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In this Issue

CURRENT COMMENT

Flash back to field day

" Current Comment " takes a slightly different form from usual this month.

JUST outside the town, where the lane climbed northward over the brow of the low hill, there were, as the week-end itinerants put it, " some strange goings on." Where the population was normally bovine, now there were half-a-dozen cars and a shooting brake, and a pair of decidedly mysterious silver coloured masts.

" Perhaps it is the Civil Defenders " thought some of the passers by who were sufficiently curious to stop at the five barred gate and take a look. Or perhaps it was " something to do with The Observer Corpse," as one of the citizenry put it; after all, there was still an R.O.C. look-out post at the top of the hill. It had to be admitted, though, that the variegated garb of the strange men in the field—ranging from duffle coats to open neck shirts for those bold enough to brave the rigours of June—seemed to have no connection at all with the traditional smartness of any disciplined body.

They could hardly know, those who paused for a minute to look, that discipline was, contrary to appearances, very much a governing factor in the activities of the local Amateur Radio Group who, usurping those aforementioned bovines, were preparing for National Field Day.

" Preparing " was perhaps the wrong word at that moment, for preparations for *this* year's had begun almost as soon as the petrol generator had died away into silence at *last* year's. The inquest held then—as was customary after each National Field Day—produced much useful experience on how to organise the event better next time; and the two conjunct dates in the Group's Fixture List which read " May meeting: preparing for N.F.D." and " June meeting: recovering from N.F.D." while they caused a laugh among members, had the practical purpose of " sifting the evidence."

* * *

So here it was again, Field Day of '54. Two hours before the deadline of 6 o'clock few of the bystanders beyond the gate would have dared to lay any money on the successful unsnarling of those apparently hopelessly tangled aerial wires and of those mains cables from generator to tents. Yet as always the job was done—and this in spite of the beating rain which made all outdoor work seem twice as hard as usual. And that moment of tingling anticipation arrived when the petrol electric war veteran, after a few apologetic coughs from an exhaust pipe which had emitted no carbon dioxide for a twelve month, consented to start. Equally reliable were last year's transmitters and receivers which performed as soon as they were switched on. It was not long before that good old bug key was being given a preliminary swing. Memories went back to an occurrence during last year's event when that same key, obeying an elementary law of electricity, sent a permanent dash as rain came through a hole in the tent and dropped neatly between its two terminals. (Strangely enough an almost identical thing occurred this year, except that the short circuiting medium was beer, spilled from a parked glass standing on the receiver).

The other tense and tingling moments were those which, separated by 24 hours, marked the first and last QSOs—the starting and finishing posts of this radio race against time. Between them were experienced all the sensations which a succession of National Field Days presses into the consciousness of every radio amateur who has ever participated in one . . . the smell of the exhaust of that putt-putt . . . the sense of moving into the kill as a " rare one " is called for the tenth time, and the grunt of triumph (there's no time for cheering) when he actually comes back . . . the hovering womenfolk who always contrive to bring that urgently desired cup of tea at just the right moment (but no glamour this year with a " gum boots and slacks " N.F.D.) . . . the strained patience when one of the less skilled takes the key and three times as long to effect a contact as *you* do (but by George, doesn't he learn quickly!) . . . that Urgent Operational Requirement, a pair of crystal filter ears . . . above all, that faint aroma of tentage which, if presented to any participant round about, say, Christmas time, will conjure his memory immediately to Raining June.

All these things were normal to any N.F.D. What was *abnormal* at the 1954 event was the mighty thunderstorm which swept over scores of the sites in the small hours of the Sunday morning, as the culmination of a spell of weather that seemed to throw at the participants everything in the locker except snow. Prudence dictated a two-hour wait at the height of the storm. No one could blame an operator for looking a little askance at that aerial lead-in only a few inches from his head.

Night lifted. So did the storm. And the petrol generator, that keystone of the whole expedition, did not miss a beat, to everyone's relief, in spite of an inch of rain upon it.

On with the show!

* * *

Now it is six o'clock. Someone presses the button on the faithful power supply motor and brings a momentary silence to the field as the smack of its exhaust ceases—but its sound is replaced by another when the tea party in the adjoining mess tent begins, and everyone seems to be talking at once. With a dozen-and-a-half adults clustering in the damp warmth of a tent designed for half-a-dozen small Boy Scouts, there is not much room to move; which is no deterrent at all to the animated exchange of reminiscences which goes on over the tea and sandwiches and cakes.

The usual radio subjects this year are supplemented by a new one, for that memorable display of visual static last night will not be forgotten for many Field Days ahead. Hopes are held that no groups suffered damage (some, it transpired subsequently, did). And to think that the B.B.C. Weather Forecast never mentioned thunder!

Thus the talk continues for an hour or so.

This sociable conclusion to the 24-hour tension of the operating period represents to many the culmination of National Field Day, and one of its particular delights—a

(Continued on page 14)

Introduction to Transistors

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

IT seems likely that for certain applications the thermionic valve may soon be replaced by the transistor. Although this device is not yet readily obtainable in this country many amateurs will want to gain a basic understanding of how it works. Most of the current literature on transistors is highly technical and rather overwhelming because of the unfamiliar language in which it is written. In this article, an attempt will be made to sift out the basic principles and present them in a simplified form.

The Atom

Before dealing with transistors themselves it is necessary to refresh our minds on the basic structure of all matter and study the atom. This, we recall, consists of a number of electrons rotating about a nucleus of protons and neutrons. Each electron possesses a unit negative charge and each proton a unit positive charge. Neutrons possess no charge. In any atom there is normally an equal number of protons and electrons and the net charge is zero. The number of protons and electrons in the atom is different for each chemical element.

The orbits of the electrons in an atom are arranged in groups which are known as shells. The shell nearest the nucleus cannot contain more than 2 electrons, the second shell not more than 8, the third not more than 18, and so on, the maximum number increasing for each shell. Generally, the inner shells are filled first. Thus an atom of sodium, which has 11 electrons, has the full 2 in the first shell, the full 8 in the second and the remaining one in the third shell. The electron arrangements of some other atoms are shown in Table I.

TABLE I

TOTAL No. OF ELECTRONS (ATOMIC NUMBER)		DISTRIBUTION OF ELECTRONS				
		Shell 1	Shell 2	Shell 3	Shell 4	Shell 5
1	Hydrogen	1				
2	Helium	2				
5	Boron	2	3			
6	Carbon	2	4			
7	Nitrogen	2	5			
10	Neon	2	8			
13	Aluminium	2	8	3		
14	Silicon	2	8	4		
15	Phosphorus	2	8	5		
18	Argon	2	8	8		
31	Gallium	2	8	18	3	
32	GERMANIUM	2	8	18	4	
33	Arsenic	2	8	18	5	
36	Krypton	2	8	18	8	
49	Indium	2	8	18	18	3
50	Tin	2	8	18	18	4
51	Antimony	2	8	18	18	5
54	Xenon	2	8	18	18	8
MAXIMUM NUMBER		2	8	18	32	

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Those shells which are complete do not really concern us. We can consider them, together with the protons and neutrons, as forming an inert core. What is of interest is the behaviour of the electrons in the outermost shell—that is to say, the outermost shell which contains electrons. It appears that an atom prefers to have 8 electrons in the outer shell. Thus the atoms of neon, argon, krypton and xenon, which have this number, are inert and do not enter into chemical reactions. Other atoms which do not have 8 outer electrons usually combine with other atoms (of the same or another element) in an attempt to remedy this condition. Of special interest in this respect is the behaviour of the germanium atom, the main ingredients of all commercially produced transistors.

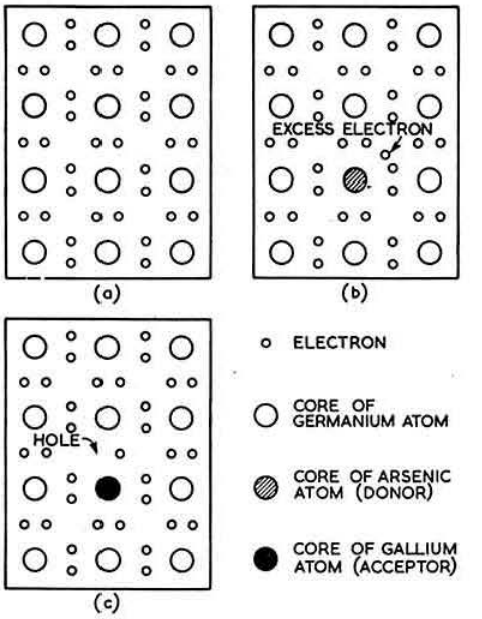


Fig. 1. Structure of germanium crystal: (a) pure; (b) with donor impurity (arsenic); (c) with acceptor impurity (gallium).

From Table I it will be seen that the germanium atom has 4 electrons in the outermost shell. When germanium atoms join together to form a crystal of germanium they arrange themselves as in Fig. 1(a). Each atom has 4 neighbours and shares 2 electrons with each of them. Having thus effectively secured 8 outer electrons the atom cores are satisfied. They resist any efforts to change the arrangements and are said to be held together by electron-pair bonds. If the crystal is subjected to an electric field the atom cores will not part with their electrons and there will be no flow of electrons through the crystal. Putting this in more usual language, pure germanium is an insulator.

Note that Fig. 1 is only a schematic diagram. In an actual crystal the structure is not flat; the neighbouring atoms are spaced as if they were at the corners of a tetrahedron and form a three-dimensional pattern.

Germanium used in transistors contains small traces of impurities. One such impurity is arsenic. Now an arsenic

atom has 5 electrons in its outermost shell and when it joins the crystal the structure becomes as in Fig. 1(b). It will be seen that there is now an excess electron which is not associated with any of the electron-pair bonds. This electron will tend to remain with the arsenic atom in order to keep the net charge of that atom zero, but it can be persuaded to move by the application of an electric field. That is to say the crystal will conduct.

If a battery were connected across the crystal this excess or free electron would flow through the crystal to the positive terminal of the battery. Another electron would flow from the negative terminal to replace it and there would be a continuous current of electrons flowing through the crystal.

Another possible impurity is gallium. The gallium atom has only 3 electrons in its outermost shell and when it joins a germanium crystal the structure becomes as in Fig. 1(c). There is then a deficiency, or hole, in one of the electron-pair bonds. With the application of an electric field, an electron from a completed bond can be moved into the hole, thereby leaving a new hole behind it. *It is as if the hole has moved.*

If a battery were connected across the crystal the hole would in fact appear to move through the crystal towards the negative terminal. On arriving there it would be filled by an electron from the battery. Simultaneously an electron from an electron-pair bond next to the positive terminal would enter the battery and create a new hole. Thus a continuous flow of current would be maintained through the crystal. This current, while consisting fundamentally of an electron flow, is more conveniently thought of as *a flow of holes.* A hole can be imagined as rather like an electron but having a positive charge.

Transistor Terms

N-type germanium—in which conduction is by negatively charged electrons.

P-type germanium—in which conduction is by positively charged holes.

Hole—this can be imagined as something rather like an electron but with a positive charge.

The arsenic atom, since it gives a free electron to the crystal, is known as a " donor." It is not the only impurity which can act in this way. Other atoms which have 5 electrons in the outermost shell, such as phosphorus and antimony, behave similarly and are also used. The gallium atom is known as an " acceptor." Other atoms with 3 outer electrons such as boron, aluminium and indium, can also be used as acceptors. Indium is the most common impurity in commercial transistors.

A germanium crystal containing donor impurities is said to be composed of *n*-type germanium, the *n* indicating that conduction is by negatively charged electrons. Conversely, one containing acceptor impurities is said to be *p*-type germanium, the *p* indicating that conduction is by positively charged holes.

Both *n*-type and *p*-type germanium are fairly good conductors and will pass current equally well in any direction. But if an *n*-type crystal is joined to a *p*-type one the joint crystal will have a low resistance in one direction and a high resistance in the other. We have, in fact, what is known as a *p-n* junction rectifier. Although we are not primarily concerned here with the germanium rectifier it will be helpful to study its action briefly as a preliminary to the study of the transistor.

The Germanium Rectifier

A *p-n* junction rectifier is illustrated diagrammatically in Fig. 2(a). Since we are only concerned with the actual current carriers, that is to say, the holes and free electrons, only these are shown. In the *p*-type germanium there are a number of holes created by the acceptor atoms and in the *n*-type there are a number of free electrons contributed by the donor atoms.

In Fig. 2(b) a battery has been connected across the rectifier, with the negative terminal to the *p*-type germanium and the positive terminal to the *n*-type. The free electrons will be attracted towards the positive terminal and the holes towards the negative terminal. Now conduction across the junction between the *p*- and *n*-regions must consist of the flow of either holes or free electrons. Since the region around the junction will be devoid of both, no current will flow.

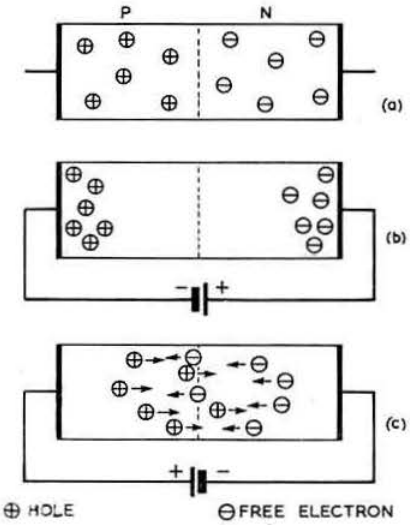


Fig. 2. P-n Junction: (a) no voltage applied; (b) reverse voltage applied; (c) forward voltage applied.

If the battery is reversed as in Fig. 2(c) the action will be different. The holes will be repelled from the positive terminal and move towards the junction, some crossing into the *n*-region. The free electrons will be repelled from the negative terminal and some will cross into the *p*-region. Thus in the region around the junction there will be both holes and electrons and these will combine. For each hole lost by becoming filled by an electron a new hole will be created near the positive terminal by an electron flowing from an electron-pair bond into the battery. Similarly, for every free electron which is lost by being absorbed by a hole a new electron enters the *n*-region from the negative terminal of the battery. There is thus a current flow through the rectifier. In the *n*-region the current will consist mainly of the flow of free electrons, while in the *p*-region it will consist mainly of the movement of holes.

Although germanium rectifiers can be of the junction type described above, the commonest in current use are of the point contact type. These usually consist of a small pellet of *n*-type germanium, little bigger than a pin-head, with a cat's-whisker contact on one side and a large area contact on the other. The rectifying action is more complex, but as a simplification we may say that immediately beneath the cat's-whisker there is a minute *p*-type region which forms a *p-n* junction with the main body of germanium.

The Junction Transistor

We can now turn to the transistor and will look first of all at the junction type.

In the thermionic triode the electron flow between the cathode and anode is controlled by varying the potential of a grid which is interposed in the electron stream. The mechanism of the *n-p-n* junction transistor is in many ways very similar. Here the electron flow through a small slab of *n*-type germanium is controlled by varying the potential of a very thin slice of *p*-type germanium which has been interposed in the centre of the slab. The composition of the transistor is shown diagrammatically in Fig. 3(a). The connection to the left-hand *n*-section is known as the emitter and corresponds to the cathode of a thermionic valve. The connection to the centre *p*-section is known as the base and corresponds to the grid. The connection to the right-hand *n*-section is known as the collector and corresponds to the anode.

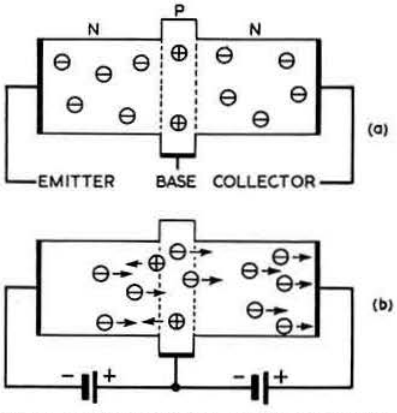


Fig. 3. Junction Transistor of the n-p-n type.

D.C. voltages are applied as in Fig. 3(b). The collector-base circuit thus forms a *p-n* junction with the voltage applied in the reverse direction. Without the influence of the emitter, electrons would be attracted towards the base connection, holes would be attracted to the collector and no collector current would flow. The emitter-base circuit has a voltage applied in the forward direction. Holes from the base section will flow towards the emitter and free electrons from the emitter section will flow towards the base. Due to thinness of the base section, however, many of the free electrons entering it will immediately flow into the more positive collector section and on to the collector without having been absorbed by holes. In fact, the number of electrons arriving at the collector is very nearly equal to the number leaving the emitter. That is to say, the collector current is practically equal to the emitter current. The base current will be equal to the difference between emitter and collector currents and will be relatively small. The magnitude of the emitter current, and therefore of the collector current, will depend on the potential difference between the emitter and the base.

A voltage amplifier using an *n-p-n* junction transistor is shown in Fig. 4. *Rb* is of the order of 100,000 ohms and gives a small positive bias to the base. The input signal is applied to the base and modulates the electron flow between emitter and collector, thus producing an amplified signal in the collector load resistance *Rc*. The value of *Rc* might be about 20,000 ohms.

Although similar to a thermionic valve circuit there are certain important differences. Whereas the grid bias on a thermionic valve is negative for class A operation, the base-bias on a transistor is positive. The grid passes no current and has a very high impedance but the base does pass current and the transistor may have an input impedance of 1,000 ohms or less. This means that in a multistage transistor amplifier a matching transformer from each collector to the succeeding base is required if the maximum possible gain is to be obtained.

Just as it is possible to operate a thermionic triode with the grid earthed and the signal applied to the cathode it is possible to operate a transistor with the base earthed and the signal applied to the emitter. The input impedance is then lower, but the arrangement may have advantages in certain circumstances.

If we look at the characteristic curves of a typical *n-p-n* junction transistor (Fig. 5) we notice a marked similarity with those of a small battery pentode. We may be rather surprised, however, to find grid voltage not replaced by base voltage but by base current. Because of its low input impedance it has become customary to regard the transistor as a current amplifying device and thus we constantly find reference to the input current. In the manufacturers' data, for example, no mention will be found of mutual conductance; instead something called the "current amplification factor" is quoted. For the earthed base connection this is defined as the ratio of the change in collector current to the change in emitter current with a constant collector

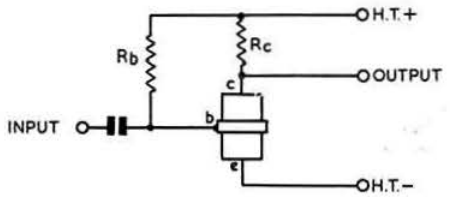


Fig. 4. Voltage amplifier using n-p-n junction transistor. The letters b, c and e identify the base, collector and emitter of the transistor respectively.

voltage. It is then given the symbol α (alpha). We have already seen that the collector current is nearly equal to the emitter current and thus we can expect the value of α to be nearly 1. In practice it is usually somewhere between 0.94 and 0.99.

For the earthed emitter connection the current amplification factor is the ratio of the change in collector current to the change in base current with a constant collector voltage. In typical cases it may have a value somewhere between 15 and 100.

A junction transistor need not be of the *n-p-n* type. In fact, it is more common for it to have a *p-n-p* formation. That is to say, it may consist of a thin slice of *n*-type germanium sandwiched by *p*-type germanium. The d.c. supplies must then be applied with reversed polarities and the roles of free electrons and holes are interchanged.

The Point Contact Transistor

The oldest transistor is the point contact type. This, in its usual form, consists of a small pellet of *n*-type germanium, the emitter and collector being cat's-whisker contacts spaced about 0.001in. apart on the germanium surface and the base a contact to a relatively large area of the germanium.

The action of this type of transistor is much more complex and is not yet fully understood. For our purposes it is sufficient to know that the behaviour is as if there were a tiny *p*-region under the emitter contact and a tiny *n*-region surrounded by a small *p*-region under the collector contact. This is shown in an exaggerated form in Fig. 6.

The emitter-base circuit is in effect a *p-n* rectifier with a

voltage applied in the forward direction. Electrons will flow from N_1 into P_1 and holes will flow in the opposite direction. Due to the proximity of the two point contacts, a number of these holes will find their way into P_2. Now we can look upon N_2, P_2 and N_1 as forming an *n-p-n* junction transistor. Thus for every hole that does enter P_2 a number of electrons will flow from N_2, through P_1 and on to N_1. By varying the emitter current we will vary the hole current into P_2. This, in turn, will vary the total current in the collector-base circuit.

The collector current will be considerably greater than the hole current from the emitter into P_2 and will be about two or three times larger than the total emitter current. This means that the current amplification factor for the earthed base connection, α, is considerably greater than 1. We have a contrast here with the junction type where α is always less than 1. An important result of α being greater than unity is that any resistance in the base circuit which is

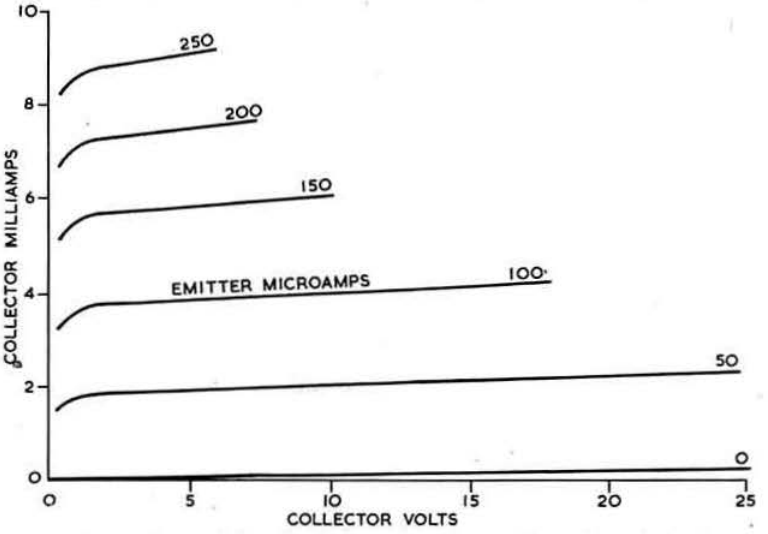


Fig. 5. Collector characteristics of typical n-p-n junction transistor with earthed emitter.

common to both emitter and collector circuits will give positive feedback.

This can be understood from Fig. 7. Suppose the emitter is made positive with respect to earth so that the emitter current increases by 1mA. If α is 3, the collector current will increase by 3mA. Of this amount, 1mA will have come from

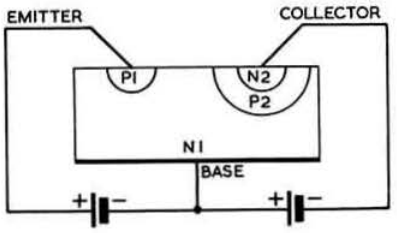


Fig. 6. Point contact transistor.

the emitter and the other 2mA from the base. The extra base current through the resistor R will cause the emitter to become more positive with respect to the base. This, in turn will cause a further increase in emitter current and further increases in collector and base currents. Unless suitable precautions were taken the currents would continue to increase until the transistor became damaged. Because of this danger it is general practice with point contact transistors to use them in earthed base circuits. Even so there is still some positive feedback due to the internal resistance of the germanium and of the base connection consequently current limiting resistors are usually inserted in the external circuit.

The positive feedback phenomenon can be used to advantage in certain applications,the most obvious of which is an oscillator. If R is replaced by a parallel tuned circuit there will be considerable feedback at the resonant frequency and the circuit will oscillate at that frequency.

While we are still looking at Fig. 7 some mention should be made of the symbol used here to represent a transistor. Although pictorially this only represents a point contact type the reader will find that it is usually used for all types.

Limitations

Having now considered the basic characteristics of the two most important types of transistors let us look at some of their limitations.

The first of these is frequency. The velocity of electrons in a transistor is much lower than that through a vacuum triode and that of the holes is lower still. Moreover, the holes and electrons do not flow through the transistor in direct lines but take meandering courses. The effect of this is to make the transistor sluggish in action compared with a vacuum triode. Generally speaking, commercial transistors are only useful up to frequencies of a few hundred kc/s and point contact types up to a few Mc/s. Junction types have been made, however, which would give a useful gain up to 40 Mc/s and special point contact types have been made which would work at even higher frequencies.

There are also temperature limitations. In a germanium crystal, although the main structure is nominally stationary there are random and erratic thermal vibrations taking place. At room temperature these vibrations are occasionally violent enough to break electron-pair bonds, thus temporarily producing free electrons and holes which can act as current carriers. The effect of this is to cause some leakage current through a *p-n* junction when the voltage is applied in the reverse direction. As the temperature is raised the thermal vibrations become more intense and electron-pair bonds will be broken more frequently. There will then be an increased number of current carriers at any given instant

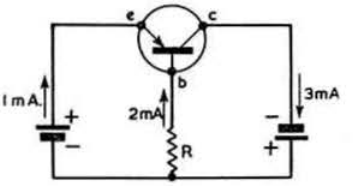


Fig. 7. Positive feedback with point contact transistor. Current is shown flowing in the conventional direction, i.e., in the opposite direction to the electron flow.

and the leakage current will be greater. The characteristics of a transistor consequently deteriorate with an increase in temperature and normally become useless at about 80°C. At lower temperatures than this it is possible to minimise the effects of temperature changes by suitable circuitry.

Current commercial transistors usually have a maximum collector dissipation of 50–100mW. This imposes some limitations on their usefulness but it seems probable that larger junction types will be forthcoming before very long.

The Future of Transistors

Although all commercial transistors have so far used germanium it is possible to use other materials. Silicon, for example, crystallises in the same way as germanium and can be made in *n*- and *p*-types. Silicon transistors can be used at higher temperatures and are less sensitive to temperature at normal levels but there are serious manufacturing difficulties. Carbon, in the form of diamond, also has the same type of crystal structure and presumably could be used. The difficulties and expense would, however, be even greater. There are other elements, such as tin, which also have 4 electrons in the outer shell but they do not have all the inner shells complete and behave differently.

At the moment, therefore, germanium appears to be the only material suitable for commercial transistors. Nevertheless, there is a possibility that compound crystals, composed of several elements, may be evolved which will prove even more favourable. The transistor, it must be remembered, has only been in existence about six years and it does not seem unduly optimistic to expect that there are still many improvements to come. Even in its present form the device has a number of important advantages. For example, there would seem to be no reason why it should ever wear out. It must be admitted that early models did not always live up to this expectation, but it seems probable that, with improved manufacturing techniques and better sealing against atmospheric contamination, the newest transistors will have an exceptionally long life.

Perhaps the most impressive features of the transistor are its small physical size and its low power consumption. Not only is there a power saving due to the fact that there is no filament; the collector efficiency tends to be higher than the anode efficiency of the thermionic valve. There are obviously great possibilities for small portable equipment. Amateurs will find them particularly useful for low-power portable rigs, radio-controlled models, sensitive field-strength meters, etc.

Some old-timers may tend to think of the transistor as a novelty of purely academic interest. It promises to be far more than this. Large-scale production is just beginning to get under way and it is planned to manufacture several million in the United Kingdom next year. How many of these will find their way into ham shacks?

CURRENT COMMENT (*Continued from page 9*)

moment when the quintessence of " ham spirit " is very much present.

It cannot continue long, though. There is much to do before all the equipment is packed in the waiting vehicles, and those silver masts, so painstakingly erected in the rain the previous day, are felled in a moment when their guy ends are lifted out of the sodden soil. At length there is nothing left—except a curling wisp of smoke rising pungently from the nettles where the rubbish from the site was burned—to show that here took place one-hundredth part of National Field Day, 1954. It will take another hour to distribute all the impedimenta of the occasion to its rightful owners—another hour of work to exercise the tired brains and muscles of already over-worked members.

None knows he is over-worked, nor would admit it if he were told. The lengths to which a man will go in pursuit of his hobby are amazing indeed!

Of the two or three thousand British radio amateurs who assisted at National Field Day, 1954, probably fewer than two or three dozen have any regrets, or, looking forward to 1955, fail to declare, with one accord: " I wouldn't miss it for words "—J.H.

Courses of Instruction

THE Department of Telecommunications Engineering, The Northern Polytechnic, Holloway, London, N.7, is inaugurating three courses designed to assist television servicing engineers in the understanding of aerial and receiver problems, with particular reference to Band III television and v.h.f. sound broadcasting. The courses will be of a practical nature covering aerial design and installation, converters, " front ends," test equipment, etc.

The courses, all of which will commence during the week beginning September 27, 1954, are as follows:

(i) One full day a week for about three months. To be held on Mondays from 9.30 a.m. to 4.30 p.m.
(ii) Full-time course of two weeks duration.
(iii) Evening courses.

The fee for each course will be about £2.

Approximately half of each course will be devoted to lectures, the remainder of the time being spent on practical experiments and measurements on television and f.m. receivers.

Courses on Radio Servicing (one day per week), Television Servicing (one day per week) and a full-time one-year course on Radio and Television Servicing will also commence during the same week.

Applications to enrol for these courses must be made not later than August 7, 1954, and should be addressed to the Secretary, Northern Polytechnic, from whom further details may be obtained.

* * *

Commencing on September 20, 1954, Brentford Evening Institute is arranging the following courses:—

(i) *Radio Servicing I* (Mondays, 7 p.m. to 9 p.m.). Assumes no previous knowledge of radio.
(ii) *Radio and Television Servicing II* (Tuesdays, 7 p.m. to 9 p.m.).
(iii) *Radio Amateurs' Examination Course* (Wednesdays, 7 p.m. to 9 p.m.). This course assumes no previous knowledge of radio and is intended to prepare candidates for the Radio Amateurs' Examination to be held in May, 1955. It does not include Morse instruction.

The registration fee for each course is 15s. and enrolment may be made during the evenings of September 13 to 17 (or subsequently).

Region 1—Westmorland Expedition

APROPOS the announcement published on page 571 of the June issue we have been asked to make it clear that it is in fact members of several Merseyside groups who will be taking part in the expedition to Westmorland during the period August 13–15, 1954.

Operation will be as follows:—

G2AMV/P, 1.8 to 28 Mc/s.	G2CUZ/P, 144 Mc/s.
G2ART/P, 1.8 to 28 Mc/s.	G3BOC/P, 144 Mc/s.

Both c.w. and telephony will be used. In addition to the licencees listed, G3EQE, G3FRT and G3HMR will be participating in the expedition.

Members who wish to make " skeds " for the bands from 1.8 Mc/s to 28 Mc/s, are invited to write to B. O'Brien (G2AMV), 1 Waterpark Road, Prenton, Birkenhead, Cheshire, and to H. M. Synge (G3BOC), Gipsy Corner, Willaston, Wirral, for " skeds " on 144 Mc/s.

Introducing Bristol

TWO months to go to Convention. With the venue in the West Country for the first time, this important event promises a return to those pre-war functions of happy memory with the *motif* throughout an atmosphere of "ham-world" friendliness. That is the primary object of all Conventions and will be the aim of the three days of activities in Bristol—to bring about personal contacts between as many Society members as possible, large numbers of whom are probably known to one another only by their transmissions on the air.

It is difficult, before the event, to give a comprehensive description of all the arrangements being made at Bristol, and this article is an attempt to give a general outline of what may be expected. Reports already received on the plans made, both for the carrying out of the elaborate programme and for the general well-being of members who will be taking part, encourage the thought that an exceptionally high standard of organisation may be looked for.

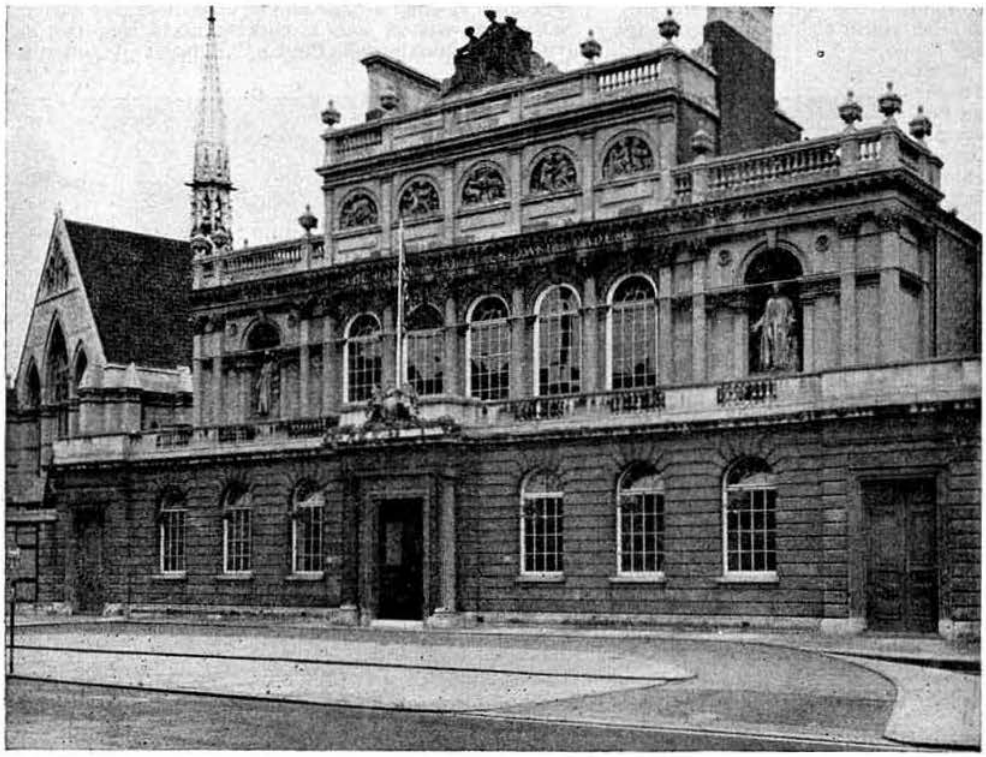
First then, the Convention "Headquarters"—the base from which all the events will originate. Region 9 members, who will be acting as hosts on this occasion, are fortunate in having at their disposal a building so well suited for the purpose as the Royal West of England Academy. Conveniently situated—an important point when it is to be the focus of a large number of visitors—it is also easily adaptable for the variety of functions which are to take place there. A Reception Desk will be set up on the first-floor balcony where all members attending the Convention will be asked to register and will receive details of arrangements made for them during their stay in Bristol. Inquiries of all kinds will also be dealt with here—whether they concern departure times of organised visits or the whereabout of friends known to be attending. To complete the usefulness of the Reception Desk, personal messages may be left there and it will be equipped with its own private telephone line.

The fine, spacious galleries of the Academy are, of course, specifically designed for displays and are particularly well suited for the special Amateur Radio Exhibition which will run for the whole period of Convention. Many representative firms of the radio trade have taken stand space and—in contrast to their more sedate exhibits at the London radio show a fortnight earlier—will be concentrating on technical features of special appeal to the amateur world. The G.P.O., too, have taken a keen interest in the Exhibition and the South-West Region are producing a special exhibit for this event, while the purely amateur features will include displays of home-built gear, the Convention Station (operating under the call-sign GB3NCB, by arrangement with the G.P.O.), a working Amateur Television station, complete with roving camera and operating on a closed circuit, and novelty sideshows of electronic interest. Headquarters will be represented by their own stand and members will be invited to leave their personal QSL cards for display.

Of the 16 different visits and trips laid on, most are self-explanatory by their titles in the programme included with this issue, but a word on some of the others may not be out of place. The scheduled visits to the Council House, for example, may have intrigued some readers, but members may rest assured that this feature—introduced as a complete "breather" from the spate of technical fare—is of considerably greater interest than the somewhat bizarre title might suggest. Bristol's civic regalia is probably the finest collection of its kind in the country and includes many items which are unique, each with a history of its own and a particular place in the pattern of civic tradition.

The Burden Neurological Institute is world-famous in the realm of brain-therapy and utilises in its researches the most complex electronic apparatus for experiments in electro-encephalography, while anyone who has not seen the minute world revealed by an electron microscope will be amazed (or horrified!) by the weird "animals" which share our life on this planet.

The series of technical lectures have been chosen to embrace as wide a field as possible. Mr. F. J. H. Charman, B.E.M. (G6CJ) will be giving good advice on the choice of aerials for chasing elusive DX. Mr. A. H Radford, A.M.I.E.E.(G6YA),



The Royal West of England Academy, venue of the R.S.G.B. National Convention, 1954.

as an exponent of high-fidelity reproduction, will demonstrate his researches into "stereophonic sound"; Mr. Louis Varney, A.M.I.E.E. (G5RV), promises even more of his practical solutions to many current problems connected with Amateur Radio, while Dr. Grey Walter, M.A., will present a fascinating account of the progress of applied electronics in the field of medical research.

In the belief that contented XYLs are a definite asset to Amateur Radio and also in accordance with an opinion that neither they nor even the most hardened "hams" are capable of absorbing three days of purely scientific fare without suffering from technical indigestion, it will be noticed that contrasting attractions are well dispersed throughout the programme. Of these, the trip to Burrington Combe and Cheddar Gorge will be too well-known to need introduction, but the visit to Blaise Castle will surprise many who have not seen a "museum" of this kind, for this noted Bristol beauty spot has been made the home for the preservation of the finer features that graced the English landscape in years gone by. Among the latest additions is a complete water mill, uprooted stone by stone from the nearby Chew Valley (now being inundated by the waters of the largest man-made lake in Europe) and reassembled, with all its accessories, in a completely ideal setting.

What may seem an unusual Convention item is Morning Service on the Sunday, though not so strange in a City of churches. The church chosen—St. Mary Redcliffe—was built by one of Bristol's most noted philanthropists, one of the famed Merchant Venturers (who, ironically enough, amassed a fortune from the notorious slave trade) and was described by the first Queen Elizabeth as "the fairest, the goodliest and most famous parish church in all England." She might have added (had she known) that its acoustics, too, are of outstanding purity for this type of building. These, then are some of the bricks which form the structure of the 1954 Convention. Binding them together to form the composite, solid edifice is the cement of friendship which is the very basis of Amateur Radio.

The tone for the whole Convention will be set at the informal Reception by the President on the Friday evening at the Royal West of England Academy, when Mr. Arthur O. Milne (G2MI) hopes to greet as many members—old and new—as possible. Immediately following will be a Conversazione and Buffet in a hall set apart for members and specially equipped for this purpose. Facilities will be available throughout the Convention for this room to be used for rag-chews and sociable get-togethers.

The official Reception by the President and the highlight of the whole programme—Convention Dinner—will be held in Bristol's finest banqueting hall, the Victoria Rooms, immediately opposite the Royal West of England Academy. With many notabilities, attending as guests of the Society this promises to be a brilliant evening which will conclude with the evergreen feature of all Conventions—a mammoth draw for free prizes.

It has been said that "you cannot please everybody" but this year's National Convention aims to do just that. Of one thing the most hypercritical may be certain—the arrangements made in the West Country will be found to be truly "ship-shape and Bristol fashion."

The imposing main staircase of the Royal West of England Academy in Bristol.

R.A.F. Amateur Radio Society

DURING Convention the Headquarters Station of the Royal Air Force Amateur Radio Society (G8FC) situated at Locking, near Weston-super-Mare, Somerset, will be open to welcome R.S.G.B. or R.A.F-A.R.S. members, who may like to take this opportunity of visiting the shack. The Headquarters staff of G8FC will be on duty throughout the period and the station will be operational on all amateur bands.

The Hon. Secretary of the R.A.F. Amateur Radio Society is Mr. R. F. Weston.

Hotel Accommodation in Bristol

MEMBERS desiring overnight accommodation in Bristol during Convention are asked to make their own hotel reservations in accordance with their individual requirements but the Honorary Secretary, Convention Committee (D. F. Davies, G3RQ, 51 Theresa Avenue, Bishopston, Bristol, 7) will be pleased to supply a copy of the City's Official Hotels List on request. A copy of the List will also be sent to each member applying for Convention tickets on the form enclosed with this issue of the BULLETIN.

The President, General Secretary and Members of Council, together with representatives of certain overseas National Amateur Radio Societies, will be staying at the Grand Hotel, Broad Street, Bristol, where the Society has been able to reserve a limited amount of additional accommodation for the benefit of those attending the Convention. Members hoping to stay at the same hotel are therefore advised to write as soon as possible, mentioning that their visit is in connection with the R.S.G.B. National Convention.

Council Proceedings

Resumé 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 Tuesday, May 11, 1954, at 6 p.m.

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

Apology.—An apology was submitted for the absence of Mr. D. A. Findlay.

* * *

Membership

Resolved (a) to elect 43 Corporate Members and 5 Associates, (b) to grant Corporate Membership to 13 Associates who had applied for transfer.

The Secretary reported that of the 920 Members whose subscription became due on February 1, 1954, 210 became overdue on April 30, 1954. The Secretary submitted details of the reasons given by the 11 and 8 Members who wrote to resign during the weeks ended April 24 and May 1 respectively. Only 5 had resigned on financial grounds.

Region 2 Conventionette

Resolved that the Council's delegation to the Region 2 Conventionette in York on July 11, 1954, shall consist of the President, the General Secretary and Mr. Hicks-Arnold.

I.A.R.U. Calendar

It was reported that I.A.R.U. Headquarters had agreed to include in the next issue of the I.A.R.U. Calendar a detailed account of the business transacted at the I.A.R.U. Region 1 Conference held in Lausanne in May, 1953.

London Television Station

Apropos the matter discussed by the Council on February 16, 1954 (see pages 442-3, April, 1954, issue), the Secretary reported that the G.P.O. had written to the effect "that even if it should eventually be decided to operate the new transmitter with asymmetric sidebands it seems clear that, in order to keep to a minimum the number of receivers requiring modification, the vision carrier frequency would remain unchanged at 45 Mc/s and the upper sideband would be partially suppressed. Any other frequency alterations would be impracticable bearing in mind the number of receivers which would have to be modified. Every television receiver in the area concerned would have to be modified if the frequencies were changed as you suggest, and quite apart from this difficulty, which is in itself decisive, the resulting overlap of the vestigial sideband transmission into the adjacent television channel would be quite unacceptable." The letter concluded by stating that the G.P.O. could hold out no hope that it would be possible to follow up the Society's suggestion.

It was agreed to send a copy of the letter to Mr. C. D. Abbott, G6TA. (It was Mr. Abbott who suggested that the sound and vision frequencies to be used by the Crystal Palace Television Station should be 3 Mc/s higher than those at present in use at Alexandra Palace.—ED.)

Convention

The Council considered and approved a financial statement, covering anticipated revenue and expenditure, which had been prepared by the Hon. Secretary, Convention Committee.

Headquarters' Station

It was reported that the President, General Secretary, Mr. R. L. Varney and Mr. H. A. M. Clark had discussed with representatives of the G.P.O. a proposal that the Society should be permitted to operate a News Bulletin or Information Service. The representatives of the G.P.O. had agreed to discuss the Society's proposals with the other interests involved. During the meeting the Secretary informed the G.P.O. representatives that 20 of the 24 I.A.R.U. Societies who had replied to his request for information, had confirmed that they are officially authorised to operate a News Bulletin Service.

The R.S.G.B. representatives had agreed to furnish the G.P.O. with a series of six typical messages.

Radio Amateurs' Examination

At the meeting referred to in the previous item the Society's representatives were informed that the G.P.O. is anxious to reduce the number of trades and catagories which carry exemption from the Morse and/or technical tests. Another meeting would be arranged shortly to discuss the matter further.

New Amateur Licences

It was agreed to request the G.P.O. to retain the suffix /P for portable operation.

The G.P.O. had confirmed that Club stations, in future, may be operated only by qualified personnel.

The Band 420–460 Mc/s

The Secretary reported that at the meeting referred to above, the G.P.O. representatives had advised the Society's representatives that consideration is being given to an application by the Private Mobile Service for additional frequencies to compensate that Service for those which will be lost to Band III television. The G.P.O. have in mind allocating the channel 450–460 Mc/s to this Service. In that event the channels 420–430 Mc/s and 440–450 Mc/s would be shared by the Amateur and Fixed Services, whilst the channel 430–440 Mc/s would become an exclusive amateur allocation in the U.K. No changes are, however, contemplated for at least 18 months.

The Secretary pointed out that in Region 1 the band 420–460 Mc/s is shared between the Amateur and Aeronautical Navigation Services only.

Morse Tests

The Secretary reported that the G.P.O. Liaison Committee were in correspondence with the Post Office regarding their action in calling-in, for inspection, station log books before authorising the use of telephony after an amateur has been licenced for 12 months. The purpose of the inspection is to ensure that the licensee has regularly operated his station on telegraphy. The G.P.O. contend that they must satisfy themselves that an amateur has retained his Morse knowledge after a probationary period of 12 months. The G.P.O. Liaison Committee were of the opinion that the action of the G.P.O. in this matter tended to strike at the root of the British system of examinations.

The Secretary stated that he had asked the Post Office to arrange a meeting with members of the G.P.O. Liaison Committee to discuss the matter.

Licence Fees

The Secretary reported that the annual fees for licences issued or renewed on or after June 1, 1954, would be as follows:—

Sound Licence	£2
Sound Mobile Licence	£1
Television Licence	£2

The G.P.O. had indicated that there would be no variation of these fees in respect of differences of power authorised, nor would there be any extra fee payable on the first issue of a licence. The additional fees now charged for portable

and alternative address working would not arise in future.

" A Guide to Amateur Radio "

Resolved to accept an estimate from South London Press, Ltd., for printing 5,000 copies of the Sixth Edition of *A Guide to Amateur Radio*. The Secretary was authorised to settle all matters of detail, including the number of pages and the selling price.

Bulletin Advertising

A general discussion took place on the question of the amount of commission paid to the Society's Advertising Agents. One Member contended that it should be possible to obtain the services of a qualified firm of agents who would be prepared to handle all Society advertising on the basis of a commission of from 10 per cent. to 15 per cent. compared with the rate of 25 per cent. being paid at present.

Resolved to request the Finance and Staff Committee to look into the question of advertising commission rates.

Past Council Members' Badges

Resolved to publish a note in the Society's Journal to the effect that any past Member of the Governing Body may apply to Headquarters for a Past Council Member's badge.

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

The Secretary reported that fewer than 800 copies of the Third Edition of the Call Book remained unsold. In view of that fact he suggested that steps should be taken to produce a Fourth Edition in time for it to be placed on sale at the Eighth Annual Amateur Radio Exhibition.

Resolved to authorise the Secretary, (a) to obtain estimates from South London Press, Ltd., for printing 3,000, 4,000, and 5,000 copies of a new edition of the Call Book, (b) to enquire from Mr. J. P. P. Tyndall whether he will prepare a new edition of the Call Book in time for it to be published during mid-November, 1954.

Coventry Amateur Radio Society

The Secretary submitted correspondence from the Coventry Amateur Radio Society relating to the assessment for rating purposes of the Club's premises. The Society had appealed successfully against the assessment.

Resolved that the Secretary's reply, which was read, be approved.

Report of Conference with Regional Representatives

The Secretary submitted a 7,000 word Report covering the business transacted at the recent Conference between the Council and the Regional Representatives.

Resolved to receive the Report and to place on record the thanks of the Council to the General Secretary and Miss Gadsden for the efficient and speedy manner in which they prepared and produced the Report.

Resolved (a) to accept Recommendation (A), *i.e.*, to retain the present Scheme of Representation, (b) to accept Recommendation (B) relating to Zonal Boundaries. (A proposal to include Region 15 in Zone E (Regions 10 and 11) was lost); (c) to accept Recommendation (C) relating to Council support for local functions recommended by Regional Representatives. (A copy of the Report may be borrowed by any Member on application to his Regional Representative.—ED.)

Exhibition (Home Constructors' Section) Committee

Resolved (a) to receive, as a Report, the Minutes of a Meeting of the Committee held on April 6, 1954, (b) to authorise the Committee to operate a " live " station at stated times from within the Eighth Amateur Radio Exhibition, provided the equipment is enclosed and that reception is by means of headphones, (c) to set aside one large and two small stands for the display of home constructed equipment.

The meeting terminated at 9.15 *p.m.*

July, 1929

THE Editorial which hailed the beginning of Volume V recorded the reception by E. T. Somerset (Burgess Hill, Sussex) of 56 Mc/s signals from G6TW (Nantwich, Cheshire). The Editor expressed the hope that British stations would be well to the fore when international work on 56 Mc/s got really under way. The Editor also referred to a contact on 56 Mc/s between 2SH (Rickmansworth), 2SZ (Mill Hill) and portable 5VG way back in 1925 " The 300 watt 5 metre set at Rickmansworth was heard by the portable receiver along practically the whole route from the transmitter to Highgate, the maximum distance being 16 miles." 2SH and 2SZ held two-way communication over a distance of 12½ miles.

* * *

All eyes were being turned towards Convention—due to take place in September. " The object of Convention " wrote the Editor " is to promote better understanding between amateurs and to show means whereby present-day difficulties may be overcome."

* * *

J. Hum, G5UM, contributed some notes on 1,875 kc/s operation. " For consistent and stable operation the modified series-fed Hartley has been found to be most satisfactory with the R.F.B. a good second. A Cleartron CT25X is used. It does not heat up very much even with 300 volts on the plate, although it is advisable to key in the h.t. circuit if too high a plate voltage is used . . . Two-way communication with stations up to 200 miles away is easily and consistently effected with 5 watts input."

* * *

F. D. Cawley, B.R.S.152, described a recent visit to Majorca where he had met EAR62—" a low power DX hound who works nightly on 42 metres." Cawley reported that " his receiver is delightful to operate. Not a trace of hand capacity and runs with only 20 volts on the plate of the detector and 45 volts for the two amplifiers. Normally, only two valves are used, a third is ready at the turn of a switch when loudspeaker reception is required. The transmitter uses a single Osram ' Metal ' valve running at an input of 8 watts."

* * *

It was announced that two special portable transmitters had been built by Stratton & Co. Ltd. for the Oxford University Exploration Expedition to British Guinea.

* * *

R. C. Horsnell, 2ABK, described a circuit " which will efficiently cover all amateur bands from 28,000 kc/s downwards and also B.B.C. waves, without winding special B.C.L. coils."

Congratulations

I feel sure that members will wish to join with the Council and myself in extending to our General Secretary, John Clarricoats, G6CL, our sincere and hearty congratulations on his election as an Alderman of the Borough of Southgate. John has long served his community as a Member of the Borough Council, and this honour is a fitting recognition of many years of devoted public service.—A. O. M.

The R.S.G.B. in Retrospect

1913—1925

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

This article—the first of a series—relates the events of the first twelve years of the Society's history and shows how a meeting of five enthusiasts led to the formation of an organisation which, despite the upheaval of the first World War, was soon able to take the first decisive steps towards starting broadcasting in the United Kingdom.

Origin

THE true origin of the Society dates back to July 5, 1913, when five keen wireless experimenters met in Mr. Rene Klein's house in West Hampstead, London, to discuss the formation of a club. Mr. Klein foresaw the difficulties which might arise through lack of co-operation between wireless experimenters themselves and more especially between them and the G.P.O. Among those present at the inaugural meeting were the late Mr. Leslie McMichael and Mr. L. F. Fogarty who, like Mr. Klein, became Founder-Members of the club from which sprang the R.S.G.B. For the first few months the club was known as " The London Wireless Club " but its name was changed shortly afterwards to " The Wireless Society of London." That name was retained until 1922 when the present title was assumed.

The first President was Mr. A. A. Campbell Swinton, F.R.S., who held office for seven years. Council meetings in those days were held in Mr. Swinton's office in Victoria Street as the Society possessed no premises of its own and had no paid staff. The first Presidential address—a most memorable occasion—was given in the Lecture Theatre of the Institution of Electrical Engineers in January, 1914. During the address a special message of greeting from General Ferrie was transmitted from the Eiffel Tower in Paris, received on a syphon recorder and projected on to the screen by an epidiascope. From that time onwards the Society has been privileged to hold all its important meetings in the I.E.E. building.

First Headquarters

The first Headquarters of the club, where members could meet and build equipment, were in Hatton Garden on premises leased by Mr. A. W. Gamage, founder of the well-known company in Holborn that bears his name. The annual rent was £10.

Re-starting after the First World War

To quote the term used by the late Mr. H. Bevan Swift, the Society was in " suspended animation " during the 1914–18 war. It restarted in July, 1919. Wavelengths allocated to experimenters at that time were 440 metres and 1,000 metres for spark, c.w., and telephony. Permission to use the 1,000 metre band, however, was soon withdrawn, because it was required for aircraft wireless purposes.

In 1920, the first lady member, Mrs. Philip Coursey, B.Sc., was elected. In that year telephony became a practical proposition because of the development of the triode valve. Programmes of gramophone records from experimental amateur stations in the London area had to be regulated in order to avoid mutual interference.

In March, 1921, at a Conference of Societies affiliated to the R.S.G.B., held under the Presidency of J. Erskine Murray, D.Sc., permission was sought for the transmission of a weekly concert for experimental purposes. The Government refused this request but twelve months later after the Society had presented a petition to the P.M.G. signed by officials of 66 Affiliated Societies, they gave way. (A photostat copy of this petition—dated December 29, 1921—is in the archives at Headquarters.—ED.).

As the Society possessed no transmitter of its own the Marconi Company agreed to undertake these transmissions. Thus was born " Two Emma Toc—Writtle," a station made famous by Capt. P. P. Eckersley, a member of the Society, who eventually became the first Chief Engineer of the B.B.C. It is a fact worth bearing in mind that the R.S.G.B. was responsible for the commencement of broadcasting in the United Kingdom. Another fact which is not generally known is that Mr. Harry Lassman, " Two Pip X " of East Ham, had the honour of suggesting the wavelength (360 metres) to be used by the first London broadcasting station—2LO. A copy of the original letter to Mr. Lassman from the Marconi Company dated May 3, 1922 (now on display at Headquarters.—ED.) is reproduced herein.

The new London broadcasting station designed to operate on high power, superseded the original experimental station at Writtle. Incidentally all London experimental stations were closed down for two evenings in order to allow 2PX to radiate signals to Marconi House without interference.

Royal Patronage

In 1922, during the presidency of Admiral Sir Henry Jackson, K.C.B., D.S.C., F.R.S., the Society came under the gracious Patronage of H.R.H. the Prince of Wales, K.G. (now H.R.H.

* *10 Chepstow Crescent, Newbury Park, Ilford, Essex.*

JULY 11, 1913. ENGLISH MECHANIC AND WORLD OF SCIENCE: No. 2520. 537

THE "SEATS OF THE SOUL."

SCIENTIFIC SOCIETIES.

BIRMINGHAM NATURAL HISTORY AND PHILOSOPHICAL SOCIETY.

ASTRONOMICAL SECTION.

THE LONDON WIRELESS CLUB.

BIRMINGHAM WIRELESS ASSOCIATION.

NEWCASTLE WIRELESS CLUB

THE NORTHANTS AND DISTRICT WIRELESS CLUB.

The formation of the Loudon Wireless Club was announced in the technical Press of the day. This is the announcement as it appeared in the " English Mechanic and World of Science."

The Duke of Windsor). At that time, as to-day, the Society was on very friendly terms with the Post Office and assisted that body in determining who were fit and proper persons to be granted licences. The Society was also able to help in the revision of the transmitting licence. In December, 1922, the first Atlantic tests were organised. Special wavelengths were allocated by the G.P.O. to those selected to take part in the tests.

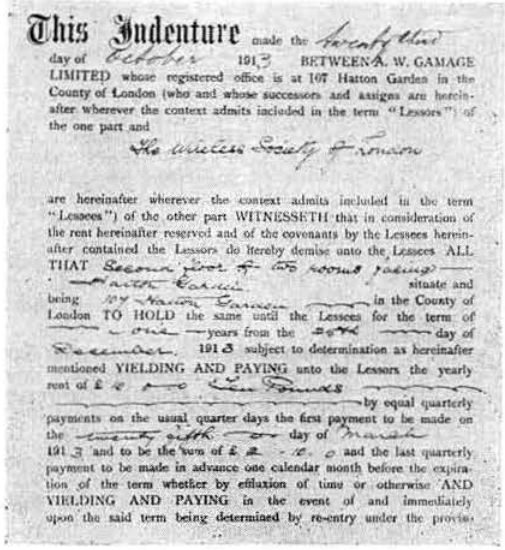
Dr. W. H. Eccles, F.R.S., succeeded to the Presidency in January, 1923. At about that time a number of influential members expressed a desire that the Society should become a professional body but Dr. Eccles steered the Society away from that course.

During 1923 Mr. Frank Hope-Jones, with the assistance of a small Committee which included Messrs. L. F. Fogarty and Hugh Pocock, undertook the laborious task of drawing-up a draft constitution for the Society.

Up to 1923 most of the work of the Society had been carried out at 32 Victoria Street, London, S.W.1, on premises belonging to a member, but as the affairs of the Society became more widespread it became necessary to seek separate accommodation. Accordingly an office was rented at 53 Victoria Street and a paid clerk employed to deal with the rapidly growing business of the Society. This office remained the permanent home of the Society until September, 1939.

During 1923 the number of societies in affiliation had increased to 160, representing in all some 3,000 persons. The affiliation fee at that time was £1 1s.

It is interesting to recall that in the years just after the 1914–18 war any one who wished to set up a receiving station had to make formal application to the G.P.O. for permission and if granted, pay a fee of 10s. for an Experimental Licence. With the advent of the B.B.C. a Broadcast Receiving Licence was issued to those who purchased a set manufactured to the specification of the British Broadcasting Company and which carried the stamp of the Company. This led to the G.P.O. tightening up on the Experimental Licence in an attempt to stop sets from being home-constructed. As a consequence of this action the Society protested vigorously to the Post Office, pointing out that the development of wireless equipment would be retarded if the experimenter was discouraged.



This Indenture made the twenty third day of October 1913 BETWEEN A. W. GAMAGE LIMITED whose registered office is at 107 Hatton Garden in the County of London (who and whose successors and assigns are hereinafter wherever the context admits included in the term "Lessors") of the one part and The Wireless Society of London are hereinafter wherever the context admits included in the term "Lessees") of the other part WITNESSETH that in consideration of the rent hereinafter reserved and of the covenants by the Lessees hereinafter contained the Lessors do thereby demise unto the Lessees ALL THAT Second floor of two rooms facing — Hatton Garden situate and being 107 Hatton Garden in the County of London TO HOLD the same until the Lessees for the term of one years from the 24th day of December 1913 subject to determination as hereinafter mentioned YIELDING AND PAYING unto the Lessors the yearly rent of £ 0 0 0 Ten Pounds by equal quarterly payments on the usual quarter days the first payment to be made on the twenty eighth day of March 1913 and to be the sum of £ 2. 10. 0 and the last quarterly payment to be made in advance one calendar month before the expiration of the term whether by effluxion of time or otherwise AND YIELDING AND PAYING in the event of and immediately upon the said term being determined by re-entry under the provis-

The Gamage Lease, 1913

The helpful co-operation of Mr. A. W. Gamage enabled the Society to establish a Club Room in Central London for the benefit of its members.

It was during 1923 that a Schools Section was formed with Dr. Eccles as its President. The object of the Section was to encourage schools which possessed wireless equipment to arrange inter-school tests, award radio scholarships and encourage students to obtain licences.

At about this time the British Wireless Relay League was absorbed by the R.S.G.B. and a new Section called "The Transmitter and Relay Section" came into being under the Chairmanship of Captain (now Sir) Ian Fraser. Corporate Members of the R.S.G.B. as well as those members of Affiliated Societies could become Members of the Section on payment of a subscription of 5s. for transmitting members and 3s. 6d. for receiving members. Non-members of either body could join on payment of a subscription of 10s. and 7s. respectively.

Marconi House, Strand,
London, W.C.2.

Henry H. Lassman, Esq.,
4 Avenue Parade,
Barking Road, E.6.

May 3rd, 1922.

Dear Mr. Lassman,

Just a couple of lines to confirm my telephonic communication of this afternoon. It has been arranged that you will transmit telephonic speech to Marconi House on a 360 metre wave to-morrow, Thursday, and also Friday, both days from 6.30 p.m. to 6.45 p.m., 7.30 p.m. to 7.45 p.m., and 8.30 p.m. to 8.45 p.m.

With best regards and hoping to see you soon again
I am,
Yours faithfully
(Signed) L. de Sousa.

The T. & R. Section

The T. & R. Section comprised a number of experimenters (mostly young men in possession of a transmitting station) who had banded themselves together to discuss wireless problems of a nature which did not always appeal to the main body of the R.S.G.B.

As mentioned above, a feature of the Section was that it could enlist transmitting amateurs who were not members of the R.S.G.B. Inevitably, an incongruous state of affairs arose, in that some members were paying a subscription to the Section but had no voice in the management of the Society or in the election of officers. Members of the T. & R. Section elected their own Committee while the main body of R.S.G.B. members elected a Council. As the Council exercised supreme power on matters of policy and finance all decisions of the Committee had to be submitted to that body for consideration. At this time the Council consisted of 23 members, four retiring annually. This method of governing the Society continued until 1926, when the members of the T. & R. Section were absorbed into the main body as Corporate Members.

It is interesting to look back now to the bitter controversy that arose over the issue of "fusion."

In 1924 another Affiliated Societies Conference took place, this time to discuss alterations to the rules, with special reference to those relating to the Officers of the Society.

It was during this year that "The Radio Transmitting Society," with Capt. P. P. Eckersley as its President, and consisting of 75 members decided to amalgamate with the R.S.G.B. In February they joined the main body and were absorbed into the T. & R. Section.

At about this time the G.P.O. withdrew permission to use "spark" and prohibited the use of the 440 metre band

during broadcast hours. A new band was allocated—115 to 130 metres. The artificial aerial licence (A.A.) also came into being during this period. This licence permitted those interested in the construction of transmitters to be able to test them out on a non-radiating aerial. At this time open aerial licensees were only allowed to work stations outside the United Kingdom if in possession of a special permit. The Society decided to take steps to get this irksome restriction removed. The *Wireless World* and Mr. Scott-Taggart each offered £500 towards the cost of a test case should the necessity arise. Later that year, however, the G.P.O. granted permission for all licensees to work stations outside the British Isles. The terms of the Receiving Licence were also amended so that anyone could now purchase or construct any type of receiver. The Experimental Receiving Licence then became obsolete.

The " Bulletin " is Born

The year 1925 was a most important one in the history of the Society. Up to that year the *Wireless World* which had been the " Official Organ " of the Society, suggested that it should no longer carry that title. This left the way open for the launching of a project which the members of the T. & R. Section had been agitating for for some time—namely, the production of a Society journal. At a meeting of two or three members in a Lyons' Tea-shop the BULLETIN was born just 29 years ago this month.

The first issue consisted of 12 pages. The Hon. Editor was Mr. J. A. J. Cooper, F.R.S.A. (5TR), who had the assistance of Mr. H. Bevan Swift, A.M.I.E.E. (2TI) and Mr. Gerald Marcuse (2NM). Having been projected by the T. & R. Section, the Journal assumed the title " T. & R. Bulletin of the Radio Society of Great Britain." The editorial office was originally at 1 Montreal Road, Ilford, but was moved later to the Society's Headquarters at 53 Victoria Street.

The *Wireless World* carried the last notices of the Society in its August, 1925, issue, and we owe it a considerable debt for its loyalty and generosity over the previous 12 years.

(To be continued.)

Ionospheric Research

AN annular eclipse of the Sun is due to take place in South Africa on December 25, 1954. In connection with this phenomenon radio amateurs and short-wave listeners throughout the world are invited to co-operate in experiments which are to be carried out by the Ionosphere Research Laboratory, Department of Physics, Rhodes University, Grahamstown. The Laboratory will study the effect of the eclipse on the ionosphere and if conditions will permit, through the medium of Amateur Radio, will observe its effect on long distance radio communication.

Readers who are prepared to take part in the experiments are asked to write to A. P. Dale (ZE4JC, ZS2JW) at the address given above so that the letter arrives before October 1, 1954. Special Report Sheets will be forwarded, on which collaborators will be asked to fill in details of the strength of signals received from ZS2RU. That station will be operating simultaneously on 7, 14 and 21 Mc/s during the eclipse.

Helvetia XXII Contest, 1954

THE leading Swiss station in the Helvetia XXII Contest, 1954, was HB9EU with a score of 118,650. The leading Canton was Zug with a score of 207,066. DL3EV (5994), PA0TAU (5643) and SM3AKM (5544) led the European entries. The top U.K. competitor G2WQ (882) finished 45th, followed by G3IBG (722) 49th, G4TM (558) 55th, G3BDS (545) 56th, G4XC (312) 63rd, G3HTW (200) 68th and G8TS (108) 72nd. FA8DA (5757) made the highest score among the entrants from outside Europe.

U.S.K.A. thanks all who helped to make the Contest a success

Yugoslav Convention

THE Yugoslav National Amateur Radio Society (S.R.J.) is to hold a Convention in Ljubljana, Central Slovenia, from August 19 to 23, 1954. The programme will include a Morse Code contest, a DX Fox Hunt (simultaneously on 2 and 80 metres), a home constructor's competition, a competition for the best design of QSL card and an exhibition of caricatures from life, of radio amateurs. There will also be a novel competition for licensed operators. Each competitor will be allowed to operate the Convention station for 30 minutes, during which time he will try to work as many DX stations as possible. The winner will be the person whose sum total of distances worked is the highest.

The organisers hope that a great many amateurs from other countries will support this Convention further details of which can be obtained from Savez Radioamatera Slovenije, Ljubljana, Lepi Pot 6—P.O. Box 180, Yugoslavia.

Technical Training Display at the Radio Show

THE Technical Training Display at this year's National Radio Show will include exhibits showing machine-shop practice, components, glass manipulation (including build-up of valves and cathode-ray tubes), circuitry, aerials and finished products. Test gear, such as oscilloscopes and pattern generators, will be in operation.

Other features will include a film made by English Electric Co., Ltd., showing training in the radio and electronics industry and a watt meter for the measurement of micro-wave power by radiation pressure, exhibited by University College, London.

The Technical Training Display will face the Society's stand (No. 209).

R.A.F. Reserve Flights

THE Air Ministry announce that arrangements are being made for the formation of Reserve Flights at certain R.A.F. stations in the United Kingdom.

An important feature of the scheme is to encourage ' G ' reservists who have no training liability, to volunteer. A ' G ' airman reservist in a Reserve Flight who joins the R.A.F.V.R. and carries out 15 days annual training will qualify for annual bounty. Inquiries from individual ' G ' reservists should be addressed to the Air Ministry (O.A.R.) in the case of those with previous commissioned R.A.F. service, or to Air Officer Commanding, R.A.F. Record Office, Gloucester, in all other cases.

" The Model Engineer " Exhibition

THE *Model Engineer* Exhibition, to be held at the New Horticultural Hall, London, from August 18 to 28, will be opened by H.R.H. Prince Bernhard of the Netherlands, who is flying to England specially to perform the ceremony.

A new award—known as the " Duke of Edinburgh Trophy " (to commemorate the opening of the Exhibition by H.R.H. The Duke of Edinburgh, K.G. in 1952)—will be presented during the period of the Exhibition.

Marconi (Basildon) Amateur Radio Club

THE official opening of the club premises of the Marconi (Basildon) Amateur Radio Club will take place at 2.30 p.m. on August 14. A full programme of competitions, sweepstakes and demonstrations and an exhibition of radio equipment has been arranged to follow the opening ceremony.

Tickets, which cover the cost of a running buffet, may be obtained, price 2s. 6d. (children 7–14, 1s.), from the Hon. Secretary, E. F. Slee, c/o Marconi's Sports and Social Club, Marconi's Wireless Telegraph Co. Ltd., Basildon, Essex.

TWO METRES AND DOWN

BY W. H. ALLEN, M.B.E. (G2UJ) *

IT has been considered for some time that *Around the V.H.F.s* does not fully convey the scope of this feature. Commencing with this issue, therefore, a change has been made to the present title.

This is an appropriate moment to remind readers that, although the majority of our news is concerned with the 2 m and 70 cm bands, reports of work on the other u.h.f. bands are always welcome.

It is hoped to stage a special display of amateur apparatus for the u.h.f. bands at the Eighth Annual R.S.G.B. Amateur Radio Exhibition to be held in London during the week ending November 27. Those willing to loan equipment are invited to get in touch with C. E. Newton (G2FKZ), 105 Underhill Road, London, S.E.22, who is arranging the display.

Shetland Stations on 2 m

During the evenings of June 3 and 4 some interesting G-DX contacts were made from Shetland on the 2 m band. Around 1900 B.S.T. on the 3rd **GM3ANG** (Sumburgh), using 28 watts to an 832 p.a. and a 4-element Yagi, on 144.18 Mc/s, worked G5YV (Leeds), RST589 reports being exchanged.

The following evening GM3ANG did even better, raising six stations—G6XM (York), 5BD (Mablethorpe, Lincs.), 6XX (Goole, Yorks.), 6LI (Ludborough, Lincs.), 2FJR (Sutton Bridge, Lincs.) and 3CCH (Scunthorpe, Lincs.). Signals from the south averaged S6 with G6LI up to RST599 at times. GM3ANG's reports were S5/6. The latter station did not fade out at G5BD until 2130 B.S.T. and for the last 30 minutes 5BD was S8 on 'phone in Shetland.

While this was going on **GM3HGA** (Lerwick, 144.1 Mc/s approximately) hastily erected a 4-element beam but unluckily his newly-built transmitter developed a fault which reduced its output to around one watt. However, G5BD (RST579) was raised at 1930 B.S.T. for a report of RST549. Later G6LI replied to a CQ call at RST599 giving a report of 559. Soon afterwards G2FJR was heard at RST579 but not worked. G5BD was logged at midnight on June 5, but since then no signals from outside Shetland have been heard by either GM3ANG or GM3HGA. The distances involved are approximately 500 miles to G5BD and 550 miles to G2FJR.

Other 2 m News

On June 3 **G5YV** found that the Newcastle Police link station on approximately 146 Mc/s was 40db over S9 instead of its normal S4 and a search was commenced for northern DX. As reported above, GM3ANG was worked, both 'phone and c.w. signals being S8, but by 1950 B.S.T. had dropped to RST439. The Police transmitter was then down to 5db over S9. Next evening when GM3ANG made six contacts with G stations, he was only just audible at G5YV.

GW5MA/P was again active in Wales on June 5 from Mynydd Llanybyther, Carmarthenshire. Operations commenced at 1300 B.S.T. but the first station, G3FAN (Isle of Wight) was not contacted until 1640 B.S.T. Between then and 0120 B.S.T. the following morning 19 other contacts were made, the best being with G6RH (Bexley, Kent) 191 miles, 8OU (Ashtead, Sy.) 174 miles, 2AHP (Perivale, Middx.) 170 miles and 3DJX (Wheathamstead, Herts.) 165 miles. A number of stations in Devon were also worked. Operation was impossible on the Sunday owing to very bad weather conditions, the first time that G5MA has been kept off the air from this cause during his numerous portable sorties: quite a tribute to the British climate.

G2FJR (Sutton Bridge, Lincs.) is generally on 2 m between 1230 and 1300 B.S.T. but very few stations seem to take advantage of this period although, judging from certain commercial signals, the band is often in good shape at that time. G2FJR's frequency is normally 144.57 Mc/s, although a crystal for 144.07 Mc/s is also available. He would be pleased to see any amateurs who may be posted to the R.A.F. Station, Sutton Bridge. New arrivals on the band in the area are G2AXQ (Wisbech), 3GPQ (Boston) and 4LO (Thetford, Norfolk).

G5MR (Hythe, Kent) is often on 2 m between 1830 and 1930 B.S.T. but seldom hears any signals apart from weak 'phones which would be fully readable if keyed. Quite frequently conditions deteriorate rapidly at nightfall, about 2230 B.S.T. at the moment. French stations are often strongest between 2000 and 2200 B.S.T.

G2CZS (Chelmsford, Essex) found conditions to be good on May 31 to the west and south-west and worked G3FAN, 4HT, 4SA, 5TZ/A 5YK and 6XH. Stations towards the north were best on June 2 and 3 and contacts were made with G3CCH, 5BD and 6XM. G3CRH (Litchfield) was called without success. **G6XX** (Goole, Yorks.) wishes to arrange a sked. with stations in Northern Ireland, preferably on Thursdays. **CN2AP** (ex-G2CIW) left Tangier on July 2 and hopes to be in this country for a time. CN2AO has been heard on 2 m by CN8BE in Casablanca.

G3IUD (Wilmslow, Ches.) has exchanged signals with G3FRY, 5TZ/A and 8OU but has so far failed to raise G2BBN, 3DJQ, 3FUM, 3GVC, 3HTY, 3IGK, 5DS or 5UF, although all are well received. **G3EMU** (Canterbury) experienced poor conditions generally between May 13 and June 9 with the exception of May 31 when both British and Continental signals came in well. Among the stations worked during the period were G2CZS, 3ANB, 3BSU, 3DIV, 3INU, 6AG, 6LL, F3LQ, F8KF and PE1PL. **G3DO** reports that G2COP/P (Caernarvon) spent 11 hours on the band during four days at Whitsun but heard nothing whatever.

G2ATK/M is now active on 2 m with 10 watts input to a pair of 6C4s. The receiver is a double superhet and the aerial a 19in. whip. While operating from Stanmore Hill (N.W. London) recently he received a report of 20db over S9 from G5TZ (Isle of Wight).

BRS19162 (Dewsbury, Yorks.) is using an R.S.G.B. 2 m Converter and finds it satisfactory although his site, hemmed in by hills in most directions except towards the south, makes the reception of 2 m signals rather difficult. G3CCH and G5BD have been heard. Local signals coming over the hills are often better on a vertical aerial.

GC2FZC reports that the best evening of the month in Guernsey was the 16th, G2BMZ and G5TZ being particularly strong. Among the stations worked by 2FZC are

* *32, Earl's Road, Tunbridge Wells, Kent.*

G2DGB, 2DVD, 2UN, 3AGA, 3CYY/P, 3FMO, 3JGJ, 5TZ, 6NB, GW8SU and F9JY. Stations heard and called were G2BMZ, 3CQC, 3FAN, 3FIH, 5NF, 5US, 6RH and 8OO.

G3CCH has made contacts with 15 Regions on 2 m, and is now using a 12-element bi-directional stack on 70 cm. Improved results on both bands have been obtained by considerably reducing the length of the feeder from the transmitter to the aerial.

TVI in reverse is a problem with **G3BW** (Whitehaven, Cumbs.) who finds 2 m virtually unusable during TV hours. Unstable TV oscillator harmonics are spread out over the band because some sets are tuned to Holme Moss, others to Kirk o' Shotts and yet another batch to the new TV station in the Isle of Man. Despite this, G3BW now has 13 Regions to his credit on 2 m and would have another if he could raise G6RH, who is often heard at good strength. G3WW was worked on June 17, S4 both ways, for the first time in two years. Skeds. with stations in Suffolk and Cornwall would be appreciated.

G3WW (Wimblington, Cambs.) now has two pairs of skeleton slots in operation which should add another 3db gain to the 10db which a single pair show over a dipole. GM3EGW was heard working G5BD on June 17; 3WW understands that his calls were heard by the Scottish station a little later. **G2XV** heard an LX1 on the band on May 30, probably LX1MF.

G3JGJ is only two miles from Dartmoor and suffers a certain amount of screening between east and north. He has worked a French station at La Rochelle with a report of S7 and has had an S9 report from G5TZ/A. GW5MA/P (Carmarthenshire) was S5/7 on June 5 but was called without success. F9JY was RST569 on the following day and on June 13 G2BBQ/P (nr. Dorchester) was RS58. Next day F3ER was RS59 when working G5TZ/A and 6NB between 2130 and 2200 B.S.T.

Two Metre Portable Site

Reg Wordsworth (G3JGJ) of Plympton, Devon, has space for caravan or tent in a secluded field with facilities for repairs, and battery charging, etc., near at hand and offers these amenities to touring v.h.f. enthusiasts. Those wishing to take advantage of his generosity should write to Boringdon House or 'phone Plympton 3054.

News from Ireland

Until the end of September **EI2W** will be conducting tests with Finland whenever conditions in that direction appear favourable for 2 m operation. EI2W listens at 1930, 2030, 2100 and 2130 G.M.T. and calls "CQ Finland" on 144.10 Mc/s for the next five minutes in each period.

Conditions were not good during most of the period May 13 to June 17. Early on June 2 G2FJR and 6NB were heard and that evening GW2ADZ was exceptionally strong together with G5TZ/A, 5YV, 6NB and 8OU. When G2DVD (Sussex) visited EI2W on June 1 it was possible to demonstrate to him that Lancashire stations really were on the band and moreover put excellent signals into Dublin.

GI3CWY (Whiteabbey, Co. Antrim) is now on 2 m.

European V.H.F. Contest

This event will be arranged this year by our Swiss friends of U.S.K.A. and take place on August 28/9. Rules will appear in the August issue.

Seventy Centimetres

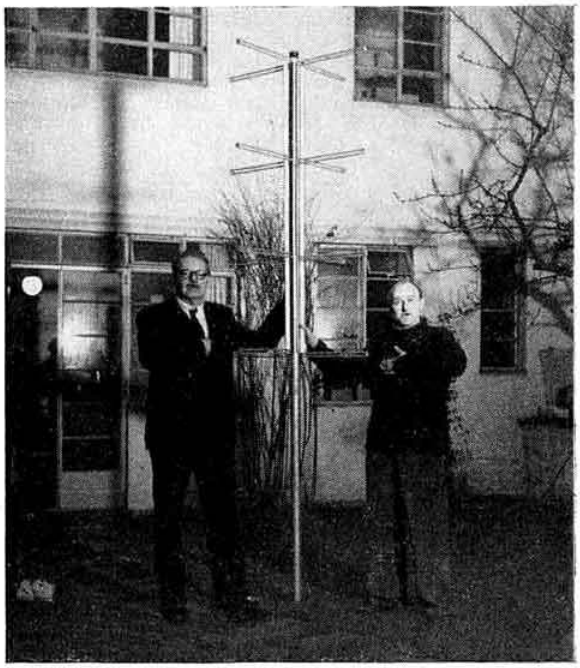
It is planned to publish an up-to-date list of stations operating on 70 cm together with their frequencies. Details are therefore requested as soon as possible so that a start may be made in compiling the list.

G5YV has worked G2WJ (Great Canfield, Essex) for his best DX to date and has heard the third harmonic of G3WW's 2 m signal. Skeds. have been arranged with G2DD and G2DDD for 1000 B.S.T. on Sunday mornings and on Tuesdays and Thursdays at 1900 B.S.T. G5YV will call these stations for five minutes on 433.2 Mc/s. with an r.f. output of 15 watts into a 16-element stack 75ft above ground. Reports from other southern stations will be appreciated.

During the recent R.S.G.B. 70 cm Contest, **G3IUD** (Wilmslow, Ches.), on 433.5 Mc/s, worked G3AOO 3BPJ, 3DA, 3GMX and 3IOO. Input was 3 watts to a CV53 p.a. and 6-element Yagi beam at 30ft. The c.c. converter employed a 446A r.f. stage, CV58 thermionic diode mixer and two i.f. amplifiers into an AR77 tuning from 20 to 26 Mc/s.

In the same event **G3GMX** (Timperley, Ches.) worked six stations within a 30-mile radius—G3AOO, 3AYT, 3BPJ, 3DA, 3IUD and 5YV—with a 6-element Yagi fed by an 832 tripler and a converter consisting of a CV53 r.f. stage, 1N21 crystal mixer, 6AC7 i.f. amplifier and c.c. oscillator. He feels that the time required to search this wide band adequately for weak signals turns DX operation into a matter of pure luck and is in favour of set ting aside a segment of the band, say, 100 kc/s wide, or even a single frequency for calling purposes. This suggestion has been discussed by, among others, the London U.H.F. Group. The consensus of opinion seems to be that it would work only so long as stations, having contacted one another, would risk shifting frequency with the possibility of losing one another. Otherwise, with a spot calling frequency, QRM would replace the present " needle in a haystack " procedure.

We realise that mention of v.f.o.'s is anathema to many v.h.f. and u.h.f. operators, but it does seem that the problem has much in common with that which existed on the lower



Omni Directional 2m Aerial

Built by Harold Chorley, G5YH, to a design by C. E. G. Bailey, M.I.E.E., this array consists of 8 folded dipoles arranged to form two interlocking spirals with the driven elements co-planar. The central mast forms one side of each of the four sets of feeders, the "outers" being of aluminium channel. As the impedance of the dipoles varies up the stack these channel members are spaced at various distances from the mast to achieve correct matching. Apart from the specially made aluminium channel, there are 108 hand-made washers in the aerial and all the self-tapping screws were chromium-plated on copper. G5YH is on the right.

frequency bands when the majority of stations were crystal controlled. The advent of the v.f.o. enabled contacts to be effected without searching the whole band and trying to sort out the answering station from a lot of other signals. On 70 cm at the present time it is a case of sorting out the answering station from a lot of nothing!

EI2W will operate the following sked. from July 10 to 20 inclusive, on a frequency of 434.727 or 432.3 Mc/s:—

Listen from 1345 to 1400 B.S.T. and 2245 to 2300 B.S.T. and transmit from 1400 to 1415 B.S.T. and 2300 to 2315 B.S.T. Stations wishing to arrange skeds. for others times should advise EI2W of time and frequency.

G5UM (nr. Knedworth, Herts.) is on the band every Monday at 2000 B.S.T. **G2DD** worked PE1PL on several occasions during the month and on June 18 their contact was on 'phone both ways. **G3JMS** (Welwyn, Herts.) will be on 70 cm shortly.

GW2ADZ (Llanymynech, Mont.) is on the band daily and calls, beamed on London, are made from 2000 to 2005 B.S.T. During the past month he has logged G2WK, 3AOO, 3BKQ, 3CCH, 3DA, 3IOO, 5YV and 8KL on 70 cm. GW2ADZ will be leaving his present location before September and suggests that anyone wanting the country or county on either 2 m or 70 cm had better hurry. He is available most evenings between 1900 and 2100 B.S.T. and on Sunday mornings.

G3HBW (Wembley, Middx.) is engaged on an extensive re-build of his 70 cm station. On the transmitting side he now has an ACT22 (CV257) p.a. giving between 50 and 80 watts output. The p.a. is driven by a QQV06–40 buffer amplifier which is in turn driven by a similar valve as tripler from an 832 in the output stage of the 2 m transmitter. Amplitude modulation of the ACT22 has not been successful and the possibilities of n.b.f.m. are being investigated. In the converter a DET24 r.f. stage now precedes the p.p. crystal mixer. During the 70 cm Contest G2DDD (Littlehampton, Sx.)—the only distant station worked—was RST589 and RS57/8, 3HBW's report being RST579.

First Two Metre Field Day, 1954 G3DVQ/P manned by G3DVQ, G3GHI and G8PB.

Conditions were poor at the time and both ends of the 50 mile path are badly screened. On the Sunday morning G2XV (Cambridge) and G3BKQ (Blaby, Leics.), both of whom were coming in at RST569, were called for some time without success.

London Area 70 cm Activity Report

G2RD (Wallington, Surrey) reports as follows:—G2DD (434.82 Mc/s.), 2HDY (435.0), 2RD (435.53), 3FP (434.95), 3MI (434.13), 3IRW (434.4), 5DT (434.82 and 436.02), 5UM (434.37), 6NF (435.5), 8SK (435.15 approx.).

The Two Metre Regional Ladder

The final placings in the Ladder for the year ending June 30, 1954, will appear in the August issue of the BULLETIN.

* * *

Correspondents are thanked for the many reports received this month. The closing date for the August issue will be July 20.

Around The Trade

A NEW beam tetrode likely to be of interest to radio amateurs is now available from Mullard Ltd. Known as the QV06–20 it has an anode dissipation of 20 watts and is intended for operation at full ratings as a power amplifier at frequencies up to 60 Mc/s and at reduced ratings up to 175 Mc/s. A single QV06–20 in class C will deliver 69 watts at 60 Mc/s while at 175 Mc/s it will deliver over 30 watts output at an anode voltage of 400. A pair in class AB1 will give an audio output of 120 watts. The mutual conductance is 7 mA/V.

The valve has an international octal base and is a direct replacement for the American 6146. It is expected to cost in the region of 25s. and should prove a welcome addition to the Mullard range.

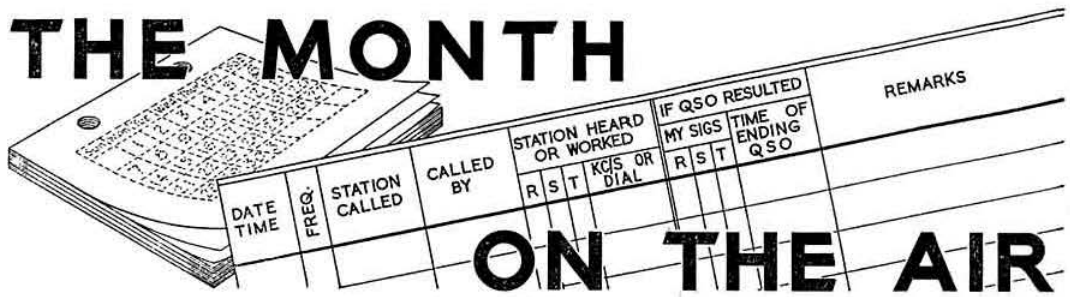
A complete series of both directly—and indirectly—heated sub-miniature valves has been added to the Mullard range, including the DC70, a directly-heated triode capable of operating efficiently as an oscillator at 500 Mc/s and the DL73 battery pentode which will deliver well over 1 watt at 200 Mc/s under class C conditions. In general, the heater consumption of all these sub-miniatures is lower than that of comparable miniature types. Type EF72, for instance, has similar characteristics to the EF95 (6AK5) but a heater rating of 6.3V, 0.15A. Other types in this series include a high-voltage rectifier, a voltage stabiliser and several low-power u.h.f. amplifier and oscillator valves.

* * *

A WELL-PRODUCED six-page brochure describing their transformers can be obtained on application to Radford Electronics, Ltd., 149 Newfoundland Road, Bristol 2. The range is particularly interesting in that the h.t. output rating is specified instead of r.m.s. voltage and current, as is generally the custom. As the d.c. regulation, in volts per mA, is also quoted the actual output under varying conditions can be calculated. Each transformer is permanently marked with relevant information and is guaranteed for two years.

CT1YA in England

WELL-KNOWN Portuguese YL operator, Maria A. V. M. Monteiro (CT1YA), is now in England with her husband, CT1JM, who is practicing at Moorfields Eye Hospital. In connection with their visit Mr. A. C. Yates, (G3FMY), will be glad to hear from members in and around London who are willing to extend hospitality to Maria and her husband. Mr. Yates, who can be reached by telephone on HILside 6994 (home) and VICtoria 2366—Ext. 139 (Office), is acting as P.R.O. to CT1YA and CT1JM. The latter's visit to England has been sponsored by the British Council.



By S. A. HERBERT (G3ATU)*

THE month under review has been very much a high-frequency band affair. Twenty started off with long periods of extreme short skip, with the band full of strong local signals, which made DX chasing hard work. Later, the skip lengthened and Japanese and other Far Eastern stations were consistently audible in the afternoons, with western signals rolling in until late at night. Fifteen openings were rather more frequent, although the band is suffering still from lack of activity.

The Ten Metre Band

The high-light for many was the behaviour of the ten metre band, which produced large numbers of Europeans and a little genuine DX—the first that many people had ever heard on the band.

G3CMH (Yeovil A.R.C.) worked CX4CS, VQ2DT and Europeans. **B.R.S. 7594** heard the CX, some LU's and W4FT—all on phone—between 2130–2200. **B.R.S. 20133** heard seven European countries besides LU3AAE and 6AB, while **Dick Poppi (Associate)** logged phone from CX4CS, LU3AAT and LU9DJR—his first 28 Mc/s DX in over three years. It seems the band will pay for watching.

Fifteen Metres

B.R.S. 7579 sends news that U.S. stations are now allowed to operate Maritime Mobile on fifteen. He has already heard W2ZXM (ss. *Flying Enterprise II*), W2NXO (off Tanganyika), W3CHZ (ss. *Atlantic Traveller*) and W4DGW (s.s. *Del Campo*). A few W1 and 2 stations came through between 2130–2200 and other phone DX was from CE, CR6, CX, EL2X, HK, HP, KP4, KV4, OA4EU (2240), VP5SC (2150), VP6, VQ5, ZS and ZD4BL. **G3CMH** worked CR6BH, KP4, KV4BD, VQ4AQ, K2BJB/MM and W3CHZ/MM (s.s. *Atlantic Traveller*, off Venezuela). **Dick Poppi** would like to see more c.w. activity on the band. His recent catches—all on phone—include CR6, CX, LU, PY, KG4, VQ2DC and, at 2300, W6DOW/MM—in the Pacific, off Salvador.

B.R.S. 20106 pulled in c.w. signals from OQ5RU, EL2X, OX3AB, VP6CJ and ZC6UNJ and phone from OQ5GU, ZD4BL, VQ4, ZS and also from Central and South America. He remarks that, for a time, things were so poor that even his two most vocal locals went all quiet—waiting for the short skip to end!

Twenty Metres

Conditions have to be very bad before interest wanes here. Happily, fairly good spells and a little exotic DX have combined to produce a sizeable batch of observations. **G3AAE,** active again on 14 c.w. after a period of nearly six years off the air, has rebuilt and appears to be free from TVI, rather to his surprise. (Good show, nevertheless). Prominent amongst the DX worked are VS6CT, YV, JA, T12WR, YS1O (2215), CT3AB, LU0BZX, HK, ZC7DO, PX1AR and VR1UX. The last two deserve further comment: PX1AR asks for QSLs via W4BRB; VR1UX faded out after a very short spell, the time being 0955. (Anyone know anything?) '3AAE is in the tantalising position of having 39 zones confirmed—40 worked and QSLs missing from several Mexicans. He wonders if anyone can put him on to an obliging XE. G3ATU's collection suggests XE1AC, XE1LA or XE2OK as good bets. The trouble these days is hearing them!

GM2DBX who worked phone from HK1DZ, VP9L, CO2MG, ET2ZZ and OA4AI says he would not object to QSOs with ZD1DO, VP2DL and F9UC (Corsica). A QSL from the last-named country would satisfy his territorial claims in Europe! Recent QSLs have arrived from SU1MQ, ZD4AH, YI2AM, HK4FV and CR9AH (Joao Pires Antas, Oficinalis Navais, Macao).

G3HCD announces quite calmly the arrival direct of a card from UB5CF, in return for one sent to Box 52, Odessa. So there you are! '3HCD is doing well with a ground-plane aerial and has worked FY7YC, VK9AU (1250), CE3RE (0630), VQ3EO, CR9AH (1420), YK1AH (0850), EA9DF, CX and CP3CA (2300).

G3JWW, too, has a QSL from UB5CF, together with an air-mail letter. Good news, this, for those needing UB5 and it *is* pleasant to know that communication is possible—at least with a few such stations.'3JWW has reached his century, thanks to VS6CT, VP7NM, LX1AB. He still needs W7, but did work LU, PY8MO, PJ2AJ, ZE3JO, 5JL, CR6AI, CR7AF and FF8AM. Unfortunately, CR9AH, JA, MP4BBL, YN1AP (0005–14010) and XE1SA (2330–14060, calling CQ Europe) escaped. **G3ATU** heard VS4RO being called during the afternoon of June 6 and was lucky enough to work him later, when '4RO was on the point of closing down. Nothing further has been heard of him at 'ATU, but he *has* been active from VS5 (Brunei) and should be signing VS6RO when this issue appears.

B.R.S. 18017 heard three new ones, in VS5RO, VS6CW and CR10AC—(the latter could be interesting but time alone will tell), FI8AP, KR6MC, 6OL, ZC6UNJ, EA6AW and LB8YB on c.w. with VP2AA, VP5AK, HP, VQ2 and FF8BJ on phone. He mentions TO1AK, repeating his call clearly several times! **H. J. Hill** advises keeping an ear open for ZD3BFC (G3BFC) on 14,000, 14,006 and 14,140 kc/s and says AB1US (Formosa) has a sked with CN8MM each Sunday afternoon on phone. Phones heard include KA and JA, KR6KS, M1B, ZP5CF, YS1MS (2130), HZ1AB, TI3LA and a near " HABC " during short skip sessions. Short skip showed up some messy operating—an example being KA9MF calling " CQ DX " and being ignored by DLs, I1s (and Gs?) doing the same around him. Harry wonders if there is any current KM6 activity; KM6AX is certainly around, but mostly, if not exclusively, on c.w.

Ron Goodman (Associate) still pulls in phone DX on his 0–V–0: CO2VW, CE, CP5EK, FM7WN, HC1FG, HR1AA, VP2AY, YS1MS, OA4M, KA, KR6 and ZD4AX are a sample. **G. Heslop** (A1167) who helps as second operator at

G3AFL, logged c.w. from CR4AD, CR7AF, EL2T, ET2PA, FI8AP, lots of JA and KA, KH6, KL7, VU2JG, 2KV, VE8MA (Eureka Sound), VE8SO (Fort Reliance) and ZL2FA to make his 1954 score 120 countries in 34 zones. **J. Oxley,** *using a domestic receiver,* pulled in phone from CT3AN, SU1MR, FF8AP, VQ2FU, OQ5, CP5EK, PJ, CR4AP, CE5GA, YS, KX5 and lots of PYs and Ws.

P. M. Crawford heard some good phone DX, including AC4NC (14135), VK9OK (Norfolk Is.), VK9YT, DI9AA, CR4AP, KR6OY *and* VS5RO. C.W. catches were T12TG, AC4NC, I5SM and VP8AJ. He hears from ZL2QI that VK4BQ has bought a trading store in Rabaul and will be active as a VK9 soon. **B.R.S.19894** overheard CE3AG saying that Easter Island activity was temporarily at a standstill owing to trouble with the gasoline plant. JA and KA were strong c.w. signals, together with I5, VS6, ST and KH6. KG6FAA and XE3ZF were new ones and one evening a loud C6CP was calling C6CK (Hmm!). On phone, '19884 picked up VE8ML (Ellesmere Is.), KL7FAK, HZ1AB and W6.

B.R.S.20106, surrounded by sundry noisy activities, dug down through the ever-increasing mass of commercials for some hard-earned c.w. He mentions the strong JA and KA signals and heard some KH6s, MP4BBE, 4BB1, PX1AR, ST2ZO, 2NG, LU0BAX, VE4RO, 5RI, 6WW, 6ZR and 7ZK, ZP8AY and ZD6BX. He is doubtful about VR1A (heard briefly at 1720) and has heard VR3A being called in the mornings (VR3A is genuine enough, but local static has so far prevented him hearing a single European). OH2ZE/0 and OH2LX/0 were on Aland Is. but are now back home. XA1AB would seem worthy of being ignored by one and all! On phone, N. C. Smith heard two noteworthy ones in VE5RN (0615) and TG9AL (2300). Another interesting signal was W7KTG, S6, using only 11 watts to a ground-plane). **Dick Poppi** is still looking for Pacific DX and logged on c.w. some ten JAs, KL7AWB, 7FAK, FI8AP, KH6, ZP and VS6CW. **B.R.S. 7594's** phone log shows EL3A, KH6QU, MP4QAH, PJ2AG, VP5DX, VU2EG, ZC7DO and much of the commoner DX, while **G3CMH** worked the ZD7 and, on the key, CO7AH and FF8GP.

B.R.S. 20133, concentrating on phone, settled for FM7WN, KA2AK, KR6OY, VP3HAG, VP5AK, ZC7DO and 9S4AD.

G3JTH (W. J. G. Hector, Longras, St. Mary's, Isles of Scilly) is now active on 7 and 14 Mc/s c.w.

Forty and Eighty Metres

The only 40 metre report comes from **G3JWW,** who worked FY7YC (a new one), YI1TR, ZS2JB (G3HHU), ZE5JJ, CR6AI, CT2BO, FF8AM and VO3X on c.w. Some good ones heard were CE2GG, KP4, VP9GX, EA0AC, CO and CM. The band is apparently still far from dead!

Although eighty doesn't appear to be doing so well **GM2DBX** was well satisfied to work OY2A on phone. A QSL resulted, which never did happen on 14 Mc/s, even after two years of effort!

Overseas News

G2DPY passes on the good news that VQ4EI will be on holiday in Zanzibar from July 22 to 29. He will operate, probably as VQ1AC, on 14 Mc/s c.w. only, using 10 watts to a crystal-controlled transmitter. Calls *on* the frequency will be ignored. '2DPY himself worked XA1AB (mentioned previously), who gave his QTH as Rhodos Is.—QSL *via* R.E.F. (Quite!). **K. G. Cass** (ex—G3GLO), now in Lebanon, has been allotted the call-sign OD5BH and will be active shortly on 14 Mc/s, phone and c.w. He will run 100 watts to an aerial on the roof of a six-storey building. The licence proved difficult to get, but was finally approved by the President himself, so all is now well! **VQ4EG** (ex-MI3TM) finds static very troublesome, even on strong signals, but he has worked some JAs, and W6MBA (0530). He would like to hear from Bert Verinder (ex-ZC4HV, MI3HV, etc.), who should write to Box 4383, P.O., Westlands, Nairobi. '4EG QSLs all contacts and is glad to confirm reports from listeners. **G3IUU,** now active on twenty from the Canal Zone, using the call MD5BY, is looking for Gs. In the same QTH are MD5FX and SU1MK (G3IGU). **VE3DAU** (ex-GM3ASY) is on 3.5 and 7 Mc/s, phone and c.w., using 300 watts. He will soon also be on 14, 21 and 28 Mc/s.

G2MI passes on the news that the A.R.R.L. are adding the Archipelago of San Andres and Providencia (HK0) to their Countries List. The designation applies to islands partially or wholly under Colombian control, between 12–14° N.Lat. and 75–78° W.Long. DXCC credit will be given as from September 1, 1954, for confirmations dated on or after November 15, 1945.

Of particular interest to operators of N.F.D. portables is this list of stations heard in Oslo by **Sqn. Leader A. R. Gilding** (ex-G3GZP). On Top Band: G8JO (the best signal), G2AAS, 2GA, 2FT, 2ZR, 3JJD, 3ELJ, 3NT, 3MA, 5PP, 6MN, 8NN, 8AW, GM6RI, 3CAR and GW5BI. On eighty metres: G3FZP, 5IV, 5RI, 5SK and GM3GFO. DL2RO/P, DL9MX/P and ON4SW/P were also logged.

G3BID has suffered damage to his rig due to a fire (unconnected with radio) in the same room. He will rebuild of course and will meanwhile be active at weekends as G3BID/A.

W4CEN suggests that Europeans should try for VR3A around 0700 on Sundays. This is one of the few times when the man-made static level is low enough to give him a chance of hearing us. About the time VS4RO departed for pastures new, a " phenomenon " came on 14 Mc/s signing AC4RO. He had a horrible chirp, a Rate 1 drift and was heard working Europeans, most of whom took him at face value. We can't imagine many Gs being taken in, but if any were—well, QSLs cost money!

The West Gulf DX Club's *Bulletin* details the following snippets. *Via* KV4AA: VU7BX will soon be on Diego Garcia Is. as VQ8C. TI9UXX will again visit Cocos. No exact date yet. X1NP (who is on board ship) speaks of land-based operation on Timor (could that be CR10AC?). KB6AQ, AB1US, KW6BB, KM6AX, KJ6FAA, FK8AL, KX6AF, KJ6AZ, VR3A, KJ6AI, KA0IJ, VR2BX and YJ1AA are all workable in the West Gulf (W5) area on 14 Mc/s c.w. Oh, for a change in conditions.

Navassa Island

KP4JE states that the expedition to Navassa (KC4) timed for June had to be postponed, due to landing difficulties in the present unfavourable tidal conditions. W2COK and party hope to make the trip during October. KP4JE has often flown over the island—whose lighthouse is fuelled from Puerto Rico—and himself has ambitions to operate from there. It may be that he will get there first.

* * *

So ends yet another month. Keep up the good work and please send your news and comments to arrive as usual by the 20th of the month.

Good hunting and 73.

First Mobile Licences Issued

MOBILE licences have been issued to G2QL, 4CG, 5AU, 5CV, 5HK, 5LJ, 6UC, 8BV, 8DF, 8TL, 2ACT, 2BXP, 3AMM, 3BLE, 3BVP, 3FVP, 3GJW, 3IVP, GM3AEI, 3DSD.

Region 1 Field Day

THE Annual Region 1 Field Day—which will take place this year on August 29—is open to small individual groups as well as to organised Town Groups and Affiliated Societies. A copy of the rules can be obtained on application to the Regional Representative, B. O'Brien (G2AMV), 1 Waterpark Road, Prenton, Birkenhead, Cheshire.

Amateur Television

By M. BARLOW (G3CVO)*

LIKE the Amateur (Sound) Licence, the new Amateur (Television) Licence is notable for its lack of unnecessary restrictions. In particular, Morse is no longer required if the licensee wishes to transmit only television signals. Unfortunately, as no sound channel has been granted, the licence is not really a very practicable proposition. The extra fee (£2), in addition to that for the Sound Licence for those who want it, makes the hobby a rather expensive pastime! The R.S.G.B. have these points in mind, and will no doubt raise them in due course with the G.P.O. Whilst on the subject of licences, news is to hand that German amateurs are now permitted to transmit vision signals on 445 Mc/s with a peak power of 20 watts, the sound being transmitted 5.5 Mc/s lower on 439.5 Mc/s, *i.e.*, in accordance with Continental standards.

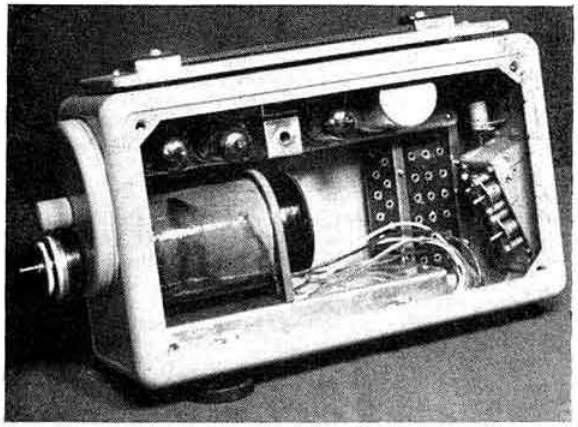
Notes and News

G2WJ/T has now installed a giant 70 cm array in the form of a 64-element stack. This, fed from the QQE06/40 air-cooled p.a. with a new high-power modulator will give no-one in the Home Counties an excuse for not being able to receive the signals! T. Sale and G3CVO are experimenting at Chelmsford with a specifically TV transmitter, using an m.o.-b.a.-p.a. line-up, all on 70 cm. In this respect, G3CVO endorses G2FKZ's remarks about the distinct possibilities of the new S.T.C. 33B/152M, a double-triode (on a B9G base) capable of some 25 watts output at 430 Mc/s. It costs less than half the price of a QQE03/20. On the Continent, the QEL1/150, equivalent to the 4X150A beloved of the American Amateur Television Club stations, is being tried. Several of the latter, including W0MMM-TV and W4SOD-TV, are using the 5527 camera described in *QST* last year. Several more cameras have been put into action in this country; J. Russell (Bournemouth) has built a really miniature camera unit, using a Staticon tube (see photo), but has not yet found an opportunity to complete it. The Weybridge A.R.C. TV camera is well on its way to completion, and it is hoped to give a public demonstration this summer.

VK6EC is an engineer at the N.B.S. m.f. broadcast transmitter 6WA at Wagin, W. Australia. In his spare time he is building for himself the first 625 line amateur TV transmitter in the Southern hemisphere! The pulsing and monitoring equipment is ready, and both 5527 and Staticon cameras are on order. The biggest difficulty is in getting ordinary viewing tubes which are just not available in Australia. G3AKJ, the Hon. Secretary of the B.A.T.C., having overhauled his camera, recently gave a lecture and demonstration to the Romford Amateur Radio Club. The B.A.T.C. meeting at Chelmsford was very successful, a most interesting lecture being given on the Image Orthicon Camera. The lecture was illustrated with a practical demonstration.

Technical Notes

Here are some brief notes that have arisen from recent enquiries: the Mazda 27M1, 2 or 3 are plug-in replacements for the RCA931A photocell, having slightly differing spectral characteristics; h.t. supplies to video stages especially must be electronically regulated to prevent v.l.f. instability. A normal 350 or 400 volt h.t. supply will feed a stabilising unit using a 6AS7/A1834 series regulator tube to give 250 volts at 250 mA in any of the usual circuits, but for preference the control amplifier should have high gain and be wide band. Gamma (contrast law) correction is not required with flying spot scanners used with still pictures, since the brilliance controls can be adjusted to give correct picture balance. The Z77/EF91 makes an extremely good video amplifier when run from a 250 volt h.t. line, and the screen can be taken direct to h.t., affording auseful economy in components.



The neat staticon camera built by J. Russell of Bournemouth. The head amplifier gives some idea of the size of the case which was home-made. The focus and deflection yoke is visible at the bottom left but the tube had been removed when this picture was taken.

As many people are experimenting with wideband television modulation, it should be remembered that both driver and p.a. must be modulated in order to get a good modulation swing. Where grid modulation is employed, the driver output impedance must be low, the whole coupling to the p.a. being wideband. This is often done by providing 200–300 per cent. excess driving power and dissipating the excess in a non-linear element such as a lamp. When checking modulation, the only reliable method is to look at the waveform produced by the r.f. monitor—a small crystal probe is ideal—and not to rely on the video signal going into the p.a. unit.

The B.A.T.C. sked on 3.5 Mc/s is temporarily in abeyance pending a change of QTH by G3CVO.

High Wycombe D/F Qualifing Event. The winner, J. Salter (G3DQC), centre, with his team, Messrs. Rhodes and Ray.

*c/o Cheyne Cottage, Dukes Wood Drive, Gerrards Cross, Bucks.

An Amateur Colour TV Camera

By C. GRANT DIXON, M.A.*

The home - constructed colour television camera illustrated and described briefly here is a striking example of the ingenuity of the British amateur. The achievement is all the more creditable when one remembers that colour television is by no means out of the laboratory stage commercially. Mr. Dixon is chairman of the British Amateur Television Club which is affiliated to R.S.G.B.

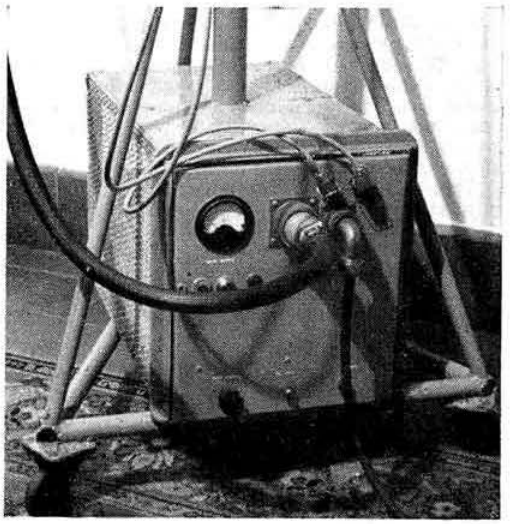
THE colour television camera shown in the accompanying photographs is one of three units designed for the transmission of medium definition colour television over a closed circuit. It was first successfully operated on Christmas Day, 1953, as reported in the February issue of the R.S.G.B. Bulletin.

The various heater, h.t. and e.h.t voltages are fed from the two voltage-regulated supplies and the current regulated supply built in the tripod base *via* a home made cable sheathed in rubber garden hose. The camera is also fed with line and frame trigger pulses and a mains supply. The only other connection is the video output co-axial cable.

The lens, an f4.5 10.5 cm, is from a discarded folding camera and the camera tube a sub-standard commercial product. Between them, in a housing 1½in. deep, runs the colour filter disc driven by a synchronous induction motor. Phasing of the disc is accomplished by varying the phase of the frame sync pulse in the pulse generator.

Surrounding the camera tube is a focus coil of some 22,000 turns carrying a regulated current of 50 mA. The coil can be seen in the side view of the camera with, above it, the video amplifier strip which delivers an output through a 6J6 cathode follower. Further amplification is provided to feed the VCR138 viewfinder tube which enables the operator to see a monochrome (green) picture of the televised scene.

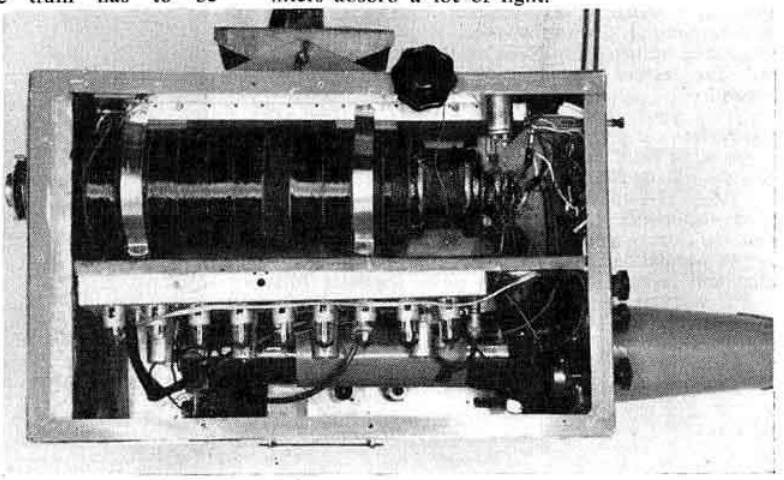
The deflection chassis is on the other side of the camera and the circuitry here is complicated because both magnetic and electrostatic deflection have to be provided. In addition, a mixed line and frame blanking pulse train has to be generated and applied to both the camera tube and the viewfinder tube. In the present design these blanking pulses are derived from the flyback pulses of the magnetic time bases driving the camera tube.



The power supplies for the camera, all of which are stabilised with series regulator valves, are housed in this cabinet mounted in the base of the camera tripod.

Another unit (not illustrated), housed in a 36in. rack and using more than 50 valves, generates the appropriate blanking and synchronising pulses and mixes them with the video signal. One chassis on this rack accepts the signal from the camera, directs it into three parallel "colour channels," and then recombines the signal again. It is thus possible to control the gain and d.c. level of the individual colours.

The monitor viewing screen is the third unit; the circuits are quite conventional, being similar to those used in electrostatic televisors built from war surplus. The additional equipment to receive colour consists of another synchronous motor and a second disc of colour filters which rotates in phase with the one in the camera. The viewing tube must, of course, have a white screen and the picture should be as bright as possible as the filters absorb a lot of light.



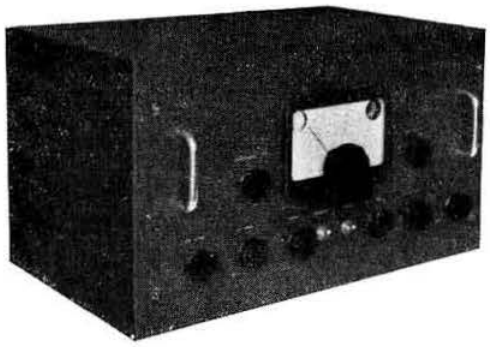
In this side view of the camera, the focus coil around the camera tube can be clearly seen. Above the coil is the video amplifier and behind the coil is the viewfinder tube—a VCR138. The disc housing, 1½in. deep, is behind the lens and in front of the camera tube.

* *23 Wye Street, Ross-on-Wye, Herefordshire.*

An Amateur-Built Communications Receiver

By N. W. AUSTIN (G2FQR)*

Building receivers at home has rather dropped out of fashion in recent years, chiefly because large quantities of surplus receivers have been available. There comes a time, however, when the performance of such equipment is no longer acceptable. Because of the high price of new commercial receivers, the amateur is once again turning his thoughts to home construction. This article describes one approach to the problem.



Front view of the receiver showing the modification to the main tuning dial for the tuning indicator and bandspread dial.

THE receiver described in this article was built around components originally intended for the Marconi CR.100 series of receivers. These components comprise a four-gang variable tuning condenser, a switched coil pack, five i.f. transformers (including a crystal filter), a b.f.o. coil and an audio filter. In addition, certain refinements considered desirable in a receiver for amateur use were incorporated without a large financial outlay.

The receiver covers 60 kc/s to 32 Mc/s in six bands, and the crystal filter provides five switched pass-bands, *viz.*, 6 kc/s, 3 kc/s, 1.2 kc/s, 300 c/s and 110 c/s (using audio filter).

The Circuit

As may be seen from Fig. 1, the circuit finally evolved has two radio frequency stages, mixer and separate local oscillator, three i.f. stages, demodulator, a.v.c. rectifier, a.f. amplifier and output stage. A b.f.o. noise limiter and tuning indicator were also incorporated together with a voltage stabiliser for the oscillator h.t. supply and an internal power supply. (Fig. 1 has been simplified by the omission of coil switching which is an integral part of the coil pack.)

The use of a tuning indicator may appear to be an unnecessary refinement but it has proved extremely useful when used in conjunction with an S-meter, provision for which was made by sockets on the back drop of the chassis.

The noise limiter is similar to the one used in the RCA AR88 and described in the September, 1947, issue of the R.S.G.B. BULLETIN. Its inclusion has been found most effective.

Construction

The receiver is built on an 18 in. x. 12 in. x 2½ in. aluminium chassis attached to a standard 19 in. by 10½ in. steel panel. The size of the chassis is largely dictated by the dimensions of the coil pack and for this reason could, with advantage, be increased to 14 in. wide.

The layout adopted was arranged to take advantage of the chassis space remaining after the installation of the coil pack in the centre and can be clearly seen in the photograph. To one side of the tuning gang (which is mounted on the top of the chassis immediately above the coil pack) is the strip comprising the two r.f. stages, mixer and local oscillator. Following the oscillator and running along the edge of the chassis is the i.f. chain, fully screened below chassis, the output of which is taken along the back of the chasis to the

* *99 Bescot Road, Walsall, Staffs.*

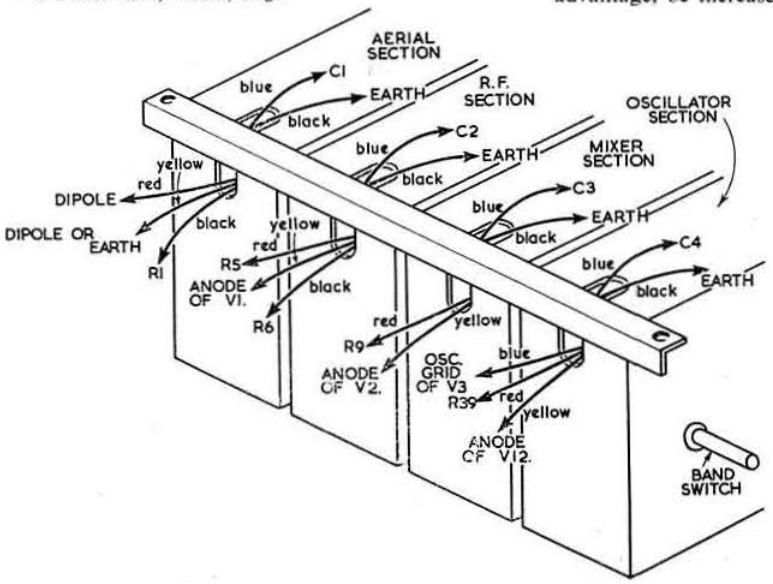


Fig. 2.
The connections to the CR.100-type coil pack.

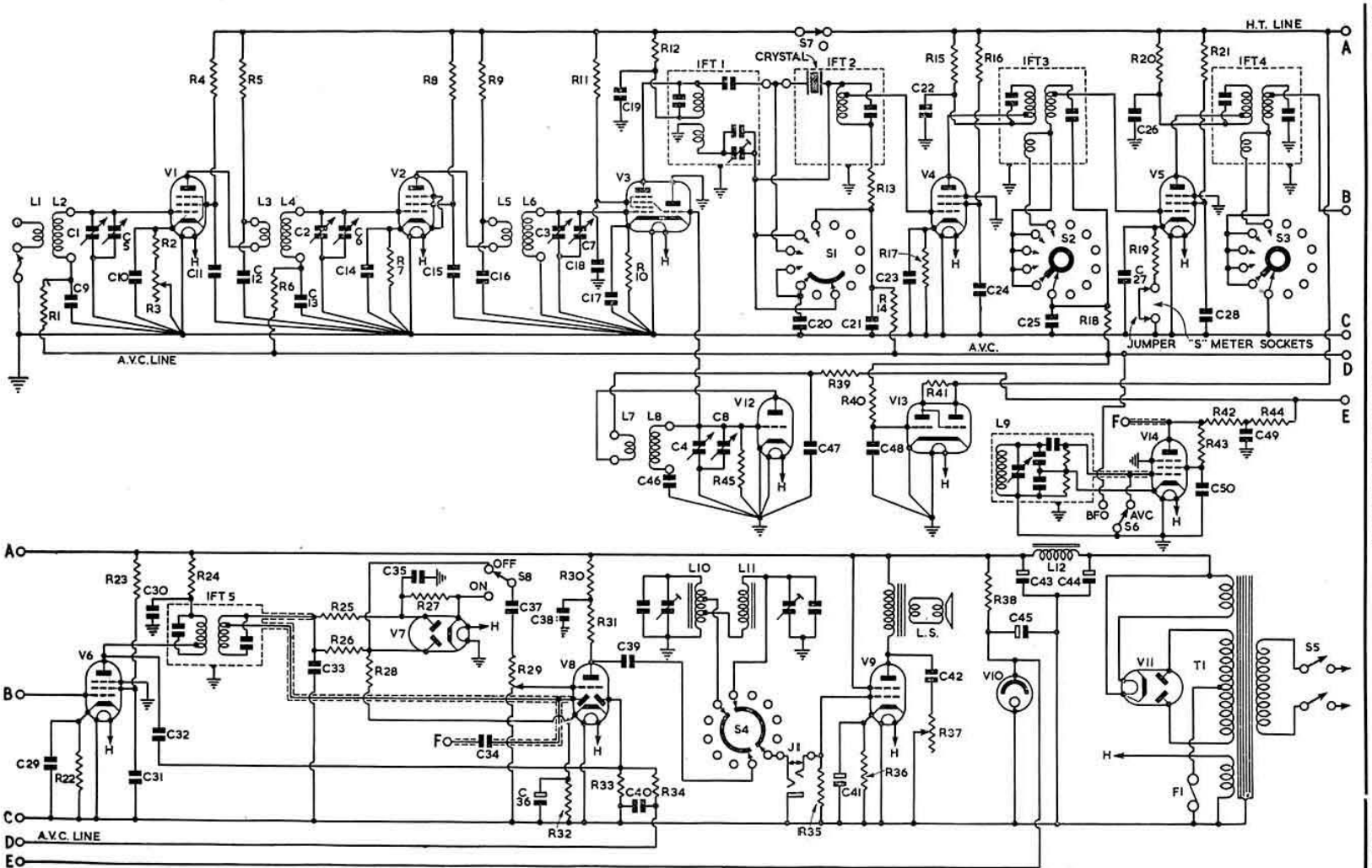


Fig. 1.—Circuit diagram of the complete amateur-built communications receiver. For the sake of clarity, wave-change switching has been omitted.

demodulator and audio stages. The audio filter is to the rear of the main tuning gang.

The connections to the coil pack are shown in Fig. 2.

It was not found possible to install a smoothing choke in the space available on the chassis, and an energised speaker is therefore used, with the field winding as the choke.

Electrical bandspread was adopted, because a suitable mechanical arrangement, such as that used in the CR.100 receiver, was not available. Accordingly, a small three-gang (25 $\mu\mu$F per section) condenser connected by a flexible coupler to a similar single section condenser was mounted on a platform along the top of the main tuning gang and connected in parallel to it. A certain amount of "cut and try" was necessary in order to secure a reasonable degree of bandspread over the most frequently used bands. This was accomplished by trimming or removing plates in the single section condenser connected across the oscillator section of the main tuning condenser.

Rear view of the chassis. The tuning condensers are in the centre with the r.f./i.f. section to the right and a.f. and power supply stages on the left. Along the rear edge are the phone jack, mains input socket, send/receive jack, sockets for the loudspeaker field and output transformer, S-meter sockets, and earth terminal. The stand-off insulators are for aerial input.

Advantage was taken of the two spaces at the top left and right-hand corners of the Eddystone dial to cut circular holes in the panel behind which were mounted the bandspread dial and tuning indicator respectively.

The actual wiring should present no difficulty but the arrangement adopted for V1 and V2 shown in Fig. 3 is strongly recommended.

Alignment follows accepted practice but it is essential for the proper operation of the crystal filter that the i.f. stages (465 kc/s) be adjusted with the aid of an oscilloscope and wobbulator.

Operation

The receiver has provided all the facilities and ease of operation required. By using the 1 Mc/s markers provided by a Class D wavemeter, the main tuning can be set conveniently to the edge of a band, further tuning then being carried out on the bandspread dial.

As is to be expected when using two r.f. stages, gain is excessive on the l.f. broadcast bands and

Components List for Fig. 1

C1, 2, 3, 4	4-gang tuning condenser (ex-CR.100)
C5, 6, 7, 8	4-gang bandspread tuning (see text)
C9, 13	Part of coil pack
C10, 11, 12, 14, 15, 16, 17, 18, 19, 22, 23, 24, 26, 27, 28, 29, 30, 31, 35, 40, 47, 48	0.1 μF
C20	7 $\mu\mu$F
C21, 25, 37, 39, 42, 49, 50	0.01 μF
C32	100 $\mu\mu$F
C33	150 $\mu\mu$F
C34	10 $\mu\mu$F
C36, 41	50 μF, 25 V.
C38, 43, 44, 45	8 μF, 450 V.
C46.	Tracking condenser incorporated in coil pack
J1	Headphone jack (closed circuit type)
L1, 2, 3, 4, 5, 6, 7, 8	Parts of coil pack
L9	CR.100 b.f.o. unit
L10, 11	CR.100 audio filter
L12	Speaker field
I.F.T.1, 2, 3, 4, 5	CR.100 i.f. transformers
R1, 6, 28	47,000 ohms
R2, 7	1,000 ohms
R3, 15	5,000 ohms
R4, 8	10,000 ohms
R5, 9	2,200 ohms
R10	350 ohms
R11, 30	33,000 ohms
R12, 20	3,300 ohms
R13, 14, 16, 18 21, 23, 31, 35, 42, 43	100,000 ohms
R17, 19, 22	400 ohms
R24	4,700 ohms
R25, 33	470,000 ohms
R26	68,000 ohms
R27	560,000 ohms
R29, 37	500,000 ohms potentiometer
R32, 36	270 ohms
R34, 40, 41,	1 Megohm
R38	5,000 ohms, 3 watts
R39, 44	22,000 ohms
R45	20,000 ohms
S1, 2, 3, 4	CR.100 selectivity switch
S5	Mains on/off switch, ganged to R37
S6	B.F.O./A.V.C. switch
S7	Send/receive switch
S8	Noise limiter on/off switch
T1	350–0–350 V, 120 mA, 6.3 V, 5A, 5 V, 3A
V1	EF54
V2	EF50
V3	6K8
V4, 5, 6, 14	6K7G
V7	6H6
V8	6Q7G
V9	6V6G
V10	VR150/30
V11	5Z4G
V12	6J5
V13	6E5

it is necessary to keep the manual r.f. control fairly low.

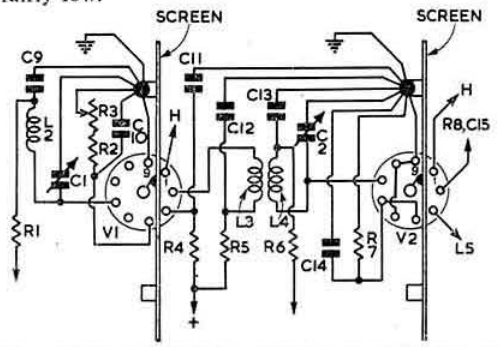


Fig. 3.—The layout of the components associated with V1 and V2.

"Television—A World Survey"

A NEW UNESCO publication entitled *Television—A World Survey* (H.M.S.O., 9s. 6d.) reveals that television services have now been set up in 21 countries, while another seven are carrying out technical broadcast experiments. Government departments and private organisations are taking active steps to introduce television in 24 other countries.

In Brazil, plans have been drawn up to cover the country with 290 stations in 186 localities, while in Thailand (Siam) television sets are selling well although the station is not yet in operation! The survey is not, however, concerned only with the commercial aspects of television: in the Soviet Union, Amateur Television is said to be widespread and enthusiasts have built not only receivers but also a complete television centre at Kharkov.

Characteristics and Performance of Apparatus for Measurement of Radio Interference

BRITISH Standard B.S.727:1954 "Characteristics and Performance of Apparatus for Measurement of Radio Interference," has been revised and the equipment described is now suitable for the measurement of radio noise in the frequency range of 150 kc/s to 150 Mc/s. A more detailed specification of the performance of noise measuring equipment replaces the somewhat loose specification, and the example of a suitable measuring set, given in the 1937 edition.

Copies of this British Standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, W.1. Price 4s.

Tape Recording Standards

THE British Standards Institution has recently issued a revision of B.S.1568, the new standard being entitled "Magnetic Tape Sound Recording and Reproduction for Programme Interchange."

The Standard specifies the requirements for recording on magnetic tape and of the associated recording and reproducing equipment necessary for the successful interchange of recordings for broadcasting or similar purposes. The characteristics are those adopted by C.C.I.R.

One of the new features of the revised standard is that a specification is given for an adaptor to allow European machines to accept both European and American tape recordings.

The Station Behind the Call—G3AAG

G3AAG, owned and operated by Vic Copley-May, "Ferndale," Gipsy Lane, London, S.W.15, was licenced in the summer of 1946, since when the station has been active on all bands up to 28 Mc/s, with a brief excursion to 144 Mc/s in 1949. Present activity is mainly on 14 Mc/s and 21 Mc/s c.w.

The station layout, illustrated in the accompanying photograph, is designed for use in the living room and is the result of more than twelve months of planning, designing and constructing.

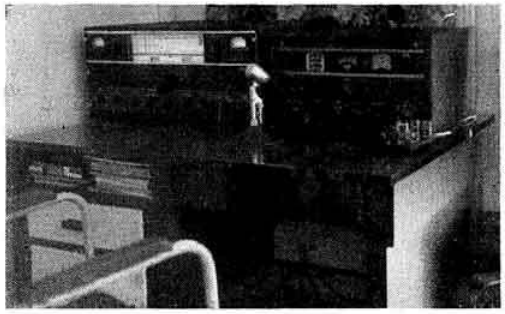
The v.f.o. or crystal controlled transmitter employs broad-band multiplier stages and covers all bands from 1.8 Mc/s to 28 Mc/s. The p.a. is an 813 which is modulated by a pair of 807s operating in class AB2. On Top Band, the 813 p.a. is cut out and the driver stage automatically connected to the aerial tuning unit. Clamp modulation is used on this band. A 100 kc/s oscillator and crystal check-points on the horizontal full-vision scale enable calibration to be accurately determined. The transmitter is entirely relay controlled.

The table top cabinet is completely self-contained apart from the 1200 volt p.a. power supply which is housed in a separate cabinet beneath the operating desk. An electric clock is mounted on the front panel. The three separate chassis, used to facilitate servicing, are mounted on ball-race runners so that they can be withdrawn easily.

As the transmitter is thoroughly TVI-proofed it is possible to operate on all bands without interfering with a television receiver in the same room.

More than 200 countries have been worked with the aid of a variety of aerial systems. Those at present in use are a remotely controlled 2 element beam for 14 Mc/s, a 4 element array for the same band, a 270 ft. long wire and a 7 Mc/s dipole.

Other equipment includes an RCA AR88 receiver, cathode ray transmission and reception monitors, a standing-wave indicator, an harmonic detection meter and a miniature recorder. And, apropos the recent Editorial—TIAKITH!



The very neat operating position at G3AAG. The table top transmitter is to the left and the receiver to the right.

A Universal Resistor Abac

By ERIC JOHNSON (G2HR)*

THE calculation of the value of resistors in parallel is always irksome, involving as it does the clumsy formula

$$\frac{1}{R}=\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}\ \ldots \text{ etc.}$$

When only two resistors are involved, the formula may be simplified to

$$R=\frac{R_1\ R_2}{R_1+R_2}$$

but even this can be a nuisance to the non-mathematically inclined.

As most Amateur Radio work does not involve high precision, so far as resistors are concerned, an Abac primarily intended for easy calculation of preferred values in parallel will prove an indispensible addition to any shack.

Development from a simple Abac

Fig. 1 illustrates the construction of a graphical method of calculating the value of any two

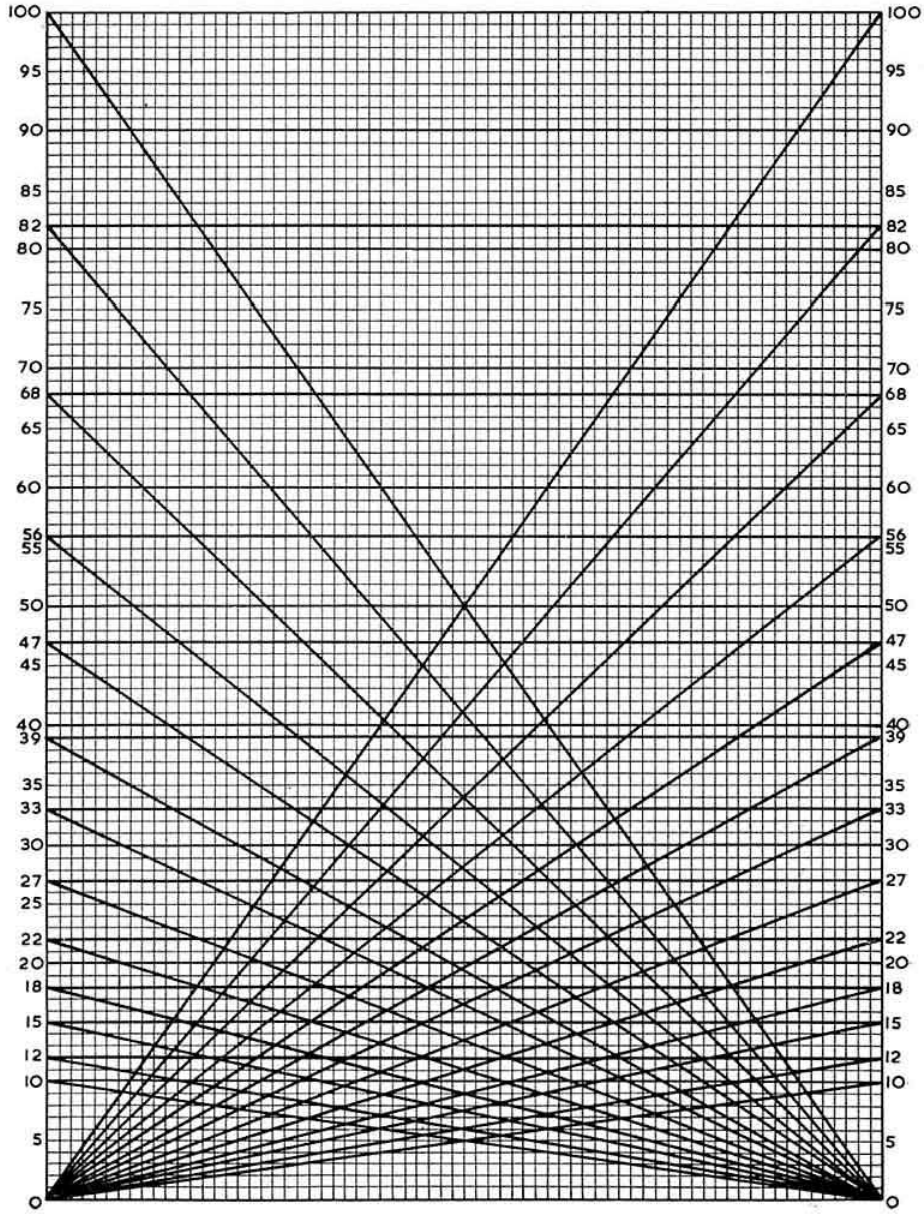


Fig. 2.—An example of the universal Abac described in the article. The diagonals correspond with preferred values of resistors.

resistors in parallel. A baseline of convenient length is drawn and perpendiculars are erected at A and B, the lengths of which are proportional to the values of the two resistors. R1 is then joined to B and R2 to A. Another perpendicular is then dropped from the point of intersection to the base line and the length of this, read off on the vertical scale, indicates the value of the two resistors in parallel.

The Abac in final form

The diagram in Fig. 2 shows the logical development from the simple graph. Preferred values are marked on each of the vertical scales and diagonals drawn from both sides in each case. Most readers will also find it useful to draw one for each decade, in which case for easier reading the latter lines should be drawn in a contrasting colour.

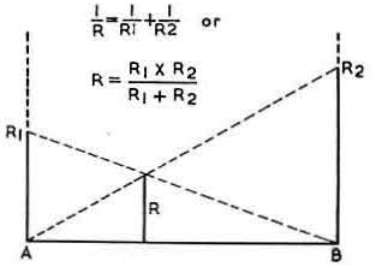


Fig. 1.—Simple graphical method of calculating the value of two resistors in parallel.

Use of the Abac

The Abac is used in exactly the same way as the simple version explained earlier. If it is desired to calculate the value of more than two resistors in parallel, this can be done by a repetitive process, *i.e.*, first evaluate *two* in parallel and then pair the result with the value of the next resistor. It will no doubt be necessary to use a straight edge as an additional diagonal, but the whole process can be done very quickly with practice.

It is also a simple matter to use the Abac in reverse. Suppose a non-standard resistor is needed. Select the value required on the vertical scale, and place a straight edge across the graph parallel to the base line. The *nearest* point of intersection of two diagonals will identify the two preferred values required with an accuracy sufficient for most requirements.

Capacitors and Inductors

The Abac can be effectively used for the calculation of inductors in parallel and capacitors in series. Because, however, of complications the value read off the graph will only apply when there is no mutual coupling between coils.

The Abac should be drawn carefully, varnished and pasted on cardboard, so that it may be hung up for easy reference.

* *35a Woodland Road, Chingford, London, E.4.*

Technical Manuals

AS result of the generosity of several members, the list of manuals available on loan from Headquarters has been considerably augmented and is now as follows:—

British Equipment.—Wireless Sender No. 12 H.P.; 19 set; 22 set; Wireless Sender No. 53; R103A; Wireless Remote Control Units D No. 1 and No. 2 Mk. II; Type 358 Receiver; Cossor D/B Oscillograph; Calibrator, crystal, No. 5 Mk II; Monitor Type 28; Radio Altimeter Equipment AYF; Signal Generator Type 9A; Test Oscillator Type 12A; Oscillator Unit Type 25; Test Set 37; Signal Generator 106; Test Set 209; Test Sets 218, 218A, 237, 237A; Test Set 219; Test Set 240; Test Set 241; Test Set 242; Transmitter T.1190A; Transmitter-Receiver TR.1464; Receiver R.1155; Valve Tester 4; Valve Tester 4A; Wavemeter W.1191A; Wavemeter W.1432; Wavemeter W.1433.

U.S. Equipment.—Morse Recorder BC1016; Radio Receiver AR88D; Receiver RA10C, RA10D, RA10CD, RA10DD; Receiving Equipment RAK7; Radio Receivers BC312N, BC312NX, BC342N, BC314G, BC344D; Radio Receiver BC348; Receiving Equipment SLR-F; Super Skyrider (1936); Radio Telephone-Telegraph Transmitting-Receiving Equipment 350A-1; Long Distance Remote Control 350LR; Power Supply 350PS-1; National HRO Senior; Remote Control Equipment RC-47-D; Communication Equipment RTA-1B; Receiving Equipment RA10FA, RA10FB; Transmitting Equipment TA-2 Series; Transmitters TA-2G, TA-2G-24 Series; Radio Telephone and Telegraph Transmitting and Receiving Equipment TCS-13; Crystal Multiplier MI-19468; Transmitters TA-6A and TA-6B; Radio Direction Finder DAE and DAE-1; Radar Equipment AN/APN4; Loran Handbook for Aircraft; Radio Compasses MN-26 Series; Radio Sets SCR522-A, SCR522-T2, SCR542-A, SCR542-T2; Frequency Meter SCR-211 B & Q (Parts List); Frequency Meter SCR211-M; Power Unit PE-95-G and PE-95-H; Radio Set SCR299C; Radio Set SCR299A, B, C, D; Radio Set SCR399A and SCR499A; Receiving Equipment RA10CA, CB, DA, DB; Hickok Valve Test Equipment I-177; Code Practice Equipment AN/GGQ-1; Dynamotor R182; Bendix Dynamotor Data; Rotary Converters, Janette, Type CA and CAF.

Diagrams.—Receiver CBY-46105; AN/APN4 Receiver Schematic; AN/APN4 Oscilloscope Patterns; I-194-A Pulse Signal Generator Schematic; SCR522A Radio Set; MN26A, C, CA Radio Compass; Receiver RC103A; Radio Transmitter BC375; Radio Compass 269G; Radio Compass AN/ARN7; Receiver BC453A, B; Radio Set AN/APN1; Radio Transmitter AN/ART13; Radio Receiver BC454A, B; Radio Receiver R89/ARN5A; Radio Receiver BC348Q; Indicator ID/APN4; Radio Transmitter BC191; Radio Set SCR274N; Radio Set AN/ARC3; Radio Receiver R47/ARN5; Radio Receiver BC624C.

Loans

No charge is made for the loan of the above manuals, but in order that they may be made available to other members within a reasonable period of time, they should be returned to Headquarters promptly after use.

Members in possession of similar manuals which they no longer require are invited to donate them to the Society. In particular, information on British Army, Navy and Air Force equipment will be most welcome.

Society News

Council Election, 1955

AT their meeting in August, 1954, the Council will be required to nominate persons to serve on the Council for the year 1955. Nominations will be required as follows:

President.
Executive Vice-President.
Honorary Treasurer.
Seven Ordinary Elected Members.

The present President (Mr. Arthur O. Milne) and the present Immediate Past President (Mr. Leslie Cooper) will automatically become Members of the Council for 1955. As from January 1, 1955, Mr. Milne will be the Immediate Past President and Mr. Cooper the Penultimate Past President.

Assuming that Members of the present Council are nominated for the office of President, Honorary Treasurer and Executive Vice-President respectively, then *one* of the remaining eight Members of the present Governing Body will be required to stand down. That Member can, however, be nominated in opposition to the Council nominees by any 10 Corporate Members, in accordance with Article 56. Alternatively he can be nominated by 10 Corporate Members resident in his Zone for one of the six vacancies for Zonal Representative. The list of Council nominees will appear in the September, 1954, issue of the BULLETIN. After the publication of the list, but not later than October 24, 1954, any 10 Corporate Members will be allowed to nominate any other Corporate Member to serve on the Council.

The September BULLETIN will also carry an announcement relating to the election of Zonal Representatives to serve on the Council. Nominations for the office of Zonal Representative, made in prescribed form, will be required to reach Headquarters by not later than October 24, 1954. Assuming that Representatives are elected from each of the six Zones, then the 1955 Council will be required to decide which two of the six Zonal Representatives shall retire at the end of 1955 and which two at the end of 1956. The 1955 Council will also be required to decide which of the other Members of the Council shall retire at the end of 1955 and which at the end of 1956. All Members of Council when they retire are eligible for re-election.

Members who have studied the new Articles of Association will appreciate that it must take three years, as from January 1, 1955, before the Triennial method of electing the Governing Body operates automatically.

Intruders in Exclusive Amateur Bands

FOLLOWING an exchange of correspondence between the Editor of the *Short Wave Magazine* (Mr. Austin Forsyth) and Mr. C. Ian Orr-Ewing, O.B.E., M.P., on the subject of "intruders" in exclusive amateur bands, Mr. Orr-Ewing recently asked the Assistant Postmaster-General (Mr. David Gammans, M.P.) whether "his attention has been drawn to the increasing number of unauthorised British and foreign broadcasting stations and armed services transmissions now taking place in frequency bands reserved by international agreement for amateur radio; what action he is taking in respect of United Kingdom transmissions; and to what foreign administrations have protests been made about the breaking of this international agreement."

Mr. Gammans in his reply said "on the few occasions when an unauthorised British station is detected in the amateur bands, steps are taken to try and locate it, but there is no evidence of any large increase in unauthorised stations either in this country or from abroad. The problem of interference caused by broadcasts from abroad is difficult to to deal with, but protests have been sent to Spain, Greece and Iraq. Possibly my hon. Friend is referring to authorised stations which are allowed to operate in bands used by amateurs. There are 14 such in the 7 Mc/s band. If my hon. Friend has any particular points in mind, I shall be glad to make inquiry."

Members will no doubt agree that this is a thoroughly unsatisfactory reply to a question which is of great importance to amateurs throughout the world.

As a Supplementary Question, Mr. Orr-Ewing asked whether the Assistant Postmaster-General would "draw the attention of the Commonwealth signals officers who are meeting in this country at present to the desirability of keeping the reserve amateur bands free?" Mr. Gammans: "I will certainly keep that point in mind."

National Radio Show

NEXT month, for the first time since 1938, the Society is to be represented at a National Radio Show. The 1954 Show will open at Earls Court, London, on Wednesday, August 25, and will continue until Saturday, September 4 (Sunday, August 29, excluded).

The Society's stand (No. 209) will be in the gallery, at a point directly above the Warwick Road entrance and facing the Technical Training Display.

It is anticipated that a lounge will be sited immediately behind the Society's stand which will provide a convenient meeting place for Members.

The General Secretary will be glad to hear from members who are willing to undertake stand duty during the period of the Exhibition. It will greatly assist in planning the duty rota if members will include the date (or dates) and period of the day (or days) they will be available.

Because of the long duration of the Show—a period of 10 days—a good many volunteers are required.

Our New Printers

THE bright and attractive appearance of this issue of the R.S.G.B. BULLETIN—the first of a new Volume—has been achieved as the result of close co-operation between the Society's new printers (Patina Press, Ltd.) and the editorial staff.

Patina Press, Ltd., are responsible for a number of high grade productions of which *The Antique Dealer and Collectors' Guide* and *British Radio and Television* provide outstanding examples.

We hope their association with the Society will be a long and happy one.

London Members' Luncheon Club

TWO *real* Old-Timers in the persons of Dr. Beverley Robinson (VE3BMZ), of London, Ontario, and Signor Mario Santangeli (I1ER), of Milan—both of whom started their Amateur Radio activities in 1921—were warmly welcomed at the meeting of the London Members' Luncheon Club held on Friday, June 18, 1954.

Others making their first appearance at a Club meeting were Laurie Jones (G5JO), of Cambridge, and F/Sgt. Frank Johnstone (G3IDC, ex-MP4BAB, etc.), of No. 1 Radio School, R.A.F. Locking. Also present was Freddie North, until recently VP6CDI, of Barbados, and now resident again in England where he is to operate as G2CDI.

The Chair was taken by Stanley Vanstone (G2AYC), who had the support of the President of R.S.G.B. (Arthur Milne, G2MI) and the General Secretary.

The Club will meet again on Friday, July 16, at the Bedford Corner Hotel, Tottenham Court Road, at 12.30 p.m. when a cordial welcome will be extended to any radio amateur visitor to London. Reservations should be made to May Gadsden, R.S.G.B. Headquarters, not later than 24 hours prior to the above date (HOL 7373.)

Tests and Contests

First Two Metre Field Day, 1954

THE first of the 1954 Two Metre Field Days was blessed with excellent weather and much activity. The contestant who thanked the Contests Committee for arranging the weather may have different views after experiencing N.F.D. week-end! The Committee claims no credit for either!

Logs were received from 34 portable stations. It was a pity that the other thirteen portables known to be operating did not send in their results. Conditions were reported as " not good." However, the winning score is higher than in the last event, and no less than 20 contacts were made over distances exceeding 200 miles.

Very few unusual items appear in the descriptions of equipment used. Cascode and push-pull r.f. amplifiers appear in equal numbers, while about half as many receivers used earthed-grid input stages. In the transmitters, two-thirds employed an 832 final stage. Aerials showed the widest divergence. One rhombic was used and arrays of 2 to 4 slots have increased in popularity, but twice as many stacks of 4 to 24 elements were used. Yagi arrays of from 3 to 5 elements were twice as popular as the stacks.

The winning station was G3DIV/P, who made six contacts of over 200 miles and 16 of between 100 and 200 miles in his total of 78 contacts. He used a QQE06/40 amplifier, a 4-element wide-spaced Yagi and a crystal controlled converter using three 6J6 valves.

Last year's winner, G3GWB/P (Northampton Short Wave Radio Club) was runner-up, with a total of 94 contacts, two exceeding 200 miles and 14 others exceeding 100 miles.

In contrast, G2BAT/P only made four contacts of less than 100 miles from his site in Cornwall. Six fell between 100 and 200 miles and the remaining six exceeded 200 miles.

Comments and criticisms were very few, but all expressed their enjoyment of the event.

Check Logs

The following are thanked for submitting useful check logs: G3CWW/P, 4AJ, 5DS, 5YK, 6MN/P, 6WF and EI2W.

Results of First Two Metre Field Day

Psn.	Call-Sign	Portable Location	Points
1	G3DIV/P	Nr. Eastbourne, Sussex	9,272
2	G3GWB/P	11 m. N. Northampton	8,337
3	G3APY/P	4 m. N.E. Leek, Staffs.	8,132
4	G3ABA/P	6 m. N.W. Coventry, Warks.	6,443
5	G4JJ/P	6 m. S. Barnsley, Yorks.	6,015
6	G3AGS/P	4 m. N.W. Rochdale, Lancs.	5,786
7	G3NL/P	½ m. W. Malvern, Worcs.	5,079
8	G5BM/P	4 m. S.E. Cheltenham, Glos.	4,394
9	G8QY/P	5 m. S. Birmingham	4,347
10	G5MA/P	2 m. W. Oakham, Rutland	3,946
11	G3GOP/P	3 m. E. Corfe, Dorset	3,910
12	G3HSD/P	2 m. S. Bristol	3,899
13	G3MA/P	5 m. E. Gloucester	3,870
14	G3FD/P	3 m. S.W. Dunstable, Beds.	3,787
15	G2BAT/P	1 m. S. St. Agnes, Cornwall	3,709
16	G2HIF/P	4 m. W. Wantage, Berks.	3,674
17	G3GB/P	6 m. N. Bolton, Lancs.	3,561
18	G3EUQ/P	9 m. N.E. Southampton, Hants.	3,213
*	GM2HCJ/P	10 m. E. Wigtown, Kirkcudbright	2,989
19	G3EGW/P	12 m. N. Helmsley, Yorks.	2,777
20	G3FIY/P	1 m. S. Amersham, Bucks.	2,701
*	G6VX/P	10 m. N. Cheltenham, Glos.	2,478
21	G4BP/P	2 m. S. Scarborough, Yorks.	2,243
22	G3AYT/P	1 m. S. Mellor, Cheshire	2,121
23	G5ML/P	3 m. E. Broadway, Glos.	1,921
24	G2UJ/P	1 m. N.E. Woldingham, Surrey	1,620
25	G3DVQ/P	2 m. N.W. Reigate, Surrey	1,616
26	G3ION/P	10 m. W. Southampton, Hants.	1,495
27	G2DKH/P	Tow Law, Co. Durham	1,346
28	G3FRG/P	1 m. S.W. Storrington, Sussex	1,114
*	GM6WL/P	12 m. S. Glasgow	585
29	GM3FGJ/P	2 m. N. Bathgate, West Lothian	386

* *Disqualified—No declaration.*

Contests Diary

1954

August 8 - -	D/F Qualifying (Salisbury)*
August 15 - -	144 Mc/s Field Day (No. 2)§
August 29 - -	D/F Qualifying (Romford/ Southend)*
September 5 -	Low Power Field Day†
September 11-12	420 Mc/s Test and Contests§
September 12 -	D/F National Final*
September 25-26	420 Mc/s Test and Contests§
October 2-3 -	Low Power
November 13-14	" Top Band " (No. 2)

* *For rules, see page 328, January, 1954* BULLETIN.
† *For rules, see page 570, June, 1954* BULLETIN.
§ *For rules, see page 37.*

Third D/F Qualifying Events, 1954

THE Third Qualifying Event, organised by Mr. G. T. Peck and held near High Wycombe on June 20 again attracted a record entry; 19 competitors left the start near Tring in perfect summer weather but soon discovered that intervening valleys made it impossible to find roads leading in the direction in which they wanted to travel. The transmitter, operated by Jack Redrup (G8VZ), was well concealed on the edge of a large wooded common. Competitors approaching directly soon found themselves proceeding on foot with very much farther to go than they had anticipated. Those with more correct bearings were able to circumnavigate the common and were faced only with comparatively minor obstacles including a steep climb of half-a-mile by a footpath and over a railway crossing.

First to arrive was J. Salter, G3DQC (High Wycombe) at 15.07, followed at 15.31 by J. K. Finch, B.R.S.15688 (High Wycombe) and at 15.38 by J. M. S. Watson, G6CT (Burgess Hill); these three competitors all qualify for the National Final. Competitors then began to arrive from all directions having traversed the common by the many possible paths—most found the welcome but unexpected sunshine too much for them and arrived carrying many of their clothes as well as their receivers. As a result the supply of iced drinks thoughtfully provided at the transmitter was soon exhausted.

In all, 14 competitors were successful and one more arrived only to find that he had left his entry form in the car on the other side of the common. Arrival times of the remainder were as follows:—

P. N. Prior (B.T.H. Rugby)	15.39
T. C. Reynolds (B.T.H. Rugby)	15.45
R. W. Charlton, G3CPC (Twickenham) ...	15.46
R. K. Seabrook (Southend)	15.46
A. C. Newman, G2FIX (Salisbury)... ...	15.46
S. Phillips (Slade)	15.48
J. J. Grant, B.R.S.6395 (B.T.H. Rugby) ...	15.48
A. E. Glozier, G3CRR (Romford)... ...	16.06
P. J. Evans (B.T.H. Rugby)	16.07
N. B. Simmonds (Slade)	16.12
H. Drury, B.R.S.5035 (Romford)	16.13

A record number sat down to tea at the Little Abbey Hotel, Great Missenden. Prizes for the leading contestants and for the first lady arrival had been kindly donated by Norman Turner (G4NT) who on this occasion joined the party and presented the High Wycombe Challenge Trophy and prizes to the winners.

R.S.G.B. D/F Qualifying Events, 1954

DETAILS of the last two qualifying events in the 1954 series are as follows:—

Sunday, August 8

Organiser: V. G. Page (G3IVP), 32 Feversham Road, Salisbury, Wilts.
Call-Sign: G3FKF/P.
Frequency: 1810 kc/s.
Assembly Point: Entrance to Wyle Railway Station, N.G.R. 008376.
Map: Ordnance Survey, New Popular Edition, Sheet 167.
Assembly Time: 1330 B.S.T.

Intending competitors should notify the Organiser by Saturday, July 31, stating the number in their party requiring tea at a location which will be notified to competitors when their entries are acknowledged.

Sunday, August 29

Organiser: H, Drury, " Ingrebourne," North Road, Havering-atte-Bower, Essex.
Call-Sign: G3FNL/P.
Frequency: To be advised to competitors when entries are acknowledged.
Assembly Point: Broads Green, Nr. Great Waltham, Essex. N.G.R. 693125.
Map: Ordnance Survey, New Popular Edition, Sheet 161.
Assembly Time: 1330 B.S.T.

Intending competitors should notify the Organiser by Friday, August 20, stating the number in their party requiring tea.

Competitors who have qualified in the 1954 series of qualifying event will receive details of the National Final, to be held on Sunday, September 12, direct by post.

Second Two Metre Field Day, 1954

THE rules for this event are substantially the same as those used for the First Two Metre Field Day, 1954, published on page 327 of the January, 1954, issue of the R.S.G.B. BULLETIN. The only amendments are to Rule 9 (the event will take place on August 15) and to Rule 15 (entries must bear a postmark not later than August 23, 1954).

420 Mc/s Tests and Contest

AFTER careful consideration of representations made to the Contests Committee by the London U.H.F. Group and comments received from other interested members, it has been decided to organise a Contest to run simultaneously with the 1954 420 Mc/s Tests. It is hoped by this means to encourage the maximum activity on the band, to the advantage of all concerned.

Entries will be accepted for either the Tests or the Contest, or for both events. As in previous years, the " Arthur Watts Trophy," will be awarded for the best entry in the Tests, and a Certificate of Merit to the leading competitor in the Contest.

The operating period has been extended to cover two week-ends, with a free week-end in between, and the hours have been arranged to encourage competitors to operate for the full period without loss of sleep! It is permissible for a station to use both fixed and portable locations, with scores to be combined (*e.g*, operating from home location one week-end and portable during the second week-end)

Rules—420 Mc/s Tests

1. The Tests are open to all fully paid-up Members of the R.S.G.B. resident in Europe.

2. Any mode of transmission may be used, provided the entrant adheres to the terms of his licence.

3. One contact may be made with a specific station during each week-end of the Tests. Proof of contact may be required, and contacts with unlicenced stations will not be taken into consideration.

4. The station may be operated from more than one location, i.e., both fixed and portable operation is permitted. The National Grid Full Six-figure reference must be given for each location in the case of entries from G, GD, GM and GW. In all other cases, entries must show the latitude and longitude of the station locations.

5. Entries should be written on lined foolscap or quarto paper, or typed on plain paper (on one side only, please), and must include details of stations worked (with distances), stations heard, and general observations on the band. A full description of all equipment used should be included, and any other evidence of experimental work carried out.

6. Multiple-operator entries are permitted, but the combining of entries from more than one station (other than fixed- and portable-operation under the same call-sign) is not permitted.

7. The Tests will cover the week-ends of September 11/12 and September 25/26, commencing at 1900 until 2359 G.M.T. on each Saturday and 0900 until 1900 G.M.T. on each Sunday.

8. Entries must be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1, postmarked not later than October 11, 1954, and must include the following signed declaration:

I declare that my station was operated strictly in accordance with the rules and spirit of the Tests, and I agree that the ruling of the Council of the R.S.G.B. shall be final in all cases of dispute.
Date..... Signature.....

Rules—420 Mc/s Contest

1. The Contest is open to all fully paid-up Members of the R.S.G.B. resident in Europe.

2. Any mode of transmission may be used, provided that the entrant adheres to the terms of his licence.

3. The station may be operated from more than one location. The National Grid Full Six-figure reference must be given for each location in the case of entries from G, GD, GM and GW. In all other cases, entries must show the latitude and longitude of the station locations. Logs must show clearly when station location has been changed.

4. One contact may be made with a specific station during each week-end of the contest. Proof of contact may be required, and contacts with unlicenced stations will not be permitted to count for points.

5. Entries should be written on lined foolscap or quarto paper, or typed on plain paper (on one side only, please), and must be set out in the form shown below:—

420 Mc/s Contests, September, 1954

Name ..... Call sign.....
Home address ..... Claimed Score.....
Site(s) of station.....
National Grid Full Six-figure Reference(s) (or latitude and longtitude—see Rule 3).....
Transmitter .....
Receiver ..... Aerial system.....

Time G.M.T.	Call sign of station worked	My report on his signals	His report on my signals	Location	Estimated distance (miles)	Leave blank
1905	*G6XYZ*	*559*	*469*	*Oxford*	*50*	
1912	*G8AAA*	*579*	*579*	*Bedford*	*45*	
1922	*G5ZYX*	*58f*	*57f*	*Edgware*	*10*	
			Claimed score.....			

Declaration: I declare that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the ruling of the Council of the R.S.G.B. will be final in all cases of dispute.
Signed.....

6. The contest will take place between 1900 and 2359 G.M.T. on each Saturday, and from 0900 until 1900 G.M.T. on each Sunday, during the week-ends of September 11/12 and September 25/26, 1954.

7. An exchange of RST or RS reports as well as location will be required before points for the contact may be claimed.

8. For each contact, points may be claimed equal to the number of miles between the two stations.

9. Multiple-operator entries are permitted, but the combining of entries from more than one station (other than fixed- and portable-operation under the same call sign) is not permitted.

10. Entries must be addressed to the Hon. Secretary, R.S.G.B. Contests Committee, Radio Society of Great Britain, New Ruskin House, Little Russell Street, London, W.C.1., and must bear a postmark not later than October 11, 1954.

European V.H.F. Contest

The rules for this event, to be held on August 28-29, 1954, will appear in the August issue of the *Bulletin*.

Radio Amateur Emergency Network

IT will probably come as a surprise to members of R.A.E.N. to hear that unsolicited and entirely independent reports have been received from different parts of the country each saying that R.S.G.B. Town and County Representatives are disgruntled because they have not been appointed E.C.O.s. In some cases, it is even suggested that these officials are opposing R.A.E.N. From the outset it has been the intention that R.A.E.N. organisation should be independent of the Society's Scheme of Representation. E.C.O.s have been appointed from among those who volunteered specifically for this work. Among those so far appointed are a number of C.R.s and T.R.s.

Procedure

The Committee recommends that R.A.E.N. groups should base procedure on that outlined in the *Civil Defence Handbook No.* 1 (Wireless Instructions for Civil Defence, H.M.S.O., price 6d.). The phonetic alphabet to be used should be that commencing "Able, Baker, Charlie."

The Committee is preparing a detailed statement of procedure recommendations, based on the above handbook, and a copy will be circulated to all E.C.O.s in due course.

Use of R.A.E.N. in Inland Cities

It is hoped that R.A.E.N. members in major inland cities will be prepared to assist in more distant distress areas if the need arises. Whilst it is not very probable that their services will be needed within their home areas they may well be required within a comparatively short radius.

Calling Frequencies

E.C.O.s and other members are asked to submit to the Hon. Secretary without delay recommendations as to suggested frequencies to be used as National Emergency calling channels. Suggestions as to alternative working frequencies will also be welcomed.

News of the Groups

South Wigston (Leicester) is concentrating on building 144 Mc/s equipment and now has three walkie-talkies and two superhet receivers completed. The E.C.O. (G3GXZ) suggests exercises between groups. **Lichfield** members helped to man Cannock N.F.D. station. An exercise is to be held on September 5 with as many portable stations active as possible. **Birmingham**'s E.C.O. (G3HHD) gave a talk on R.A.E.N. to Birmingham South R.S.G.B. Group recently. A 10-valve transmitter-receiver for 144 Mc/s has been completed. **Middlesbrough** are using small 1.8 and 3.5 Mc/s battery operated rigs. The group includes members in Wingate, Redcar and Stockton-on-Tees.

Holt (Norfolk) group have been experimenting to find out the ranges which can be covered using 0.5 watt input and an 8ft. whip. On 3.5 Mc/s, signals were RS55 at 2 miles, RS57 at 1 mile. With the whip base loaded, signals were RS55 at 4 miles and RS58 at 2 miles. **Romford and Dagenham** have several transportable sets and mobile equipment under construction. **Ilford** recently gave the first of a series of demonstrations for the benefit of Borough officials when the Chief Civil Defence Officer visited the E.C.O. (G3IRL). Those co-operating in the demonstration included G3JAM, G6HU and G8TL/M. **Sidcup** have agreed that 28 Mc/s phone walkie-talkies should be used. While equipment is being built, c.w. is being used for the practice "net" on Sundays at 1000 on 3505 kc/s.

Monthly Reports

Very few E.C.O.s are submitting regular reports. As it is most difficult to assess the country-wide position without such information, E.C.O.s are asked to let the Hon. Secretary, C. L. Fenton (G3ABB), 40 Fourth Avenue, Chelmsford, Essex, have reports of activities by the 15th of each month.

G3JAM's Walkie-Talkie

It has been found that the U1915 penlight cell is better than the U16 originally suggested. The Ever Ready D14, designed for deaf aid use, is also excellent.

New E.C.O. Appointments

The following have been appointed E.C.O.s:—

S. Sawyer (G3IRL), 166 Stradbroke Grove, Ilford, Essex.

W. S. Horsfall (G3GXX), 33 Clarence Avenue, Cleveleys, Lancs.

The following have been appointed Acting E.C.O.s:—

G. A. Partridge (G3CED), 11 Ethel Road, Broadstairs.

W. J. Mason (G3HSM), 39 Victory Road, Clacton-on-Sea.

J. Thompson (GI3ILV), 1 Westland Road, Portadown, N.I.

Dr. J. J. Cosgrove (GI3HXM), Stacumnie, Culmore Road, Derry, N.I.

S. Clarke, junr., Calgorm Road, Ballymena, Co. Antrim, N.I.

Mobile Operation

Members who operate mobile equipment from cars or other vehicles are invited to send reports and descriptions of their equipment for inclusion in a new feature which will begin in the August issue of the BULLETIN.

Contributions should be addressed to "Mobile Column," R.S.G.B. BULLETIN, New Ruskin House, Little Russell Street, London, W.C.1, to arrive by the 20th of the month preceding publication.

Regional and Club News

ABERDEEN AMATEUR RADIO SOCIETY. — New members are always welcome at meetings which are held on Fridays at 6 Blenheim Lane, Workshop, and canteen facilities are available.

BRISTOL.—At the June meeting, A. G. Blackmore (G3FKO) demonstrated his 1.8 and 28 Mc/s emergency equipment for fixed and mobile use. A discussion on R.A.E.N. followed. Members are asked to support the " Sale Table " at meetings by bringing equipment for disposal.

CHESTER & DISTRICT AMATEUR RADIO SOCIETY.—The club will be operating GW3ATZ/P on 2 m from Hope Mountain on August 15 and GW3GIZ/P from Merioneth on August 29. All contacts will be confirmed. John Swinnerton (G2YS) former Chairman, was a welcome visitor recently. Meetings are held on Tuesdays at 7.30 p.m. in the Tarran Hut, Y.M.C.A., Chester. *Hon. Secretary*: A. N. Richardson (B.R.S. 19678), 23 St. Mary's Road, Dodleston.

GRAFTON RADIO SOCIETY.—The society's annual field day was held at Tumulus Field, Hampstead Heath, on June 19 and 20 when G3AFT/P and G2CJN/P were active on all bands from 1.8 to 14 Mc/s. The weather was excellent. There will be no meetings during August but activities will be resumed on September 10. *Hon. Secretary*: A. W. H. Wennell (G2CJN), 145 Uxendon Hill, Wembley Park, Middlesex.

ISLE OF MAN AMATEUR RADIO SOCIETY.—The A.G.M. was held recently at Manor Guest House, 48 Victoria Road, Douglas—the new clubroom, made available to the society by the President, H. Grist (GD3FBS). *Hon. Secretary*: R. S. Trickey (GD3DRB), " Aigburth," 35 Sunningdale Drive, Onchan, I.o.M.

LEICESTER RADIO SOCIETY.—So much interest has been aroused by G3CCA's recent transistor experiments that the society has formed an Experimental Transistor Group under his leadership. G3CCA has developed a tetrode transistor. G2AA, G3CCA, G3GVK, G3HIZ and and G3IZS operate transistor transmitters on 1,850 kc/s at 22.30 each evening with G3CFG as control station. *Hon Secretary*: W. N. Wibberley, 21 Pauline Avenue, Belgrave, Leicester.

NORWOOD & DISTRICT.—Apart from being forced to close down for one hour during N.F.D the event went off well. A junk sale will be held at the July meeting. Visits to places of interest are being planned.

QRP SOCIETY.— An exhibition is to be held in October and a V.H.F. Section has been formed for those active on 144 and 420 Mc/s. VQ2W is organising a DX contest on behalf of the society and many local radio clubs have joined the affiliation scheme. Full details may be obtained from the *Hon. Secretary*: J. Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

ROMFORD & DISTRICT AMATEUR RADIO SOCIETY.—The Society continue to meet at R.A.F.A. House, 18 Carlton Road, Romford, at 8.15 p.m. on Tuesdays. A junk sale is held on the first Tuesday in each month. The Society station (G4KF) is on Top Band during meetings. *Hon. Secretary*: N. Miller, 18 Mascalls Gardens, Brentwood, Essex.

SLADE RADIO SOCIETY.—Recent activities have included a Midnight D/F Test, a lecture on " Receiver Design " by G. Nicholson (G3HKC) and a talk on " Servicing Car Radios " by W. E. Lewis. Meetings are held at the Church House, High Street, Erdington. *Hon. Secretary*: C. N. Smart, 110 Woolmore Road, Erdington, Birmingham, 23.

SOUTH SHIELDS & DISTRICT AMATEUR RADIO CLUB.—The Club will be operating GB3SFS at the Sixth Annual South Shields Flower Show from August 23 to 29, 1954. Meetings are held at Trinity House Social Centre, 134 Laygate Lane, South Shields, on Fridays at 8 p.m. The Club station (G3DDI) operates on 3.5 Mc/s (phone and c.w.) every week night; reports will be welcomed. *Hon. Secretary*: W. Dennell (G3ATA), 12 South Frederick Street, South Shields.

SOUTHEND & DISTRICT RADIO SOCIETY.—The last lecture of the session was given on June 25 by J. Wallace, B.Sc. on " Frequency Modulation." *Hon. Secretary*: J. H. Barrance, M.B.E. (G3BUJ), 49 Swanage Road, Southend-on-Sea, Essex.

STOCKPORT RADIO SOCIETY.—Following a recent series of lectures by R. Dixon (G3HSY) on the equipment installed at Telephone House, Salford, a visit is being arranged to that building. Future meetings will be held at the Blossoms Hotel, Buxton Road, on Wednesdays. *Hon. Secretary*: G. R. Phillips (G3FYE), 7 Germans Buildings, Buxton Road, Stockport.

STOURBRIDGE & DISTRICT AMATEUR RADIO SOCIETY.—The terms and conditions of the new amateur licences were discussed at the June meeting when it was generally agreed that the changes introduced were in the right direction. R.S.G.B. members kept two stations on the air during N.F.D. despite the appalling weather. A film of the event was made by G3HGI. *Hon. Secretary*: F. W. Meredith, 26 Gilbanks Road, Wollaston, Stourbridge.

SURREY RADIO CONTACT CLUB.—L. Aylwen Stockley (G3EKE), Hon. Treasurer of the British Amateur Television Club, lectured on " The Elementary Principles of Television " at the June meeting. A practical demonstration is planned for later in the year. The local R.S.G.B. T.Rs are using the July meeting as a forum for a discussion on N.F.D. *Hon. Secretary*: S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, South Croydon.

TORBAY AMATEUR RADIO SOCIETY.—A lecture on " Mobile V.H.F. Work " by Mr. Thomasson of Exeter aroused a great deal of interest at the June meeting. " Aspects of Crystal Grinding " will be the subject of a talk by W. A. Launder, B.Sc. (G3FHI) at the meeting on August 21. G3AVF is now active on Top Band with a transistor transmitter. Visitors to Torbay—who will be warmly welcomed at meetings of the Society—are invited to contact G3JD, 46 Dower Road, Torquay, or the *Hon. Secretary*: L. H. Webber (G3GDW), 43 Lime Tree Walk, Newton Abbot.

WORTHING & DISTRICT AMATEUR RADIO SOCIETY.—There will be no meeting during August. *Hon. Secretary*: J F. Wells, 37 Salvington Gardens.

New Members

Corporate Members Home (Licenced)

G3FNE	J. R. HUTCHINSON, 34 Cross Road, Hanworth, Feltham, Middx.
G3GGR	J. H. SYKES, 12 Lily Street, West Bromwich, Staffs.
G3HAO	E. H. WEBSTER, 83 Tudor Court North, Wembley Hill, Middx.
G3IMK	S. C. WALTERS, 12 Chesley Gardens, East Ham, E.6.
G3JEM	J. WALLACE, 37 Westmorland Road, Harrow, Middx.
G3JHR	A. BARNETT, 1 Phoenix Street, Wolverhampton, Staffs.
G3JIC	*A. RENWICK, 11 St. Paul Street, St. Helens, Lancs.
G3JIZ	*J. M. READ, 4 Wendover Drive, New Malden, Surrey.
G3JLV	D. R. EASSON, " Waygill " Ayloffs Walk, Hornchurch, Essex.
G3JNJ	D. A. PLATT, 342 Billet Road, Walthamstow, E.17.
G3JNZ	V. D. KNIBBS, 39 Mixbury, Brackley, Northants.
G3JOQ	H. E. SKELTON, 35 Cowsfield Avenue, New Malden, Surrey.
G3JQS	*J. GUTTRIDGE, " Greendene," Backwell Common, West Town, Som.
G3JSA	D. A. WILCOX, 43 Langley Road, Slough, Bucks.
G3JSJ	D. V. PRITCHARD, 88 Kingsway, Enfield, Middx.
G3JUG	D. B. SHIERS, 2 Toynbee Road, Eastleigh, Hants.
G4IC	*R. A. CLARKE, 10 St. Vincents Road, Dartford, Kent.
GM3JSO	W. E. DIXON, 33 Reidhaven Street, Elgin, Morayshire.

Corporate Members Overseas (Licenced)

CN8MM	EVA PERENYI, P.O. Box 166, Casablanca.
F8WL	J. M. HEBRE, 11 Rue Barbes, Bourges (Cher), France.
KL7PI	J. R. PAQUETTE, Box 1551, Juneau, Alaska.
PA0FB	†J. H. ADAMA, 42 Waalsdorperlaan, Den Haag, Holland.
ST2NG	L.D. L. A. GRANT, c/o International Aeradio Ltd., P.O. Box 516, Khartoum, Sudan.
VE2AAG	T. D. COTTON, 790 Grande Cote, Rosemere, Terrebonne, Quebec, Canada.
W2AXR	E. F. PEACOX, 155 Iroquois Street, Webster, New York, U.S.A.
W6MU	†A. H. BARNETT, 341 South Canon Drive, Beverly Hills, California.
W7HXG	L. A. BATES, 7819 S.E. Henry Street, Portland 6, Oregon, U.S.A.
ZL3AR	†W. BUCHANAN, 40 Wills Street, Ashburton, New Zealand
ZS1PC	L. G. PREECE, P.O. Box 1255, Capetown, S. Africa.
ZS6ALP	J. W. MARTINAGLIA, 5 Lang Street, corner of Carnavon Street, Judiths Paarl, Johannesburg, S. Africa.

Corporate Members (British Receiving Stations)

20213	A. B. LEONARD, " Elmsfield," Thornwood Common, Nr. Epping Essex.
20214	*D. E. HANNAFORD, 49 Kenmare Gardens, N.13.
20215	*T. E. HERWIN, 11 Rectory Close, Coltishall, Norwich, Norfolk.
20216	*J. H. TINKER, 68 Caulfield Road, East Ham, E.6.
20217	*D. C. SPEER, 14 Saltash Road, Barkingside, Ilford, Essex.
20218	*G. H. LISTER, The Lodge, 29 Bawtry Road, Wickersley, Yorks.
20219	*K. W. DAWSON, 41 Longton Street, Blackburn, Lancs.
20220	*W. H. SMITH, 31 Benjamin Street, Wakefield, Yorks.
20221	*K. F. MOSS, 42 Acresfield Road, Timperley, Altrincham, Ches.
20222	*T. CRATHORNE, 5 Kayll Road, Sunderland, Co. Durham.
20223	*S. W. JONES, " Hindsford," 5 Tudor Road, Wrexham, Denbigh.
20224	*F. HALLSWORTH, 2 Rudford Avenue, Nr. Openshaw, Manchester 11.
20225	J. M. VARDY, 1 Council House, Baydon, Nr. Marlborough, Wilts.
20226	J. C. JAMESON, 18 Lomond Road, Edge Lane, Liverpool, 7.
20227	R. HARRIS, 56D Block, Fallin, Stirling.
20228	R. J. J. G. COLE, 26 Albert Road, Ledbury, Hereford.
20229	A. M. PARKS, 14 Pratchetts Row, Nantwich, Ches.
20230	C. J. ROBERTS, 9 Charles Street, Rogerstone, Newport, Mon.
20231	R. R. PYGALL, 2 Leeson Gardens, Eton Wick, Eton, Bucks.
20232	P. CREASEY, 3 Lilac Place, Yiewsley, West Drayton, Middx.
20233	R. G. HAWKINS, 5 Dale Street, St. George, Bristol, 5.
20234	L. H. WEALL, 34 Valentines Road, Ilford, Essex.
20235	†G. BUSBY, 81 Virginia Road, Thornton Heath, Surrey.
20236	J. K. HARDING, " Iverna," Bodmin Road, Truro, Cornwall.
20237	*R. V. WALLIS, " Hillside," 29 Kavanaghs Road, Brentwood, Essex.
20238	E. J. STREET, 91 Warren Road, Torquay, Devon.

Associate Members (Licenced)

D. BELLINGHAM, Belmont, 73 Carlton Avenue, Wednesfield, Staffs.
R. N. BIRCHALL, Dairy House Farm, Colleys Lane, Willaston, Nantwich, Ches.
D. P. CONNOLLY, Church Road, Mundesley-on-Sea, Norfolk.
A. M. ERNEST, Robinwood, Bridgeman Road, Penarth, Glam.
G. N. M. MELLERSH, " Cowells," One Tree Hill, Guildford, Surrey.
D. S. SIMS, 1 Horniman Drive, London, S.E.23.
B. J. TILLEY, 20 Norfolk Avenue, Sanderstead, Surrey.

*Denotes transfer from Associate Grade.

†Denotes re-elected.

Forthcoming Events

REGION 1

Barrow.—Mondays, 7.30 p.m., Castle House, Walney Island, Barrow-in-Furness.
Blackpool.—July 27, 7.30 p.m., G8GG, 25 Abbey Road, Blackpool.
Bury.—Next meeting September 9, 52 The Drive, Seedfield, Bury.
Chester.—Tuesdays, 7.30 p.m., Tarran Hut, Y.M.C.A., Chester.
Crosby.—Tuesdays, 8.0 p.m., over Gordon's Sweetshop, St. John's Road, Waterloo.
Lancaster.—August 4, 7.30 p.m., George Hotel, Torrisholme.
Liverpool.— (L. & D.A.R.S.).—Tuesdays, 8.0 p.m., St. Barnabas Hall, Penny Lane, Liverpool, 15. (M.R.S.).—July 24, August 7, 3 p.m., Larkhill Mansion House, West Derby.
Preston.—July 16, 30, August 13, Belle Vue Hotel, New Hall Lane, Preston.
Rochdale.—Fridays, 7.45 p.m., 1 Law Street, Sudden.
South Manchester.—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.—July 21, August 4, 18, 8 p.m., Blossoms Hotel, Buxton Road, Stockport.
Warrington.—July 20, August 3, 17, 7.30 p.m. "King's Head Hotel," Winwick Street, Warrington.
West Cumberland.—August 5, 7 p.m., Kells Community Centre, Whitehaven.
Wirral (W.A.R.S.).—July 21, August 4, 18, 7.45 p.m., Y.M.C.A., Whetstone Lane, Birkenhead.

REGION 2

Barnsley.—No meeting in August.
Bradford.—August 17, 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.—August 11, 7.30 p.m., Y.W.C.A., Cleveland Street.
Gateshead.—Mondays, 7.30 p.m., Mechanics' Institute, 7 Whitehall Road.
Hull.—July 27, August 10, 7.30 p.m., "Rampant Horse," Paisley Street.
Leeds.—Wednesdays, 7.30 p.m., Swarthmore Educational Centre, 3 Woodhouse Square.
Middlesborough.—Thursday, 7.30 p.m., Joe Walton's Boys' Club, Feversham Street.
Newcastle-upon-Tyne.—August 3, 7.30 p.m., c/o D. G. Lucas, 33 Broad Chare, Quayside.
Pontefract (P.A.T.G.).—July 22, August 5, 8 p.m., "Fox Inn," Knottingley Road.
Rotherham.—Wednesday, 7 p.m., "Cutler's Arms," Westgate.
Scarborough.—Thursdays, 7.30 p.m., B.R. Rifle Club, West Parade Road.
Sheffield.—July 28, 8 p.m., "Dog and Partridge," Trippet Lane. August 11, 8 p.m., Albreda Works, Lydgate Lane.
Slaithwaite.—Fridays, 7.30 p.m., 3 Dartmouth Street.
Spenborough.—July 28, 7.30 p.m., Temperance Hall, Cleckheaton.
York.—Thursdays, 7.30 p.m., Club Rooms, Y.A.R.S., Fetter Lane.

REGION 3

Birmingham (South).—Summer Recess. (M.A.R.S.).—July 20, 6.45 p.m., "Imperial Hotel."
Coventry.—July 16, 7.30 p.m., Priory High School, Wheatley Street. (C.A.R.S.).—July 19, August 16, 7.30 p.m., 9 Queen's Road, Coventry.
Kenilworth, Leamington & Warwick.—August 19, 7.30 p.m., Dalehouse Lane.
Malvern.—Summer Recess.
Stoke-on-Trent.—July 25, 8 p.m., "Lion's Head," John Street, Hanley.
Stourbridge (S.A.R.S.).—August 10, 8 p.m., King Edward VI School.
Wolverhampton.—August 16, 8 p.m., Stockwell End, Tettenhall.
Wrekin.—Summer Recess.

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 of Arts and Crafts, Sub-basement, Green Lane.
Leicester (L.R.S.).—July 19, August 16, 7.30 p.m., "Hollybush Hotel," Belgrave Gate.
Lincoln (L.S.W.C.).—August 4, 7.30 p.m., Technical College, Cathedral Street.
Mansfield (M. & D.A.R.S.).—No August Meeting.
Newark.—July 25, August 8, 7 p.m., "Northern Hotel," Appleton Gate.
Northampton (N.S.W.C.).—Fridays, 7 p.m., August 6, 6 p.m., Club Room, 8 Duke Street.
Nottingham.—July 16, 7.30 p.m., Sherwood Community Centre, opposite Woodthorpe Drive, Sherwood.
Peterborough.—August 4, 7.30 p.m., 21 Hankey Street, Peterborough.
Worksop.—No August Meeting.
Retford.—No August Meeting.

REGION 5

Cambridge (C. & D.A.R.C.).—July 16 (V.H.F. Converters, Martin O'Dwyer, G4MW), August 13, (Junk Sale), 8 p.m., "Jolly Waterman," Chesterton Road.
Chelmsford.—August 3, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Lowestoft & Beccles (L. & B.A.R.C.).—July 28, August 11, 7.30 p.m., Y.M.C.A., Lowestoft.
Southend.—July 21, 8 p.m., G2BHA, 27 Park Road, Southend-on-Sea.

REGION 6

Cheltenham.—August 5, 8 p.m., Great Western Hotel, Clarence Street.
Gloucester (G.R.S.).—Thursdays, 7.30 p.m., The Cedars, 83 Hucclecote Road, Gloucester.
Oxford (O. & D.A.R.S.).—July 28, August 11, 7.30 p.m., Club Room, "Magdalen Arms," Iffley Road, Oxford.
Portsmouth.—Tuesdays, 7.30 p.m., British Legion Club, Queens Crescent, Southsea. (Club Room open every evening).
Southampton.—August 7, 7 p.m., 1 Prospect Place.
Stroud.—Wednesdays, 7.30 p.m., Subscription Rooms.

REGION 7

Acton, Brentford & Chiswick.—Tuesdays, 7.30 p.m., A.E.U. Rooms, 66 Chiswick High Road, W.4.
Barnes, Putney & Richmond.—August 6, 7.30 p.m., 337 Upper Richmond Road, S.W.14.
Bexleyheath (N.K.R.S.).—July 22, August 12, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Bromley (N.W.K.A.R.S.).—August 6, 8 p.m., "Shortlands Tavern," Station Road, Shortlands.
Chingford.—August 3, 8 p.m., venue from G4GA, SIL 5635 or B.R.S. 19765, SIL 6055.
Chislehurst & Sidcup.—August 11, "Seven Stars," High Street, Foots Cray.
Croydon.—August 10, 7.30 p.m., "Blacksmith Arms," 1 South End, Croydon.
Dorking.—Tuesdays, 7.30 p.m., 5 London Road, Dorking.
Dulwich & New Cross.—No meeting in August.
East Ham.—July 20, August 3, 8 p.m., 57 Leigh Road.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway, W.5.
Enfield.—July 18, August 22, 3 p.m., George Spicer School, Southbury Road, Enfield.
Finsbury Park.—July 20, August 17, 7.30 p.m., 164 Albion Road, Stoke Newington, London, N.16.
Hayes & Uxbridge.—July 26, August 9, 7.30 p.m., Hillingdon Primary School, Uxbridge Road.
Hendon & Edgware.—Wednesdays, 8 p.m., 22 Goodwins Avenue, Mill Hill, N.W.7.
Hoddesdon.—August 5, 8 p.m., "Salisbury Arms."
Holloway (G.R.S.).—July: Fridays, 7.30 p.m., Grafton L.C.C. School, Holloway, N.7. No August meetings.
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.
Norwood.—July 17, August 21, 7.30 p.m., Windermere House, Weston Street, Crystal Palace.
Southgate & Finchley.—August 12, 7.30 p.m., Arnos School, Wilmer Way.
Sutton & Cheam (S. & C.R.S.).—July 20, August 17, "The Harrow," Cheam Village, Surrey.

REGION 8

Brighton.—T.R. at home, Wednesdays, 7.30 p.m., 27 Warren Avenue, Woodingdean. (B.D.R.C.).—Tuesdays, 7.30 p.m., "Eagle Arms," Gloucester Road.
Chatham (M.A.R.T.S.).—July 19, August 2, 16, 30, 7.30 p.m., "Services Rendered Club," 14 High Street, Brompton, Chatham.
Hastings (H. & D.R.C.).—July 20, August 3, 17, 7.30 p.m., Saxons Cafe, Denmark Place, Hastings.
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.).—Next meeting September 13, 8 p.m., Adult Education Centre, Union Place, Worthing. (A.G.M.).

REGION 9

Bristol.—July 16, August 20, 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol, 1.
Exeter.—August 6, 7 p.m., Y.M.C.A., St. David's Hill.
North Devon.—August 5, G3BO, Rosebank, Westcombe, Bideford.
Penzance.—August 5, "Railway Hotel,"
Torquay.—July 17, August 21, 7.30 p.m., Y.M.C.A., Castle Road.
West Cornwall (W.C.R.C.).—July 15, August 5, "Fifteen Balls," Penryn, near Falmouth.
Weston-super-Mare.—August 3, 7.30 p.m., Y.M.C.A.
Yeovil.—Wednesdays, 7.30 p.m., Grove House, Preston Road.

REGION 10

Cardiff.—August 9, 7.30 p.m., "The British Volunteer," The Hayes, Cardiff.
Neath & Port Talbot.—August 11, 7.30 p.m., "Royal Dock Hotel," Briton Ferry.

REGION 13

Dunfermline.—Mondays and Thursdays, 7.30 p.m., behind 34 Viewfield Terrace, Dunfermline.

REGION 14

Falkirk.—July 30, August 13, 7.30 p.m., Temperance Cafe, High Street, Falkirk.

Slow Morse Practice Transmissions

Organiser: C. H. L. Edwards (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex

B.S.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
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	GI5UR	1860	Belfast
14.00	G5AM	1900	Witnesham, Ipswich
21.00	G2FIX	1812	Nr. Salisbury
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
22.30	G8TL	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
21.30	G3DBP	1915	Nottingham
Wednesdays			
19.00	G3GZA	1837.5	Bristol
22.30	G3FBA	1910	Bath
Thursdays			
19.00	G3NC	1825	Swindon
19.15	G2FRX	1850	Plymouth
20.00†	G2CPS	1910	Hull, Yorks.
	G2CNX		
	G3GWT		
22.30	G3ADZ	1940	Southsea
23.00	G3LA	1915	Brentwood
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

† *Alternatively*

MEMBERS USING THIS SERVICE ARE REQUESTED TO SEND LISTENER REPORTS TO THE STATIONS CONCERNED.

Representation

THE following are amendments to the list of County Representatives published in the December, 1952, issue:—

Region 9—Devonshire

A. J. Scanes (B.R.S.4948), 77 Woolsery Avenue, Whipton, Exeter.

Region 13—Fifeshire

I. J. Taylor (GM2DBX), The Pharmacy, Main Street, Methilhill, By Leven.

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

Region 1—Lancashire East

Manchester South

M. Barnsley (G3HZM), 17 Cross Street, Bradford, Manchester

* * *

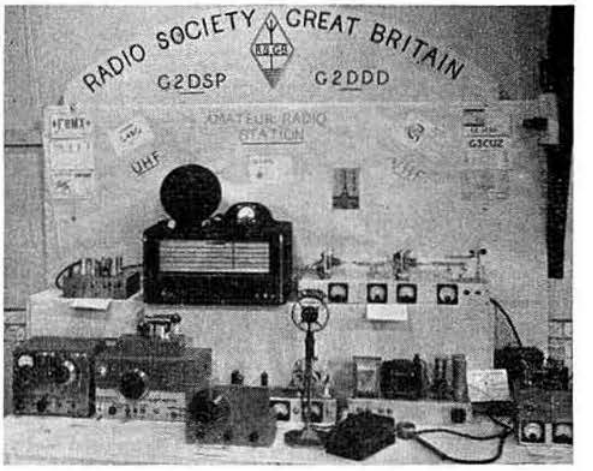
Vacancy

Consequent upon Mr. Scanes' election to the office of Devon C.R., a vacancy now exists for the office of Town Representative for Exeter. Nominations should be made in the prescribed form and sent to reach the General Secretary by not later than August 31, 1954.

* * *

Change of Address

The address of Mr. F. N. Kendrick (G3CSG), T.R., for the Wirral (Region 1) is now 25 Cook Road, Leasowe, Wirral Cheshire.



Eric Cosh, G2DDD, and R. Allen, G2DSP, were responsible for the organisation of the Amateur Radio exhibition at a Hobbies Exhibition held recently in Littlehampton, Sussex, under the auspices of the Rotary Club of that town. A part of the Amateur Radio stand is featured in this picture.

Reggie's Retreat

Some of those who gathered at the home of the Revd. R. T Newcombe (G2AWJ), on Whit Monday.

From left to right: G2DVD, G3HCU, G3BGU, G3DJD, G2AWJ, Mrs. Newcombe G5PR, G3JEP, G2CDN, G3GQE, G2HCV, G3FEX, G3IYL, Mrs. G2MI, Mrs. G2CDN G2HCZ, Miss G2MI, G2VB, G3EFP Mrs. G2VB, G3HVH..

Letters to the Editor

The R.S.G.B. Two Metre Converter

DEAR SIR,—Before answering G3FYY's specific queries I would like to state that the requirements for the R.S.G.B. Two Metre Converter were that it should:—(a) be simple in design, construction and adjustment; (b) possess reasonable performance; (c) be cheap; (d) be suitable for use by the newcomer to two metres. It was decided to use a single-grounded grid amplifier so as to avoid neutralisation and to allow for the provision of an adjustment in the input circuit to enable minimum noise to be obtained by use of optimum coupling to the aerial. The overall noise is kept down by use of as high an anode load for the amplifier as is practicable together with careful operation of the mixer to give a high conversion conductance and correct oscillator injection voltage.

There are several methods by which the performance of a receiver can be gauged, one of them being by use of a calibrated signal generator. However, it has become customary to employ the simpler method of noise comparison. Reference should be made to page 92 of Volume 28 and page 515 of Volume 29 of the BULLETIN. The overall noise factor of a receiver in any case takes account of the various stage gains. It is also possible to calculate the input to give a particular signal to noise ratio if the noise factor is known.

The difficulty in obtaining sufficient bandwidth is not understood. During the evaluation of the circuit it was found possible to obtain a bandwidth of about 6 Mc/s at 3db down with tight coupling. The coil diameter used was twice that specified with half the turns; however, considerably more than 2 Mc/s should be obtained with the smaller diameter coils specified. Care should be taken to see that one of the coils is not inadvertently resonated twice the i.f. away from 145 Mc/s.

In conclusion, I would like to say that I have had a converter of this type in use employing a 6BQ7 valve for two years, during which time it has compared very favourably with the same valve used in push-pull grounded cathode, push-pull grounded grid and cascode circuits.

Yours faithfully,
A. J. R. PEGLER, A.M.I.Mech.E. (G3ENI).
Commander (E), Royal Navy

H.M.S. *Eagle*,
c/o G.P.O., London.

The Art and Science of Sound Reproduction

DEAR SIR,—I was very interested in the report of Mr. Brittain's lecture, in the June BULLETIN. I feel that more frequent publication of the papers read at Society meetings would be much appreciated by members who, like myself, are not usually able to attend.

The somewhat unorthodox views Mr. Brittain holds regarding the desirability of high-fidelity reproduction were rather startling. I cannot agree with him about the place of art in the reproduction of sound, for I believe that the analogy he employs is invalid. In the case of the visual arts the artist is not primarily concerned with making a physical likeness of what he sees, though unfortunately most people seem to think he should be, but with the expression of something much deeper than that. Turning to music, the most important category of sound dealt with, the completed work of art is the song or the symphony actually sung or played. Hearing it in the concert hall is analogous to seeing the artist's completed canvas in the picture gallery. I suggest that the aim of the recording engineer, and the designer of the audio equipment that is used to reproduce the sound in our homes, should be the same as that of the process engraver and printer who reproduce from a picture the prints which adorn our walls, namely, to re-create as accurately as possible in all respects the original work of art. This is craft, not art.

There is no *a priori* reason why the realisation of this aim should stop short, and such limits as there are appear to be economic rather than technical, as Mr. Brittain's demonstrations made clear.

Yours faithfully,
A. GARD (A1162).

Chingford, E.4.

(All who lecture to the membership at The Institution of Electrical Engineers are invited to submit a precis of their lecture for publication, but few do so.—ED.)

The 1921 Transatlantic Tests

DEAR SIR,—The admirable letter by G3BY in the April number of the BULLETIN, referring to the pioneer development of the short waves by amateurs, covers the ground quite well in so short a space, but I think his references to the 1921 Translantic tests give a wrong impression of the actual position. I would be the last person to dull the honours due to Paul Godley for the prowess shown by his reception of his fellow " Hams " but it is well to remember that the tests were a joint effort and that considerable work was also put into them by the amateur organisations in this country, particularly by Philip Cousey G2JK. Actually when Mr. Godley made his first reception the Atlantic was already bridged and the job done, for the reception of an American amateur station was made by W. R. Burne (G2KW), the first prize winner in the tests, two days before Mr. Godley received his first amateur. It will be seen, therefore, that G2KW vindicated the ability of the British " Ham " to receive the signals on British gear, and the main honours of the " bridging of the gap " lie with this country, as was indeed clearly stated in the writer's article *The Dawn of International DX*, published in the July, 1938 number of the *T. and R. Bulletin*.

Yours faithfully,
W. E. F. CORSHAM (G2UV).

Wembley, Middlesex.

The Editor does not necessarily endorse the views and opinions expressed by contributors to this feature.

Interference to Reception

DEAR SIR,—It would appear from correspondence that nobody ever takes the trouble to read the conditions printed in the schedule on the back of a receiving licence. Paragraph 3 of the Broadcast (Sound) Licence and Paragraph 4 of the Broadcast (Television) Licence states that " The apparatus shall be so maintained that it does not cause interference with any other wireless telegraphy."

Surely this applies to interference from the time bases of a TV set as it does to the radiations of an oscillating receiver, and the last four words as much to amateur reception as to reception of broadcasting. If the terms of the paragraph are enforced then the owner of an offending TV set can be made to switch off until the interference is suppressed.

If the Post Office fail in their duty to enforce their own terms for granting a licence then I see no reason at this point why legal action cannot be taken and an injunction be obtained to restrict the use of the offending set until such times as the set is made interference free.

Perhaps some of your more legal-minded readers may like to take the matter up.

Yours faithfully,
JOHN W. ROBINSON (G5UP).

High Westhouse,
via Carnforth, Lancs.

More About KN

DEAR SIR,—I hesitate to question the comment of so distinguished an authority as " Fergie " (Capt. A. M. H. Fergus—G2ZC) on the topic of operating procedure, but with all due respect I think he missed, in his letter (May issue), the point of G3GLV's inquiry about the meaning of KN. G3GLV did not ask whether it was a good thing to use it, but merely asked what the abbreviation means.

To quote the *G.P.O. Handbook* as a reference, is rather like quoting *Chamber's Dictionary* as an aid to finding the meaning of an American colloquialism—the term in question just isn't there. Whether the symbol just grew, or whether it was formulated, doesn't much matter. The fact is it has been officially recognised by the A.R.R.L., and is recommended by them in one of the " Operating Aids " published by the League. If we are to understand properly what U.S. amateurs are talking about during QSO's we must learn what their symbols mean, even if we eschew their use ourselves. If that is accepted then surely the editorial comment (March issue) was absolutely correct " technically." I say technically, because being the undisciplined crew that we are, KN is not used in quite such a definite manner as to imply " all others keep out," and it is seldom used on an initial call to a specific station. In practice it is used to indicate " I am in QSO," and as such it has definite value, especially when only one side of the QSO is audible.

If the use of this symbol becomes universal and provided it is used exactly as A.R.R.L. recommends, then when you hear just " . . . . de AC3BB K," you will be able to call him with a clear conscience, *knowing* that he is not already booked.

There is a snag to using GA for " go ahead "—the other fellow sometimes thinks it means " good afternoon," sends GA himself and departs!

Yours faithfully,
BOB ELDRIDGE (VE7BS).

Vancouver, Canada.

Operating Proceedure

DEAR SIR,—It was a timely reminder from G2ZC about the misuse of QRZ? at the end of a QSO, instead of CQ (3 times *only* followed by 3 call signs).

It would surprise many operators to find how many more contacts they would make by using this procedure and at the same time there would be a notable reduction in QRM from unnecessary CQ calls. These are nearly always much too long; a sequence of 3 CQ's × 1 call-sign sent 3 times, finishing with 3 CQ's × 3 call-signs is ample.

Needless to say, the adoption of the above CQ procedure at the end of a QSO requires the finishing station to stay on his frequency and the other one to move away sufficiently to clear him before doing likewise.

Yours sincerely,
BRIAN C. CHRISTIAN (G5XD).

Oakley, Bedford.

DEAR SIR,—I should like to thank Mr. J. Worthington (G3COI) for his letter in the June issue of the BULLETIN because he raised a very interesting point in connection with c.w. operation. The force of his remarks on the copy of any but " skeleton " QSO matter should, I think, be evident to all; but there is a far greater danger in the average c.w. operating which is not so apparent. When an operator finds he can receive RST, QTH and name at 25 w.p.m. he erroneously assumes he can *operate* at this speed. That this is not so, may be easily brought home as I found recently. I had spent a hectic hour on 7 Mc/s and on coming down to 3.5 Mc/s worked a G at 589 both ways. We were both " solid copy " at about 20 w.p.m.—until he asked me a question in plain language.

I was at once out of my depth and mechanically debated whether to say supper was ready, or that QSB was knocking his signal about. Then I remembered what Mr. Worthington had written, and with flushing face and quavering key, sent " PSE QRS."

Now, despite the loss of amateur pride involved, I felt I had learnt a lesson. Judging from similar incidents when the weight has, so to speak, been off the other bug-key, I think that we have here a warning against continual " skeleton " operation which all would do well to heed.

Yours faithfully,
Sutton, Surrey. NIGEL HARVEY (G3IRU).

7 Mc/s C.W. Operation

DEAR SIR,—I find myself entirely in agreement with the view expressed by Mr. J. H. Cant (G6FU) in the June issue regarding interlopers in the 7 Mc/s band and feel that if only a few of the QRO DX men would spread themselves over our exclusive 300 kc/s we should soon find a much easier state of affairs.

It is still possible to work DX on this band as I myself have proved, having W.A.C. except Asia with a B2 (c.c.) transmitter and no more than 25 watts in the past twelve months. This, I might add, using a two-valve straight receiver and burning no midnight oil!

Yours faithfully,
Bath, Somerset. J. W. RUSSELL (G2ZR).

Converting the RF24 Unit

DEAR SIR,—After studying the circuit and article on the conversion of the RF24 unit, by G3BPM in the R.S.G.B. BULLETIN for December, 1953, it occurred to me that an alternative method (which may be of interest to your readers) involving little more than perhaps some adjustment of the trimmers, would be to use the unit as a " fixed-tuned " converter feeding into a receiver covering a suitable range around the i.f. output of the RF24 (7.5 Mc/s).

By selecting suitable positions of the RF24 bandswitch (probably positions 1 and 5) a single unit could provide both 21 and 28 Mc/s coverage. Added refinements might be the incorporation of the R9'er input circuit, or a midget variable mounted on the panel to serve as an aerial " peaker."

I am expecting to receive one of these units shortly and intend trying it in the manner suggested above.

Yours faithfully,
F. G. BAIL (VK3YS).

Box Hill North,
Victoria, Australia.

Unnecessary Bric-a-Brac?

DEAR SIR,—With all respect to the very worthy gentlemen involved, may I raise a voice of protest at the apparently lavish spending of R.S.G.B. hard-earned funds (see *Current Comment* last month) upon trivial and unnecessary bric-a-brac such as the " Past Council Members' Badges." How about a Past Ordinary Member's Badge for ex-members, or a change of colour for long service? Surely, Sir, these monies would be better spent on, say, providing Morse practice tapes to be sent over the Headquarters station?

Yours faithfully,
M. BARLOW (G3CVO).

Chelmsford, Essex.

Stamp Club Proposed

DEAR SIR,—Having recently met several amateurs who are keen stamp collectors, may I suggest that we revive the R.S.G.B. Stamp Club, mainly on the lines of exchanges between members?

To this end I appeal to those interested to contact me, indicating countries of interest. From this we could organise an exchange of envelopes or booklets of spares suitable to all, and a system of balancing credits, etc.

Yours sincerely,
N. HORROCKS (G2CUZ).

32, Sandbrook Road,
Ainsdale, Southport, Lancs.

Can You Help ?

● C. H. I. Edwards (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex, who wishes to obtain miniature (1in. diameter) meters (from 1-25 mA f.s.d. and 100-300 mA thermoammeters) for use in portable equipment.

* * *

● M. W. Parry (G3AUZ), 32 Harstoft Avenue, Worksop, Notts., who requires information on the Bendix Radio Corporation aircraft receiver type RA-1B.

Correction

In the list of New Members published last month, the call-sign held by E. Birch, 89 Meadow Lane, West Derby, Liverpool, 12, should have been quoted as G3JHQ. G3JMQ is held by C. S. Cotter, 19 Homer Street, Dingle, Liverpool, 8.

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on July 16 and August 20, 1954.

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

New Books

BASIC ELECTRONIC TEST INSTRUMENTS. By Rufus P. Turner. Page size 9in. × 5¾in. 254 pages. Profusely illustrated. Published by Rinehart Books Inc. New York and Toronto. Available from Arthur F. Bird, 66 Chandos Place, London, W.C.2. Price 32/-.

This book fills the needs for an accurate up-to-date treatise on the test instruments used in television, radio and the general field of electronics.

The scope is very comprehensive, ranging from a description of simple meters for increasing current and voltage to a full account of radio frequency measuring devices, audio test oscillators, r.f. test oscillators, signal tracers, distortion meters, and square wave generators. Each chapter is followed by a series of questions designed to review the study just undertaken.

This is a book which should find a place in the library of every television service man and radio engineer. It will enable the reader to choose easily and intelligently from the mass of equipment available on the market, those instruments which will prove of greatest help to him.

TELEVISION RECEIVER SERVICING: Volume 1: Time-base Circuits, by E. A. W. Spreadbury, M.Brit.I.R.E. Page size 8¾in. × 5¼in. 310 pages. 187 illustrations. Published by Trader Publishing Co., Ltd., and distributed by Iliffe & Sons, Ltd. Price 21/-.

This book is mainly intended for the professional service engineer who, having already become skilled in the art of fault tracing in radio receivers, wishes to extend his activities to television servicing. Others interested in television will, however, also find it a fund of information not available in other current books on the subject. It does not attempt to teach the principles of radio servicing, but extends them to the more complex circuits and techniques of television.

The author describes, in a practical and straightforward manner, each section of the receiver, and shows the reader how to check that the waveform is correct at the input and output of each section. Comprehensive information is given on fault location, and how to isolate a faulty section from the rest of the receiver. The work is fully illustrated and includes diagrams of a wide variety of actual circuits, each of which is discussed in detail in the text.

The present volume covers the time-bases and their associated circuits only; and probably at least half the servicing problems likely to be met by the engineer occur in these sections. The remaining sections of the receiver are to be dealt with in a second volume now in course of preparation.

Television Receiver Servicing should prove particularly useful to service engineers who intend to take the Television Servicing Certificate Examination conducted by the City and Guilds of London Institute and the Radio Trades Examination Board, particularly in the practical test. The author has been a practical examiner for several years.

THE OSCILLOSCOPE AT WORK. By A. Haas and R. W. Hallows, M.A. (Cantab), M.I.E.E. Page size 8¾in × 5¼in. 172 pages. 102 diagrams and 217 oscillograms. Published for *Wireless World* by Iliffe and Sons, Ltd. Price 15/-.

This book, originally published in France, is a practical guide to the application of the Cathode-Ray Oscilloscope to many branches of electronics, with especial reference to radio and television receivers. It has been adapted for English-speaking readers and considerably enlarged by R. W. Hallows.

An important feature is the large number of oscillograms which help to make the book of much practical value. More than 200 of these oscillograms, representing more than two years' work, were specially prepared by Alfred Haas while many new ones have been added for the English adaptation.

Although, as its title implies, *The Oscilloscope at Work* deals mainly with the uses of the instrument and correct interpretation of the oscillograms produced, it also contains a good deal of valuable information on oscilloscope circuits, construction and adjustment.

Silent Key

G. R. MARSH (G2IW)

The recent death of Mr. G. R. Marsh, G2IW, of Bath, Somerset, has deprived the Society of one of its earlier members and Amateur Radio of a pioneer worker.

Mr. Marsh was first licenced in 1913, since when, except for war periods, he maintained an active station up to the time of his death. In recent years his activities had been confined to 80 metres, on which band he put out a first class signal.

Mr. Marsh was one of the Old School who strongly disapproved of the current practice of indiscriminately using Christian names unless he personally knew the person with whom he was in contact.

He had wide interests outside Amateur Radio, in fact his chief hobby was collecting unique clocks—of which he had more than 80—many of them very valuable. He possessed a most comprehensive workshop which would have done credit to a small factory. Practically all of his radio gear was home made. Mr. Marsh was a retired schoolmaster.

His passing will be mourned by a very wide circle of members and enthusiastic short-wave listeners.

F. G. S.

RADIO SOCIETY OF GREAT BRITAIN

NATIONAL CONVENTION—BRISTOL 1954

Programme of Events

HERE is the full programme of events for Convention. An application form for tickets is enclosed in this issue.

In order to give the Convention Committee as much time as possible to complete their many arrangements, members are requested, as a matter of urgency, to complete and return their forms, together with the necessary, remittances, to the Honorary Secretary, Convention Committee, without delay.

Friday, September 17th

10.00 a.m. *Amateur Radio Exhibition opens.

1.45 p.m. Visit to the Bristol Aeroplane Company, Ltd., Aircraft Division, Filton.
(Accommodation for 30—duration 2½ hours.)

2.15 p.m. Visit to W. D. & H. O. Wills' Tobacco Factory, Bedminster.
(Accommodation for 30—duration 2½ hours.)

2.50 p.m. Visit to Council House (City's Historic Relics and Regalia), Corn Street.
(1s. Party, Accommodation for 25 – duration 2 hours)

3.00 p.m. Visit to B.E.A. Control Room, Clifton.
(Accommodation for 40—duration 1½ hours)

3.00 p.m. Visit to B.B.C. West of England Studios, Control Room and Recording Department, Clifton.
(Accommodation for 12—duration 2 hours)

3.20 p.m. Visit to Council House, Corn Street.
(2nd Party, Accommodation for 25—duration 2 hours)

3.30-6 p.m. *Informal Tea.

6.30 p.m. *Informal Reception by the President (Arthur O. Milne, Esq., G2MI).

7.00 p.m. *CONVERSAZIONE & BUFFET.

8.30 p.m. *Film Show and Demonstration of Large-screen Television, including TV Camera Equipment.

10.30 p.m. *Amateur Radio Exhibition closes.

Saturday, September 18th

9.45 a.m. Visit to Burden Neurological Institute, Stapleton.
(Accommodation for 20—duration 2¼ hours)

10.00 a.m. *Amateur Radio Exhibition opens.

10.30 a.m. *Lecture, "Stereophonic Sound," by A. H. Radford, A.M.I.E.E. (G6YA).

10.30 a.m. Visit to B.B.C. Television Outside Broadcast Unit, Whitchurch (subject to B.B.C. commitments).
(Accommodation for 20—duration 2 hours)

10.45 a.m. Visit to G.P.O. Automatic Exchange and Repeater Station, Telephone Avenue.
(Accommodation for 20—duration 2½ hours)

10.45 a.m. Visit to "Bristol Evening Post" Newspaper Offices, Silver Street.
(Accommodation for 15—duration 2¼ hours)

11.45 a.m. *Lecture, "Aerials for DX," by F. J. H. Charman, B.E.M. (G6CJ).

2.00 p.m. Visit to B.E.A. Generating Station, Portishead.
(Accommodation for 30—duration 3 hours)

2.00 p.m. Visit to G.P.O. Radio Station, Portishead.
(Accommodation for 30—duration 3 hours)

2.00 p.m. Visit to Blaise Castle and Grounds.
(Duration 2¾ hours)

2.00 p.m. Visit to Cheddar Gorge, via Burrington Combe and the Mendips, with optional visit to Caves.
(Duration 3½ hours)

2.30 p.m. *Lecture "T.V.I. Problems" by Louis Varney, A.M.I.E.E. (G5RV).

2.45 p.m. Visit to Council House, Corn Street.
(1st Party, Accommodation for 25—duration 2 hours)

3.00 p.m. Visit to B.E.A. Control Room, Clifton.
(Accommodation for 40—duration 1½ hours)

3.05 p.m. Visit to Council House, Corn Street.
(2nd Party, Accommodation for 25—duration 2 hours)

3.45 p.m. *Lecture, "Recording and Interpretation of Brain Potentials," by Dr. W. Grey Walter, M.A.

5.45 p.m. OFFICIAL RECEPTION BY THE PRESIDENT at Victoria Rooms.

6.45 p.m. CONVENTION DINNER at Victoria Rooms. (8 p.m., Toasts, 9 p.m., Interval, 9.30 p.m., Draw for Free Prizes).

8.00 p.m. *Amateur Radio Exhibition closes.

Sunday, September 19th

9.30 a.m. *Amateur Radio Exhibition opens.

10.00 a.m. Visits to Electron Microscope at Royal Fort, Bristol University, commence.
(Duration 1 hour)

10.00 a.m. Conducted Tour of Bristol by coach.
(Duration 2 hours)

11.00 a.m. Morning Service at St. Mary Redcliff Church.

12.30 p.m. *Amateur Radio Exhibition closes.

2.30 p.m. Visit to Bristol Zoological Gardens (Tea may be obtained at the Restaurant in the Gardens if required).

Events marked thus * take place at the Royal West of England Academy, Queen's Road, Clifton, Bristol, 8.

Members attending the Convention are requested to Register at the Reception Desk in the Royal West of England Academy on arrival.

EXCHANGE AND MART SECTION

ADVERTISEMENT RATES. MEMBERS' PRIVATE ADVERTISEMENTS 2d. per word, minimum charge 3s. Trade Advertisements 6d. per word, minimum charge 9s. (Write clearly. No responsibility accepted for errors). Use of Box number 1s. 6d. extra. Send copy and payment to National Publicity Co., Ltd., 36-37 Upper Thames Street, London, E.C.4, by 22nd of month preceding date of issue.

5RV 75 watt TVI proof transmitter in rack with power packs and aerial unit, £25. Buyer collects. Avo oscillator, mains, £7. Electronic keyer with 6J6/6SN7, 30/–. G2BNZ, 489 St. Helens Road, Bolton. (180

B2 transmitter/receiver power pack complete in watertight cases, brand new, offers. Wanted: communication receiver, new condition. H. Cooke, Larbreck, G. Eccleston, Nr. Preston. (181

ACCOMMODATION wanted. Two hams seek furnished flat in Cambridge for two years from September if suitable. Alan Davidson, Brasenose College, Oxford. (182

T1131 80/40/20/10 m. xtal control, complete, £40. 1450SC, 50/–. 579 High Road, Ilford. (183

UNMODIFIED T1131 in case, complete less valves. What offers? BC221 best offer over £26. Box 184, National Publicity Co. Ltd., 36-37 Upper Thames Street, London, E.C.4. (184

LIONEL bug key, £2. Acos microphone MIC22, £4. Murphy 6FI pre-amp, Midland, £1. Duomag focaliser, low flux, 30/–. 3525 kc/s, crystal, 10/–. Butler low pass filter, 10/–. Labgear E5023 coil turret, £2. Numerous valves and other items. Please send S.A.E. for list. Frakes, G3HIK, 105 Mansfield Road, Warsop, Nr. Mansfield, Notts. (187

VALVES mostly new and boxed. At 2/–: EB34, 9D2, 15D2, 8D2, EF50, RL37, VP23, 6H6, 28D7, BL63, ACP4, 313C, 1637, SP61, P61, 37, DDR5. At 3/6: KTZ41, MU2, 6C8, 6G6G, OB3, 12C8GT/G, 3B7, 1LC6, 1LN5, 3D6, 1LH4, OZ4, 1X2A, 9001, 9002, 9003, 955, CV54, 6SH7, U76, V960 (VU133), HVR2A, 2A3, EF36, 956, 9004, 12AU6, 12AW6, DET25, UU3, 25Z5 4687, 12J5, 12AH7, 6S7. At 5/–: 1625, 7V7, 6AC7, 7475, 6AG5, 6SK7, 12SG7, 717A, Z77. At 7/6: 866, 6SN7GT. Please add 3d. each post and packing. Jeapes, 129 Cambridge Road, Trumpington, Cambs. (188

NEW, boxed, 3E29 (829), 50/–. 6J6, 6BA6, 6BE6, 9002, 9003, 1T4, unboxed, 1U5, 7/6. 12 at 10/–. 5,000V extension for Pullin 100, 35/–. DZJ, 79 Burnside Road, Dagenham, Essex. (189

SSB Exciter 10A also model 20A for sale at list price. G2MF, 51 Townhead Road, Dore, Sheffield. (190

EXCHANGE Manual S27D for Manual BC348N. Haydon, 5 Crown Road, Muswell Hill, London, N.10. (192

CR100/2 built in signal strength meter. Manual and valve replacements, £20. Johnston, 224 South Palmerston Street, South Shields. (194

HRO Senior 8 coils 100 kc/s to 30 Mc/s power unit, £23. BC348R 6AK5 RF 'S' meter built in 'Q' fiver power unit, £18. Fully metered power supply 280V 150 mA 6.3V 10A, 12.6V 3A, variable AC 100V, 150V, 200V, 220V, 240V, 150W, £5. E. Jennings, 93 Merlin Grove, Beckenham, Kent. (191

IMPORTANT NOTICE

All Exchange & Mart advertisements must be sent with remittance made payable to:

THE NATIONAL PUBLICITY CO., LTD.

36-37 Upper Thames Street, London, E.C.4

The Society and its Advertisement Manager cannot intercede in any matters arising from advertisements appearing in this section.

BC348 wanted. Exchange for transmitter, grey metal screened cabinet, 3 sections: three power supplies: Wilcox-Gay v.f.o. transmitter (p.p. 807 final) Supermodulator: VCR138 scope, f.b. condition, spare valves, tube. Sale commercial R9'er 6BA6 coils 14, 28, £1. RF25 converted 28 Mc/s, 10/6. G.P.O. Tester W153400, coils, headset, batteries, leather ase, 65/–. G2BVN, 51 Pettits Lane, Romford, Essex. (195

CR100, good condition, less cabinet, £10. "Argus" 6in. television, spare tube, magnifier, brand new perfect, £10. Or exchange lot for good receiver, carriage extra. BRS 20068, Schofield, 201 Upholland Road, Orrell, Wigan, Lancs. (196

WANTED one or two ten-section aluminium masts, as used with American TBW sets. Masts must be in good order and complete with three sets guy ropes, metal pin, base plate, stakes and canvas bags. Box 197, National Publicity Co. Ltd., 36-37 Upper Thames Street, E.C.4. (197

BRAND new:—T.V.1 proof—band-switched transmitter in twin grey-crackled table top cabinets, comprising v.f.o./r.f. and modulator sections. Genuine 150 watts plus on phone or c.w. "813" final. Fully metered. The best 'Ham' transmitter built in Britain—first-class workmanship and appearance. Photo on request. Built at cost of £125—will sacrifice for £85. Oswald, G3EKH, 3 "Briardale," Edgware. MIL 1333. (198

WANTED BC610 Hallicrafters, ET4336 transmitters. AR88s receivers and spare parts for above. Best prices. P.C.A. Radio, Beavor Lane, Hammersmith, W.6. (199

WANTED R.C.A. speech amplifiers, type M1–11220 J or K and aerial tuning units BC939A—Offers stating quantity and price to P.C.A. Radio, Beavor Lane, Hammersmith, W.6. (200

FOR SALE. CR.100 receiver. Good condition, £22 o.n.o. Inspection. G8TB, 67 Old Lodge Lane, Purley. (201

(Continued on page 48)

EXCHANGE AND MART SECTION

(*Continued from page 47*)

METALWORK.—All types cabinets, chassis, racks, etc., to your own specifications.—PHILPOTT'S METAL WORKS, LTD. (G4BI), Chapman Street, Loughborough. (99

PATENTS and Trade Marks, Handbooks and advice free.—KINGS PATENT AGENCY, LTD. (B. T. KING, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146A Queen Victoria Street, London, E.C.4. Phone: City 6161. 50 years' refs. (98

QSL.s and log book (P.M.G. approved). Samples free. State whether G or B.R.S.—ATKINSON BROS., Printers, Elland. (772

WANTED: HRO coils, receivers, power packs, AR88Ds, AR88LFs, SX28s, BC348s, AR77s, and many other types, also laboratory test equipment and R54/APR4, TN17, TN18 and TN19 units.—Details please to R.T. & I. SERVICE, 254 Grove Green Road, Leytonstone, London, E.11. (LEY 4986). (1010

VFO Type 145 complete with 807, pair of S.130 VR tubes, and Barretter. Output 3.0 Mc/s to 7.0 Mc/s inclusive, £4 10s. G3EMD, 99 Shenstone Valley Road, Quinton, Birmingham, 32. (202

CALLING all VE, VK, W, ZL, ZS Hams: Private collector will pay your price, if reasonable, for "CQ," January, March, April, June, November, December, 1945, May, 1946. "QST" before 1924. "Radio" before 1936. "R/9" before April, 1935. Lots "Amateur Radio," "Break-In" (lists on request). Any "Xtal," "Radio ZS." Any quantity other overseas Ham magazines in English, any period. Air-mail your offers, please. All expenses repayed. Also require 8 HRO valve can tops, good American bug, 2 6AU6. G3IDG, 95 Ramsden Road, London, S.W.12. (203

ROTARY converter, 230 d.c.—230 a.c., 200W, fully screened, TV1/BCI proof, £10, o.n.o. plus carriage. Valves: 1625 (4), 25L6 (2) 5/- each. Carrington, Nepeta, Stringers Common, Guildford, Surrey. (204

1 50 Watt, Canadian Marconi Transmitter, 160, 80' 40, 20 Metres, switched, £35 o.n.o. 1147A American Receiver, 2 r.f., Mix, Osc, 3 i.f., etc., 1.5 to 30 Mc/s, £35 o.n.o. R103 Receiver, £6 10s. o.n.o. 19 Set crystal Calibrator, £2. V.C.R. 97 Television Receiver, in separate units, working but needs attention, £5 o.n.o. Quantity of spare parts, s.a.e. for list. G3BEF, 11 Geoffreyson Road, Caversham, Reading, Berks. Tel.: Reading 73480. (205

VIEWMASTER Table Cabinet (Tallon), £3 10s. 75 watt c.w./transmitter (650 volt p.p.), £8. Haynes Focus Coil, 7/6. Focus Magnet Elac, 10/- K3/100, 5/-. Set Viewmaster Coils (HM), 5/-. GW6GD, "Cor-y-Llwyn," Glyn Ceiriog, Wrexham. (206

R103 for sale in first-class condition, 160, 80, 40, metres p.p. with built-in speaker, £8. G3JML, 9 Cliffe End Road, Longwood, Huddersfield. (209

MOBILE cw/phone transmitter/receiver (see BULLETIN May), send S.A.E. for list of one almost complete set of components, including valves, coils, Rotary, T17 Mic. and aerial, etc., for £3 10s. Q5'er, with circuit £2 7s. 6d. Webbs driver transformer. 2A3's into 807's 12s. 6d. HRO coils (perfect) B/S 40, 80 and med. wave. Best offer. M/c meters 7s. 6d. each—2in. R.F. 3A (2) 1A (2) .5A (2). 2in. Voltmeter 0-40V. 0-300V 2in.—50, 150 mA, 2½in. 0-600V 12s. 6d.—50 mA 10s. Blue metal cab. for 2½in. scope 15s. Labgear 10 and 20—150 watt coils and base complete with swinging link 20s. Lots other gear cheap. S.A.E. lists. Box 210, NATIONAL PUBLICITY CO., LTD., 36/37 Upper Thames Street, E.C.4. (210

FOR SALE: Radiovision "Commander"—double superhet—continuous 1.5–31 Mc/s. Bandspread all amateur bands, little used, perfect condition. What offers? G3GII, 9A Hewett Road, Dagenham, Essex. (211

CLEARANCE sale; give away prices. Valves, meters, transformers, crystals, etc. S.A.E. for lists. McKinty, 1 Abbey Park, Whitehouse, Belfast. (212

AR88D receiver, lovely condition, £65. Current model U.S.A. double conversion receiver £85. R.E.M.69 6-band superhet receiver 550 kc/s to 32 Mc/s £20. American H.F. signal generator 330/8 Mc/s £45. Bell-Howell 16 mm. sound projector £120. Would exchange for C.J.K. portable tape recorder. S.A.E. enquiries. Box 214, NATIONAL PUBLICITY CO., LTD., 36/37 Upper Thames Street, E.C.4. (214

APPOINTMENTS SECTION

Situations Vacant

RADIO OFFICERS required by the EAST AFRICA HIGH COMMISSION DIRECTORATE OF CIVIL AVIATION for one tour of 30 to 48 months in the first instance with prospect of permanency. Salary, etc. in scale £742 rising to £965 a year. Gratuity of 10 per cent. of total emoluments received for those not taken on permanent establishment. Free passages. Liberal leave on full salary. Outfit allowance £30. Candidates must be capable of operating at 25 w.p.m. and should preferably hold M.C.A. 1st Class Certificate in Radio Telegraphy. Knowledge of touch typing for teleprinter, the operation of modern radio or radar aids, or experience in radio maintenance would be an advantage. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30606/RC.

McMICHAEL RADIO, LTD., require experienced Radio Technicians for the Inspection, Testing and Servicing of Government Radio and Electronic Equipment.—Apply to the Personnel Manager, Wexham, Road Slough, Bucks.

STOREKEEPER (RADIO EQUIPMENT) required by NIGERIA GOVERNMENT Posts and Telegraphs Department for one tour of 12–24 months in first instance either (a) with prospect of pensionable employment at salary, etc. £750 rising to £1,175 a year, or (b) on contract at salary, etc. £807 rising to £1,269 a year plus gratuity at rate of £100/£150 a year. Commencing salary according to experience. Outfit allowance up to £60. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for their maintenance in U.K. Liberal leave on full salary. Candidates must have substantial experience in radio equipment storekeeping, including H.F. and V.H.F. stock control, and stores accounting procedure. Write to the Crown, Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experiences and quote M3B/34215/RC. (186

ASSISTANT SIGNALS OFFICER required by the SIERRA LEONE Government Civil Aviation Department for one tour of 18–24 months with prospect of permanency. Salary, etc., according to qualifications and experience in scale £742 rising to £1,177 a year. Outfit allowance £60. Liberal leave on full salary. Free passages for officer and wife. Assistance towards cost of children's passages or grant of up to £150 annually for maintenance in U.K. Candidates should be experienced in M.F., H.F., V.H.F., and V.H.F./D.F. and ancillary equipment and should hold the P.M.G. Certificate in Wireless Telegraphy or equivalent. Preference will be given to those holding City and Guild certificates in Radio. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30353/RC. (193

WORKSHOP FOREMAN required for the NIGERIAN BROADCASTING SERVICE for two tours of 15–18 months each in the first instance. Salary, etc. in scale £807 rising to £1,115 a year. Gratuity £100/£150 a year. Outfit allowance £60. Free passages for officer and wife. Assistance towards cost of children's passages or grant up to £150 annually for their maintenance in U.K. Liberal leave on full salary. Candidates should be experienced Machinists, and familiar with all types of machine tools and with workshop organisation. Ability to read circuit diagrams advantageous. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30481/RC. (207

RADIO OFFICER required for NIGERIA for one tour of 12–24 months in the first instance Salary, etc. (a) in scale £750 rising to £1,175 a year with prospect of pensionable employment, (b) on temporary terms in scale £807 rising to £1,269 a year with gratuity at the rate of £100/£150 a year. Outfit allowance up to £60. Free passages for officer and wife and assistance towards cost of children's passages or grant up to £150 a year for their maintenance in U.K. Liberal leave on full salary. Candidates must have recent experience in operating wireless and direction finding ground stations for air services, and possess a P.M.G. Certificate in Radio Telegraphy, an air operator's certificate, or equivalent service qualification. They must also have a thorough grounding in I.C.A.O. codes and procedures. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age name in block letters, full qualifications and experience and quote M2C/30648/RC. (208

RADIO TECHNICIAN required as SIGNALS ASSISTANT INSPECTOR OF POLICE by NYASALAND GOVERNMENT for one tour of 2–3 years with prospect of permanency. Salary, etc. £651 rising to £1,103 a year. Commencing salary according to experience. Outfit allowance £50. Uniform allowance £10 a year. Free passages. Liberal leave on full salary Candidates must be between 21 and 30 years of age, of good education and physique, not below 5ft. 7in. in height, normal vision without glasses. They must have a sound knowledge of H.F. and V.H.F. fixed and mobile simplex and duplex radio telephone systems and low-power petrol/electric charges and alternators. Knowledge of morse and ability to instruct trainees in radio subjects desirable. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M1/36023/RC. (213

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