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CURRENT COMMENT

Shedding a Load

IT may not be generally known that the amount of correspondence received at Headquarters totals many hundreds of letters *per day*. The ordinary member may marvel at how the flood is ever kept at bay by what is by no means an over-inflated Headquarters staff. Canute's job was a sinecure by comparison.

To change the metaphor from stemming the flood to shedding the load, the thought arises: *Just how much of this load could be shed?* For if any of it *can* be shed without impairing the efficiency of the Society in any way, then it *ought* to be. A good deal of it is routine, of course, and cannot be handled by any other body than the Headquarters organisation. Into this category come such matters as renewal of subscriptions, queries about the BULLETIN, or about material intended for publication in it; a hundred and one such crowd in every day.

Even so, the thought still obtrudes itself: How much of the remaining correspondence could be avoided? There must be a great number of specialised queries and matters of local and district importance that could be handled in another way, and that is *via* the R.S.G.B.'s office-holder for that particular area. Regional Representatives are very close to the Council in matters of policy, and they in turn are in close touch with the smaller local groups. It may often be the case that a member's query can be answered perhaps by his local Town Representative, or, more likely, by his Regional Representative, with consequent lessening of the burden on the central body.

Let it never be thought that the writer puts out this personal thought (not inspired, by the way, from the central body, but quite extempore!) from any idea of cheese-paring or saving miserly pence on post. No such saving would occur, since R.S.G.B. local representatives can claim their postal expenses anyway. One's concern is much more with seeing that the load does not become so insupportable as to keep its bearers' eyes on the ground and not sufficiently on the more distant horizons ahead. Modern life generally tends to oppress the individual with a great clutter of detail which could be mitigated in some measure were the value of this detail truly measured. Much of it could be sloughed off, assuredly.

It would be unfortunate if the central directive of this Society were accused of inaction—or slow action—when in fact the accusers were to blame for clogging the wheels themselves! Improbable—maybe; impossible, no.

All of which boils down to this: keep in touch with your Town Representative and through him with County and Regional Representatives, all of whom constitute a web of R.S.G.B. knowledge and source of information covering the whole country. Obviously they cannot give answers on many matters of higher policy; but they *can* give a lot of answers on a lot of things. They, the membership's men, are there to help; they can do so—probably more often than may be thought.—J.H.

Controversy

THE liveliness of any journal, and the strength of its impact on its readers, can be measured almost directly by the amount of correspondence it publishes. In this respect the R.S.G.B. BULLETIN can claim a forward place.

Members who like to thumb reminiscently over the past year's issues will find that a great number of topics have come under searching review. There is no doubt about the impact!

To whip up correspondence, come what may, has never been the policy of this journal. Much material that might have appeared as correspondence later metamorphoses into something larger in the shape of a full-dress article or technical note. But although "Letters to the Editor" is diminished by that much, a counterbalancing gain appears somewhere else in the issue.

We amateurs are an argumentative lot. There is always a great deal to talk about, and many of the subjects which are discussed over the air usefully find a place in these columns. But the off-the-cuff remark made *via* Morse key or microphone usually needs careful reconsideration before it can stand the permanence of print. All the more credit then to those who have contributed so usefully—and often so forcefully—to these columns. May they long continue to do so. And may it be remembered that this journal has never feared the cut and thrust of controversy and debate, so long as it is performed with reasoned good temper and moderate language.—J.H.

*Presidential Address**

A CENTURY OF AMATEUR RADIO

By F. CHARMAN, B.E.M. (G6CJ)

A Presidential Address may deal with almost any subject under the sun : sometimes it is topical ; often it concerns the speaker's work or studies. Our new President appeals to the spirit of adventure, and takes us on a trip of the imagination into the future. From our platform of 1952—and considering but a few of the things which may influence our destiny—he tries to see what we could be doing in the year A.D. 2000. Keeping somewhat to the technical side, he finds that if only men can learn to live *with* each other, rather than *in spite of* each other, radio amateurs will continue to exist and enjoy a wealth of experience which today we are hardly able to comprehend.

AFTER hearing the title of this talk, it may well be wondered where the century is, since our hobby is barely half that age. Are we to try and discover what our counterparts of 1852 were doing ? What Michael Faraday, that grandfather of all radio amateurs—was working-out for us ; or the joys of Clark Maxwell with his mathematical discoveries in the " sixties " ? Or, by a study of sunspot numbers, try and determine what DX would have been like in those days ? No—this is work for the historian, and the radio amateur may only have time for history when he thinks he is making it! He is an adventurer, and adventures belong to the realm of imagination and the future.

Therefore let our century be the twentieth century. Amateur Radio conveniently began at about the beginning of this century, and, in the fifty years since a few pioneers first learned the art of telegraphy without wires, Amateur Radio has grown until today one person in every 20,000 in the whole world is a member of its fraternity. Our daily adventures take us out amongst this throng, meeting new members and old friends all over the globe. But for today's adventure, let us step into the future, into the realm of fancy, and try and imagine what *could* become of us in the next fifty years.

The Adventure

I said " *could* become " deliberately, because it is so easy to prophesy but so difficult to be right. Our art does not grow by itself in an otherwise empty universe ; it is not isolated. It interacts with the whole range of human activity ; everything happening in the world has some influence, great or small, good or bad, on its course. We should need to examine and weigh the whole accumulation of human experience if we were to attempt an accurate weave of the pattern of the future. This we leave to artists like Jules Verne or H. G. Wells. It is only too easy to plot curves of change or growth, and then boldly project them forward. Such charts commonly adorn our office walls and magazines, and too often exhibit a tragic ignorance of the fundamentals of statistics. Nature does not work quite as simply as that. For example, if there were 10 radio experimenters in the year 1900, and 100,000 amateurs today, it is quite a simple trick with logarithms to show that early in the next century there would be about 2×10^9 of them—the present world population! That would not work, because there would be nobody left over to generate the power for their stations, grow potatoes, or make atomic bombs! Human progress would come to a standstill.

So we see there is an important factor—saturation of environment—which slows up growth. The chemist calls it the law of mass action ; the electrician plots the charging of a condenser ; the biologist worries about how much more food the world can grow. Call it what you will, the curve always takes the same form, and if this form can be seen, progress charts become a little more useful. Amateur Radio shows some sign of approaching saturation. It does appear, at times, as if there are as many of us as the world can support. The coming epoch has been described as the electronic age ; this would be a stimulating factor. On the other hand, the need for communication grows with the increasing tempo of human affairs and in some ways is, to us, very competitive.

We live on the pioneer enthusiasm of youth. Many come to our ranks at an early age, only to retire as they grow older ; but many also, once amongst us, seem never to grow old, and keep their boyish enthusiasm for life. That shows it is good for them to be radio amateurs, and if we can remember it, there always will be radio amateurs. As long as there are new worlds to conquer, fresh ideas to exploit, we shall go on, for these are the spice of life, and we amateurs enjoy our full share. On this count, the prospects for survival are good.

There is a third factor besides growth and saturation, which is the prophet's *bête noire*, and which I shall call the " accident factor." An accident is something you can't avoid, but *could* have avoided if you had been cleverer. This idea is epitomised by a road sign at Camberley, Surrey, which reads " No Accidents Please." There are so many accidents that the further one tries to look ahead, the less likely one is to be right. Prophecy is conditioned by probability. The last war was an accident which greatly affected the course of Amateur Radio. Possible future wars may so affect the arts or the structure of society that we may be everywhere or nowhere. Telepathy may outmode us ; man-made ionisation may dispropagate our waves.

With this reservation—" no accidents please "—let us take the arts as we know them today, feed them into our crystal ball (electronic), watch them develop and imagine how they will affect the amateurs of the future. We have transmitters, receivers, aerials, and the whole wealth of science at our call. We have learned how to make our apparatus work very well. We are beginning to understand how our waves are propagated ; what frequencies and times to use for various purposes ; even a little of the way these things change through the years. Wars, famines, and Amateur Radio wax and wane with the solar cycles. These things we have learned in about 25 years. Now, science

** Delivered at a meeting of the Society held at the Institution of Electrical Engineers, London, W.C.2, on Friday, January 25, 1952.*

begins to learn the fundamentals of the art of communication itself: speech, hearing, the working of the brain—that wonderful combination of library and portable telephone exchange—and, hence, more efficient ways of exchanging our ideas. We have, coming along, electronic devices to replace our routine thinking and release our minds for culture or experiment. We have the advent of atomic power to give us the free choice of work or play, and enable us to cease worrying about how much life this busy little planet will support, but, instead, to think of expanding beyond it. Man has learned, powerfully, how to use the laws of nature to his own ends; if he can appreciate this and not try to alter them as he so often does, then this wonder world of the future is in his hands. It is in this world that our adventure tonight roams.

Communication

The key to this world, as we know it today, is communication—and we are amateur communicators. Surely that is significant. The main problem of communication today is congestion. The difficulty of maintaining space in which to talk affects us profoundly as radio amateurs, and we must learn, with others, how to use the available space efficiently so that every one of us can say a word now and then!

Assuming then, that we continue to practise the art of communication, this difficulty is one we shall learn to master because we must do so to survive. Professional communicators are seeking more efficient groupings of channels and better ways to use them. The present mania for "nation to speak peace unto nation," with Hell's orchestra thrown in for emphasis, is but a phase in the struggle for stability in human society, which must abate if the struggle is to be won. (We shall always retain some amateur bands meanwhile, for they provide convenient outlets for such efforts.) It is doubtful, however, that these factors alone will give us any more space, and it is in the realm of selectivity and improved codes that we are most likely to advance.

Selectivity is a process forced upon us which we amateurs have raised to a high degree of perfection. But so far we have only used what might be called mechanical means—crystal filters and wonderful receivers. With all these aids we still use the human brain as the greatest selector of any. As we learn more of how we hear and separate different sounds, we shall develop mechanical and maybe psychological aids to selectivity, just in the same way as we can focus our ears on one man speaking in the midst of a Babel. Our amateur of the future will extract more from the signals he receives, and will feel that the VK he is listening to is over there in the north-east corner of the shack, whilst all those Americans chattering away over there to the west will not be noticed. There may be something in DX contests after all!

Along with developments of this type, the modern theory of communication will gradually descend from the plane of hyper-mathematics, down to the common language, and our codes will improve. Morse has had a good innings, but its efficiency is low. To us it may seem a sad day when it is gone, but the boys of the future will wonder how we ever managed to use it. Speech is a little better, but, under amateur conditions of today, quite as unsure as Morse, and more easily misunderstood. Codes, in clear channels, can be highly efficient, and in this sense I mean all manners of communication—speech, Morse, pulses, signs and wonders. In the presence of noise or interference the efficiency must be balanced against the permissible error, by introducing otherwise redundant terms to give a check to anything misread. In the limit, the message must be repeated back to ensure that the output is a faithful copy of the input—a process known as feedback!

Great strides have been made in recent years through a proper study of such ideas, with information as the flux and time and space as the boundaries. It may seem a fantasy for amateurs to be using the complex machinery needed for a modern system such as Pulse Code Modulation, but many of us can still remember the days when superhets and crystal oscillators were themselves too complex for the average amateur.

When we listen to another man we hear his accent, we see his eyebrows, watch his gestures. All these and many other things convey to us his meaning. Yet, when we read his same words in the simple medium of print, what different interpretations we can make! So we must give the amateur of the future a television picture, and maybe other things too—all coded into a high-efficiency communicating system.

Technical Progress

I have taken some time over the possibilities of the art of communication because it is, after all, fundamental. But, you may ask, if the amateur's equipment is already so elaborate, how will he ever come to possess the complex gear necessary to these enhanced methods, or the frequency space in which to exploit them? To the first part there is a twofold answer. With time and usage, complex systems become more simple when the correct type of apparatus and a better understanding are found. Who would have thought of a universal amateur single-sideband system twenty-five years ago, when it was little more than a mathematical hope? Yet the demand for space has forced it upon us, and we have found how to build equipment which all can copy and make to work. Further, with the increasing application of electronic controls, we foresee automatic production units, producing our needs in plenty, causing things which today are elaborate and costly to become commonplace and freely available. We have almost reached this stage with components — like resistors and capacitors which are now consumed in incredible quantities—and even with complete radio sets.

To the second part of the question—the finding of frequency space—again let us compare today's position with that in the days before short waves were opened. The need for more room is so distressing that it must eventually result in new ways of using the medium, probably quite early in our 50-year span. We think of short-wave long-distance communication as limited by the properties of the ionosphere, cutting us off in a mere 25 Mc/s. of space. It is the most fickle and least reliable part of all our radio circuits. Engineers have struggled for years to master it; they will abandon it and make their own substitute —more efficient, more reliable, and with countless megacycles of range.

Again, we think of aerials, and see fundamental reasons why we cannot make them directive or supersensitive, without making them too large to be practicable. This is because we barely understand how they work. Let us remember that in this year of 1952, no man can accurately calculate the properties of the simple half-wave aerial, unless he fashions it to a special shape to fit his equations! You will be assured that micro-

(Continued on Page 360)

By J. W. MATHEWS, Assoc. Brit. I.R.E. (G6LL)*

A SENSITIVE HARMONIC INDICATOR

For detecting harmonics within the TV range

FOR some time past it has been apparent that something more sensitive than the usual crystal-rectifier type of harmonic indicator is needed, more especially in areas some distance from the local television station, where the field strength is only a hundred microvolts or so.

The instrument described here was built with the object of being capable of detecting a harmonic, within the TV range of frequencies, of the order of 300 μV. in the region of the source of the harmonic. Since this would finally be measured close to the output circuit, and before any attenuation in the form of low-pass aerial filters, electrostatic screened link-coupled circuits, etc., it follows that with its use it should be possible to arrange for the amount of harmonic radiated to be less than, say 30 db. down on 300 μV., that is about 10 μV. or less. This should ensure that even in an area where the TV field strength is as low as about 100 μV., no interference from a radiated harmonic will be caused. In fact, it should be quite possible to achieve considerably greater attenuation than the 30 db. taken as an example.

It should be understood that references to the harmonic voltages detectable are only approximate, and in fact the sensitivity of the device may vary considerably with individual models. The figures quoted apply to the device described, but by using similar components, voltages and layout, it ought to be possible to repeat them within reasonable limits.

Circuit

From the circuit diagram in Fig. 1 it will be seen that the device is merely a 2-stage r.f. amplifier with a diode rectifier and meter. A second diode is incorporated, with an adjustable resistance, so that the meter zero can be set, in spite of the contact potential of the rectifying diode.

Since it was desired to keep the design simple, only two stages were used, and no attempt was made to obtain extremely high gain. If, in special circumstances, greater sensitivity should be required, a further stage of amplification could be incorporated. For all normal purposes, however, it will be found that the sensitivity provided by 2 stages of medium gain is adequate. Compared with the crystal-rectifier type of indicator, the sensitivity is about 10 times greater.

It will be noticed that the second r.f. stage has a standard TV type of band-pass transformer in its anode circuit. This permits of uniform performance over the particular TV channel to which it is adjusted. Using 50 $\mu\mu$F. ganged variable condensers to tune the two grid circuits, the whole TV band can be covered with the coils described, but for slightly greater sensitivity on the lower frequency channels it would be better to add a turn or two and use the tuning condensers towards their minimum capacity.

Details of the band-pass transformer are given in Fig. 2.

Layout

The whole instrument is contained in a metal cabinet with a sloping front, as seen in the photograph in Fig. 3. Fig. 4 shows the layout of the chassis, from which it can be seen that the r.f. section occupies a space of about 7in. x 2in., the remainder of the chassis carrying the mains transformer, rectifier valve and smoothing choke. The indicating meter, together with its range switch and zero adjuster, is mounted on this sloping front thereby making observations easy. The tuning knob, being on the condenser spindle, is,

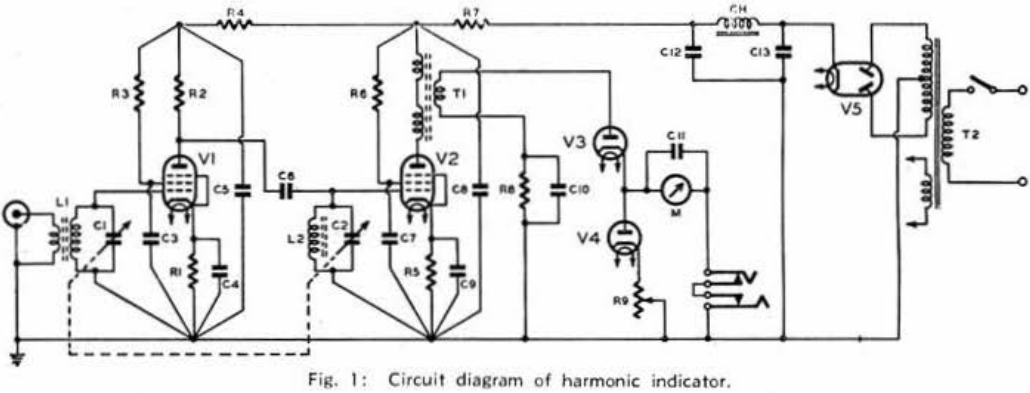

Fig. 1: Circuit diagram of harmonic indicator.

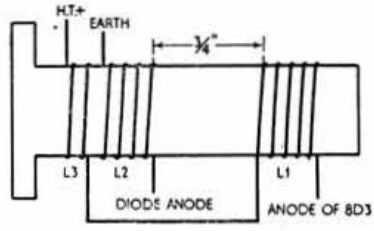

Fig. 2: Details of Band-pass Transformer T1.

L1 and L2 are each wound with 10 turns of No. 26 s.w.g. enamelled wire close-wound. L3 comprises 2 turns wound close to the end of L2 and connected as shown. Spacing between coils is ¾". The transformer is slug-tuned, with an iron-dust core each end of the *Aladdin* former type 5937.

* "Woodlands," Tolmers Road, Cuffley, Herts.

of course, on the front of the cabinet, with the mains switch and panel light.

The r.f. is fed through a pick-up loop or probe at the end of a short length of co-axial cable, which is plugged into the unit by means of a co-axial plug and socket mounted on the rear edge of the chassis. If a harmonic check point is provided on the transmitter panel itself, after the manner described by Louis Varney, G5RV, in his "TVI-proof Transmitter," then the unit may be connected directly up to this point, through a short length of co-axial cable. It will be found, however, that a loop-probe will be useful, since it permits examination of all parts of the transmitter, including power leads, modulator leads, etc. In one case it has been found extremely useful in detecting the presence of standing waves at 45 Mc/s. on a length of co-axial cable connecting an already well-suppressed transmitter to an aerial tank circuit tuned to 14 Mc/s.

The meter has a full scale reading of 100 μA., and three shunts should be provided to extend the range to 500 μA., 1 mA. and 5 mA. The largest range should protect the meter from damage unless the harmonics being checked are unduly strong.

No great difficulty should be experienced in the wiring, provided the usual care associated with v.h.f. construction is followed. This includes short leads, adequate by-passing and common earth points for associated circuits. A screen should be mounted across each valveholder to ensure that the grid and anode circuits are well shielded from each other.

Alignment of circuits

Since the device will normally only be required to work at maximum sensitivity over the channel used by the local TV station, alignment is fairly simple.

If a grid dip oscillator is available it should be set up to a frequency around the middle of the channel required. If not, then the indicator may be aligned by using a suitable harmonic from the transmitter. Sufficient r.f. should be fed-in to give some indication on the meter, and the iron cores in the coils adjusted for maximum reading. The tuning condenser should previously be set at a point towards its minimum capacity, since it is desirable to have as little capacity in the grid circuits as possible.

Fig. 3: General view of harmonic indicator.

The band-pass transformer may now be adjusted by first connecting a resistor of 500 ohms across the secondary (*i.e.* the winding connected to the diode), and then trimming the primary, by adjusting the iron core, for maximum reading in the meter. The resistor should then be changed over to bridge the primary, and the secondary adjusted in the same way. A final check should be made on the primary, with the resistor re-connected across the secondary. After these adjustments the resistor may be dispensed with.

The sensitivity of the indicator should now be such that only a very small amount of r.f. is required to give a full scale deflection of the meter without its shunts.

In areas not too remote from the local television transmitter, it may be connected directly to a standard television aerial and a reading obtained therefrom.

A telephone jack is wired in series with the meter, in case it is desired to listen to the signal being checked.

The time and money spent in making up an instrument of this type will be amply repaid by its

COMPONENT LIST

RESISTORS

R1, 5	150 ohms, *Erie* ½-W.
R2	47,000 ohms, *Erie* ½-W.
R3, 6, 8	4,700 ohms, *Erie* ½-W.
R4, 7	3,000 ohms, *Erie* ½-W.
R9	20,000 ohms variable, *Reliance type TW/1*

CONDENSERS

C1, 2	50 $\mu\mu$F. variable, *J.B.* "*Airtune*" with extended spindle.
C3, 4, 5, 7, 8, 9, 10	0.001 μF., *T.C.C. type CM20N*
C6	100 $\mu\mu$F., *T.C.C. type 543*
C11	0.01 μF., *T.C.C. type 545*
C12, 13	8+8 μF., *T.C.C. type CE27L*

COILS & TRANSFORMERS

L1	5 turns, spaced $\frac{1}{16}$", on ¼" *Aladdin* former, *type PP5938*. Aerial coil, 2 turns at earthy end, close to grid coil. Slug tuned.
L2	5 turns on *Aladdin* former as above. Slug tuned.
T1	See Fig. 3. Wound on *Aladdin* former, *type PP5937*
T2	Mains transformer, *Gardner Radio* "*Burley*" *type RB173*
Ch.	L.F. choke, *Gardner Radio type C230*

VALVES

V1, 2	*Brimar* 8D3
V3, 4	*Mullard* EA50
V5	*Brimar* 6X4

MISCELLANEOUS

Meter: 0–100 microammeter, *Pullin type 34*, with shunts to extend range to 0.5 mA., 1 mA., and 5 mA.
Mains Switch: *Bulgin type S259*
Mains Plug and Socket: *Bulgin type P74*
Signal Lamp: *Bulgin type D9*
Rotary Switch: 2-pole, 4-way, *Bulgin type S206*
Valveholders: Two diode, *Belling-Lee type L358/2*; three B7G ceramic (two with screen), *Webb's Radio*
Concentric Plug and Socket: *Belling-Lee type L604*
Miniature Dial: *Webb's Radio type 595*
Pointer Knob: *Webb's Radio type 1044*
Igranic Jack: *Webb's Radio*
Coil Cans: Two *John Dale type D/TV2*; one *type D/TV1*
Cabinet and Chassis: *E. J. Philpott's Metalworks, Ltd.*
Chassis Handle: *A. Imhof, Ltd., type 15A*
Name Plates: *T. A. Butler & Co. (1927), Ltd.*

extreme usefulness. Not only is it capable of detecting transmitter harmonics, but it can also be used to check the effectiveness at TV frequencies of low-pass and high-pass filters, as well as for their adjustment.

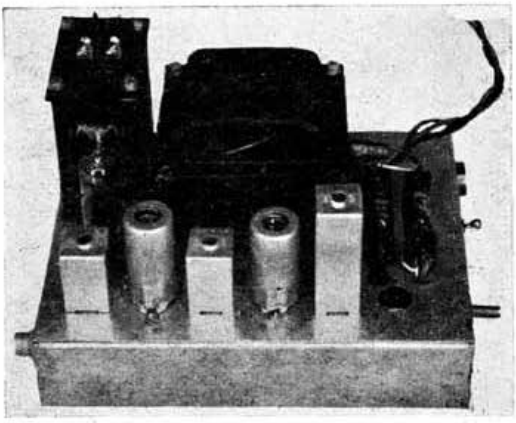

Fig. 4. View of chassis removed from cabinet, showing general layout.

It could very well be constructed by a local club for the use of its members, and the expense involved recovered by making a small charge for its hire.

We would all do well to remember that TV is here to stay and if we wish to "live with it" we must take steps to put our own house in order; the first steps must be the elimination or reduction of radiated energy on frequencies outside our own bands.

A Mechanical Audio Filter

*by R. Young (G3BTP)**

THE device to be described in this article is a simple resonant audio reproducer, which forms an effective tone-filter for the reception of c.w. signals under difficult conditions.

It consists of a loudspeaker closely coupled to a sealed resonant tube, which acts as an attenuator to all frequencies other than its resonant frequency. Consequently, the bandwidth of the a.f. reproduction is greatly reduced, resulting in an improved signal-to-noise ratio.

Construction

The construction and method of assembly of the unit are illustrated in Fig. 1. A three-inch loudspeaker is mounted inside a wooden box 5 in. square by 3 in. deep, in which the only aperture—a 3-in. diameter hole—is closed off by the speaker itself. To avoid unwanted box resonance, the interior should be packed tightly with cotton-wool, care being taken to avoid obstruction to the speaker cone. The twin wire feeding the speaker may be led-out through a small hole in the side of the box.

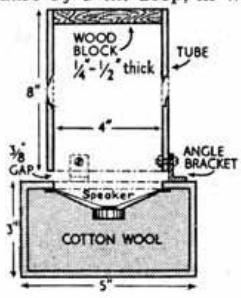

Fig. 1
Construction and method of assembly of mechanical audio filter.

A tube, 8 in. long and 4 in. in diameter, sealed at one end by a circular piece of wood ¼ to ½ in. thick, is mounted over the hole in the box by means of three equally-spaced angle brackets. The open end of the tube should be raised a distance of ⅜ in. from the face of the box.

The tube can be made from any stiff material (*e.g.* cardboard, fibre-board or paxolin) which will not produce unwanted resonance due to its composition.

Results

In operation, the filter produces a marked reduction in background noise, and has the property of causing most signals to sound "pure" in tone. The absence of any ringing effect is useful when weak signals are being copied, since their mark-space ratio is not affected. Performance figures are difficult to obtain without extensive audio test equipment, but it is hoped that the simplicity of construction may tempt those interested into further experiment.

* 16 Elmhurst Road, Langley, Bucks.

Extraordinary Administrative Radio Conference, Geneva, 1951

ALTHOUGH the full text of the Agreement reached at the Geneva Radio Conference has not yet been published, it is now known that it is concerned with measures for implementing the lower part (below 27.5 Mc/s.) of the Atlantic City Frequency Allocation Table.

Its provisions can be broadly summarised by stating that, below about 2850 kc/s., the table will be implemented by transfers on specified dates of all services (except amateurs) to frequencies in plans which were agreed at the Conference; above about 4000 kc/s. it will be implemented by a piecemeal process of transferring services to frequencies in accordance with the Table (and, in the case of mobile services, so far as possible in accordance with the agreed assignment plans) over a period of several years. Assignment plans have been adopted for the intervening bands (2850-4000 kc/s.) and transfers to frequencies in these plans will also be spread over several years.

The position of amateurs in the bands for which assignment plans have been adopted is governed internationally, so far as Region I (which includes the U.K.) is concerned, by a paragraph of the Agreement which reads:

> "Although allocations to the amateur service are not shown in the Plan, this does not affect in any way the right of Administrations to make such allocations in accordance with the Radio Regulations."

Apart from the indirect effect of confining amateur operations below 27.5 Mc/s. to the bands allocated to the Amateur Service at Atlantic City, this Agreement is not of much consequence to amateurs.

Reading between the lines it would seem that some months must elapse before the present amateur allocations below 27.5 Mc/s. are modified in accordance with the Atlantic City Frequency Allocation Table.

MENTION THE BULLETIN WHEN WRITING TO ADVERTISERS.

THE COLLINS COUPLER

By D. WOODS, A.M.I.E.E. (G6OC – G5WV)*

Although well known among amateurs for many years, and recently favoured for its T.V.I.-reducing properties, the form of pi-coupling network known as the Collins Coupler is, perhaps, not so widely used as might be expected in view of its flexibility and excellent matching characteristics. This may be due to the fact that the fundamental requirements for the design of a satisfactory circuit are not always fully appreciated. In the following article the author describes and exhaustively analyses the Collins Coupler, providing design and performance data that will prove invaluable to those who wish to experiment with this interesting device.

WHEN the author's post-war transmitter was being designed, various forms of coupling between the p.a. stage and the feeder were considered. The one finally selected was a particular form of pi-section impedance-transforming network commonly known as the Collins Coupler. This device possesses important advantages. For example, it is extremely flexible and if properly designed will match the p.a. stage into any impedance likely to be encountered in practice (*e.g.*, ten ohms to several thousand ohms) with an efficiency closely approaching 100 per cent. Only two controls are required, consisting of two variable capacitors which can be common to all bands from 3.5 Mc/s. to 28 Mc/s. In addition only one inductor is needed per band. The network offers high attenuation to harmonics and also neutralises any unwanted reactive component which may be present at the input to the feeder system.

A theoretical analysis carried out on this circuit revealed a rather peculiar property which, it is believed, may not be widely appreciated; namely —that if the inductor is made too large then the network will not match into impedances below a certain value. If, therefore, one is guided solely by the well known axiom "high L/C ratio" in designing a Collins Coupler, it may so happen that the network will not match into the lower range of impedances associated with transmission lines. This may explain why many amateurs have not had much success with this form of coupling; the reason usually given being that the coupler does not "draw" properly. This is precisely the type of effect which would occur if the inductor was made too large for the value of load impedance in use.

Theory

The basic circuit of the coupler is given in Fig. 1 where R_L is the load resistance and R_S the source resistance, *i.e.*, the effective interval resistance of the p.a. stage. The coupler consists of the two variable capacitors C_S and C_L and the inductor L. It is required to find the conditions for maximum power transfer from the source to the load when the input terminals *a a'* are connected to the source terminals *b b'*. It is also a condition that the input to the network should be purely resistive so that no reactance is presented to the source.

In the appendix it is shown that if the lowest load resistance into which it is required to obtain a match is R_L' then the value of L must not exceed that given by:

$$L = \frac{\sqrt{R_S R_L'}}{\omega} \qquad (1)$$

Having thus fixed the value of L the values of C_L and C_S for any other load resistance R_L are given by:

$$C_L = Co \left\{ 1 + \frac{R_S}{R_L} \sqrt{\frac{R_L - R_L'}{R_S}} \right\} \qquad (2)$$

$$C_S = Co \left\{ 1 + \sqrt{\frac{R_L - R_L'}{R_S}} \right\} \qquad (3)$$

$$\text{when} \quad Co = \frac{1}{\omega^2 L} \qquad (4)$$

Design Procedure

(a) *Unbalanced Network.*—In order to design a circuit of this nature a value must first be chosen for the minimum load resistance R_L' into which it is required to obtain a match. The value of L can then be calculated from Equation (1) where R_S is the effective source resistance of the p.a. valve and ω is the highest frequency of the band in question. Co is next obtained from Equation (4) which can then be used in Equations (2) and (3) to obtain values of C_L and C_S for various values of load resistance R_L.

An example has been worked out and the corresponding values of C_L and C_S are shown plotted against values of R_L in Fig. 2. It will be seen that the value of the main tuning capacitor C_S increases smoothly from a value of 55.6 $\mu\mu$F. at $R_L = 10$ ohms to a value of 134 $\mu\mu$F. at $R_L = 8.000$ ohms. The value of the matching capacitor C_L is equal to C_S at $R_L = 10$ ohms and increases rapidly to a maximum of 612 $\mu\mu$F. at $R_L = 20$ ohms after which the value decreases smoothly to 94.7 $\mu\mu$F. at $R_L = 8.000$ ohms. The values of C_L and C_S are the same, and approximately equal to 2Co, when $R_L = R_S$. Owing to the rapid rate of change in the value of C_L between R_L' and $2R_L'$ the tuning of this capacitor will be rather critical, so it is advisable not to use this portion of the range; which means that the value chosen for R_L' (to calculate L from Equation (1)) should be one-half the minimum load resistance required in practice. Values of load resistance in excess of 1.000 ohms will not be encountered very frequently but as a matter of interest it can be stated that as R_L approaches infinity, C_S also approaches infinity and C_L is asymptotic to the value of Co.

(b) *Balanced Network.*—The circuit of the balanced network is given in Fig. 3 where R_S represents the source resistance of each p.a. valve and $2R_L$ the load resistance, the line of symmetry through the network being shown dotted. This line represents a plane of equipotential so that the

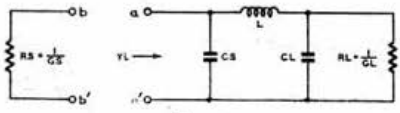

Fig. 1

Basic circuit of the Collins Coupler—unbalanced network.

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points *a*, *b*, *c* and *d* can be connected together without affecting the properties of the network. In practice it does not matter whether or not these points, or any combination of them, are connected together physically. In order to design such a balanced system it is only necessary to consider one-half of the network in the manner already described for the unbalanced network. The value to be taken for Rs will, therefore, be the same as for the unbalanced network, but the value of RL′ will be one-quarter of the minimum value of the balanced load resistance into which it is required to obtain a match.

If the inductors are constructed with their axes in line then there will be mutual inductance between the two coils. The effect of this, amongst other things, is to increase the effective inductance of each coil (if they are wound in the same direction) by an amount which is equal to this mutual inductance. This means that the coils will have to be made physically smaller for the balanced network than the value predicted by Equation (1) for the unbalanced network.

Constructional Details

Design details for a range of inductors suitable for a balanced system on 7, 14, 21 and 28 Mc/s. are given in Fig. 4. The insulating strips on which the coils are mounted can be either keramot or ebonite. These materials are quite satisfactory because the capacitance due to the electric field through the strip is very small in this design and no significant improvement would be obtained by using ceramic or other low-loss material. The brass sockets are obtained from domestic 5 amp. moulded sockets of the connector type which can be purchased from a well-known multiple store for a few pence each. These sockets and the associated plugs complete in their mouldings are quite suitable, incidentally, for balanced feeder connections between 75 ohms and 600 ohms for frequencies up to 30 Mc/s. The types in question are those in which the mouldings are identical for both the plugs and the sockets.

A suitable component for the main tuning capacitor Cs is a *Cyldon* 100+100 $\mu\mu$F. variable transmitting capacitor having ceramic insulation. The two end plugs for the inductor are mounted directly on the ends of the stator clamping studs by drilling the ends of the plugs at 90° to their axes. The two centre plugs, insulated from the capacitor, are mounted between the two sets of stator plates on a small ebonite panel attached to the capacitor end plate clamping pillars.

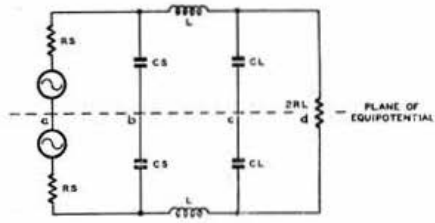


Fig. 3
Basic circuit of the Collins Coupler—balanced network.

The matching capacitor CL consists of a conventional 500 $\mu\mu$F. twin-gang receiving capacitor of the larger type having ceramic insulation. Connection between the two centre plugs and this capacitor is by means of a low inductance line consisting of two $\frac{3}{4}$ in. wide copper strips spaced about $\frac{1}{16}$ in. between their $\frac{3}{4}$ in. faces and approximately 6 in. in length. The inductance of this line is additive to that of the inductors L. The strips should be sufficiently thick to form a rigid self-supporting assembly.

A Practical P.A. Stage

The circuit of a practical p.a. stage and coupling network is given in Fig. 5. When this circuit was first used, some trouble was experienced due to CL sparking-over when using amplitude modulation. It was noticed that the effect was most pronounced in dry weather, and was eventually traced to a d.c. voltage building up across Cs and CL in parallel, the magnitude being dependent upon the ratio of the insulation resistances of these two capacitors and the coupling capacitor

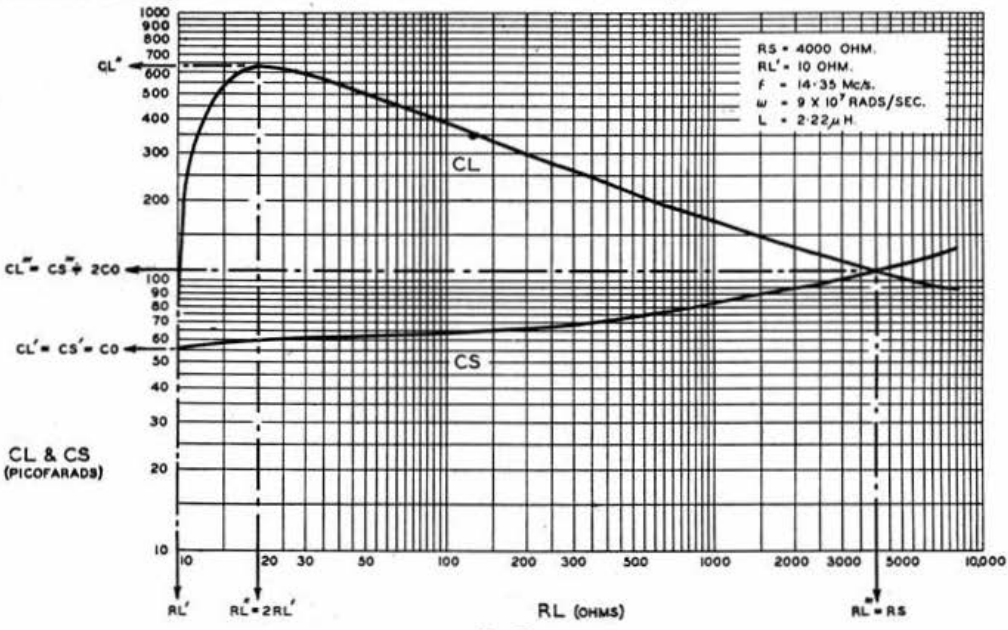


Fig. 2
Variation of Cs and CL with load resistance.

C11 or C12. The trouble was cured by connecting a pair of 1 megohm resistors in parallel with the two halves of CL so that, for example, if the insulation resistance of C11 and C12 does not fall below 100 megohms, then the maximum d.c. potential which can appear across each half of CL will not exceed one-hundredth of the h.t. voltage.

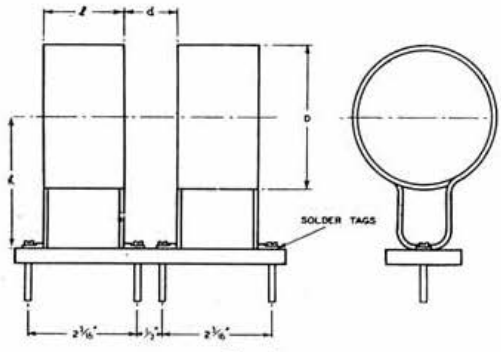


Fig. 4
Coil design data for a balanced system.

Band Mc/s.	Turns (each coil)	S.W.G.	Dimensions in inches			
			D	*d*	*l*	*h*
7	9	14	3½	4½	2	2½
14	5	11	2½	4½	1½	2½
21	4	7	2½	4½	1½	2½
28	3	7	2½	4½	1½	2½

N.B.—The two coils are wound in the same direction.

It will be found that for low values of load resistance the value of CL may exceed 500 $\mu\mu$F. In order to obtain a match in this range a fixed capacitor of 220 $\mu\mu$F. can be plugged across the points *cc' or dd'*. This is equivalent to increasing each half of the variable capacitor by 440 $\mu\mu$F. The former is the most convenient method of connection because the additional plugs can be located on the coil former, where they will be accessible. A suitable type of capacitor for this purpose is the tubular ceramic approximately $\frac{6}{16}$ in. in diameter and $1\frac{1}{8}$ in. long.

The two thermal ammeters shown in the output connections are of the plug-in type in order that suitable indications of feeder current may be obtained over a wide range of load impedances. Suitable meters for a power input of 100/150 W. are those having full-scale values of 0.5 A., 1.0 A. and 2.5 A.

The suppression of parasitic oscillation is carried out by means of the two 10-ohm resistors connected directly at the anodes of the p.a. valves. This method is simple and has been found very effective, but approximately 1 W. of r.f. power is lost in each resistor with 100 W. input. This loss is negligibly small, amounting to only 0.1 db.

The small H.F. chokes in series with the grid resistors are only effective in the 28 Mc/s. band and assist in maintaining the required p.a. grid current by isolating the grid resistors from the driver anode circuit. The driver used is a *Mullard* QQVO47 with 300 V. on the anode—the usual split anode circuit providing a balanced output to the P.A. input terminals *t t'*.

Performance

In order to assess the efficiency of the coupler the r.f. power developed in load resistances of 50, 75, 100, 150, 300 and 600 ohms was measured at 7, 14, 21 and 28 Mc/s. In all cases the power output was 65 W. within the limits of accuracy of measurement, the d.c. power input to the p.a. remaining constant at 105 W. with a total grid current of 6 mA. The resistors employed for the various loads were 5 W. solid carbon-rod types, used either singly or in combinations in parallel. One of these resistors will stand 65 W. dissipation for about 20 seconds without undue overheating.

The tuning procedure was found to be very simple indeed, only a few seconds being needed to tune for maximum output current. It was found convenient to reverse the mechanical drive to one of the variable capacitors so that rotation of the controls in one direction produced an increase in capacitance of one capacitor and a decrease in capacitance of the other. The reason for this will be apparent from an inspection of Fig. 2, because if the load resistance is changed then the controls of Cs and CL will have to be rotated in the same direction to restore the condition of match. If, however, the frequency of the drive is changed for the same load resistance, then it will be found that tuning can be restored by Cs alone when the change in frequency is small. It will be seen from Fig. 2 that Cs and CL are dependent upon one another, but with reversed drives the tuning procedure is simplified because the controls are then rotated progressively

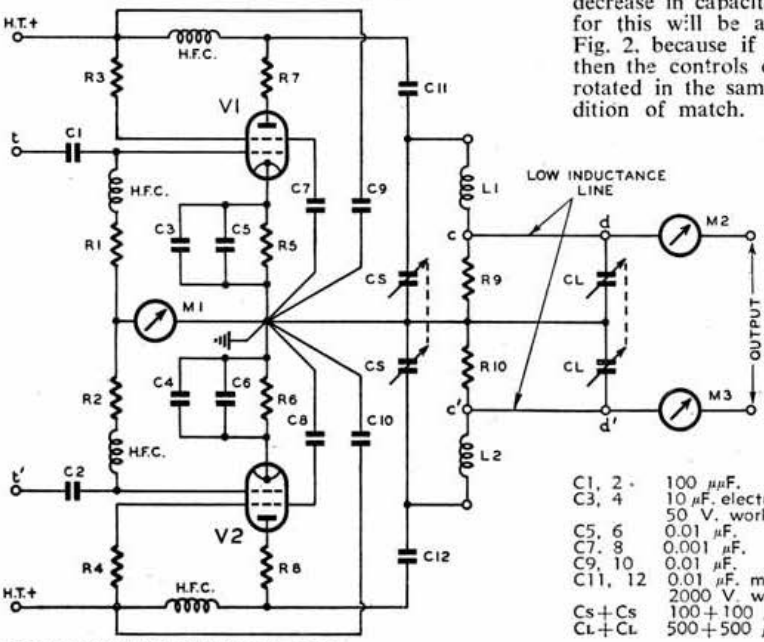


Fig. 5.
A practical p.a. stage and Collins Coupler.

C1, 2	100 $\mu\mu$F.	L1, 2	See Fig. 4.
C3, 4	10 μF. electrolytic, 50 V. working.	R1, 2	10,000 ohms, 1-W.
C5, 6	0.01 μF.	R3, 4	40,000 ohms, 1 W.
C7, 8	0.001 μF.	R5, 6	470 ohms, 2 W.
C9, 10	0.01 μF.	R7, 8	10 ohms, 1 W.
C11, 12	0.01 μF. mica, 2000 V. working.	R9, 10	1 megohm, ½-W.
Cs+Cs	100+100 $\mu\mu$F.	M1	0-10 mA.
CL+CL	500+500 $\mu\mu$F.	M2, 3	See text.
		V1, 2	807 valve.

in the same direction, adjustment being made for maximum load current in each instance, until settings are found for Cs and CL which both produce maximum load current. These settings then correspond to the matched condition.

If any unwanted reactance is present at the input to the feeder system then this will be automatically neutralised by CL in the tuning procedure, so that zero reactance is presented to the p.a. anodes. For example, if the input to the feeder system is, say, capacitive, then CL will be set to a value which is less than the theoretical value by an amount which is equal to this feeder input capacitance, so that the total capacitance between *d d'* (Fig. 5) is equal to the theoretical capacitance. The input capacitance of the feeder, whether this be negative or positive, is therefore utilised as part of the network matching capacitance CL. It should be noted that this does not eliminate any unwanted reactance at the aerial end of the feeder, nor any standing waves on the feeder due to this cause. In a similar manner the valve and wiring capacitance is, of course, included in the value of Cs.

Harmonic Attenuation

At harmonic frequencies of the carrier, the series reactance due to L will be greater than at the carrier frequency, also the shunt reactance due to CL will be smaller, thereby affording increasing attentuation with increasing frequency, up to the self-resonant frequency of L, when the attenuation will be at a maximum. In order to utilise this property of maximum attenuation at one particular frequency (*e.g.*, 42 Mc/s. in the T.V. band) each half of the inductor can be tuned to shunt resonance at the unwanted frequency by means of two small trimmer capacitors fixed to each inductor assembly. It will not be possible to do this in the 3.5 Mc/s. band because the self-resonant frequency of L will be lower than 42 Mc/s. In the 7 Mc/s. band the inductors will probably be somewhere near self-resonance due to their own self-capacitance. On the higher frequency bands satisfactory rejection should be possible in the manner described. The foregoing scheme has not yet been tried out in the circuit of Fig. 5. It is pointed out that if the full benefit is to be obtained from this method of attenuating an unwanted harmonic then very efficient screening of the complete p.a. stage and coupler will be necessary.

Checking the Feeder Input Impedance

It is possible to obtain a rough indication of the feeder input impedance by means of the coupler. As has already been mentioned, the power output of the p.a. stage is independent of load resistance and frequency when the coupler is correctly adjusted. This parameter is called the "available power" of the source and means the maximum power which can be extracted from it. This condition occurs when the resistance presented to the source by the coupler is equal to the effective internal resistance of the source. The available power of the p.a. stage can be determined by measuring the current into any value of load resistance, but a value between 100 and 300 ohms is to be preferred. When the feeder system is connected and matched for maximum current, then its effective shunt resistance will be given by the available power divided by the current squared.

An indication of the magnitude and sign of the shunt capacitance present at the input to the feeder can also be obtained if a calibration of CL is made against a range of carbon resistors used as various loads. If the setting of CL for the value of artificial load which is the same as the feeder input resistance is now compared with the value of CL obtained under the latter condition, then the difference will be a measure of the effective shunt capacitance present at the input to the feeder. If CL is smaller in value with the feeder connected than with the same artificial load resistance, then the feeder input capacitance must be positive. Small differences between the two values of CL amounting to 20 or 30 $\mu\mu$F. are usually not significant, but it depends upon the frequency in use and the value of the resistive component. If this difference is, say, ΔCL, then $1/\omega\Delta C_L$ should be not less than several times the feeder input resistance. If this is not so, or if it is impossible to obtain a match with the feeder connected, then there is probably something wrong with the matching at the aerial end of the feeder, assuming of course that the coupler performs correctly when working into a range of artificial loads. In addition to ΔC_L being small, the value obtained for the feeder input resistance should also be close to the nominal characteristic impedance of the feeder, otherwise the matching of the aerial to the feeder should be viewed with suspicion. The foregoing remarks refer to untuned feeders. With tuned feeders an unduly large input capacitance, or incorrect input resistance, can also be caused by an incorrect length of feeder, in addition to maladjustment of the aerial itself.

Appendix

Reference Fig. 1—Let the input admittance of the network, terminated by R_L, be $Y_i = G_i + j\omega C_i$, when it can be shown that:—

$$Y_i = \frac{G_L + j\omega\left\{C_L(1 - \omega^2 L C_L) - L G_L^2\right\}}{(1 - \omega^2 L C_L)^2 + \omega^2 L^2 G_L^2} + j\omega C_S \qquad \text{(A1)}$$

For correct matching it is required to make $G_i = G_S$ and $C_i = O$.

Therefore: $$\frac{G_L}{(1 - \omega^2 L C_L)^2 + \omega^2 L^2 G_L^2} = G_S \qquad \text{(A2)}$$

and $$\frac{C_L(1 - \omega^2 L C_L) - L G_L^2}{(1 - \omega^2 L C_L)^2 + \omega^2 L^2 G_L^2} + C_S = O \qquad \text{(A3)}$$

Solving equations (A2) and (A3) for C_S and C_L in terms of R_S, R_L and L:—

$$C_L = Co\left\{1 + \frac{R_S}{R_L}\sqrt{\frac{R_L}{R_S} - \frac{\omega^2 L^2}{R_S^2}}\right\} \qquad \text{(A4)}$$

$$C_S = Co\left\{1 + \sqrt{\frac{R_L}{R_S} - \frac{\omega^2 L^2}{R_S^2}}\right\} \qquad \text{(A5)}$$

where $Co = \frac{1}{\omega^2 L}$ (A6)

In equations (A4) and (A5) the square root term must always be positive so that the lowest value of R_L, say R_L', which will satisfy this condition is given by:—

$$\frac{R_L'}{R_S} - \frac{\omega^2 L^2}{R_S^2} = O$$

Thus $R_L' = \frac{\omega^2 L^2}{R_S}$ (A7)

and $L = \frac{\sqrt{R_S R_L'}}{\omega}$ (A8)

If, therefore, we require to match into a load resistance as low as R_L' then L must not exceed the value given by equation (A8). When $R_L = R_L'$ and the square-root term is zero, it can be seen from equations (A4) and (A5) that $C_L = C_S = Co$. These particular values will be called C_L' and C_S'.

For another value of R_L, say R_L'', the value of C_L reaches a maximum. This relationship is given by:—

$$R_L'' = \frac{2^2\ \omega\ L^2}{R_S} = 2R_L' \qquad \text{(A9)}$$

The capacitance of C_L, therefore, reaches a maximum at a value of R_L which is twice the minimum value into which it is possible to obtain a match. The value of C_L, say C_L'', at which this condition occurs is given by:—

$$C_L'' = Co\left\{1 + \tfrac{1}{2}\sqrt{\frac{R_S}{R_L'}}\right\} \qquad \text{(A10)}$$

The associated value of C_S, say C_S'', is given by:—

$$C_S'' = Co\left\{1 + \sqrt{\frac{R_L'}{R_S}}\right\} \qquad \text{(A11)}$$

Inspection of equations (A4) and (A5) indicates that C_L is again equal to C_S when $R_L = R_S$. Calling these particular values C_L''' and C_S''' we get:—

$$C_L''' = C_S''' = Co\left\{1 + \sqrt{\frac{R_S - R_L'}{R_S}}\right\} \doteq 2Co \text{ (because } R_S \gg R_L') \qquad \text{(A12)}$$

Once R_L' is fixed by design considerations one can, by using equation (A7), write $\frac{R_L'}{R_S}$ for $\frac{\omega^2 L^2}{R_S^2}$ in equations (A4) and (A5) which leads to the following design formulae:—

$$C_L = Co\left\{1 + \frac{R_S}{R_L}\sqrt{\frac{R_L - R_L'}{R_S}}\right\} \qquad \text{(A13)}$$

$$C_S = Co\left\{1 + \sqrt{\frac{R_L - R_L'}{R_S}}\right\} \qquad \text{(A14)}$$

Amateur Television Licence

As a result of suggestions put forward by the G.P.O. Liaison and Technical Committees of the Society, the G.P.O. has agreed to make the following alterations to the present Amateur Television Licence:

1. The term "Television" will be used in place of "Vision."
2. Condition 3(3), which stated "Alternating current shall not be employed for the h.t. supply to the sending apparatus unless rectified, and the h.t. supply shall be so smoothed that the residual ripple voltage shall not exceed five per cent. of the d.c. voltage," is to be deleted.
3. Condition 8(2) is to be amended to read "A representation in visual form of the call signal shall be sent at the beginning and end of each period of sending visual images except when these are produced by other than scanning methods."
4. The power permitted, as shown in the Schedule, will be measured in the manner laid down in the R.S.G.B. BULLETIN dated February, 1951 (page 292).

As a purely formal measure the G.P.O. proposes to insert a paragraph in the licence on the lines of Condition 11 of the Amateur Sound Licence.

P.M.G.'s Interference Advisory Committees

THOSE members who recollect the Editorial comments on the subject of the P.M.G.'s Interference Advisory Committee published in the August, 1950, issue of the BULLETIN, will be interested and gratified to learn that Mr. W. A. Scarr, M.A. (G2WS) has been appointed to serve on the Committee which has been set up by Earl de la Warr to advise him on interference caused by small electrical motors. The Chairman of the Committee is Mr. J. R. Beard, C.B.E., M.Sc.

Although Mr. Scarr's appointment is in a personal capacity and not as a representative of the R.S.G.B., it is none the less satisfactory to know that a member of his high standing in Amateur Radio circles has been chosen to serve on this important body.

Register of Affiliated Societies & Clubs

IT is planned to publish in the March issue of the BULLETIN an up-to-date register of Societies and Clubs affiliated to the R.S.G.B., together with names and addresses of Honorary Secretaries.

Secretaries of Affiliated Societies and Clubs who have taken office recently and have not notified R.S.G.B. Headquarters, are asked to do so by not later than February 25, 1952.

Societies who have failed to renew their affiliation will not be listed.

Can You Help the B.B.C.?

THE Far Eastern Service of the B.B.C. is gathering material for a programme on "Amateur Radio," to be illustrated by recordings of actual 'phone contacts between stations in the United Kingdom and *native* amateurs of Far Eastern countries. Present conditions have caused such contacts to be rare and invariably noisy.

Members who have recordings of this type, of broadcast quality on disc or tape, made during the past year, are asked to communicate with: G3GDT, Ariel Radio Club, B.B.C., Bush House, Aldwych, London, W.C.2.

I.E.E. Radio Section Debate

MR. W. A. SCARR, M.A., G2WS (Immediate Past President), is to speak against a motion, to be proposed by Mr. Geoffrey Parr, at an I.E.E. Radio Section debate on February 25, that "The lone worker can no longer make a major contribution to radio developments." It is anticipated that a number of other prominent members of the Society will oppose the motion.

D.U.F. Award

MEMBERS are reminded that claims for the D.U.F. Award should be sent direct to R.E.F., 72 Rue Marceau, Montreuil (Seine), France, and not *via* R.S.G.B.

LONDON LECTURE MEETINGS, 1952

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

Friday, February 29, 1952: **Mullard, Ltd.**
"MODERN VALVES FOR V.H.F. WORK."

Friday, March 28, 1952: **Mr. H. A. M. Clark, G6OT**
MICROPHONE ACOUSTICS FOR THE RADIO AMATEUR.

A Compact Low-Power Transmitter and Tuning Unit

By F. R. ELLORY, A.M.Brit.I.R.E. (G3CUI)*

Growing interest in QRP operation has resulted in many requests for articles describing low-power transmitting equipment of straightforward design. In the following article G3CUI presents complete constructional details of a compact transmitter and aerial tuning unit capable of 10 watts output on three bands, with a choice of either crystal-controlled or v.f.o. operation.

THIS article has been written in response to many requests for details of the low-power transmitter and aerial control unit originally designed for use at Uxbridge "B" station during the 1951 N.F.D. contest. The equipment provides a useful stand-by for the main rig, or may be used without alteration as a m.o. or exciter unit, supplying up to 10 watts of drive at low impedance in the 7 and 14 Mc/s. bands, while a simple modification will enable a similar output to be obtained in the 3.5 Mc/s. band.

The transmitter is designed around a TU 52 unit available for a few shillings as war-surplus radio equipment. This is an American plug-in type unit, tuning from 6.35 to 8 Mc/s., containing master-oscillator, frequency-multiplier, and power-amplifier coils, with associated tuning condensers, enclosed in a copper-plated steel chassis. Very little mechanical work is needed to convert the unit into the transmitter illustrated in Fig. 1.

The circuit (Fig. 2) comprises a crystal-controlled or variable-frequency oscillator, a buffer stage, a frequency-multiplier and a power-amplifier. The output is link-coupled and connected to a miniature co-axial socket at the rear of the chassis.

Fig. 1.
Front view of the low-power transmitter.

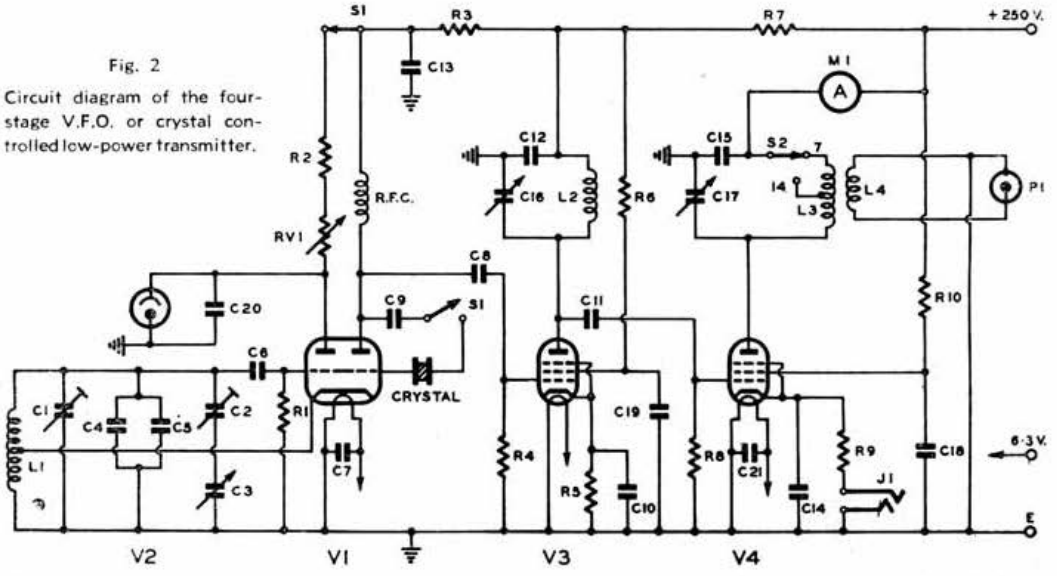
Oscillator

When switched to the v.f.o. position, V1a (one triode section of the 6J6) functions as a Hartley oscillator. C1 is the pre-set band-set condenser, while C2 provides band-spread. The oscillator frequency is normally adjusted to 3.5 Mc/s. with C3 at maximum, C2 being set to allow a restricted frequency range of 3.5 to 3.575 Mc/s., thus making reduction-drive oscillator tuning unnecessary. The coverage is adequate for the 7 and 14 Mc/s. c.w. bands. The anode voltage of V1a is stabilised at 150 V. by a miniature neon (V2), the variable resistance RV1 being adjusted so that in the "key down" condition, a current of approximately 4 mA. is flowing through the neon circuit.

* 153 Windsor Avenue, Hillingdon, Middlesex.

Fig. 2

Circuit diagram of the four-stage V.F.O. or crystal controlled low-power transmitter.



Buffer Amplifier—Crystal Oscillator

The remaining triode section of the 6J6 (V1b) is used either as a buffer amplifier or as a crystal oscillator. For v.f.o. operation, V1b is directly coupled to the grid of V1a, and the output waveform is rich in second and fourth harmonics. When switched to "crystal control," V1b functions as a Pierce oscillator, crystals with frequencies in the 3.5 or 7 Mc/s. band being used. In this condition the anode of V1a is disconnected from the h.t. line.

Fig. 3.
Front view of aerial tuning unit.

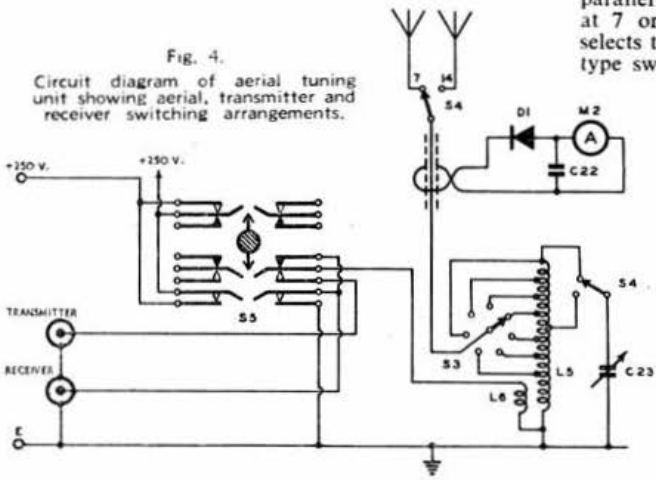
Frequency Multiplier

V3 (Z77) functions as a doubler or quadrupler. Tuning of the anode circuit is sufficiently broad to permit pre-setting to the centre of the 7 or 14 Mc/s. bands, the output obtained being sufficient to drive the p.a. up to its maximum rating. The cathode resistor R5 provides protective bias in the event of an oscillator failure.

Power Amplifier

The p.a. valve (V4) is a 5763 miniature r.f. beam power tetrode. The tank coil, which is tapped for the 14 Mc/s. band and is switched from the front panel, is link-coupled to a miniature *Pye* plug at the back of the chassis. R9 and C14 form a key-click filter, and also prevent V4 from exceeding its rated maximum anode dissipation in the absence of grid drive. The filters R3, C12, R7, C13 and C15 prevent r.f. feedback from occurring due to coupling *via* the h.t. supply line.

Fig. 4.
Circuit diagram of aerial tuning unit showing aerial, transmitter and receiver switching arrangements.



COMPONENT LIST

CONDENSERS

C1	25 $\mu\mu$F. air-trimmer
C2	15 $\mu\mu$F. air-trimmer
C3	25 $\mu\mu$F. variable
C4	20 $\mu\mu$F. *T.C.C. Metalicon CC66Y*
C5	220 $\mu\mu$F. *T.C.C. SM2N*
C6, 8, 11	100 $\mu\mu$F. silver-mica *T.C.C. SM2N*
C7, 9, 10, 12, 13, 15, 18, 19, 21	0.001 μF. *Hunt's W99*
C16	100 $\mu\mu$F. variable
C17	50 $\mu\mu$F. variable
C20, 22	470 $\mu\mu$F. silver-mica *T.C.C. SM2N*
C23	250 $\mu\mu$F. variable

RESISTANCES

R1, 4	47,000 ohms *Erie* ½-W. insulated
R2	8,200 ohms wire-wound *Welwyn AW3101*
R3, 6, 7	2,700 ohms *Erie* ½-W. insulated
R5	220 ohms *Erie* ½-W. insulated
R8	82,000 ohms *Erie* ½-W. insulated
R9	150 ohms *Erie* ½-W. insulated
R10	8,200 ohms *Erie* ½-W. insulated

MISCELLANEOUS

J1	*Igranic* midget jack
M1	50 mA. moving-coil meter
M2	500 μA. moving-coil meter.
P1	Output plug, *Belling-Lee L625/S*
RV1	10,000 ohm 4-W. wire-wound potentiometer, *Colvern CLR3001.*
S1	*Bulgin* double-pole toggle switch.
S2, 3	British N.S.F. "Oak" switch
S4	Low-capacity double-changeover switch.
S5	G.P.O. key switch

VALVES

V1	*S.T.C.* 6J6
V2	*English Electric* SQ150/45
V3	*M.O.* Z77
V4	*S.T.C.* 5763
D1	*GEX33* (germanium crystal rectifier)

Valveholders.—V1, 2, 3: B7G *McMurdo BM7/UA* (with can); V4, B9A *McMurdo FM9/UH* (with can).

Aerial Tuning Unit

The aerial tuning unit (see photograph, Fig 3, and circuit diagram, Fig. 4) which also controls the receiver and transmitter switching, consists of a parallel tuned circuit (L5, C23) tuned to resonance at 7 or 14 Mc/s. A low-capacity switch (S4) selects the correct tap and aerial, while the "Oak" type switch (S3) selects the coil tap for optimum aerial matching. S5, a G.P.O. key-switch, performs the following functions: *Position 1* "*Net*"—Aerial link switched to receiver; h.t. applied to transmitter; *Position 2* "*Receive*"—Aerial link switched to receiver; no h.t. applied to transmitter; *Position 3* "*Send*"—Aerial link switched to transmitter; h.t. applied to transmitter; receiver aerial input earthed.

A fraction of the r.f. flowing in the aerial circuit is fed *via* an electrostatically screened current loop to the germanium crystal rectifier and aerial current meter M2.

Construction

Details of chassis dimensions and front panel drillings are given in Fig. 5,

while Fig. 6 illustrates the under-chassis layout. The modification procedure is as follows.

Having taken off the bottom plate of the TU 52, remove the m.o. coil, tuning condenser, fixed condensers, toggle switch, and the plate spaced-off the front of the chassis. Remove the doubler tuning condenser. Punch out the $\frac{5}{8}$ in. and $\frac{3}{4}$ in. holes for the valveholders, fitting the latter in their correct positions, and then drill $\frac{1}{8}$ in. clearance holes for the pre-set condensers.

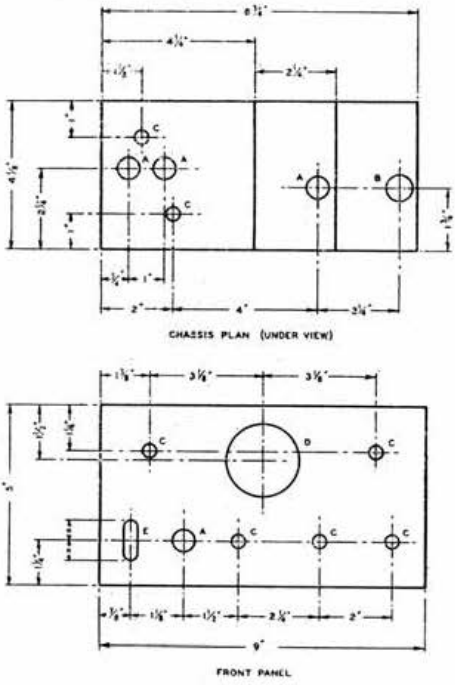


Fig. 5.
Plan view of chassis and elevation of front panel showing position and designation of important fixing holes.

The p.a. anode coil should be taken out and modified in accordance with the coil data table. After this has been replaced, the 100 $\mu\mu$F. variable condenser may be mounted in the frequency multiplier compartment, after which the 25 $\mu\mu$F. oscillator tuning condenser and the double-pole change-over switch may be installed. Finally, the front panel is bolted to the chassis; wiring can then proceed.

Coil Data Table

L1—32 turns No. 26 s.w.g. enamelled wire close-wound with cathode-tap 10 turns from earthed end. Winding length $\frac{7}{8}$" on $\frac{1}{2}$" diameter former.

L2—14 turns No. 26 s.w.g. silk-covered enamelled wire. Winding length $\frac{3}{8}$" on 1" diameter former.

L3—20 turns No. 26 s.w.g. silk-covered enamelled wire with tap 5 turns from end. Winding length $\frac{5}{8}$" on 1" diameter former.

L4—Link winding 3 turns No. 18 s.w.g. p.v.c.-covered wire wound over tapped 5 turns of L3.

L5—Link winding 3 turns No. 18 s.w.g. p.v.c.-covered wire wound over earthed end of L6.

L6—16 turns No. 18 s.w.g. wire spaced $\frac{1}{8}$" between turns, with taps at 3, 4, 5, 7, 9, 12, 14 and 16 turns.

If it is desired to make up a chassis similar to the TU 52, copper or aluminium must be used in order to keep eddy currents to a minimum and to obtain adequate screening.

The layout of the aerial tuning unit is not at all critical—any metal box about 5 or 6 in. cube being suitable. Fig. 3 shows the general appearance of the unit, and indicates the approximate positioning of the various components. A power supply of 250 V. at 60 mA. (h.t.) and 6.3 V. at 1.4 A. (l.t.) is required. In the "key down" position, the total h.t. drain is made up as follows: V1a—6 mA.; V1b—8 mA.; V2—4 mA.; V3—10 mA.; and V4—30 mA.

Performance

Prior to N.F.D. 1951, tests were carried out with the p.a. running at 5 watts input. About 100 stations in 22 countries were worked, reports averaging one "S" point below those normally obtained with an input of 80 watts to the same aerial. No reports below T9 were received, and the master oscillator proved to be all that was desired.

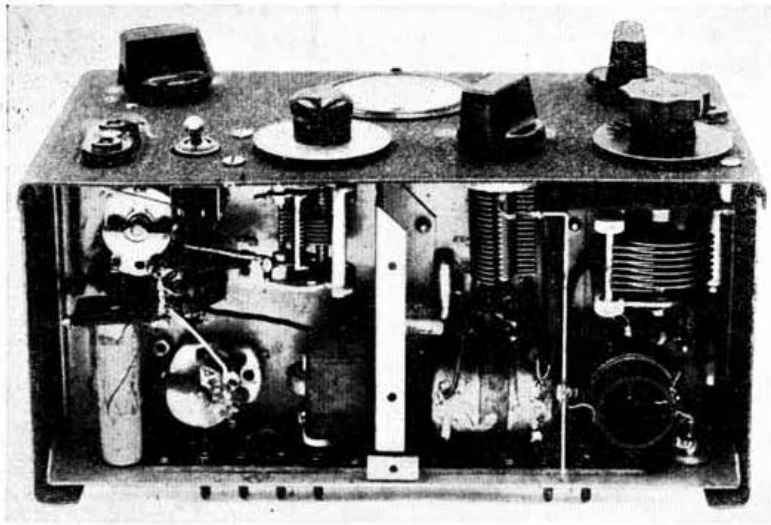


Fig. 6.
Under-chassis view of the low-power transmitter.

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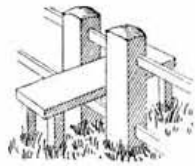
THE HELPING HAND



TO AMATEUR RADIO

Part VIII.—The Clapp Oscillator & Power Amplifiers

By

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The Clapp Oscillator

Before leaving the subject of oscillators—dealt with fairly fully last month—mention should be made of a modern circuit which has achieved widespread popularity in the amateur sphere because of its excellent frequency stability—*i.e.* the Clapp oscillator, illustrated in Fig. 1a.

The oscillatory circuit consists of L1.C1, and is required to have a high "Q," necessitating a large coil for L1 (in fact the number of turns often seem more appropriate for medium-wave than for 1.8 or 3.5 Mc/s. operation). Ideally, the coil should be about two inches in diameter, and should be sufficiently rigid to be self-supporting, but in practice any slight vibration of the turns would tend to impair the transmitted note; consequently, a low-loss ceramic former may be advisable.

C1 should be as small as possible (around 75 $\mu\mu$F.), and should consist of a high-grade fixed condenser in parallel with just sufficient variable capacitance to provide band-spread. In this way, good isolation between the valve and the coil may be secured. Feed-back to maintain oscillation is obtained *via* C2 and C3 (0.001 μF. each), which are in parallel with the valve grid-cathode and cathode-heater capacitances (about 10 $\mu\mu$F.), so that any change in the latter, through heating, tuning, or even valve replacement, will have negligible effect on the generated frequency.

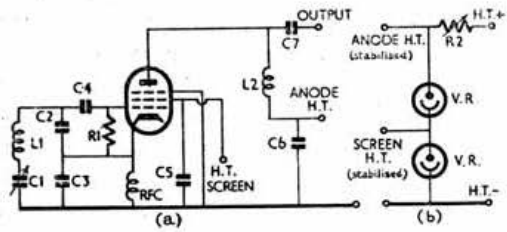


Fig. 1.

(a) Circuit of Clapp oscillator; (b) Series connection of voltage regulator tubes to provide stabilised screen and anode voltages. The value of R2 should be adjusted to drop 100 V. at combined screen and anode currents.

C1	75 $\mu\mu$F. (max.)	C4	100 $\mu\mu$F.
C2, 3, 5, 6	1,000 $\mu\mu$F.	C7	50 $\mu\mu$F.
		R1	50,000 ohms

Choice of Oscillator Frequency

An oscillator should always work on a lower frequency than the output stage, since coil changing or switching endangers accurate calibration. Present-day practice favours the use of an oscillator operating permanently on a low-frequency band, followed by one or more stages of frequency doubling or tripling to reach the required output frequency and power level. A disadvantage of this system is, however, that any slight imperfection in oscillator stability is greatly magnified in the output. Thus, if keying or voltage fluctuations cause a barely perceptible change of 100 c/s. in an oscillator working on 1.8 Mc/s., the result on 14 Mc/s. will be a change of 800 c/s., which is too great to be tolerated. Apart from careful mechanical design of the components and their assembly, the screen and anode voltages of the oscillator should be stabilised by means of gas-filled voltage-regulator valves. If desired, similar types may be connected in series to provide the required voltages (Fig. 1b); *e.g.* a VR.105-30 and VR.150-30, giving stabilised voltages of 105 V. and 255 V., when series connected, for feeding the screen and anode respectively of an oscillator valve.

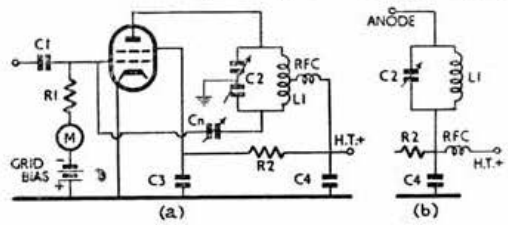


Fig. 2.

(a) Power amplifier circuit, using neutralisation and a split-stator tank condenser; (b) Anode circuit connections using a single-section tank condenser without neutralisation.

C1	50 $\mu\mu$F.	R1	30,000 ohms
C2	See Table I	R2	To drop voltage to 250 V. (or manufacturer's figure)
C3, 4	1,000 $\mu\mu$F.		
Cn	0–2 $\mu\mu$F.	M	0–5 mA. meter

Power Amplifiers

A typical power amplifier circuit, using neutralisation and a split-stator tank condenser, is shown in Fig. 2a. With careful lay-out, and a valve of low anode-grid capacitance, neutralisation may not be required; also, a spilt-stator condenser is by no means essential; so that the tank circuit may alternatively be arranged as in Fig. 2b, the basic principles and method of tuning being the same.

The r.f. output of the oscillator (or intermediate stage) is applied to the grid of the amplifier *via* the coupling condenser C1 (value about 50 $\mu\mu$F.), causing a rectified current to flow through the grid resistor R1 (which is generally between 15,000 and 50,000 ohms, the highest value being desirable when the stage is frequency multiplying). The voltage developed across R1 by this flow of grid current provides a source of grid-bias, which, however, disappears in the absence of r.f. drive—*e.g.* if the driving stage is keyed, or the oscillator fails to start—causing the amplifier to draw excessive anode current. It is thus desirable, in order to protect the valve, to provide fixed bias from a battery (G.B.) at the chassis end of R1 (30 V. is generally sufficient for anode voltages up to 500). B does not supply current ; in fact the grid current flowing through it is in the "charging" direction, and the battery life will be roughly equal to its shelf life. Alternatively, the battery may be omitted, protective bias being obtained from a resistor of some 400 ohms in the cathode lead.

The anode or "tank" tuning condenser has both d.c. and r.f. voltages on it. For inputs above 25 watts, and especially if telephony is envisaged, a condenser having greater spacing between the vanes than the receiving type will be required, or arcing may occur. A split-stator condenser is often used, the frame being earthed directly or through a blocking condenser, thereby providing a by-pass for unwanted second-harmonic voltages; h.t. is then fed to the centre-tap of the coil, preferably through a choke, which need not be of high impedance in this type of feed. If, however, the tank condenser is of the single-section type, then a by-pass condenser must be provided between the h.t. feed point and chassis. Where neutralisation is not required, the h.t. feed and the by-pass condenser are connected to the end of the tank coil instead of to the centre (Fig. 4).

When a split-stator condenser is used, the two sections are in series across the tank coil, the resultant capacitance being halved—*e.g.* a 50 + 50 $\mu\mu$F. condenser will give an effective capacitance of only 25 $\mu\mu$F. The value of the capacitance required across the coil is proportional to the frequency of operation, and varies with the type

Table I

Ratio $\frac{Va}{Ia}$	Effective capacitance (in $\mu\mu$F.) required across tank coil.					
	Fig. 3 *Band (Mc/s.)*			Fig. 4 *Band (Mc/s.)*		
	3.5	7	14	3.5	7	14
10	25	12	6	100	50	25
5	50	25	12	200	100	50

of circuit used. Table I enables the minimum values to be selected for the circuits of Fig. 2a and 2b respectively. The value is dependent on the ratio of valve anode-voltage divided by anode-current (in milliamperes). Ratios of ten, representing a valve working at, say, 500 volts and 50 mA. input, and five, representing, say, 400 volts and 80 mA., have been chosen as typical.

Capacitance values quoted are the minimum required for telegraphy. A 50 per cent. increase is desirable for telephony.

Tuning a Power Amplifier

With no h.t. applied to the anode or screen of the power amplifier, the driving stage is switched on and its anode circuit tuned to resonance—indicated by a dip in the anode current of that stage, and by a rise in the rectified grid current indicated by the grid circuit milliammeter M.

Tetrodes and pentodes of ratings comparable with type 807 valves will generally require a grid current of some 3 mA., assuming a grid resistor of 50,000 ohms and a small amount of protective bias. Lower values of R1 will result in higher currents. Larger tetrodes may require some 5 to 7 mA., while low impedance triodes may take up to 40 mA. in the larger types. Excessive grid current may damage the grid electrode and should be avoided by slightly detuning the driver stage or, preferably, by reducing its anode and screen voltages.

If neutralisation is employed, the correct setting of Cn to counteract feed-back through the anode grid capacitance of the valve must next be found. With still no h.t. applied to the amplifier, the anode tuning condenser should be swung through resonance, at which point a flicker will probably be noted in the reading of the grid current meter. Cn is then adjusted in small steps until this flicker is eliminated. Neutralisation can be roughly examined by means of a r.f. indicator consisting of a single turn of stiff insulated wire, 2½ in. in diameter, connected across a flash lamp ; with the loop held close to the tank coil, the bulb will glow at resonance. As Cn approaches the correct value, the brightness will be progressively reduced, increasing again as Cn passes through this setting. Absence of flicker in grid current is, however, a much more sensitive indication of good neutralisation.

If feed-back is taking place through paths other than the anode-grid capacitance of the valve, increased screening must be arranged between the anode and grid components of the circuit before the stage can be neutralised.

When neutralisation has been effected, anode and screen voltages are applied to the amplifier. The anode current will rise to an excessive value and must immediately be reduced by tuning the tank condenser to resonance, indicated by the current dipping from say, 70 mA. to about 10 mA. (or an even lower value on the lower frequencies). Maximum r.f. current and voltage will then be present in the tank circuit. The flash-lamp indicator will now light even when held several inches away from the axis of the coil, and a neon bulb will "strike" with a reddish glow when held near the anode cap of the valve (assuming an anode voltage of more than 300 V.).

A valve should always be operated with the tank-circuit tuned for maximum dip in anode current but, if it is not loaded by an aerial (real or artificial for testing purposes) the screen electrode may overheat. With larger valves, flash-over may occur or the tank-circuit insulation may be charred. A resonant aerial should accordingly be connected ; as the coupling is increased, so the valve's d.c. anode current will rise to make up for the greater power being transferred to the aerial. At the same time the r.f. voltage and current in the tank circuit will fall.

Under correct operating conditions, the aerial current will cease to rise when anode current has been drawn up to a value about 90 per cent. of the reading obtained when the tank circuit is detuned from resonance. The latter figure is greatly dependent on the screen voltage, which should be around 250 volts for most valve types. A high-resistance voltmeter should be used to check the screen voltage when the amplifier is

tuned and loaded ; the meter reading will be somewhat less than the true value, as the current drawn by the instrument will cause an additional voltage drop in the screen resistor.

The off-resonance current of a triode is usually much higher than that of a tetrode or pentode, and may impair the cathode emission or cause gas to be liberated inside the valve if allowed to persist for more than a few seconds when tuning-up the stage.

Amplifier Efficiency

On frequencies up to 15 Mc/s., a valve operated with high bias and high drive (Class "C" conditions), will have an efficiency of about 66 per cent. A slightly higher figure is possible with careful adjustment and circuit design. Thus two-thirds of the input power will be converted to useful r.f. output, while one-third will appear as heat at the valve anode. For a d.c. input of 24 watts a valve having a rated anode dissipation of eight watts is sufficient, since the remaining 16 watts will be converted into useful r.f. power.

The maximum anode dissipation of a valve may be fixed by the temperature at which the anode can be run without gas being liberated, a cherry-red colour being permitted in older type valves. Modern valves are constructed with carbon or blackened anodes designed to run at temperatures insufficient to produce visible glow, dissipation being limited by the electron emission which the cathode (or filament) is able to handle without damage. This emission represents the cathode current, of which the anode current constitutes the greater proportion, the balance comprising both grid and screen-grid currents.

Region 3—Pool of Lectures

A pool of lectures has been formed and is available to any group in Warwickshire and possibly (by arrangement) to those in adjoining counties. Details from the C.R. (G5PP) or the R.R. (G5JU). The material available is of considerable interest, and groups are urged to take advantage of the lectures.

(Continued from Page 345)

wave aerials must be large in size, and, hence, highly directive to be sensitive enough to use. Only our largest aircraft can carry them. Nevertheless, we may yet see the day when men will focus electric pulses as accurately and as devastatingly as bullets.

The Amateur of A.D. 2000

We have had a short adventure in the realm of fantasy. We have taken just a few of the things which may concern our future and have seen where they could lead us. If we had taken more, the outlook might be stupendous, or, on the other hand, horrible! No thought has been given to the possibility of changes in human relationships, or to what the young science of biology may do to the world of human beings and us with it.

Our simple adventure shows us our "Ham" in his brave new world, still doing the things we do today—competing with his fellows, taking whatever is new, bending it to his needs, and thus enriching the world he lives in. He does it with apparatus beyond our ken, using words, languages, and a depth of intercourse which make our present efforts seem primitive. And, no doubt, his museums will show, amongst telephone headsets, HRO's and model aerials, QSL cards which were *actually transmitted by hand!*

Sixth Annual European DX Contest

AS part of their Silver Jubilee Celebrations, Experimenterende Danske Radio Amatorer (E.D.R.)—the National I.A.R.U. Society in Denmark—have accepted an invitation to organise the Sixth Annual European DX Contest. The Contest will take place towards the end of November or early in December. Full details will be published later.

Safety First!

EVEN a few hundred volts can cause unpleasant physiological effects if carelessly handled. The voltages developed at many modern amateur stations are capable of causing serious injury or death. Reasonable precautions should always be taken.

All apparatus and wiring should be placed so that it is impossible to touch points of high d.c. or r.f. potential under normal operating conditions.

The aerial should never be directly connected to the anode coil of the output stage (see note in Licence). Never attempt to change transmitter coils with the power ON.

Use double-pole iron clad switches to ensure complete isolation of all mains transformers. These switches should be clearly marked with ON-OFF positions.

Connect a pilot lamp (preferably of the neon type) across the primary of h.t. transformers to reduce the possibility of a burnt-out bulb. This lamp should be clearly visible to the operator at all times.

Orderliness in layout is the keynote of safety.

Morse keys connected in h.t. circuits should be of the enclosed insulated type; otherwise employ keying relays. Microphone stands should be earthed.

Insulated extension spindles fitted to transmitter tuning condensers will eliminate danger from exposed grub screws.

High wattage bleeder resistances across power-pack filter condensers will prevent shocks from fully charged condensers.

At least one other person in the house should always know how to operate the main switch in case of emergency.

If it is necessary to touch the transmitter while the power is ON keep one hand behind the back or in a pocket. Never wear earphones while working on the transmitter.

Make sure that all metal work is effectively earthed. Do not rely on gas piping or radiator systems.

Take your time—develop a safety technique.

DX TOPICS
THE MONTH ON THE AIR

by A. O. Milne* G2MI

A Personal Word of Appreciation

I CANNOT begin this article without a special word of thanks to the very large number of members who so kindly sent Christmas greetings and good wishes during my recent spell in hospital. To the hundred or more also who sent cards—please accept this word of thanks. The task of writing to everyone individually is quite beyond me.—G2MI.

ZS2MI

Many British and European amateurs have been puzzled by the apparent failure of their signals to get through to ZS2MI on Marion Island. We air-mailed ZS6BW who is handling the QSL's and asked him to find out what was wrong. He discovered that the operator was using a rhombic for transmission—hence the S9 signals—but only a piece of wire for reception! A switch to change over the rhombic to the receiver worked like magic! It is understood that ZS2MI is now working South African stations only on one or two days each week. This means that if he is heard calling CQ DX, he will not reply to ZS calls. In our letter to ZS6BW we also pointed out that the whole DX amateur fraternity now knows ZS2MI's QSL address by heart, so this should enable a few more contacts to be fitted in. His frequencies are 14150 and 14350 'phone and 14060 c.w. He usually listens 5-10 kc/s. either side of his frequency and works 'phone from about 1630 to 1830 G.M.T. and c.w. from 1830 to 2000 G.M.T. All contacts will be QSL'd, card for card. The address for QSL is c/o ZS6BW, Box 256, Johannesburg. Those who want a card by Air Mail should include postage to the value of 9d. as the cards are too thin to go without an envelope. For some of the above information we are indebted to G3BID.

Monaco

F7AT, who operated as 3A2AG, is now back in the States as W0HZA. He will verify all QSO's made with F7AT, 3A2AG, PX1AR or DL4FA. 3A2AG started operations at 2200 G.M.T. on October 26 and closed down four days later on October 30, 1951. No less than 360 contacts were effected on 3.5, 7 and 14 Mc/s. with stations in 51 countries. Input was 50 watts for most of the time and the receiver was a "Super-Pro." Aerial 136ft. long wire, fed 45ft. 4in. from one end with 300-ohm line. The first contact was with 3A2AN, who is HC1FG when at home. Some difficulty was experienced in working South America. By the way, there is now a resident amateur in Monaco—M. V. Klaveren (3A2AH), 6 Rue Comte F. Gastaldi, who QSL's.

"Top Band" Topics

G6LB worked EK1CW at 0700 G.M.T. on December 30, 1951, one of several G's to do so. This is his fourth continent on "Top Band," with an input of 10 watts. G2HW forwards the following list of British stations heard by TF5TP between 0015 and 0128 G.M.T. on December 30, 1951: GM3GUS, 569, G3EIW, 569, G2YY, 57 'phone, G2HW, 569, G3HRM, 569, G3HWX, 569, G6ZT, 579, and G8WP, 459. The G's have also been heard in Cyprus on "Top Band." ZC4XP, who sends this news, hopes to work some of them soon. So far, he has worked SU1PJ and has heard GW3ZV and UA6KET. He will be on 1850±10 kc/s. from 2300 to 0045 G.M.T. and from 0300 to 0500 G.M.T. every Wednesday and all night on Saturdays from 2000 G.M.T. onwards. W8PQK, who has been using the receiver in 'XP's shack, has heard the following: OH3NY, G2YY, GM3AVA, G2HW, G3HRM, G6ZT, G6NW, G2SU and G2FGD between 0118 and 0452 G.M.T.

Notes and News

W2GT reports that both FD8AA and 8AB are on 14010 kc/s. around 1700 G.M.T. He also mentions FL8AB but gives no details. FL8BC is active and QSL's. QTH is Box 335, Djibouti. He works c.w. on 14 Mc/s.

Norman Burton, ex-B.R.S.11494, writing from N.S.W., says the father of the "Sara" quads has just got the call VK2QV. "Quad Victor," of course! He says there is an official W.I.A. broadcast every Monday morning from VK2WI (input 250 watts) lasting some 25 minutes.

W2APU would like to know the present address of Norman Webber, who operated as MP4BAB during 1950. Any offers?

B.R.S.7594, of Yeovil, reports the following on 'phone: CR6BC, 14203 at 1830, FF8DA, FF8MM and VP2KM all on 14335 at 1930, ZS1TGE (portable in Zululand), and on 28 Mc/s.: VU2WR, ZP3AW and ZS3G.

ZL1MB operated by "Slim" Herbert, Remuera, Auckland, was a New Zealand Zone winner in the 1951 B.E.R.U. Contest.

* 29 Kechill Gardens, Hayes, Bromley, Kent.

VU5AB is now active on 7 Mc/s. from Car Nicobar Island. A batch of cards has already arrived from him. QSL *via* R.S.G.B.

G3HVP was surprised when he worked UA3DG at Kolomona, near Moscow, on 3.5 Mc/s. c.w. on December 2 at 1819 G.M.T. Otherwise the ban seems complete. We have no idea why. B.R.S.250 reports OY3IGO (3510), PY3FE and KP4DJ also on 3.5 Mc/s.

G5JL, still wedded to 7 Mc/s. despite the dozen or so Spanish broadcast stations in the exclusive amateur section of the band, offers the following: MP4BAM, EA9DP, ZC4DT, TA2EFA, VQ4CT, OX3BI, TF5TP (7010), TF3NA, SU1WL, SU1GO, VK6LU, CN8CW, ZC6UNJ, IS1CXF and OY3IGO (7028), all between 1830 and 1930 G.M.T. In the early mornings his collection includes KZ5BE (7007), TA2EFA, KL7EH (7007), FF8AC (7006), VQ4HJP, EA8DU and OA4ED. ZC4XP has been heard on 3510 kc/s.

Apologies to G3GZO for spelling the "ship's" name incorrectly in our December issue. Our printer must have a sense of humour!

G2HOF has worked JA3AF, 14078 at 1120, and KG6AAE, 14020 at 1200. He says—send very slowly to CR4AJ. TF7SF's cards have come in, so he is O.K. B.R.S.10663 says PX1AA was operated from a "Jeep" by DL4IA, not DL4VI. VQ8AL, on 'phone at 1600, QSL's. G3HHU kindly draws attention to our paragraph last month headed "Basutoland." Mental abberation O.M. Of course it should have been Swaziland!

G5GQ recently heard FD8AA giving Box 95, Bucharest, as his QTH for QSL. Howcum? GM2UU celebrated the New Year by working FR7ZA, ZS2MI and ZS7C. ZD6HU guarantees a QSL to all contacts.

The report from G6XS this month deserves a paragraph to itself: FM7WF 569, 14020 at 1735; EA0AC 569, 14060 at 1800; EA0AB 579, 14028 at 1737; PJ5TR, 1400 at 1730; 9B3AA 567, 14023 at 1015; FD8AA 559, 14020 at 1700; FB8ZZ 569, 14084, 1735; CR5AF 567, 14040 at 1800; VS9AC 588, 14122 at 1330; ZD1SS 588, 14014, 1755; ZD6HN 576, 14070 at 1733; LZ1KAB working GW5SL 589c., 14032 at 1719; PJ1UF 589, 14028 at 1803; VQ5CK 569, 14110 at 1618; VP2KM 579, 14062 at 1750; MC1WN (Benina Airport, Benghazi) 599, 14064 at 1830; VK9SA 569c., 14032 at 0905; VK9AU 459c., 14030, 0907; W7AH (Arizona) 579, 14082, 1730, and HZ1AA 559, 14038 at 1732.

G2BJY has been giving 3.5 Mc/s. a whirl in search of W.A.E., but says the poor conditions on the high frequency bands have been reflected on the low frequency bands also. However, in spite of everything he got W6ZAT on November 22. Altogether, 41 countries have been worked in three months, including PY7WS, 4X4BX, F9QV/FC, ZL3JT and SU1WL.

From W5KUC's *DXCC Bulletin* we glean the following: LB6XD is on Jan Mayen Island; LB9AC, who was active in Spitzbergen, is now back in Tromsoe; XE4PK will be operating from Revillagigedo Island mostly on 'phone. There is a ZD7AB on the air, giving the name of Bill but no other information. QTH of FY7YB is H. Ravin, c/o Post Office, Cayenne, French Guiana. FB8BB is held by M. Loubet, Boanamary, near Majunga, Madagascar. QSL by air with coupons will bring a reply QSL by air. Bob Pybus confirms the general poor conditions but has heard a number of U.S. broadcasting stations around 1600 kc/s. He has his QSL from HE9LAA.

G2HKU has worked FQ8AE, LZ1AR, F9JD/FC and still wants SM2 on 7 Mc/s. and SM1 on 14 Mc/s. for his W.A.SM.

Afghanistan

Mr. R. A. Perryman asks us to make it clear that the offer referred to under the above heading in the January issue, applies only to cards addressed to YA2UU. He cannot undertake to handle cards addressed to EQ or other YA stations. By the way, Mr. Perryman's call is G2APN and not G2APM as recorded last month.

Ceylon

We have the assurance of VS7NG that he has really been on 3.5 Mc/s. and has worked G3ATU, 3HBB, 3EYQ, 5RI and 8KP. 'HBB's input was only 17.5 watts to a single 6L6.

R.S.G.B. AMATEUR RADIO CALL BOOK

If your call was not included in the First Edition, or if you have changed your address since that Edition was published, please notify the Call Book Editor, John Tyndall, G2QI, 174 The Drive, Ilford, Essex, without delay.

VS7NG is trying to get other amateurs in the Dominion to interest themselves in 7 and 3.5 Mc/s. He runs 75 watts on c.w. and 50 watts on 'phone to a completely home-made rig, and works from 1500 to 1630 G.M.T. and from 0030 to 0200 G.M.T. Aerials are half-wave dipoles on all bands. VS7TM (G3EET) is looking for G's.

Who's Who

John Rowe, ZC4OR, now at the Met. Office, Royal Signals, Hemsby, Great Yarmouth, would like to contact local amateurs. Herb Becker, W6QD, has handed over the DX column in *CQ Magazine* to Dick Spenceley, KV4AA, but is remaining on the staff. VQ4SGC, home on leave, has his logs with him (QTH 12 Oaklands Avenue, London, N.9). G3HAY, better known as MB9BO and MD2BU, is at present on leave in New Zealand, where he is operating his father's station ZL4IC.

VS2AL closed down last September and will not be active again from Malaya. Les Coupland, G2BQC, has left for Australia and should arrive at VK2DI about February 18. G2BUV and his family now live in Belgium. He is operating as ON4KT. "Butch" Orrell, VS9AO/MT2E, is home again, QTH 30 Radcliffe Road, London, N.21. MD5PM is also home and on the air as G3HFZ. All contacts QSL'd. VP8AJ is operated by George Collop, G3AXN, from Port Lochroy, 1,500 miles south of the Falkland Islands. Input 350 watts, 'phone and c.w. on 7 and 14 Mc/s.

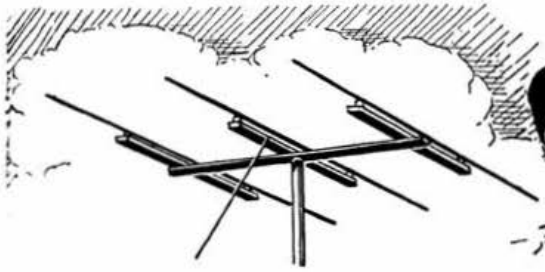
Kenneth Jowers, G5ZJ, and more recently AP2J, is now at the Mid-Asian office of Marconi's Wireless Telegraph Co., Ltd., New Delhi (P.O. Box 195). He hopes soon to become active as VU2ZJ.

Eclipse Expedition—Sudan

Until February 26, 1952, AJ4AB/ST will be active from the Sudan in connection with an Eclipse Expedition organised by the U.S. Military Amateur Radio Service. The station will operate on 14390 kc/s., as well as on 14405 kc/s. in the M.A.R.S. network. QSL *via* G2MI.

Tailpiece

Can anyone please loan G2MI a copy of the December, 1950, issue of *Practical Wireless?*



AROUND THE V.H.F.'s

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

2 m. Record in Australia.
New 70 cm. Activity Plan.

An Australian Two Metre Record

VERY little has been heard in this country of v.h.f. activity in Australia, and it is with particular pleasure, therefore, that we refer to a report received from VK5JD, v.h.f. representative for the Wireless Institute of Australia, concerning an outstanding achievement on the 2 m. band in that country.

On December 30 two-way contact was established over a great-circle distance of approximately 1,325 miles between VK5GL and VK6BO situated near Perth and Adelaide respectively. The Perth end of the contact was carried out with the aid of 18 watts to an 832, a 4-over-4 beam and a c.c. converter. No details are available at the moment of the gear at VK6BO, nor is any mention made in the report of the strength of signals.

At the time of the contact barometric pressure showed a gradual decrease from Adelaide to Perth, while a "front" lay slightly to the north and parallel to the coast line of the Great Australian Bight. The temperature was 82 degrees at Perth and 68 degrees at Adelaide. No marked inversions were present in the lower atmosphere, a condition which had been apparent on those occasions in the past when radio contact was possible between Adelaide and Melbourne on a frequency of 122.9 Mc/s.

70 cm. Activity Plan

Throughout last year a series of Activity Periods were arranged on the 70 cm. band with the object of focusing activity at certain definite times and thus providing the opportunity of a contact for those wishing to make one. With about two exceptions the response was almost entirely confined to the London area, and although no startling results were achieved it was felt by many who took part that a useful purpose was served.

Just as we are told that nothing succeeds like success, so it is true that activity on a band breeds more activity. This is common sense, as none but the most patient and enthusiastic of amateurs is prepared to search a dead band night after night unless there is some reasonable chance of a contact being obtained. Once a nucleus of regularly operating stations is formed, more will make a point of joining in. The idea will spread until all over the country local groups are in being. These will find that they can, as they improve the efficiency of their apparatus, join up with other groups. An outbreak of good conditions, far from being almost unnoticed, would serve to stir up enthusiasm still further. But . . . how to get that nucleus ?

Rather than continue with the Activity Periods on the old lines, a fresh scheme is to be tried. An attempt will be made to organise skeds. and publish details of them regularly together with any pertinent information. By the time these words are in print most amateurs known to be interested in 70 cm. operation will have received a questionnaire asking whether they are willing to co-operate in the scheme and, if so, requesting details of their times of operation, frequency, etc. Others who are interested are cordially invited to write to the author for details. The object is *not* DX contacts, although they will come inevitably, but activity. This is a sincere attempt to popularise the 70 cm. band ; your co-operation is invited as only by co-operation can anything be achieved.

* *32 Earls Road, Tunbridge Wells, Kent.*

The Two Metre Band

During a month when meteorological conditions ran almost the whole gamut of changes (about the only exception being a heat-wave), the effect on the v.h.f. bands was very interesting. In Banwell, Somerset, G3EHY found that although he could continue his 100-mile skeds. around 1900 to 2000 G.M.T. without interruption, whatever the weather, the effect on signal strength was marked, some stations varying from R4 S4 on c.w. at the worst periods to S8/9 on 'phone at best. Just before and after December 20 conditions were very good indeed, and during the week following January 5 operation over a distance of 150 miles was quite normal, while on the 7th there was some Continental activity.

It is encouraging to note that, despite the lower level of activity on the band at this time of the year, new stations continue to make an appearance. G3HXS (Long Marston, Herts.), formerly a keen listener on the v.h.f.s, is now putting out a good signal which has been well received by G3EHY when no other stations near London were audible.

Well-known old-timer Alan Dyer, GW8UH of Cardiff, is now active on 145.44 Mc/s. every Sunday between 1830 and 2000 G.M.T. and again after 2215. During the week he is occasionally on the band after 1900 G.M.T. He pays tribute to the assistance which he has received from G3EHY, whom he works regularly, and states that one or two stations local to him are becoming interested now that they know there is someone to contact: a clear case of activity inducing further activity. Other stations heard are G3BLP—an S9 signal—3AGA (Falmouth), 5UF (Dorchester) and 5TP (Stoke Row, Oxon.). G8IL (Salisbury) is so far the best DX.

The gear at the Cardiff station includes a 522 transmitter, shortly to be replaced by a 100-watt job with an 829B in the final, a 3-over-3 beam and a p.p. 6J6 type of converter. GW8UH would like to hear from anyone with practical experience of the cascode circuit.

G2DHV (Lewisham, S.E.13) is now operating on alternate evenings on 144.99 or 145.206 Mc/s. c.w. The final stage in the transmitter is at present an RK34 tripler, with 21 watts input, but a p.a. stage is being added shortly. Two aerials are available, a 4-element Yagi and a dipole

40 feet high. Contacts and listeners' reports would be welcomed.

IIBMP (Milan) is active on 2 m. with an 832 feeding a 4-element rotary beam and a modified BC639 receiver. He is also interested in the 70 cm. band, but points out that suitable valves for that frequency are not available in Italy. Despite that handicap he has contrived to work over a distance of 47 miles with a 6J6 p.a., a corner reflector aerial, and a super-regenerative receiver.

One of the keenest of 2 metre operators, Harry Wilson, EI2W, was presented with the A.R.U.P. Cup for his outstanding work on that band at the annual dinner of the I.R.T.S. in Dublin on January 26. All those to whom he gave their first EI contact on v.h.f. will wish to join with us in congratulating him on this well-deserved honour.

The 70 cm. Band

GW2ADZ and G3EHY continue to run their skeds. on this band nearly every evening between 1900 and 1930 G.M.T. Under the best conditions signals have been RST 599 both ways, but during the past month most contacts have been spoilt by fading. The number of occasions when some kind of a signal gets through is, however, surprising, and there seems little doubt that when r.f. stages, comparable in efficiency to those in general use on 144 Mc/s., become normal practice, and the powers-that-be permit more than the present inadequate input of 25 watts, quite reliable results will be possible on the higher frequency, even over such a difficult path as this.

The Welsh station managed to work G2FKZ and G3FZL (London, S.E.22) on most of their skeds. between 2000 and 2020 G.M.T. One of the best nights was December 12 when G3EHY was an S9 signal, G2FKZ S5 and G2WJ (nr. Dunmow, Essex—153 miles) was heard at S4. Both GW2ADZ and G4LU (Oswestry) beam eastwards every evening at 2030 G.M.T. and call G3APY for five minutes.

We are inclined to agree with G3EHY's views that little useful knowledge results from isolated cases of freak propagation while much remains to be learnt from regular skeds. between stations situated within possible range of one another. In fact we come back to the question of regular activity, and it is hoped that the scheme referred to earlier will prove attractive to those enthusiasts who are at the moment ploughing a more or less lonely furrow, and will result in more stations being encouraged to operate regularly on this fascinating band.

70 cm. Propagation

With reference to the American tests on 412 Mc/s. mentioned last month and the fact that signals were found to increase in the early mornings, G2FKZ remarks that during skeds. with GW2ADZ over a period of some three months at 0700 G.M.T. he could always hear the latter station provided the barometric pressure was above 29.9 inches and cloud either absent or very high, the latter condition indicating that the maximum night-cooling effect was necessary to provide a usable path. These conditions are probably quite normal in Central U.S.A., where the tests referred to were carried out, and accounted for the pronounced rise in signal strength noted between 0400 and 0700 local time.

G2FKZ has been making a study of the meteorological conditions which prevailed during some of the more outstanding DX contacts on both 2 m. and 70 cm. last year, and found that apart from a Continental duct the remainder occurred in "warm sector" air conditions. Conditions on 70 cm. during January 14 were good, while a number of 2 m. stations in the Midlands and in S.W. England could be heard. Severe gales were raging along the west coast, the north of Yorkshire and in northern Scotland, and as these conditions travelled eastwards across the country during the evening, to reach the London area early on the following morning, the movement of the "front" could be followed by noting how the DX signals peaked and faded, and showed an approximate speed of 30 mp.h.

* * *

The closing date for reports to appear in the March issue is Thursday, February 21.

Libya

THE following calls have been issued to amateurs resident in the Province of Tripolitania:

5A2TA—Major S. G. Purkiss, 595 Ordnance Depot, Tripoli, M.E.L.F.1.
5A2TB—B. F. Noel, 1261 Air Transport Squadron, Wheelus Field, Mellaha.
5A2TC—J. A. Zaruba, N.C.U. No. 4, Wheelus Field, Mellaha.
5A2TD—K. Hirschinger, 1950 A.A.C.S. Squadron, Wheelus Field, Mellaha.
5A2TE—Mok Seng Tan, c/o U.N. Commission in Libya, Grand Hotel, Tripoli.
5A2TF—J. H. Bowen, N.C.U., No. 4, Wheelus Field, Mellaha.
5A2TG—J. T. Blackwood, G.P.O., Tripoli.
5A2TH—J. Wylie, 1603rd Air Base Group, Wheelus Field, Mellaha.
5A2TI—E. Jones
5A2TJ—A. B. Whatman
5A2TK—E. R. Gay
5A2TL—D. H. Willoughby
5A2TM—W. J. D. Norris
c/o Tripolitania Signal Troop, Tripoli, M.E.L.F.1.

THE CALL BOOK YOU CAN RELY UPON

Indispensable to the radio amateur and short-wave listener, the **R.S.G.B. Amateur Radio Call Book** lists more than 6,000 licensed amateurs in the British Isles and Eire, and costs only **3/6**, or **3/9 by post.** Order now from Headquarters.

London Lecture Meetings

ABOUT 85 members were present at the Institution of Electrical Engineers on Friday, January 25, 1952, when Mr. W. A. Scarr, M.A., G2WS (Immediate Past-President), installed Mr. F. Charman, B.E.M., G6CJ, as President, and presented him with his badge of office. After expressing thanks to Mr. Scarr, Mr. Charman delivered his Presidential Address. *(The Address appears elsewhere in this issue.—Ed.)*

At the conclusion of his Address, Mr. Charman explained that, due to illness, the representative of Standard Telephones and Cables, Ltd., who had agreed to lecture on "Overtone Mode Crystals," was unable to be present, and that at very short notice Mr. E. A. Dedman, G2NH (Quartz Crystal Co., Ltd.), had agreed to lecture on "Quartz Crystal Manufacturing Processes." Samples of modern quartz crystals were displayed, together with a number of other interesting exhibits. Messrs. Scarr, Clacy, Craig, Allen and Thorogood were among those who took part in the subsequent discussion.

A vote of thanks to Mr. Dedman was proposed by Mr. H. A. M. Clark (Vice-President and Chairman of the Technical Committee). Among those present were Mr. L. Cooper, G5LC (Executive Vice-President); Mr. D. A. Findlay, D.F.C., G3BZG (Hon. Treasurer), Messrs. T. L. Herdman, B.A., G6HD; F. G. Lambeth, G2AIW and R. Walker, G6QI (Members of Council); D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E., G5CD; J. W. Mathews, Assoc. Brit. I.R.E., G6LL, and H. V. Wilkins, G6WN (Vice-Presidents).

* * *

MESSRS. L. BOUNDS and C. W. Touch, of Mullard, Ltd., will lecture on "Modern Valves for V.H.F. Work" at the meeting of the Society to be held on Friday, February 29, 1952, at the Institution of Electrical Engineers.

Examples of valves designed for operation on frequencies between 400 and 600 Mc/s. will be exhibited including the new Mullard Butterfly Double Tetrode. The lecture will conclude with a number of demonstrations.

Members living in the London Region and others who may be in London at the time are cordially invited to attend. Buffet tea will be served from 5.30 p.m. and the lecture will commence at 6.30 p.m.

R.S.G.B. Amateur Radio Exhibition

ALTHOUGH reference was made in the article published in the January issue to the assistance given by members who manned stands and loaned equipment for the Amateur Constructors' Section at the recent Amateur Radio Exhibition, the names of the members of the Committee charged with the responsibility for organising this highly successful section were omitted. The Chairman of the Committee was Mr. P. W. Winsford, G4DC, who had the assistance of Messrs. W. N. Craig, G6JJ, C. H. L. Edwards, G8TL, H. F. Knott, G3CU, F. Ruth, G2BRH, S. F. Sharpe, G3CKX and E. Yeomanson, G3IIR.

Adelaide Jubilee Exhibition

DURING the Jubilee Exhibition to be held in Adelaide from March to May, the South Australian Division of the Wireless Institute of Australia will operate an Amateur Radio transmitter (call sign VK5WI) on the 7 and 14 Mc/s. bands. All contacts will be acknowledged by special QSL cards.

CQ Single Sideband

*By H. F. KNOTT (G3CU)**

THE views expressed by those who visited the Single-Sideband Equipment Stand at the recent R.S.G.B. Amateur Radio Exhibition appear to indicate that, for many, s.s.b is still something of an unknown quantity. This is to be expected, and it was for this reason that a comprehensive show of the type of equipment needed was given prominence. The intention of the exhibit was to introduce s.s.b., and to demonstrate how it can be tuned in to provide an intelligible signal on a simple unmodified receiver.

It was also apparent that—in the minds of the uninitiated—the equipment must necessarily be complicated, and the number of valves prohibitive. This last idea is quite false, as was obvious to those who took a more careful look at the items exhibited.

A s.s.s.c. exciter or generator (using the filter method) is basically similar in design to a standard communications receiver—but "in reverse." The two audio valves are the equivalent of the speech amplifier (a.f. stages); the balanced modulator replaces the detector; and the crystal filter performs its usual function in cutting-off the unwanted frequencies—in this case, the sidebands. This is all that the equipment really consists of, for once the required single-sideband has been produced, the rest is merely a matter of amplification through linear stages (class "A" or "B") to the power level required. By using about five valves of receiving-power class and, say, a pair of 807s, a complete s.s.s.c. transmitter, including the modulator, can be built-up without the worry of expensive modulator valves, transformers and power supplies associated with the usual a.m. rig of that input. There are other advantages too—an increase in gain by no less than 9 db., and a band occupancy of only 3 kc/s., to name but two.

"It's all a question of balance . . ."

So far as alignment is concerned, while admittedly greater care in adjustment is needed if a high-quality s.s.b. transmission is intended, in most cases a simple oscilloscope and a source of 1000-cycle sinusoidal tone are all that is required in the case of a phase-shift rig; and a valve voltmeter and signal generator covering the working frequency for the alignment of a filter rig. It is not necessary to own this test equipment, so long as one knows somebody who does! The adjustments are simple, and probably take less time to make than to describe. It is all a question of balance!

At this time of the year there is a reasonable possibility that transatlantic s.s.b. QSO's on 3.5 Mc/s. will take place. American s.s.b. stations are normally to be found between 3999 and 3999.5 kc/s., using the lower sideband. Operating times are from about 0100 to 0300 G.M.T. It has been suggested that British stations should call from 3797 kc/s. when seeking contact, using the upper sideband.

Latest stations to use the system are G4OO (Crystal Palace) on 14 Mc/s., GI3ZX (Belfast) on 3.7 Mc/s., and G6HV (Essex) on 1.8 Mc/s.

*31 Batchwood Green, St. Paul's Cray, Orpington, Kent.

The Flying Enterprise

MEMBERS will be glad to know that British radio amateurs were represented at the official welcome given to Captain Kurt Carlsen, W2ZXM, by Mr. W. R. Metcalfe, G3DQ—himself in the marine salvage business at Falmouth—and Mr. Harold Clements, G2QL, a staff photographer of the *Daily Express*.

Land's End radio station was the main link between the shore and the drama being played out at sea, and it is to be regretted that so little recognition was given by the Press to the magnificent job done by the G.P.O. operators in handling many hundreds of messages each day in addition to their normal traffic.

Mr. Metcalfe, wishing to send a message to W2ZXM on behalf of the Cornwall Radio Club, telephoned the Club's President—Mr. L. Rodgers, G2FDQ—who is also T.R. for Falmouth. He then learned that a communication had been received from R.S.G.B. Headquarters, asking that greetings and congratulations be sent to Capt.

[Photo by courtesy of "Daily Express"

Shortly after his arrival at Falmouth, Capt. Kurt Carlsen (W2ZXM), met Harold Clements (G2QL) (left) and Knud Anderson (OZ5KP) (right).

Carlsen from all British amateurs together with an invitation to attend the next meeting of the London Members' Luncheon Club. As G2FQD was ill, G3DQ undertook to see that this message was delivered.

It is gratifying to learn that, even when the avalanche of offers of everything from an electric shaver to exclusive film rights had reached such proportions that some degree of filtering into order of priority became essential, the Society's message was passed *via* Land's End radio, and Commander O'Brien of the *U.S.S. Willard Keith* saw fit, personally, to relay it to Captain Carlsen while he was still aboard the *Flying Enterprise*. W2ZXM later mentioned the great pleasure its receipt had given him.

Members in the West Country were able to hear Capt. Carlsen's transmissions, in which connection G3DQ comments on his utter calmness while seas were running 20 ft. high, with baulks of timber, boxes, and a litter of floatable gear tossing about like matchsticks, able with one blow to kill a man or sweep him into the sea.

The Arrival

Falmouth was decorated for the occasion when Capt. Carlsen and Mr. Dancy came ashore from the *Turmoil*. After the address of welcome and the citations of the various authorities had been delivered, G3DQ was introduced to Capt. Carlsen as a representative of British radio amateurs in general and the R.S.G.B. in particular. Even though the magnitude of his reception had obviously taken him aback, there was no doubt about his pleasure at this greeting. When reminded of the invitation to the Luncheon Club, he asked that his thanks and appreciation should be expressed to the amateurs of Britain, but pointed out that, as the *Enterprise* had foundered, he would have to fly back to New York before the date of the luncheon. Although so many people were waiting to interview him, Capt. Carlsen continued to chat with G3DQ, mentioning, among other things, that he had lost all his equipment, including a brand-new receiver, which had been purchased just prior to that fateful trip.

G3DQ's personal impression of the man was one of great strength of character; though physically quite small, he had a calm dignity—and a merry twinkle in his eye.

The Future

All radio amateurs will join in wishing Capt. Carlsen God-speed. May we soon hear once again the call sign W2ZXM/MM ringing out on the 28 Mc/s. band. Good DX, O.M.!

Expedition to Iceland

DURING August and September of last year, amateurs listening on the off-band frequency of 4666 kc/s. may have heard the call TF1AA, followed by traffic of a meteorological nature. The origin of those signals was the base camp station of the schoolboys' expedition to Iceland, organised by the British Schools' Exploring Society.

The expedition, which included adult leaders, a larger number of schoolboys, stores, provisions and radio equipment, landed at Reykjavik, and after being greeted by local dignitaries, was conveyed to the interior of the island by bus. Eight hours later, the bus journey over, members shouldered packs and started marching to the site of the base camp some miles away. Here, during the next few days, the base camp radio station was unpacked, set up, and tested.

Base Camp

The equipment consisted of a 40-watt Admiralty c.w.-phone transmitter, with aerial tuning unit, power supply, two receivers, and an operating desk. This was assembled and installed in a tent, forming a compact and easily operated station. End-fed aerials were erected in appropriate directions, the charging plant for the batteries being sited some distance away. Test signals with Reykjavik were reported RST 599 both ways, and regular schedules were maintained for the passing of meteorological traffic throughout the period of the expedition.

The party was divided into groups of boys—each under the supervision of one of more leaders—who were to march to the various outstations situated around the ice-cap of Hofsjokull, which is 5,000 ft. high and 20 miles across. Base camp was established on the western side, with the three outstations on the northern, eastern and southern sides. Each outstation was manned by a crew of three. During the marches every member of the party had to carry a 63 lb. pack, which included rations for 10 days—a more than adequate load in view of the difficult terrain.

At the Outstations

In spite of having to wade across many rivers in a biting wind, and battling over lava, the three

outstations were successfully established at distances of 1¼, 2 and 3½ days' march from base camp. Crews were left to fend for themselves, being relieved each week during the course of the expedition.

Radio equipment used at the outstations included three Army type 22 sets, and six type 46 sets—all of which could be man-packed. Daily schedules were maintained with TF1AA on the fixed frequency of 4666 kc/s.—this being the only frequency permitted by the Icelandic authorities, who would not grant an amateur licence. Consequently, no use could be made of the varying m.u.f., and no work could be carried out on v.h.f. or u.h.f., where interesting results might have been expected. It was found that a vertical rod aerial, inclined 30 degrees away from the required station, was the most effective. The ice-cap tended to act as a screen, greatly attenuating signals.

From the last week in August, the weather deteriorated; cold winds raised the laval dust, and the snow came, producing some strange effects. For instance—a signal which was being received when the snow started, gradually faded completely for nearly five minutes, and during this interval, the band was quite dead. Dust storms brought corona discharge, raising the noise level to a very marked extent, and in some cases blotting-out all but the strongest signals. Little trouble was experienced with the equipment once it was on the air; the generator broke down twice, but was speedily repaired.

Departure

TF1AA closed down at 1330 G.M.T. on September 12, having passed 244 formal messages, and participated in many 'phone and telegraphy contacts. Finally, the expedition left Iceland. The schoolboy members had experienced—and enjoyed—some of the rigours of life amid lonely and adverse surroundings, and had learned in some measure the vital part which radio communication plays today in the service of mankind.

Federation of Sussex Radio Clubs and Societies Proposed

THE C.R. for Sussex (Mr. G. W. Morton, G3DRC), proposes to investigate the possibility of forming a federation of Sussex Radio Societies and Clubs, the chief objects of which would be to effect liaison between the Societies, to facilitate the exchange of lecturers, and to organise social functions and competitions.

A meeting to discuss the proposal is to be held at the Golden Cross Hotel, Western Road, Brighton, on Sunday, March 16, at 6.30 p.m., to which all Radio Clubs and Societies in the county are invited to send delegates.

Further details of the proposal can be obtained from Mr. Morton whose address is 42 Southfarm Road, Worthing, Sussex.

Region 10 (South Wales) Representative

THE Council has been pleased to appoint Mr. John Banner, GW3ZV, "Cartref," Rhigos Road, Rhigos, Nr. Aberdare, Glamorgan, to the office of Region 10 (South Wales) Representative.

Mr. Banner is the present holder of the Arthur Milne Trophy, awarded to the British Isles station (other than English) scoring the highest number of points in the A.R.R.L. DX Telegraphy Contest. Signals from Mr. Banner's station were recently heard in New Zealand on the "Top Band."

London Members' Luncheon Club

MR. STANLEY VANSTONE, G2AYC, President of the Sutton and Cheam Radio Society, was re-elected Chairman of the London Members' Luncheon Club, at a brief business meeting held after the January luncheon. Mr. Clem Jardine, G5DJ, North London D.R., was re-elected Hon. Treasurer, and by the unanimous wish of those present, Miss May Gadsden agreed to take over the duties of Hon. Secretary in succession to Mr. Frank Fletcher, G2FUX, who has resigned for business reasons.

Club members were glad to welcome Mr. W. R. Metcalfe, G3DQ, of Falmouth who, in the course of an entertaining after-luncheon speech, described his recent meeting with Capt. Kurt Carlsen. W2ZXM. Applause greeted the news that a cablegram to Capt. Carlsen, whilst he was still on board the Flying Enterprise, sent at the instance of Headquarters on behalf of all the radio amateurs of Great Britain, reached him safely.

Meetings of the Luncheon Club, to which all members are cordially welcomed, will be held on the following Fridays during 1952:

February 22, March 21, April 18, May 23, June 20, July 18, August 22, September 19, October 17, November 21 and December 19.

The venue is the Kingsley Hotel, Bloomsbury Way, W.C.1 (opposite Headquarters).

Members of the Club will, in future, pay a nominal annual subscription of 2s. 6d. to offset the cost of postcard notifications of meetings.

It is hoped that overseas and provincial amateurs who expect to be in London on the day when the Club meets, will make a point of contacting Miss Gadsden either on BARnet 4692 or HOLborn 7373.

East London News Letter Proposed

THE East London District Representative, Mr. J. Hunter, G6HU, 63 Aintree Crescent, Barkingside, Essex (Valentine 8947), would like to hear from any member living in the East London District who is able and willing to undertake the production of a monthly News Letter. Several members have already agreed to act as despatchers. The need now is for someone with experience to co-ordinate all sections of production.

Mr. Hunter proposes to convene a meeting as soon as sufficient members have offered their services. As a guide it is expected that the News Letter will sell at about 4d. per copy post paid.

Electrical Engineers' Exhibition

AN exhibition organised by the Association of Supervising Electrical Engineers, will be held at the Royal Horticultural New Hall, Greycoat Street, Westminster, London, S.W.1, on March 28 and 29, 1952 (10 a.m.-7 p.m. daily). Exhibits will include special fesatures by the British Electricity Board, Electrical Research Association, and Electrical Development Association. Manufacturers will show lighting, heating, neon equipment, switchgear, cables, relays, motors, etc.

Admission by ticket, trade card or—for R.S.G.B. members—by badge.

Wedding Bells

FRIENDS of Brian Lagden, G3GX, will be interested to hear that he was married in Bermuda early in February. Prior to leaving England a few months ago he was active on the local and DX bands from his home in North London.

N.F.D. Trophy Presented to Falkirk Group

A LARGE gathering of Society members, with their wives and friends, attended an informal dinner at the Falkirk Ice Rink last month to celebrate a great event in Scottish Amateur Radio, the presentation of the National Field Day Shield and replica to the Falkirk Group, by Council Member Hugh McConnell, GM2ACQ. This is the first occasion on which the trophy has gone to Scotland since the inception of N.F.D.

Mr. W. W. Peat, GM3AVA, whilst proposing a toast to the R.S.G.B., outlined the great work that has been done by the Society since its formation. He expressed the satisfaction of Scottish members in now having, for the first time, a representative on the Council, in the person of Mr. McConnell, thus connecting every member in Scotland with the representative body.

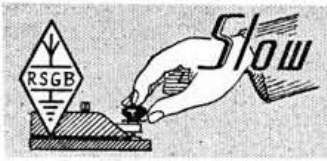
In his reply, Mr. McConnell, who was guest of honour, outlined the basic aims of National Field Day—the development of portable radio equipment capable of being operated without a mains power supply, and the training of each group of operators into an efficient communications team. He referred to instances during the past year when, in other countries, all commercial services had been interrupted by floods, hurricane or earthquake, and amateurs had provided the only radio link with relief organisations. He then presented the Shield to Mr. N. Holden who, in accepting it, congratulated the Dunfermline Group in gaining second place, their "B" station having been only one point behind Falkirk. He expressed the hope that Falkirk, or another Scottish Group, might gain first place in N.F.D. this year, and so keep the Shield north of the Border.

The Regional Representative, David Ross Macadie (GM6MD), after congratulating the Falkirk Group, mentioned the steps being taken, with the co-operation of the G.P.O. Radio Branch in Glasgow, to ensure the early diagnosis and elimination of any interference caused by amateur radio transmissions to television reception. The toast was acknowledged by Mr. Holden. Mr. B. B. Fulton, GM4JQ (County Representative) welcomed the visitors, and paid a tribute to the ladies. Mr. D. Scott, GM2GUS, of Dunfermline, responded.

During the proceedings twenty-eight free prizes were raffled. The function, which was supported by strong contingents from Dunfermline and Glasgow, ended with the singing of "Auld Lang Syne."

Helvetia XXII Contest

THE annual Helvetia XXII Contest will take place during the periods February 23/24 (Telephony) and March 22/23 (Telegraphy). Full details can be obtained from U.S.K.A. Headquarters, P.O. Box 196, Berne, Switzerland.



Slow Morse Practice Transmissions

The following slow Morse transmissions, sponsored by the Society, are intended to assist those who aspire to obtain an amateur transmitting licence. More volunteers are still required for parts of the British Isles not already covered, particularly in the London Area. Stations listed who find themselves unable to continue transmissions should immediately notify the organiser, Mr. C. H. L. Edwards, A.M.I.E.E (G8TL), 10 Chepstow Crescent, Newbury Park, Ilford, Essex.

* *Each station will operate in turn.*

G.M.T.	*Call*	*kc/s.*	*Town*
Sundays			
10.00	G6MH	1990	Southend-on-Sea
10.00	G5XB	1950	Reading
10.30	G3GIO	1915	Guildford
10.30 *	G3ESP	1990	Pontefract
	G3US		
	G3HCX		
	G3IDT		
11.00	G2FXA	1900	Stockton-on-Tees
21.00	G2FIX	1812	Nr. Salisbury
22.15	G3AEZ	1847	Dorking
Mondays			
19.00	G3NC	1825	Swindon
20.00	G3DSR	1750	Derby
21.00	G3BLN	1900	Bournemouth
21.00	G3BHS	1820	Eastleigh, Hants
22.00	G3AEZ	1847	Dorking
22.00	G3GIO	1915	Guildford
22.00 *	G3EJF	1810	Bury, Lancs
	G3DZU		
	G2AYG		
20.30 *	G6LX	1875	Croydon
	G3BLP		
22.15	G2BRH	1900	Ilford
22.30	G8TL	1896	Ilford
Tuesdays			
18.00	G2FXA	1900	Stockton-on-Tees
19.00	G5XB	1905	Reading
19.30 *	G3HGY	1830	Coventry
	G5PP		
	G5SK		
21.00	G3EFA	1855	Southport
22.00	G3ELG	1772	Rotherham
22.00	G3GIO	1915	Guildford
22.00	G2BND	1890	Dalston, E.
23.00	G2XG	1735	Chingford
Wednesdays			
14.00	G3ADZ	1910	Southsea
Wednesdays *(continued)*			
19.00	G3ADZ	1900	Southsea
19.30 *	G3HBX	1870	Warwick
	G6XA		
20.00 *	G2LU	1830	Coventry
	G3HDB/A		
21.30	G3HKC	1770	Birmingham
22.00	G3DLC	1800	Grays, Essex
22.00	G3GIO	1915	Guildford
Thursdays			
18.00	G2FXA	1900	Stockton-on-Tees
19.00	G3NC	1825	Swindon
19.30 *	G2DOF	1830	S. Birmingham
	G3DTG		
	G3ENH		
	G6KI		
	G8JI		
20.00	G3FVH	1920	Hull, Yorks
21.30	G6DL	1760	Birmingham
22.00	G2NK	1730	St. Mary Cray
22.00	G3AEZ	1847	Dorking
22.00	G3GIO	1915	Guildford
22.30	G3OB	1803	Manchester
Fridays			
19.00	G3BLN	1900	Bournemouth
20.00	G5AM	1900	Witnesham, Ipswich
20.00	G2AMV	1870	Wirral
21.00	G3BHS	1820	Eastleigh, Hants
22.00	G3GIO	1915	Guildford
22.00 *	G3AUT	1785	Rugby
	G3AUF		
	G3CBV		
	G3GTX		
Saturdays			
14.00	G3ADZ	1910	Southsea
22.00	G3GIO	1915	Guildford
23.00	G2FXA	1900	Stockton-on-Tees

NATIONAL FIELD DAY 1952

THE rules for N.F.D. this year are substantially the same as those of last year, apart from three minor changes. Rule 7a prohibits alterations to the aerial or feeder system during the course of the event. Rule 10 now specifies that any station receiving *frequent* tone reports lower than T8 may be disqualified. Rule 12 requires that the first three letters of the operator's surname shall be included in reports exchanged between portable stations.

T.R.s are reminded that appications for N.F.D. permits should be submitted as early as possible in order to facilitate the clerical work and licensing procedure involved.

Rules

1. The event will commence at 1700 B.S.T. (1600 G.M.T.), Saturday, June 7, 1952, and conclude at 1700 B.S.T., Sunday, June 8, 1952.

2. The event will be confined to properly constituted R.S.G.B. Town or Area Groups within the British Isles, which, for the purpose of the event, comprise the prefix zones G, GC, GD, GI, GM and GW.

3. Each Town or Area Group taking part will be permitted to place two stations ("A" and " B ") into operation. Station "A" will operate on the 1.8 Mc/s. and 3.5 Mc/s. bands and Station " B" will operate on the 7 Mc/s. and 14 Mc/s. bands. Both stations may operate from the same site or from different sites, provided they are located within the agreed limits of the area covered by their Regional Representative. It will be permissible for two or more towns or areas within a single Region to amalgamate for the purpose of this event.

4. Each station must be licensed to use a different call sign. T.R.s are responsible for forwarding to Headquarters applications for N.F.D. permits. Such applications should be set out as follows:

National Field Day, 1952

On behalf of the members in.....(Town or Area), I submit this application for permission to operate portable stations for the duration of the above event, as follows :—

"A" Station Call Sign...../P Licensee.....

Site.....

" B " Station Call Sign...../P Licensee.....

Site.....

(If applicable) I desire to combine with..... (Town or Area) for the purpose of scoring.

Signed.....(T.R. or A.R.)

Call Sign..... Address.....

.....

The above application, which is necessary to obtain the permission of the G.P.O., will also be regarded as an entry for the event. Permission is normally sent to the licensee direct by the G.P.O.

Applications, duly signed, must be in the hands of the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, W.C.1, **not later than April 1, 1952.** A list of portable stations and their locations will be published in the May issue of the BULLETIN.

5. Equipment at any "A" or " B " station must not exceed one transmitter and one receiver. Reserve equipment may be kept available, but not connected.

6. The total d.c. input to the anode circuit of the valve or valves energising the aerial or to any previous stage of the transmitter shall not exceed 5 watts. Power for any part of the station shall not be derived from supply mains.

7. Any aerials may be used up to a total of 3 per station (including the receiving aerial) subject to the following limitations:—

(*a*) No changes in dimensions, direction, or position of aerials or associated feeders may be made during the event.

(*b*) No part of the aerials shall exceed a height of 45 feet above ground level

8. Stations must be operated from tents.

9. No apparatus may be erected on the site prior to 1200 B.S.T. on June 7, 1952. This rule includes aerial and aerial fittings as well as tented accommodation.

10. The event is restricted to the use of c.w. (A1) only. Any station receiving frequent tone reports lower than T8 may be disqualified.

11. All transmissions must be completed with an indication of the band in use; the numerals 1, 3, 7 and 14 signifying the four bands (e.g. ". . . AR 7 K ").

12. An exchange of reports must be made before points can be claimed. In the case of portable-to-portable contacts between stations located in the British Isles (G, GC, GD, GI, GM and GW), this report must include the first three letters of the operator's surname, *e.g.*, RST 579 JON (station being operated by W. Jones). Proof of contact may be required.

13. Points will be scored for established contacts on the following basis:—

A.—Between all Town or Area Portable Stations and Fixed Stations:—

	Points
(*a*) Outside the Town or Area (or Town or Area Group), but within the British Isles	1
(*b*) In the rest of Europe (including Eire)	2
(*c*) Outside Europe	3
(*d*) In the British Empire	6

B.—Between G, GD and GW portable stations on the one hand and:—

	Points
(*a*) Portable stations outside their Town or Area (or Town or Area Group), but within the prefix zones G, GD and GW	3
(*b*) Portable stations in the prefix zones GC, GI and GM	4
(*c*) Portable stations in Europe (including Eire)	4
(*d*) Portable stations outside Europe	6
(*e*) Portable stations in the British Empire	12

C.—Between GC, GI and GM portable stations on the one hand and:—

	Points
(*a*) Portable stations outside their Town or Area (or Town or Area Group), but within their own prefix zones	3
(*b*) Portable stations outside their own prefix zones, but within the British Isles and Eire	4
(*c*) Portable stations in Europe	5
(*d*) Portable stations outside Europe	6
(*e*) Portable stations in the British Empire	12

14. Only one contact with a specific station may be made on each band during the contest.

15. In addition to the *National Field Day Trophy* and miniature replica which will be awarded to the Town or Area Group obtaining the highest combined score, miniature replicas will be awarded to the Town or Area Groups with the leading "A" and " B " station scores. Should the winning Town or Area Group also lead with the highest "A" or " B " station score, it will only be eligible for one replica; the other would not then be awarded. A certificate will be awarded to the chief operator of the British Empire or foreign portable station contributing the largest number of points to stations taking part in the event.

16. Contacts with ships, or unlicensed stations located in countries where licences are obtainable, will not be permitted to count for points. The decision as to whether a station is to be classed as unlicensed will rest with the Contests Committee.

17. All entries must be submitted and signed by the T.R. or A.R., who will be solely responsible for the conduct of the event in his Town or Area.

18. Entries must be made on the approved log sheets which will be issued to all competitors by Headquarters. Log sheets must reach the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, W.C.1, postmarked *not later than* Monday, June 23, 1952.

19. The *N.F.D. Trophy* will be held by the winning Town or Area Group for one year and will be handed to the T.R. or A.R., who will be held responsible for its custody during the year.

20. Operators of portable stations competing in the event must be holders of a G.P.O. Amateur Transmitting Licence and must be fully paid-up corporate members of the Society at the time of the contest.

Contests Diary

March 29-30	B.E.R.U. (Telegraphy)
April 5-6	B.E.R.U. (Telephony)
May 10-11	144 Mc/s. Field Day (No. 1)
June 7-8	National Field Day
June 22	420 Mc/s. Tests
July 6	European V.H.F.
July 26-27	144 Mc/s. Open Event
September 7	Lower Power Field Day
September 21	144 Mc/s. Field Day (No. 2)
October 4-5	Low Power
November 8-9	"Top Band" (No. 2)

REPRESENTATION 1952

THE following is a complete list of Regional, County and Town and Area Representatives as at January 31, 1952. Amendments or corrections to the list should be sent to Headquarters without delay.

REGION 1 (NORTH WESTERN)

Regional Representative: B. O'Brien (G2AMV), 1 Waterpark Road, Prenton, Birkenhead, Cheshire.

CHESHIRE
County Representative: H. M. Synge (G3BOC), Gipsy Corner, Willaston-in-Wirral.
Town Representatives:
Chester.—H. Morris (G3ATZ), 24 Kingsley Road, Boughton Heath.
Wirral Area.—L. N. Goldsbrough (G3ERB), 54 Kings Lane, Bebington.

CUMBERLAND
County Representative: W. H. Hodgson (G3BW), 53 Hill Top Road, Arrowthwaite, Whitehaven.
Area Representative :
West Cumberland.—J. Colebrook (G3BJD), 33 Hollins Close, Mirehouse, Whitehaven.

LANCASHIRE—EAST
County Representative: I. D. Auchterlonie (G6OM), 4 Stand Close, Ringley Road, Whitefield, Manchester.
Town Representatives:
Bury.—Mrs. D. Kelly (G3FYT), 52 The Drive, Seedfield.
Darwen & Blackburn.—J. Simpson (G4JS), 1 March Terrace, Darwen.

LANCASHIRE—WEST
County Representative: S. M. Sugden (G3GSS), Loretto, Gores Lane, Formby, Liverpool.
Town Representatives:
Blackpool.—I. C. Lamb (G6LD), 7 Mossom Lane, Norbreck.
Liverpool.—D. M. Bolton (G3DVB), 45 Terence Road, Liverpool 16.
Preston.—H. A. Woods (G2AXH), 13 Merrick Avenue, Farringdon Park.
Southport & Formby.—F. H. P. Cawson (G2ART), 113 Waterloo Road.
Warrington & District.—N. Atkins (G3EXG), 17 Belmont Crescent, Sankey.

REGION 2 (NORTH EASTERN)

Regional Representative: C. A. Sharp (G6KU), 56 Moore Avenue, Wibsey, Bradford, Yorkshire.

DURHAM
County Representative: T. Orr (G3IV), 31 Grange Park Avenue, Sunderland.
Town Representative :
Darlington.—Paul Lucas (G3BQJ), 32 Brougham Street.
West Hartlepool.—L. Foden (G3CHJ), 207 Park Road.

NORTHUMBERLAND
County Representative: L. G. Spencer (G4LX), 31 Harley Terrace, Gosforth, Newcastle-on-Tyne, 3.
Town Representative :
Stocksfield, Corbridge, Hexham & Haltwhistle.—J. G. Wardhaugh (G4LA), 20 Hallgates, Hexham.

YORKSHIRE—EAST RIDING
County Representative: A. Bell (G2XA), 22 Orchard Road, Anlaby Park, Hull.
Town Representatives:
Scarborough.—P. B. Briscombe (G8KU), 31 St. John's Avenue.
York.—G. F. Nottingham (G3DTA), off 51 Carr Lane, Acomb.

YORKSHIRE—NORTH RIDING
County Representative: Gerald A. Kenyon (G3YK), 32 Emerson Avenue, Middlesbrough.
Town Representative:
Middlesbrough.—J. H. Wood (G5YP), Flat No. 3, "Woodleigh," 9 Park Road North.

YORKSHIRE—WEST RIDING
County Representative : J. R. Petty (G4JW), 344 Carter Knowle Road, Sheffield, 11.
Town Representatives:
Bradford.—A. W. Walmsley (G3ADQ), 6 Hilton Road, Legrams Lane.
Pontefract.—W. Farrar (G3ESP), Stanton, Hemsworth Road, Ackworth.
Sheffield.—R. M. Strickland (G8KB), 733 Worrall Road, Worrall, Sheffield.

REGION 3 (WEST MIDLANDS)

Regional Representative: J. N. Walker (G5JU), 333 Rednal Road, Northfield, Birmingham, 31.

HEREFORDSHIRE
County Representative: M. Conu (B.R.S. 15036), 5 Orchard Gardens, Putson, Hereford.
Town Representative:
Hereford.—P. B. Buchan (B.R.S.18819), 123 Hinton Road.

SHROPSHIRE
County Representative: E. R. Westlake (G6KR), Ardlui, Wenlock Road, Shrewsbury.
Town Representatives: None.

STAFFORDSHIRE
County Representative: R. Bowers (G3CXD), 9 Kingsway East, Newcastle under Lyme.
Town Representatives: None.

WARWICKSHIRE
County Representative: R. Palmer (G5PP), 22 Sherlock Road, Coventry.
Town Representatives:
Birmingham South.—D. Howell (G2DOF), 222 Shenley Fields Road, Selly Oak.
Coventry.—J. R. Tuck (G6TD), 121 Grayswood Avenue.
Kenilworth, Leamington & Warwick.—R. Webb (G6XY), 233 Warwick Road, Kenilworth.
Rugby.—R. T. O'Neill (G4KK), 41 Catesby Road.

WORCESTERSHIRE
County Representative: J. Timbrell, B.Sc. (G6OI), Englefield House, Kinver, Nr. Stourbridge.
Town Representatives:
Malvern.—F. E. Wingfield (G2AO), St. Margaret's, Imperial Road.
Stourbridge.—W. A. Higgins (G8GF), 28 Kingsley Road, Kingswinford, Nr. Brierley Hill.
Worcester.—J. Morris-Casey (G8JC), 4 Kennels Road, Station Road, Fernhill Heath.

REGION 4 (EAST MIDLANDS)

Regional Representative: Dr. E. S. G. K. Vance, M.B. (G8SA), "Sycamores," Huthwaite, Nr. Mansfield, Notts.

DERBYSHIRE
County Representative: R. Bonner Williamson (G5RW), 18 Burns Street, Ilkestone.
Town Representative:
Derby.—F. C. Ward (G2CVV), 5 Uplands Avenue, Littleover.

LEICESTERSHIRE & RUTLAND
County Representative: V. H. Thomas (G2CUR), 3 West Avenue, Wigston, Leics.
Town Representatives:
Leicester.—A. L. Milnthorpe (G2FMO), 3 Winster Drive, Thurmaston.
Loughborough.—G. Mason (G3CKF), 8 Herrick Road.
Melton Mowbray.—S. Clark (G8CZ), 125 Thorpe Road.

LINCOLNSHIRE
County Representative: C. B. Raithby (G8GI), The School House, Martin, Lincoln.
Town Representatives:
Boston.—B. J. Killick (G3GPQ), 75 Willoughby Road.
Grimsby & Cleethorpes.—F. R. Petersen (G3ELZ), 58 Peaksfield Avenue, Grimsby.

NORTHAMPTONSHIRE
County Representative: Vacant.
Town Representatives:
Northampton.—V. R. Hartopp (B.R.S.15304), 22 Purser Road.
Peterborough.—H. Bone (G3EHQ), 104 Montague Road.

NOTTINGHAMSHIRE
County Representative: A. Goode (G2DTQ), 128 New Victoria Street, Mansfield.
Town Representatives:
Mansfield.—F. N. F. Bewley (G8HX), 116 Westfield Lane.
Retford.—D. Smith (B.R.S.16757), 13 Rockley, Nr. Retford.
Worksop.—E. R. Martin (G6MN), "Castlemount."

REGION 5 (EASTERN)

Regional Representative: R. F. G. Thurlow (G3WW), North House, Wimblington, Nr. March, Cambs.

CAMBRIDGESHIRE
County Representative: F. W. Crabtree (G3BK), 28 Regent Avenue March.
Town Representatives: None.

ESSEX (outside Region 7)
County Representative: Vacancy.
Town Representatives:
Chelmsford.—C. Fenton (G3ABB), 40 Fourth Avenue.
Southend on Sea.—P. F. Clarke (G3CQL), 29 Station Road, Leigh on Sea.

HERTFORDSHIRE (outside Region 7)
County Representative: Vacancy.
Town Representative:
Baldock, Hitchin, Letchworth.—N. F. Wilsher (G3CEU), 56 Chilvers Bank, Baldock.

NORFOLK
County Representative: D. J. Buddery (B.R.S. 2999), 57 Southtown Road, Great Yarmouth.
Town Representatives:
Great Yarmouth.—P. Harrison (G3CFK), 63 Southtown Road.
Norwich.—F. W. Fisher (G3VM), Keppel, Dereham Road, New Costessy.

SUFFOLK
County Representative: E. J. R. Cowles (G2AJU), Post Office Farm, Stutton, Nr. Ipswich.
Town Representative:
Ipswich.—A. E. Cullington (G3HEZ), 1 Spring Road.

REGION 6 (SOUTH CENTRAL)

Regional Representative: H. G. Hunt (G3ECV), 9 Salerno Road, Southampton, Hants.

BERKSHIRE
County Representative: F. Hill (G2FZI), Cheriton, St. Mary's Road, Mortimer Common.
Town Representatives:
Newbury.—A. W. Grimsdale (G3CJU), 164 London Road.
Reading.—L. A. Hensford (G2BHS), 30 Boston Avenue.

BUCKINGHAMSHIRE
County Representative: Vacancy.
Town Representatives:
Bletchley.—L. Wilfred Limb (G2DTD), 107 Newton Road, Old Bletchley.
High Wycombe.—J. Salter (G3DQC), 6 Peterborough Avenue.

GLOUCESTERSHIRE (Excluding Bristol)
County Representative: A. Barber (G5WA), Nanpanton, Windmill Road, Minchinhampton, Stroud.
Town Representatives:
Cheltenham.—John J. Yeend (G3GGD), 30 St. Luke's Road.
Gloucester.—E. A. Perkins (G3MA), 40 Calton Road.
Stroud.—B. L. Horton (G3CBH), Prescott, Haven Avenue, Bridgend, Stonehouse.

HAMPSHIRE
County Representative: R. Bassett (B.R.S. 16075), 42 Norham Avenue, Southampton.
Town Representatives:
Christchurch.—J. Singleton (B.R.S.9196), 51 Walcott Avenue.
Petersfield.—R. T. Dealey (G6DT), Woodville, Drillhall Road, Horndean.
Portsmouth.—J. S. K. Stephens (G8WC), 65 Ebery Grove, Copnor.
Southampton.—F. A. L. Russell (G3BHS), 11 Chestnut Avenue, Eastleigh.

OXFORDSHIRE
County Representative: F. A. Jefferies (G8PX), 1 Lovelace Road, Oxford.
Town Representative:
Oxford.—D. Collins (B.R.S.17378), 5 Ellesmere Road.

WILTSHIRE
County Representative: R. A. Hiscocks (G6LM), 22 Woodstock, Gardens, Melksham.
Town Representatives:
Swindon.—J. G. Rooke (G4AP), 72 Goddard Avenue.
West Wilts.—E. A. Parsons (G2PS), 12 Station Road, Westbury.

REGION 7 (LONDON)

(The London Region includes all areas within a radius of 25 miles from Charing Cross, and the whole of Surrey)

Regional Representative: W. H. Matthews (G2CD), 7 Beddington Road, Seven Kings, Essex.

LONDON: NORTH
District Representative: D. C. Jardine (G5DJ), 77 King James Avenue, Cuffley, Herts.
Town Representatives:
Barnet, Borehamwood & N.20.—R. Walker (G6QI), 7 Potters Lane, New Barnet, Herts.
Enfield & N.9, 15, 17 & 18.—H. McFarlane (G8SK), 15 Rotherfield Road, Enfield, Middx.
Finsbury Park & N.1, 4, 5, 7, 16 & 19.—R. C. Harris (G2BAB), 9 Queen's Drive, N.4.
Hoddesdon.—H. A. W. Jones (G4HJ), 99 Stanstead Road.
Southgate & N.8, 11, 13, 14, 21 & 22.—S. Feldman (G3GBN), 10 Oak Way, N.14.
Welwyn Garden City.—Jack Hum (G5UM), Wyldes, Bulls Green, Nr. Knebworth.

LONDON: SOUTH
District Representative: C. E. Newton (G2FKZ), 105 Underhill Road, S.E.22.
Town Representatives:
Coulsdon.—L. C. B. Blanchard (B.R.S.3003), 122 St. Andrew's Road, Coulsdon, Surrey.
Croydon.—R. L. Glaisher (G6LX), 279 Addiscombe Road.
Dulwich & New Cross.—S. H. Ledbrooke (G3FDV), 36 Lowther Hill, Forest Hill, S.E.23.
Norwood.—W. D. Gilmour (G2VB), 35 Grangecliffe Gardens, S.E.25.
Sutton & Cheam.—R. I. Clews (G3GDK), 1 Hurstcourt Road, Sutton.

LONDON: SOUTH-EAST
District Representative: A. V. Dyer (G6VV), 96 Bladindon Drive, Bexley, Kent.
Town Representatives:
Bexley, Bexleyheath, Welling & Crayford.—D. W. Wooderson (G3HKX), 39 Woolwich Road, Bexleyheath.
Bromley & Beckenham.—M. J. Frost (G3GNL), 15 Northbourne, Hayes.
Cray Valley.—P. Woodhouse (G2BQY), 41 Orchard Rise East, Sidcup.
Erith, Belvedere & Dartford.—E. C. Hasted (G3BHF), 22 Vickers Road, Erith.
Gravesend.—P. F. Jobson (G3HLF), 13 Brandon Street,

LONDON: SOUTH-WEST
District Representative: F. G. Lambeth (G2AIW), 21 Bridge Way, Whitton, Twickenham, Middlesex.
Town Representatives:
Barnes, Putney & Richmond.—N. G. Anslow (G4GD), 35 Gilpin Avenue, East Sheen, S.W.14.
East Molesey.—G. F. Barrett (G8IP), 23 Warfield Road, Hampton, Middx.
Guildford & Woking.—G. K. Allen (G3HST), 18 Selsdon Road, New Haw, Weybridge.
Kingston & Surbiton.—V. L. Mayhead (G2ACA), 2 Springfield Road, Kingston on Thames.
Reigate & Redhill.—L. Knight (G5LK), 6 Madeira Walk, Reigate.

LONDON: EAST
District Representative: J. Hunter (G6HU), 63 Aintree Crescent, Barkingside, Essex.
Town Representatives:
Chingford.—A. V. Greenwood (G3DCQ), 8A Sunnydene Avenue, Highams Park, E.4.
Harlow.—B. E. Rogers (G8LC), 20 Priory Avenue.
East Ham.—W. H. Hayes (G3CJQ), 129 Altmore Avenue, E.6.
Ilford.—F. F. Ruth (G2BRH), 579 High Road.
Grays.—C. Munday (B.R.S.15584), 68 Chestnut Avenue.
Romford.—W. F. Jeffery (G3FKJ), 94 Gubbins Lane, Harold Wood.

LONDON: WEST
District Representative: Vacancy.
Town Representatives:
Ealing.—R. E. G. Caws (G3BRL), 34 Greystoke Lodge, Hanger Lane, W.5.
Hayes (Middx.).—V. E. W. Whitaker (G3HRG), 6 Warley Avenue.
Hendon, Mill Hill & Edgware.—P. A. Thorogood (G4KD), 1 Gibbs Green, Edgware.
Kensington & Shepherds Bush.—W. G. H. Robinson (G3EZM), 38 Royal Crescent, W.11.
Slough.—R. Rivers-Young (G3BTP), 16 Elmhurst Road, Langley, Bucks.
Uxbridge.—F. J. Rutter (G2FMF), 237 Windsor Avenue, Hillingdon, Middx.

REGION 8 (SOUTH EASTERN)

Regional Representative: R. J. Donald (G3DJD), 2 Canfield Road, Brighton, 7, Sussex.

KENT (outside Region 7)
County Representative: W. E. Nutton (G6NU), 42 Richmond Road, Gillingham.
Town Representative:
Tonbridge & Tunbridge Wells.—F. Barnard (G4FB), 34 Springwell Road, Tonbridge.

SUSSEX
County Represntative: G. W. Morton (B.R.S. 10769), 42 Southfarm Road, Worthing.
Town Representatives:
Brighton.—R. J. Harvie (G2DRP), 66 Larkfield Way, Withdean.
Eastbourne.—W. A. Allwright (G2AON), 333 Seaside.
Hastings.—G. W. Spray (G3FXA), 255 London Road, Bexhill on Sea.

REGION 9 (SOUTH WESTERN)

Regional Representative: H. A. Bartlett (G5QA), Lendorie, Birchy Barton Hill, Exeter, Devon.

BRISTOL
County Representative: R. T. Poeton (G3CTN), 37 West Broadway, Henleaze.

CORNWALL
County Representative: D. J. Beattie (G2WW), Suffolk House, Lidden, Penzance.
Town Representatives:
North Cornwall.—J. E. Bowden (G2AYQ), Albany House, Goonown, St. Agnes.
Falmouth.—A. L. Rogers (G2FQD), 6 Woodhouse Terrace.
West Cornwall.—R. V. Allbright (G2JL), 12 North Parade, Penzance.

DEVONSHIRE
County Representative: E. G. Wheatcroft (G3HMY), 27 Lower Wear Road, Countess Wear, Exeter.
Town Representatives:
Exeter.—T. W. A. Smith (G3EFY), 98 Ladysmith Road.
North Devon.—W. Mills (G2FHW), Prospect House, Pitt, Appledore, Nr. Bideford.

DORSET
County Representative: A. A. Barrett (G5UF), Moigne Court, Owermoigne, Dorchester.
Town Representatives: None.

SOMERSET
County Representative: H. Andrews (G5DV), 175 Moorlands Avenue, Weston-super-Mare.
Town Representative:
Bath.—P. J. Tolman (G3EKS), 14 Kensington.

REGION 10 (SOUTH WALES)

Regional Representative : J. Banner (GW3ZV), Cartref, Neath Road, Rhigos, Nr. Aberdare, Glam.

BRECKNOCKSHIRE
County Representative: Vacancy.

CARMARTHENSHIRE, PEMBROKESHIRE & CARDIGANSHIRE
County Representative: Vacancy.

GLAMORGANSHIRE
County Representative: E. A. Hayward (GW2UH), 6 Kenfig Road, Gabalfa, Cardiff.
Town Representative:
Neath, Port Talbot.—D. E. Davies (GW3FSP), Sunnyridge, Castle Street, Skewen.

MONMOUTHSHIRE
County Representative: G. R. Silverthorne (GW2BG), Preswylea, Springfield Road, Abergavenny.
Town Representatives: None.

REGION 11 (NORTH WALES)

Regional Representative: F. G. Southworth (GW2CCU), Samlesbury, Bargillt Road, Holywell, Flints.

ANGLESEY & CAERNARVONSHIRE
County Representative: G. N. Roberts (GW3ENY), Montclare Hotel, North Parade, Llandudno, Caerns.
Town Representative:
Llandudno.—J. P O'Brien (GW2BCH), Fron Heulog, Bryn Derw Road, Nr. Llandudno Junction.

DENBIGHSHIRE
County Representative: O. Postle (GW3EFZ), Glan Aber, Bont, Trevor, Nr. Wrexham.
Town Representative:
Wrexham.—G. Didcote (GW3BKP), 8 High Street, Coedpoeth.

FLINTSHIRE
County Representative : E. G. Foulkes (GW5FU), Katheric, Kinard Drive, Rhyl.

REGION 12 (SCOTLAND—EASTERN)

Regional Representative: J. Douglas (GM2CAS), 43 Abbotswell Drive, Bridge of Dee, Aberdeen.

ABERDEENSHIRE, BANFFSHIRE & KINCARDINESHIRE
County Representative : B. McK. Davidson (GM3ALZ), 42 Smithfield Drive, Aberdeen.
Town Representatives:
Aberdeen.—L. Hardie (GM2FHH), 91 Inchbrae Drive, Garthdee.
Banff.—A. Johnston (GM3GCH), 16 Whinhill Terrace.

ANGUS & PERTHSHIRE
County Representative: Vacancy.
Town Representatives:
Angus—Dundee.—A. Miller (B.R.S.6731), 71 Byron Crescent.
Forfar.—W. Robertson (GM6RI), The Schoolhouse, Tannadice.

NORTHERN COUNTIES (Morayshire, Nairnshire, Inverness-shire, Ross-shire, Sutherland, Caithness, Orkney and Shetland)
County Representative: R. B. S. Braid (GM3GME), Vaila, Sheriffbrae, Forres, Morayshire.
Town Representatives: None.

REGION 13 (SCOTLAND—SOUTH EASTERN)

Regional Representative : W. Baker (G3AFL), 4 Devon Terrace, Berwick-on-Tweed.

BERWICK, PEEBLES, ROXBURGH & SELKIRK
County Representative: Vacancy.
Town Representative:
Berwick on Tweed.—R. Lyall (G8SG), Ewart, Wooler, Northumberland.

FIFESHIRE & KINROSS-SHIRE
County Representative: C. A. M. Clackson (GM8KR), 24 Blake Street, Brucefield, Dunfermline, Fifeshire.
Town Representative:
Dunfermline.—J. F. Shepherd (GM3EGW), 12 Park Place.

EAST, MID & WEST LOTHIANS
County Representative: Vacancy.
Town Representative:
Edinburgh.—A. Dewar (B.R.S.18777), 37 Calder Circle, Edinburgh 11.

REGION 14 (SCOTLAND—WESTERN)

Regional Representative: D. R. Macadie (GM6MD), 154 Kingsacre Road, Glasgow S. 4.

ARGYLL & DUMBARTONSHIRE
County Representative: Vacancy.
Town Representatives: None.

AYRSHIRE, BUTE, DUMFRIES, KIRKCUDBRIGHT & WIGTOWNSHIRE
County Representative: T. Elliott (B.R.S. 10053), 98 Portland Street, Troon, Ayrshire.
Town Representatives: None.

CLACKMANNAN & STIRLINGSHIRE
County Representative: B. B. Fulton (GM4JQ), Kerton, Burnbrae Road, Falkirk, Stirlingshire.
Town Representative:
Falkirk.—F. C. Robertson (GM3GIV), Mount Carron.

LANARKSHIRE, RENFREWSHIRE & COUNTY OF GLASGOW
County Representative: A. H. Mason (GM6MS), 390 King's Park Avenue, Rutherglen.
Town Representative:
City of Glasgow & Postal Districts.—W. R. Eadie (GM4JO), 32 Mitre Road, Glasgow W.4.

REGION 15 (N. IRELAND)

Regional Representative: S. H. Foster (GI3GAL), 31 Belmont Park, Belfast

ANTRIM, DOWN, ARMAGH, FERMANAGH, LONDONDERRY & TYRONE
County Representatives: Vacancies.
Town Representative.
Belfast.—R. Barr (GI5UR), 4 Dunkeld Gardens.

CHANNEL ISLANDS

Group Representative : F. E. Atkins (GC3ZU), 50 Victoria Road, St. Peter Port, Guernsey.
Town Representative :
Guernsey.—W. Breton (GC3HFE), Palmerston, St. Johns.

Representation

Vacancies

Mr. J. H. Barrance, G3BUJ, has resigned as C.R. for Essex (outside Region 7) and Mr. S. F. Sharpe, G3CKX, as D.R. for West London.

Nominations for their successors should be made in the prescribed form and sent to reach the General Secretary by March 15, 1952.

HELP US . . .

- *When writing to Headquarters do not include* BULLETIN *items, queries, changes of address and publication orders, etc., on the same sheet of paper. Only one envelope is necessary, but a separate sheet for each subject please.*
- *Always print, or write clearly, your full name and address. Christian names, call-signs and illegible signatures cause much unnecessary checking.*
- *Notify Headquarters of impending changes of address several weeks before you move. Alterations to subscription reminders, etc., are not sufficient unless definite instructions are given. Include your B.R.S. number and/or call sign, your present address and, if possible, the date your subscription falls due. Remember that* BULLETIN *wrappers are prepared up to a fortnight before the publication date.*
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- *Please send all QSL cards to Mr. A. O. Milne, G2MI, 29 Kechill Gardens, Hayes, Bromley, Kent, and not to Headquarters.*
- *The Society is seldom able to supply information on ex-Government equipment except in the form of* BULLETIN *articles.*

. . . TO HELP YOU !

HEADQUARTERS CALLING

December Council Meeting

Résumé of the Minutes of the Proceedings at the Meeting of the Council of the Incorporated Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, December 10, 1951, at 6 p.m.

Present.—Messrs. W. H. Allen, A. P. G. Amos, L. Cooper, W. N. Craig, V. M. Desmond, C. H. L. Edwards, T. L. Herdman, A. O. Milne, P. A. Thorogood, P. W. Winsford and John Clarricoats (General Secretary).

Apologies for absence were submitted from the President (Mr. W. A. Scarr) and Messrs. Charman and Watson.

* * *

Chairman.

Resolved that Mr. Cooper be appointed Chairman of the Meeting.

Finance

Resolved to accept and adopt the Cash Account for the month of November, 1951, as prepared by the Honorary Treasurer.

Membership.

Resolved:—

(a) to elect 102 Corporate Members and 19 Associates;
(b) to grant Corporate Membership to 9 Associates who had applied for transfer;
(c) to grant Life Membership to Mr. C. F. Cole, G3GEN, and Mr. J. H. English, G2DZF.

Applications for Affiliation.

Resolved to grant affiliation to the Wrekin Amateur Radio Society and to the QRP Research Group.

Regions 6 & 8.

After consideration had been given to resolutions passed at a Hampshire County Meeting held on September 23, 1951, it was resolved to advise the Region 8 Representative that, as there is no evidence that members resident in Dorset and Wiltshire desire to become part of a new Region, the Council is unable to adopt the proposals set out in the resolutions on that matter passed at the Meeting.

The Secretary was instructed to advise the Southampton T.R., the Hampshire C.R., the R.R.-elect for Region 6 and the Region 6 Representative of the decision of the Council in this matter.

Reading

After consideration had been given to a Report from Mr. R. J. Donald (Region 8 Representative) concerning matters discussed at a meeting held in Reading, it was agreed to advise Mr. Donald that it has not been the policy of the Council to authorise the publication of election addresses, whilst the question of the financial remuneration offered to Service Radio Reservists is a matter outside the scope of the Society.

November Editorial.

The Secretary submitted correspondence from about 100 members and groups of members supporting the action taken by the Council in publishing a rejoinder to the Editorial published in the October issue of "The Short Wave Magazine." Correspondence was also submitted from five members who were opposed to the action taken by the Council.

Resolved to receive the correspondence and to make it available to those Members of the Council who wish to peruse it.

A resolution in support of the action taken by the Council was submitted from the East London District.

Resolved to request the East London D.R. to convey the thanks of the Council to those members who were present when the resolution was passed.

Correspondence between Mr. Forsyth and Mr. Milne was tabled.

Resolved to take no further action in this matter at the present time.

Memorandum on Television Interference.

The Council gave consideration to a report of a meeting held at Headquarters on December 7, 1951, between representatives of the Technical Committee and three of the members who were responsible for a Memorandum dealing with certain matters relating to Television Interference. (See Résumé of the Minutes of the October, 1951, Council Meeting.)

Resolved to refer the Report to the Technical Committee in its technical aspects and to the G.P.O. Liaison Committee in its legal and political aspects.

The Council also gave consideration to a letter from Mr. Anslow (T.R. for Barnes and Richmond) and other members dealing with matters relating to television interference.

It was agreed to send a detailed letter to Mr. Anslow together with a copy of the Report of the meeting referred to above.

Amateur Radio Exhibition.

The Council considered a Report from the Secretary dealing with the 5th Annual R.S.G.B. Amateur Radio Exhibition. This showed that nearly 3,000 persons paid for admission and that a small profit would accrue after all expenses had been met.

Resolved:—

(a) to receive the Report and to place on record the thanks of the Society to all those who had contributed in any way to the success of the Exhibition;
(b) as a token of appreciation, to offer to pay the subscriptions, when due, of 16 members who had rendered special service to the Society at the Exhibition;
(c) to suggest to the 1952 Council that, in view of the success of the Amateur Constructors' Section at the 1951 Exhibition, a similar feature be arranged in connection with the 1952 Exhibition, if held.

Mr. Winsford and those associated with him in the organisation of the Amateur Constructors' Section, received the warm congratulations of their colleagues on a highly successful display of home-constructed equipment.

Circulars.

Consideration was given to correspondence from a T.R. concerning his claim against the Society for the cost of circularising the local membership prior to monthly meetings.

Resolved:—

(a) that not more often than twice in any calendar year a Town Representative may, at the Society's expense, issue a circular to local members on matters of local interest;
(b) that in such cases the T.R. will be permitted to make an "en bloc" entry on his Expenses Sheet for circulars sent at the cheap postal rate;
(c) that a copy of each such circular shall be appended to the Expenses Sheet if reimbursement is claimed.

Technical Committee.

Resolved to receive as a Report the Minutes of a Meeting of the Committee held on November 8, 1951.

The Minutes dealt with a wide variety of matters including Single Side-Band Transmissions, Amateur Television, Television Interference, Bevan Swift Premiums, Headquarters' Station, Amateur Wireless Stations on Ships, the R.S.G.B. BULLETIN and the Radio Amateurs' Examination.

Contests Committee.

Resolved to receive the Report of the Committee covering meetings held on September 25, October 18 and November 22, 1951.

Resolved:—

(a) to adopt the recommendations contained therein relating to the 1951 B.E.R.U. Contest and Disqualifications;
(b) not to adopt a recommendation relating to printed log sheets for the 1952 B.E.R.U. Contest.

Retiring Members of Council.

Messrs. Craig and Desmond referred to the pleasure they had derived from their service on the Council and spoke of the great assistance they had always received from the General Secretary and his staff.

The Meeting terminated at 10.5 p.m.

The Aberdeen Amateur Radio Society recently held their annual dinner and social at the George Hotel. In the front row, "Sandy" Anderson (GM3BCL), John Douglas (GM2CAS) (President), and B. McK. Davidson (GM3ALZ) (Vice-President).

REGIONAL AND CLUB NEWS

Admiralty Electronics Society

Membership of the Society is open to civilian and Service members of the Admiralty, and to members of other Government Departments, at the discretion of the Committee. Full workshop facilities are available, including test equipment, radio and television aerials, and transmitting facilities to licensed members. The Society's call sign is G3BPU. Hon. Secretary: W. J. Green, Room 110a, "A" Block, Admiralty Offices, Foxhill, Bath.

Baldock & District Radio Club

A large number of members and their wives attended the Club's Annual Dinner held last month.

Barnet Amateur Radio Society

An illustrated lecture on "Television Interference" will be given by the Engineering Staff of the G.P.O. at Bunny's Restaurant on March 8 (See *Forthcoming Events*). Light refreshments will be provided, and new members are welcomed.

Barnsley & District Amateur Radio Club

More than 100 members and guests attended the Annual Dinner held last month. The President (Mr. G. Wigglesworth) paid a warm tribute to the services of Mr. J. J. Rose, the late Hon. Secretary, who is leaving the district. The ladies present received a gift. Messrs. J. A. Ward (G4JJ) and Williams organised the event.

Bath

All local members are cordially invited to attend a meeting at the Y.M.C.A. on February 18 (7 p.m.), when a lecture and demonstration on T.V.I. will be given by a representative of the G.P.O.

Brighton & District Radio Club

At the recent A.G.M. of the Club, the following were elected to office: Chairman, E. Bannister; Hon. Secretary, R. T. Parsons (re-elected); Hon. Treasurer, W. Pitfield. Meetings are held on Tuesday evenings.

Bristol

At the January meeting Messrs. W. P. Lewis, B.R.S.16886, and D. V. Newport, G3CHW, spoke on "V.H.F. Communications Equipment" and "'S' Meter Calibration" respectively. At the same meeting, a small committee was set up to organise N.F.D in Bristol.

The Bristol Branch of I.S.W.L. has been challenged to a skittles match on February 25th, at Eastfield Inn, Henlease Road.

Channel Islands

In the January issue it was recorded, in the report of the QRP Research Group, that the Kaleveld Cup, presented to Mr. E. Banks, GC2CNC at the recent R.S.G.B. Amateur Radio Exhibition, was the first Amateur Radio trophy to be awarded to a Channel Islands amateur.

Mr. Banks wishes it to be made known that, prior to the 1939-45 war, the late Martin C. Bourke, 2AOU was awarded the B.E.R.U. Receiving Trophy. The Kaleveld Cup is, however, the first transmitting award to be won by a Channel Islands amateur.

Chelmsford

Through the courtesy of the Marconi Wireless Telegraph Co., Ltd., accommodation is now available for meetings of the local R.S.G.B. group at Marconi College, Arbour Lane, Chelmsford, at 7.30 p.m. on the first Tuesday of each month. All members and prospective members are invited to participate in the interesting programme of lectures and discussions being arranged. The T.R. is C. L. Fenton, G3ABB, 40 Fourth Avenue, Chelmsford.

Cornish Hamfest

A "North meets West" meeting is to be held at the Cove Cafe, The Quay, St. Agnes, Cornwall on Sunday, February 17. The assembly will be at 3 p.m. for tea at 4 p.m., followed by a film show, rag-chew and draw for prizes.

Tickets for this event, which will be on the lines of a miniature hamfest, are available from G2JL (Penzance), G3AET (Falmouth) and G2AYQ (St. Agnes). All members, whether living in the South West or elsewhere, are assured of a warm welcome.

Coventry

A successful "junk sale" was held at the December meeting, many members securing good bargains. At the forthcoming February meeting J. H. Williams is giving a lecture entitled "After Radar—Then What?" Welcome is extended to Mr. Kennesford, VQ5CB, now temporarily resident in Coventry.

Coventry Amateur Radio Society

Future talks include: "Mathematics made Easy" by T. R. Theakston, B.Sc. (February 18); "Frequency Modulation" by W. Grimbaldeston, G6WH (March 3); and "Twenty-five Years of Amateur Radio" by L. W. Gardner, G5GR (March 17). The Annual Dinner will be held at the Opera House on February 29. Hon. Secretary: K. Lines, 142 Shorncliffe Road.

Darwen & Blackburn

Meetings are held at the Y.M.C.A., Limbrick, Blackburn, commencing 7.30 p.m. A junk sale will be held on February 22. On March 14, Chief Inspector Gee (G6OG) will lecture on "Aerials, Synchronising Gear and Police V.H.F." Secretary and A.R.; J. Simpson, 1 Marsh Terrace, Darwen, Lancs.

Derby & District Amateur Radio Society

Among the Officers elected at the A.G.M. in January were: Chairman, C. M. Swift; Hon. Secretary and Treasurer, E. Shimmin (B.R.S. 18015); Hon. Asst. Secretary, F. C. Ward (G2CVV). The Society's Annual Dinner and Social will be held on February 29 at the Irongates Hotel, Derby. Reservations to the Asst. Secretary at 74 Derby Lane.

Eastbourne

After several months without organised meetings, the local group has been reformed, and W. A. Allwright (G2AON) has been nominated for the office of T.R. Meetings are held on alternate Thursdays at the Swallow Cafe, 333 Seaside.

East London District

At the January meeting held at Ilford Town Hall, James W. Mathews, G6LL, lectured on and demonstrated examples of measuring equipment built by himself. Later he was kept busy answering questions.

Arrangements are being made to hold a District dinner or other function in Ilford. Also under consideration is the production of a monthly newsletter for which an organiser and assistants are required (see separate announcement).

The next meeting will be held on February 17, when Mr. G. T. Peck (last year's D. F. Contest winner) will lecture on D.F. Equipment for Contests.

Eccles & District Radio Society

At the recent A.G.M., G. Gray, of Woodlea, 2 Egerton Road, Monton Green, Eccles, was elected Secretary for 1952. The previous Secretary, Mr. E. Rayson, is leaving for Australia.

Edinburgh Amateur Radio Club

The Club continues to meet on Wednesdays at 7.30 p.m. in Unity House, Hillside Crescent, Edinburgh. The following lectures have been arranged: "Television" (February 20); "Clamp Modulation" (March 12); "Visual Receiver Alignment" (March 19). Hon. Secretary: C. L. Patrick, 19 Montgomery Street, Edinburgh.

Hastings

The newly-formed group plans to attack the T.V.I. problem. The very low signal strength in the area together with the

QRP Research Society Presentation

Ernest Banks (GC2CNC) (left) receiving the Kaleveld Cup from the donor at a ceremony held during the R.S.G.B. Amateur Radio Exhibition in December. Arthur Milne (G2MI), President of the QRP Research Society, is on the right.

popularity of certain television receivers prone to amateur-band interference makes the problem serious. Several stations are equipped with T.V.I.-proof transmitters, and others are in the course of construction. A scheme on the lines of the "Dallas Plan" is being organised and members have been assured by the R.R. (G3DJD) that provided their equipment is beyond reproach, full support will be given. Meetings are held fortnightly at Saxon's Cafe on the sea-front.

Kingston & District Amateur Radio Society

Radio theory classes are held on alternate Fridays, and are proving popular. On February 27, John Clarricoats, G6CL (General Secretary R.S.G.B.) will lecture on "The History of Amateur Radio". Amateurs from neighbouring societies will be specially welcome on this occasion. Meetings are held at Penrhyn House, 5 Penrhyn Road, Kingston, commencing 7.45 p.m. Hon Secretary: R. S. Babbs, 28 Grove Lane, Kingston (Tel. KIN 2801).

Leicester Radio Society

At the Annual Dinner held last month Mrs. Ridgeway (wife of the President) presented the Ridgeway Trophy to K. Chapman (G3AFZ), winner of a recent transmitting contest. A new trophy (presented to the Society by Capt. H. V. Thomas, G2CUR, and to be known as the "Thomas Trophy") will be awarded to the B.R.S. member who performs an outstanding achievement in future contests. G2CUR was speaker at a recent meeting. Hon. Secretary: A. L. Milnthorpe, 3 Winster Drive, Thurmaston, nr. Leicester.

Loughborough

Meetings of the town group are now held on the third Wednesday of each month at 7.30 p.m. in the Great Central Hotel, Central Road, Loughborough. Enquiries should be addressed to the T.R., G. G. R. Mason, 8 Herrick Road.

Merseyside Radio Society

At the January meeting, Mrs. Eileen Heightman (wife of G6DH) talked on early 2 and 6 metre contacts from that station, and displayed QSL cards confirming some of the first transatlantic contacts on 6 m. Meetings are held at 3 p.m. in Room 7, Mansion House, Queen's Drive, West Derby, Liverpool, on alternate Saturdays as from February 2. Future programme includes a Mullard Film Strip on "Television" (March 1), and a talk on "Audio Amplifiers" by C. G. Rich (March 15). Visitors are welcome at all meetings. Hon. Secretary: A. Bell, 20 Craigside Avenue, Liverpool, 12.

Newbury and District Amateur Radio Society and R.S.G.B. Group

The recent "Home-Built Equipment Contest" was won by A. H. G. Smith, who constructed a miniature superhet receiver designed to be carried on the handlebars of a bicycle. Last month members visited a rural area-type automatic telephone exchange. Future plans include a film show on February 29, and a "Hamfest" on March 9. Hon. Secretary and A.R.: A. W. Grimsdale, 164 London Road, Newbury.

Pontefract Area Transmitting Group

The Group plan to hold a dinner for members and ladies next March. R. Shadlock, G3US, has been elected Chairman of the Group.

Sheffield Amateur Radio Club

At the Annual Dinner held in January, prizes were presented to the leaders in the "Hallam Trophy" Contest. The trophy was won by P. Jones (G3DRE); K. Ward (G3CGF) and P. Wilson (G3HTE) were runners-up. Prizes were donated by a number of well-known radio firms. The following Officers were elected at the recent A.G.M.: President, R. Strickland (G8KB); Hon. Secretary, E. Walker (G2LT); Hon. Treasurer, A. Hallam.

Slade Radio Society

At a recent meeting, the Secretary announced that Mr. John Clarricoats (General Secretary R.S.G.B.) and Mr. H. F. Smith (Editor *Wireless World*), had accepted invitations to become Vice-Presidents of the Society. Future lectures include: "Nuclear Physics" (February 29), and "Home-Built Tape Recorders" (March 14). Meetings are held on alternate Fridays at the Parochial Hall, Broomfield Road, Erdington, Birmingham.

Southend & District Radio Society

"Oscilloscopes" and "Radar" were subjects for recent talks by W. A. Smith. On February 22, S. Smith (G3BSI) is to discuss "Beginners' Transmitters." The Society has accepted an invitation to take part in a Boy Scouts' Association Jamboree during the summer, when it is hoped to set up a transmitter at Belchamps. Hon. Secretary: S. E. Stevenson, 239 Westbourne Grove, Westcliff-on-Sea, Essex.

South Birmingham

A useful sum was realised at the sale held during a recent meeting, when the new T.R.—D. Howell (G2DOF)—was in the chair. The proceeds are to be used to cover N.F.D. and social expenses.

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South Manchester Radio Club

The Club recently acquired more suitable premises situated at Ladybarn House, Mauldeth Road, Manchester 14, with a separate room for station operation (call G3FVA), and greater facilities for all activities. Meetings are held on alternate Friday evenings (key date February 15). Hon. Secretary: F. H. Hudson, 21 Ashbourne Road, Stretford.

Sutton & Cheam

Arrangements are now being made for N.F.D. Interested members should contact R. Clews, 1 Hurstcourt Road, Sutton, Surrey. Group meetings are temporarily postponed.

Torbay Amateur Radio Society

At a recent meeting F. J. Wadman (G2GK) lectured on "Aerial Couplers." The speaker on March 17 will be R. Hope (G3AUS), subject "Propagation." Efforts are being made to hold a dinner before Easter. The Society meets at 7.30 p.m. in the Y.M.C.A., Castle Road, Torquay, on the third Saturday each month. Hon. Secretary: W. A. Launder, 15 Cambridge Road, St. Marychurch, Torquay.

Wirral Amateur Radio Society

"Bits and Pieces" (Workshop Practice) by L. Flint, and "Japanese Morse" by F. N. Kendrick (G3CSG) were the titles of recent lectures. Future activities include a symposium on aerials and matching systems, and the Annual Constructional Contest.

Worthing & District Amateur Radio Club

The Mullard Film Strip on "Cathode Ray Tube and Amplifier Valve Construction" was shown at the January meeting. Details of future meetings can be obtained from F. H. Betterly, Anweir Avenue, Lancing, Sussex.

Members of the World Friendship Society of Radio Amateurs (Junior Section) at a recent meeting. In the centre is Miss Barbara Jordan holding the bock token presented to her as a mark of the Society's esteem for passing the C.P.O. Morse test at the age of 14. (See "It's Topical," July, 1951, issue.) Others pictured in the group are: P. Walsh, (15 years), second operator at G2AJU, Miss S. Raynott, R. J. Dixon and Miss M. Uttley (aspiring amateurs); and L. J. Smith (17 years) (G3HJF).

LETTERS TO THE EDITOR

Radiation from 0-V-1 Receivers

DEAR SIR,—In the Low Power Contest report ("Vive QRP"—November, 1951, issue) the writer of that report, when referring to the use of 0-V-1 receivers stated: "straight receivers without a r.f. stage can—and do—radiate considerable interference when used for c.w. reception; indeed, most of them generate considerably more r.f. power than, for instance, the transmitter at G6ZN" (0.027-0.072 watt).

I have used an 0-V-1 receiver in the past two QRP contests, and the measured input to the oscillating detector is 0.029 watt—a mere 0.002 watt greater than the *minimum* used by G6ZN. But, whereas the r.f. generated by '6ZN's Hartley oscillator is no doubt fed directly to the aerial, the r.f. from the 0-V-1 detector is largely blocked by two 2 $\mu\mu$F. series condensers, the aerial consisting of only six feet of wire. The reason for using such a small aerial with weak coupling is to obtain adequate selectivity from a single tuned circuit. When the opening words of the contest report are considered —"2,000 reported QSOs in 23 hours"—the need for adequate selectivity is obvious.

In order to check this assertion regarding radiated interference, Mr. S. W. Jones, of Wrexham, in the presence of GW3GWA, made the following comparison between the oscillating 0-V-1 with its six-foot aerial and a Class "D" wavemeter with an 18-inch radiator, using as test equipment the "S" meter of a Type MX National H.R.O. receiver and an Avo wide-range signal generator with accurately calibrated attenuator.

3.5 Mc/s. signal source	Measured R.F. input	
	At distance 30 ft.	At distance 10 ft.
0-V-1 receiver	16 μV.	40 μV.
Class "D" wavemeter	40 μV.	60 μV.

Thus it will be seen that my 0-V-1, as used for c.w. reception, radiates less r.f. than a standard G.P.O.-accepted wavemeter. It seems, therefore, that G3ANQ has taken us to task needlessly. If other wavemeters are comparable with the Class "D" in the amount of radiated signal, then we had all better use them with discretion in future if, in these enlightened days, a simple straight receiver is grudged of its feedback!

Yours faithfully,

O. POSTLE, GW3EFZ.

Trevor, Nr. Wrexham

The Bulletin Takes a Bow

DEAR SIR,—In case I should be amongst the last to recognise the splendid value offered by the BULLETIN in its more recent issues, I am anxious to let you know how much I appreciate improvements—all of them, and especially the variety of subjects now being covered. Unfortunately, the bulk of the contributions inevitably seem to fall upon home-county members. When the new assistant to the General Secretary is appointed perhaps it would be possible for a technical person from London to call round in the Provinces upon members who have material to publish, obtain a view of the experimental set-up, a photograph or two, a circuit and the write-up. The technician would include several calls in one excursion. Many hard-pressed members might, by this means, be able to get their contributions into print whereas, at present, they cannot find sufficient time to launch a fully illustrated article. The initial time devoted to the experimental work all too often means the sacrifice of some urgent domestic task. Although the Society offers a generous reimbursement to the unaided free-lance he may still find, especially in the more isolated parts of the country, that he cannot place his gain before his duties.

The present BULLETIN now offers more than American publications. If more provincial members can be induced to contribute, much original material will come to light, and it will be a sign of the times that we shall no longer have to send away our good dollars for periodicals filled mainly with advertising, policy talks and remotely local news. This enriched BULLETIN makes a striking challenge to any counter-attraction. As one of those living among a scattered membership I would like to know if others have been inspired to the same view. How about it, Provincials?

Yours faithfully,

A. E. LIVESEY, G6LI.

Ludborough, Grimsby.

Nets

DEAR SIR,—The opening paragraph of "The Month on the Air" for December, 1951, contains much with which all will agree, but we should study our licences closely before condemning people for what they or their friends do or say on the air.

The 80 metre band has known many "nets" and without a doubt some are run better than others. My main criticisms are of the technical failures, such as inability to "net" accurately, over-modulation and failure to check channels before transmitting—a slight pause between transmissions is to my mind essential.

I assume there is some connection between the paragraph referred to and the resolution of the Dorset County Meeting regarding "breakfast clubs" (Headquarters Calling). To me there is only one "Breakfast Club" which was founded, if that is the right word, by 4DC, 3CSX, 4HG, 5AK, 2AON, 2DUG and others about three years ago. I, too, have been associated with it for most of its existence and soon learned to my discomfiture the penalty of bad transmissions. This regular "net" or "club" has set a very high standard of operating and technical performance, and it has been a pleasure to be associated with it. I take exception, therefore, to my activities being classed by Dorset people or anyone else with other nets under the general heading of "breakfast clubs" with a small "b."

If some people do not know how to behave, let's not condemn the netting principle which can save a lot of trouble in a multi-way, but rather attack bad behaviour itself.

I beg to remain,

A staunch member,

R. W. CAVILL, G3GN.

Knebworth, Herts.

PS.—Recent issues of the Bull have set an exceptionally high standard and been much appreciated.

Report of the 25th Annual General Meeting Control of the Bulletin

DEAR SIR,—In the very excellent precis which appeared under the above heading in the January, 1952, issue of the BULLETIN, the condensation of some lengthy remarks made by me may cause them to be misconstrued or misquoted. I refer to the sentences which state:

> "... there was no reason why the BULLETIN should not become a paying concern. This, he suggested, could be done either by making it a commercial publication controlled direct by the Council, or by forming a separate publishing organisation."

To those present, it was quite clear that all my suggestions embodied the principle that control must always remain with the R.S.G.B.; that the separate publishing organisation referred to above must be under R.S.G.B. control.

May I therefore trespass upon your valuable space to quote some of my actual remarks, which began;

> "The BULLETIN is a valuable asset, an asset which we have built up over 25 years. Because it's run at a loss, it may appear valueless. But, if it were run to make ends meet, or even make a profit for us, it could be a very valuable asset to R.S.G.B. *Never let it die or pass out of our possession.*"

I then put forward the suggestion that it should be compelled to stand on its merits by having its own budget and account. Continuing, I said, to quote;

> "If there are legal objections to the R.S.G.B. running the BULLETIN in this manner directly, then let it be done through a subsidiary company under the control of R.S.G.B. If necessary, even take in a commercial firm as junior partner, provided we still retain control of our asset."

I trust that this amplification, which covers all foreseeable contingencies, is now quite clear.

Yours faithfully,

BASIL WARDMAN.

London, N.W.3.

South Wales Wireless Training College

Mr. T. Evans, B.R.S.8202, 7 Maesquarre Road, Ammanford, Carms., is anxious to contact students who were at the South Wales Wireless Training College, St. Mary's Street, Cardiff, during the years 1914-15. The Principal at the time was Commander Schofield and the tutor Mr. Wright.

Silent Key

With deep regret we record the death on January 2, 1952, after a long illness, of Mr. L. W. Gard, G8JL of Bucklebury, Reading.

Mr. Gard was licensed in about 1936 and in pre-war days was active on most bands. Since 1946 he had concentrated his activities mostly on 10 metres.

He was a pilot in the R.A.F. during World War I and a Home Guard instructor in the 1939-45 War.

Our sympathies are extended to his family and close friends.

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Ex-Government Surplus. 1 kilohm, 2 kilohms, 5 kilohms, 20 kilohms, 25 kilohms, 50 kilohms, 100 kilohms, 120 kilohms, ALL CARBON TRACK, **1/-** each. 5 ohms, 200 ohms, 20 kilohms, WIRE WOUND, **1/6** each.
Standard Can Condensers. 8 μF. 450 V., **1/11** each. 16 μF. 350 V., **2/9** each. 32 μF. 350 V., **4/-** each. 16 μF. 500 V., **3/9** each. 24 μF. 350 V., **4/9** each. 16 x 16 μF. 450 V., **4/9** each.
Speakers. 3in. 3Ω FOR PERSONAL SETS. **12/6** each, post 6d. Output Transformer to suit 1S4, 3S4, etc., **4/6** each. 5in. 3Ω lightweight, **12/6** each, post 9d. 8in. 3Ω lightweight, **14/6** each, post 1/-. 6½in. 3Ω with dust cover, **13/6** each, post 1/-. 10in. 3Ω robust job, large magnet, **32/6**, post 1/6. 6½in. 3Ω Mains energised 1500Ω field, **17/6** each, post 1/6. 8in. 3Ω Mains energised, 600Ω field, **15/9** each, post 1/6.
Standard 3 Gang. .0005 μF. Ceramic insulation, ¼in. spindle, **7/-** each.
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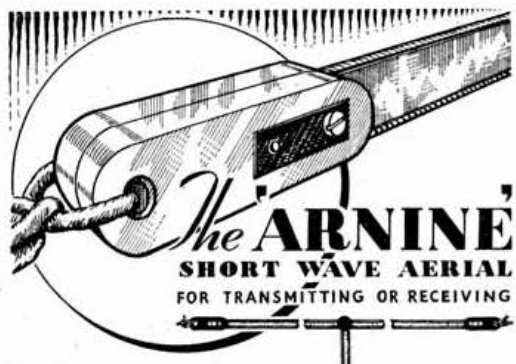

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