JUNE, 1962

RSGB BULLETIN

VOL. 37, No. 12

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

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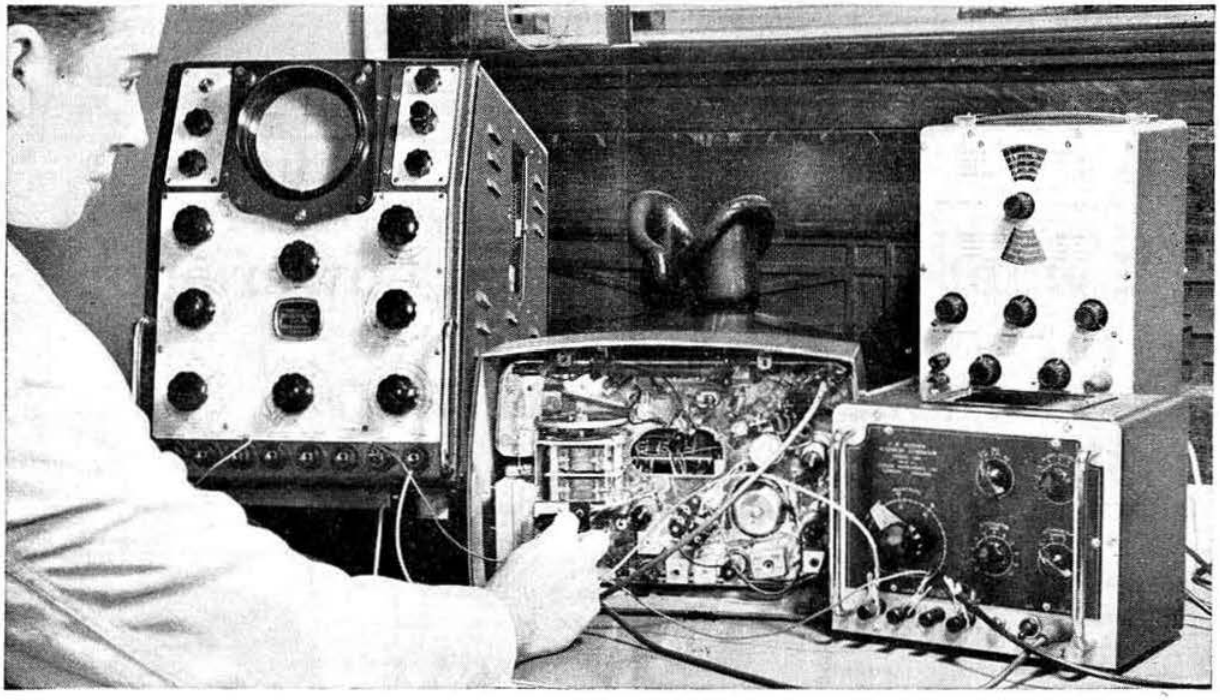

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R.S.G.B. BULLETIN

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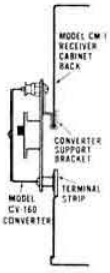

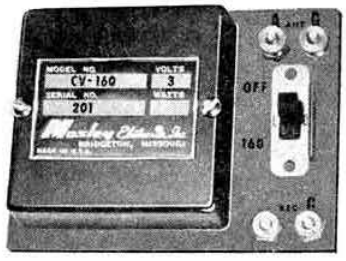

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Current Comment

discusses topics of the day

Operating Awards

BEFORE the last war the number of recognized DX operating awards could be counted on the fingers of two hands. Today it would require the hands of a goodly number of amateurs to count the number of all such awards in existence.

In the early days of Amateur Radio the Worked All Continents Certificate, issued by the A.R.R.L. and later by the I.A.R.U., and the Worked the British Empire Certificate, issued by the R.S.G.B. were the yard-sticks of DX attainment. Gradually, as long distance working became more commonplace, new goals were set and new certificates offered. For example, the annual A.R.R.L. DX Contest provided the spur which led to the introduction of the DX Century Club Certificate, in the same way that the British Empire Radio Union Contest led in due time to the introduction of the British Empire Radio Transmitting Award.

The thrill and excitement of working new countries was great, but the deadly competition of the present generation of DX enthusiasts was still 30 years away. The proceedings were on the whole leisurely and the "collection" of a new country became an event of considerable importance, to be talked about over the air for weeks, or discussed with pride at the next local meeting. In those halcyon, happy, days it took years and years to qualify for the B.E.R.T.A. or the DXCC certificate. Even for a period after the war the elegance of pre-war days existed—but all that has now changed.

Today we learn of stations set up on tiny islands, sometimes only a few miles off the mainland, stations which in a matter of hours have given hundreds of contacts—of sorts—to amateurs all over the world. All for the purpose of adding a "new" country to the list.

Recently one of Her Majesty's Ministers stated in the House of Commons that the United Kingdom Government recognizes about 230 countries; yet we read of amateurs who have worked well over 300 countries. What is the status of some of these places that count as separate countries for various DX operating awards? No one really knows but it seems that so long as there are specks in the ocean and people willing to journey there to establish a station, then each of those specks will count as a separate country.

So far, so good, but it is the practices that are associated with the setting up of some of these stations that arouse the ire of many who remember the basic principles upon which Amateur Radio is founded—principles expounded so well by Paul Segal of the A.R.R.L. and defined as The Amateurs' Code.

There have been consistent reports that the operators of certain DX-expedition stations will not confirm a contact unless they first receive payment for the card. Clearly this is a matter for individual conscience but to many amateurs the idea of demanding payment for a card is abhorrent.

Expeditions to out of the way places no doubt cost a good deal of money but why should an amateur who works an expedition station be required to provide a subsidy in order to obtain confirmation of a contact? The fact that hundreds, possibly thousands, of amateurs *do* subsidize expedition stations by sending cash for QSL cards is evidence of the lengths that many will go to in order to obtain a fresh confirmation and "one more" for the countries total.

Very fortunately the abuses—for that is what many amateurs would call them—have not affected seriously, if at all, the prestige value of the Empire DX Certificate which is, and is always likely to be, regarded as the most worth while of all DX operating awards. It would be a sad day for the Commonwealth if its amateurs had to depend upon the exploits of those who seek—in a veiled way—to commercialize Amateur Radio by demanding payment for QSLs.

An amateur call-sign is a very personal possession, more personal in fact than one's own name, because a call-sign cannot be duplicated. For that reason, perhaps more than any other, it should be guarded with great care. It would be a very great pity if the QSL card—the sending of which is a mark of courtesy to confirm the completion of a contact—became a pawn in a commercial game. Yet that danger is with us today, as all who use the DX bands must know.

There are other aspects of operating awards that have aroused deep concern among many amateurs, of which the most criticized is the award that is offered for some trivial purpose. Many of these awards can only be obtained on payment of money. Is it to be wondered at that at the Folkestone I.A.R.U. Region I Conference in 1960 the representatives of the I.R.T.S. and other National societies expressed themselves strongly on this particular aspect of Amateur Radio?

Amateur Radio is a hobby and as such it is not within the purview of a National Society to say what shall or shall not be done in the matter of operating awards, other than those within their own jurisdiction, but it is certain that hundreds of radio amateurs view with considerable apprehension some of the dubious practices that are going on today in respect of both operating awards and QSL cards.

J. C.

V.H.F. Aerial Materials

By D. A. S. DRYBROUGH, B.Sc. (B.R.S.22550)*

MOST amateurs interested in v.h.f. or u.h.f. operation would like to experiment with aerials, knowing that they play a very important part in the overall performance of a station. However the availability of cheap and effective commercially-made beams may well have discouraged some from taking up this aspect of station design, especially where a fair amount of " plumbing " appears to be involved. Not everyone thrives on the bending, shaping and fixing of aluminium tubing, such as is called for in most v.h.f. or u.h.f. aerial designs, and it is the purpose of this article to point out that such skills are not really necessary because other, more easily handled, and cheaper materials can be used for most aerial experimental work at these frequencies.

The idea of using other materials occurred to the writer during a visit to the Lichfield I.T.A. station some years ago when the engineer-guide showed the party a spare element for the aerial then in use. It was galvanised! If such a finish was considered suitable for a high power v.h.f. TV aerial then it would surely be worth investigating for amateur use. A check was therefore made into the relative merits of various materials for use as v.h.f. aerial elements with interesting—and cheering—results.

The radiating efficiency of an aerial can be defined as the ratio of the power radiated by it to the power supplied to it

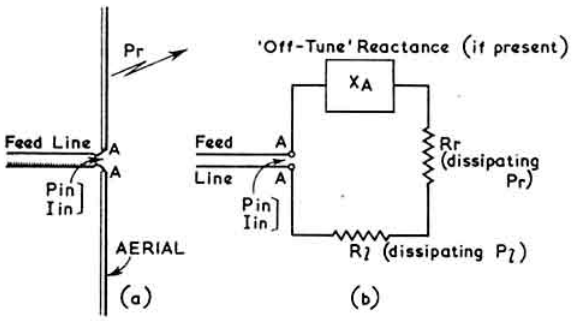

Fig. 1. Dipole aerial and equivalent circuit.

and is sometimes quoted as a percentage. The difference between the radiated power, P_r, and the input power, P_{in}, is the power lost in the aerial itself, P_1. The aerial can therefore be given the equivalent circuit shown in Fig. 1 (b) because power in such a circuit can be lost only in a resistive element and both power-dissipating mechanisms in the aerial can be replaced by resistors, R_r and R_1, such that together they dissipate the same total power as the actual aerial does. R_r, proportional to the power radiated by the aerial, is then the " effective radiation resistance " of the aerial while R_1, proportional to the power lost in the aerial elements, is the " effective loss resistance." When considering the relative efficiencies of various materials as aerial elements amateurs are vitally interested in the behaviour of the " effective loss resistance," R_1, as defined above, of an aerial system when the materials of which it is made are changed.

Starting from the fact that most aerials are made up of arrangements of lengths of metal of more or less uniform cross-sectional area the " d.c." resistance of such a length, say L, with area A, can be calculated by applying the formula:

$$R_{dc} = \frac{L}{A} \times \textit{resistivity},$$

where resistivity is the resistance per unit length and unit area for the material involved, usually given in ohms per centimetre cube. Taking L as a half-wavelength at 145 Mc/s and A as the area of $\frac{1}{8}$ in. diameter rod, typical values of R_{dc} are as follows:

Metal	*Resistivity (ohms per cm. cube)*	*Resistance*
Copper	$1{\cdot}72 \times 10^{-6}$	0·0023 ohm
Aluminium	$2{\cdot}83 \times 10^{-6}$	0·0037 ohm
Zinc	$5{\cdot}90 \times 10^{-6}$	0·0077 ohm
Brass	$7{\cdot}50 \times 10^{-6}$	0·0098 ohm

All these are negligible with respect to the radiation resistance, R_r, of a half-wave dipole which is about 65 ohms for the chosen element diameter, but this is not the whole story. As the frequency of the current flowing in the material is increased from " zero frequency," or d.c., an effect, called the " skin effect," modifies the current distribution in the cross-section of the conductor, tending to concentrate it more and more in its outer skin as the frequency rises—hence its name. This reduces the working area of the conductor and so increases its effective resistance. At v.h.f. the skin carrying most of the current becomes very thin indeed, less than half a " thou " (0·0005 in.), and is proportional to the square root of the conductor resistivity. Thus the skin is thicker for the metals with the higher resistivities, making their " r.f. " resistance less relative to their " d.c." resistance than for the better conductors like copper and their use at v.h.f. less futile than might be assumed from their resistivities. The " r.f." resistance, R^1_{rf}, for a current which is constant along the length of the half-wave element is found to be approximately as follows:

Metal	*Skin Depth*	*R^1_{rf}—R.F. Resistance*	*Ratio of R^1_{rf} to R_{dc}*
Copper	0·00022 in.	0·34 ohm	148
Aluminium ..	0·00028 in.	0·41 ohm	111
Zinc	0·00040 in.	0·60 ohm	78
Brass	0·00045 in.	0·68 ohm	69

These " r.f." resistances cannot yet be used to calculate the efficiency of a dipole aerial because such an aerial does not carry a current which is uniform along its length. The current distribution for a half-wave dipole is normally taken to be half a sine wave, having its maximum at the centre of the aerial, and so equal to I_{in} in Fig. 1. The average current and also the effective loss must therefore be less than for the constant current case considered above and integration of the power loss over the whole aerial results in the value $0{\cdot}5\ I_{in}\ R^1_{rf}$ or $I_{in}^2 \times 0{\cdot}5\ R^1_{rf}$. Since the input current to the aerial is I_{in} it follows that the true effective loss resistance, R_1, for a half-wave dipole is $0{\cdot}5R^1_{rf}$. This value, and the corresponding radiation efficiency and aerial loss in db, is shown for the selected metals in the following table:

Metal	R_1	*Radiation Efficiency*	*Loss due to Aerial Elements*
Copper	0·17 ohm	99·75%	0·011db
Aluminium ..	0·20 ohm	99·7%	0·013db
Zinc	0·30 ohm	99·5%	0·022db
Brass	0·34 ohm	99·4%	0·026db

It should be noted that these results are for $\frac{1}{8}$ in. diameter elements, not the more usual $\frac{1}{4}$ in. diameter tubes. Such larger tubes would result in still lower " r.f." resistances although the " d.c." resistance of very thin-walled tubes

* *421 Walsgrave Road, Coventry, Warwickshire.*

could be greater than those quoted above for $\frac{1}{8}$ in. diameter rods.

Simple formulae for those who wish to calculate skin depth and R^1_{rf} for themselves are as follows:

$$\text{For solid rods, } R^1_{rf} \doteqdot R_{dc} \times \frac{\text{diameter in inches}}{4 \times \text{skin depth in inches}}$$

For thin-wall tubes,

$$R^1_{rf} \doteqdot R_{dc} \times \frac{\text{wall thickness in inches}}{\text{skin depth in inches}}$$

$$\text{Skin depth, at v.h.f., in inches} \doteqdot 2\sqrt{\frac{\sigma}{\mu F}},$$

where σ is resistivity in ohms per cm. cube
μ is permeability, taken as 1 for non-ferrous materials.
and F is frequency in cycles per second.

Having theoretically established that quite thin elements of a variety of metals could be used for v.h.f. and u.h.f. aerials the next step was the choice of a suitably cheap, easily available and readily worked material with which to experiment. Zinc wire is a rare commodity, of course, but a standard line in agricultural ironmongers is galvanized fencing wire in various gauges. This is iron wire with a very heavy zinc coating, entirely adequate to act as a zinc conductor at v.h.f. and u.h.f.; it costs only about 1s. 6d. per pound. The length to the pound for 10 s.w.g. wire, which has a diameter a little over $\frac{1}{8}$ in., is more than 22 ft., making the cost just over $\frac{3}{4}$d. a foot. The wire can readily be shaped and soldered and is self-supporting for lengths of at least quarter-wave at 145 Mc/s. It can be fixed to wooden supports by means of staples and this construction is adequate for loft arrays. For Yagis a boom is required and $\frac{3}{8}$ in. or $\frac{1}{2}$ in. galvanized tubing can be used. This can then be drilled transversely at the appropriate element spacings for the $\frac{1}{8}$ in. diameter elements which can be fixed in position by soldering, using a normal, medium-sized, electric iron. This construction results in a light, yet strong, aerial suitable for fixed or mobile applications.

This cheap material has been used by the writer for a wide range of aerials with good results. The most spectacular perhaps, was a 10-turn, bi-directional helical aerial. This was supported from a 10 ft. 6 in. long wooden beam. Each turn was 26 in. diameter, spaced 14 in. from the next turn, and the aerial was split in the centre for connection to the feed line through a balun. The total conductor length used was about 69 ft.—think of coiling that amount of $\frac{1}{2}$ in. diameter aluminium tubing into a smooth helix! On this aerial I1SVS was heard in the summer of 1959 on sporadic *E* — a fluke of course, but useful for proving that the aerial did work!

Slot aerials are especially easy to make and mount and another bi-directional array consisting of two such slots, stacked one above the other on a wooden pole some 20 ft. high, was used with good results for an extended period. Folded dipoles are also convenient and a pair in a broadside, or " flat top " array was used for a spell in the loft. Yagis of various sizes have also been tried. The outside aerial at the moment is a four-element, wide-spaced unit, supported by a bamboo pole about 7 ft. long which is cleated to a wall so that the Yagi is about 12 ft. above ground. Even in the writer's rather poor QTH this aerial has performed well and has weathered many high winds in the two years it has been erected. Since January, 1961, 40 counties and eight countries have been heard using it, indicating that its performance has not yet been affected by corrosion.

A word of caution is necessary about the substitution of the smaller diameter elements for other sizes in published designs. The length of $\frac{1}{8}$ in. diameter rod required for a half-wave dipole is about $0{\cdot}956\lambda$ (exact half-wavelength) instead of about $0{\cdot}94\lambda$ (exact half-wavelength) for $\frac{1}{2}$ in. diameter elements, an increase in length of about 1·7 per cent. This correction can be applied to parasitic elements of the same order of length in Yagi arrays but element spacings need not be altered.

The thinner elements exhibit a narrower bandwidth and this may become significant, even for the relatively narrow amateur bands, in the case of close-spaced Yagis or other aerials which have a very low impedance feed point.

Very little attention has been paid to the 430 Mc/s band and higher bands, mainly because the writer has not yet operated in any band higher than 144 Mc/s but, theoretically at least, the fencing wire should be even better at the higher frequencies. This arises because, with increasing frequency, the " r.f." resistance of a given length of material rises only in proportion to the square root of frequency whereas the length required for a half-wave dipole decreases inversely as the frequency. The " r.f." resistance of a dipole therefore decreases in inverse proportion to the square root of frequency, and is therefore only about $1/\sqrt{3}$ or 0·58 of the 145 Mc/s figure at 430 Mc/s. The radiating efficiencies of such dipoles, constructed of the zinc-coated metal, should be indistinguishable from those of aerials using larger aluminium or copper elements and the diameter of $\frac{1}{8}$in. should be mechanically adequate for all normal element lengths and perhaps even for mounting booms. It is hoped to try such an array shortly when a new 430 Mc/s converter has been constructed.

References

Radio Engineering, E. K. Sandeman.
Radio Engineers' Handbook, F. E. Terman.

Ceylon Call Book

THE Radio Society of Ceylon has recently published the first issue of *The 4S7 Call Book and Amateur Radio Directory*, edited by Ian D. Wollen (4S7IW). In addition to listing the addresses of 4S7 licensees, details of their occupations and other hobbies are also given.

South Trinidad Amateur Radio Society

DURING her recent visit to Trinidad, Nell Corry (G2YL) was guest of honour at an international Ham Barbecue. Amateurs from Venezuela, Canada, St. Vincent and Barbados were also present at what is believed to have been the largest social gathering of its kind ever held in Trinidad.

Radio amateurs who visit the Land of the Humming Bird on business or pleasure are cordially invited to contact the Rev. Lawrence Purdy (VP4NC), Chaplain's Residence, Naparima College, San Fernando.

South Trinidad Amateur Radio Society Barbecue
VP4KE, VP4VP (President), YV6BC, VP4LQ, G2YL, VP4LP, VP4MM, VP4TO, Mrs. VP4TO, Mrs. VP4MM. Back row, VP4BO, VP4KR, VP4NC (Host), VP2SX, VP4LH, VP4LR, VP4PL. *(Photo by VP4PL)*

TECHNICAL TOPICS

By PAT HAWKER (G3VA)

"Vive La Lash-up" · Bridged-T Crystal Filter · The Simplest Modulator
14 Mc/s Mini-Dipole · Signal Injector · Prototype Construction
Two-stage Clamping · Low-cost Audio Filters · V.H.F. across Mountains
"One-knob" A.M. Transceiver

THE other day a youngster just becoming interested in Amateur Radio called round and asked if he could see the equipment. As is the way with these things, it was just at a time when a lash-up 1·8 Mc/s transmitter was going through a period of drastic modification. The sight which met the youth's astonished gaze looked like something out of the early 'twenties, with trailing wires, twisted connections, meters and extra components resting on the bench, all forming a most glorious hay-wire effort (the home-built gear at G3VA is not exactly constructors' competition material at the best of times, but that day it really excelled itself). Clearly, this was not how he had imagined an amateur station—and not at all like those tidy and impressive shacks in the magazines.

But after he had departed (disillusioned?), we began to wonder whether there is not a modern tendency among amateurs to prize too highly the " professional " appearance: the control panel with every hole symmetrical and correctly filled; all control knobs carefully matched; every interconnecting wire cabled up and out-of-sight. Such equipment, of course, has much in its favour, and often represents great skill and forethought on the part of the constructor; but sometimes it may conceal a rather inflexible station which cannot readily be modified to take into account technical developments or a shift of interest on the part of the owner.

Few experimental designs are likely to work well at first go, and it is only on v.h.f. that results are greatly affected by the actual construction. The production of original prototypes, no matter how rough so long as they do what was intended, can give great satisfaction. All credit to those who afterwards go on and produce a neat and really well-built working model, but we should not consider this the prime aim of the amateur station, which in this country was once officially classed as " experimental."

This is certainly not an attack on the careful constructor—far from it. But we feel that many amateurs are deterred from attempting much homebrew equipment because they know that with limited tools or constructional experience, or lacking the necessary temperament, they will not produce equipment looking like a factory-built job. This, we suggest, is a sad reflection on our sense of priorities and could lead to our failing to enjoy much of the very best in our hobby.

Symmetrical Crystal Filters

Most of the professional texts on i.f. crystal filters devote considerable space to the bridged-T type of filter (sometimes called " combined crystal and mutual inductance coupled circuits "). With a single crystal two points of infinite rejection can be placed one each side of the crystal frequency, thus providing a symmetrically shaped response curve roughly similar to that of the more familiar two-crystal, half-lattice bandpass filter. The basic circuit is shown in Fig. 1, though ome variations can be noted between different authorities.

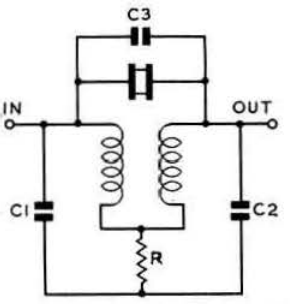

Fig. 1. Basic bridged-T crystal filter. C1 and C2 are adjusted for maximum response at the series-resonant frequency of the crystal. C3 adjusts the position of the maximum rejection points. In some designs the series resistor R is omitted and the mutual coupling arranged as in an i.f. transformer.

Although this type of filter was successfully used in some wartime Service receivers (R201 and R206) as a plug-in unit (see a good description in *Proc. I.E.E.*, Vol. 94, Part 3A, 1947), it never seems to have been widely adopted for amateur receivers. A possible drawback is that for optimum performance the inductance of the i.f. transformer coils and the mutual coupling have to be specified, and the series resistance (sometimes omitted) also affects results (typical value about 5000 ohms). Yet clearly a useful filter can be made, quoted performance figures for one of the Service 465 kc/s filters being: bandwidth −6db, 2·5-3 kc/s; bandwidth −60db (infinity points), 4·5-11 kc/s; and better than −40db at lobes.

It was therefore with considerable interest that we noted in the German *Funk-Technik* (Nr.6, 2 March, 1962), the use in an amateur-bands receiver of a variable bandwidth filter which appears to combine both bridged-T and half-lattice techniques, using three 467 kc/s crystals. In the article, it is said that this filter (see Fig. 2)—developed by the Valvo firm (type API001/70)—is fairly easy to construct, though some care is need in the choice of values for C20 and C27. The trimmers compensate for the crystal capacitances and the bandwidth is controlled by C22. Unfortunately, no response curves are included in the article. Such a filter avoids the problem of staggered crystal frequencies as well as providing variable bandwidth, and we feel sure that members would be interested to learn of the results achieved by anyone experimenting with this type of circuit.

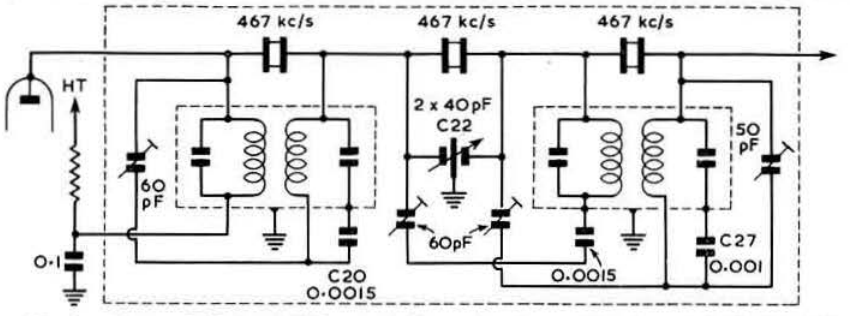

Fig. 2. Valvo variable bandwidth crystal filter using three 467 kc/s crystals (*Funk-Technik*).

Another unusual feature of this particular German design for a homebuilt receiver is the inclusion of a built-in two-metre converter.

The Simplest Modulator

For those who run c.w.-only transmitters, but who feel the urge to make an occasional phone contact without the expense of a high power modulator or a modulation transformer or even any extra h.t. supply, the following idea, though not new, may be of interest. Almost nine years ago, W6LNN showed (*QST*, September 1953) how a very simple 6SL7/6Y6G modulator could be just plugged into the usual keying jack on many transmitters. Now, in *QST* (April 1962), W1PH revives the idea for a 1·8 Mc/s rig. Fig. 3 shows the basic details.

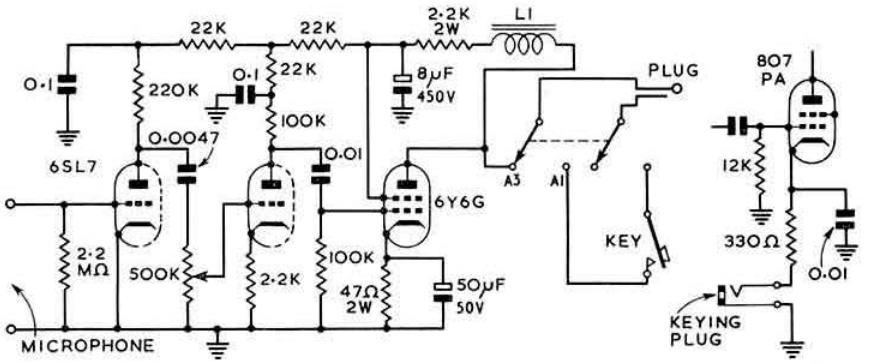

Fig. 3. W1PH's version of the W6LNN "simplest modulator." L1 is a small filter choke of about 15H. (*QST*).

When the modulator is inserted in the p.a. cathode lead, it provides principally grid-bias modulation, although there is a small amount of accompanying anode and screen-grid modulation. Almost any p.a.—triodes, tetrodes or pentodes, single-ended or push-pull—should respond to this treatment. The efficiency is, of course, a good deal lower than with anode modulation, but it is said that good quality can be obtained since the correct operating conditions are developed almost automatically. The transmitter is first tuned up as for c.w. and loaded to normal power; the modulator is then plugged in. The p.a. anode current should then drop to about half the previous reading—and this is the correct condition for phone. The small filter choke removes the a.f. component from the h.t. supply for the two-stage speech amplifier, in this case a 6SL7. The h.t. supply for the p.a. (from which the h.t. for the modulator is series derived) is about 400–600 volts.

Condensed Rotary Dipole for 14 Mc/s

The rotating dipole can still be a most useful aerial for those who want to radiate signals to all points of the compass without the constructional and adjustment problems of a multi-element beam. But for 14 Mc/s it is often difficult to fit a rotating 33 ft. element into the space available. In *CQ* (March 1962), K2EEE describes the construction of a mini-dipole (Fig. 4) of about 16 ft. overall length, using two 7·5 μH loading coils (approximately 11 turns on 2½ in. diameter former, 6 t.p.i. using U.S. No. 12 or 14 wire). Final adjustment is made by two end lengths (each 2 ft. long) of $\frac{5}{8}$ in. tubing which slide into the main $\frac{3}{4}$ in. tubing. K2EEE's centre hardwood mounting is 28 in. by 2$\frac{3}{4}$ in. by $\frac{3}{4}$ in., and at the two coil mounts, the ends of the $\frac{3}{4}$ in. tubing are flattened and sandwiched between two 6 in. by 2 in. polystyrene plates with the coils connected to the inner mounting screws. The dipole need be rotated by only 90°, or even less if necessary.

Simple Signal Injector

More and more service engineers are finding that a simple multivibrator type of generator can be a useful aid for stage-by-stage tests of receivers—particularly those using transistors. We have an idea that such an accessory would also be pretty useful to constructors. It is a logical extension of the old dodge of putting your finger on the grid and listening to the resulting hum, but with the great advantage that it produces a signal extending well into the r.f. range, so that one need not stop at the detector stage. Several designs have appeared using transistors, permitting a small generator to be built to a size and shape approximating that of a fountain pen, with an output probe in place of the nib. Fig. 5 shows one recent design, from *Radio-Electronics* (March 1962), using small mercury cells to power the transistors; these transistors were type 2N1265/5 in the original, but almost any small-signal type should be reasonably effective.

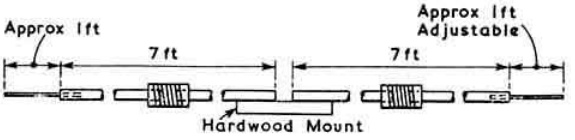

Fig. 4. K2EEE's mini-dipole for 14 Mc/s, fed with 70 or 50 ohm coax. (CQ).

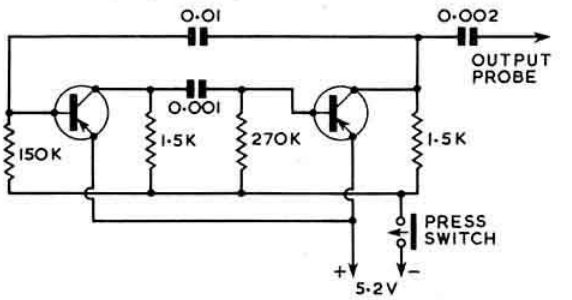

Fig. 5. Signal injector for servicing and testing, built into unit resembling a ball-point pen (*Radio-Electronics*).

Rapid Prototype Construction

Those who are interested in trying out new ideas and circuits soon feel the need for methods of speeding up the assembly of prototypes without incurring the expense or drilling of individual chassis. After the initial ideas have been committed to paper in the form of a circuit or possibly a rough sketch of layout based on available parts, comes the time for the first hook-up. At this stage it can be very useful to have available some partly-wired chassis kept for this purpose. To adapt some of the ideas for a universal experimental chassis put forward in R. H. Garner's *Mechanical Design for Electronics* (Newnes), this can comprise a number of valveholders, preferably with the heaters pre-wired (but watch out for the odd octal valves which do not use pins 2 and 7 for this purpose); a long tag strip (or one on each side) for locating resistors, fixed capacitors, transistors, etc.; space for rapid mounting of " iron " components, electrolytics, etc., and with plenty of holes available for mounting any other

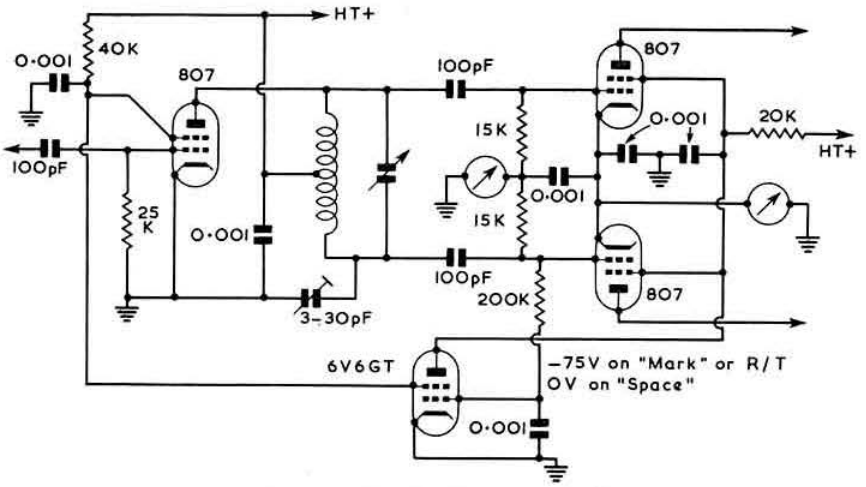

Fig. 6. VP3MC's two-stage clamp circuit.

components; either a pre-drilled vertical panel or a series of mounting brackets for variable capacitors, potentiometers, etc.; suitable terminations for power-supply leads, possibly with bus bars running the length of the chassis. One idea is to have p.v.c. wires permanently attached to the pins of the valveholders with colours corresponding to the usual colour code (brown pin 1, etc.).

For lighter work, and particularly for small transistor units, a very convenient form of construction is described in one of the leaflets issued by the Mullard Educational Service (No. 20 *The Mullard Pegboard Circuit System*), devised to enable experimental and permanent circuits to be quickly and cheaply constructed for demonstration purposes.

The basis of this system is soft pegboard (recognizable by its light colour from the darker, rather brittle type) in conjunction with numbers of cylindrical brass pillars $\frac{3}{4}$ in. in length and $\frac{3}{16}$ in. in diameter, tapped at both ends with a 6BA thread (the pillars are cut from standard $\frac{3}{16}$ in. brass rod and tapped). These pillars can be just pushed into the pegboard (for what is sometimes called " temporary permanent " hook-ups), or firmly attached to it by means of 6BA nuts with washers or solder tags. These pillars are then used as tag points for mounting light components and wiring, or for attaching heavier parts; even if the component mounting holes do not exactly match the pegboard hole spacing, the pillars can usually be sloped a little to accommodate the difference. Wiring can either be all on the component side or concealed on the opposite side of the board. This general technique is, of course, most suitable for lower frequency circuits where the effect of the brass rods is negligible; for r.f. work it might be advisable to use the rods solely for mounting purposes, possibly in conjunction with conventional tag strips.

More complicated equipment (Mullard mention a square-wave generator as an example) can be made by assembling two layers of pegboard above one another.

Two-stage Clamping

The use of screen grid clamping valves with grid current biased p.a. stages has been popular for a number of years with little variation of circuit details. Now, however, VP3MC sends along information on an arrangement which he has been successfully using for some time and which he feels may be useful to others. This differs from the conventional system in that the clamping action is applied simultaneously to the screen grids of both the buffer and the p.a., resulting in much lower standing current during " key up " (" space ") conditions (thus incidentally creating less "noise" radiation) and the need for only a single clamp valve for both stages. Fig. 6 shows his circuit, though the scheme could be readily adapted to other transmitters. VP3MC writes: " The screen grids of the p.a. are fed from the main h.t. via a 20 K resistor. The anode of the clamp valve is tied to the screen grids of the p.a., and the screen grid of the clamp valve connected to the screen grid of the buffer. At VP3MC the grids of the p.a. valve are fed via grid-blocking capacitors with individual gridleak resistors of 15 K ohms each. The blocking bias for the clamp valve is therefore taken from the grid of only one of the p.a. valves, via a 200 K ohms $\frac{1}{2}$ watt resistor connected closely to the p.a. grid lead for the purpose of isolation, so as to counter any unbalancing effect. On c.w. the v.f.o. is keyed, and this two-stage clamp holds both buffer and p.a. down to very low values of cathode current during " space " conditions, providing also a useful safeguard during tuning up of the earlier stages or during loss of drive.

" Should a common gridleak resistor be used for the p.a. valves, the blocking bias for the clamp valve would be taken from this resistor, and if the point is at zero r.f. potential the isolating resistor would not be required. Compared with a triode-connected clamp, the improved action on the p.a. is because the screen grid of the clamp valve is at a higher potential during ' space ' conditions, but is low enough to effectively clamp the buffer stage."

Low-cost Audio Filters

There are a number of applications in both receivers and

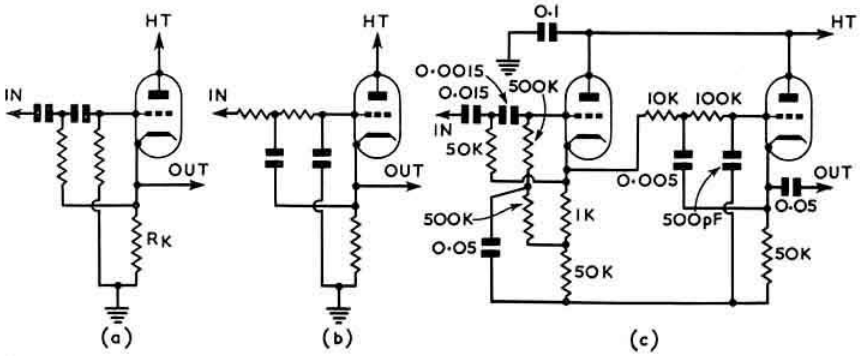

Fig. 7. A.F. filters without " wound " components: (a) basic high-pass filter; (b) basic low-pass filter; (c) practical design for bandpass filter using cascaded high- and low-pass filters. (*Electronics* and DL-QTC).

transmitters for low-pass, high-pass and bandpass audio filters which give a " roll-off " of the order of 12 db/octave outside their pass range. Most such filters have tended to depend upon " wound " components such as toroids and audio chokes. In *Electronics* (April 10, 1959), it was shown that low cost high-pass (Fig. 7(a)) and low-pass (Fig. 7 (b)), filters could be constructed using a cathode-follower valve in conjunction with three resistors and two capacitors: two such filters can be cascaded for bandpass characteristics.

The original article gives full design procedure for determining component values, though like almost all filter design this involves a fair amount of mathematics. However, we recently noted in *DL-QTC* (March 1962), a practical example for amateur telephony: see Fig. 7(c). This has a pass-band of about 250–3000 c/s.

One-knob A.M. Mobile Transceiver

The use of a single v.f.o. for transmission and reception is by now well favoured among s.s.b. enthusiasts. But there is, of course, no reason why the same principle should not be applied to a.m. set-ups. In *DL-QTC* (March 1962), DJ3YN describes a compact 3·5 Mc/s " Einknopf " mobile rig which uses an EF80 e.c.o. as a basis for the transmitter mixer-type exciter and also for the receiver local oscillator; transmitter and receiver both being automatically tuned to the same channel. Fig. 8 shows more clearly than words how this is achieved. A simple adapter, using a single 6U8A, to convert existing equipment to simultaneous transmitter and receiver tuning, is described by W6EOT in *QST*, May 1962.

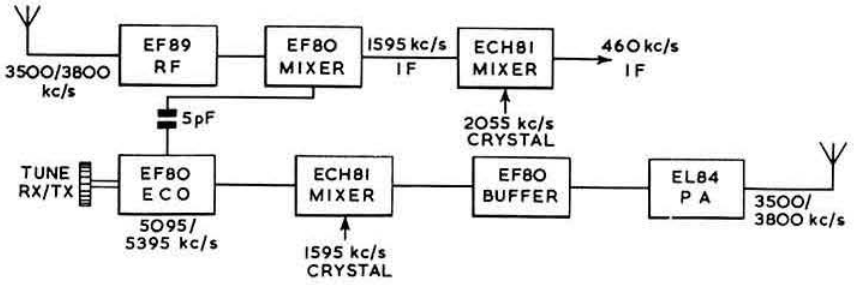

Fig. 8. Part of the DJ3YN " one-knob " a.m. mobile transceiver showing how receiver and transmitter are tuned automatically to the same channel by the single e.c.o. (*DL-QTC*).

Ionospheric Forecasting

An article in *Proc. I.E.E.* (March 1962), explains the new method of Ionospheric Forecasting now being used by D.S.I.R. This is based on the identification of " epochs " during which corresponding conditions prevailed in past years, rather than plotting completely new forecast maps as done previously. It has been found that it is usually possible to identify some period within the previous ten years when almost identical radio conditions occurred. One result of this new system, it is said, is a great increase in the accuracy of predictions made several months in advance.

Knife-edge Diffraction Propagation

V.H.F. enthusiasts will probably tell us that there is nothing new in the idea of getting signals across a mountain range by aiming their beams accurately at a sharp ridge. That this technique has now been recognized and adopted by our commercial colleagues is made clear in *Electronics* (April 6, 1962). An article describes how 1855 Mc/s signals from a 15 watt transmitter with a 10 ft. dish (parabolic) aerial sent signals over a 45 miles path across a range of mountains by aiming the aerial at an intervening ridge (3789 ft. high), the signals being diffracted down the other side. It is forecast that ranges of 1000 miles could be achieved using this type of scatter.

While on the subject of parabolic dish aerials, already being used by amateurs for moon-bounce and radio astronomy, it is worth noting that the Russians are reported to have constructed 20 metre dishes for cloud observation radar using reinforced concrete plated with zinc at a cost " some hundreds of times less than for a conventional metal structure." Better scout round the nearest building site for a spare concrete mixer.

Follow-ups

Some postscripts can usefully be added to items from recent *Technical Topics*.

Another application of Nuvistors (see *T.T.*, February 1962), is highlighted in *R.C.A. Ham Tips* (Spring 1962). This is for low power miniaturized v.h.f. transmitters for mobile or fixed-station use. The high anode dissipation rating for their small size, their suitability for use up to 400 Mc/s, their rugged construction are all points in their favour. The article, by W2OKO, gives constructional details of a 144 Mc/s transmitter with a pair of 7587 Nuvistor tetrodes in the p.a. for inputs up to 7½ watts, and two 7586 triodes in the earlier stages. The whole r.f. section sits comfortably on a 5 in. by 7 in. piece of copper or brass. In the May *QST*, W1YDS describes a simple and compact 420 Mc/s super-regen transceiver using a 6CW4 Nuvistor plus two a.f. transistors.

G3JDM mentions that the R.C.A. 6939 u.h.f. twin power pentode (see *T.T.* April 1962), has at least two local equivalents: the Mullard QQV02-6 and the G.E.C. TT23 both priced around £3 10s. He also draws attention to an article in *Electronic Technology* (May 1962) on the A.E.I. s.s.b. generation system reported briefly in *T.T.*, April 1962.

We have several times commented on the controversy still raging in professional as well as amateur circles on the relative merits and demerits of the various a.m. and sideband modes. Latest shot is the argument that suppressed carrier has severe limitations for use in high speed aircraft because of Doppler shift (even a 20 c/s error can upset data links and selective calling systems). So watch your speed on s.s.b. mobile!

Mountbatten Research Studentships
New Awards to be Instituted by Brit.I.R.E.

THE Council of the British Institution of Radio Engineers has decided to establish research studentships to encourage fundamental research in radio and electronic engineering. The award will be named after the Institution's Charter President, Admiral of the Fleet The Earl Mountbatten of Burma, K.G.

It is intended to award one studentship in October 1962, the second in October 1963, and thereafter as they become vacant. Each studentship will have an annual value of £500 plus university or college tuition fees, and will normally be tenable for two years, with a possible extension of one further year.

Potential candidates for the Studentships may obtain application forms from the Secretary of the Brit.I.R.E. at 9 Bedford Square, London, W.C.1.

LONDON U.H.F. GROUP
will meet at the Whitehall Hotel, Bloomsbury Square, London, W.C.1.
at 7.30 p.m. on Thursday, July 5, August 2 and Sept. 6, 1962
All v.h.f. and u.h.f. enthusiasts welcome.

Transistor Circuit Design Made Easy

PART 3

By M. C. HATELY, B.Sc.(Eng.), A.C.G.I., A.M.I.E.E. (G3HAT)*

THE two previous articles† in this series have dealt with some simple aspects of circuit design using audio transistors. This final part shows how simple power amplifiers may be designed and then as a conclusion, some useful hints for dealing with transistor circuits are mentioned.

Simple Power Amplifiers

Class A Single Ended

Class A stages are useful for speaker monitor amplifiers, simple output stages for portable receivers and for drivers of class B push-pull stages. The limit of power that may be obtained depends on the collector power dissipation. For instance, the medium power transistor GET115 may have a collector wattage of 400 mW in free air or up to twice this

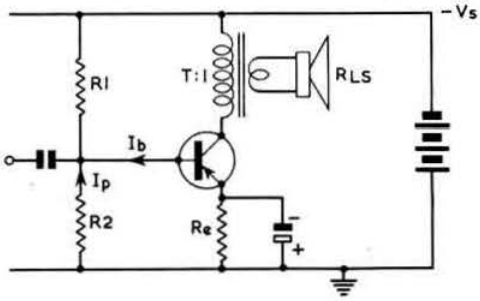

Fig. 19. Class A low power audio amplifier.

when screwed down to a 3 in. × 3 in. metal sheet as a cooling fin or heat sink. This means that nearly 200 mW (or 400 mW with a heat sink) could be obtained as audio output power.

Referring to Fig. 19 proceed through the following steps:

(i) Choose a transistor whose allowable collector power (P_c) is at least twice the desired output power (P_o).

(ii) Check that the transistor chosen will stand a collector voltage of at least twice the supply voltage (V_s) that it is intended to use.

(iii) Calculate the quiescent collector current I_c that is necessary to give the desired output with chosen supply voltage.

$$I_c = 2\,P_o/V_s.$$

(iv) Make the emitter voltage one-tenth of the supply voltage, i.e. the value of R_e is $R_e = V_s/10\,I_c$.

(v) Calculate the base current, I_b, which will be necessary to cause this current I_c to flow; $I_b = I_c/\beta$.

If β is not known assume it is 30.

(vi) Drain ten times the base current down the base potentiometer network *R1* and *R2*. This is called potentiometer current I_p. $I_p = 10\,I_b$.

(vii) Make the base voltage one-tenth of the supply voltage plus a quarter of a volt i.e.

$$R2 = \frac{V_s/10 + \frac{1}{4}}{I_p} \quad \text{(Use nearest value.)}$$

(viii) Calculate *R1* to drop the rest of the h.t. voltage with $I_p + I_b$, i.e. $R1 = 4\,V_s/5\,I_p$. Use the nearest value.

(The next two steps are omitted when designing a driver for a class B push-pull output stage. Refer to steps 13 and 14 of that design for the method of calculating the driver transformer requirements.)

(ix) Calculate the peak voltage (V_{LS}) across the loudspeaker when the expected power is put across the loudspeaker resistance R_{LS}.

$$V_{LS} = \sqrt{2\,P_o\,R_{LS}}$$

(x) Calculate the required turns ratio of the transformer:

$$T = 8\,V_s/10\,V_{LS}$$

The transformer must have a reasonable size since the quiescent collector current is flowing through it all the time, and may otherwise saturate the iron. (See also steps 13 and 14 of class B design.) The emitter decoupling capacitor must be large and 100 μF is the smallest that can be used; its working voltage need only be the emitter voltage plus a safety margin of a volt or so.

Worked Example of a Class A Power Amplifier

Suppose it is desired to provide 300 mW from an output stage into a 3 ohm loudspeaker; a GET116 transistor is available of which the β is 30.

(i) P_c = 800 mW (with a cooling fin in use).
(ii) V_s = −12V (Max. $V_{c-e} = -30$V).
(iii) I_c = 2 × 300 mW/12V = 50 mA.
(iv) R_e = 12V/10 × 50 mA = 240 ohms (use 220).
(v) I_b = 50 mA/30 = 1·7 mA.
(vi) I_p = 17 mA.
(vii) *R2* = (1·2 + 0·25) *V*/17 mA = 85 ohms (use 82).
(viii) *R1* = 4 × 12V/5 × 17 mA = 560 ohms.
(ix) $V_{LS} = \sqrt{2 \times 0{\cdot}3 \times 3} = \sqrt{1{\cdot}8} = 1{\cdot}34$ V.
(x) T = 8 × 12/10 × 1·35 = 7·2 to 1.

Class B Push-Pull

Class B push-pull stages are very useful for higher powers such as mobile modulators, car public address output stages and so forth. There is almost no limit to the power that may be obtained. These stages are fairly efficient, they make good use of their component transistors, and they are economical in current consumption. Like class B amplifiers using valves, they depend for their quality on the cancellation of even order harmonics in the output transformer. Theoretically the quality could be improved by overall negative feedback but this is very difficult to apply without causing oscillation.

The design technique given below should enable the careful experimenter to produce satisfactory quality for the uses suggested. Referring to Fig. 20 the steps in the design are:

(i) Decide how much power output will be required, say P_o.

(ii) Choose a pair of transistors whose separate permissible collector power dissipation is at least one-third of the desired power output.

$$P_c \geqslant P_o/3$$

(iii) Choose a suitable negative voltage, remembering that the peak voltage which will appear on each collector

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† Parts 1 and 2 were published in the April and May, 1962, issues of the R.S.G.B. BULLETIN respectively.

will be twice this. So V_s must always be less than $\frac{1}{2}$ V_c max.

$$V_s \leqslant \tfrac{1}{2} V_c \text{ max.}$$

(iv) Calculate the peak current that is required from each collector:

$$I_{cpk} = 3P_o/2V_s$$

(v) From a knowledge of β calculate the peak base current required:

$$I_{bpk} = I_{cpk}/\beta$$

But note that β usually falls off at high collector currents and so care must be taken to use a conservative value.

Manufacturers' data should be consulted. If no data is available β must be assumed to be 10 only.

(vi) Calculate the quiescent collector current the pair of transistors will pass in their undriven condition.

$$I_q = I_{cpk}/15$$

(vii) Calculate the quiescent base current the pair must be set to.

$$I_{bq} = I_q/\beta$$

(viii) Calculate the total resistance to negative supply voltage that will pass I_{bq}.

$$R_b = V_s/I_{bq}$$

Make half of it a fixed resistor and the remainder a preset resistor equal to R_b. This must be done so that the current may be set for minimum distortion when the amplifier is completed.

(ix) The two germanium diodes conduct when their companion transistor is cut off. They may be any small germanium diode with a peak current rating sufficient for the peak base current I_{bpk}. Most small diodes are adequate for moderate power stages.

(x) The output transformer should have a turns ratio to match the peak output voltage required (V_{opk}) to the transistor amplifier supply voltage. The turns ratio is calculated as follows:

Whole Primary/Secondary $= 2V_s/V_{opk}$

For Modulator: V_{opk} = h.t. voltage of p.a. of transmitter.

For Loudspeaker: $V_{opk} = \sqrt{2P_o \times (\text{Loudspeaker Resistance})}$

The windings should have a low resistance (compared with the source and load impedance) and the transformer must have a large iron core area to prevent saturation (especially if h.t. current for the p.a. flows through the secondary in the case of a modulation transformer).

(xi) The driver transformer must have a low resistance secondary winding with a centre tap, capable of delivering twice the peak base current required at a voltage of 1·2 volts peak (i.e. 600 mV each half). Calculate peak drive power required. $P_{dpk} = 1{\cdot}2 \times 3\ I_{bpk}$ watts.

(xii) The design of the driver stage is performed as described above for class A amplifiers. The design should be generous for P_{dpk}.

(xiii) Driver transformer primary should be capable of carrying P_{dpk} and the d.c. collector current of the driver transistor and retain a reasonable inductance* under this condition.

(xiv) The turns ratio of the driver transformer must match the driver transistor collector voltage swing (which is 1·8 V_s to 1·2 volts).

Turns Ratio of Primary/Whole Secondary = $1{\cdot}8V_s/1{\cdot}2$. The secondary is then centre tapped.

(xv) The centre tap is decoupled to earth by means of a very large capacitor. It should be at least 1000 μF, but it may be very low voltage working. It is prevented from charging negatively by the presence of germanium diodes. The polarity is shown.

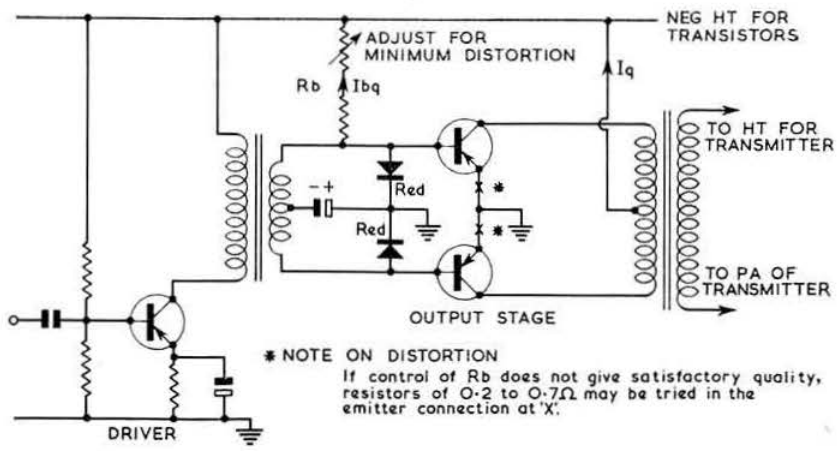


Fig. 20. Class B high power audio amplifier and driver as a modulator.

Worked Example of Class B Amplifier

A modulator is required for a 30 watt transmitter, so that anode and screen modulation may be applied. The p.a. input current is 100 mA from a 300V power supply. (Required modulator power = 15W.)

(i) P_o = 15 watts.
(ii) P_c = 5 watts so GET572 will be satisfactory. β is 25.
(iii) V_s = −12V, since GET572 V_c = 30V max.
(iv) I_{cpk} = 3 × 15/24 = 45/24 ≃ 2A.
(v) I_{bpk} = 2/25 = 80 mA.
(vi) I_q = 2/15 = 133 mA.
(vii) I_{bq} = 133/25 = 5·3 mA.
(viii) R_b = 12/5·3 mA = 2·25 K ohms. (Use 1 K ohms and 2·5 K ohms as a variable.)
(ix) Use GEX54 for instance.
(x) Turns ratio = 2 × 12/300 = 24/300 = 1 to 12·5.

(A 20V 1·5A centre tapped heater transformer might be a suitable transformer for this purpose using the mains winding as the secondary.)

(xi) $P_{dpk} = 1{\cdot}2 \times 3 \times 0{\cdot}080 = 290$ mW.
(xii) Use 300 mW.
(xiii) Transformer to be about 2 ounces in weight and have about 3 turns per volt.
(xiv) 1·8 × 12/1·2 = 18 to 1, so turns ratio could be 72 to 4 (centre tapped) constructed of wires thick enough to use up half the window of the core for each winding.

Limitations of Transistors

Upper Frequency Limit

Since the transistor action depends upon the diffusion of electrons through the lattice of atoms in a semiconductor crystal, it is a moderately slow process and the device is inherently a low frequency amplifier. The ordinary audio frequency types will amplify up to 10 kc/s and above that frequency most have a fall-off in β. The frequency capabilities of transistors are quoted by the many manufacturers in various ways. The understanding of semiconductor theory is still improving.

Every month, or so it seems, the writer comes across a new symbol relating to the frequency characteristics of a transistor. Two of the most frequently seen symbols are:

* See Appendix.

$f\alpha$ which is very roughly β times the frequency at which β has fallen 3db.

$f1$ which is defined as the frequency at which β has fallen to one. Since this is the result of a normal CR type of fall-off, it is fairly easy to plot back towards low frequencies on a logarithmic frequency graph with β, rising at 20db per decade until this line cuts the line of low frequency β. The frequency at which this occurs is the 3db down frequency for β (see Fig. 21).

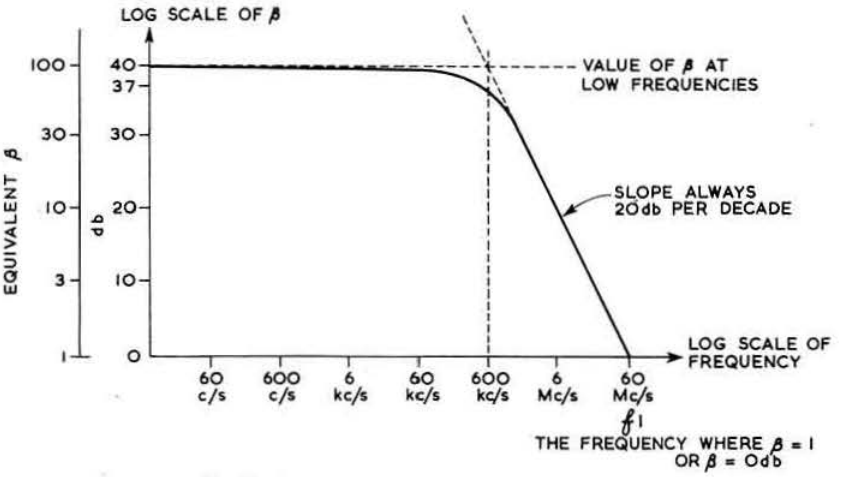


Fig. 21. The meaning of f1 (typical r.f. transistor).

Collector Leakage Current

There is a small irreducible collector current (symbol I_{co}) which flows from emitter to collector regardless of base current and becomes larger as the transistor becomes warm. It forms the limit of minimum safe collector current for non-distorted amplification as was explained in the first article. In germanium transistors it is about 250 or 300 μA at room temperature; but silicon transistors have I_{co} values of only 10 μA or less.

Noise

Transistors have a fairly small noise power output in the audio frequency range. As was mentioned in the section on current amplifiers, small currents are easy to amplify above noise; but very small voltages may not be so. Noise factors are quoted in the manufacturers' data as db over the noise that would come from a pure resistance of the value stated at the temperature and bandwidth in question. Reference should be made to a textbook on transistor theory for an explanation of this.

Maximum Collector Voltage

The *p-n* junction forming the collector-to-base active region will break down and be destroyed if the collector voltage is too greatly negative of base (or emitter). This fixes the maximum negative supply voltage that may be used. Note that if the collector load is inductive, when the collector current is low, a negative overswing of voltage equal to the positive change is produced. Thus a collector working through a transformer must be capable of standing twice the negative supply voltage. In circuits where a transistor is controlling a relay, in order to protect the transistor, a germanium diode is always wired across the coil so that it conducts when the voltage overswing is present. It is always quoted in the data as $V_{ce\ (pk)}$ or $V_{cb\ (pk)}$.

Maximum Collector Power

The maximum power the transistor can dissipate is critically related to how well it is cooled by its surroundings. A large collector power dissipation can be designed for if the ambient temperature is never likely to be high or if heat dispersal from the collector can be accelerated. It is prudent to keep power transistors well ventilated, or better still, to screw them to a heat sink. Power transistors are usually sold complete with two insulated bushes and a thin mica sheet so that they may be screwed down to a cool chassis or other cooling surface. Another method is to use an anodized aluminium sheet as the insulated heat sink. Yet another is to use a circuit variation with the circuit and power supply " floating " above the chassis but the collectors of the output stage connected in firm electrical and thermal contact with the chassis.

The maximum collector dissipation is always given in the manufacturers' data and there is often a derating curve for higher ambient temperatures and some figures of the expected temperature rise per watt.

Possible Faults and General Hints

Bad Distortion

This is usually caused by the last transistor in an amplifier having too large a signal on its collector. Quality should suddenly improve as the signal level is reduced. Check by a voltmeter that there is enough d.c. voltage difference between the collector and emitter to allow the collector voltage to swing the full signal voltage output required. For instance, a collector which is normally only 2 volts negative of its emitter cannot provide 2V r.m.s. output because collector to emitter voltage will be zero over part of the sine wave.

Alternatively the transistors may be getting too hot. Keep them away from valves.

No Amplification

A transistor that is damaged will usually show up because of anomalous d.c. behaviour and this can be diagnosed by a careful check of conditions using a voltmeter. Care must be taken to get the correct polarity from the battery before switching on. Transistors must not get too hot when being soldered into the circuit. Use a pair of small pliers as a heat shunt between the joint and the transistor.

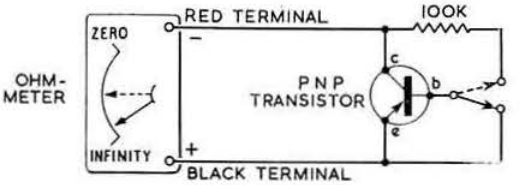


Fig. 22. Simple test arrangement for *p-n-p* transistors.

Tests of Transistor Activity

The best way to check transistors is to use a tester such as the one described by Ivor L. Hampton (G3JLH) in the R.S.G.B. BULLETIN for August, 1960 entitled " A *P-N-P—N-P-N* Transistor Tester."† The next best way is to connect

† Also described in the Measurements Chapter of *The Amateur Radio Handbook*.

(*Continued on page 582*

How to make

Air Spaced Inductors

By ALAN W. FAWCETT, M.B., F.R.C.S.(Eng.) (G2HQ)*

SOME time ago the writer decided to build a copy of the Central Electronics 20A s.s.b. exciter, a unit which has a band-switched turret to tune the mixer and final stages from 15 to 160m. The inductors are the small air spaced type wound on polystyrene† ribs. As such coils do not appear to be manufactured in the U.K. an attempt was made to construct them at home. For those having a workshop with a screw cutting lathe, or access to one, together with a few essentials such as a milling and slotting saw machine, it is an easy matter to make air spaced coils of the type shown in the photograph and the following notes may be of interest to those who feel like trying.

Cold Method

The first experiments were made with hardwood jigs, made by screwing together at each end two large and one central (small) pieces about 5 in. long, turning them circular on a lathe, then milling slots in the two outer pieces about $\frac{3}{16}$ in. wide and deep to take strips of polystryrene which were then flush with the wood. These strips were held in place with rubber bands, the complete jig reassembled and replaced in the lathe chuck. Winding was then carried out using the screw cutting gear to obtain the correct number of turns per inch, which is usually either 8, 10, 16 or 32. The wire is held in position with polystyrene cement and by placing another strip of polystyrene on top of the turns.

Polystyrene can be obtained in sheet or rod form in various sizes, and to make the strips it is necessary to cut the sheet using water as a lubricant to prevent the saw sticking.

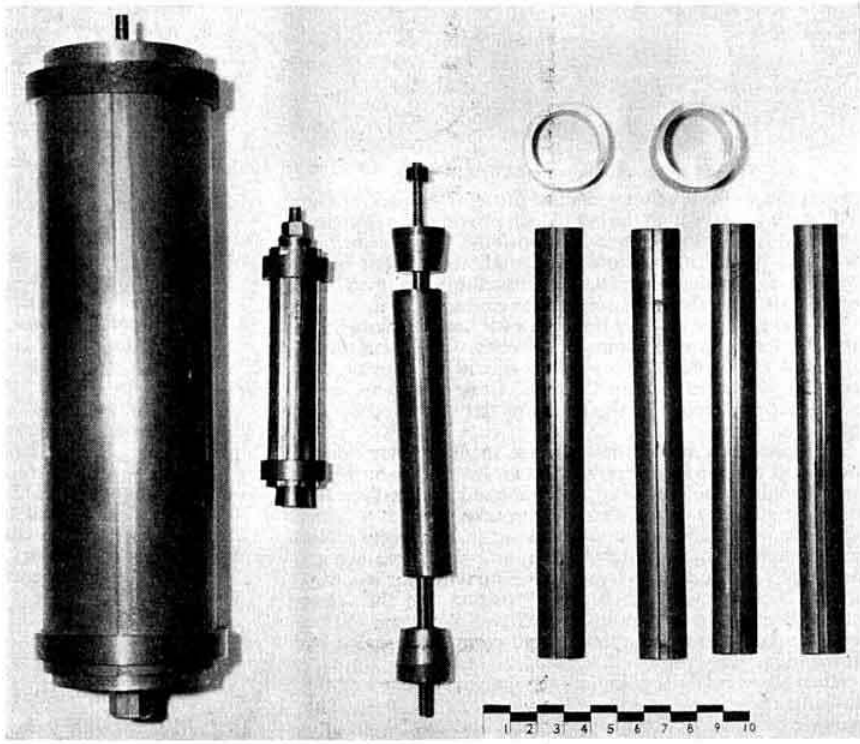
There are a number of disadvantages to the method just described and it was eventually abandoned although some fairly good coils were made. Wood jigs are apt to stick, the coil is difficult to remove and the cement causes discoloration. Lubricating the wood with graphite simplifies taking the pieces apart when the screws are removed but they are still apt to be troublesome.

Hot Wire Method

It occured to the writer that a better way to make the coils would be to heat the wire during the winding operation in order to melt the polystyrene and so achieve self-sealing to the polystyrene strips. This can be done in one of two ways, either by heating the wire as it is fed on with a very hot electric soldering iron or, much better, by passing a heavy current through it. Both methods require metal jigs, all of which can be made from brass tubing of various sizes. For large coils the tube must be thick walled, about $\frac{1}{4}$ in., as the milling has to be deep. It was found better to use rod rather than strip for the supporting polystyrene bars.

After turning the two ends to get them square, the tube was milled in at least four places and then cut into equal segments with a circular slotting saw. Two rings of metal should also be turned about $\frac{1}{2}$ in. wide to be close fitting over the tubing to hold the segments when the jig is assembled for the winding. Slightly conical endpieces must also be turned and the centre drilled and threaded at one end to take a rod so that when this is tightened the cones will be pulled into the segments pressing them slightly against the retaining ring, so that the whole jig is rigid. The segments should all be numbered for identification and accurate assembly. A small hole is drilled and threaded at one end of one of the segments to hold the wire during winding. In the smaller diameter jigs, a central tube is advantageous to prevent sagging during winding as this will tend to make it difficult to remove the coil.

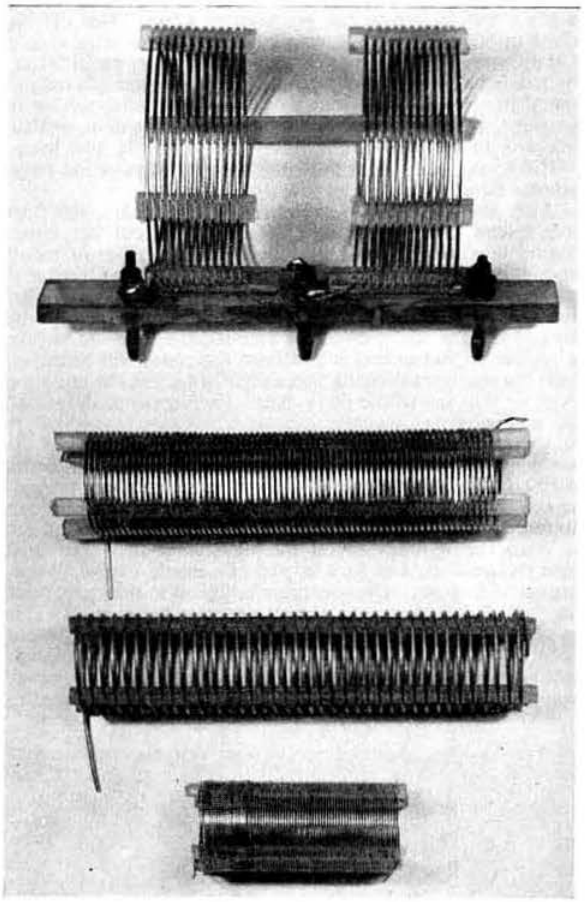
When the jig is assembled, the polystyrene strips are fitted into the grooves, and held in place by elastic bands. Winding can then begin. The wire must be fed on to the jig through an " eye," drilled to take the size of wire being used. This eye is fitted into a piece of hard wood, which is clamped in the tool holder of the lathe (wood is used to provide electric insulation), and a lug is soldered to it for a heavy gauge connecting wire. The back rest of the lathe must be used to



Jigs for the construction of various sizes of coils. The scale is in centimetres.

* *4 Woofindin Avenue, Sheffield 11.*

† Polystyrene sheet and rod may be purchased from Miltoid Sales Dept., 34/36 Royal College Street, London, N.W.1.



Typical air spaced coils made by G2HQ.

prevent the jig from being wrenched out of the chuck. After feeding the wire through the eye (which provides the electrical contact) it is fixed to the screw, and with the " back gear " in, the whole jig is rotated slowly by hand, the current being adjusted to produce the right temperature to melt the polystyrene as the hot wire comes into contact with it.

The transformer used by the writer for heating the wire is capable of supplying 60 amps at 13 volts. A Variac transformer is employed in the primary circuit to provide the necessary adjustment of the current. Heavy leads are used to connect the supply to the frame of the lathe and to the metal eye.

The wire from which the coils are made is heavy duty tinned soft copper fuse wire, which can be bought on small reels. Holding the reel firmly in one hand and pulling the lathe belt with the other, winding can take place at a fairly rapid rate. Care should be taken to see that the wire melts the polystyrene to a constant depth, and that there are no bad kinks. A current of 60 amps will be required for 16 s.w.g. but for 26 s.w.g. very much less. Provided that the screw cutting mechanism is working correctly all the turns will be perfectly parallel to one another, and completely sealed by the melted polystyrene.

When the winding is complete the jig can be removed by loosening the end plates so that the segments fall apart. The resulting coil has a pleasing appearance, and can be cut into lengths as required by sawing through the supporting polystyrene bars with a small fine toothed wetted saw.

One method of mounting the coils is to use strips of polystyrene cut to shape and fitted inside the coil. The supports can be cemented to the bars by employing a few drops of benzene as a solvent.

Transistor Circuit Design Made Easy

(Continued from page 580)

up a simple circuit such as one stage of the voltage amplifier design. Another way is to use a low voltage ohm-meter (providing the output polarity is known). The red terminal of an AVO becomes the negative terminal for current coming out of the instrument when used as an ohm-meter. The low ohms scale is used since this will have the internal battery with the lowest voltage.

Referring to Fig. 22 the procedure is:

Connect the positive output to the emitter, connect the negative output to the collector and connect the base to emitter. The " resistance " indicated is caused by the collector leakage current.

When the base is also connected via a 100 K ohms resistor to the negative terminal, the indicated " resistance " will change to a lower value because more current is flowing in the collector circuit. No change indicates a dud transistor.

Further Reading

A book which is suitable for further reading is the *Reference Manual of Transistor Circuits* price 12s. 6d. from booksellers or 13s. 6d. post paid (U.K. only) from Mullard Ltd.

Appendix

Steps of Class A Design

8. $$Rl = \frac{\frac{9}{10}\,V_s}{I_p \times \frac{1}{10}\,I_p} = \frac{\frac{9}{10}\,V_s}{\frac{1}{10}\,I_p} = \frac{9}{11}\,V_s/I_p \simeq \frac{8}{10}\,V_s/I_p \simeq 4V_s/5I_p$$

9. $$P_o = V^2_{rms}/R_{LS}$$
$$V_{rms} = \sqrt{P_o\ R_{LS}}$$
$$V_{LS} = \sqrt{2P_o\ R_{LS}}$$

10. Turns Ratio = 8/10 V_s/V_{LS} since base potentials are $\frac{1}{10}$ of V_s and another $\frac{1}{10}$ V_s is allowed for linearity reasons.

Steps of Class B Design

4. $I_{cpk} = 1{\cdot}41\ P_o/V_s + 10$ per cent for losses
$= 1{\cdot}51\ P_o/V_s \simeq 3\ P_o/2V_s$

6. An arbitrary choice meant to be a reasonable compromise to improve " cross-over distortion."

10. Each transistor provides half the full modulator voltage swing.

11. The presence of the diodes causes I_{bpk} to flow on both half cycles on both sides of the transformer.

So $P_{dpk} = 1{\cdot}2V \times 2\ I_{bpk} + 50$ per cent for inefficiences.
$P_{dpk} \simeq 1{\cdot}2 \times 3\ I_{bpk}$.

13. A *reasonable* inductance depends upon the lowest frequency it is desired to amplify. For instance: 300 mW output from a 50 mA collector current and lowest frequency 300 c/s requires primary inductance of 0·4H (while carrying 50 mA). An experienced amateur will be able to guess whether a transformer is adequate for the job by its size.

(*Concluded*)

Enquiries Regarding Bulletin Articles

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

Single Sideband

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

IT would be quite possible to continue the discussion on linear power amplifiers for several more months to come. However this topic has been under consideration in *Single Sideband* since last September and it is considered that the basic considerations and circuitry have been dealt with in sufficient detail to meet most amateurs requirements. This contribution will therefore be the last one devoted entirely to linear amplifiers and it is felt that some discussion of tuning-up and loading procedure will bring the subject to an appropriate conclusion.

R. F. Amplifier Adjustment and Loading

The discussion will be based on class AB1 tetrode operation because of its current popularity as a method of achieving good linearity and TVI free operation.

Fig. 1 shows a set of constant current characteristics for a typical tetrode valve. These curves show instantaneous values of anode and screen current for any given grid and anode voltage conditions. Inspection of the diagram will show that the lines of constant anode current are nearly horizontal, while the constant screen current lines are tilted upwards from left to right and are concentrated in the lefthand region of the plot. This is generally true of all tetrodes and accounts for the fact that the screen current meter is the most sensitive indicator of resonance.

A typical load line is shown in Fig. 1 and would be plotted as follows. Point O (at −55 volts on the grid in this case) is the operating point at which the valve rests with zero r.f. grid drive. The straight line OA represents a tuned r.f. circuit load (a pure resistance at the operating frequency). As 100 volts peak to peak grid drive is applied, the first positive half cycle can be represented by a point moving along the operating line from O to A and back to O again. During this half cycle the grid-voltage swing from −55 volts up to −5 volts and back to −55 volts has caused the anode current to swing from the value at point O (100 mA) up to the value at point A (850 mA) and back to 100 mA again. At the same time, the anode voltage swings from 2000 volts down to 500 volts. The a.c. anode current is made up of all the instantaneous values intercepted by the point travelling along the operating line. The same is true of screen current. During the 180 degrees of the driving cycle, the point travels from O down the slope through cut-off, to a point opposite −105 volts on the grid voltage scale and back to point O again along the operating line. The negative going grid voltage therefore swings the anode current down to cut-off (for a small portion of the cycle) and the anode voltage continues on up to 3500 volts and back down again due to the fly-wheel action of the anode tank circuit. This half of the load line is not normally plotted and is not important because the valve does not "work" during the negative half cycle.

* 5 Janice Drive, Fulwood, Preston, Lancashire.

As the load line is a function of instantaneous anode current and voltage, it represents in graphical form the load into which the valve is operating. Its value in ohms is therefore the *total* voltage swing of the valve anode (1500 × 2) divided by the maximum instantaneous anode current (850 mA). Expressed as a formula this is $R_L = 2\ (V_a - V_{a\ min})$ divided by I_a peak. From this it is seen that the *slope* of the load line is determined by the ratio voltage-swing/peak-current. If the value of peak current were higher, point A would be higher up the graph and the slope A−O would be steeper. A lower value of I_a peak would bring point A farther down the graph and the slope of A−O would be nearer to the horizontal.

Driving and Tuning

Now that it is possible to predict exactly what the screen and anode current will be for any instantaneous point during the grid voltage cycle, it is possible to answer some probing questions. What happens when we reduce the grid voltage to half? The answer is simple. The *length* of the operating line is merely cut in half. The grid voltage swings to only half the original peak-to-peak amplitude and the operating point O is still the centre of the new load line length Now what happens if we detune the anode tank circuit? This actually changes the anode load impedance, and this tilts or rotates the load line *about the operating point* O. As the load impedance is lowered (detuned from resonance) the operating line assumes a steeper angle (a zero impedance load would be represented by a vertical operating line).

As "seen" by the valve, the act of tuning to resonance amounts to increasing the load impedance to a maximum value consistent with the degree of aerial loading selected. Therefore the operating line will have *minimum* slope at resonance. Notice the angle at which the load line of Fig. 1 cuts the constant anode current lines. The angle is small. As the tank circuit is tuned out of resonance the operating line might assume the position indicated by the dashed line (lower impedance). Note that the angle between the dashed line and the anode current lines has not changed radically, and that the moving point will still intercept essentially the same anode-current values. This is precisely the reason that anode current in a tetrode is not a good indicator of resonance (very little dip). Look at the screen current. It consists of zero or even negative values in the out-of-resonance position. At resonance it is positive. Therefore a peak in screen current indicates resonance.

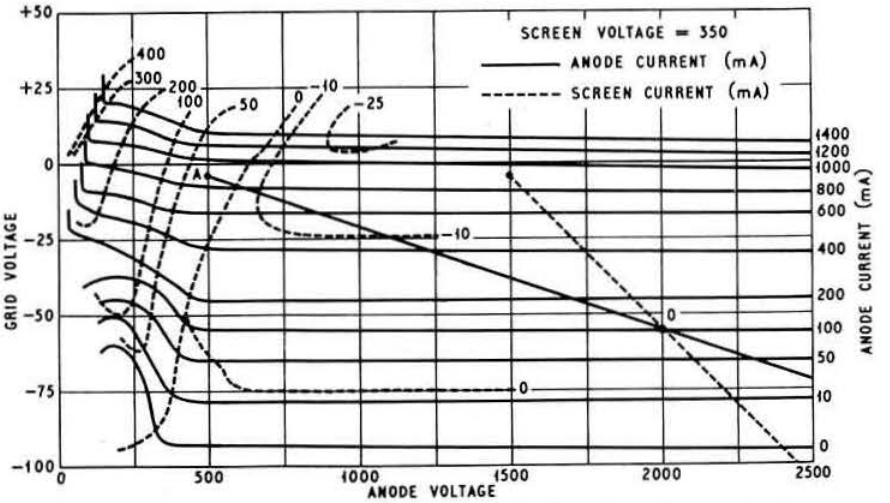


Fig. 1. Typical constant current characteristics of the Eimac 4CX300A Valve.

During the rotation of the operating line while tuning, its length actually changes, since it is confined vertically only by the constant peak-to-peak amplitude of the grid driving voltage (two imaginary horizontal lines, one at −5 volts and one at −105 volts). The length increases as resonance is approached and reaches a maximum at resonance. As the length increases, point A penetrates the heavy-screen-current region and the d.c. screen current reaches a sharp peak of resonance.

Loading

A change in loading merely changes the anode-load impedance (still resistive). Again, the effect is to tilt the load line about the operating point. As the load impedance is lowered (more coupling) the operating line assumes a steeper angle (such as the dashed line). It is easy to see that as loading increases, screen current decreases. Thus, screen current is also an indicator of loading.

During the r.f. cycle, the point traverses many different instantaneous values of screen and anode current. The *average* of all these values is what the d.c. meter in the circuit reads. For class AB1 operation the d.c. meter reading is approximately one third the peak value of current at the top of the operating line.

Tuning-up Procedure

Contrary to popular opinion, a linear amplifier should never be loaded for maximum power output. Loading should be set to obtain a predetermined value of screen current under single tone input driving conditions. It is recommended that the amateur try to duplicate as nearly as possible a given set of data sheet conditions as presented by the valve manufacturer. The peak-to-average ratio of d.c. anode current (as read on a fluctuating meter) varies with the individual voice, from 2 : 1 to over 3 : 1. Therefore it is normal on voice peaks for the anode current meter to read no more than half the true maximum signal value.

Tuning-up should be done on a dummy load and after matching a set of data sheet conditions, the amplifier is ready to connect to the aerial. If there is any change in the screen and anode current readings due to a small amount of aerial mismatch (small standing wave on the line) it should be possible to repeat the data sheet conditions by merely adjusting anode tuning and loading with the same drive level as before. Now, remove the carrier or inserted tone, and set up for voice single sideband drive and adjust the audio gain control for the highest level possible without drawing grid current on voice peaks or flat topping (check this with an oscilloscope).

Screen Protection

It is dangerous to operate a tetrode power amplifier with the screen voltage supplied from a separate power pack. Any failure of the anode supply—even momentarily—due to a fault or the failure of a "tired" fuse will result in excessive screen current, excessive screen dissipation and resultant valve failure.

Screen protection can take a number of forms, but before using a given circuit it should be examined to ensure that it is capable of maintaining the correct screen voltage in the presence of moderate negative d.c. screen current, or normal positive values of current, and the protective circuitry must not allow a condition of excessive screen current (positive or negative) to persist.

For the amateur, voltage regulator valves offer a simple and nearly foolproof method of screen protection. An appropriate combination of VR valves to add up to the desired screen voltage, connected in series to earth and fed from the anode high voltage supply through a dropping resistance, adjusted so that the VR chain extinguishes at the value of screen current that produces maximum rated screen dissipation, will give a high degree of protection. Excessive positive screen current will extinguish the regulator valves and lower the screen voltage, while normal values will be maintained at the desired level. Negative current will not change the voltage but will merely increase the current flowing through the VR valves.

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LONDON S.S.B. DINNER

It is proposed to hold a dinner for single sideband enthusiasts in London during the early autumn. Those interested are invited to write to either J. A. Steele (G3KZI), 12 Broadwalk, Woodford, London, E.18, or to R. F. Stevens (G2BVN), 51 Pettits Lane, Romford, Essex, in order that the likely support for such a function may be judged.

The Ex-G Radio Club

APROPOS the paragraph published on page 545 of our May issue the President and Editor of the Club's *News Bulletin* is R. H. Cherrill (W3HQO), 8005 Palmetto Street, Philadelphia 11, Pa., and not as stated. Owing to business commitments Mr. Almond, (G3NUY) has given up the post of U.K. distributor for the Ex-G Radio Club membership lists. The task is now being undertaken by Mr. H. J. Basterfield (G4MJ) of Quinton, Birmingham.

Speedy Recovery

TO Tommy Price (G3KDH), ex-Wembley speedway rider, who crashed during the Easter Monday motor-cycle road racing meeting at Thruxton, Hants. He was taken to hospital with a suspected fractured collar-bone. Tommy Price was British Speedway Champion in 1946 and World Speedway Champion in 1949.

A Transistorized Crystal Activity Check Meter

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

SUPPLIES of cheap ex-government crystals are fast diminishing and it is becoming increasingly difficult to obtain crystals of exactly the wanted frequency. However, crystals of odd frequencies are still available, usually lower than required, and it is possible to etch or grind these units to the frequency required. Those who have attempted to alter such crystals know how easy it is either to shift the frequency too high or to ruin the activity of the crystal. It is usual therefore to build a small valve oscillator using the Pierce circuit to check both the activity and frequency of the crystal under test.

After a suggestion by G6LL the writer built a transistorized version of the Pierce oscillator with a diode and a d.c. amplifier to measure the output, which was found to be proportional to the activity of the crystal under test. The use of transistors makes the device readily portable and it is possible to check crystals for activity at the time of purchase.

It must be appreciated that this device can only be used to compare the activity of different crystals (or the same crystal before and after cleaning or etching) and does not give absolute readings of crystal activity, neither is it usable on low frequency crystals below 3 Mc/s.

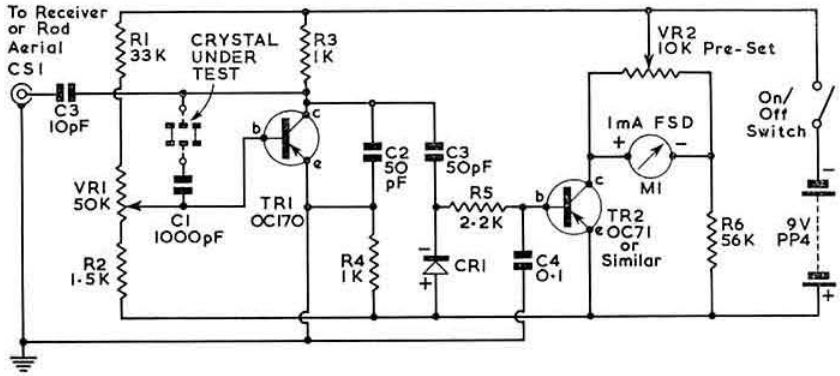

Fig. 1. Circuit diagram of the transistorized crystal activity check meter.

The Circuit

In the circuit shown in Fig. 1, an OC170 or XA131 v.h.f. transistor is used as a Pierce type oscillator, frequency and output being controlled by the crystal under test though the base bias of the oscillator transistor is controlled by VR1 so that the output may be adjusted to give a suitable reading on the meter.

As the collector current of the oscillator transistor TR1 shows only a small difference between the oscillating and non-oscillating condition it is necessary to sample the r.f. produced and rectify it with a germanium diode CR1, employing an audio type transistor TR2 to amplify the rectified current so that an indication can be obtained on the meter. It is necessary to balance out the small leakage current of TR2 and the network VR2. R6 is used to zero the meter when TR1 is in the non-oscillating condition. VR2 is a pre-set control and needs no adjustment once the zero has been set.

With such an indicating device it is clear that the readings will be far from linear and even though a transistor capable of oscillating at some 150 Mc/s is used for the oscillator TR1, the device is somewhat frequency conscious making absolute activity readings impossible to achieve.

A coaxial socket CS1 is provided so that a receiver may be coupled to the unit for frequency measurement purposes. Alternatively, a small rod aerial may be used. It has been found that 8 Mc/s crystals give sufficient 18th harmonic output to provide an S9 signal in the 144 Mc/s band and can be used for 2 metre converter alignment purposes, VR1 serving to control the output quite smoothly from S9 to zero. A high activity crystal may cause "squegging" at a high setting of VR1 making exact detection of frequency difficult or impossible to achieve, but if VR1 is adjusted to give a reading on the meter of something under full-scale deflection no trouble should be experienced.

Construction

The device is built on the lid of an aluminium box 5¼ in. × 3 in. × 2½ in. with the panel layout shown in Fig. 2. TR1 has its collector connected directly to pin 1 of the B7G holder, its base to the slider of VR1 and its emitter direct to an earthing tag on the panel. The indicating section and other components are fitted to a piece of paxolin attached to the back of the 1mA f.s.d. meter as shown in Fig. 3. An Ever-Ready PP4 9 volt battery is used to power the unit and lasts almost its shelf life, total current consumption being less than 3mA.

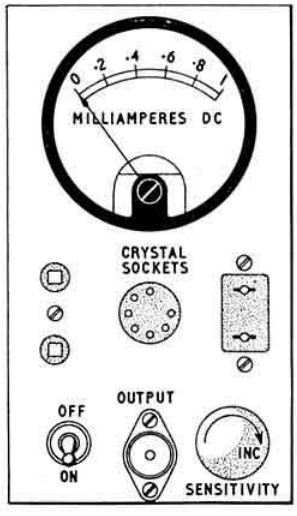

Fig. 2. Front panel layout of the crystal activity meter.

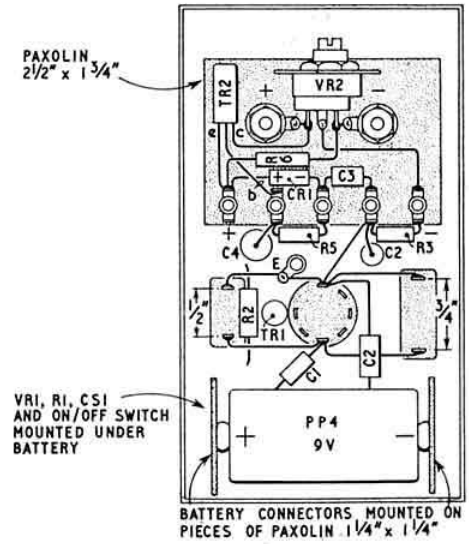

Fig. 3. Layout of the components on the paxolin sheet attached to the back of the meter.

* 192 Haselbury Road, London N.9.

Mobile Column

By C. R. PLANT (G5CP)*

THE writer recently came across a transistorized converter in the Australian magazine *Amateur Radio* which seems to offer an efficient unit in a very simple form. The author, VK2SG, surveys the normal methods used for conversion and compares their operation—on the face of it the transistorized version has a great deal to offer. It is run by two 3 volt torch batteries the current demand being a mere 2 mA; the use of local batteries cuts out noises often present when the car accumulator is used. The unit, being an untuned device, may be hidden away in a glove compartment but access is necessary for coil and crystal changing and for switching on and off. Referring to Fig. 1 it will be seen that the band coverage, tuned on the car radio, gives excellent spread on all bands from 1·8 to 28 Mc/s. A claim is made that this unit gives a performance equal to its valved counterpart; the stability is extremely good, there is no heating up period, and operation is simple. A Pierce oscillator circuit is used, the small link coil wound over the cold end of the oscillator coil forming the injector. The mixer circuit corresponds to the triode valve mixer using cathode injection from the oscillator, the major difference being the low input impedance of the transistor compared with the relatively high impedance of the valve. Although many surplus crystals lend themselves readily to overtone operation, it is recommended that commercial overtone crystals be purchased for the 14, 21 and 28 Mc/s bands. All the inductances are wound on slug tuned ½ in. diameter formers and shunted with the capacities shown in the table. The neon tube NE2 is used as a protective device to prevent damage to the first transistor from r.f. surges; it was obtained from the aerial circuit of a "Command" receiver. The substitution of a Zener diode type ZA6 will give even greater protection.

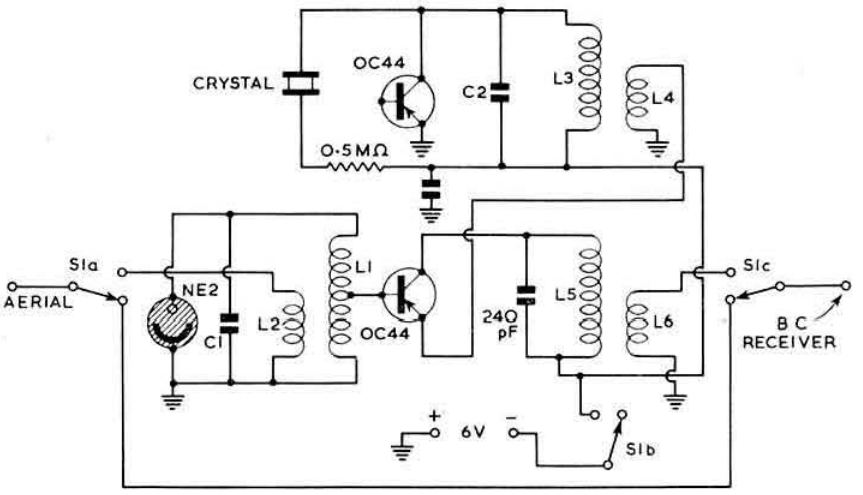

Fig. 1. Circuit diagram of a transistor converter. Details of the coils are given in the accompanying table.

For the benefit of anyone using transistors for the first time, here are a few tips:

(i) If possible always wire a transistor holder into the circuit—the transistor can then be kept away from heat (a killer of transistors) and plugged into circuit when the wiring has been completed.

(ii) If for some reason the above recommendation has not been accepted, be sure to use a good heat sink and hold it in position for several minutes after the soldering iron has been removed to ensure complete heat dissipation—preferably use a "non electric" iron.

(iii) Always "earth" to the chassis the positive pole of the battery—a reversed battery connection will ruin the transistor.

Forthcoming Mobile Rallies

More information has now been received concerning the **Bridlington Mobile Rally** to be held at the Spa Royal Hall, on **June 24.** Proceedings open at 1 p.m., but the work-in stations, G3GBH/A on Top Band and G3FKV/A on 144 Mc/s, will commence operations at 11 a.m. A Mobile Radio Ramble is planned to cover a 20 miles course with time checks, transmission and reception tests, route finding, etc. For those who enter this should be extremely interesting. Entry application should be addressed to the secretary and it is also necessary to book in advance if tea is required; the charge is 7s. 6d. per person. The address is Mr. I. Purves, 10 Meadow Road, Bridlington, E. Yorks. A lecture will be given at 3 p.m. by H. Jones (G3GBH) entitled "Vehicle Interference Suppression." Mobile installation judging will take place and the grand raffle and prize presentation will be at 5.30 p.m.

The **A.R.M.S. International Rally** will take place on **Sunday, June 24,** at the U.S.A.F. Base, Barford St. John, Oxford. The organizing committee has five U.S. amateurs on it so the international flavour should be apparent in the competitions and displays. The British Red Cross Society will give demonstrations of the latest "Kiss of Life" method of artificial respiration and arrangements have been made to keep the children and the XYLs fully engaged. Canteens will be available, parking is free and the Hon. Secretary (G3FPK) says that there are lots of surprises in store for all who make the effort to attend.

The **South Shields Mobile Rally** will take place on **Sunday, July 8,** at Bents Park Recreation Ground, Coast Road, South Shields. The talk-in station will be G3DDI on 1980 kc/s from 11 a.m. onwards and competitive events arranged for all visitors are timed to commence at 2 p.m. A special contest for mobile operators attending the Rally opens at 23.01 G.M.T. July 7 on Top Band only when operators are invited to work as many /M stations as possible. The completed logs are to be handed in on arrival at the reception point and the winner will be awarded a prize. Light refreshments will be available at the site but for those requiring a full meal, there are several good restaurants and hotels nearby.

The **Southern Counties Mobile Rally** is to take place on **Saturday, July 14,** and will form part of the Great Southampton Show, which is located on Southampton Common, the route being A33, The Avenue, to the site. The work-in stations will be G3IVP/A on 1880 kc/s and G3ION/A on 144·14 Mc/s; both stations will open at 10 a.m. Prizes and a free draw have been arranged and competitions include an award for the longest distance travelled. A special car

* "Lynton," *12 Nottingham Drive, Wingerworth, Chesterfield, Derbyshire.*

park has been arranged and visitors are requested clearly to display their call-signs so that the attendants may recognize radio visitors and so direct them to the enclosure.

The **Ariel Radio Club (B.B.C.)** is holding a Mobile Rally in conjunction with the B.B.C. Club's Summer Festival at Motspur Park, New Malden, Surrey, on **Saturday, July 14,** from 2 to 11.30 p.m. The programme will include buffet tea, children's tea party, dancing, mobile bars and a cabaret. There is ample parking on the site and admission will be 1s. The talk-in stations will be G3GDT on 1970 kc/s and G3AYC on 144·7 Mc/s.

Rally Reports

The first Mobile Rally of the season, held at **Trentham Gardens** on **April 29,** proved to be a greater success than ever. The Trentham authorities gave the attendance as approximately 4000 and 500 cars, of which more than 300 were fitted with transmitting equipment. A survey of the bands in use showed that Top Band is still the most popular, with 144 Mc/s a poor second, but several stations were equipped for h.f. and v.h.f. using separate units for each.

Coil, Capacitor and Crystal Table

Band	Coil Details	C1	C2	Crystal	I.F. Range
1·8 Mc/s	L1 140 turns 40 s.w.g. enam. tapped at 25 turns L2 10 turns 36 s.w.g. enam. L3 100 turns 36 s.w.g. enam. L4 10 turns 36 s.w.g. enam.	40pF	40pF	2700 kc/s	700– 900 kc/s
3·5 Mc/s	L1 60 turns 40 s.w.g. enam. tapped at 16 turns L2 8 turns 33 s.w.g. enam. L3 82 turns 33 s.w.g. enam. L4 5 turns 35 s.w.g. enam.	40pF	40pF	2850 kc/s	650–1150 kc/s
7 Mc/s	L1 35 turns 28 s.w.g. enam. tapped at 10 turns L2 6 turns 28 s.w.g. enam. L3 40 turns 28 s.w.g. enam. L4 4 turns 28 s.w.g. enam.	33pF	33pF	6350 kc/s	650– 950 kc/s
14 Mc/s	L1 23 turns 24 s.w.g. enam. tapped at 6 turns L2 5 turns 24 s.w.g. enam. L3 26 turns 24 s.w.g. enam. L4 3 turns 24 s.w.g. enam.	15pF	15pF	4450 kc/s third overtone	650–1000 kc/s
21 Mc/s	L1 15 turns 20 s.w.g. enam. tapped at 5 turns L2 3 turns 20 s.w.g. enam. L3 15 turns 20 s.w.g. enam. L4 2 turns 24 s.w.g. enam.	15pF	15pF	6783 kc/s third overtone	650–1100 kc/s
28 Mc/s	L1 12 turns 20 s.w.g. enam. tapped at 4 turns L2 2 turns 20 s.w.g. enam. L3 12 turns 20 s.w.g. enam. L4 2 turns 24 s.w.g. enam.	15pF	15pF	9283 kc/s third overtone	650–1600 kc/s

All coils are wound on ½ in. diameter dust-iron cored formers

Personalities at the Trentham Gardens Mobile Rally

The Lord Mayor and Lady Mayoress of Stoke-on-Trent with a number of well-known Midland amateurs at the Trentham Gardens Mobile Rally on April 29, 1962. The Chairman of the Rally Committee (G3JPN) and the President of M.A.R.S. (G2AJK) are to the right of the Mayoress, whilst G3UD, G5PP, G3NAQ and G3EHM are in the back row. The young lady is Lesley R. Parkes.
(Photo by Holloway Studio (B'ham) Ltd.)

The Rally was officially opened by the Lord Mayor of Stoke-on-Trent (Alderman William Hancock, J.P.), after which Lesley Parkes, seven-year-old daughter of G3EHM, presented a bouquet to the Lady Mayoress.

Closed circuit TV was demonstrated by the M.A.R.S. TV Group and members of B.A.T.C. About 25 manufacturers, societies and representatives of H.M. Forces had stands at the Rally and demonstrations of equipment and radar were given. There was also a radio controlled model section which put on several shows. In the draw for prizes, conducted by Miss Jennifer Rawlings, there were 80 lucky winners. The organizing Committee consisted of G3NAQ, G5PP, G3BA and Howard Parker, a TV expert, under the Chairmanship of G3JPN. Their efforts deserve the highest praise—the attendance figures, almost double those of last year, speak for themselves. Competitions for the best mobile installations resulted in certificates being issued to, amongst others, G3BMN, G3LHA, G3LZY, G3GTN, G3JFH, G3IPL, G3OVM, G3FUR, G6GR and G8CK. One visitor, a boy of 13 years, came by himself from Liverpool—such enthusiasm surely deserved a prize!

At the Trentham Rally
From left to right, G3BA, G3EJO and G3APD.
(Photo by G5CP)

MOBILE RALLIES
1962

June	17	Longleat Mobile Rally, Bristol R.S.G.B. Group, Longleat House, nr. Warminster, Wilts.
June	24	A.R.M.S. Rally & A.G.M., U.S. Air Base, Barford St. John, Oxon.
June	24	East Yorks. Coast Mobile Rally, Spa Royal Hall, Bridlington, E. Yorks.
July	8	South Shields & District Mobile Rally, Bents Park Recreation Ground, South Shields, Co. Durham.
July	14	Southern Counties Mobile Rally, Southampton Common, Southampton, Hants.
July	14	Ariel Radio Club (B.B.C.) Mobile Rally at B.B.C. Club Summer Festival, Motspur Park, New Malden, Surrey.
July	15	Harlow & District Mobile Rally, Magdalen Laver, Essex.
July	15	Chiltern Amateur Radio Club Mobile Rally, West Wycombe Park, Bucks.
August	19	Derby Radio Societies Mobile Rally, Rykneld School, Derby.
August	25	Houghton and District Radio Club, Hetton and District Trade Society, Hetton, Co. Durham.
August	26	Stockport Radio Society Mobile Rally, Pavilion Gardens, Buxton.
Sept.	2	Thames Valley Amateur Radio Transmitters' Society Mobile Rally.
Sept.	9	R.S.G.B. National Mobile Rally, Woburn Abbey, Beds.
Sept.	16	Lincoln Radio Society Mobile Rally, North Kesteven Grammar School, North Hykeham, Lincoln.
Sept.	22	Region 9 Mobile Rally at Weston-super-Mare.

The **Thanet Radio Society Rally** took place on **May 6** from a site overlooking Pegwell Bay but the overcast skies and strong winds made aerial erection difficult and tended to spoil what would have been an extremely pleasant day. Approximately 100 people attended and 15 of the cars were fitted with radio transmitting equipment. The farthest distrance travelled was that by G2AVC/M and his wife G3GOX from Hansworth, Middlesex; the prize for the farthest contact went to G3JEQ/M. Awards for the best mobile equipment were won by G3PNU/M for the best transmitter, G3ONR/M for the best receiver and to G3IEX/M for the safest installation.

The **West Kent Amateur Radio Society Rally** also held on **May 6** took place at Tunbridge Wells and drew a total of 90 visitors and 30 mobiles. The poor weather turned what is normally a beautiful park into rather a dismal place, but despite this a happy time was enjoyed by all who attended. In view of the weather it was decided to put all the prizes into the raffle and so six ladies and eight gentlemen's prizes were presented to the lucky winners. The 144 Mc/s station G4IB/M was very successful in working incoming visitors but the Top Band station G2UJ/A experienced difficulty due to being crystal controlled and so being unable to move out of QRM.

The **R.S.G.B. National Rally** organized by the Grantham & District Radio Society and Stamford R.S.G.B. Group took place in the grounds of Belton House, Grantham, on **May 13.** The cold wind and dull weather was no doubt responsible for the poor attendance but those who braved the elements spent a pleasant few hours inspecting the fine 17th century home of the present Lord Brownlow and meeting old and new radio friends.

"The First Weekend of July"

The V.H.F. National Field Day will be something quite new in Contests: Inter-Group Rivalry: Phone at last!

By JACK HUM (G5UM)*

IN approximately a fortnight's time something quite new in the calendar of R.S.G.B. contests will take place—the first ever V.H.F. National Field Day. The following notes describe something of the thinking that prompted its inauguration.

When members of the V.H.F. Committee observed during 1961 the large number of group and club—as distinct from private—stations which were put into the field that year for the v.h.f. events they felt that many members would approve of the idea of placing this random inter-group rivalry on to a more organized basis. Already, it was argued, there was immense competition during the traditional first weekend of June when the "low frequency" N.F.D. was held. Could not this enthusiasm be extended to the v.h.f. as well?

The feeling of the V.H.F. Committee was that it could, and the Contests Committee upon being consulted concurred. Accordingly, it was agreed to go ahead to institute what would be known as V.H.F. National Field Day. The date almost suggested itself: the first weekend of July was more or less a "natural," since most groups and clubs, already organized for the June event, would find that the logistics would click conveniently into place if the v.h.f. event were held only a month later. What is more, the middle weeks of the year can be hopefully (but not confidently!) expected to produce above average conditions at v.h.f.

To make things easy, the first National Field Day will be confined to the 145 Mc/s band, but in 1963 when other v.h.f. and u.h.f. bands will be employed a certain piquancy will be added to the proceedings, especially if the tougher u.h.f. bands rate for bonus points! (Personal comment this; not intended in any way to compromise future decisions of the V.H.F. and Contests Committees.)

Members who contributed to the discussion in the BULLETIN some time ago on "Phone on National Field Day" will at last have their requirements met by reason of the fact that telephony will be allowed during the forthcoming V.H.F. National Field Day on a band where it has much more logic than in the chronically over-crowded h.f. spectrum.

The Awards

Members will have noticed from the rules for this new contest published in the April BULLETIN that certificates of merit will be awarded to groups or clubs in top positions. But if discussions now proceeding should mature there is every chance that the Council will allocate a special trophy for this now annual contest.

And now with this brand new transmitting contest only a couple of weeks ahead the hope may be expressed that V.H.F. National Field Day will prove to develop into an annual event of even greater appeal than the traditional National Field Day. For there will be much more room to move around frequency-wise, phone will be permitted, and above all there will be that relaxed atmosphere special to "Two" which encourages people to stop to talk awhile at the height of a contest, and to exchange courtesies as though the phrase "rat race" had never been invented. So far as v.h.f. is concerned, probably it hasn't!

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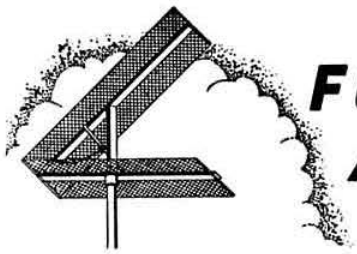
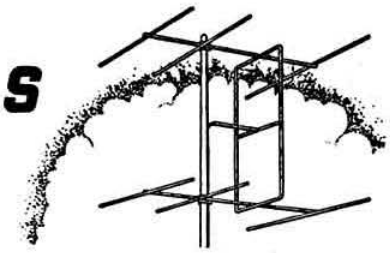
* *Member of the V.H.F. Committee, Bulls Green, Knebworth, Herts.*



FOUR METRES AND DOWN



By F. G. LAMBETH (G2AIW)*

IT is not very usual to hear from a Past President of the Society that he is again active on 2m, but this is so in the case of G6GR who became operative on the band as soon as it was released. Previously he had a long record on 5m. The frequency now being used is 145·35 Mc/s from the north-west corner of Wolverhampton where an eight element stack has been erected at 55 ft. in average flat type of country. The present transmitter is a Withers TW2 taken from the car, a very efficient little rig, while the old 90 watt push-pull Eimac 15Es will be coming along soon. A Nuvistor pre-amplifier in front of the cascode converter has done a lot of good. No striking results have been reported yet, and it would seem that the QTH is " equally weak in all directions." Stations well received include G5MA, G5YV, and GB3VHF; GI stations are being heard and a few c.w. contacts have been made at over 100 miles. We expect to hear more later from " the old dog who will not lie down." Activity will include work on 4m and 70cm. There is of course another Past President (G5QA) who is keeping 2m and 70cm busy down Devon way. Are there any others hiding their lights under bushels? [What about G6NF and G2WS?—ED.]

Cornish Activity

G3OJY (nr. Penzance) reports on 2m activities in Cornwall. Stations currently active are G3XC (nr. St. Columb) 144·135 Mc/s, G2BHW (Falmouth) 144·46 Mc/s, G3JFS/M (Helston) 144·275 Mc/s (approx.), G3CZZ/M (nr. Redruth) 144·065 Mc/s (approximately) and G3OJY on 144·130 Mc/s. The use of out-of-Zone frequencies is due to interference from f.m. experienced by stations in the Plymouth district, although G3OJY is going to attempt to use an alternative frequency of 144·036 Mc/s shortly in the hope of being able to get below this interference. There is a possibility more Cornish stations would come on to 2m if operators outside Cornwall were to show an increased interest in attempting to work this county.

G3XC and G3OJY are both able to go out mobile and do so from time to time. During the 144 Mc/s Field Day G3XC/P heard G3MAR/P at good strength, but was unable to work him; however, he did work G3MRA/P in Hampshire, as did G3OJY from his home QTH, a distance of some 200 miles. G3OJY/M was out on May 2 at The Lizard, 350 ft. a.s.l., and worked into South Wales, raising GW3MOP four miles west of Swansea, and GW3CBY in Swansea at 59 both ways, running a Heathkit Pawnee transceiver at 18 watts input and a 5 element Yagi. On the same evening he worked G3LTN (Weyhill, Andover) at 56 and F2NX (Granville, Manche) at 58.

G3XC, G2BHW and G3OJY are on the band most evenings and would appreciate stations outside Cornwall turning their beams in a s.w. direction in the hope of working one of them. Judging by results obtained recently under not too good conditions there would appear to be quite a fair chance of working into Cornwall. G3OJY has a reasonably good home QTH as does G2BHW, both being on moderately high ground and having fair take-offs.

GW3MOP and GW3BHY are both on the band between 18.30 and 19.00 G.M.T. most evenings, with their beams in the direction of Cornwall and Devon, looking for contacts. GW3MOP reports the beacon station GB3CTC as being consistently 59 with him in South Wales.

G3OJY is now using a Heathkit Seneca VHF-1 transmitter running 120 watts on c.w. and 95 watts on phone with carrier controlled modulation. The receiver is a G2YH converter, using two 6CW4s in cascode, feeding an AR88D. He also uses the Pawnee transceiver in the home station from time to time. G2BHW is in the process of constructing a new 2m rig using two 6CW4s in cascode in the front end of the receiver section. He is also building a new aerial array which will be going into operation later this summer.

The times of operating for G3XC, G2BHW and G3OJY are from about 19.00 G.M.T. most evenings and from about 09.30 G.M.T. on Sunday mornings. G3CZZ/M is on most Sunday mornings from about 09.30 G.M.T. to about 12.00 G.M.T. from a site 750 ft. a.s.l. near Redruth.

Reports on the beacon station, GB3CTC, would be appreciated, and should be sent direct to G3CZZ, or communicated to any Cornish station.

Two metres in Cornwall is not dead, neither is the bottom of the 2m band, so how about some of those fine aerial arrays " up country " being moved around in that direction if they have not become stuck in the E-DX position?

Scilly Isles Expedition

G3OSS gives the following information about the Scilly Isles Expedition **GB2IC** which will commence on June 16-17 and last for two weeks. G3OZF will be in charge, and operation will be on 144·03 Mc/s as follows: Skeds or general 21.00-22.30 G.M.T., checking bands for general calls 21.00-23.00 G.M T. Skeds can be arranged between 05.00/07.30 G.M.T. if there is sufficient interest. The gear comprises a transmitter using a QQV03-20A at approximately 50 watts phone and c.w., a converter loaned by Withers Electronics and a 6-over-6 aerial loaned by J-Beam. Operation on Top Band will include arranging skeds for 2m. The address for correspondence is City & Guilds Radio Society, Imperial College, South Kensington, S.W.7.

The Scottish Scene

From recent reports the inference would not be correctly drawn that the only v.h.f. activity in Scotland has been in the North East of Scotland. There has, in fact, been a better general level of 2m activity there in the first few months of this year than for many a long day. Talks and demonstrations given over a year ago have resulted in many new stations coming on the band. A bit of friendly rivalry between a few

* *R.S.G.B. V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex. Please send all reports to arrive by June 20.*

West of Scotland stations as to who would work most 2m stations during 1962 has led to the band being scanned eagerly for new ones. The geographical and propagation conditions are such, however, that in the first three months no one had progressed beyond the 29 mark, and it is perhaps significant that no G station was reported heard in the West during that entire period, although one or two had been worked by East Coast GM stations. It is only since the latter part of April that some signals have begun to filter through.

Despite his plea in the April issue, the signals of GM3LTJ (Aberdeen) have not yet been reported heard in the West, but GM3NG (Carluke) has worked GM3JFG and heard GM3ODP, both in Ross-shire.

The following list, compiled from the logs of several of the most active operators, is of stations known to have been on the 2m band in Scotland, even if only briefly, since the beginning of the year. To this should perhaps be added G3BA and G3BAK, both of whom operated mobile for short periods in Scotland.

GMs 2UU, 3NG, 3UM, 4HR, 4HX, 4QV, 5VG, 6KH, 6SR, 6TF, 6XW, 6ZV, 2CHN, 2CQI, 2FHH, 2FNF, 3BCD, 3CIX, 3DDE, 3DIQ, 3ENJ, 3EGW, 3FGJ, 3FMD, 3FSD, 3FYB, 3GUI, 3GUO, 3HLH, 3INK, 3JFG, 3JRP, 3JWS, 3KGJ, 3KXM, 3KPD, 3LAV, 3LCP, 3LDU, 3MAS, 3MJE, 3MWX, 3MZZ, 3NZI, 3OCV, 3ODP, 3OFY, 3OJA, 3OQS, 3POK, 3PMB (from GM2CHN).

Scottish 2m activity has been fairly low of late but it is usually possible to make a QSO. A new call heard recently was GM3POK (Edinburgh) who had a contact with GM6RZ (Edinburgh). GM3ENJ is back on 2m. Stations joining the s.s.b. fraternity include GI5AJ, GM3CIX (Barrhead), GM3FGJ, GM3DDE and GM3KPD, indeed GM3DDE has already produced an s.s.b. signal on 2m. GM3EGW and GM3FYB will be on soon.

New Internal Irish 144 Mc/s Record

EI6AI (Bruckless, Co. Donegal) worked EI2W (Dublin) for a new Irish internal record on April 24 at 19.53 G.M.T. The distance is 142 miles, but EI6AI is located in the Donegal Highlands surrounded by mountains. EI6AI is on most evenings and has already worked EI2A (Navan, Co. Meath).

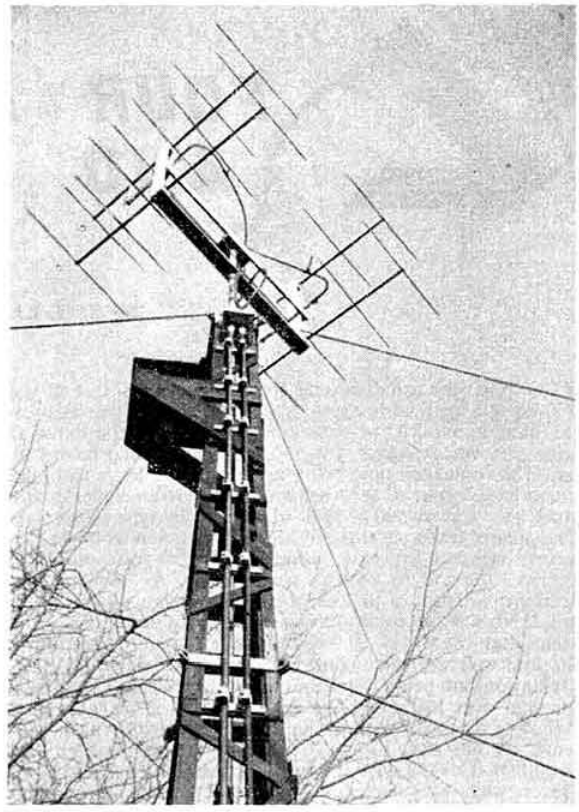
Two Metre News and Views

G3KMS (Macclesfield) reports that G3JZN, G3GMR and G3KMS operated GW3JZN/P from Drum mountain, seven miles s.w. of Conway (Caernarvonshire) during the 144 Mc/s Field Day, 105 contacts being made, including seven with GMs. GC2FZC was an excellent signal throughout the day but was not raised. There was a short auroral opening during the afternoon but only GMs and GIs were heard.

G3LCK (Canterbury) says 2m activity has been very limited since the beam came down in February. However a two element Yagi in the roof space has made some QSOs possible—even F3XK and ON4AB/P! On a recent trip to Holland G3LCK had the pleasure of personal QSOs with PA0COB and PA0KT and G2JF was actually heard in QSB. It's sometimes rather nice to be at the DX end.

It was pleasant to receive a note from **G3LSF** (nr. Ormskirk) who found conditions very good between May 1 and 4, when G3EHY (Banwell), G3PBV and EI2A were worked. G3LSF is on the band every weekday at 22.00 G.M.T. on 145·460 Mc/s, looking south. Local activity is not very high at present apart from a nightly sked with Blackpool stations G6MI, G5VN and G5TH. The Southport Radio Society is on 2 every Sunday evening from about 17.00/22.00 G.M.T., using its call G3FJG and would welcome QSOs. The transmitter runs 10 watts to an 832, with a G2IQ converter into a Command receiver. As the club has no mains supply, the combined unit is run off 12 volts. The aerial is an eight element Yagi at 50 ft.

G2HIF (Wantage) says that he and G3NNG have grown tired of jamming each other at two and a half miles range during previous /P contests, and are combining their resources under the A.E.R.E. (Harwell) A.R.C. call-sign G3PJA during the portable events of May and July. Basically the rig will be the G2HIF standard outfit with a 6-over-6 at 40 ft. with the addition of a new Nuvistor preamp providing dual outputs with the G2HIF receiver and the G3NNG new transistorized job in the second receiving position.



The aerial system at G3HRH (Digswell, Herts) comprises two 144 Mc/s 5-over-5 Yagis side by side, with separate feeders back to the shack. Each 5-over-5 has its own Pawsey stub balun. The measured gain of the combined array, which is 33ft. above ground at the centre, is 15 db relative to a halfwave dipole.

G3KXA (Solihull) will be in Wales from July 2 to 14. Operation will be each day between 18.00/20.30 G.M.T. (or later depending on demand). As much operation as possible will take place during the weekend July 7-8. It is hoped to visit every Welsh county. This seems an excellent chance for those county chasers who missed the previous expedition. G3KXA hopes to pass on day to day information to G3BA or G4LU, but will be arriving at Caernarvon on July 2. The equipment will include a QQV02-6 at 5 watts, and a five element Yagi at 24 ft. Frequencies will be 144·633 Mc/s, with 144·14, 144·15 and 144·38 Mc/s for emergencies and the call-sign GW3KXA/P.

G3NBQ (Coventry) reports on the expedition to Norfolk and Hunts from April 22 to 24 under the call **G3KEF/M** (145·28 Mc/s). From Norfolk (9 mile e. of King's Lynn) conditions were good on April 23, GB3VHF being 59+. The best QSOs were G3AOS, G4LU and G3EGK, with G3PLS and G3BA strongest from the Midlands. Activity in the South appeared poor and only G5DF and G3IAS were

worked on the 22nd; only G6OX was heard on the 23rd. From Hunts one station was worked on the 22nd, G3BA (S9+), despite many long CQ calls. On the 24th eight Midlands stations were worked at S9+ but no southern stations except G6GN at S7-8. On the journey home on the 24th GB3VHF was heard at a solid S8 on the halo. The biggest complaint, apart from activity, was the fact that there were many S7-8 stations with insufficient modulation—they could have been worked otherwise. A trip with G3KEF to Broadway (Worcs) on 144 Mc/s Field Day found them too centrally placed, as the band was " wiped out " with S9++ signals from all directions. Signals like ON4AB/P (S8/9 all day), GI3GXP, GI3KYP, G3ILD and GB3VHF were heard. They are going 170 miles farther north next time, " to get away from it all "! Conditions from Coventry (home frequency 145·22 Mc/s) have been variable, with April 24-25 and 27 the best. On the 24th GW3KXA/P (Montgomery), G3ILD and GB3VHF were all around S7. On April 25 ON4BZ (S8-9), ON4BD (S6) and GB3VHF (S6) were heard. Conditions were good on the 27th with GB3VHF at S9, G3ILD heard and G4NT, G3CO, G5HZ/P, G8DF, G3MNW and G3OQH worked. May opened with good conditions and some S9 DX signals including G3JHM/A. The most notable signals on 2m appear to be G3JHM/A and G3KMP—they come through at reasonable strength in the poorest of conditions.

G2HOP (Uffington) had worked 13 countries and 45 counties up to May 15 using a 829B in the final at 100 watts. The aerial is a 6-over-6 slot fed at 70 ft. and the receiver has a Nuvistor 6CW4 pre-amp ahead of a cascode c.c. converter. Since the aerial was raised from 50 to 70 ft. results have greatly improved, with weak PAs audible most days. The QTH is 146 ft. a.s.l. overlooking the Fens to the East, with a good take off in all other directions.

EI2W will be on 144·008 Mc/s during reasonable or good conditions, but he also has a transmitter working on 145·8 Mc/s for local contacts with EI or GI. There are now four active stations in EI : EI2A (new frequency 144·15 Mc/s), EI6AI (Donegal) and EI7D 144·2 Mc/s (Dublin) as well as EI2W.

G3LTF (Galleywood) had meteor scatter skeds with UR2BU on April 19-21, but only heard one short burst. Well, that's something, anyway! Better luck next time. Similar skeds with OH1NL were not successful—the latest were May 10-11. G5ZT was a fair c.w. signal on April 21 and it is thought GB3CTC was heard, but it was very weak. April 25 brought DL1SN, DJ2BE and DJ7BQ as firm QSOs. The band was " bedlam " and G3LTF says " with a bit more c.w., a bit less bellow and the odd 3·4 kc/s low pass filter in the modulator and we'd all work more and further DX."

G3PXB (Gloucester) was licensed on April 17 and came on 2m that evening. The rig uses a QQV03/10 at 15 watts and the aerial is a 4-over-4 slot 70 ft. a.s.l. By May 18 45 QSOs had been made.

Sr. J. L. Parejo-Bravo, chief of the radio and television technical services in the Balearics (Palma, Majorca) hopes to be on 2m and 70cm soon with an **EA6** call. On 2m he will run a QQE06/40 at 80 watts on A3 to a 10 element Yagi. On 70cm a QQE06/40 running 40 watts to a 12 element array will be used. The location is 3,000 ft. a.s.l. and should have possibilities over a wide distance (including Malta).

V.H.F. QSY

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

Crystals Offered

By Welwyn Garden City Group, c/o G5UM, " Wyldes," Burnham Green Lane, Bulls Green, Knebworth, Herts., has several 8100 kc/s in FT243 holders.

Crystals Required

By Welwyn Garden City Group, as above, crystals between 8040 and 8061 kc/s.

G3OSS (Finchley) has worked 47 British counties plus two in the Irish Republic with the best DX an SM6. In all, 12 countries were worked on 10 watts with a Withers TW2. A new transmitter running 120 watts to a QQV06/40A, is now in use. The transistor v.f.o. on 4 Mc/s beats with a 20 Mc/s crystal oscillator. There has been some criticism of the use of v.f.o.'s on 2m but G3OSS will always call CQ on 144·92 Mc/s in the London Zone specifically, moving to another part of the Zone in case of need. A collinear stack for 2m beamed on the Midlands and Wales will soon be in use, and comparative reports between this and the 6-over-6 will be welcomed. The low power transmitter used on 70cm is a modified Withers TW2 transmitter using a QQV02-6 as a tripler instead of a QQV03-10 in the p.a. The grid drive is 250 μA. With this rig PA0COB, G3JHM/A, and G3BYX and several others have already been worked. The high power transmitter using a 4X250B will shortly be running at 150 watts.

SM6PU will be looking for sporadic *E* contacts on 2m during the summer.

G4LX's Auroral Report

There was very little to report during the months of March and April 1962. In March, no auroral signals were heard as high as 144 Mc/s, although strong auroral reflection was observed on 88 Mc/s on March 5, 6, 12, 15, 19, 20 and 21. In April, SM6PU had auroral QSOs with SM7ZN on April 8, and with SM3AKW and SM4CDO on April 10. On other days during the month, disturbances were observed on 88 Mc/s on April 7, 11, 15, 21 and 22. On April 22 SM5LE was heard.

Seventy Centimetres

G3NOX/T has submitted a list of Continental stations active on 70cm, some of which are already well known. Their usual frequencies are given, which is a great help, and who knows, even the most distant of them may sometimes be raised.

DJ1CK	Munich	433·049 Mc/s
DJ1KC	Munich	433·100 Mc/s
DJ3QC	Erlangen	432·950 Mc/s
DJ3ENA	Feldberg	432·525 Mc/s
DJ4KH	nr. Nuremberg	432·54 Mc/s
DJ4TV	Munich	433·820 Mc/s
DJ5LY	Munich	432·902 Mc/s
DJ5LZ	Munich	433·179 Mc/s
DJ7GK	Munich	433·220 Mc/s
DL0SZ	Munich	432·008 Mc/s
DL1EI	Munich	433·420 Mc/s
DL1EY	Erlangen	433·150 Mc/s
DL1IS	Heidelburg	433·344 Mc/s
DL3SPA	Erlangen	432·325 Mc/s
DL6SW	nr. Stuttgart	433·782 Mc/s
DL9FX	Munich	433·80 Mc/s
DL9JH	Munich	433·333 Mc/s
DL9MW	Munich	432·900 Mc/s
DL9YZ	Munich	433·368 Mc/s
DM2ADJ	Possneck	432·050 Mc/s
OE2BM	Salzburg	432·435 Mc/s
OE2JG/P	Salzburg	432·450 Mc/s
OE5HE	Gmunden	433·120 Mc/s
OK1EH	Bor nr. Jackau	433·600 Mc/s
OK1VR/P	Schneekoppe	432·000 Mc/s
PA0FE	nr. Haarlem	432·05 Mc/s
PA0FP	nr. Haarlem	433·00 Mc/s
PA0AKA	nr. Amsterdam	432·519 Mc/s
PA0JPH	Hilversum	434·88 Mc/s
PA0LOD	nr. Amsterdam	432·00 Mc/s
PA0LWJ	Hoorn	434·16 Mc/s
PA0MAJ	nr. Amsterdam	432·42 Mc/s

During a recent opening G3NOX/T located a Dutch amateur, PA0COB, who is very keen to take TV pictures. He has built a TV converter and during the next opening it is almost certain that the first G/PA TV contact will be achieved. PA0COB has a film camera ready and will send over pictures for this feature as soon as he is successful. During the opening on April 25 from 19.00-22.00 G.M.T. G3NOX/T worked PA0KPO, ON4HC and PA0COB and heard DL3FR. Conditions were first suspected to be good when an excellent TV picture from France (819 lines) was received; the first station heard on 70cm was a PA. G3NOX/T has a 23cm c.c. converter nearly finished and will be in a position to receive on that band, using a large parabolic aerial, in a few weeks' time.

G3LTF (Galleywood) had some nine QSOs with G2CIW (Birmingham) during the latter part of April, and on the 25th worked DL3FR, ON4HC, ON4ZN, ON4ZK, PA0COB, PA0KPO and DL3YBA. PA0KT and F8AA were heard. It really sounded more like 2m.

G3PUR/T (Worthing) is now fully operational on 70cm and has worked G3JHM/A many times on sked. The equipment is extremely simple being a 2m exciter (12AT7, 5763, 832) and a QQV06-40 tripler p.a. to a 16-element stack with a mesh reflector. A TV transmitter at G3JHM's home QTH has been successfully modulated, the receiver being a modified P58. When the apparatus is completed it is hoped to send video across the town. Listener reports and QSOs with any South Coast stations (cross-band to 2m if necessary) will be appreciated. The frequency in use is 434·02 Mc/s.

Twenty-three Centimetres

G2RD/M (Wallington) had an interesting crossband mobile contact on May 20 with G3FP. The band on which G2RD/M was transmitting using a halo was 2m. G3FP's signals were received on a dipole. The contact lasted for about 45 minutes while G2RD/M was moving, the maximum distance tried being about three miles. When a more suitable receiving aerial for 23cm is available, more tests will be made. There was a lot of high speed flutter on G3FP's 23cm signal. When things became difficult at times through screening, c.w. was possible, but otherwise contact was on phone. Congratulations!

Four Metres

Scottish interest in 4m is represented at the moment by GM3BCD, GM3LCP, GM3FGJ, GM3EGW and GM3UM. Sunday morning QSOs either direct or crossband with 2m are taking place regularly. Other interested stations are asked to make themselves known.

G3PXB reports that G3NUE and G3LQB, both in Worcester, are active and that G3EHY is regularly received at good strength in Gloucester.

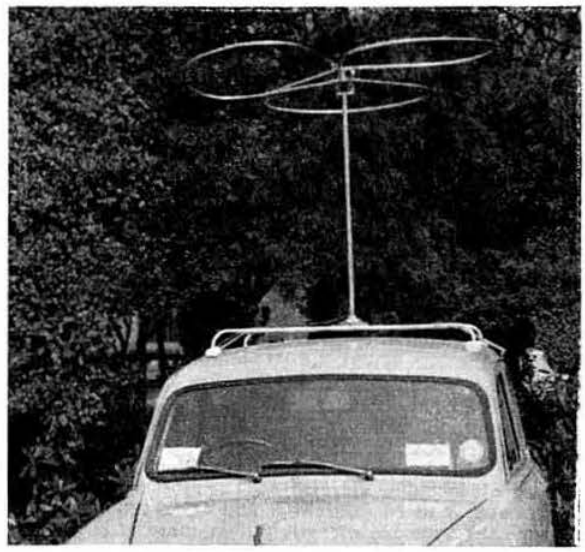
QRA Locator

Owing to the impossibility of being certain that all operators will be able to work out their QRA Locators in time, their use will be *optional* in the 1962 I.A.R.U. Region I V.H.F. Contest in September. By next year, however, it will be compulsory, as by that time all should be able to get their maps and "locate" themselves. A European map is in preparation in Switzerland, and when this is available further information will be given.

QSL Cards

To many, the QSL card is a mixed blessing, and could indeed be dispensed with, writes G5UM. But as verification to back up claims for the new R.S.G.B. "Four Metres and Down" Awards it is indispensable—yet extremely hard to acquire when you are stuck at 24 or 25 counties and simply cannot get those last four or five cards in to make up the requisite 30 to enable a claim to be made.

It is suggested that those who have been fortunate enough to get their cards in and to have won the award are in a position of special responsibility, for they, of all people, should be meticulous in sending cards to others needing them. One of the members of the Welwyn Garden City group reports with regret that no fewer than 13 of the operating award holders have failed to send a QSL when asked to do so. The deprived member is G3JLA—and if this note should strike the eye of any who owe him a card, he would be glad indeed!



G3KFD'S "clover leaf" aerial for 144 Mc/s at the Trentham Mobile Rally on April 29, 1962. *(Photo by G5CP)*

General Notes

F9NJ (Lille) is almost daily on the band and is always a very good signal in the South East. **F2XO** (Bordeaux), a newcomer to 2m, puts a very powerful signal into the South Coast.

G6OU (Basingstoke) reports that there are 22 call-signs in his postal district, G3PXC being one of the more recent ones. **G3OTN** (Woodford Green) is preparing for 70cm. **G3DGI** (Cambridge) is another 70cm aspirant and hopes to finish the gear soon.

ON4BZ reports hearing OH1NL calling a DL station on 144·25 Mc/s on April 21 and says his signal was S2-S3. G3LTF and ON4TQ have also been heard calling OH1NL on meteor scatter schedules.

Wolverhampton Amateur Radio Society will be operating **G8TA/P** on 144 Mc/s from Highgate Common, seven miles south of Wolverhampton, on June 17, 1962, commencing at 10.00 G.M.T.

Late News.—A new Amateur Television record was set up on June 6, 1962, at 06.25 G.M.T. when **G3ILD** (Darlington, Co. Durham) received pictures from **G3NOX/T** (Saffron Walden) over a path length of about 200 miles.

R.S.G.B. V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham Hill, Kent, when measured by the B.B.C. Frequency Checking Station, was as follows (nominal frequency 144·50 Mc/s).

Date	Time	Error
May 1, 1962	10.30 G.M.T.	1170 c/s high
May 8, 1962	10.45 G.M.T.	572 c/s high
May 15, 1962	13.00 G.M.T.	530 c/s high
May 22, 1962	11.05 G.M.T.	1030 c/s high
May 29, 1962	10.12 G.M.T.	762 c/s high

The station is in operation from 06.30-23.59 G.M.T. daily, but may be on for the full 24 hours for test purposes from time to time.

"Eighth Annual"

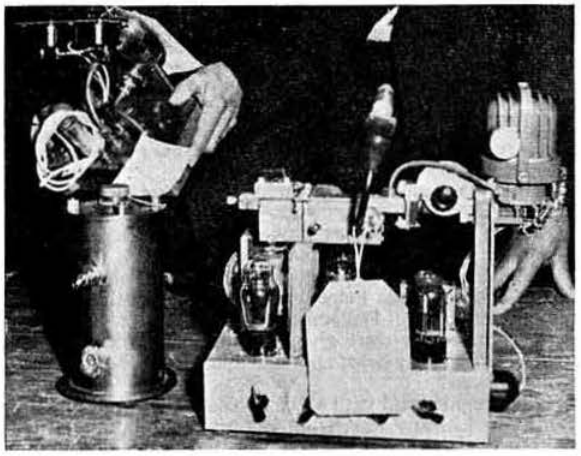
A look at last month's International V.H.F. Convention in London

By JACK HUM (G5UM)*

SOMEBODY was heard to remark: "You know, this V.H.F. Convention has now turned out to be *the* annual R.S.G.B. convention."

It was clear what he meant. Before the war the Society's annual Convention, held at the I.E.E. on the Thames Embankment, represented the crown of the Amateur Radio year. Today, for a great many members, the yearly V.H.F./U.H.F. Convention has taken its place as the most sustained and continuing social and technical "annual" in the R.S.G.B. calendar. And in 1962 the eighth in the canon was reached.

First of all to set the time-scale, let it be recorded that the Eighth International V.H.F./U.H.F. Convention took place at the Kingsley Hotel in London's Holborn district on Saturday, May 19. It fell broadly into three parts: the exhibition that opened in the morning, the technical lectures of the afternoon and the Grand Dinner in the evening.



First time winner of the new 1962 V.H.F. Committee Trophy for annual award in the Convention Constructors' Competition was Clem Tucker (G5DT) of Wallington, Surrey, with this parametric amplifier for 23cm.

Of the exhibition it might be said that there was an embarrassment of riches, ranging from the array of home constructed equipment to the display-boards full of graphic information on the auroral and meteorological phenomena that govern propagation at metre-wavelengths and below. Two or three hours spent here would not have exhausted the extraction of information from charts and chassis—but they *would* have meant missing some of the lectures which occupied the afternoon.

Four Lectures

Promptly at 2 o'clock that ever-popular visitor to the V.H.F. Convention, Dr. R. T. Kaiser of Sheffield University, took the floor to deliver a lecture of literally cosmic universality, "Ionospheric Effects at V.H.F.", complete with working models, space music and dynamism of delivery that belied the popular (but misguided) conception of the "university prof."

And at the end of the afternoon, from the cosmic to the immediacy of the operating position, Tom Withers (G3HGE) brought members up-to-date on the current "TW" range of v.h.f. equipment with a fascinating outline of some of the design considerations behind it.

In between came two truly u.h.f. lectures, one by H. Gibson (B.R.S.1224) of the M-O Valve Co. to describe that exceedingly useful marker for the 70cm men, GB3GEC; and the other by M. Davenport (also of M-O Valve) that delved into the future by explaining the theory and practice of the Adler tube for 70cm.

"Delving into the future" was indeed the operative phrase for the whole Convention—but, then, v.h.f. is like that: there is always something fresh to try.

With this thought in mind one felt it to be singularly appropriate that the first place in the Constructors' Competition should be awarded for a device which can assuredly claim to be "of the future": a parametric amplifier for 23cm. What is more, its builder, Clem Tucker (G5DT) is one of the more elderly of the u.h.f. fraternity ("past 73, OM!" as he has been heard to say).

To Clem goes the honour of being the first holder of The 1962 V.H.F. Committee Cup, donated by this year's V.H.F. Committee for annual award at the Convention Exhibition.

One of the younger members, John Gazeley (B.R.S.20533), was rated second in the competition by the three judges (Dr. Kaiser, Mr. W. A. Kirkpatrick of the G.P.O., and Committeeman Bert Allen, G2UJ). Characteristically from a member who has repeatedly shown his forward looking flair for u.h.f. design, John's exhibit was a transistorized printed-circuit converter for 435 Mc/s. To A. J. Reynolds (G3NNK) went third place for a beautifully built 2m transmitter, 100 watts to a QQV06-40A and series-gate modulation, in a case as small as a bedside radio.

The Dinner

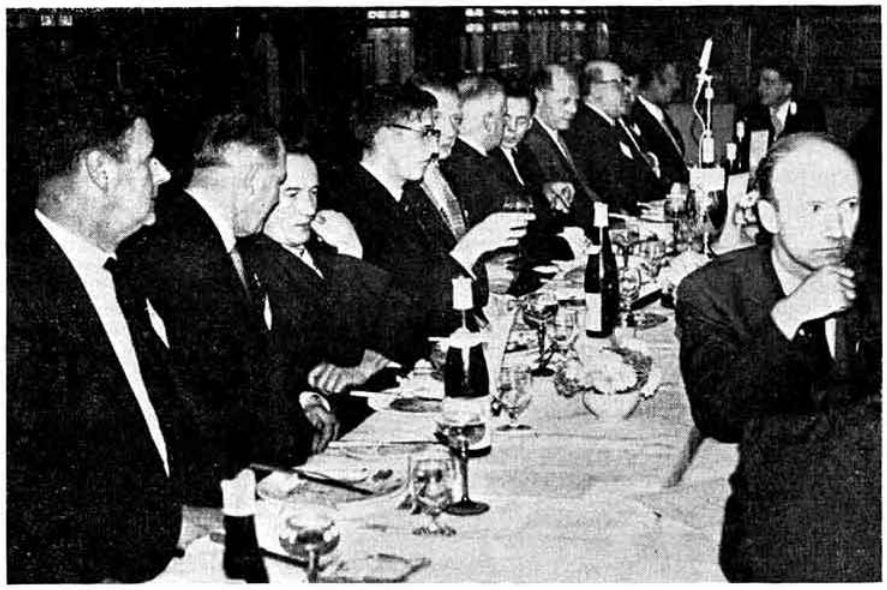
The "futuristic" trends evident in the exhibition found

At the quadripartite lecture session during Convention afternoon: Dr. Kaiser of Sheffield University in action. Behind him, left to right, Fred Lambeth G2AIW (V.H.F. Manager) and President Ted Ingram, GM6IZ.

* *Member of V.H.F. Committee, Bulls Green, Knebworth, Herts*

echoes later that evening in the after-dinner speech by Dr. R. L. Smith-Rose (past-president of the R.S.G.B., lately-retired director of the Radio Research Station, and without question one of the world's leading authorities on electronics). Proposing the toast of "The R.S.G.B.," Dr. Smith-Rose urged the importance of keeping abreast of the times and reminded members that there were three allocations above 5Gc/s awaiting exploration. On another subject-of-the-future, the Society's proposed new Headquarters, the speaker observed that the R.S.G.B. was not by any means "solely a headquarters in London: it makes its progress and derives its strength largely through the vigour of groups and clubs up and down the country."

Replying, President Ted Ingram (GM6IZ) commented on the special *esprit de corps* so evident among u.h.f. men, and the intense exploratory activity of mind which they manifested.



Top table at the Convention Dinner, including (among others from left to right) G3BGP (Editor of "Electronics Weekly"), G2AIW (V.H.F. Manager), Mr. W. A. Kirkpatrick of the G.P.O., G3HRH, Chairman of the V.H.F. Committee, the hon. secretary of which, G3GMY, is at the right. In the centre of the top table is R.S.G.B. President GM6IZ, with Past President Dr. R. L. Smith-Rose, Dr. Kaiser, B.R.S.1224, G6FO, Editor of "Short Wave Magazine," G3FZL and F9CQ in the distance on the right.

This gregarious tendency was also commented upon in Bert Allen's (G2UJ) toast to "The London U.H.F. Group" in the observation that other centres now had their own thriving groups, notably N.W. England and Scotland.

The London U.H.F. Group, who join forces with the R.S.G.B. to promote the annual convention, have one officer, their treasurer. He is Norman Caws, G3BVG (and the Society's Executive Vice-President, as it happens), and it was fitting that he should reply to this toast.

The third toast, "The Visitors," was given by that person who could almost be called "Mister V.H.F." himself—Fred Lambeth (G2AIW) whose work extends far beyond his monthly conducting of *Four Metres and Down*. It is largely thanks to Fred's I.A.R.U. work, and associations with outside-U.K. societies, that the annual convention may truly prefix itself "international." Just *how* international the May 19 convention was may be assessed from the fact that all G prefixes except GD were represented, there was the usual welcome contingent from the Continent, and even a VE2 figured among those who signed in.

In the response to the toast to "The Visitors", given by Mr. W. A. Kirkpatrick of the G.P.O., members could discern clearly the friendly relationship which exists between the licensing authority and the radio amateur movement. There were those present who could recall the time when it would have been unheard of to expect a G.P.O. official to attend a transmitting amateurs' dinner. It is a sign of the times—of the liberal attitude prevailing, and of the Post Office acceptance of radio amateurs as a responsible body of people—that it would now be unheard of *not* to have a G.P.O. personality present!

Magic Numbers

Then it was time for the lucky number dinner ticket to be drawn by Mrs. G5UM to bring a handsome 8-over-8 J-beam to grace the new house of Rouse (G2AHL is about to move). And so into the annexe for the excitement of the main raffle draw, a final look at the Constructors' Exhibition, and innumerable "personal QSOs" long after the time that many an operator would have pulled the proverbial big switch.

All that remained to be done—and it was a sizeable "all"—was the clearing up afterwards by Ray Hills (G3HRH), his V.H.F. Committee and the numerous helpers whose one-ness of purpose helped make this "Eighth Annual" the success it was. Deliberately, this narrative omits their names—once you start giving credit lines where do you stop when so many help; and who apart from the accredited really notices?

What may be said with all emphasis is that everyone who contributed in any way, from lecturing, exhibiting, writing signs, organizing the p.a., *et al.*, was playing his part in constructing a Convention that stands as a challenge to all of them to better it next year—if they can!

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...TO HELP YOU!

Project Oscar

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

IF the earlier of the two dates mentioned in the "Late News" flash in this column last month has been met (early June), *Oscar II* may already be hurtling around the earth as these words are read. On the other hand, the United States Air Force may not launch the satellite (as part of the *Discoverer* space research programme) until early in July and there will still be time for observers to get organized for reporting the signals.

Transmissions will consist of a succession of Morse "HIs" sent on a nominal frequency of 145 Mc/s (the actual frequency radiated by *Oscar I* was 144·984 Mc/s) and the two alternative types of report requested by the Project Oscar Association are as follows:

(i) a report written on the station QSL card stating the date and time *in G.M.T.* when *Oscar II* was heard together with the signal strength and the "HI-rate," i.e. the time in seconds for the transmission of ten "HIs";

(ii) a fuller report on the new form (copies of which may be obtained by sending a foolscap-size, or larger, s.a.e. to G2UJ at the address given below), which in addition to the information mentioned under (i), requires a note of the average signal strength above noise, an accurate measurement of radio frequency and Doppler shift characteristics. The geographical position of the observing station should be given in decimal degrees to the nearest 0·01 degree.

In a recent Press statement by Bill Orr (W6SAI), Publicity Manager of the Project Oscar Association, it was stated that *Oscar II* is the second training-type beacon to be launched in preparation for an advanced satellite that will both receive and retransmit amateur signals.

Information is also given in the latest *Newsletter* of the arrangements made in the United States for broadcasting news of the satellite once *Oscar II* is in successful polar orbit. Oscar Headquarters station W6EE and W6QEZ will transmit on and monitor the sideband frequencies 3820, 7220, and 14335 kc/s, one or both of the stations being active during the period 15.00-05.00 G.M.T. These broadcasts will be repeated for the benefit of overseas areas on 14050 kc/s c.w. during the evening hours after the launch by various W6 stations. The A.R.R.L. Headquarters station W1AW will also transmit *Oscar* news on its regular schedule and frequencies as given in *QST*.

During observations on *Oscar I*, F3NB heard on several occasions a burst of signal for a brief period an appreciable time after the normally received signal had faded out, indicating that reception was taking place via some indirect path. It is particularly requested that a full report be sent in to the writer if this phenomenon should be heard again. The time between fade-out and the reappearance of the signal varied between one and two minutes, but there is a possibility that even longer delays might be recorded.

Observers who sent reports on the signals received from *Oscar I* will be interested to know that the promised QSL cards are being despatched by air mail from the Project Oscar Association bearing the unique call-sign W6EE/S.

Late News— Oscar II in Orbit

The second *Oscar* satellite was launched at 00.32 G.M.T. on June 2, 1962, and was first heard in the U.K. by G3CCH (Scunthorpe) at 06.10 G.M.T. The orbit time appears to be slightly shorter than for *Oscar I* and is just over 91 minutes. The frequency is 144·993 Mc/s.

All reports on signals from the satellite should be sent to G2UJ for forwarding in bulk to the Project Oscar Association, but readers' attention is drawn to the fact that by special permission of the Post Office, third party messages concerning the reception of signals from the satellite may be transmitted by radio to the United States by any British amateur station.

* *R.S.G.B. Project Oscar Co-ordinator for the U.K., 24 Arundel Road, Tunbridge Wells, Kent.*

GB2RS SCHEDULE

R.S.G.B. News Bulletins are transmitted on Sundays in accordance with the following schedule:

Frequency	Time	Location of Station
3600 kc/s	9.30 a.m.	South East England
	10 a.m.	Severn Area
	10.30 a.m.	North Midlands
	11 a.m.	North East England
	11.30 a.m.	South West Scotland
	12.00	North East Scotland
145·3 Mc/s	11.15 a.m.	Beaming north east from Sutton Coldfield
	11.30 a.m.	Beaming north west from Sutton Coldfield
	11.45 a.m.	Beaming south west from Sutton Coldfield
145·1 Mc/s	12 noon	Beaming north from South East England
	12.15 p.m.	Beaming west from South East England

News items for inclusion in the bulletins should reach Headquarters not later than first post on the Thursday preceding transmission. Reports from Affiliated Societies and from non-affiliated societies in process of formation will be welcome.

Special Events Stations

AN exhibition station using the call-sign **GB3LCH** will be in operation at the Garden Fête at the Leonard Cheshire Home, Sandbach, Cheshire, on June 23, 1962. All bands will be used and all contacts confirmed. Visitors will be most welcome throughout the day.

GB3SFG will be the call-sign of the amateur station at the Shipley Fête and Gala on July 7, 1962. The station will be operated by members of the Bradford Radio Society under the leadership of Fred Davies (G3KSS), who is loaning a Panda Cub transmitter and Minimitter MR44 receiver for the occasion.

All contacts will be confirmed by a special QSL card. Cards for GB3SFG should be sent to G3KSS via the R.S.G.B. QSL Bureau.

Members of the Marconi Apprentice Association Amateur Radio Club will be operating **GB3MWT** at the Marconi Wireless Telegraph Co.'s Gala Day on July 18, 1962.

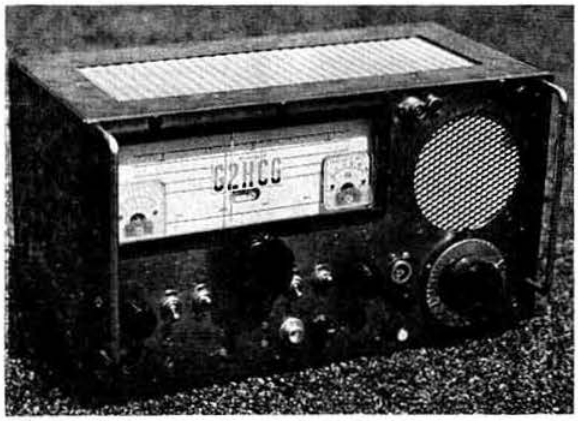
All these stations will appreciate contacts during the periods they are active.

Mr. H. L. Wilson, EI2W (right), President of the Irish Radio Transmitters' Society, chatting with Mr. Gwilym Jones, M.Sc., of the Department of Posts and Telegraphs at the Annual Dinner in Dublin. Mr. Jones was Guest of Honour at the function.
(Photo by courtesy of Irish Independent)

It Happened Again

Isle of Wight Rescuers Summoned by Amateur Radio

FOR the 144 Mc/s Field Day on May 6, 1962, members of the Northampton Short Wave Club, led by Bill Sykes (G2HCG), decided to visit the Isle of Wight. The location selected for their station G3GWB/P was a seldom visited part of St. Boniface Down. Weather conditions were very adverse with a howling gale and visibility down to 15 yards due to a sea fog. Radio conditions on the other hand were good and the score was mounting steadily when at about 4 p.m. Ted Price, a local man, staggered into their station. His hands bleeding and his clothes torn, he told the group of astonished radio amateurs that a DC3 aircraft had crashed into the hillside 200 yards away.



The transmitter-receiver in use at G3GWB/P on May 6, 1962

G2HCG immediately put out an emergency call over G3GWB/P. There was no reply but a second call attracted the attention of G3NIM of Southampton who dialled 999, reported the crash and asked for medical supplies and other assistance. Within five minutes of the first distress call, the group could hear the sirens of the fire engines in the distance.

Meanwhile, the rest of the team rushed to the scene of the crash, accompanied by G3FAN and G3LOK, to render what assistance they could to the injured. It was then decided to move G2HCG/M to the actual scene of the disaster, G5NF (Farnham) acting as the other end of the circuit. The first message handled by G2HCG/M and G5NF was for a police officer without radio who asked the Police to take full disaster action. Within a short time ambulances equipped with radio began arriving and the Amateur Radio network was closed down after maintaining two v.h.f. channels for almost an hour.

In a letter to R.S.G.B. Headquarters, G2HCG pays tribute to the amateurs taking part in the rescue, all of whom were relatively badly shocked: P. Hunt (G3FWB), R. Perrett (G3HWE), S. Berridge (G3ITW), M. A. Perry (G2ANS), A. Fowler (G3FAN), E. St. B. Sydenham (G3LOK), V. Hartopp (B.R.S. 15304), Major R. Easton (W5PSY), U.S.A.F. Chelveston, and last but by no means least a friend of G3FAN known simply as Fred. All those named gave up their coats and macintoshes in the driving rain to the survivors and did everything possible to make them comfortable. Mr. Sykes pays particular tribute to G3LOK who arrived as the emergency arose and worked ceaselessly in inadequate clothing trying to make the injured comfortable and promptly vanished as soon as he could be of no further assistance.

Grateful thanks are also due to G. J. Meikle (G3NIM) and C. L. Ward (G5NF) for their part in the operation and to G3PNA/P who, when informed he was interfering with G2HCG/M, immediately closed down.

After the operation, senior police officials and the Rescue Co-ordination Service, Plymouth, conveyed their thanks to all the radio amateurs concerned.

Amateur Radio for the Disabled

NO ONE would doubt that Amateur Radio is an ideal hobby for the physically handicapped, whose mobility and means of communication are often to a large extent irreparably destroyed.

The triumph of C. D. Hyde (G3OFU) in the 1961 R.A.E.N. Rally and the highly creditable performance of Peter Odell (G3MUM) in coming fourth, prove not only that the disabled man can be good at the job but also that he can be of service to the community. The days when physical disability necessarily meant invalidism are fortunately gone. This is strikingly true of paraplegics.

Each year, at the National Spinal Injuries Centre near Aylesbury, Bucks., paralysed competitors from about 20 countries take part in the International Stoke Mandeville Games. Swimming, fencing with foil and sabre, and wheelchair basketball are among the sports.

This year an Amateur Radio Station operating under the call-sign GB3SMG is to be set up at the games during the period July 22-29. The station will use a.m. on all bands from 160 to 10m as conditions permit and all contacts will be confirmed with a special card.

Among the operators will be Gunnar Esbjornsson (SM2BZU) who is a patient at the hospital. In the exceptional circumstances the G.P.O. have given permission for Gunnar to " operate the Games transmitter under the direct supervision of " his British colleagues. It is hoped that GB3SMG will contact many other stations in the United Kingdom and abroad, manned by disabled operators, or set up by clubs and individuals on behalf of disabled people. All those interested in setting up a station, if only for a few hours during the period, and those wishing to pre-arrange QSO's, are invited to write initially to Kenneth Jones (G2FQW), 3/50 Shelley Road, Worthing, Sussex.

One of the aims of GB3SMG is world-wide communication at the annual Games.

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS (G2BVN)* and J. DOUGLAS KAY (G3AAE)

THE expected seasonal change in conditions is now taking place and this will lead to a lower m.u.f. during the hours of daylight whilst the night time m.u.f. will be higher than during the winter months. The lower frequency bands will also be affected as ionospheric absorption will increase as the sun rises higher in the sky and static levels will hinder reception. Sporadic *E* ionization reaches its peak during the late Spring and early Summer and an increase in the openings provided by this method of propagation may be expected.

The last month has provided a number of early morning openings to the Pacific and with the increase in activity from this area many operators have been able to fill gaps in their lists of countries worked. Outstanding amongst the stations which have been heard at good signals strengths for periods of two hours or more during the Pacific openings are FO8AN, KH6KH and K6CQV/KS6, the latter unfortunately working 'phone patch traffic for the greater part of the time. The signals from VQ9AA at the Aldabras peaked at much higher levels on 21 Mc/s than on 14 Mc/s, whilst the various stations on Christmas Island (VR3) have been worked more readily than previously. All of which leads to the conclusion that provided there is activity then conditions at this stage of the sunspot cycle, although the number is now lower than at any time since 1955, are sufficient to allow reasonable propagation. The mean sunspot number provided by the Zurich Solar Observatory for the month of April was 46, whilst the predicted value for June is 35. Latest indications are that the rate of decline in sunspot activity has slowed during the last three months.

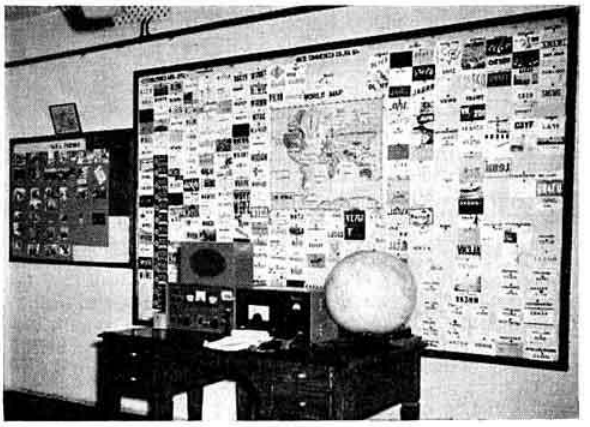
It has been suggested that a forecast of propagation conditions covering the h.f. amateur bands would be of value and readers in favour of the inclusion of such a feature are asked to send a postcard to G2BVN. It will be recalled that for a considerable period *M.O.T.A.* included a table of frequency predictions.

News from Overseas

From Nigeria **5N2JKO** sends the following news: **5N2AMS** and **5N2DMS** landed in the U.S.A. on May 15 and will be there for the next ten weeks; **5N2BRG** spent the major part of his U.K. leave convalescing after two operations but should be on the air again very soon; **5N2DCP** is now back on the air on 14 and 21 Mc/s c.w.; **5N2EBL** and **5N2FEL** are now on leave in the U.K.; **5N2IJS** and **5N2IND** recently arrived back from U.K. leave; **5N2JAH** retires in September from his post as Chief Signals Officer with the Nigeria Police and will be living in the U.K.; for **5N2JKO** the remainder of the year will be busy and activity will mainly be restricted to the weekends; **5N2LKZ** continues to work all the DX available on c.w.; **5N2RSB** and **5N2SMW** flew to Europe on June 1 for three months' leave; **9G1CN** will be going to Nigeria for a short tour after his next leave. The Nigerian Wireless Telegraphy Act which was passed last year, and which no longer includes the clause that operators have to be Nigerian or of U.K. nationality, has not yet come into force, and consequently there are a number of would-be licensees who are still waiting to go on the air.

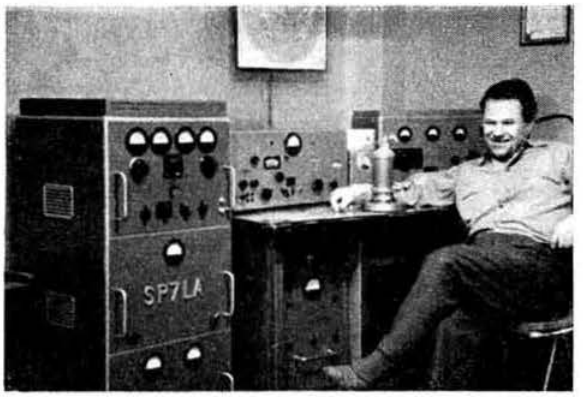
AP5CP, who has provided many stations with their first QSO with **East Pakistan,** has sent an account of the difficulties encountered in assembling his equipment. First licensed in April 1952, AP5CP came on the air on July 26, 1961, and the period between was largely spent in gathering a transmitter, receiver and ancillary gear. Amateur equipment is just not available in E. Pakistan for it is not imported by the local dealers because there is no market, direct importation is impossible owing to the exchange restrictions and " surplus " gear does not exist. However a large measure of co-operation was forthcoming, particularly from U.S. amateurs, and the station seen in the photograph was eventually assembled. Mohd, the operator of AP5CP, is trying to put three further stations on the air, and any assistance will be gratefully received. Recently a large number of QSLs were received from the West Pakistan QSL Bureau, some of them for contacts during the summer of 1961. These are now being answered and to obviate further delay it is requested that in future QSLs should be sent to the address shown in *QTH Corner*. A copy of the station log for April shows contacts in all parts of the world, and out of the total of 100 QSOs, four were with U.K. stations.

JZ0ML (ex-G3MJL) is now active from Pirimapoen after delays in the arrival of his equipment, and is looking for European contacts on 3·5, 7 and 14 Mc/s. He does not favour 7 Mc/s as this necessitates getting up and starting diesel



AP5CP (Dacca, East Pakistan) has been on the air with this attractive set-up since July, 1961.

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



SP7LA (Lodz), licensed since 1937, runs 750 watts on c.w., a.m., and s.s.b.

generators at 04.00. JZ0ML will be in Netherlands New Guinea until October of this year. QSLs should go to W2CTN.

From ZC4CS via G3FPK comes news of happenings in **Cyprus.** ZC4PC, a club station, is very active with six operators, ZC4's CS, CT, RC, SJ, TL, and WD. The only s.s.b. transmitter is the SB10-DX100 combination at ZC4PC, but ZC4CS is expecting delivery of a Viceroy in the near future. A number of DX stations have been worked on s.s.b. and a.m., a noteworthy feature being that only one W station was worked on the latter mode during the entire month. G3MBS, a former operator at ZC4AK, is now at Benghazi and using the call 5A3CJ; his present address will be found in *QTH Corner*.

The **Fifth Jamboree-on-the-Air** will take place between 00.00 G.M.T. Saturday October 20 and 24.00 October 21. The Boy Scouts World Bureau will be operating its own station from Ottawa under the call VE3WSB on the bands 3·5 to 28 Mc/s, and GB3BPH will be in operation from Baden Powell House in London. Arrangements are in hand for world wide participation; last year over 1,000 stations in 47 countries took part, including at least 50 in the U.K. The British organizer is G3BHK.

VR4CV is active on most days from the Solomon Islands using basic crystal frequencies of 7,020 and 7,030 kc/s for c.w. operation in the 14 Mc/s band. Operating times are usually between 06.00 and 13.00 G.M.T. using dipole aerials. QSLs should be sent to K6EC, and it may be noted that I.R.C. cannot be exchanged in VR4.

DXpeditions

FW8BH should be active on s.s.b. by the time this will be read. Operation is scheduled to commence on June 10 and to last for anything up to one month. The operator is VK3AHO, and all QSLs (except from VK and ZL) should go to W4ANE, accompanied by a self-addressed envelope and return postage. Operating frequencies will probably be 14,130 and 14,345 kc/s, listening 5 or 10 kc/s lower.

FO8AN has been worked extensively from Europe, and at the time of writing is scheduled to be on his way to Flint Island around the end of May, by which time the licence formalities should have been completed. Danny Weil transferred his s.s.b. operating frequency from 14,195 to 14,335 kc/s with better results and less interference from Latin American a.m. stations. Those interested in receiving regular copies of the *Yasme News Letter* should contact KV4AA at Box 403, St. Thomas, Virgin Islands, U.S.A.

W0MLY has received permission to operate from **TR8** and should have been heard during the first part of this month. After a spell in TR8 it is planned to visit all those republics in the area from which licences can be obtained. The planned operating frequencies are: c.w. 14,001 and 21,001 listening 10 kc/s higher; s.s.b. 14,195 to '199 and 21,400 listening on 14,305/7 and 21,410 respectively. QSLs should go to KV4AA.

PX1RV will be the call used by **G5RV** when operating from Andorra during the period August 3 to 17. F7GX will also be a member of the DXpedition and will operate **PX1GX/M** using 50 watts input on a.m. It is planned to use all bands from 3·5 to 28 Mc/s as conditions allow, and the fixed station operation will be on c.w. and s.s.b. On the latter mode it is proposed to transmit between 14,120 and 14,140 listening for N. American replies around 14,300, and for others 10 kc/s above or below the operating frequency. The equipment in use will be a KW Viceroy and a KW77 receiver, together with a ground plane and (obviously) a G5RV dipole. QSLs should be sent to G5RV.

After a spell of operation at the **Aldabras, VQ9AA** and **VQ9HBA** returned to the Seychelles on May 19 for one or two weeks, after which they were due to return to the Aldabras equipped with a three element beam with which it is hoped to make many more N. American contacts. Scheduled for early visits are Mauritius, Chagos and Agelega. QSLs should continue to be sent to W4ECI.

W1RAN has furnished a most interesting account of his fortnight of operation as **FP8BX,** which is unfortunately too long to reproduce in its entirety. During the 12 days spent on St. Pierre 2,380 QSOs were made despite adverse

QTH Corner

AP5AH via AP5CP
AP5CP Mohd, Dacca Signals, Dacca, 6. E. Pakistan.
KV4CI/AP5 via W2CTN
EA6AZ via K1QAJ/6, 381 Cottonwood, Vackaville, Calif., U.S.A.
FG7XH Box 335, Pointe-a-Pitre, Guadeloupe.
FG7XL Box 109, Pointe-a-Pitre, Guadeloupe
FG7XM Box 521, Pointe-a-Pitre, Guadeloupe
FG7XN Box 387, Pointe-a-Pitre, Guadeloupe
FM7WQ s.s.b. operation only to W4OPM.
FW8BH via W4ANE.
HH2P via K0RDP.
HI3PC Box 282, Santiago, Dominican Republic.
HK0AB via W4DQS.
HL9KN A.P.O. 358, Postmaster, San Francisco, Calif., U.S.A.
HP1IE via W2CTN.
HP2ER Box 568, Colon, Rep. of Panama.
KB6BZ R. H. Garman, Box 79, USPO 06-50000, Canton Island.
KB6CA Box 87, Canton Island.
WA6WVQ/KH6 P.M.R. Box 57, Navy 14, F.P.O. San Francisco, Calif., U.S.A.
K3GAD/KJ6 Box 189, APO 105, 1957 Comm. Group, San Francisco, Calif., U.S.A.
W4LCY/KM6 via W4LCY.
KX6BU Navy 824, Box 148, F.P.O. San Francisco, Calif., U.S.A.
LZ1HA Box 205, Sofia, Bulgaria.
MI1H via IICR
UA2AW V. I. Liapin, Box 7, Kaliningradsk Oblast, U.S.S.R.
UA2DB and UA2DO, Box 13, Riga, Latvian S.S.R., U.S.S.R.
VE8MZ via K0RDP
VK9GP via VK3AOM.
VQ9A and VQ9AA via W4ECI.
VP7NS via W2CTN.
VR3P via W5HTM
VR3S via WA6MAZ
WA6WQM/VR3 via W6AFI
WA6MFY/VR3 via WA6MAZ.
XE1CV Box 325, Mexico City, Mexico.
ZB1BW via G3PEU.
ZC5DO I.J. Robertson, Box 41, Singapore.
KV4CI/4S7 via W2CTN.
5A3CJ S. Gibbs, c/o I.A.L., Box 62, Benghazi, Libya.
5R8AG Boite Postale 173, Diego Suarez, Madagascar.
5R8AP C. Larriu, Station Ampataka, Antsirake, Madagascar.
5R8CG D. Wallerand, Boite Postale 3039, Tanarive, Madagascar.

* * *

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

weather conditions which made erection of aerials a difficult task. U.K. stations who were contacted on 1·8 Mc/s included: G3CHN, G3ERN, G3IGW, G3OQT, G5JU, G6BQ (an outstanding signal), and G8NF with, in addition, EI9J. G3KMQ made contacts on four bands (excluding 1·8) within 12 hours. FP8BX is now engaged in answering all QSLs received, and it is hoped that this task will be completed shortly.

The trip by the **Cheltenham Club** to Wales over Easter resulted in a tally of 106 stations in 29 counties. Operators concerned were G3CGD, G3CHV, G3OLN, and G3PME, and the station used the call **GW5BK/P.** The transmitter in use was the unit used by the Cheltenham Club for N.F.D. operation running from a generator charged car battery. Sites in Radnor and Carmarthen were chosen, and from both locations the best DX was GM3KLA in Shetland. The Club hope to arrange a further trip to Scotland later in the year.

GM3BHT/A (G3BHT) will be operating from Loch Sunart in **Inverness** between July 8 and 13. C.w. and a.m. activity is anticipated using a KW Valiant and an Eddystone 888A receiver. The power will be derived from a portable generator as mains supply is not available. QSLs should be sent via the Bureau as the *Call Book* address is now not correct.

G3OZE/M will be operating from the Norfolk Broads during the period June 16 to 30 on c.w. only on 1·8, 3·5 and 7 Mc/s. Activity will be confined mainly to the evenings using an input of 3 watts.

The City and Guilds College Radio Society will be visiting the **Isles of Scilly** from June 16 to 29 from where they will operate under the call **GB2IC** mainly on 1·8 and 144 Mc/s, and using all modes.

DL9PF and DL5HI will be active from **Corsica** during the period July 10 to August 2 with emphasis on s.s.b.

DXCC News

The A.R.R.L. has said that contacts with **SM5ZS/ZC6** will count for credit with Egypt only, regardless of the suffix used. This station was operated by a member of the U.N.E.F. in the Gaza Strip area.

Contests

The results of the **CQ World Wide DX Contests** are now available, the leading stations being as follows: **C.w.** section: Top 5, all band, single operator: 7G1A (1,177,893); CX2CO (856,416), KW6DG (841,334), KH6IJ (791,840), and 5N2LKZ (777,155). European continent leaders on the various bands were: 28 Mc/s G5RP (3,360), 21 Mc/s ZB1HC (65,807), 14 Mc/s G4CP (131,145), 7 Mc/s OK2KOJ (69,048), and 3·5 Mc/s OK3DG (18,300).

In the **Telephony** section the top five stations were: CX2CO (876,304), KW6DG (349,492), VQ2WZ (337,176), 5N2JKO (302,222) and HC1AGI (290,928). European continent leaders were: 28 Mc/s DJ1LP (4,956), 21 Mc/s ZB1HC (57,009), 14 Mc/s DJ1BZ (145,452), 7 Mc/s G3JUL (2,666) and 3·5 Mc/s I1AIM (7,560). In sending details of these results, W1WY, the Contest Committee Chairman, *CQ Magazine*, laments the very small number of logs received from U.K. stations, which were far less in number than the operators known to be active during the contests. This is a phenomenon previously experienced in connection with domestic contests, and the unwillingness of the U.K. stations to send in logs compares unfavourably with many other countries, notably DJ/DL, JA and SM, where interest is at a high level.

The **VK/ZL Oceania DX Contest** is the former VK/ZL contest, which has been widened in scope and, it is hoped, made more interesting. The basic changes are that overseas countries may contact stations in any Oceania country as well as VK/ZL stations, and that, in addition to the usual awards, certificates will be awarded for a certain minimum number of VK/ZL contacts during the contest. The phone section will take place during the weekend October 6-7 and the c.w. section October 13-14. Full information on the rules will be given in a later issue.

Awards

In connection with the U.S.C.A. Award and others that depend upon identification of U.S.A. counties, there have been some difficulties as, in the past, it has not been the usual practice for W/K operators to name their counties. To assist U.K. operators who would like information on this subject **G5GH** has kindly offered to furnish the county status of any stations where the town and state are known. Call-signs are not required and it is suggested that a list should be prepared showing the town/state information and sent to G5GH who will then fill in the appropriate county. A stamped addressed envelope should be enclosed for reply; the address of G5GH is C. R. Emary, 133 Fairlands Avenue, Thornton Heath, Surrey.

From 5A4TC come details of the **Libyan Amateur Radio Award,** which is available to those operators who can submit proof of contact with eight Libyan amateur transmitting stations. For stations in Europe at least three amateur bands must be used. All contacts after December 24, 1951, are valid and 'phone, c.w. or mixed QSOs will be accepted. A station may be worked on more than one band to score. QSLs must be held by the applicant but need not be sent. However a check list showing calls, dates and frequencies should be forwarded and countersigned by: (*a*) the secretary of the local radio club or society, or (*b*) at least three licensed amateurs stating that they have actually seen and checked the QSL cards. Applications, together with one U.S. dollar or ten I.R.C. should be sent to: The Awards Manager, 5A QSL Bureau, P.O. Box 372, Tripoli, Libya. The charge includes return postage by second class airmail.

The **Diploma Ribatejo** may be claimed by operators who, after January 1, 1962, contact five CT1 stations in Ribatejo using all bands and all modes. QSLs, together with one U.S. dollar or the equivalent, should be sent to CT1PK, Cartaxo, Portugal. Active stations in Ribatejo include: CT1s AP, DT, HL, IS, KJ, KK, KI, PK, TT and FL.

Around the Bands

As is to be expected at this time of year DX activity falls to a very low level on both 1·8 and 3·5 Mc/s and, in fact, no noteworthy contacts have this month been reported on either band.

Thus reports this month start with the **7 Mc/s** band and **G3JAG** (Rochdale) who, despite the layers of QRM, established contacts with YV5BKA (06.00), VE8DU (07.20), ZL1, 2, 3, VK2 and 3 (06.00-07.00), XE1OK (06.35), VP9AK (06.50), HK0AB (05.45), HP1IE (05.40), KS4BF Serrana Bank (05.40), VP8GB South Shetlands (05.10), CP5EZ (05.10) and M1H (22.20), the last station also being reported by **G3PSY** (Hornchurch). **G3POI** (London S.E.22) worked UA9CM (00.02), PY7IV (23.40) KP4ANJ (02.20), TF3IC (23.55) and the ever present M1H (22.20).

As anticipated at this period in the sunspot cycle **14 Mc/s** has produced more DX than all the other h.f. bands put together. A typical example of what has been heard and worked on c.w. comes from **G2FFO** (Burnley) who reports HK0AB Baja Nueva (20.05), KS4BF Serrana Bank (12.15), W1MV/KP6 (05.55), W6GMQ/VR3 (07.50), VR1M (09.25), VQ9AA Aldabra (19.10), VQ9HBA the other half of the Aldabra DXpedition (20.35), K6SKU/KS6 (07.05), YK1AK (21.15), UA1KED Franz Josef Land (07.10), VE0MC maritime mobile in the North Pacific (08.00) and 3A2CZ (15.05). A good lot.

G6XL (Leeds) exchanged Morse signals with 5U7AD (06.20), W1MV/KP6 (06.24), W6SKU/KS6 (06.55) and

KH6ENT/KS6 (06.45). An unusual one is reported by **G3PSY** who worked TZ8BF giving his QTH as Bamako, Mali at 08.00 and asking for QSLs via R.E.F. **G3POI** engaged 4S7NE (18.50), VS6DS (18.35), XE1OK (23.30), VS1LD (18.30), VP6PJ (01.00), ST2AR (20.10) and UA1KED (19.35).

Avid DXer **G3HDA** (Stratford-on-Avon) contacted AP5CP East Pakistan (18.50), FO8AN (07.40), FY7YI (22.15), HK0AB (11.30), W1MV/KP6 (06.15), KS4BF (21.45), W6VUN/KW6 (07.40), UA0YA Zone 23 (07.15), VP7NQ (11.30), VQ9AA (21.00), W6GMQ/VR3 (07.30), ZD1CM (21.00) and 5U7AD (06.25). During the same period he heard K3GAD/KJ6 (07.32), KJ6CU (07.10), KB6CL (08.00), VR1M (09.30), KH6ENT/KS6 (06.40), K5FOQ/KS6 (07.25), K6SKU/KS6 (07.10), W5HTM/VR3 (07.30), VR3H (06.45), VR3L (07.30) and VR3P (07.15). The above list indicates that at the present time as much Pacific DX is audible in Europe per month as until recently was audible per decade: and that despite the proximity of sunspot minimum. Increased amateur population of small islands is no doubt the main factor.

Indoor aerial exponent **G8PL** (London N.W.3) also received Pacific originated signals from K5FOQ/KS6, KW6CP, VR3P, W6GMQ/VR3, K3GAD/KJ6, KM6CE and KH6s, while TT8AL, 5H3HZ, EP2BQ and 5U7AC were also heard between the period 05.00-09.00 G.M.T.

G3AAE (Loughton) keyed with AP5AH East Pakistan (17.30), AP5HQ West Pakistan (19.30), HK0AB (12.00), KB6CA (09.05), K3GAD/KJ6 (09.15), KM6CE (09.30), W1MV/KP6 (08.15), KS4BF (20.20), K6SKU/KS6 (08.15), TA2AR (06.30), UA0YA Tannu Tuva (18.00), VQ9AA (17.30), VR1M (09.15), VR3P (08.30) and YK7YS (08.20). **B.R.S.1066** (Cheltenham) logged CP5EZ (22.40), HK0AB (22.05), HI3LJP (21.55), KV4CI/FL7 (23.10), OA5KF (22.25), PZ1AM (23.15), doubtful ZA1KG (20.35), ZP5LS (21.00) and ZS9KP (22.50). **A.2423** (York) completes the c.w. picture by reporting DU2MA (12.45), KG4AN (20.25), ST2AR (22.35), YA1AN (22.45), FG7XM (22.00), BY1PK (13.20), 6W8DD (22.25), CP5EQ (22.35), MP4MAH (18.55), ZD8JP (22.45), VQ5GJ (22.55), AP5HQ (22.35), YK1AK (22.47), and PJ2AA (23.10).

The picture on a.m. is not very healthy but sideband users have had a bumper month. **G6XL** worked HK0AB (08.30), VQ9AA (18.15), WA6ARD/KM6 (06.55), FO8AN (07.15), VR3S (07.50) and VR3H (06.30). **A.2452** (Addington) logged OA4CV, VR2BJ, FK8AU, KB6CL, all between 06.00 and 09.00, and VP3YG (19.00). Also at present using the contemporary mode are HH2P (22.15), VR3P (07.40), W0AMJ/KP6 (08.15), W4LCY/KM6 (09.40), ZC5DO (16.30) and the new United Nations international amateur radio station in Geneva **4U1ITU** (18.15).

The **21 Mc/s** band is definitely in summer and low sunspot repose with antipodean contacts almost non-existent, but good openings to many remote parts of the world have occurred as the following bears testimony: **G3AAE** talked to KR6MF (12.00), 4S7EP (12.30), VQ9AA (18.30), and exchanged Morse reports with KV4CI/FL7 (09.30), VQ9AA (14.05), UM8KAA (15.45), and 9M2FK (12.50) plus numerous Japanese stations. **G3PSY** reports c.w. from VQ9AA (14.10), OA4KF (18.20), CR7IZ (16.40), YA1BW (14.30), KV4CI/FL7 (09.15) and HS1K (12.40), while **G3POI** contributes HK7YC (21.45), TI2LA (18.55) and EL4A (17.15).

B.R.S.24643 (Potters Bar) logged A3 from CP1BH, CR5SP, DU1EH, ET2US, KR6MF, MP4QAD, MP4TAC, TA2AR, TN8AD, TT8AL, TU2AD, VQ5IS, VS4RS, VS9OC, XW8AL, ZD1JWC, ZD6RM, ZS3NZ, 4S7EP, 5T5AB and 9K2AD. A very good list indeed. **A.2452** heard MP4TAC (12.00), TA2AR (15.00), PZ1BW (16.00), ZD6KH (16.00) VQ5AU (17.00) and VP2SY (20.00). **A.2340** (Plymouth) concentrated on 21 Mc/s a.m. and located 9U5JH (18.05), 6W8CU (12.15), VP6WR (18.15), PZ1BF (18.45), ZP5CF (19.00), TU2AC (15.45), TA2AR (13.00), **OA8B** (13.00), DU1AN (15.00), TI2HK (18.40), TN8AG (19.15), CP1PH (17.10), VP2LS (21.34), KG4BC (21.55), FM7WK (22.00), ZP5CF (23.10) and 3A2BB (18.35).

Poor old **28 Mc/s** is but a shadow of its former self, but while nothing DXotic has been heard or worked, there have been numerous short lived openings to Africa and southern Europe, while even those oddly modulated Russian signals have once or twice been refracted into the United Kingdom by the " ion " curtain! However nothing very exciting can be expected to occur on the band until next Autumn and even then openings will be largely confined to the North/South path.

On the whole then a rather mixed month with the two lowest and one highest frequency band contributing little to the DX load, but 14 and 21 Mc/s together affording good openings to every part of the world: long may they continue thus.

DX Briefs

From 5N2JKO it is understood that the call **5N2TS** is legitimate despite assertions to the contrary. **KH6IJ** will be in London during the period September 9 to 12.

The logs for **VP3YG** that are held by G2BVN relate to the period when Des operated the portable s.s.b. transmitter and not to any c.w. or a.m. QSOs.

5N2BCF is active from Lagos using a transistorised s.s.b. exciter feeding a 5B/255M running at 30 watts input.

From **DL9VZ/SV0** (Rhodes) via G6YL it is understood that there has been a delay in the printing of the QSL cards, but the 200 or so U.K. stations that he worked will all receive a card in the near future.

From G3MWG: **VU2BK** travelled 3,500 miles to Bhutan for an operating period of three days. The DXpedition made 1,400 QSOs which included DXCC.

GM3IAA worked W1BB and W1PPN on 1·8 Mc/s, and is believed to be one of the few Scottish stations to make transatlantic contacts on this band. **ZD1JWC** has left Sierra Leone and is returning to the U.S.A. via Ireland. GW3PNZ (ex-VP3RW) may soon be proceeding to ZD1. On the subject of QSLs G3MWG has received a card (eventually) from CR5SP via the Bureau, but lacks confirmations from VQ8AV, YA1AC and CR9AI. Any information on the QTH of the last named would be appreciated.

A recent contact on 14 Mc/s sideband was between **G3BXI/M** in the East London area and **9M2CR/M.**

FM7WQ is now operating from Martinique using the portable s.s.b. transmitter loaned by HB9TL, and has been heard at the low end of the 14 Mc/s band with good signals. A supplement written by KV4AA and forming part of the April *Yasme Newsletter* makes a number of pertinent points regarding DXCC and should make interesting reading for all country chasers.

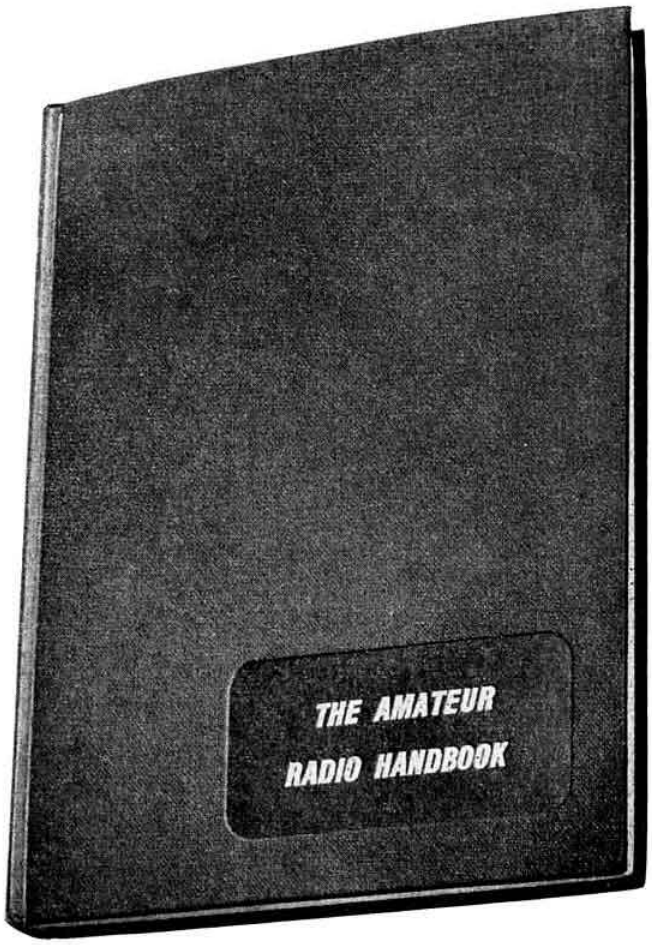
4U1ITU is the call-sign allocated to the amateur station operating from the International Telecommunications Union Building at Geneva. This station has been active on 14 Mc/s s.s.b. and *may* be given separate country status. QSLs should go to I.T.U., Geneva 20, Switzerland.

The new prefix for **Timor** is said to be **CR8** (replacing CR10), and operation by CR8AB on c.w. should take place in the near future.

ZL4JF (Campbell Is.) may often be heard around 07.30 on 14,130 kc/s in company with VE7ZM acting as m.c.

* * *

Thanks are due to G3AAE who dealt with the band reports in the absence on holiday of your scribe, and acknowledgment is made to the *West Gulf DX Bulletin*, *DX Magazine* (W4KVX), the *Yasme Newsletter* and to our numerous correspondents. Please send all items to R.S.G.B. Headquarters to arrive not later than June 20.



R.S.G.B. AMATEUR RADIO HANDBOOK

34/- POSTAGE AND PACKING 2/6

$5.50 post paid U.S.A. and Canada

Among the contributors to this 544 page Third Edition of the *Amateur Radio Handbook* are W. H. Allen, M.B.E. (G2UJ), A. J. Bayliss, B.Sc. (G8PD), G. L. Benbow, M.Sc., A.M.I.E.E. (G3HB), F. J. H. Charman, B.E.M. (G6CJ), D. N. Corfield, D.L.C. (Hons.), A.M.I.E.E. (G5CD), G. C. Fox, A.M.I.E.E. (G3AEX), D. W. Furby (G3EOH), W. E. Green (G3FBA), D. E. A. Harvey, Grad.I.E.E., J. P. Hawker (G3VA), D. W. Heightman, M.Brit.I.R.E. (G6DH), H. M. Humphreys (GI3EVU), N. G. Hyde, A.M. Brit.I.R.E. (G2AIH), J. H. Jowett (ex-G3CFR), J. Douglas Kay, Assoc.Brit.I.R.E. (G3AAE), L. A. Moxon, B.Sc. (G6XN), R. D. Nicol (G3ENQ), S. N. Radcliffe, M.A. (G3GZB), R. F. Stevens (G2BVN) and G. M. C. Stone, A.M.I.E.E., A.M.Brit.I.R.E. (G3FZL).

EDITOR: JOHN A. ROUSE (G2AHL)

CONTENTS

Society News

New Zone D Representative

MR. H. A. BARTLETT (G5QA) of Pinhoe, Exeter, Devon, has been elected unopposed to fill the casual vacancy on the Council occasioned by the resignation of Mr. F. A. Russell (G3BHS) from the office of Zone D Representative.

Mr. Bartlett served on the Council from 1952 to 1960 and was President in 1955.

The Scheme of Representation

THE Council has decided that as from January 1, 1963, the office of Area Representative shall replace the office of Town Representative. As from the same date the London Regional Representative will be authorized to appoint two Deputy R.R.s (one North and one South of the River Thames). All other R.R.s will also be authorized to appoint Deputy R.R.s as required. The Deputy R.R.s will assist the R.R.s in the administration of their respective regions.

Although the office of County (or District) Representative will disappear at the end of the current year it is anticipated that the majority, if not all, of the present C.R.s will be invited to take office as Deputy R.R.s.

As from January 1, 1963, it will be a condition that every club or society applying thereafter for affiliation shall be required to appoint an Affiliated Society Representative.

R.S.G.B. News Bulletin Service

ON several occasions recently the reception of R.S.G.B. News Bulletins has been spoilt by interference from other U.K. amateur stations operating on or very close to 3600 kc/s. The North East of England service, in particular, has been subjected to interference from stations in the Glasgow area.

The Council would be grateful if members generally could, as far as possible, avoid using 3600 kc/s during the time the News Bulletins are being transmitted on Sunday mornings.

Headquarters Fund List No. 9

THE following is the ninth list of those who had contributed to the Headquarters Fund up to May 31, 1962:

M. C. Butcher (B.R.S.22246), A. L. Rogers (G2FQD), J. H. G. Allsop (G3OGX), R. G. Hindes (G3IGM), A. W. Morgan (B.R.S.23364), D. Melville (GM3HGU), P. B. Briscombe (G8KU), M. J. Leahy (JZ0ML ex-G3MJL), E. H. Goldsmith (G3GRW), B. Bush (G3IUM), E. G. Bright (G3JW), Surrey Radio Contact Club, Anon., J. O. Minks (B.R.S.22751).

Total amount contributed to date: £1,416 10s. 10d.

GFA

DURING recent months many members have complained to the Society about interference to amateur stations from GFA, an Air Ministry station which operates on a frequency of about 3766 kc/s.

After the complaints were received the frequency was regularly monitored by the G.P.O. On some occasions the transmissions were found to be free of the key clicks and spurious sidebands that had been complained of but on other occasions when they were heard the Post Office took the matter up with the Air Ministry and the faulty condition was corrected.

The Society has now been informed that a new transmitter, which had been on order by the Air Ministry for some time, was recently installed so it is confidently expected there will be no further cause for complaint.

During the time GFA was causing interference it is understood that several amateurs telephoned the Baldock Monitoring Station to complain. The G.P.O. consider it to be desirable that there should be no interruption of the routine working of the Baldock station and for that reason they ask that amateurs who wish to complain about interference should contact their local Telephone Manager.

Appeals for Rare Drugs

MEMBERS are reminded that the policy of the British Red Cross Society is not to accept requests for rare drugs from individual radio amateurs even when such requests are passed on to them via the police authorities. The British Red Cross Society recommend that when a United Kingdom amateur is asked by a foreign amateur to accept a message for a rare drug he should advise the sender to contact his National Red Cross Society.

Only requests from, or through, National Red Cross Societies, can be dealt with by the British Red Cross Society and any drugs obtained would be sent to the National Red Cross Society concerned.

More Pirates Fined

AT Burton-on-Trent Borough Magistrates Court on May 11, 1962, four local residents were fined a total of £50 for using wireless transmitting apparatus without a licence. They were Peter Bloor of Adelaide Crescent, Sydney Wardle of Sycamore Road, John Alfred Clarke of Rosliston Road and Frank Bray of Harper Avenue.

At Southampton Magistrates Court on May 9, 1962, Graham John Dowse of Cornwall Road was fined £15 with £2 2s. costs for a similar offence. He was also fined £5 for not having a television licence.

Model Radio Control

SINCE the Model Control Licence was introduced on June 1, 1954, the Post Office has issued more than 5,000 such licences for the radio control of model vehicles, vessels and aircraft.

From the inception of the Model Control Licence licensees have been authorized to use frequencies in the bands 26·96 to 27·28 Mc/s and 464 to 465 Mc/s. On and after January 1, 1963, the frequencies which they may use will be those in the bands 26·96 to 27·28 Mc/s and 458·5 to 459·5 Mc/s.

Marcuse Memorial Seat

AT a ceremony on the Green outside Bosham Parish Church at 3 p.m. on Saturday, July 21, 1962, the Chairman of the Parish Council (Mr. Frank Parham) will accept from representatives of the Radio Amateur Old Timer's Association a teak seat which has been provided for from monies subscribed to the Marcuse Memorial Fund. The seat will commemorate the very close association which the late Gerald Marcuse (G2NM) had with the village of Bosham.

Mrs. Irene Marcuse and her family hope that as many of her late husband's radio friends as possible will be present at the ceremony.

Silent Key

H. W. P. JANSSEN (G3HAH)

It is our sad duty to record the death on May 3, 1962, of H. W. P. Janssen (G3HAH) of London, S.W.1. For many years while resident in Ilford he was a staunch supporter of both the Ilford and East London Groups and continued to attend the Ilford meetings regularly when he moved to South West London.

To his widow and sisters we extend out condolences in their great loss. C.H.L.E.

Council Proceedings

Résumé of the Minutes of the Proceedings at a Meeting of the Council of the Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Saturday, April 14, 1962, at 2.30 p.m.

Present: The President (Mr. E. G. Ingram in the Chair). Major-General E. S. Cole, Messrs. N. Caws, C. H. L. Edwards, R. C. Hills, A. O. Milne, L. E. Newnham, A. D. Patterson, R. F. Stevens, G. M. C. Stone, J. W. Swinnerton, P. H. Wade, E. W. Yeomanson (Members of the Council) and John Clarricoats (General Secretary).

Apologies for absence
Apologies for absence were submitted on behalf of Messrs. F. K. Parker and A. C. Williams.

* * *

The Amateur Radio Handbook
It was agreed to send information in respect of the *Handbook* to all secondary schools in the United Kingdom.

Membership
Resolved (i) to elect 75 Corporate members and 24 Associates; (ii) to grant Corporate membership to six Associates who had applied for transfer.

Applications for Affiliation
Resolved to grant affiliation to the following societies and clubs: B.B.C. (Evesham) Club, Ilminster Grammar School Amateur Radio Society, South-East Essex Technical College Amateur Radio and Television Society, South Yorkshire Amateur Radio Society.

The Office of Zonal Representative
It was proposed and seconded that the office of Zonal Representative be abolished. After a discussion the motion was lost by a large majority.

QSL Envelopes
Resolved to take no action on a suggestion that the Society should offer for sale to members specially printed envelopes for sending cards to the Society's QSL Manager.

Membership Records
It was reported that completely new and up to date card files of members had recently been prepared by Headquarters and sent to the R.R.s. Only four R.R.s had written to acknowledge receipt of the card files.

Service Valve Equivalents
Resolved to accept an estimate submitted by W. H. Matthews & Sons Ltd. for printing 5000 copies of a revised edition of *Service Valve Equivalents.*

Reports of Committees
The Minutes of meetings of the following Committees were submitted as Reports:

R.A.E.N. Committee	January 20, 1962
Mobile Committee	March 14, 1962
Technical Committee	March 15, 1962
Membership and Representation Committee	March 19, 1962
Contests Committee	March 22, 1962
V.H.F. Committee	March 26, 1962
Golden Jubilee Celebrations Committee	March 29, 1962
R.A.E.N. Committee	March 31, 1962

Resolved (i) to receive the Reports; (ii) to accept certain of the recommendations contained therein.
The recommendations dealt with a decision to inform R.R.s of the names and addresses of members whose subscription is six months' in arrear; various contest matters; various matters of v.h.f. interest; invitations in respect of the Golden Jubilee celebrations; R.A.E.N. Committee membership.

The meeting terminated at 6.20 p.m.

Radio Amateurs' Examination

THE next Radio Amateurs' Examination arranged by the City and Guilds of London Institute will be held on Friday, November 2, 1962, from 6.30 to 9.30 p.m., only at the Technical Colleges listed below. Candidates for the examination must apply to one of the Colleges named *not later than October 1, 1962.* (No entries can be accepted after that date.) The examination fee of £1 10s., must be paid to the college authorities at the time of the entry.

BEDFORDSHIRE	
Luton:	College of Technology
BUCKINGHAMSHIRE	
Bletchley:	Evening Institute
CHESHIRE	
Birkenhead:	Technical College
DERBYSHIRE	
Ilkeston:	College of Further Education
DEVONSHIRE	
Plymouth:	Plymouth and Devonport Technical College
ESSEX	
Grays:	Thurrock Technical College
GLAMORGAN	
Gorseinon:	College of Further Education
Llandaff:	Technical College
GLOUCESTERSHIRE	
Bristol:	Technical College
Cheltenham:	North Gloucestershire Technical College
HAMPSHIRE	
Southampton:	Technical College
KENT	
Bromley:	Technical College
Dover:	South East Kent Technical College
Sheerness:	Technical Institute
LANCASHIRE	
Openshaw:	Technical College
Oldham:	Municipal Technical College
Preston:	The Harris College
Rochdale:	Technical College
St. Helens:	Technical College
LEICESTERSHIRE	
Leicester:	College of Technology and Commerce
LINCOLNSHIRE	
Lincoln:	Technical College
LONDON (L.C.C.)	
Holloway:	The Holloway Institute, Montem Road, Hornsey.
MIDDLESEX	
Wembley:	Evening Institute
NORTHUMBERLAND	
Newcastle-on-Tyne:	College of Further Education
SOMERSET	
Weston-super-Mare:	Technical College
STAFFORDSHIRE	
Stoke-on-Trent:	North Staffordshire Technical College
Walsall:	Technical College
SUFFOLK	
Bury St. Edmunds:	West Suffolk College of Further Education
SUSSEX	
Bognor Regis:	Technical Institute
Brighton:	Preston Technical Institute
WARWICKSHIRE	
Birmingham:	Garrett's Green Technical College
WILTSHIRE	
Trowbridge:	West Wiltshire College of Further Education
YORKSHIRE	
Cottingham:	Evening Institute (E. Yorks.)
Halifax:	The Percival Whitley College of Further Education
Huddersfield:	College of Technology
Hull:	College of Technology
Middlesbrough:	Constantine Technical College
SCOTLAND	
Dunfermline:	Lauder Technical College
NORTHERN IRELAND	
Belfast:	College of Technology
Coleraine:	Technical School
Kilkeel:	Technical School

Posting Certificate

ALL copies of the May issue of the R.S.G.B. BULLETIN were posted on Monday, May 14, 1962, and the Society holds a certificate to that effect from the Letchworth, Herts, Post Office.

CONTEST NEWS

RESULTS — REPORTS — RULES

First 1.8 Mc/s Contest 1962

THE First 1·8 Mc/s Contest held on February 24-25, 1962, was well supported, 79 entries and nine check logs being received. Conditions were good; the numerous foreign stations audible during the event made it one of the most interesting ever held, and helped to provide the extremely close finish—I.T. Cashmore (G3BMY) leading H. J. M. Box (G6BQ) by only one point.

The logs of some competitors could well have been for higher frequencies, G3BMY having contacts with ZC4PB, VE1ZZ, UB5WF, OK1NR, OK1ZL and HB9T, whilst G3IGW's showed EP2BK, ZC4PB, VO1FB, UB5WF and OK1NR. The overseas stations providing most contacts for contestants were OK1ZL with 34 and OK1NR with 28.

There were few comments by entrants, and those related mainly to the duration of the event. G6BQ would like shorter contests to provide continuous interest, and is supported by G2DHV, but G3BIK argues that it is not until the rate of contacts slows that those in the more populated areas look for the weaker signals of more distant entrants, and thus the longer contests even matters up to some extent. He is partially supported by G3LPT who, whilst saying that the rate of scoring drops off as the time goes on, wishes that there were more stations within reasonable distance.

All comments will be discussed by the Contests Committee when drawing up the rules for the 1963 events, and the views of others who usually enter would be appreciated.

Check logs from EP2BK, HB9QA, G3HBW, G3KRC, G4VF, G8JM, G8NF, B.R.S.2834 and B.R.S.24733 are acknowledged with thanks.

Posn.	Call-sign	Points
1	G3BMY	166
2	G6BQ	165
3	G3KLH	154
4	G3IGW	151
	G3FYE	151
6	G3JEQ	145
7	G5LR	133
8	G2MJ	131
9	G3OIT	129
10	G3ERN	127
11	GW3NAM	122
12	G2AFV	116
13	G3MEH	113
14	G3IAS	112
15	GM3AVA	108
16	G3LHJ	106
	G3JJZ	106
*	G3NBL	105
18	G3IPG	104
19	G3PGN	103
20	G3NXQ	100
21	G3BIK	97
22	G3ECC	96
	G3NNF	96
24	G2DC	93
25	G3HBR/A	91
26	G3JKY	80
27	GI3LZS/A	79
28	G3KXT	78
29	G3KKQ/A	76
	G3KZG	76
31	G3NNW/A	73
32	G3KTA	72
33	G3DCZ	71
	G3JTK	71
35	G2CUZ	70
†*	G3KBC	70
36	G3FTQ	69
37	G2BOF	67
38	G2ZZ	66
39	GI3NEB	65
40	G3OJI	64
	G3PJX	64
†‡	G3OZN	63
42	G3GAH	62
	G3LZE	62
	G3KZZ/A	62
45	G2XP	60
46	G3JFY	58
	G3IWB	58
48	G2HIK/A	57
49	G2BTO	56
	G3CWW	56
	G3OYU	56
52	G3LPT	52
53	G3KSH	50
	G8TA/A	50
55	G3BY	47
56	G3LLM	45
	G3OHC	45
58	G2ZR	44
	G3KUG	44
60	G2HBA	43
61	G3MWZ	42
	G3KWH	42
63	G6TS	41
64	G3CBW	40
65	G3PJB	38
66	G2VV	36
67	G2DHV	35
	G3LWS	35
69	G6OO	32
70	G3OXI	31
	G3IMO	31
72	G8BN	27
73	G3IGS	26
74	G8KU	25
75	G2ABK	24
76	GM4AN	23

* Late Entry † No Cover Sheet ‡ No Declaration

144 Mc/s Open Contest 1962

AS in the 1961 event, the leader in the 144 Mc/s Open Contest held on March 3-4, 1962, was a multiple-operator station and is therefore ineligible for an award. G2JF, with a score of 2127 points, was well ahead of all other contestants having contacts with 26 Continentals (12Fs, seven ONs, eight PAs and one DL). G2JF's entry was the only one to show contacts with Europeans.

In the very poor conditions the countries bonus intended to benefit stations in the North and West failed. No GM-GI or GM-G contacts were logged and only one G-GI and eight G-GW. Incidentally, Monmouth is in England for R.S.G.B. contest purposes (see page 360, January 1962, BULLETIN).

Posn.	Call-sign	Counties	Contacts at 10 pts.	Contacts at 25 pts.	Points
*	G2JF	21	100	25	2127
1	G3BA	33	99	5	1937
2	G3GHI	22	135	—	1897
3	G3LLJ/A	26	112	4	1895
4	G4DC	20	129	—	1790
5	G3OHC/A	27	100	4	1775
6	G5MA	27	108	—	1755
7	G3IAS	20	123	—	1727
8	G2HIF	26	77	—	1420
†	G3OSS	18	89	—	1330
9	G3PBV	23	70	—	1275
10	G3LOV	13	88	—	1205
11	G6GN	23	51	3	1160
12	G3MNQ	23	58	—	1155
13	G2AXI	16	70	—	1077
14	G3EDD	22	57	—	1045
15	G3KKK	11	76	—	1035
16	G3FD	15	65	—	1025
17	G5DF	16	62	—	1020
18	G3OBD/M	16	54	3	1015
19	G5UM	15	63	—	1002
20	G2HOP	20	50	—	1000
	G3NNG	20	50	—	1000
21	G5DS	14	62	—	980
22	G2XV	17	54	—	962
23	G3HWR	11	54	—	815
*	G3KEU/P	18	35	—	800
24	G5HZ/P	15	35	—	725
25	G3LDY	12	36	—	660
26	G2BLA	11	32	—	595
27	G2DHV	6	36	—	510
28	G3NUE	10	23	—	480
29	G2BHN	7	21	1	410
	G3GRA	8	21	—	410
30	G6JQ	9	16	1	407
31	G3LTN	7	21	—	385
	G3MPL	7	21	—	385
32	G3AYC	6	23	—	380
33	G3NIM	5	17	—	295
34	G6TS	4	18	—	280
35	G3NXQ	5	11	—	235
36	G3OSA	3	14	—	215
37	G3NJH	3	10	—	175
38	GM3LAV/M	4	7	—	170

* Multi-operator station. † Incomplete entry.

The Mitchell-Milling Trophy goes to Tom Douglas (G3BA) with a score of 1937, though he has not entered this particular contest before. Tony Naylor (G3GHI) who came second with 1897 points will receive a certificate of merit.

The entry from Phil Dutfield (G3OBD/M) caused some interest; he operated from Dorset on March 3 and from Wiltshire on March 4. There is of course nothing in the rules against this though portable stations are required to operate from one site only, but it is worth mentioning that these rules are under consideration with a view to reappraisal.

More serious is the problem of multi-operator stations. In a 26 hour event a relief operator can make a lot of difference to the score, especially if conditions are good enough to justify all night operation. The position of multi-operator stations will therefore be given further consideration.

Some comments were received concerning the scoring system; four entrants advocate a method based on distance (as in the September contest), one a decreasing score so that successive contacts with each county become progressively less valuable, and one a further bonus for working 20 (or more) stations in one county. The last suggestion may not be

intended seriously but the Contests Committee will examine the problem after the National 144 Mc/s Open Contest in September.

Check logs from G2UJ, G2WJ/A, G3EHR, G3HBW, G3HRH and G3MEH are gratefully acknowledged.

Listeners' V.H.F. Contest 1962

THIS event coincided with the 144 Mc/s Open Contest and was held on March 3-4, 1962. None of the six entrants heard any stations outside his own country. A. C. Young (A.3126) in Plean, Stirlingshire, logged 14 GMs but

Posn.	Name	Number	QTH	Counties	Stations	Pts*
1	A. W. Blandford	B.R.S.18572	Surrey	17	111	1,535
2	W. Parmenter	B.R.S.22445	London	8	73	920
3	E. R. Crane	B.R.S.13336	London	9	44	665
4	D. A. S. Drybrough	B.R.S.22550	Warks.	9	18	405
*	A. C. Young	A.3126	Stirling	6	14	290
5	M. S. Box	A.1795	Dorset	6	11	260

* Incomplete Log.

unfortunately omitted their QTH so that his score could not be checked.

The leader was A. W. Blandford (B.R.S.18572); eight of the stations he logged could fairly be called DX but the rest were all within 50 miles or so. The runner-up, W. Parmenter (B.R.S.22445), logged locals only.

Low Power Contest 1962

COMPETING against a slightly smaller field than in 1961, Vic Curling (G6VC) completed his " hat trick " of wins in this Contest held on April 7-8, 1962, and improved on his previous score by some 60 points. Again he relied upon the 6AC7 v.f.o.-6AC7 p.a. rig of previous events, and won by a comfortable margin over Ben Pooley (G3PAH) whose commendable effort on a transistorized rig deservedly puts him in second place. He used an OC45 v.f.o., followed by two buffers and a push-pull output stage, all using OC44s. The other transistorized entrant, Mrs. Mary Moore (G3ORU), who used a home built push-pull c.o. (transistor types not specified), gave her near neighbour Jack Petty (G4JW) a close run for third place—his position last year.

A certificate of merit is to be awarded to M. Harrison (B.R.S.24733) whose accurate and extensive check log was of

Posn.	Call-sign	Points	Contacts	County Areas	Power
1	G6VC	2220	82	29	0·5 watt
2	G3PAH	1320	22	11	*0·18 watt
3	G4JW	1120	34	21	0·46 watts
4	G3ORU	1040	21	10	*0·45 watt
5	G5LQ	1020	34	17	0·475 watt
6	G3ORB	860	32	20	0·45-3·75 watts
7	G3OYU	840	28	14	0·5 watt
8	G3CWL	640	21	11	0·35 watt
9	G3HQT	432	40	19	5 watts
10	G3JKY	250	14	9	1·8 watts
11	G2ATD	215	11	8	1·5 watts
12	G3CGD	21	1	1	5 watts

* Denotes transistorized transmitter.

great help to the adjudicators. He and G3GNS are thanked for their useful logs.

A number of last year's contestants were again active but failed to submit entries. It is hoped that they will return to the fray next year, otherwise the future of this Contest may be in doubt.

Those who did participate appear generally to have enjoyed it, and press for its retention under the same rules. It is suggested that accurate " zero beating " on a CQ call would help contestants to be heard, but on the other hand there are often what one contestant described as " bulldozing QRO tactics " on the channel (a European contest in progress) which the QRP station must avoid—and it is the *good listener* who triumphs in such conditions.

Over half the contestants failed to enter their County Code number on the Cover Sheet. In view of the small entry this has been overlooked, but future contestants may find themselves disqualified if the requirements of the General Rules for R.S.G.B. Contests are ignored.

Oxford D/F Qualifying Event

OUT of 12 starters in the Oxford D/F Quaifying Event on May 13, 1962, no less than 10 found both transmitters. To quote that veteran of direction finders, G. T. Peck—" A couple of years ago you wouldn't have had more than two." While smaller and more efficient receivers play their part, there is no doubt that the intense spirit of competition which now exists in these events has much to do with the improvement.

G8PX/P was 6½ miles from the start, which necessitated a not too long, but energetic run up a steep hill before it could be located. G2DU/P, only 2½ miles from the start, proved far more difficult for most competitors. The spot chosen was a mile from any road, in thick undergrowth, surrounded by marsh land, where running was impossible, and even walking was difficult. Despite this, and the fact that the distance between transmitters was 8 miles, G. H. Taylor (G3MDC) of Rugby had found both transmitters by 3.25 p.m. Next was E. Mollart, B.R.S.10977 (Oxford) at 3.51 p.m. and third J. H. Andrews of A.E.I. Rugby at 3.52 p.m. As Mr. Mollart had already qualified, the fourth, F. Allsop of Derby qualified for the final, together with Messrs. Taylor and Andrews.

At the tea following the event, prizes were awarded to the first three competitors, and the usual stories of " spot on " bearings, plus the one that went astray, were being swapped.

D/F Qualifying Events

DETAILS of forthcoming qualifying events are as follows:

RUGBY

Sunday, July 1, 1962
Organizer: R. T. Craxton (G3IKL), 103 Clifton Road, Rugby.
Frequencies and call-signs: To be announced at the start.
Map: Ordnance Survey, New Popular Edition, Sheet No. 132.
Assembly Point: 1½ miles N.E. Theddingworth (N.G.R. 678875).
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer by June 27, stating the number in their party requiring tea, which will be at the A.E.I. Rugby Recreation Club, Hillmorton Road, Rugby.

WIRRAL

Sunday, July 15, 1962
Organizer: L. N. Goldsbrough (G3ERB), 56 Kings Lane, Bebington, Wirral, Cheshire.
Frequencies and call-signs: 1930 and 1910 kc/s, G3NWR/P and G3PYU/P respectively.
Map: Ordnance Survey, New Popular Edition, Sheet No. 109.
Assembly Point: Beeston Towers Hotel on A.49 near Beeston Castle and Tarporley station.
Assembly Time: 13.00 B.S.T.
Entries and Tea: Intending competitors should notify the Organizer as soon as possible, stating the number in their party requiring tea, the venue being Beeston Towers Hotel. (High tea, 7/6 per head).

National 144 Mc/s Open Contest 1962

THIS contest which has been arranged to take place during the period of the European V.H.F. Contest has been restored to the calendar by popular request.

Members who wish to enter the I.A.R.U. Region I V.H.F. Contest are advised to read the rules of that contest also, as there are minor differences in the two sets of rules (see page 606).

The rules are as follows:

Duration. The contest will run from 18.00 G.M.T. Saturday, September 1, to 18.00 G.M.T. Sunday, September 2, 1962.

Eligible Entrants. All fully paid up members of the R.S.G.B. resident in the British Isles (G, GC, GD, GI, GM, GW). Multiple operator entries will be accepted provided only one call-sign is used (see R.S.G.B. General Rule 7).

Sections. The contest will comprise three sections:
(*a*) Fixed-high power (up to 150 watts input to the p.a. stage).
(*b*) Fixed-low power (up to 30 watts input to the p.a. stage).
(*c*) Portable or mobile stations (see R.S.G.B. General Rule 8). Such stations must operate from the same site for the duration of the contest.

Contacts. Contacts may be made on A1, A3, A3a and F3 subject to the conditions of the Amateur (Sound) Licence.

Scoring. Points will be scored on the basis of one point per kilometre.

Contest Exchanges. RST (RS) reports, the contact number (beginning at 001) and the location. Location will be given either as distance and bearing from a town on the O.S. " 10 mile to 1 inch " map or as QRA Locator. (Stations taking part in the I.A.R.U. V.H.F. Contest will require QRA

Locator numbers; entrants in the National 144 Mc/s Contest must be able to supply this information on request but it is the responsibility of the receiving station to obtain sufficient information to compute his score.†) If the QTH sent is varied during the contest a note must be made in the log against the appropriate contact and the various forms of "QTH transmitted" noted on the cover sheet.

Logs. (*a*) Must be tabulated in columns headed (in this order): "Date/Time (G.M.T.)," "Call-sign of station worked," "My report on his signals and serial number sent," "His report on my signals and serial number received," "Location of station contacted as received," "QTH sent," "Points claimed."

(*b*) The cover sheet must be made out in accordance with R.S.G.B. General Rule 5 and the declaration signed. The cover sheet must include the following special information: the QTH of the station as transmitted for each contact, full national six figure reference in the case of stations in G, GD, GW and GM and latitude and longitude in the case of stations in GC and GI.

Awards. At the discretion of Council a miniature cup will be awarded to the winner of each section of the National 144 Mc/s Open Contest, and certificates of merit to the three runners-up and the non-transmitting member submitting the best check log.

Rules for I.A.R.U. Region I V.H.F. Contests

FIVE official v.h.f. contests shall be held each year under the auspices of the Region I I.A.R.U. V.H.F. Committee but each national Society shall retain the right to organize such extra contests as it may see fit. The first four official contests each year shall be national events designed to increase v.h.f. activity in the countries concerned but QSOs with foreign amateurs are permitted. Rules for these contests are optional and any country may make its own, but the use of the international rules is recommended. The fifth official contest will be known as the I.A.R.U. Region I V.H.F. Contest and will be arranged by a different Region I Society each year. The sequence will be Austria, Belgium, Denmark, France, Germany, Great Britain, Holland, Italy, Yugoslavia, Sweden and Switzerland (1962). For the Region I I.A.R.U. V.H.F. Contest the official rules, adopted at the Turin V.H.F. Managers' Conference 1961, apply:

1. **Eligible Entrants.** All licensed radio amateurs resident in Region I. Multiple operator entries will be accepted provided only one call-sign is used. Contestants must operate within the letter and spirit of the contest and at no greater power than permitted in the ordinary licences of their country. Stations operating under special high power licences do so *hors concours* and cannot be placed in the contest proper.

2. **Contest Sections.** The first two and the fourth and fifth contests will comprise the following sections: (i) Fixed Stations—2m; (ii) Portable/Mobile Stations—2m; (iii) Fixed Stations—70cm; (iv) Portable/Mobile Stations—70cm; (v) Fixed Stations—24cm; (vi) Portable/Mobile Stations—24cm.

The third contest will be operated on 70cm and 24cm only (*Note 3*). Portable/Mobile stations must operate from the same location throughout the events.

3. **Dates of Contests.** The four general contests will take place during the first weekends of March, May, July and September each year; the third contest (70 and 24cm) will take place during the last weekend in May. The sequence 31/1 or similar not to count.

4. **Duration of Contests.** The contests will commence at 18.00 G.M.T. on the Saturday and will end at 18.00 G.M.T. on the Sunday.

5. **Number of Contacts.** Each station can be worked once only on each band whether fixed, portable or mobile. If a station is worked again during the same contest on the same band only one contact will count for points, but any duplicate contacts should be logged without claim for points and should be clearly marked as duplicates.

6. **Types of Emission.** Contacts may be made on A1, A3, A3a or F3.

7. **Contest Exchanges.** Code numbers exchanged during each contact shall consist of the RS or RST report followed by a serial number commencing at 001 for the first contact on each band and increasing by one for each successive contact on each band. This exchange must be immediately followed by the QRA Locator of the sending stations (example—59003CX24 or 57902IYG46E). QTHs may be exchanged if desired.

8. **Scoring.** Points will be scored on the basis of one point per kilometre. The final claimed score must be shown at the top part of the first sheet.

9. **Entries.** Entries must be set out as shown in the example below. In the case of the I.A.R.U. Region I V.H.F. Contest two copies of the entry must be sent to the National V.H.F. Manager concerned postmarked not later than the second Sunday following the contest weekend. Late entries will not be accepted. The judging of the entries shall be the responsibility of the organizing Society whose decision shall be final. Submission of a log implies acceptance of the rules (*Note 2*).

10. **Disqualification.** Entrants deliberately contravening any of these rules shall be disqualified. Minor errors may result in loss of points. Errors in call-signs and code numbers will be penalized by deducting the following percentage of claimed scores for both stations. One error 25 per cent, two errors 50 per cent, three or more errors 100 per cent. The claimed contact will be disqualified for (*a*) an obviously wrongly stated QTH; (*b*) a time error of more than 10 minutes (*Note 1*).

† Exchange of QRA Locators will not be compulsory in the 1962 Region I I.A.R.U. V.H.F. Contest.

11. **Awards.** The winner of each section will receive a certificate. The top scorer on 2m whether fixed or portable will be awarded the Region I V.H.F. trophy. The winner in the remaining 2m category will be awarded the P.Z.K. cup.

Notes. (1) In U.K. countries it is customary to use a band identification letter (A for 2m, B for 70cm and C for 24cm). Should this letter be used or not used no penalty will be exacted.

(2) Not later than the seventh Sunday following I.A.R.U. Region I V.H.F. Contest the V.H.F. Manager or properly constituted Contest Committee will forward to the Society organizing the contest one copy of each entry, after examining the logs and certifying them to be acceptable to the best of their knowledge.

(3) The May 70cm contest will be known as the I.A.R.U. Region I U.H.F. Contest.

Sample Contest Log Sheet

Contest..... Date..... Claimed Score.....

Section..... Call-sign.....

Name .....

Home address..... QRA Locator.....

Location of station.....Latitude.....Longitude.....

Height above sea level in metres.....

Transmitter..... Input power..... watts

Operating frequencies..... Crystal or v.f.o.?.....

Receiver..... Aerials.....

Date/ Time	Call-sign	Serial sent	Numbers received	QTH	Emission	Distance km	Points claimed

DECLARATION. *I declare that this station was operated strictly in accordance with the rules and spirit of the contest and I agree that the ruling of the organizing society shall be final in all cases of dispute.*

Date..... Signed.....

Wolverhampton Field Day

ON June 17, 1962, commencing at 10.00 G.M.T., Wolverhampton Amateur Radio Society is to hold a field day at Highgate Common, seven miles south of Wolverhampton. All bands from 2 to 160m will be used and the station will operate under the club call-sign G8TA/P.

CONTESTS DIARY

June 16–17 – 70 Mc/s Contest (see page 552, May 1962)
June 24 – D/F Qualifying Event (Newbury) (see page 551, May 1962)
1250 Mc/s Tests (see page 552, May 1962)
July 1 – D/F Qualifying Event (Rugby) (see page 605)
July 7–8 – V.H.F. National Field Day. (For rules, see page 504, April 1962)
July 15 – D/F Qualifying Event (Wirral) (see page 605)

August 10-11 — European Fox-Hunting Championships (Ankaran, Yugoslavia).
August 11-12 — W.A.E. DX Contest (C.W.).
August 18-19 — W.A.E. DX Contest (Phone).
August 25-26 — All Asian DX Contest.
September 1-2 — National 144 Mc/s Open Contest (For details, see page 605).
September 1-2 — Region I I.A.R.U. V.H.F. Contest.
September 9 — D/F National Final.
September 15-16 Scandinavian Activity Contest (C.W.).
September 16 — Low Power Field Day.
September 22-23 Scandinavian Activity Contest (Phone).
October 6-7 — VK/ZL Oceania DX Contest (Phone).
October 7 — R.A.E.N. Rally.
October 12-24 — Goose Bay A.R.C. QSO Parties.
October 13-14 — VK/ZL Oceania DX Contest (C.W.).
October 20-21 — Second 420 Mc/s Contest.
October 27-28 — R.S.G.B. 7 Mc/s DX Contest (Phone).
November 3-4 — R.S.G.B. 7 Mc/s DX Contest (c.w.).
November10-11— Second 1·8 Mc/s Contest.
December 1-2 — R.S.G.B. 21/28 Mc/s Telephony Contests.
December 9 — OK DX Contest.

Letters to the Editor . . .

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

The Amateur's Contribution to the Birth of Broadcasting

DEAR SIR,—I was interested to note that Professor Briggs in Volume 1 of his *History of Broadcasting, The Birth of Broadcasting*, reviewed in the February issue of the BULLETIN, has at last firmly placed on record the point I, personally, stressed in the article *The Dawn of International DX* in the *T and R* BULLETIN for July, 1938, that the large number of wireless amateurs of the day, in spite of restrictions " refused to be contained in a mesh of bureaucratic regulations " and " with enthusiasm filled the gap between the cessation of the Writtle experiments, and the authorisation of short regular broadcast programmes in 1922."

This is not, however, quite accurate, for amateur stations were broadcasting fairly regular programmes before Writtle was requested. Writtle was a useful service but played only a minor part in keeping and feeding the rapidly growing public interest. Amateur stations of the period were transmitting music and speech practically every day and night to libraries and halls where Societies were holding lectures and in spite of the restrictions, fortunately not enforced by the Post Office, weekly transmissions were quite common. I personally transmitted one of these programmes generally lasting about half an hour, opening with the Skaters Waltz and ending with the Stein Song. The newspapers of the day often reported us in their columns. The amateurs of 1922-23 could almost be called the first " disc jockeys " of the new age.

As I wrote in that article 23 years ago, the B.B.C. owe the amateur much that the progress of broadcasting was so smoothly introduced to an already aclimatized public. Its success was assured from the start and no record of its growth would be complete without an acknowledgement of this debt. Professor Briggs is to be congratulated upon his fair appraisement of the position and deserves the thanks of the Amateur Radio movement as a whole.

Yours faithfully,

Wembley, Middlesex. W. E. F. CORSHAM (G2UV).

Narrow Band F.M.

DEAR SIR,—I read with great interest the letter from Mr. Sedgwick, G8WV (February 1962) on the advantages of n.b.f.m., and the means to exploit them. I am not sure, though, that I fully understand what he means when he says that it is the one system which " allows the receiving end to increase the effective modulation of a signal." So far as I know, there is no way by which the effective deviation can be increased in an f.m. system. However, from later remarks it would appear that it is a matter of increasing the relative efficiency of the detection system, so that a given deviation will give more audio output. The question of the percentage of the r.f. or i.f. is relatively unimportant except in so far as the amount of audio gain required is concerned. Since such gain is usually the easiest to obtain, it does not appear to be a serious problem. Reducing the discriminator bandwidth will give no other important advantage than an increase in audio level and less audio stages. Indeed the amount of output G8WV suggests may well produce problems in that such a level of voltage can introduce new problems of stability in the i.f. limiter chain.

The advantage of an i.f. of 50 kc/s compared to 465 kc/s seems very trifling, since the bandwidth required for good performance with a $\pm 2{\cdot}5$ kc/s deviation is just about that of a good 465 kc/s i.f. amplifier. If one assumes a deviation of $-2{\cdot}5$ kc/s and a top modulating frequency of 3·0 kc/s the i.f. amplifier will require a bandwidth, at the 3db points, of at least 7·5 kc/s so as to accommodate the significant sidebands and the highest modulating frequency, since, even where the deviation is less than the top modulating frequency, the i.f. must be at least as wide as the modulating frequencies. If it is assumed that the average 465 kc/s i.f. stage has a bandwidth of 10 kc/s so as to accommodate a.m. broadcasts, then we seem to have a very good compromise, as the deterioration compared with the optimum bandwidth will represent a loss of less than 2db in the signal-to-noise ratio. There should be little difficulty in constructing a suitable discriminator from an old i.f. transformer (probably the Foster-Seeley type of discriminator is the easiest to construct) as it is only necessary to find an old type with a secondary winding that can be centre-tapped; in addition it can be easily aligned without having a signal generator since any signal will serve. A wide discriminator is not " useless," it merely requires a lot of a.f. gain after it. It will not affect the performance from an f.m. point of view.

I am 100 per cent with G8WV when he calls for more use of n.b.f.m. For v.h.f. working it represents a performance at low signal levels that closely approaches s.s.b., but is infinitely simpler, although to judge from recent correspondence in the BULLETIN this is not so. No one seems to have heard of the phase modulator which is ideal for low deviations and can be hung on after a crystal oscillator or v.f.o.

The use of de-tuned receivers, which G8WV rightly deplores, produces an additionally unfavourable result since no limiter is used, thus nullifying one of the main advantages of f.m., the removal of a.m. noise. In addition, severe distortion is introduced, both by the non-linear detection and the phase modulation introduced in the, equally, de-tuned i.f.'s.

In conclusion, perhaps the easiest discriminator for narrow band f.m. is the 6BN6 gated beam valve that combines limiting and discrimination in one envelope, while giving a high volts-per-kc/s output.

Yours faithfully,

San Carlos, California, U.S.A. GEOFFREY M. WARD (G3BOB)

Maritime Mobile Operation

DEAR SIR,—I am one of the more fortunate United Kingdom Amateur Radio operators referred to by Mr. Hughes (G3OSR) in his letter which appeared under this heading in the November 1961 BULLETIN; fortunate in that I hold a Maritime Mobile licence to operate on 28 Mc/s only—there my good fortune ends!

Band conditions on 28 Mc/s have for some time been very unstable and look like remaining that way for some years yet. Under these conditions the Maritime Mobile operator spends his time either listening or calling CQ and generally ending up with another blank page in his log. For this he pays £4 per annum.

With the limited time at our disposal—we have our own job to do as well, day and night—we need a band we can rely upon to give us regular contacts with fellow amateurs around the world. We would like to be able to have contacts with amateur stations in our home country, from which we are separated for periods varying from a couple of weeks to several years. We would also like to be able to make contacts with fellow amateurs at our next port of call, the latter proving a boon to the sea-going operator, especially after a long period at sea.

I can see no foundation for the argument that certain operating companies object on the ground that our activities might cause them a loss in revenue, presumably through handling third party traffic. Marine operators handle enough of this type of traffic during duty hours without carrying it on in their spare time. Marine operators are not interested in handling third party traffic and anyone who is foolish enough to do so should be dealt with in the prescribed manner. A United Kingdom Amateur Radio licence is still held in high regard in most parts of the world and it is surely not worth jeopardizing it by questionable practices.

The Royal Naval Amateur Radio Society was formed in the hope that a concerted voice from " frustrated " radio amateurs in the Royal Navy would make the Post Office authorities reconsider the Maritime Mobile question. Could not the R.S.G.B. (of which body I am a staunch supporter) having done so much for the radio amateur, both in the United Kingdom and abroad, join the R.N.A.R.S. in presenting a joint case to the Post Office for licensed Maritime Mobile operation on board British ships?

Let " G " calls be heard on the high seas and above all let the Marine Radio Officer, and his R.N. equivalent, enjoy their chosen hobby in their spare time.

Yours faithfully,

M. J. MATTHEWS,
(G3JFF/VR1M/VR2EA/YJ1MA/VS1HU/9M2MA).
H.M.S. Cook,
Taveuni, Fiji Islands.

R.S.G.B. Intruder Watch

DEAR SIR,—In *M.O.T.A.*, March 1962, reference is made to the I.A.R.U. report of non-amateur stations monitored in the band 7000 to 7100 kc/s; 21 stations are listed for the period April/August 1961.

I should like once again to remind the membership that the Society has its own organization for dealing with intruder stations in the exclusive amateur bands. A number of watchkeepers monitor parts of the amateur bands at various times in the course of each month. Individual complaints from members are also investigated. Resulting from this, reports are sent to the G.P.O. via R.S.G.B., on all cases of confirmed intruders where the offending station is causing harmful interference to the Amateur Service. The G.P.O. then check the interference in question, and in proved cases, where possible, make representation to the administrations or services concerned. In this way amateurs themselves are helping to look after their own bands.

The R.S.G.B. Intruder Watch is at present very short of volunteer watchkeepers. The normal wastage is difficult to replace. My particular thanks go to G8IJ, G3BTC, G3MND, and G3OPQ, who are at present sending regular monthly reports. I should be very pleased to send details to other volunteers. Essential minimum qualifications are a good receiver, frequency measuring equipment, 18/20 w.p.m. c.w., and where possible, some ability to recognize various foreign languages, as well as the different types of commercial/service traffic. Minimum time one hour per week.

Our records show that 300 intruder stations were heard more than three times in the exclusive 7, 14, 21 and 28 Mc/s amateur bands from January 1959 to March 1962.

Yours faithfully,
(Major) D. W. J. HAYLOCK (G3ADZ)
Havant, Hants. *Hon. Organizer*, R.S.G.B. Intruder Watch

Are You a Sailor?

DEAR SIR,—On several occasions I have heard Society members who own boats of various types discussing how many other members fall in the same category. It is known that several members own sailing or power cruising crafts which are fitted with marine radio equipment, and that they maintain contact when at sea, using the frequencies allotted to small craft.

I would be willing to collect, collate and distribute the resulting information to any such members who would co-operate by sending me the following information not later than June 30, 1962, under the headings and in the order given below:

Name
Address
Amateur Call-sign
Name of Yacht
Type of Yacht
Home Post
If in Lloyd's Register
If licensed for R/T
If fitted for D/F

Yours faithfully,
H. A. M. CLARK (G6OT)
119 Wynchgate,
London, N.14.

The F.B.5 Aerial

DEAR SIR,—Having read, with considerable interest, G4ZU's article in the March 1962 issue of the BULLETIN may I be allowed to make a few constructive comments?

In his ingenious use of ferrite beads, Mr. Bird has undoubtedly achieved improved feeder matching conditions for a multi-band aerial on 15 and 10m. However, by shortening the flat-top he has produced, on 20m, what is virtually a " double-extended Zepp " giving *reinforced radiation at right angles to the axis of the aerial.* This is fine if one is only interested in obtaining optimum results in the direction of the two major lobes thus produced, but, unless one possesses a rotary beam or alternative fixed aerials suitably oriented, anything like all-round DX coverage will not be possible.

G4ZU has stressed that, in both the G5RV and the W3DZZ aerials, the radiation pattern is " broken up into a number of minor lobes " (as if this were necessarily a bad thing) and that, for this reason, the performance on 20, 15 and 10m will be " sub-standard." Here I must take issue with him! For, surely, it depends on what you want—bi-directional radiation or, as nearly as possible with one aerial, all-round DX coverage? Certainly, for a given r.f. power delivered to the aerial, the power radiated is divided between the lobes produced according to their number and configuration. Naturally, this means that the power in any one of, say, six lobes will be much less than the power contained in one of only two lobes produced as, for example, in the case of the F.B.5 aerial. However, it may well be that one of the six lobes referred to happens to be in the right direction for that long-sought-after YJ1, achieving perhaps a 449 report, whereas the powerful side-lobes of the F.B.5 (erected in the same garden) might put an S9 signal into W1 and nothing at all into the New Hebrides!

Incidentally, Fig. 2 may give the wrong impression that the radiation is mainly in the vertical plane (or at least that it forms a " toroid shape " around the centre of the aerial) as the aerial and feeder are shown in side view and the lobe should really be going through the paper! Also, if the open wire stub is 10 ft., surely when using 300 ohm ribbon (Fig. 3) in order to join the stacked pair, allowance should be made for the velocity factor of solid dielectric feeder ($20 \times 0{\cdot}88 = 17{\cdot}6$ ft.)?

Yours faithfully,
Paris, France. LOUIS VARNEY, A.M.I.E.E., A.I.L.

Break-Break is not a Call-sign

DEAR SIR,—May I make another appeal through your columns to those so-called amateurs who, whilst in QSO, fail time and again to make any announcement other than " break-break "? I realize that some people regard it a chore to give full calls each time they hand over the transmission to another station, especially if it is a regular weekly QSO which lasts for a couple of hours. However, the P.M.G. and other licence issuing authorities allocate calls for the sole purpose of identification on the amateur bands. If a call-sign is not used by the person to whom it has been issued then why is that person allowed to continue to hold a licence?

I have noticed in recent years many letters to editors on the practice to which I have again drawn attention but I cannot remember reading one reply in defence of the practice. Perhaps a few pink slips would do the job!

Yours faithfully,
(Sgt) D. T. R. LLEWELLYN (B.C.R.S.1117)
18 Signal Regt., c/o G.P.O. Singapore.

TVI and a Cure

DEAR SIR,—The following case of TVI was recently encountered on channel 11, and the cause may be of interest to other members of the society.

Radiations from a 2 metre transmitter having an 8-24-72-144 Mc/s multiplier chain were received on numerous nearby television receivers. With the aid of an Admirality G300 Wavemeter, considerable radiation on 201·5 Mc/s was detected. This spurious signal, occasioned by the 25th harmonic of the crystal oscillator, coincided almost exactly in frequency with that of channel 11 sound on 201·25 Mc/s.

A complete cure was effected by connecting a series tuned circuit, resonating at approximately 40 Mc/s, between anode and earth of the first (24 Mc/s) tripler stage.

Yours faithfully,
Cambridge. K. C. HOOPER, Ph.D., F.R.I.C. (G3DGI).

Gold Tinted Lacquer

DEAR SIR,—In the early days, before electroplating became commonplace, it was usual to finish brass parts of wireless and electrical instruments with a very durable gold tinted lacquer.

The writer would be interested to know if and where this lacquer may be obtained or, alternatively, if any reader can furnish a formula together with details of the process involved.

The information is required for the purpose of maintaining and re-conditioning old equipment for museum purposes.

Yours faithfully,
JAMES FOYE (ZS5JF)
P.O. Box 885, Durban, Natal, South Africa.

European Band Plan

DEAR SIR,—In view of recent correspondence on the subject of band-planning on the 7 Mc/s band, is the Society now in a position either to advise adherence to the existing Band Plan, or to formulate a revised version? If the Society does not take some such action the band would appear to be in danger of becoming a phone-only band, by default.

Yours faithfully,
Bromley, Kent. WILLIAM H. BORLAND (G3EFS).

(The European band plan for 7 Mc/s is as follows: 7000-7050 kc/s telegraphy, 7050-7100 kc/s telegraphy and telephony—EDITOR.)

R.S.G.B. Slow Morse Practice Transmissions

The following Slow Morse Practice transmissions are sponsored by the Society. Those responsible for the transmissions have a duty to the membership to adhere to the schedule but if they cannot do so for any reason they should notify the Honorary Organizer, Mr. C. H. L. Edwards (G8TL), 28 Morgan Crescent, Theydon Bois, Essex.

Time	Call-sign	kc/s	Town
Sundays			
09.30	G3BHS	1910	Southampton
09.30	G3HNJ / G3OFP / G3OMJ	1840	Doncaster
10.15	G3CGD	1875	Cheltenham
10.30	G3NCZ	1920	Blackburn, Lancs.
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
11.00	G3NXQ	1850	Warndon, Worcs.
11.00	GW3PCK / GW3PEX	1850	Cefncoed, Breconshire
12.00 †	G3HVI / G3IVB / G3OGD	1920	Stoke-on-Trent
12.00	G3ONQ / G3IGW / G3NBI	1900	Halifax
12.00	GI5UR	1860	Belfast
Mondays			
18.30	G3NC	1825	Swindon
18.30	G3NCZ	1920	Blackburn, Lancs.
19.00	G3EEL	1960	Peterborough
19.00	G3KTP	1850	Heanor, Derby
19.00	G3MXS	1915	Wirral
19.30	G3AJD	1940	Barnet
20.00	G3BMY	1838	Birmingham
20.00	G3GZE	1840	Blackburn
20.00	G3HJG	1825	Manchester
20.00	G3NIM	1910	Southampton
20.30	G3AGN	1875	Felixstowe
21.30 †	G3IRM / G3MWO	1981	Bury St. Edmunds
21.30	G3NOE	1900	Bradford
22.00	G3PRM	1916	Alvaston, Derbys.
Tuesdays			
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
19.00	G3ONB	1850	Kirkby-in-Ashfield
19.00	GW3BQY / GW5VX	1918	Port Talbot
19.30	G3AJD	1940	Barnet
20.00	G3NBV	1910	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MEH	1900	Old Coulsdon, Surrey
20.30	G3NKX	1875	Loughton
21.00	G3LSC / G3MKN / G3NUN	1875	Poole
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
22.00 †	G2CZU / G3LLM	1820	Bath
22.00	G3AWL	1980	Wingate, Co. Durham
Wednesdays			
19.00	G8RQ	1850	Chesterfield
19.30	G2BSQ	1930	Ashtead, Surrey
19.30	G3AJD	1940	Barnet
Wednesdays			
19.30	G3NQR	1875	Harrow Weald
19.45	G3KFE	1950	Stevenage
20.00	G3BHS	1910	Southampton
20.00	G3GZE	1840	Blackburn
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3LCK	1910	Canterbury
20.30	G3PED	1910	Goodmayes, Essex
21.00 †	G3HVI / G3IVB / G3OGD	1920	Stoke-on-Trent
21.00	G3LSC / G3MKN / G3MXF	1875	Poole
21.00 / 22.00	G3AGX	1920	Hull
21.30	G3HNJ / G3OFP / G3OMJ	1840	Doncaster
21.30	G3NOE	1900	Bradford
22.00	G3NXQ	1850	Warndon, Worcs.
Thursdays			
18.30	G3NC	1825	Swindon
19.00	G3EEL	1960	Peterborough
19.30	G3AJD	1940	Barnet
20.00	G3NBV	1910	Southampton
20.00	G3NHR	1900	Hounslow
20.00	G5XB	1890	Reading
20.15	G2AYQ	1875	St. Agnes, Cornwall
21.15	G3LGK	1916	Ilkeston, Derbys.
21.30 †	G3IRM / G3MWO	1981	Bury St. Edmunds
22.00 †	G2CZU / G3LLM	1820	Bath
22.00	G3AWL	1980	Wingate, Co. Durham
22.00	G3HZM	1825	Manchester
Fridays			
18.30	G3DMN / G3FVP	1880	Ipswich
18.30	G3NCZ	1920	Blackburn, Lancs.
19.00	G3PGS	1850	Kimberley, Notts.
19.30	G3AJD	1940	Barnet
20.00	G2BOJ / G3NXZ	1840	Doncaster
20.00	G3JQS	1915	Totton
20.00	G3NYB / G3NXZ	1980	Doncaster
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.30 †	G3OVU / G3KSS	1900	Bradford
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
14.30	G3NQA	1925	Birmingham
19.30	G3KPO	1900	Peterborough
19.30	G3KPO	1960	Peterborough

† *Alternately*

Alterations and additions to this list should be sent to the Honorary Organizer at the address given above.

Bridlington Mobile Rally and Hamfest

THE Mobile Rally and Hamfest organized by the Bridlington and District Radio Society will be held at the Spa Royal Hall, Bridlington, on Sunday, June 24. There will be no charge for admission.

The talk-in stations, G3GBH/A on Top Band and G3FKV/A on 144 Mc/s, will be on the air from 11 a.m.

Grafton Radio Society Contest

THE leading entrants in the Top Band Contest organized by the Grafton Radio Society and held on March 24 and 31, 1962, were as follows: *Members' Section*—G3JZX (100 points), G3KRH (98), G3NMV (88), G3LCA (68); *Open Section*—G3ERN (119 points), G3LHJ (111), G3OZF (108), G3OQT (99). Check logs were received from B.R.S.24814, G3IES, G3MXJ and HB9QA.

Institution of Electronics Exhibition

THE Seventeenth Annual Electronics, Instruments and Components Exhibition and Convention organized by the Institution of Electronics will be held at the College of Science and Technology, Manchester, during the periods July 5-7 and July 9-11, 1962, inclusive. Admission will be by ticket only, available free of charge by sending a stamped addressed envelope to W. Birtwistle, General Secretary, The Institution of Electronics, 78 Shaw Road, Rochdale, Lancashire. An illustrated catalogue will be available at the end of June, price 4s. post paid.

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the 18th of the month preceding publication. T.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out the copy, preferably typed double spaced, in the style used below. Standing instructions for more than three months ahead cannot be accepted.

DATES FOR YOUR DIARY

July 1.—Worthing "Bucket and Spade" Party.
September 2.—G6UT's Ham Party.
September 8—B.A.T.C. Amateur Television Convention, Conway Hall, London, W.C.1.
September 22.—Region 9 Mobile Rally at Weston-super-Mare.
September 23.—Region 9 O.R.M. at Weston-super-Mare.
September 23.—Surrey Radio Contact Club 144 Mc/s D/F Hunt.
October 20-21.—Jamboree-on-the-Air.
October 31-November 3.—R.S.G.B. Exhibition, Seymour Hall, London.
December 15.—Annual General Meeting, Overseas House, London S.W.1.

Details of Mobile Rallies are given in *Mobile Column*.

REGION 1

Ainsdale (A.R.S.).—June 27, 8 p.m., 37 Hawthorne Grove, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., Pontins Holiday Camp, Squires Gate.
Bury (B.R.S.).—July 10 ("Discussion Night"), 8 p.m., Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., Y.M.C.A.
Eccles (E. & D.R.C.).—Tuesdays, 8 p.m., Congregational Mission Church, King Street (July 24, lecture by D. Atter, G3GRO, on "Amateur Communication Receiver Design").
Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—June 26, July 10, 24, 42 Jordongate.
Manchester (M. & D.A.R.S.).—Wednesdays, 7.30 p.m., King George VI Club, North Road, Moston, Manchester, 10. **(S.M.R.C.).**—Fridays, 7.30 p.m., Fallowfield Bowling and Lawn Tennis Club, 81 Wellington Road, Fallowfield, Manchester, 14.
Morecambe.—July 4, 125 Regent Road.
Preston (P.A.R.S.).—June 26 (Illustrated Tape Lecture on "Semi-Conductors"), Wednesday, July 4, visit to I.T.A. Transmitter at Winter Hill. July 10, Night on the Air. July 24—no meeting. (All meetings include Morse practice at 7.30 p.m.), St. Paul's School, Pole Street.
Southport (S.R.S.).—Thursdays, 8 p.m., The Esplanade.
Stockport (S.R.S.).—June 20, July 4, 18, at 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral (W.A.R.S.).—June 20, July 4, 18, 7.45 p.m., Harding House, Park Road West, Claughton.

REGION 2

Barnsley.—June 22 ("A Transistorised El-bug Key," by Harold Taylor), 7.30 p.m., King George Hotel, Peel Street. July 13, visit to Holme Moss TV Station.
Bradford.—June 26 (Visit to A. R. Sugden (Engineers) Ltd., Brighouse). July 10, 7.30 p.m., 66 Little Horton Lane.
Halifax.—June 20, July 4 (Junk Sale), July 18 (Ragchew), Beehive and Crosskeys Hotel, Halifax. **(Northern Heights).**—June 20 (Ragchew), July 4 (Display of Members' Gear), July 18, Sportsman's Inn, Ogden.
Scarborough.—Thursdays, 7.30 p.m., Chapman's Yard, North Street.

REGION 3

Birmingham (M.A.R.S.).—June 19 ("Your Receiver and You," by George Brown, G5BJ), 7.45 p.m., Midland Institute, Paradise Street, Birmingham. **(Slade).**—Second and last Fridays in each month, 7.45 p.m., The Church House, High Street, Erdington. **(South).**—June 21, 7.30 p.m., The Friend's Institute, 220 Moseley Road, Birmingham, 12.
Coventry (C.A.R.S.).—Mondays, 7.30 p.m., R.A.F.A. Club, Holyhead Road, Coventry.
Cannock Chase.—First Thursday in each month, 8 p.m., White Lion Hotel, Bridgtown.
Dudley (D.A.R.C.).—June 22, 8 p.m., Treasure Hunt starting at Priory Hall, Dudley, July 6, 7.30 p.m., Station visit to G8SR and/or G3OSP, starting from Priory Hall.
Stourbridge.—July 3, 7.45 p.m., Foley College, Stourbridge.
Sutton Coldfield.—June 23, Sutton Coldfield Carnival. June 28 (Club Activities), July 12 ("Resistance and Capacity Bridges"), 7.30 p.m., 92 The Parade, Sutton Coldfield.
Wolverhampton.—Second and fourth Mondays each month, 8. p.m., Neachells Cottage, Stockwell End, Tettenhall.

REGION 4

Chesterfield (C. & D.A.R.S.).—July 11, 7.30 p.m., Newbold Observatory, Newbold Road, Chesterfield.
Derby (D. & D.A.R.S.).—June 20 (D/F League Fixture), June 27 (Open Night), July 4 (Surplus Sale), July 11 (Problems of the Sightless Radio Enthusiast, by L. Ball), July 18 (D/F League Fixture), 7.30 p.m., Room No. 4, 119 Green Lane, Derby. **(D.S.W. Exp. Soc.).**—Fridays, 7.30 p.m., Sundays 10.30 a.m., Nunsfield House, Boulton Lane, Alvaston, Derby.
Grantham (G. & D.A.R.S.).—Mondays, 7.30 p.m., Club Rooms (rear of Manners Arms Hotel), London Road, Grantham.
Grimsby (G. & D.A.R.S.).—June 21, July 5, 19, 8 p.m., R.A.F.A. Headquarters, Abbey Drive West, Grimsby.
Leicester (L.R.S.).—Mondays, 7.30 p.m., Club Rooms, Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (L.S.W.C.).—Fortnightly, Wednesdays, 7.30 p.m., Lincoln Technical College, Cathedral Street, Lincoln.
Melton Mowbray (M.M.A.R.S.).—June 21, 7.30 p.m., St. John's Ambulance Hall, Asfordby Hill, Melton Mowbray.
Nottingham (A.R.C.N.).—Tuesdays (R.A.E.), Thursdays (Lecture), 7.15 p.m., Room No. 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Nottingham.
Northampton (N.S.W.C.).—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
Peterborough (P. & D.A.R.S.).—July 6 ("A 40 valve Receiver," by F. K. Parker, G3FUR), 7.30 p.m., Peterborough Technical College, Eastfield Road, Peterborough.
Retford & Worksop (N.N.A.R.S.).—Tuesdays (Beginners), Thursdays (Club), 7.30 p.m., Victoria Institute, Eastgage, Worksop, Notts.

REGION 5

Cambridge (C. & D.A.R.C.).—June 20 ("Constructional Techniques", by R. Dalton Raby, G3IDR), June 29 ("Discussion on A.T.U.'s"), 7.30 p.m., Corporation Yard, Victoria Road.
March (M. & D.R.A.S.).—Tuesdays, 7.30 p.m., Police Headquarters, High Street.
Shefford (S. & D.A.R.S.).—June 21 ("Loudspeakers," by R. D. Raby, G3IDR), June 28 ("Telephone Systems in the U.K.", by J. Harper), July 5 (Talk by Mr. Hockenhull), July 12 (Quiz by John and Dave), Thursdays, 7.30 p.m., Digswell House, Shefford.

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.

REGION 7

Acton, Brentford and Chiswick (A.B.C.R.C.).—June 17 ("Top Band Transmitter," by G3OJX), 7.30 p.m., A.E.U. Club, 66 High Road, Chiswick.
Bexleyheath (N.K.R.S.).—June 28, July 12, 26, 8 p.m., Congregational Hall, nr. Clocktower, Bexleyheath.
Croydon (S.R.C.C.).—June 27 (Treasure Hunt Car Rally), July 10 (Lecture), 7.30 p.m., Blacksmiths Arms, South End, Croydon.
Dorking (D & D.R.S.).—June 26, The Cock, Hendley.
Ealing.—Sundays, 11 a.m., A.B.C. Restaurant, Ealing Broadway.
East Ham.—Tuesdays, fortnightly, 8 p.m., Leigh Road, East Ham.
East Molesey (T.V.A.R.T.S.).—July 4 ("Unusual Army Emergency Equipment and Army Emergency Reserve," by Major R. J. Hughes, G3GVV), Carnarvon Castle Hotel, Hampton Court.
Edgware and Hendon (E. & D.R.S.).—Second and fourth Mondays in each month, 8 p.m. John Keeble Hall, Church Close, Deans Lane, Edgware.
Enfield.—Fourth Thursday in each month, 8 p.m., George Spcier School, Southbury Road.
Harlow.—Tuesdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.
Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays (R.A.E. and Morse), 7 p.m., Fridays (club), 7.30 p.m., Montem School, Hornsey Road, Holloway.
Hounslow (H.A.D.A.R.C.).—Mondays, 7.30 p.m., Isleworth Town School, Twickenham Road, Hounslow.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (nr. Seven Kings Station).
Kingston.—Lectures alternate Thursdays, Theory and Morse classes weekly, 7.45 p.m., Y.M.C.A., Eden Street, Kingston. (Morse classes at 2 Sunray Avenue, Tolworth).

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Friday, June 15, July 20 and August 17, 1962.

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

Mitcham (M. & D.R.S.).—Lectures alternate Fridays, June 15 and 29 (Morse classes 7 p.m.), "The Cannons," Madeira Road, Mitcham.
New Cross (C.A.R.S.).—Fridays, 7.30 p.m., Sundays 11.30 a.m., 225 New Cross Road, S.E.14.
Paddington (P. and D.A.R.S.).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
Romford (R. and D.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.
Science Museum (C.S.R.S.).—June 19, July 3, 6 p.m., Science Museum, South Kensington.
Sidcup (C.V.R.C.).—June 26 (Talk on V.H.F., by G. Stone, G3FZL), 8 p.m., Station Hotel, Sidcup.
Slough (S.A.R.S.).—First Wednesday in each month, 8 p.m., July 4 ("Simple Aerials," by G3XH), United Services Club, Wellington Street. June 23, G3NLF/A at Rover Scout Moot, Duffield Park, nr. Slough.

REGION 8

Crawley (C.A.R.C.).—June 27 ("Members' Evening"), 8 p.m., West Green Centre. July 11, informal, for details contact G3FRV.
Tunbridge Wells (W.K.A.R.S.).—June 22 ("Television Principles and Practice", by H. F. Richards and R. Trevitt), 7.30 p.m., Culverden House, Culverden Park Road, Tunbridge Wells.

REGION 9

Bath.—June 18, 7.30 p.m., Committee Room,

Bath Technical College, Lower Borough Walls, Bath.

Bristol.—June 22 (" Display of local Home-built Equipment "), 7.15 p.m., Carwardines Restaurant, Baldwin Street, Bristol 1.

Burnham-on-Sea.—July 10, 8 p.m. (Carnival Station discussion), Crown Hotel, Oxford Street, Burnham-on-Sea.

Dorchester (S.D.R.S.).—July 6, 7.30 p.m., Labour Rooms, West Walks, Dorchester.

Exeter.—July 3, 7.30 p.m., Y.M.C.A., St. David's Hill, Exeter.

Falmouth (C.R. & T.C.).—First Wednesday in each month, Y.M.C.A., Falmouth.

Plymouth (P.R.C.).—First Tuesday in each month, 7.30 p.m., Guild of Social Service Building, Plymouth. Other Tuesdays, Virginia House Settlement, St. Andrews Cross, Plymouth.

Torquay (T.A.R.S.).—July 14 (" TVI Precautions," by B. E. Symons, G3LKJ), 7.30 p.m., Y.M.C.A., The Castle, Torquay.

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

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

REGION 10

Cardiff—July 9, 7.30 p.m., T.A. Centre, Park Street, Cardiff.

REGION 11

Llandudno (C.V.A.R.C.).—July 12 (Junk Sale), 7.30 p.m., Albert Hotel, Llandudno.

Prestatyn (F.R.S.).—June 25 (" Aerial Fundamentals," by Peter F. Jones, GW3FPF), July 30 ("Quiz"), 7.30 p.m., Railway Hotel, Prestatyn.

REGION 13

Edinburgh (L.R.S.).—June 28 (A.G.M.), 7.30 p.m., Y.M.C.A., South Street, Andrews Street.

REGION 14

Ayrshire.—Third Sunday in each month, 7.30 p.m., Royal Hotel, Prestwick.

REGION 16

Basildon (B. & D.A.R.S.).—Last Monday in each month, 8 p.m.; for details of venue, etc. contact G3ORT or G3IFN.

Chelmsford (C.A.R.C.).—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.

Southend (S. & D.R.S.).—Alternate Fridays at Canteen of E. K. Cole, Ltd., Priory Road, Prittlewell. June 29 (Club night, using the Club Station G5QK).

REGION 17

Newbury.—June 29 (" Crystal Techniques," by W. B. Mansell, G2CPM), 7.30 p.m., The Canteen, Elliots of Newbury, West Street, Newbury.

Southampton.—Second Saturday in each month, 7 p.m., Lanchester Building, University of Southampton, University Road, Southampton.

Regional and Club News

Basingstoke.—Meetings are held at the Immanuel Hall, Wote Street, on the first Saturday in each month (except August) at 7 p.m. In July there will be a talk on " Communications Receivers." The A.G.M. will take place in September. *Hon. Secretary:* P. Jackson, 11 Oaklands Way, Basingstoke.

Bristol.—There was an attendance of 45 members and visitors at the May meeting when John Tanner (G3NDT/T) gave a talk on " Constructional Techniques." At the meeting on June 22 members' home-built equipment will be displayed. Further details from the *Hon. Secretary:* E. C. Halliday (G3JMY), 4 Parkside Avenue, Winterbourne, Bristol.

Cambridge and District Amateur Radio Club.—Recent events have included a most interesting talk by Brian Armstrong (G3EDD) on " Problems of the Professional V.H.F. Design Engineer." The Technical Committee have constructed a modulator and power pack for the club transmitter, and hope to have this operational very soon.

Clifton Amateur Radio Society.—In the second round of the inter-club quiz against Crystal Palace A.R.S., the society retained its narrow lead. The first 80m D/F contest attracted a record entry of 10, first to find the transmitter being G3OYU. Only one team failed to locate G3GHN/P. The second in the series will be held on July 8. *Hon. Secretary:* C. Godsmark, 211 Manwood Road, London, S.E.4.

Cornish Radio and Television Club.—At the May meeting, Mr. Moore, Area Radio Supervisor, gave a most interesting talk on " Marine Radio and Coastal Stations." Visitors to Cornwall are always welcome at meetings which are held on the first Wednesday of each month at the Y.M.C.A., Falmouth. *Hon. Secretary:* W. J. Gilbert, 7 Poltair Road, Penryn, Cornwall.

Crawley Amateur Radio Club.—To the meeting at the West Green Centre on June 27, members will be bringing equipment made during the past year. Plans are being made to take part in V.H.F. National Field Day next month. Visitors and prospective members are always welcome at meetings. *Hon. Secretary:* R. G. B. Vaughan (G3FRV), 9 Hawkins Road, Tilgate, Crawley, Sussex.

Cray Valley Radio Club.—There was a good attendance at the April meeting when a Brains Trust comprising G2AQB, G3HRC, G3JJC and G3JYT answered many questions. An Extraordinary General Meeting was due to be held on May 22. Meetings are held at the Station Hotel, Sidcup, on the fourth Tuesday in each month. *Hon. Secretary:* Stan Coursey (G3JJC), 49 Dulverton Road, London, S.E.9.

Dudley Amateur Radio Club.—After being in existence for only nine months, membership has risen to 41 and meetings are held fortnightly at the Priory Hall, Dudley—see *Forthcoming Events.* The first *Newsletter* was due to be published on June 1. An AR88 receiver and a T.1131 transmitter for 10-80m have been obtained for the club station.

Flintshire Radio Society.—J. T. Lawrence (GW3JGA/T) recently gave a demonstration of amateur colour television. Meetings are held at the Railway Hotel, Prestatyn, on the last Monday in each month. *Hon. Secretary:* H. T. Jones (GW3NQP), Bedwyn, Queens Walk, Rhyl.

Harrow, Radio Society of.—A Junk Sale is being arranged for June 22 and a Brains Trust for July 6. " Audio Amplifiers " will be described on July 20. Meetings on alternate weeks will be devoted to practical activities, preceded by Morse classes. The club station, G3EFX, is active on Friday evenings from 7.30 p.m. and contacts with other societies will be appreciated. *Hon. Secretary:* A. C. Butcher, 95 Norval Road, North Wembley, Middlesex.

Lincoln Short Wave Club.—At the A.G.M. the following were elected: *Chairman:* Mr. Charlesworth; *Hon. Secretary:* Cpl. Tech. J. S. Russell (G3PMT), Royal Air Force, Scampton, Lincs.; *Hon. Treasurer:* Mr. Dellar; *Committee Members:* Major Dave Hollander (W0CJW), Allan Clarke (G3MZB), R. Draper (G4BU) and B. Otter. The Annual Hamfest will be held on September 16, 1962.

Northern Heights Amateur Radio Society.—Recent events have included a visit to the Leeds and Bradford Airport and the A.G.M. at which all the officers were re-elected. Meetings will be held at the Sportsman Inn, Ogden, on June 20 (informal), July 4 (Display of Members' Gear) and July 18 (Ragchew). *Hon. Secretary:* Arthur Robinson (G3MDW), Candy Cabin, Ogden, Halifax.

London Members' Luncheon Club.—The May meeting was attended by the Society's President, Ted Ingram (GM6IZ), and two Past Presidents, Herb Bartlett (G5QA) and " Dud " Charman (G6CJ), Council Member Phil Wade (G2BPJ) and the General Secretary, John Clarricoats (G6CL) who welcomed old timer Jack de Cure (VK5KO) and Mrs. de Cure. Others present included Ted Chader, Chief Technical Superintendent of the B.B.C., and Les Hale (W5LYT). At a recent meeting, Howard Lorensen (W5BLC) made a presentation to the General Secretary on behalf of the Washington Chapter of the Quarter Century Wireless Association as a mark of appreciation of his work for Amateur Radio. The dates of future meetings are given in *Forthcoming Events.*

Manchester and District Amateur Radio Society.—Recent activities have included Top Band operation during an outing to Westmorland and participating in N.F.D. from Heaton Park. Details of future meetings are given in *Forthcoming Events. Hon. Secretary:* S. J. Andrew, 69 Pine Tree Road, Oldham.

Mid-Lanark R.S.G.B. Group.—The group is now licensed as GM3PXK and the station is active on Wednesday evenings from the Clubroom at the Carfin Hall using a CNY transmitter and an R.1155 receiver. Informal meetings are held on Wednesdays and lecture meetings on the third Friday in each month, commencing at 7.30 p.m. *Hon. Secretary:* I. G. Swan (B.R.S.24547), 50 Mouse Bank Road, Lanark.

Paddington and District Amateur Radio Society.—The General Secretary of the R.S.G.B. was a recent visitor and his talk was much appreciated. Coaching in technical subjects is provided for members taking the R.A.E. A magazine, *Key Klix,* is published each month. Meetings are held at Beauchamp Lodge Settlement, 2 Warwick Crescent, London, W.2. Plans are being made to take part again in the Little Venice Fete. Details of other activities may be obtained from the new *Hon. Secretary:* L. Orbach (B.R.S.23281), 2 Warwick Crescent, W.2.

Peterborough and District Amateur Radio Society.—At the May meeting, a cheque for £180 was presented to the society by

W. T. Werry, Hon. Secretary of the former Peterborough Radio and Scientific Society. Mr. Werry explained that the old society had now been wound up, and it had been decided that all the funds be handed over to its successor. He was thanked by G3KPO and G3HXR, who presided. *Hon. Secretary:* Douglas Byrne (G3KPO), Jersey House, Eye, Peterborough.

Plymouth Radio Club.—At the A.G.M. the following were elected: *President*—H. Jones (G5ZT); *Vice-Presidents*—E. Diggle (G3LSD), L. J. N. Kirkby (G3BRJ); *Chairman*—A. Baker (G3KFN); *Hon. Treasurer*—N. Stoneman; *Hon. Secretary*—R. Hooper (B.R.S.22861), 2 Chestnut Road, Peverell, Plymouth. The retiring Chairman reported that the membership stood at 56, an increase of 100 per cent over the previous year. A drive to recruit members to R.S.G.B. is to be started.

Preston Amateur Radio Society.—Meetings are held at St. Paul's School, Pole Street, Preston, at 7.30 p.m. on the second and fourth Tuesdays in each month. Recent events have included talks by W. Brown (G3NQX) on " The Construction of Masts and Towers " and " El Bugs " by Norman Horrocks (G2CUZ). The club station is active on meeting nights under the call-sign G3KUE. B. O'Brien (G2AMV), Region 1 Representative, will be visiting the society on July 10, 1962. *Hon. Secretary:* W. K. Beazley, 9 Thorngate, Penwortham, Preston.

Reading Amateur Radio Club.—At the April meeting, members demonstrated and described their communications receivers. On June 30 at 8 p.m. at the Palmer Hall, West Street, G8SC will give a talk on transistors. *Hon. Secretary:* R. G Nash (G3EJA), 9 Holybrook Road, Reading.

Reigate Amateur Transmitting Society.—A successful N.F.D. trial was held on May 13, and at the monthly meeting a few days later G3FM gave a talk on crystal grinding. The programme for the meeting at The Tower, Redhill, on June 16 at 7.30 p.m. will include a Quiz and " Question Time." Junior members will meet at the home of the hon. secretary on July 7 at 8 p.m. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

Royston and District.—Details of a new club being formed in this area may be obtained from George Sear (G3PPT), 3 Baldock Road, Royston, Herts.

South Dorset Radio Society.—At the A.G.M. held in Weymouth, the following were elected: *President*—T. R. Stevens (G3DUQ); *Chairman*—P. Dean (G3FNT); *Hon. Treasurer*—W. Burden (G3EAT); *Hon. Secretary*—C. Biggs (G2TZ), 54 Prince of Wales Road, Dorchester, Dorset. Mullard films on X-rays and transistor production will be shown at the next meeting on July 6 at the Labour Rooms, West Walks, Dorchester.

Shefford and District Amateur Radio Society.—On May 3, the Regional Representative, S. J. Granfield (G5BQ) visited the headquarters, Digswell House, when R. D. Raby (G3IDR) gave an informative demonstration of " Constructional Techniques." A 15 minute Morse practice precedes each weekly meeting.

Surrey Radio Contact Club.—The Constructional Contest was won by R. E. T. Dabbs (G2RD) with a three-band transmitter for the 2m, 70cm and 23cm bands, followed by B. W. Wynn (G8TB) with a transistor 2m receiver and C. R. E. Ayley (G3GRK) with a transistor audio oscillator. There was a total of 19 entries, all of a very high standard. A Rally and Treasure Hunt is to be held on June 27. *Hon. Secretary:* S. A. Morley (G3FWR), 22 Old Farleigh Road, Selsdon, South Croydon.

Thames Valley Amateur Radio Transmitters Society.—There was an attendance of 45 at the May meeting when G. A. Bird (G4ZU) gave an excellent lecture on the principles involved in the design of multiband aerials, referring in particular to the use of ferrite beads in the F.B.5 aerial. *Hon. Secretary:* K. Rogers (G3AIU), 21 Links Road, Epsom, Surrey.

Torbay Amateur Radio Society.—The May meeting was held at the Y.M.C.A. Torquay. Plans for N.F.D. were discussed and two R.S.G.B. members from Germany welcomed. Six members took the R.A.E. last month. *Hon. Secretary:* Mrs. Gee Western (G3NQD), 118 Salisbury Avenue, Barton, Torquay.

West Kent Amateur Radio Society.—At the A.G.M. the following were elected: *President:* W. H. Allen, M.B.E. (G2UJ); *Senior Vice-President:* L. S. King (G4IB); *Junior Vice-President:* R. Delves; *Hon. Treasurer:* W. Dobson; *Hon. Secretary:* H. F. Richards; *Hon. Editor:* R. Trevitt; *Competition Organizer:* D. Colwell. The Constructional Competition was judged by E. G. Hubbard (G5OX) who awarded the John Wheeler Cup to L. S. King (G4IB) for a 2m converter and the VS9AW Trophy to W. H. Allen (G2UJ) for an audio oscillator.

York Amateur Radio Society.—" Hints on Mobile Operation " is the title of an R.S.G.B. recorded lecture to be given at the Clubrooms, Fetter Lane, on June 21 at 8.15 p.m. The club station, G3HWW, will be active on 1925 kc/s from 7 p.m. the same evening. Visitors will be most welcome but are asked to notify the *Hon. Secretary:* N. Spivey, 80 Melton Avenue, Clifton, York.

Representation

THE following are additions to the list of Town and Area Representatives published in the December 1961 issue.

REGION 7—LONDON WEST

WEST MIDDLESEX AREA

(Boroughs of Richmond, Twickenham, Southall, Heston and Isleworth)

J. M. R. SUTTON (G2NG), 75 Langham Road, Teddington, Middx.

REGION 15—CO. ANTRIM

BALLYMENA

WM. DAVISON (B.R.S.19828), 1 Clarence Street.

Affiliated Society Representative

THE following is an addition to the list published in the December 1961 issue.

FLINTSHIRE RADIO SOCIETY: J. Thornton Lawrence (GW3JGA), Perran Porth, East Avenue, Prestatyn, Flints.

Affiliated Societies

THE following are additions to the list of Affiliated Societies published in the August 1961 issue:

King's College Radio Society, c/o A. E. Wilson, The Union Society, King's College, Newcastle-upon-Tyne, Northumberland.

Severn Valley Amateur Radio Club, c/o R. G. Yearwood, c/o A. T. & E. (Bridgnorth) Ltd., Bridgnorth, Shropshire.

South-East Essex Technical College Students Union Amateur Radio and Television Society, Longbridge Road, Dagenham. Essex.

Can You Help?

● W. K. Findlay (B.R.S.22260), 42 Hanover Street, Stranraer, Wigtownshire, who requires the operating and maintenance manual for the Panda Explorer transmitter Mark 2?

● C. D. Hawkins (A.1888), 67 Warwick Road, London, N.11, who requires the circuit diagram of the Crystal Calibrator No. 10?

● J. E. Loades (G3OTL), 17 Manor Park Road, West Wickham, Kent, who requires the circuit diagram and/or manual for the MCR1 receiver?

● C. C. Wilson (G3CCW), 11 Grosvenor Street, Liscard, Wallasey, Cheshire, who requires the circuit diagram of the transmitter section of the Army B36 Set?

● H. Gilbert (VP9AN), Hunt Holme Cottage, East Shore Road, Somerset, Bermuda, who requires the circuit diagram of the B28 or CR100 receiver?

Receipts

RECEIPTS for subscriptions pajd by cheque, bankers' order or postal order are not now issued unless specially requested. Receipts are drawn, however, and kept on file at Headquarters for six months.

COPY DEADLINE

TO enable the R.S.G.B. BULLETIN to be printed in time for bulk postings to take place by not later than the 14th day of the month, the closing date for editorial copy, the 22nd day of the preceding month, must be strictly adhered to. Society Representatives and Club Secretaries will greatly assist the Editorial staff by posting copy to reach Headquarters by not later than the 20th of the month whenever possible.

Copy received after the 22nd day of the month will be held over for future use if still topical.

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WANTED FOR CASH.—Good clean communication receivers and s.s.b. equipment. Please state price.—Short Wave (Hull) Radio, 30-32 Princes Avenue, Hull. (Telephone 18953).

WANTED: T.C.S. Transmitters, Receivers, Connectors, Loading Coils, etc. Gilfillan, 98 Dominion Road, Worthing, Sussex. Tel.: Worthing 8719.

WANTED.—HRO. Good condition/appearance, prefer unmod. Senior or MX table model, bandspread coils, also Geloso Converter, preferably less PP and case, or QP166 Coil Unit. Prices and details.—Robertson, Cairngorm, Seamill, West Kilbride.

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SP.400.SX. 1·25-40·0 Mc/s general coverage plus excellent bandspread. Complete with P.U. Very good condition, £45. Also Eddystone 358X in very good condition complete with all coils, handbook and P.U. 40 kc/s. to 31 Mc/s, £15. Also B.C. 348 modified for 240v. A.C., performs well. Crystal filter, B.F.O., 2 H.F. plus 3 I.F., with speaker, £13. Also offers for MR44/II, just overhauled by makers, as new. Buyers please inspect and COLLECT.—Ivin, B.B.C. Station, Ludlow. Phone 121, or Brimfield 240 evenings.

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INDEX TO ADVERTISERS

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THIS MONTH'S BARGAINS

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ARP3	3/-	EC70	10/-	EZ41	6/9	PY80	6/9	Z31	6/-	6C6G	3/-	7Q7	7/-	85A1	9/-	9002	5'6
ARP4	3/6	EC90	20/-	EZ80	6/-	PY81	7/-	1A3	3/-	6C8G	5/-	7V7	5/-	85A3	15/-	9003	6/-
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ARP34	3/6	ECC82	6/6	G120/1B	9/-	PZ1-35	9/-	1D8GT	6/-	6F5GT	5/9	8D2	2/6	250TH	£9	Cathode Ray Tubes:	
ATP4	4/-	ECC83	7/-	GL450	10/-	QP21	6/-	1E7G	7/6	6F6G	4/-	9D2	3/-	350B	8/-	ACR1	15/-
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D77	4/3	EF70	4/-	KT76	10/-	SP41	2/6	2C46	30/-	6K8G	5/9	12SA7	7/6	815	40/-	«canning coil)	45/-
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EC70	10/-	EZ41	6/9	PEN46	5/-	VP41	5/6	6AQ5	7/-	6Y6G	6/-						
EC90	20/-	EZ80	6/-	PEN45	6/6	VR90	8/-	6AT6	5/-	6Z4	5/6						
EC91	3/-	EZ81	6/9	PEN220A	3/-	VR105/30	5/6	6B7	5/6	7B7	7/6						
ECC81	5/6	EBF80	8/6	PL36	10/6	VR150/30	6/-	6B8G	2/6	7C5	7/-						
ECC82	6/6	EBF89	7/-	PL81	9/-	VT4C	25/-										
ECC83	7/-	EBL21	15/-	PL83	10/-	VU39	6/-										
ECC84	7/-	EBL31	20/-	PY33	10/-	W31	7/-										
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