is news to non-competitors—as a parallel there are the sports pages in the daily newspapers and the football crowds.

No contest can be completely fair to all contestants—the D/F event is the nearest, in my opinion, to the ideal.

3. The Contest Committee is fully appreciative of the advantages of the points mentioned and due to my own knowledge on the same subject, no-one was more surprised than I to work Mr. Parker from my QTH—he's probably forgotten that QSO. And his last point here—it only needs one fixed station with 150 watts, excellent aerials and high a.s.l. location in an open contest to put Mr. Parker's evidence against him on points 1, 3, 4 and 5.

4. /P stations were encouraged to enter in an "open" contest because the fixed entries were getting less; it is *essential* to have as large a number participating as possible in any contest to produce as great a difference in scores as possible. This facilitates judging, obviously.

Mathematically, the fewer the entrants the nearer to a draw must be the result.

Contests Committee members cannot have either certificates or cups, so should we feel discouraged over contests?

5. If by chance several fixed stations happened to have high a.s.l. locations and everything else—and this might happen as we can never know when arranging a contest who might enter—and were allowed to enter into portable contests—Mr. Parker this time being a /P contestant could have written his letter just the same, but "on the other foot."

It will be news that Mr. Allen (G2UJ) was invited to the 1954 Committee to discuss with us the v.h.f. contests, and did, expressing his satisfaction with the arrangements.

It will also be news that at least three other members of the Committee have been on 2m and may still be. Also that Mr. Newton (G2FKZ) and Mr. Hobbs (G3JQN) came to one of our meetings to discuss 420 Mc/s and expressed their satisfaction with the arrangements for that band.

As far as I am aware, two members of the Contests Committee have been on that band too!

I hope that you will continue to publish correspondence of this nature as it will tend to better the understanding of contests and contestants.

Yours faithfully,

W. H. MATHEWS (G2CD).
Chairman, 1954 Contests Committee.

Seven Kings, Essex.

Lundy Island

DEAR SIR,—Recent news items concerning the unusual status of Lundy Island in the Bristol Channel have raised some amusing ideas as to its position in the world of Amateur Radio.

As I understand it, Lundy Island has its own ruler and currency, there being no British Civil Service influence, no Income Tax and no custom duties. I assume therefore that the G.P.O. has no jurisdiction, in which case it can surely claim its own amateur prefix, at the very least GL.

This opens up the glorious prospect of a DX-pedition fully supported by the Royal Navy (viz., "Clipperton Island," *QST*, July, 1954) with Bristol Group landing gear under D Day conditions!

What a vision—a "rare one" right on our own doorstep!

Yours faithfully,

ANTHONY COCKLE (G3IEE).

Kingston-on-Thames.

Affiliated Societies

THE following is an addition to the list of Affiliated Societies published in the August, 1954, issue of the BULLETIN:

COMPTON BASSETT AMATEUR RADIO CLUB (G3HXZ), c/o Sgt.'s Mess, R.A.F. Station Compton Bassett, near Calne, Wilts.

New Members

Corporate Members, Home (Licensed)

G2JR †H. B. BURTON, 149 Longfellow Road, Stoke, Coventry.
G2BSQ †R. ANDREWS, 93 Wolsey Drive, Kingston-upon-Thames.
G3AG †F. INCHLEY, 11 Carnwath Road, Sutton Coldfield, Warwicks.
G3GUA H. R. MOREY, 109 Dene Way, Newbury, Berks.
G3IOF F/Off. K. O'ROURKE, No. 2 Officers Mess, R.A.F., Marham, Norfolk.
G3IQD N. A. CARTER, 163 Chelmsford Avenue, Chase Cross, Romford.
G3IXN M. M. LOVEJOY, 14 Iris Road, Bassett, Southampton, Hants.
G3IXV P. B. HAYES, 25 Twelve Acre Crescent, Minley Estate, Cove, Farnborough, Hants.
G3JRE 4036129, CPL. THOMAS, Signals Section (T.X.S.), R.A.F., St. Mawgan, Newquay, Cornwall.
G3JXF †N. W. CURTIS, "Lleydn," 43 Wellington Road, Mablethorpe, Lincs.
G3JXQ W. R. ELLIOTT, 138 Woodside Green, South Norwood, London, S.E.25.
G3JYP *W. B. CAPSTICK, "Lockholme," Battlebarrow, Appleby, Westmorland.
G3JYW W. S. H. CHEUNG, 33 Church Crescent, London, N.10.
G3JYX Y. S. SHUM, 33 Church Crescent, London, N.10.
G3JZK G. T. SASSOON, New House, Oundle, Peterborough, Northants.
G3KAD *T. N. AYSCOUGH, 39 St. Peters Road, Balby, Doncaster, Yorks.
G3KAW J. W. MADDISON, 8 Chapel Place, Dover, Kent.
G3KBE W. HAZELDEN, "Hazeldene," Bretby Lane, Bretby, nr. Burton-on-Trent.
G3KBT R. T. G. DAVIS, 38 Marlborough Road, Tuebrook, Liverpool, 13.
G3KBW D. M. HERMALYNE, 44 Annandale Road, Sidcup, Kent.
G8OG †H. DOBSON, 67 Gledhow Lane, Leeds, 8.
GC3KAV J. C. DE CARTERET, La Mare Denis, St. Martins, Guernsey.
GM3HOM *J. REILLY, 20 Ornsay Street, Glasgow, N.2.

* * *

G3BIW J. B. BEDFORD, 18 Market Place, Alford, Lincs.
G3DSZ †A. F. C. KENT, 5 Back Lane, Long Sutton, Spalding, Lincs.
G3DZW S. T. CHREES, 44 Oakleigh Road South, New Southgate, London, N.11.
G3JAD *J. DRURY, 61 Queens Road, Hull, E. Yorks.
G3JAG *J. A. CRUX, 392 Bury Road, Rochdale, Lancs.
G3JJM A. CROOK, 205 St. Helens Road, Daubhill, Bolton, Lancs.
G3JYN *M. J. NETHERSOLE, St. Marys Lodge, Cottage Place, Chelmsford, Essex.
G3JZF J. E. SMITH, 53 Woolmore Road, Erdington, Birmingham, 23.
G3KAN *A. T. SHREWSBURY, 50 Danefield Road, Northampton.
G3KAR D. G. HAMMOND, Brookhurst, Wisborough Green, Billingshurst, Sussex.
G3KBH M. P. HUGHES, "Northdean," Meopham, Gravesend, Kent.
G3KBO T. J. DEVINE, Crombie Villas, Halstead, Sevenoaks, Kent.
G3KBR R. A. HUNTSMAN, 2 Lincoln Terrace, Hexham-on-Tyne, Northumberland.
G3KCB B. N. GREEN, 138 Flixton Road, Urmston, nr. Manchester.
G3KCD P. BEDWELL, 29 Kingsville Road, Higher Bebington, Wirral, Ches.
G3KCN A. G. G. WILLS, 42 Anne of Cleves Road, Dartford, Kent.
G5QI W. S. CARTER, The Ards Flat, Dorridge Road, Dorridge, nr. Birmingham.
GI3KDS W. J. WOODSIDE, 27 Burnside Road, Portstewart, Co. Derry, N.I.
GM3KBU C. WATSON, B.Sc., "Arras," Kinlochleven, Argyll, Scot.

Corporate Members, Overseas (Licensed)

DL2WM 2589204 S.A.C. MOORE, G., Box 125a, R.A.F., Butzweilerhof, 2nd T.A.F., B.A.O.R. 19.
DL2XQ 585389 CPL. NEVILLE, G., Radio Servicing Flight, H.Q.83 Group Signals Squadron, R.A.F. Wahn, 2nd T.A.F., B.A.O.R. 19.
EI6F †DR. T. D. O'FARRELL, 38 Nutley Road, Ballsbridge, Dublin.
SM7AKG L. T. NORDQVIST, 14e Oxtorgsgatan, Eksjo, Sweden.
VQ2AT A. W. TUCKFIELD, P.O. Box 17, Broken Hill, North Rhodesia.
VS1GF *L. HALL, "D" Block, Braddell Hill, Braddell Road, Singapore, 11.
VS1FO W. F. GRAHAM, Chin Bee Wireless Station, Army Wireless Chain Squadron, G.H.Q. Signals Regiment., c/o G.P.O., Singapore.
VS1GE D. W. MARTIN, P. O. Box 51, Singapore.
VE3AIU F. H. BISSET, Goderich, Ontario, Canada.
W1HX N. H. YOUNG, 24 Gibbons Street, Melrose 76, Mass., U.S.A.
W2ESO E. BLACK, 130 East 24 Street, New York City 10, N.Y., U.S.A.
ZB1LG L. G. LESTER, R.N. W/T. Station, Dingli, Malta, G.C.

* * *

DL2WL E. J. ROBERTS, Signals Section, R.A.F., Bruggen, B.A.O.R. 34.
DL2WQ A. G. OSBORNE, Box 125a, R.A.F., Butzweilerhof, B.A.O.R. 19, Germany.
VE2OI J. L. GARTSHORE, P.O. Box 372, Asbestos, Quebec, Canada.
W3PGB L. R. SCOTT, 2703 Terrapin Road, Wheaton, Silver Spring, Maryland, U.S.A.
W8QJR F. L. BAKER, P.O. Box 546, McComb, Ohio, U.S.A.
ZD4BT S. BROWNE, The Wireless Engr.(E), Radio Division, Dept. of Posts & Telecommunications, Accra, Gold Coast.

Corporate Members (British Receiving Stations)

20475 *R. R. J. CAINES, 9 Miller Road, Gravesend, Kent.
20476 *R. MURRAY, 6 Agricola Road, Wingrove, Newcastle-on-Tyne, 4.
20477 *W. R. ANDREWS, 123 Burrow Road, Chigwell, Essex.
20478 *H. H. FORD, 94 Milner Road, Selly Park, Birmingham, 19.
20479 *R. J. J. HICKLIN, 13 Clive Road, Heath Park, Romford, Essex.
20480 *W. A. WHITWORTH, La Salle House, 7 Brookside, Cambridge.
20481 *E. PRITCHARD, 72 Clayton Street, Clayton, Manchester, 11.
20482 *G. Stocks, 26 Dudley Road, Marsh, Huddersfield.
20483 *P. K. PARKHOUSE, 20 Lonsdale Road, Formby, Liverpool.
20484 *K. E. R. JARVIS, 123 Gale Lane, Acomb, York.
20485 *P. N. BROUGHTON, 13 Church Road, Croft, Skegness, Lincs.
20486 *H. R. HODSON, 61 Molineaux Road, Sheffield, 5.
20487 *A. G. EDWARDS, 244 Ballards Lane, North Finchley, N.12.
20488 *R. W. BAKER, 62 Titterton Street, Sheffield, 9.
20489 *D. G. BENNETT, 63 Fairlands Road, Limefield, Bury, Lancs.
20490 K. R. LAWN, 6 Sandringham Crescent, Horden, Co. Durham.
20491 *G. M. SUTCLIFFE, 12 Upper Bell Hall, Savile Park, Halifax, Yorks.
20492 *H. Taylor, Rosevilla, Georges Lane, Banks, near Southport.
20493 *A. COULTHARD, 3 Waverley Road, Stanwix, Carlisle, Cumberland.
20494 *A. J. COX, 40 Hill Crest Avenue, Brierley Hill, Staffs.
20495 A. E. PHILP, 19 Killieser Avenue, Streatham Hill, S.W.2.
20496 *I. MCLUSKIE, 195 Main Street, Renton, Dumbarton.
20497 †A. E. GRAHAM, 97 Winifred Crescent, Kirkcaldy, Fife.
20498 P. P. HAYWARD, 74 Dartmouth Avenue, Cannock, Staffs.
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(*Continued on page* 416).

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