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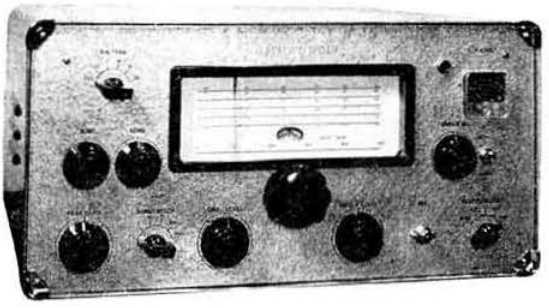

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A Christmas Message from the President

The Jubilee Year of the Radio Society of Great Britain is nearly over. This has been a momentous year and will, I am sure, remain in the memories of us all. In this year we have tried to pay tribute to those who in the past fifty years have achieved so much in Amateur Radio; Jubilee celebrations have been held all over the country. The success of these celebrations has been the result of close co-operation between members, and my wish at this Christmas time of goodwill is that this spirit of co-operation shall continue in the years ahead so that the achievements of Amateur Radio in the future can match those of the past.

Mr. Norman Caws, F.C.A., G3BVG, President, 1963

I wish you all a very happy Christmas and a prosperous New Year.

Norman Caws, G3BVG,
President.

A Simple Pre-amplifier for 3·5 to 30 Mc/s

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

A RECEIVER will work, after a fashion, with the aid of any piece of wire as an aerial but the full performance of which it is capable cannot be expected unless more attention than this is paid to the signal collector.

A practical aerial, particularly for the listener interested in receiving both amateur signals and short-wave broadcasts, means, more often than not, a " long-wire " erected in as favourable a position as possible as the site permits. Only the luckier operators will be able to set up a number of separate aerials designed to give optimum results on even a few of the required bands and in many cases the listener will have to make do with what may be a very inefficient aerial indeed—a short length of wire around the picture rail or in a loft.

The electrical length of an aerial, that is to say the apparent length as " seen " by an incoming wave, can be varied by

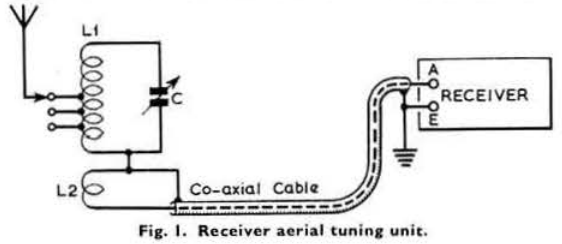


Fig. 1. Receiver aerial tuning unit.

means of an aerial tuning unit (a.t.u.). In its simplest form an a.t.u. could consist of a parallel tuned circuit on to the coil of which the receiver end of the aerial is tapped. A link winding of a few turns of wire would be coupled to the earthy end of the coil and connected via a short length of co-axial cable to the aerial and earth terminals of the receiver to effect a step down of impedance and so roughly to match the input impedance of the receiver in use. Such an arrangement is shown in Fig. 1.

It will be realised that L1 can only be made to cover a comparatively restricted frequency range efficiently, a ratio of highest-to-lowest frequency of around 2 : 1, so that a number of coils would be required for operation over the complete frequency range of the receiver. In addition, the optimum tapping point for the aerial would have to be found for each range and the number of turns on L2 (the link winding) would also require some variation. All this adds up to the provision of a fairly complicated switching system or the use of plug-in coils. It was felt therefore that a less unwieldy approach to the problem of getting the best out of a given aerial might usefully be sought.

The unit to be described does not seek to effect a perfect match between aerial and receiver but aims at amplifying the signals available from whatever aerial is in use with the addition of as little noise as possible and then presenting them to the receiver at a reasonably low impedance. In the process the circuit provides quite a useful amount of additional front-end selectivity. A gain of at least two S-points of signal over noise can be expected at all frequencies within the range of the pre-amplifier.

The Circuit

From Fig. 2 it will be seen that two sections of a double triode valve are employed, the first as a grounded grid amplifier and the second as a cathode follower providing a low impedance output to the receiver. The circuit L1, C4 is tuned to the frequency in use; to cover the designed range of 3·2 to 30 Mc/s only four coils are required, these being selected by means of a simple four-way single-pole Yaxley-type switch.

The grounded grid triode, V1a, takes its input from the aerial on its cathode which is connected to the earth line through RFC1, the blocking capacitor C1 being inserted in series with the aerial lead to prevent possible short circuit of the choke. The grounded grid acts as a screen between the cathode and anode to prevent unwanted regeneration, and the output of the stage is developed across the tuned circuit L1, C4 to which it is parallel fed through C3. High tension voltage is supplied to the anode of V1a through R1 which is of sufficiently high resistance not to shunt the tuned circuit unduly. C2 and R2 serve as decoupling components.

The high impedance end of the tuned circuit is connected between the grid and earth of the second triode section which is employed as a cathode follower with output taken from

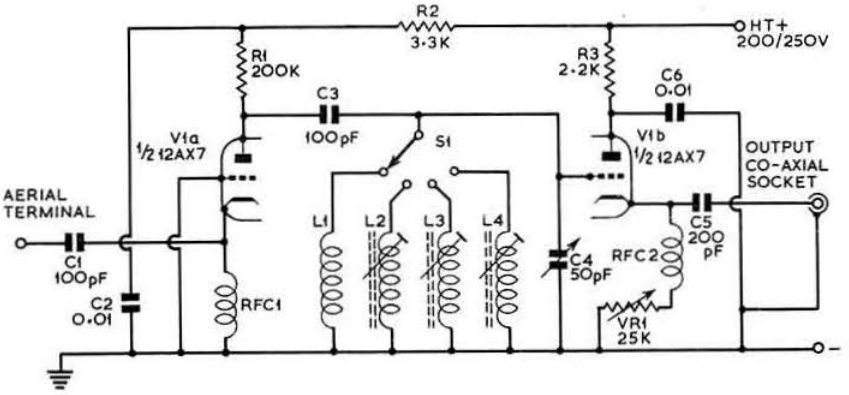


Fig. 2. Circuit diagram of the pre-amplifier. V1a and V1b are the two halves of a 12AX7 double triode valve. RFC1 and 2 are receiver type pi-wound r.f. chokes of approximately 1·5 millihenries inductance.

* 24 Arundel Road, Tunbridge Wells, Kent.

its cathode and the anode earthed, so far as r.f. is concerned, by C6. R3 merely serves as a decoupling resistor feeding h.t. to the anode.

When connected as a cathode follower a valve has a high input impedance (grid to earth) and a low output impedance (cathode to earth) and so acts in much the same way as a step-down transformer. The step-down ratio is dependant upon the mutual conductance (*gm*) of the valve, the output impedance being equivalent to $\frac{1}{gm}$ ohms, *gm* being measured in *amps* per volt, e.g. if the *gm* is 5 mA per volt the output impedance is 200 ohms.

Referring to Fig. 2 it will be seen that the cathode circuit of V1b includes VR1 of 25,000 ohms. By varying this resistor the current through the valve is altered, so varying the *gm* and in consequence the output impedance. RFC2 is inserted to prevent the signal being shortcircuited to earth when VR1 is at a low value. Variation of output impedance is not, however, the prime use for VR1 which, in this circuit, acts as a control over regeneration and therefore the gain of the amplifier.

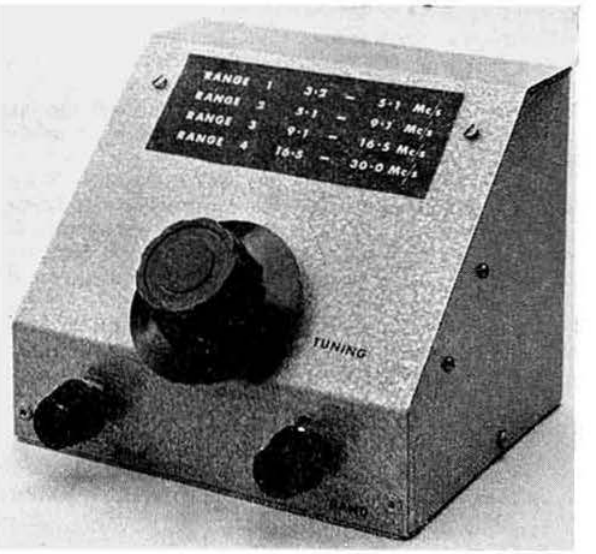
A cathode follower is generally considered always to have a voltage gain of less than unity, i.e. a loss of magnitude depending upon the characteristics of the valve and circuit values, but this is only true if the cathode load is capacitative. Without such a load the stage becomes regenerative, the effect being that the high impedance between grid and earth first rises and then becomes negative, resulting in oscillation. It is this effect which is employed here, and in order that it shall operate it is essential that the co-axial lead from pre-amplifier to receiver shall not be long enough to provide sufficient capacitance to prevent adequate regeneration being available when required.

Returning to the tuned circuit, it will be appreciated that its losses will become smaller as regeneration is increased and the point of oscillation approached, which is the same as saying that its *Q* or " goodness-factor " becomes higher, thus increasing the selectivity. This tuned circuit, however, also serves as the anode load for V1a, and as it becomes more efficient, and its impedance rises, the gain of V1a becomes greater, so that the whole amplifier increases in gain as regeneration is increased. Care must be taken, of course, to prevent actual oscillation taking place as this would almost undoubtedly cause interference to television reception.

Construction

The circuit is very flexible in so far as the values of components are concerned and quite wide variations may be made without any appreciable effect being noticeable on the performance. It is suggested, however, that the resistance of VR1 should not be less than 15K ohms nor much higher than the specified value. Several types of double triode have been tested in the circuit, including 12AT7 and 12AU7, but the 12AX7 was chosen as the h.t. current drain was least and the results no different from the 12AT7. If the latter valve is used it is advisable to increase the value of R3 to around 10K ohms to prevent excessively high anode current when VR1 is set towards maximum gain (minimum resistance).

With the value of C4 50 pF as shown in Fig. 2, each coil covers a tuning range of approximately 1·8 : 1. The use of a maximum value of 75 pF would extend the tuning range on each coil somewhat but with sharper tuning, and any higher capacitance than this is not recommended unless only the lower frequency ranges are to be used. If desired a further coil may be incorporated, details of which are included later, enabling the 1·8 to 2 Mc/s amateur band also to be covered. This would, of course, require a five position switch in place of that shown for S1.



The G2UJ pre-amplifier for the h.f. bands

No actual layout of the components is given because this is in no way critical so long as reasonably short leads are employed. This applies particularly to those between the coils and switch and the lead from the latter to the tuning capacitor C4. The earthy ends of all coils should be connected to the chassis on one double-ended soldering tag fixed to the chassis close to C4.

The sloping-front box in the unit shown in the photograph was used in order to harmonize with existing apparatus but, it must be admitted, such a shape does not lead to ease of construction and is in no way essential, and a normal chassis and panel may be used with advantage.

A slow-motion drive for the tuning capacitor is essential as tuning becomes very sharp indeed when operating near maximum gain. The type of drive used is left to the individual constructor, for although cheap slow-motion dials are conspicuous by their absence from component catalogues these days, and such an application hardly warrants the expenditure of a lot of money on a dial, surplus items are obtainable or some form of cord drive with a reduction ratio of 10 or 15 to 1 can quite easily be devised.

Coils

The coils for Ranges 1, 2 and 3 are wound with 30 s.w.g. enamelled wire on Radiospares† 0·3 in. diameter polythene formers with dust-iron cores, the frequency coverages and winding details being as follows:

Range 1 3·2 to 5·1 Mc/s 70 turns in two layers.
Range 2 5·1 to 9·1 Mc/s 56 turns single layer.
Range 3 9·1 to 16·5 Mc/s 25 turns single layer.
The method of securing the wire to the former is first

† Radiospares components may be ordered through local retailers.

to wind one layer of Sellotape on the former with the sticky side *outwards*. The fine wire will adhere to this and not slip during winding. The finished coil is then covered with a further layer of the same material. The formers may either be fixed to the chassis by 6 BA bolts through the lugs provided or, more simply, may be secured by a dab of Araldite.

The coil for Range 4, covering 16·5 to 30 Mc/s, is self-supporting and wound with 24 s.w.g. enamelled wire directly into the threads of a dust iron core similar to those used for the other ranges. It will be found that the core is held quite tightly and may be adjusted to set the coil inductance in the ordinary way.

A suitable coil to cover the 1·8 to 2 Mc/s amateur band, should it be required, would consist of 125 turns of 30 s.w.g. enamelled wire wound in the same way as the coil for Range 1.

Results

The pre-amplifier has been tested in conjunction with quite a wide range of receivers including the HRO, RME69, CR100, R.1475, AR88, an experimental double-conversion superhet and even on the short wave ranges of a broadcast receiver, and in each case a satisfactory improvement in both signal strength and signal-to-noise ratio was obtained. Naturally, so far as signal-to-noise ratio is concerned, the improvement to be expected depends entirely upon that of the existing receiver, being greater in the case of the less efficient types. Even on the double superhet, which possesses both high selectivity and sensitivity, the improvement was quite marked, particularly when using an indifferent aerial, which, after all, is one of the main reasons for requiring a pre-amplifier. A note of warning should be sounded here in regard to the use of such an amplifier in conjunction with a very efficient aerial system or in the presence of strong local stations when it is possible that the additional r.f. amplification could lead to overloading of the receiver and consequent cross-modulation between signals.

Some measurements made with the aid of a signal generator and the double-conversion receiver indicated that the maximum gain was approximately 30 times at 21 Mc/s and 40 times at 3·5 Mc/s.

Mobile Column

By E. ARNOLD MATTHEWS, G3FZW *

DURING the latter part of the summer G3FZW had the opportunity of inspecting a considerable number of mobile equipments and the thought occurs that the Amateur Radio image (it seems fashionable to talk about " images " these days) is projected to the public more strongly by the mobile station than by the home station because it is so much more open to casual inspection by the passer-by.

Some of the most efficient mobiles are nothing much to look at, unobtrusively sited in the vehicle, occupying little space in the car interior. A few, regrettably, sprawl over the seats with cables in an untidy maze. Aerials for the l.f. bands are sometimes mounted on too flexible bases, and then require some form of " check strap " to counteract excessive sway. The strap is often a piece of string! The remedy is not a matter for the outlay of much money, yet the changed impression created in the mind of the uninformed observer would be much to the good of our hobby. Even as cumbersome a rig as the ZC1 has been mounted neatly under the near side parcel tray of a small car with a little ingenuity and work.

It is possible that some untidy installations are due to understandable enthusiasm to " get going mobile." Now, in the " back end " of the year, is the time to do any necessary tidying-up.

Control Systems

Earlier remarks on the position of the send/receive switch have prompted the thought that the ideal method of control is VOX. However, the high ambient noise level in a car on the move raises very practical difficulties. G3JPN tried an *ARRL Handbook* circuit but found that he had to set the audio gain low and speak loudly. He was not using a microphone with any special directional characteristic, and found that any loud noise would switch the transmitter on. For example, on one occasion Mrs. G3JPN pointed out with some emphasis that they had just missed a turn on their route and the whole band heard. Has any member used a circuit which overcomes the difficulties?

* 1 Shortbutts Lane, Lichfield, Staffs.

RSGB Radio Communications Exhibition

Looking round the Society's exhibition last month it was possible to see equipment to suit all tastes and all pockets—from the Collins KWM-3 transceiver at £395 to a packet of solder. In addition to Collins, there were s.s.b. rigs by KW Electronics and Sonar, kits for a transmitter and receiver by Heathkit, and the home-built Courier transceiver on the ARMS stand.

Among the a.m. equipment, considerable interest was gained by Withers Electronics " Topmobile " transmitter, which has a frequency stability such that a 2 ft. drop on to the stand counter produced no more than a momentary frequency deflection of a few cycles! This firm's well-known TW-2 complete station was also shown, together with a halo aerial. The Minimitter range included their very popular all-transistor 160m receiver and a d.c.-to-d.c. converter. Green & Davis showed a 15-20 watt 2m transmitter employing a QQV03-10 in the final. Using their 2m converter an existing 160m mobile could be converted to 2m for under £20.

Aveley Electric had a range of solid state voltage changers to cover pretty well every mobile need. Webbs' Radio exhibited the new Eddystone EC10 general coverage transistor receiver which is quite small enough for mobile use. For the constructor, Electroniques were showing a switched pi-tank unit very suitable for an average power h.f. bands mobile transmitter.

Enthoven Solders' new " Miniscope " iron seemed just the thing for running repairs or " on site " modifications, as although conservatively rated for 6 volt operation it can be safely used from a 12 volt battery by using extended leads as a voltage dropper. The very fast warm-up time should make it ideal for the mobile operator.

* * *

This issue being the last before Christmas, G3FZW would like to wish all members a very Happy Christmas; may all your journeys be made in safety in the coming year.

TECHNICAL TOPICS By PAT HAWKER, G3VA

Demand for H.F. Allocations · Bandwidth Economy · Beam-deflection Mixers - Cascode Mixers
The Deltahet RA17-type Tuner · Stable Transistor V.F.O. · G.D.O. Calibration
Voltage Doubling and Quadrupling · Shunt-regulated Transistor Power Supply
Full-wave 144 Mc/s Aerial · Rayistors

THE most precious possessions of the Amateur Radio movement are of course its frequency allocations. While we may look back with nostalgia to the days when amateurs could operate anywhere below 200 metres, the realists among us appreciate that our present h.f. bands, narrow though they often seem, represent almost 3 Mc/s or 10 per cent of the total spectrum between 3-30 Mc/s (admittedly largely concentrated in the less consistently useful region above 21 Mc/s).

Anyone who comes into contact with professional communications soon becomes aware of the intense demand for frequencies in the h.f. band. Only one very small instance need be quoted. Oceanographers have recently become extremely anxious to acquire small exclusive bands to facilitate the setting up of unmanned automatic buoys for telemetering ocean and weather data to base stations. At present this service has no allocations whatsoever and even though the demand is for channels only 3·5 kc/s wide, those concerned are finding it extremely difficult to acquire such bands.

There are many other new and established services desperately pressing for new or increased allocations. Furthermore, there are now many newly emerged countries represented on the various international bodies, many of whom have little or no tradition of amateur activity, but who are well aware that, despite all the developments in ocean cables and possible satellite communications systems, by far the most economical long-distance services—particularly for light traffic loads—are still h.f. point-to-point circuits.

As such pressures build up, so does possible future danger to our present bands. It is this reasoning which appears to be playing an important factor in the recent bout of critical self-appraisal going on in the American journals.

For example, a particularly strong editorial in *CQ* (September, 1963) argues that dozens of newly independent nations are eagerly awaiting a chance to make greater commercial use of the h.f. spectrum, and that it is therefore dangerous for amateurs to emphasize the purely " hobby " aspect of Amateur Radio.

And the ARRL has now made formal application to the FCC for 'phone operation on 3·5 to 21 Mc/s to be restricted eventually to holders of an " advanced class " licence—despite strong opposition from many members.

This is why it looks as though in future more stress will be put—at least in the United States—on the " self-training " side of Amateur Radio, and this includes the keeping abreast of technical developments and a better understanding of how equipment—even if factory-built—really works.

Bandwidth Economy

The pressure for frequencies—particularly during the current sunspot minimum period—is also making many of us think more carefully about transmission bandwidth. It is significant that a recent Geneva conference on relieving congestion in the h.f. bands came out with a firm recommendation on the adoption of single sideband techniques. It is also noted that frequency instability and spurious emissions (including excessive sidelobes on directional arrays) were major causes of congestion.

At present we are still in the fortunate position that the use we make of our bands is largely left to our own choice, but this does not absolve us from the need in crowded bands of not hogging more than our fair share of bandwidth. In this connection, some sound hints will be found in the new ARRL Operating Aid No. 11 (*QST* September, 1963) on how to widen bands by efficient occupancy, by avoiding the use of long-distance bands for local contacts (unless of course the bands are completely dead for DX), and by using minimum bandwidth, consistent with good engineering practice, and compatible with the mode of transmission.

K4TUA reports in *CQ* (October, 1963) on a careful analysis he has made of 1000 a.m. and 1000 s.s.b. stations. This shows that the average bandwidth of the a.m. stations was 10 kc/s (68·4 per cent falling between 8 and 11 kc/s) with only 3·6 per cent 6 kc/s wide (the theoretical minimum is about 5-6 kc/s). On s.s.b. the great majority were between 4 and 6 kc/s wide, with only 2·4 per cent 3 kc/s wide and the average 5 kc/s compared with the theoretical minimum of 2·5-3 kc/s. A few a.m. stations were found to be occupying 15 kc/s and more.

Thus, by more careful limitation of bandwidth by the better use of low pass a.f. filters, considerably more stations could operate effectively. Although such bandwidth limitation involves loss of the higher audio frequencies, this does not involve great loss of communication ability. In fact by carefully limiting audio response to within about 500-2500 c/s, considerably greater " talk power " is possible. Particularly the cutting out of frequencies below about 500 c/s (usually achieved by reducing inter-stage coupling capacitor values in the audio equipment) allows average modulation levels to be raised considerably. A good deal of information on the design and installation of low pass filters appears in *Electronics World* (September, 1963).

For those who are interested in bandwidth economy carried to extremes, it is worth pointing out that all existing forms of telephony leave very much to be desired. According to experts in " communication theory " the actual amount of information transmitted could theoretically be contained

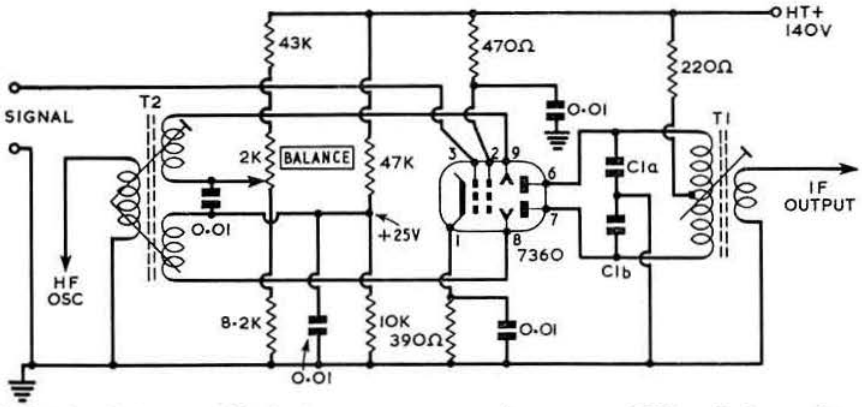


Fig. 1. W2PUL's circuit for using a 7360 beam deflection valve as a first or second mixer as a means of reducing cross-modulation in h.f. communications receivers. Oscillator voltage at deflection plates 1-10 volts r.m.s. T1, T2 and general layout should be arranged to maintain balance.

in bands of about 50-100 c/s. At present not even the most complex frequency-compression vocoders have yet got down to anywhere near this figure.

Similarly, although c.w. is inherently far more efficient on this score, the relatively poor stability of present receivers and transmitters means that we are throwing away many of the potential advantages. If it were practical for us to think in terms of 40 or 50 c/s bandwidth (theoretically more than ample) we should be able to pack in some 20 to 25 c.w. channels in each kilocycle.

Receiver Developments

Since the publication of our article on h.f. receiver front-ends (September, 1963), there have been several significant developments. One of the most promising of these is W2PUL's description (*QST*, September, 1963) of the use of 7360 beam deflection valves as h.f. mixers. This technique is to be used in the forthcoming SS-1-R receiver of Squires-Sanders Inc. (associated with Clegg Laboratories) and, it is claimed, will drastically reduce receiver susceptibility to cross-modulation.

Beam deflection valves such as the 7360 (which was introduced in 1960) have been widely used as balanced modulators in s.s.b. equipments, product-detectors (*TT*, September, 1959) and phase splitters (*TT*, August, 1960) but little has been published before on their use as receiver mixers. In the beam deflection valve a single electron stream can readily be deflected to either of two anodes. In the W2PUL circuit (Fig. 1) the local oscillator switches the electron stream between the two anodes and it is claimed that when the circuit is correctly adjusted the stage is as linear as a conventional class A pentode and yet functions effectively as a mixer. Since the two anodes are connected in the push-pull mode, the stage provides considerable protection against i.f. breakthrough.

Another important point is that the calculated equivalent noise resistance of the mixer is only 1500 ohms so that optimum sensitivity can readily be achieved on h.f. bands without an r.f. stage. To reduce image, an old type of trick input circuit has been revived which puts a series-tuned image trap across the valve signal frequency input circuit.

Certainly the performance figures claimed by W2PUL for such a mixer are extremely impressive and furthermore in the October *QST* he shows how such a stage which is almost immune to cross-modulation can be used in conjunction with a pre-i.f. noise silencer since there is no lengthening of interference pulses to provide what W2PUL describes as " genuinely amazing results."

Another new mixer circuit, used in the B & W 6100 s.s.b. transmitter, appeared in the September *QST*. This comprises a 12AU7 in a cascode arrangement and is claimed to have better stability than the conventional mixer and to provide good conversion gain: Fig. 2.

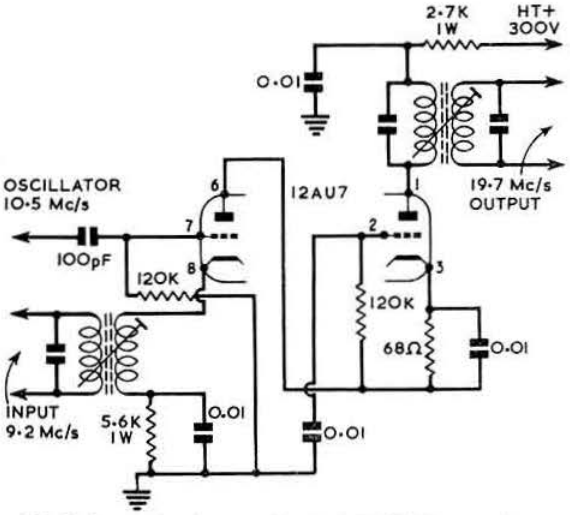


Fig. 2. A cascode mixer used in the B & W 6100 transmitter.

RA17 Type Converter

Our September article, mentioned above, also referred to the Racal RA17 triple-conversion front-end with automatic drift correction and suggested that at least some amateurs have been able to duplicate this system. This produced a most interesting letter from Ian Pogson, VK2AZN, who forwarded by air-mail two long articles from the Australian journal *Radio, Television and Hobbies* (July and August, 1963) which give full constructional and alignment details of a 0·5-30 Mc/s front-end unit called the " Deltahet " but which uses exactly the same conversion technique as the RA17. This unit has been designed and described by VK2AZN and built by VK2BG.

The block schematic is shown in Fig. 3 from which it will be seen that this eight-valve tuner unit (on a chassis 11¼ in. by 7⅞ in. by 2½ in.) is effectively the equivalent of 30 crystal-

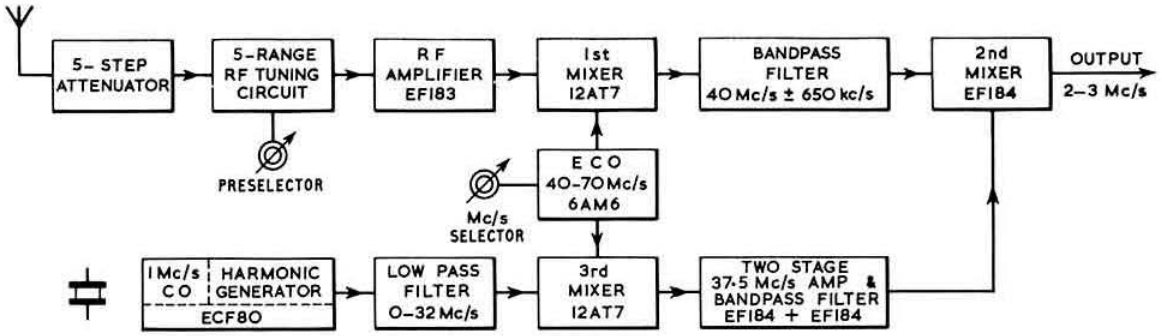


Fig. 3. Block diagram of VK2AZN's "Deltahet" 0·5-30 Mc/s tuner unit using RA17-type triple conversion with automatic drift correction providing the equivalent of 30 crystal-controlled converters with a single 1 Mc/s crystal.

locked converters providing continuous h.f. coverage in 1 Mc/s bands for feeding into a tunable receiver covering 2-3 Mc/s. Only one 1 Mc/s crystal is used with harmonic generation. Triple conversion provides drift cancellation of the 6AM6 40-70 Mc/s e.c.o. which forms the Megacycles selector. Controls on the converter are the MEGACYCLES SELECTOR knob; R.F. TUNE and R.F. RANGE; and AERIAL ATTENUATOR. No ganged circuits or unusual components are involved. There is only one signal frequency tuned circuit in the grid of the r.f. stage which has an untuned resistive anode load. Both the double-triode mixers use the type of circuit shown in Fig. 6 of our September article.

VK2AZN points out in his articles that the construction of such a front-end is intended for those who have at least some experience of communication receivers, and perhaps some TV experience, as well as access to a certain amount of standard servicing equipment. Still, from the full constructional details given it would appear that the project is well within the capability of many amateurs (certainly if one judges by the very high standard of exhibits at last month's RSGB show!).

For example the 40 Mc/s ± 650 kc/s bandpass filter consists of four double-tuned circuits wound on standard slug-tuned formers. Alignment equipment includes g.d.o., sweep and marker generator for the 37·5 and 40 Mc/s bandpass filters. There are some 17 i.f. and fixed tuned circuits so that alignment is an important part of the operation.

For anyone who has heard the enthusiastic reports of those who use RA17 receivers and who wants to tackle a full-coverage receiver, these two articles are likely to be of great interest. The address of the journal is *Radio, Television and Hobbies*, Box 2728, GPO, Sydney, Australia. VK2AZN, who is a staff member of the journal, is still working on possible improvements to what he terms "this most fascinating front-end."

Synthetic Rock

The main malady from which current equipment suffers is "driftitus," a disease proportional to the patient's temperature. The doctor's prescription, according to W3JHR, is a good dose of semiconductors, which offer promise of real progress in the field of stable frequency generation. To support his argument W3JHR offers (*CQ*, September, 1963) a "synthetic rock" v.f.o. using mainly ex-ARC5 ("Command series") components for the tuning components (L1, C1, C2) and a cut-down ARC5 chassis to make a 6 in. by 6 in. by 6 in. unit which can be placed well away from sources of heat. Fig. 4 shows the two-stage circuit which in the original provides a 4·9 to 6·1 Mc/s output for an s.s.b. transmitter. The output is fed into a 6AH6 amplifier.

Many transistor oscillators tend to suffer from a form of instability, which appears as a low frequency burble on the signal, but W3JHR claims that this circuit is free from such troubles. One secret is that the oscillator transistor is connected across a relatively low impedance and only very loosely coupled to the tuned circuit through the a.c. potentiometer action of C3, C4 and C5. The original type 2N384 transistors are small-signal *p-n-p* types with a cut-off frequency ($f\alpha$) of about 100 Mc/s and could probably be replaced by such types as the AF114 or AF115 etc.

Calibrating a GDO

G2UJ has very kindly sent along details of an effective means of calibrating a g.d.o., or indeed any other type of oscillator, directly from a signal generator. He reports that this has proved far quicker and less open to ambiguity than, for instance, using a receiver as an intermediary.

Fig. 5 indicates the set-up using either a microammeter of around 200 μA f.s.d. or less, or, if this is not available,

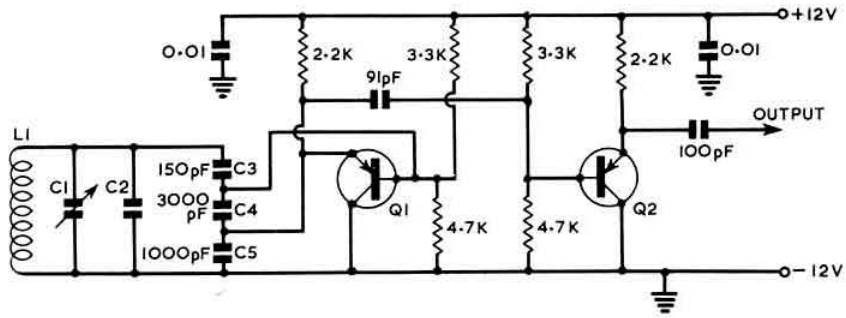


Fig. 4. W3JHR's "synthetic rock" transistor v.f.o. using ARC5 parts. Q1, Q2, 2N384 or similar.

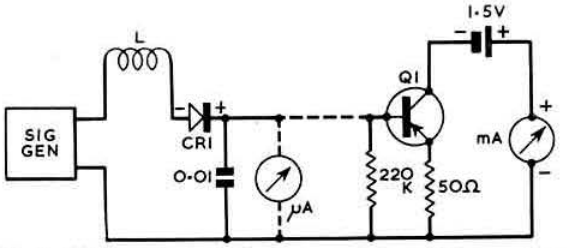


Fig. 5. G2UJ's method of calibrating a grid dip oscillator or other oscillator directly from a signal generator. L is 3-5 turns, 1 in. diameter, self-supporting for about 10-80 Mc/s. Up to 10 turns may be needed below 10 Mc/s. CR1 crystal diode, Q1 OC44 (or almost any small-signal transistor).

a standard 1 or 2 mA f.s.d. meter with a transistor d.c. amplifier of the type described several times in *TT* (for example, November, 1958). As indicated in the caption, the inductor L depends to some extent on the range being covered but is entirely non-critical and G2UJ has found a five turn coil suitable as low as 1·5 Mc/s.

The signal generator is simply set to the required range and the output adjusted until a suitable reading is obtained on the meter due to the rectifying action of the crystal diode. Then the g.d.o. or other oscillator is coupled to L, and this should normally cause an increase in the meter reading except when the frequency of the g.d.o. exactly coincides with that of the signal generator when a very sharp dip occurs. To find the exact centre of the dip it will usually be necessary to increase the coupling to L.

G2UJ has found a typical dip to be from say 80 μA to less than 10 μA, even though the g.d.o. itself shows no indication of resonance. He points out that no indication whatever is obtained on any harmonic so that the calibration is completely unambiguous.

If, for any reason, a more elaborate arrangement were required, it would be possible to increase the range of the d.c. amplifier, for example by replacing the fixed 50 ohm emitter resistor by a 22 ohm fixed resistor in series with a 1K ohms variable resistor; such a d.c. amplifier could handle input currents of 1 μA to 100 μA on a 2 mA f.s.d. meter. A simple transistor "valve voltmeter" of this type is not linear but this is of no consequence if one only requires a dip.

Voltage Multiplication Circuits

The availability of reasonably priced surplus silicon power diodes (we have noted some 800 p.i.v. units in the stores recently for only five shillings) offers a good opportunity for experimenting with voltage multiplication power supplies. Because of the low forward resistance of semiconductor diodes, much better regulation is possible with voltage multiplication than was possible with thermionic diodes and selenium metal rectifiers. One standard circuit which is often overlooked but which might form the basis of a useful transmitter supply using only a standard receiver mains transformer is the voltage quadrupler shown in Fig. 6. This is in effect two of the cascade integrator-type voltage doublers with the output in series. Another use for this type of circuit is to obtain a bias supply of about 25 volts from a 6·3 volt winding using small crystal diodes. With high voltage units suitable surge and transient suppression components should normally be added.

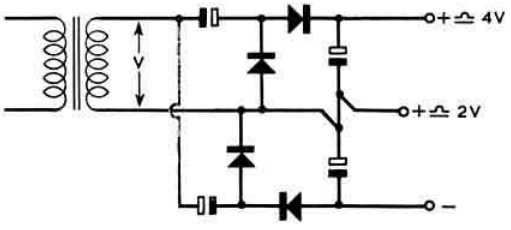


Fig. 6. Semiconductors make this voltage quadrupling circuit attractive for both high and low voltage units.

Incidentally, a slight modification to the usual circuit for one of these asymmetrical type of voltage doublers

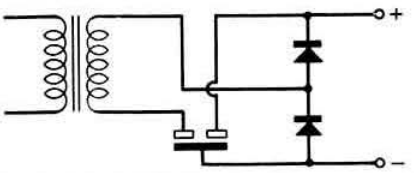


Fig. 7. How the cascade voltage doubler can be modified to permit use of twin electrolytic capacitors.

permits the use of the twin electrolytic capacitor with the outer case common to both sections: see Fig. 7. One section is used for isolation and the other forms the reservoir capacitor.

Transistor Power Unit

A well regulated, low ripple power unit which delivers about 6 volts d.c. at 200 mA is described in *Electronics World* (October, 1963): see Fig. 8. This has the advantage of being a shunt regulated unit rather than the more usual series regulation and will withstand a short-circuiting of the output without damage. The unit consists of a conventional bridge rectifier with a shunt-regulator consisting of a standard power transistor with a 5·7 volt, 250 mW Zener diode. This is usually a considerably cheaper system than using a high-power Zener diode regulator alone. Q1 acts as an emitter-follower whose input voltage is governed by the Zener diode.

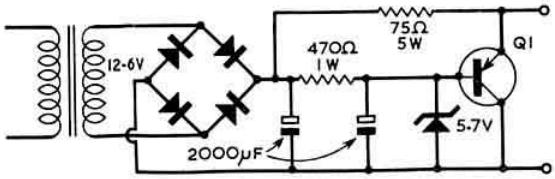


Fig. 8. A solid-state power unit using a low-power Zener diode with power transistor in a shunt-regulated circuit. Q1, 2N301 or similar power transistor such as the XC141. In the original design the bridge rectifier was rated at 36 volts a.c., 1·5 amps.

Two Metre Aerial

From WA6TGY and *The DX'er* comes a note on a useful and fairly easily constructed extended full-wave aerial for 144 Mc/s as used at W6WX: see Fig. 9. This provides a gain

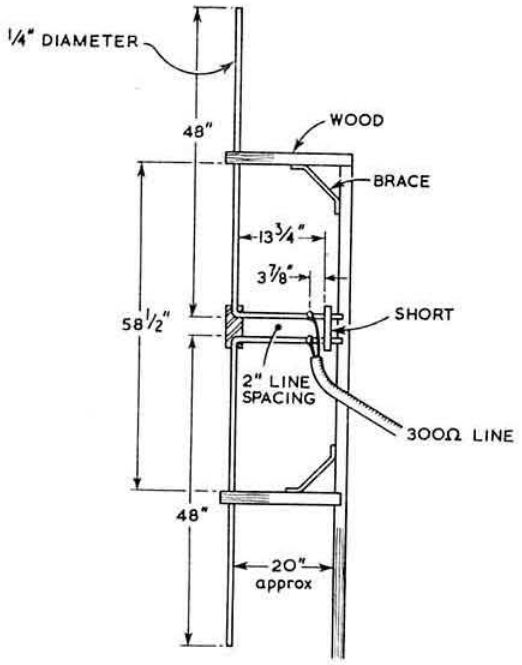


Fig. 9. Extended full-wave 144 Mc/s aerial designed by W6WX.

of about 3·2 db over a vertical dipole, has a low angle of radiation and reasonably good bandwidth. The aerial is omnidirectional but can be converted into a beam with about 10 db gain by adding directors about 40 in. in length spaced at 21 in. from the two radiating elements.

Although the aerial is shown with 300 ohm balanced feed, a coaxial balun (see *TT* August, 1963) could be used mounted at the phasing line feeder tap point. No insulation is required except between the two radiators. The 2 in. spaced phasing line is made of the same material as the radiators (¼ in. o.d. aluminium). If possible the feeder line should be extended horizontally some 40-50 in. before being brought downwards in order to minimize any interference with the radiation pattern. The wooden " C " frame can be made of any suitable, light wood.

Here and There

In *TT* (February, 1963) we showed how the combination of a small photoconductive cell and a small pilot bulb could be used for remote control applications. The value of this approach has been recognized by Raytheon who have produced a range of miniature combined units which they call " Rayistors," with light from the bulb directed on to the cell via a prism. One ingenious application suggested for this unit (CK1102) is as an a.g.c. system for s.s.b. reception. The bulb is connected across the low impedance loudspeaker output winding and the photoconductive cell across the input of the first a.f. stage (as in the February circuit). It is claimed that audio output can be held within 6 db for signal changes of 30-40 db, thus easing s.s.b. net working.

We were interested to learn that the British firm of S. G. Brown whose headphones have been world-famous for more years than we care to remember is introducing an entirely new type of piezo-electric ceramic headphone transducer (see *Electronics Weekly*, October 30) claimed to have advantages over the electromagnetic type and to be cheaper to produce.

In a note to *QST*, W4HHK extols the virtues of the 6AS6 transitron v.h.f. high-stability crystal oscillator circuit (see Fig. 16, page 470 of the March, 1963 BULLETIN) but points out that more consistent results with different valves have been obtained by increasing the value of the 3·9K ohms resistor across L1 to about 39K ohms.

Old-timer G2NS, who once did some years of cowpunching and goldmining in Brazil, has put forward an ingenious theory as to why PY2BCD named his aerial (*TT*, October, 1963) " Maria Maluca." Briefly, he recalls that " Maluca " was often applied to " wild women, wild steers or anything or anybody behaving in a crazy manner." He therefore suggests that " Maria Maluca " could be " Crazy Mary," a Brazilian counterpart of the old AOG aerials which worked without anyone knowing just why! It is a nice thought.

G8ON tells me that he has now traced neon diode oscillators back to Eisenstein's 1908 patent well before any triode oscillators were developed. He also believes that some form of neon amplifier was devised.

Several more members have reported building the ZL2AMW el-bug (*TT*, February, 1963). Amongst those who have commented on the excellent results achieved are G3JCB, G2BP and VS1FZ.

A Novel Aerial

By L. E. NEWNHAM, B.Sc., G6NZ*

CAN you imagine an aerial which requires no supporting masts, towers, wires, ropes, guys, pulleys, balloons or kites? An aerial that will not rust or decay, that is weather proof and requires no maintenance, no supports and no insulators; an aerial that is adjustable to resonance by merely turning a handle which controls neither a capacitor nor an inductor, the same handle being used to dispose of the aerial completely when not required; an aerial perhaps especially useful at sea in that it cannot be shot down nor chopped down and presents no stowage problem. If by now you are thinking of some Indian rope trick, forget it—this is real and the aerial worked!

Have you guessed it? I was reminded of this novel aerial used by radio pioneer Fessenden in the early 1900s when I paused one summer evening by the lake of Geneva and watched, fascinated, the Jet d'eau, that marvellous fountain stretching vertically up for about 300 ft. What an aerial that might make!

Using a copper tube for the supply and a water pump, Fessenden made a simple coupling loop to his spark transmitter, adjusting his aerial jet of sea water to resonance by regulating the height of the fountain by the tap! It worked quite successfully as a quarter wave aerial between ships on sea water though with considerable electrical leakage and some loss of efficiency. Nevertheless a report of the time tells us that good communication was carried out over about 60 miles of sea using this aerial, whereas normally the distance covered was about three times this.

Perhaps some enterprising amateur might be tempted to repeat these experiments—Top Band results would certainly be interesting. My companions and I certainly had our own enthusiasim somewhat damped when investigating the Geneva jet at close quarters on the lake!

* Member of the Council.

The International Years of the Quiet Sun

By G. M. C. STONE, A.M.I.E.E., G3FZL *

MEMBERS will recall the world-wide programme of scientific investigation carried out during the International Geophysical Year which lasted from July 1, 1957 to December 31, 1958, a time of maximum sunspot activity. In view of the success of the IGY, the programme was extended for one year until December 31, 1959: this period was known as the year of International Geophysical Co-operation, IGC.

For the whole of this time the Society conducted a programme (full details of which were published in the RSGB BULLETIN), to study v.h.f./u.h.f. tropospheric propagation, h.f./v.h.f. ionospheric propagation, v.h.f. communication by auroral reflection and artificial earth satellite signal observation and recording. Some results have already been published and further articles are in preparation.

Plans for the IQSY

An informal meeting of the International Geophysical Committee (CIG) was held in Helsinki during August, 1960 when several proposals for future programmes of geophysical research were discussed. One of these was a solar activity minimum programme envisaged as complementary to the IGY/IGC programme, which had coincided with sunspot maximum. A working group was formed to consider the proposal and prepare a report. This report was presented and accepted at the third CIG meeting held in Paris during January, 1961 and contained a preliminary programme for the years 1964-65 in each of those fields in which solar-terrestrial relations play an important part. The name of this project was agreed as the International Years of the Quiet Sun (IQSY) and the proposals made by CIG were approved at the Ninth General Assembly of the International Council of Scientific Unions held in London in September, 1961.

The IQSY

The programme for the IQSY, which will last from January 1, 1964 to December 31, 1966, has been arranged by an international committee, the Chairman of which is Professor W. J. G. Benyon, who was the international reporter for the ionosphere during the IGY. The secretary is Dr. C. M. Minnis of the Royal Society. The IQSY Secretariat is located at an office of the Royal Society in London.

The fields of study, or disciplines, cover the following: meteorology, geomagnetism, airglow, aurora, ionosphere, solar activity, cosmic radiation and aeronomy. More than 54 countries will be participating in the IQSY programme including the USA, USSR, many European countries, including the German Federal Republic and the United Kingdom, and several "new" countries such as Ghana.

RSGB Scientific Work

Scientific work within the Society is co-ordinated by the Scientific Studies Committee (SSC) which was formed in 1960 to continue the work started during the IGY which was conducted by two co-ordinators appointed by the Council. The SSC first discussed possible participation in the IQSY programme in May, 1962 and following a recommendation from the Committee the Council in July, 1962 approved in principle that the Society should participate.

Since that time the Committee has been working on plans which are now well advanced and were sufficiently advanced during mid-1963 for the RSGB to request that this item be discussed at the meeting of the Region I IARU meeting held in Malmö during June, 1963. Only two Amateur Radio societies indicated their definite intention to participate in the IQSY programme, those of the German Federal Republic (DARC) and the United Kingdom (RSGB) although certain others expressed some interest. Consequently these two societies were charged with the co-ordination of Amateur Radio activity in Europe during the IQSY. Rather surprisingly the American Radio Relay League, which did so much during the IGY, has so far shown no intention of continuing the activity previously known as the Propagation Research Project, PRP (a US Air Force sponsored project).

The DARC programme has already been published and is principally concerned with auroral back scatter observations, which will be carried out:

(*a*) By use of a 170 watt c.w. transmitter on 29·000 Mc/s (call-sign DL0AR) located 200 km west of Lindau with a three-element beam aerial pointed to the north. A receiver is employed also having a beam aerial pointed to the north.

(*b*) By observing the occurrence of auroral communications on 144, 28 and 21 Mc/s at some 50 amateur stations in West Germany. This network was formed in 1957 and has been operating ever since.

The co-ordination of the DARC programme is in the hands of Edgar Brockmann, DJ1SB. The international reporter for the ionosphere is Professor Dieminger, for whom Dr Lange Hesse, DJ2BC, works. Dr Lange Hesse provides information to G2BVN for the monthly ionospheric predictions in *The Month on the Air*.

The RSGB programme is similar to that of the DARC although of different origin and is being submitted to the Royal Society for official recognition. It is a continuation of the auroral communication observations which were started in July, 1957 and have continued since that time, firstly under the IGY co-ordinators and later by the SSC for whom G4LX has acted as a focal point. Extensive data is held which shows the frequency of occurrence, the times of day and the extent to which communication was possible during every major and most minor 144 Mc/s auroral openings reported. Many British amateurs contributed to this data and many excellent reports were also received from Olof Karlsson, SM6PU.

A function of auroral reflection communication is that the occurrence is greater on lower frequencies such as 28 Mc/s than it is on 144 Mc/s. Therefore during the IQSY, when auroral communication will be rare, it is proposed to conduct observations both in the 144-146 Mc/s and in the 28-29·7 Mc/s bands.

During the IGY, a beacon was operated for the Society by K. E. S. Ellis, G5KW, under the call-sign GB3IGY, from a site near Chelsfield, Kent. This was the forerunner of the present RSGB beacon station, GB3VHF, located at the BBC Transmitting Station, Wrotham, which is to continue its operation on 144·5 Mc/s. GB3CTC, at the Cornwall

* Chairman, Scientific Studies Committee, 10 Liphook Crescent, Forest Hill, London, S.E.23.

Technical College, will continue to operate on 144·1 Mc/s under the control of W. D. Old, G3CZZ. Both of these beacons will be useful for 144 Mc/s auroral observations.

The Lerwick Experimental Station

A third station is being set up at The Observatory, Lerwick (call-sign GB3LER) under the control of Ray Flavell, GM3LTP, a member of the SSC who is professionally connected with the IQSY programme for the DSIR Radio Research Station, Slough. He will be living at Lerwick for at least two years.

The Society is indebted to the Superintendent of The Observatory at Lerwick for his co-operation in this project.

The transmitter, rated at 25 watts output, will operate on a frequency of 145·995 Mc/s and use two J-Beam six-over-six skeleton slot fed aerials, one pointing north and the other pointing south. R.f. will be switched alternately from one aerial to the other, each cycle lasting approximately 10 seconds with the call-sign being sent every five minutes. The v.h.f. transmitter will also be used as a signal source to study long range tropospheric propagation using the southerly pointing aerial.

In addition to the v.h.f. stations it is hoped to obtain GPO approval to establish another transmitter at Lerwick operating in the 28-29·7 Mc/s band, also operating under the call-sign GB3LER, radiating simultaneously with the v.h.f. transmitter and having a three element beam aerial pointing north. K.W. Electronics Ltd. is assisting the Society in this project by providing the necessary transmitter which will be rated at 50 watts output.

Observers

To provide the maximum amount of data on auroral communications, all reports of the reception of signals by this mode of propagation should be sent to the RSGB Scientific Studies Committee. In addition volunteers are required to become Registered Observers. Anyone who participated in the IGY programme and who has experience of v.h.f. auroral communication will be especially useful. All those interested are invited to write to G3FZL offering their services. A data sheet describing what is required is available from RSGB Headquarters.

Solar Activity Warnings

An important aspect of our work will be the receipt of regular warnings of unusual solar activity from Cable and Wireless Ltd., and means by which these will be communicated to observers are under discussion at present. It is likely that, as during the IGY, a number of Area Activity Co-ordinators will be appointed to whom warnings will be sent and who will be responsible for passing them on to observers in their particular areas. In addition the RSGB News Bulletin Service, GB2RS, will be used whenever possible. **One point to stress is that since auroral propagation will be a rare event every report received will be of great value.**

Duration of the IQSY

Originally the IQSY was planned to start on July 1, 1964, but as it appeared that the sunspot minimum was approaching more rapidly than at first expected it was decided in March, 1963 to start on January 1, 1964, and to continue until the end of 1966. Present indications, however, show that sunspot minimum will probably occur in October, 1964 near the time originally expected. Reports on solar activity will be reported by R. F. Stevens, G2BVN, in *MOTA*. G2BVN is also responsible for co-ordinating h.f.observations since the observation of auroral propagation in the 28 Mc/s band is a new activity in this country. H.f. band operators can thus provide very valuable data.

First Reports

The first pieces of operating news are that GM3LDU sent in some excellent reports concerning the 144 Mc/s auroral opening of September 22—see the November issue of the BULLETIN. During an auroral opening on October 29, GM3LTP heard DL0AR on 29 Mc/s.

Further reports of both auroral openings, and any others observed during the past 18 months are urgently required to ensure that a continuous supply of data originating in 1957 is available. If you can give any reports, please do so indicating dates, times, stations heard and worked, beam aerial heading and any other comments. Reports should be sent to the Scientific Studies Committee. Information on the IQSY will be reported from time to time in a feature to be entitled *IQSY News*.

Satellite Communication

IEE Christmas Holiday Lecture for Schoolchildren

The annual Christmas Holiday Lecture arranged by the Institution of Electrical Engineers will be given this year by Mr. D. Wray, B.SC.(ENG.), A.M.I.E.E., of the Post Office Engineering Department. The lecture, which is intended for boys and girls of the fifth and sixth forms, will be given in the lecture theatre at Savoy Place on Tuesday, December 31, 1963, at 2.30 p.m., and will be repeated at the same time the following afternoon.

Mr. Wray will talk on "Satellite Communication," and will illustrate his lecture with slides, films and recordings, and demonstrations of microwave radio transmission.

Admission to the lecture is free; applications for tickets, stating for which afternoon they are required, should be made to the Secretary of the Institution, Savoy Place, Victoria Embankment, London, W.C.2. As accommodation is limited, parents are asked not to accompany their children.

Space Radiocommunication Conference

By JOHN CLARRICOATS, O.B.E., G6CL *

SOME weeks before the Space Communication Conference opened in Geneva, on October 7, 1963, the GPO advised the Society that it was the intention of the United Kingdom administration to propose at the Conference that amateurs should be allowed to use space stations in the band 144-146 Mc/s. The effect of the proposal, if adopted, would be, officially to permit amateurs in all parts of the world to practise space communication techniques in the exclusive amateur 2m band.

The proposal, welcomed by the Council, was supported by an excellent " brief " for use by members of the UK delegation at the Conference. The " brief " outlined the work already done by amateurs in the sphere of space research and made special reference to the *OSCAR I* and *II* satellites which had operated within the band 144-146 Mc/s.

When the Space Conference opened, it came as something of a surprise to the IARU Region I observers present that no other administration had submitted a proposal similar to that of the United Kingdom. It soon became apparent, however, that the proposal had been discussed at a pre-Conference meeting at Government level in Munich and also with the United States administration.

As is usual at International Telecommunication Union Radio Conferences the task of examining proposals was assigned to Committees. The Frequency Allocation Committee (in the present case Committee 5, led by Mr. W. Klein of Switzerland, himself an ex-amateur) was divided into three Sub-Committees or Working Groups. Committee 5A dealt with the proposals concerning frequencies for communication satellites. Committee 5B discussed the proposals relating to space research and radio-astronomy. Committee 5C examined all remaining frequency proposals, including the UK proposal concerning the band 144-146 Mc/s. Mr. James Penwarden (Chief Signals Officer, Ministry of Aviation and a Member of the UK Delegation) was elected Chairman of Sub-Committee 5C.

In the absence of any other proposal affecting the Amateur Service it had been assumed that the UK proposal would be dealt with under " Other Business " towards the end of the Conference. Instead, and to the surprise of everyone concerned, it was made the first item of business at the first meeting of Sub-Committee 5C and it remained the chief item of business at the next four meetings of that Sub-Committee!

At the first meeting the proposal was introduced by the United Kingdom spokesman who referred to the work already done by amateurs in the field of space research with special reference to the *OSCAR* projects. Representatives of the United States, Denmark and Australia supported the proposal but objections came from the USSR. It seemed obvious from the discussion that the Soviet delegation had had no prior knowledge of the space research work done by amateurs and they commented that the UK proposal had not been submitted until after the Conference had opened. They appeared to think that something peculiar was going on between the amateur fraternity in America and the US War Department. They could not understand how US amateurs had been able to arrange for satellites to be launched! Notwithstanding some clear explanation by the UK and US the first meeting of Sub-Committee 5C ended in deadlock.

At the second meeting, held 24 hours later, the IARU Region I observers present were invited to state a case for the Amateur Service. The opportunity was then taken to explain that radio amateurs had been interested in space research problems from the day the first *Sputnik* was launched by the Soviet Union on October 4, 1957. Attention was also drawn to the fact that the Radio Sports Federation of the USSR is now a Member Society in the IARU and that the President and other representatives of that organization had been present at the recent IARU Region I Conference in Malmö, Sweden, when a model of the *OSCAR* satellite had been displayed. It was also emphasized that amateurs in a great many countries including, it was thought, the Soviet Union and other Eastern democracies, had co-operated with the OSCAR Association in connection with the *OSCAR I* and *OSCAR II* projects.

As the result of this statement the IARU observers were asked to prepare a short paper summarizing the OSCAR Space Satellite Programme. This paper was duly produced and became Conference Document 84.

As the outcome of an informal meeting between Government delegates representing the UK, the USA, the USSR, and Canada a revised text was drawn up which was submitted to the third meeting of Sub-Committee 5C. At that and subsequent meetings it became clear that the Soviet fears had been allayed.

Halfway Stage

After some discussion 5C finally agreed to recommend to Committee 5 that " in the band 144-146 Mc/s space satellites may be used by the Amateur Service and that such use should be subject to co-ordination among all the national Amateur Radio organizations concerned and to the provisions of Article 41 of the Geneva Radio Regulations 1959 (Amateur Stations)." The Sub-Committee also agreed to recommend that the International Radio Consultative Committee (CCIR) should be asked in the light of information received from the IARU, " to study and recommend upon the technical principles on the basis of which the use by amateurs of space satellites for communications can be conducted in the band 144-146 Mc/s taking into account the normal use of the band by terrestrial Amateur Radio stations."

That was the position at the halfway stage of the Conference but when the recommendations of Sub-Committee 5C were considered by Committee 5 it was decided, after much discussion, to omit the references to the CCIR and IARU.

Final Plenary Stage

Later in the Conference, when the recommendations of Committee 5 were submitted to a Plenary Assembly, objections were raised by a number of nations to the proposal that " the use of space satellites by amateurs in the band 144-146 Mc/s *should be subject to co-ordination among the national Amateur Radio organizations concerned and to the provisions of Article 41.*" The matter was put to the vote and after a long debate the objectors were successful by 42 votes to 18 in having the part of proposal shown in italics deleted.

The USSR then proposed that the references to the CCIR and IARU should be reinstated in the text but, notwithstanding support from the UK and the USA, the proposal was rejected by 38 votes to 23.

The Conference finally accepted a proposal that "*Artificial earth satellites may be used by the Amateur Service in the band 144-146 Mc/s.*"

Efforts made during the Conference by the IARU observers present to solicit support for a proposal to extend the original UK proposal to cover 28 Mc/s and other amateur bands were not successful. A second paper drawing attention to the work done by amateurs in the sphere of space

(*Continued on page 353*)

* Secretary, IARU, Region I Division.

Single Sideband

By G. R. B. THORNLEY, G2DAF *

MANY experienced s.s.b. workers are looking for an improved method of transmitter frequency control. The conventional v.f.o. using some form of tunable *LC* oscillator has the merit of simplicity, but unfortunately it suffers from frequency drift. To give some idea of how great this frequency error can be, it is of interest to examine the figures given in the Collins publication *Fundamentals of Single Side Band*. These are shown, together with figures for other types of oscillators, in Table 1. It is also important to realize that the errors quoted are for a v.f.o. of first class design and construction made with all the resources of a large factory. The home constructor would be very lucky indeed if he could match these figures—in practice his frequency error is likely to be much worse than the figures given.

So far as amateur stability requirements are concerned, the crystal oscillator can be considered drift-free. It follows therefore that the ultimate aim is some method of providing the required v.f.o. output, but in some way obtained from, or controlled by, a stable quartz crystal oscillator.

One method of doing this is the result of some experimental work undertaken by the writer in which the output of a stable 100 kc/s quartz bar is divided down into 2·5 kc/s " steps " and the " steps " given continuous coverage by " pulling " the crystal. The basic principal together with a block diagram of the associated stages was given in *Single Sideband* last month. That part of the equipment associated with the balanced converters, V4 and V5, the bandpass filter, the v.f.o. and the tunable output stages is conventional circuitry that is well known. The early stages comprising the 100 kc/s

* 5 Janice Drive, Fulwood, Preston, Lancashire

TABLE 1

LONG TERM FREQUENCY ERROR				
Oscillator Type	Error %	Error c/s 3 Mc/s	10 Mc/s	30 Mc/s
Variable Frequency Oscillator ...	0·05	1500	5000	15,000
Crystal Oscillator	0·005	150	500	1500
Temperature Controlled Crystal Oscillator	0·001	30	100	300
Precision Standard Oscillator ...	0·0001	3	10	30

SHORT TERM FREQUENCY ERROR				
Oscillator Type	Error PPM	Error c/s 3 Mc/s	10 Mc/s	30 Mc/s
Variable Frequency Oscillator ...	20	60	200	600
Crystal Osc. and Temperature Controlled Crystal Oscillator	1	3	10	30
Precision Standard Oscillator ...	0·01	0·03	0·1	0·3

PPM = Parts per million. c/s = cycles per second.

oscillator, the frequency dividers and the harmonic amplifier, will however, be relatively unfamiliar. These will now be described in detail.

An Experimental Single Crystal Frequency Synthesizer

Fig. 1 shows the circuit diagram of all stages up to the input of the first converter V4. The first valve, V1, is arranged as a Colpitts oscillator using either an EF80 or EF91 valve. A variable capacitor of 50 pF is connected effectively in shunt with the 100 kc/s quartz bar. This is the FINE TUNING control, and is used to " pull " the crystal the small amount necessary.

Output from the oscillator V1 is fed via the 50 pF capacitor to the anode of a blocking oscillator V2a. The oscillator

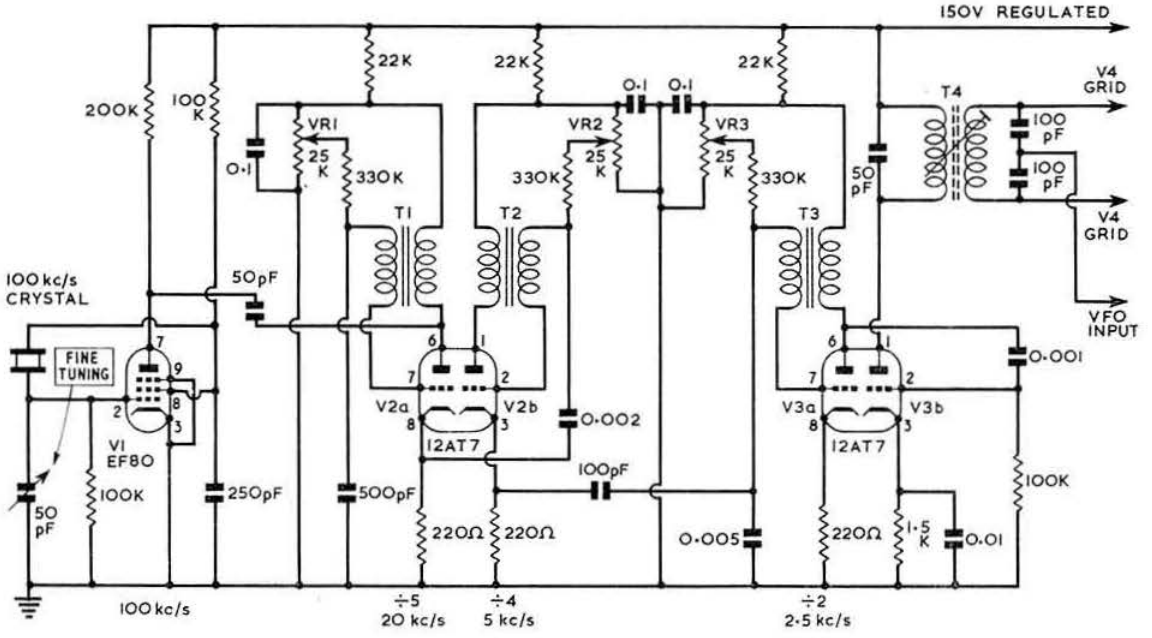


Fig. 1. Circuit diagram showing crystal oscillator, blocking oscillator dividers and harmonic amplifier. VR1, VR2 and VR3 may be ½-watt pre-set potentiometers. All resistors Erie type 9 ½-watt rating.

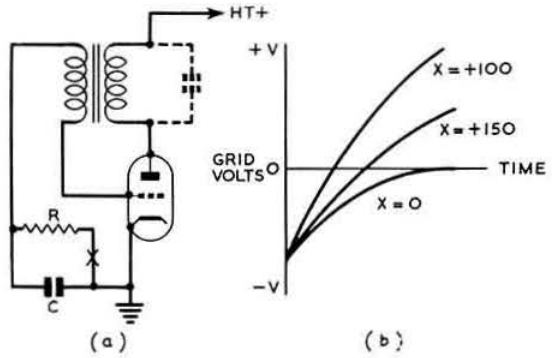


Fig. 2.(a). Blocking oscillator circuit (point X may be taken to a source of positive potential). (b) Graph showing discharge of capacitor C. If resistor R is returned to a source of positive potential, discharge speeds up and cuts zero bias line at a more acute angle—giving improved accuracy of hold control.

repetition frequency is controlled by the time constant of the 500 pF capacitor and the 330K ohms resistor in the grid circuit. Transformer T1 is used to couple energy from the anode back into the grid circuit to maintain oscillation. Fine control of repetition rate is obtained by the 25K ohms preset potentiometer VR1. The blocking oscillator is adjusted to run at approximately 20 kc/s and is held in synchronisation by the triggering pulses from V1 (i.e., every fifth sine wave from the 100 kc/s oscillator anode arrives at the right moment of time necessary to initiate the start of the 20 kc/s blocking oscillator waveform).

The second blocking oscillator V2b is made to run at a lower frequency by the greater value of the grid capacitor—in this case 0·002 μF. Fine control of repetition rate is

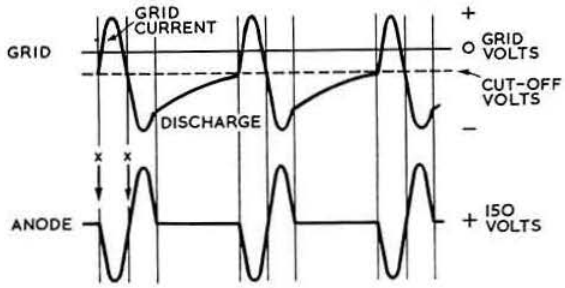


Fig. 3. Blocking oscillator—grid and anode waveform width XX determined by resonant frequency of transformer primary.

obtained by the potentiometer VR2 so that the oscillator free runs at approximately 5 kc/s. It will be noted that the 0·002 μF grid charging capacitor is not returned directly to earth (as in the grid circuit of V2a) but is returned via a 200 ohm resistor that is also part of the cathode circuit of V2a. This provides the synchronising pulse, and the reason for taking this pulse from the previous oscillator cathode instead of the more obvious transformer side of the valve will be described later.

The third blocking oscillator, V3a, has the time constants of the grid circuit chosen to run at a lower speed than V2b. Potentiometer VR3 is adjusted until the repetition speed is approximately 2·5 kc/s. The synchronising pulse is again taken from the previous oscillator cathode, but in this case via a 100 pF capacitor to limit the pulse amplitude.

It will be seen that the stable signal source has a repetition frequency of 100 kc/s and that V2a set to 20 kc/s is dividing down by a factor of five. V2b set to 5 kc/s is dividing down by a factor of four, and V3a set to 2·5 kc/s is dividing down by a factor of two. The total blocking oscillator chain is therefore dividing down by $5 \times 4 \times 2 = 40$ and is therefore producing an output of 2·5 kc/s that is locked back to, and controlled by, the 100 kc/s stable crystal oscillator.

The large amplitude pulse at the anode of V3a is coupled via the 0·001 μF capacitor to the grid of the harmonic amplifier V3b. This stage is driven positive into heavy grid current that takes the valve into class C operation and a small angle of anode current flow that is rich in harmonic output. Transformer T4 is resonated at 3·25 Mc/s and this feeds a spectrum of 2·5 kc/s harmonics—over the range 3·0 to 3·5 Mc/s—into the following converter valve grids.

The blocking oscillator transformers used in the prototype were Haynes Radio Type TQ132 connected so that there is a step *down* from the anode to the grid. Standard inter-valve audio transformers of 3 : 1 or 4 : 1 should be equally suitable.

Blocking Oscillator Frequency Dividers

Blocking oscillator time bases are widely used in domestic television receivers because they are easily synchronized and the degree of " hold " or " lock " is very good. It is this characteristic that makes it possible to provide a 2·5 kc/s output that will still remain in synchronisation with the 100 kc/s controlling source while this source is being "pulled" in frequency by the FINE TUNING variable capacitor.

A basic blocking oscillator circuit is shown in Fig. 2; loosely this can be looked upon as a tuned anode oscillator with a coupled feed-back winding of a type commonly used for r.f. application, but so proportioned as to provide an extreme case of intermittent oscillation. This is achieved by (i) making the anode inductance large and using only the valve and distributed capacitance for tuning, (ii) using a turns ratio between anode and grid so that the peak grid driving voltage is high, (iii) using a grid capacitor that is not too large, and (iv) employing a grid leak of sufficient resistance to make the time constant RC large.

Under these conditions the waveforms that are generated have the character shown in Fig. 3.

A full explanation of the action of the blocking oscillator is so complex, it is outside the scope of these notes. Some knowledge of the way in which the oscillator waveform is derived will, however, be of value. Briefly, a single half cycle of oscillation will build up sufficient charge on the grid capacitor C to provide a bias that is much greater than the cut-off bias of the valve. At this moment of time the valve

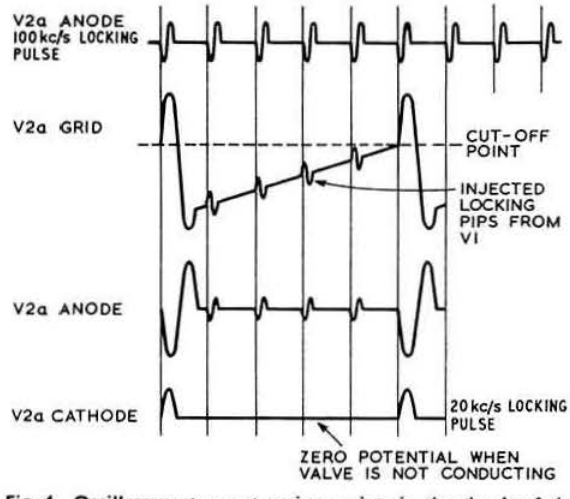


Fig. 4. Oscilloscope trace at various points in the circuit of the first divider V2a.

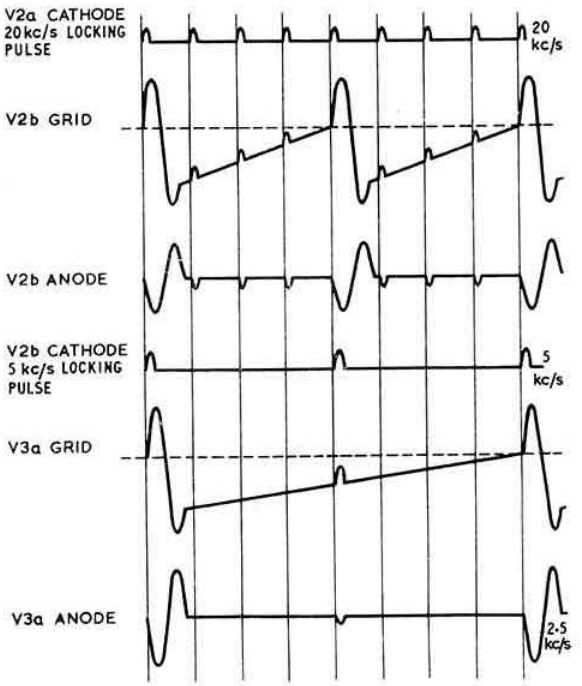


Fig. 5. Oscilloscope trace at various points in the circuit of the second and third divider V2b and V3a.

ceases to conduct and the energy stored in the resonant system is dissipated in a damped oscillation that is superimposed on the bias voltage across the grid leak-capacitor combination. This bias voltage decays exponentially according to the time constant of *RC*; when it reaches the cut-off value of the valve, anode current again flows and the cycle then repeats.

A cathode ray oscilloscope is necessary in order to set up the dividers. The oscilloscope trace at various points in the circuit of the first divider V2a is shown in Fig. 4. VR1 is adjusted until exactly four pips appear during the discharge period of the grid charging capacitor, as shown. There is therefore one oscillation for every five oscillations of the 100 kc/s crystal and the blocking oscillator is dividing down by a ratio of five. During the duration of the 20 kc/s pulse, V2a grid is biased beyond cut-off, and the valve is not conducting, therefore the cathode is at zero potential. At the onset of grid current, V2a conducts heavily, a potential appears across the 200 ohm cathode bias resistor and produces a positive-going pulse. This pulse at the repetition frequency of 20 kc/s is used to lock the second divider.

The various oscillograms for the second and third divider are shown in Fig. 5. In this case VR2 is adjusted until exactly three pips appear during the discharge period, and the divider is then running at exactly one quarter the frequency of the incoming 20 kc/s synchronising pulse—that is at 5 kc/s. Finally VR3 is adjusted until one pip appears in the centre of the discharge period of V3a. This divider is then running at half the frequency of the incoming 5 kc/s synchronising pulses, that is at the required final output frequency of 2·5 kc/s.

Enquiries Regarding Bulletin Articles

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

Space Radiocommunication Conference

(Continued from page 350)

research was prepared by the IARU observers and this too became an official Conference document.

The International Amateur Radio Union (Region 1 Division) was represented at the Conference by Mr. John Clarricoats, O.B.E., G6CL (Secretary of the Division), Lt. Col. Per-Anders Kinnman, SM5ZD (Vice-Chairman of the Executive Committee) and Mr. Arthur Milne, G2MI (a past Secretary of the Division). Other IARU observers present included Mr. John Huntoon, W1LVQ (General Manager, ARRL, and Secretary, IARU), Mr. Robert M. Booth, Jr, W3PS (General Counsel, ARRL) and Mr. William Orr, W6SAI (Project OSCAR Association). Mr. Alfred Schädlich, DL1XJ, who is a member of the IARU Region 1 Executive Committee, was present throughout the Conference as a member of the Federal German Republic delegation.

The United Kingdom delegation was led by Capt C. F. Booth, C.B.E., who, until his retirement earlier in 1963, was Deputy Engineer-in-Chief of the GPO.

Electronics and Power
IEE renames its Journal

The Journal of the Institution of Electrical Engineers will have a new title next year—*Electronics and Power*. The previous title will be retained as a sub-title.

The Council of the Institution wishes to emphasise the range of the Institution's activities, and in *Electronics and Power* a name has been chosen that reflects the breadth of electrical technology.

The first copy of *Electronics and Power* will appear in January 1964.

Also to be renamed from January 1964 are the three "quarterlies"; they will become *Electronics Record*, *Power Record* and *Science and General Record*.

New Books

PRINTED WIRING AND PRINTED CIRCUIT TECHNIQUES. Published for The Electronic Engineering Association by Iliffe Books Ltd. Size 8¼ × 5⅝ in., 49 pages. Price 5s. net.

This booklet is the first of a series to be issued by arrangement with The Electronic Engineering Association and deals with a comparatively new and rapidly expanding subject; it gives a broad treatment of the general principles of the manufacture of printed circuits, including the technical practices employed for equipment other than that which is purely domestic. Every stage in the production of a printed-circuit board is covered in some detail, from the preparation of the original artwork through to the application of a protective coating to the finished assembly.

RADIO AND LINE TRANSMISSION: VOLUME I by G. L. Danielson, M.Sc.(Tech.), B.Sc., A.M.I.E.E., and R. S. Walker, Grad.I.E.E., Grad.Brit.I.R.E. Published by Iliffe Books Limited. 252 pages, 200 diagrams. Price 21s. net.

This is a well compiled text for those studying for the Telecommunications Technicians examination of the City and Guilds of London Institute. It covers the full syllabus of Radio and Line Transmissions A, a principal subject in the second year of the course. Typical questions, including some taken from previous papers, are provided, together with answers.

The subject matter is covered with a minimum of mathematics although an elementary knowledge of algebra and trigonometry is assumed in the examples and in amplifying various portions of the text. The book will therefore be useful to readers seeking background knowledge of the subject, as well as to those with definite examinations in view. The field covered is a very wide one and it is impossible to cover more than an introduction to the subject in a volume of this size and cost. Nevertheless, the text is very readable and refreshingly free from errors and can be recommended. G. C. F.

THE MONTH ON THE AIR

A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By R. F. STEVENS, G2BVN *

THE current contests season is now in full swing and a glance at the *Contests Diary* on page 359 will show that most weekends contain some activity of this nature. Opinion is sharply divided on the subject of contests, some operators feeling that they are a complete waste of time and clutter up the bands with a meaningless jumble of figures, whilst others participate happily, gathering new countries and applying the acid test to new equipment and aerials. To those in the latter category it is urged that they should follow up their contest participation by the submission of an entry to the contest organisers. Nothing can be more dispiriting to contest committees than to be aware of large scale operation followed by only a handful of entries.

The recent comments by EI8P attracted a small number of replies only and the opinions voiced by OZ5S and GC2FMV are typical of several that do not agree with the views expressed by our correspondent from the Emerald Isle, and suggest that an improvement would result if some of the gentry who call on the frequency of the DX station would conform to the advice to call 5 or 10 kc/s away from the transmitting frequency.

The financing of the many operations of W4BPD by the World Radio Propagation Study Association is running into shallow waters and any contributions will be gladly received by W4ECI. These contributions will augment the funds provided by a small group of US amateurs which have hitherto been the major means of keeping Gus on his travels.

News from Overseas

Continuing a yearly operating activity established in 1932 and held every year since that date (except during WW II) the **Annual Transatlantic and World Wide DX Tests** will be held on 160m on the following Sundays: **December** 1 and 15; **January** 5 and 19 and **February** 2 and 16. The times for attempting Transatlantic DX will be between 05.00 and 07.30 on those days. W/K/VE stations will call CQ DX Test during the first minutes of the hour and then during the third, fifth five minute periods, listening in between these times.

Stations outside North America will call CQ DX Test during the second, fourth etc. five minute periods, listening during the alternate periods. It is essential that all clocks should be accurately set. East Coast US stations will be using frequencies between 1800 and 1825 kc/s, West Coast stations between 1975 and 2000 kc/s, New Zealand stations between 1875 and 1900 kc/s with Australians using 1800 to 1860 kc/s. It is anticipated that other DX stations will mainly use the segment 1800 to 1830 kc/s. Participation reports on these tests may be sent to W1BB, or in the UK to G6QB, 186 Winchelsea Road, Hastings, Sussex. W1BB emphasises that these are tests, not contests, and offer an unusual operating activity with a valuable opportunity to acquire information regarding propagation characteristics during the present stage of the sunspot cycle, bearing in mind that the International Quiet Sun Year commences on January 1, 1964.

ST2AS is the present call of G3KPQ (ex-VS1FO) now active from the Sudan Republic. The rig is a home-built s.s.b. transceiver using a McCoy filter, and the aerial a G2ATD groundplane as described in the July issue of the BULLETIN, and which has been found to work extremely well mounted on the flat roof of the house. ST2AS is at present active on 14 Mc/s but hopes to be heard on 3·5 Mc/s in the near future. QSLs should go via the RSGB Bureau.

The QSL Bureau for the **Aruba Amateur Radio Club** has now been taken over by **PJ3AO** and cards and correspondence should be sent to Post Office Box 275, San Nicolas, Aruba, Netherlands Antilles.

VP8GQ expects to leave Signy Island in the South Orkneys group during the coming month, thus ending a period of activity unprecedented in the annals of Antarctic operating. During his stay on the base Peter has furnished many hundreds of operators with a new country, both on c.w. and s.s.b. After two or three weeks spent in transit on the relief boat, VP8GQ will be heard from Port Stanley in the Falkland Is. The facilities for aerials will be inferior to those at Signy Is. and the signals may not have their former punch. After a stay at Port Stanley, VP8GQ will return to the UK during the early part of the year and resume operation as G3LET. All QSLs should go, as before, to G3PAG. With the tremendous number of cards being dealt with it would be appreciated if operators would ensure that the date of their QSO is correctly given. Incorrect dates lead to many hours spent hunting through log copies looking for a contact.

The latest **W1BB 160m DX Bulletin** is full of information and notes the Transatlantic openings that have already occurred this season. The W1BB/1 Test station will use an aerial of the inverted Vee doublet type with the apex located 260 ft. over salt water. This is an attempt to beat the high noise level experienced by W1BB and which has caused many lost contacts, and with which QSOs have already been made with the UK and DL1FF. A recent noteworthy event was the operation by **VE2UQ** from Baffin Island, where, under very difficult conditions QSOs were made with W1BB, W2EQS, VE1ZZ and K9YWO. VE2UQ operated from an over-sized box at the foot of a vertical tower, the temperature in the "shack" being 38°F! Nearer home, it is noted that **GM3KLA** located at Lerwick has erected a new vertical radiator 130 ft. in height with a ground radial system, and incorporating 3500 ft. of galvanised guy wire, hundreds of insulators and 100 yards of co-axial feeder. Located only 180 miles from Norway GM3KLA should radiate a potent signal on Top Band. Top Band

*Please send all items to RSGB Headquarters to arrive not later than **December 6** for the January issue, and **January 10** for the February issue.

enthusiasts will now be no doubt looking forward to the **CQ 160m C.W. Contest** during the weekend of January 25-26, 1964.

K2MGE relates one of the methods used in North America to ensure that a DXotic station is worked by everybody in a group who are linked by a telephone conference circuit. One group of seven stations is located in various towns in New Jersey and all equipped with the usual phone patch facilities, and directly a DX station is heard this is put on the line for all to hear. The DX station having been picked up by one of the group is located on the band and can be called by the others tied in the telephone circuit. It is understood that this neat arrangement is quite successful, and represents an advance on the technique whereby DX'ers are linked by low power v.h.f. equipment! A painless method (but not necessarily the best) of working DX.

W4DQS, one of the operators who took part in the DXpedition to **Malpelo Island** has been conducting some statistical research which is reproduced in the *Florida DX Report*. Points on which information was desired included: (i) the number of stations who failed to send a QSL, and (ii) the number of stations who made more than one QSO per band. With regard to (i) it was discovered that approximately 40 per cent of W/VE contacts failed to QSL, with the W0 district a blasé 50 per cent. Altogether out of 1761 different station QSOs, 755 failed to QSL. Operators who made multiple contacts were limited to 4½ per cent of the total, but W4DQS rightly concludes that this art of muscle flexing should be discouraged. In the case of **HK0TU** 79 stations made a total of 260 contacts with a brand new country whose total operating time was limited to 82 hours. To quote the writer: "All these were on 14 Mc/s and regardless of any possible excuses given, it is an example of piggishness at its worst." Unfortunately this disconcerting habit is not limited to North American stations as all users of the 14 Mc/s band will be aware. A step towards elimination of the DX hog was taken by W9WNV when operating KG6ID as anyone in the log more than twice per band did not receive a card.

The **QSL Bureau** for **Sierra Leone** has been taken over by **9L1HN,** P. N. Heywood, whose QTH is The Technical Institute, Freetown.

4S7IW, Ian Wollen, mentions the *South East Asia Net* which meets weekdays at 14.30, and on Saturdays and Sundays at 12.00, on a frequency of 14,320 kc/s. The net control is usually BV1USG, and those reporting in include DU1JC, VS6EK, VS1MB, 9M2DQ, 6O1WF, and a good number of other stations in this area. **VK4JQ** on Willis Island is said to be very active and is looking for Europeans at weekends between 02.00 and 14.00 between 14,230 and 14,250 kc/s. 4S7IW participated in the phone section of the *CQ WW DX Contest* and found conditions good to Europe, Central and South America, but no North Americans were heard. Apparently VQ4RF was invaded by safari ants during the contest! **VS9ADV** told Ian that he hoped to visit Swaziland during December if the licence formalities can be completed.

DXpeditions

5N2RSB will be "DXpediting" to Cameroun (TJ8) during the first weekend in December (7th and 8th) when he will be using equipment loaned to him by Hallicrafters and consisting of a SR150 and a SX117. At the beginning of January 5N2RSB will be visiting **Niger** (5U7) and during the first weekend of February will be going to Dahomey (TY2). QSLs should be sent via the RSGB Bureau, or may go to PMB 2022, Kaduna, Nigeria, with two IRC if a direct reply is desired.

From **G2HFD** comes the latest information on the forthcoming operation of **ZS6BBB** from Basutoland and Bechuanaland. ZS6BBB will be on the air from Basutoland from 16.00 Friday, January 3 until the morning of Tuesday, January 7 using the call **ZS8Z.** Operation from Bechuanaland will be from 16.00 on Wednesday, January 8 until the morning of Monday, January 13 using the call **ZS6BBB/ZS9.** QSLs should go to PO Box 9299, Johannesburg, and s.a.s.e. and IRC would be appreciated. It is hoped to use the following frequencies: *transmitting*, 7098 kc/s; 21,105 and 21,445 kc/s; 14,105 and 14·345 kc/s; *receiving*, 7098 and 7200 to 7210 kc/s; 14,255 to 14,265 kc/s and 21,410 to 21,420 kc/s.

CR9AH is the only active amateur in Macao.

The RAFARS and the WRPSA are the joint sponsors of the **Kuria Muria** DXpedition, which after much planning set forth in mid-November for Halliniya, the largest island of the Kuria Muria group. This island group is located some 800 miles East of Aden in the Arabian Sea. Halliniya is some eight miles long and three miles wide. Presented to Queen Victoria in 1854 by the Sultan of Muscat and Oman, this island boasts a population of some 80 persons living in one settlement. The island is most inhospitable, consisting mainly of jagged peaks and not having any vegetation. In addition to the four man Amateur Radio team, a support team of 12 men will carry out a topographical and geological survey of the island, a task which has not been previously carried out. The trip from Aden was made in a 1200 ton motor vessel taking between five and six days.

Operation commenced on November 15 with weak signals from temporary aerials, but many European stations were worked on the following Sunday.

After a false start on October 26 the DXpedition to **Aves Island,** a joint venture by the Hammarlund Mfg. Co. and the Radio Club of Venezuela, commenced operation on November 9 using the call **YV0AA,** when their signals were well heard in the UK. The original sortie was abandoned when wind velocities of up to 80 m.p.h. were encountered. QSLs should be sent to the Hammarlund DXpedition-of-the-Month address, i.e. PO Box 7388, GPO, New York. W2GHK notes that virtually all complaints of lack of delivery of QSL cards can be attributed to wrong dates and/or wrong times, and asks for attention to this point which will speed the sending out of the cards.

Following his short stay in Afghanistan, from where he operated under the call YA1A, **W4BPD** travelled to Aden to join the Kuria Muria group. If present plans mature Gus expects to be back in AC3 around December 10, followed by further trips to AC5, and also YA, if there

should be the demand. Permission is still being sought for Gus to operate from the VQ8 islands.

The operation from **Juan Fernandez** by W4QVJ was not an unqualified success in so far as European stations were concerned. Indifferent conditions and a limited period of operation enabled only a few UK stations to work **CE0ZI.** W4QVJ left Mas a Tierra Island of the Juan Fernandez group on October 30 and QSLs should go to his home QTH.

The **South Sandwich Islands** may at last see activity when G3RFH, at present operating /MM, calls there in February, 1964. It seems likely that operation will be limited to low power and on 7 Mc/s using the call **VP8HF.**

Through the courtesy of WA2WUV and the Long Island DX Association it is hoped that a KWM-2 and a 3OL1 will be available for use by members of the RAFARS in the Malaysian area in the near future. It will be remembered that Singapore/Malaya and Sarawak/Borneo comprise the two new countries counting for DXCC purposes after September 16, 1963.

In addition to the foregoing activity it is hoped that **Easter Island,** a difficult country to work from the UK, will be available during January, 1964, when WA2WBH intends to visit this spot.

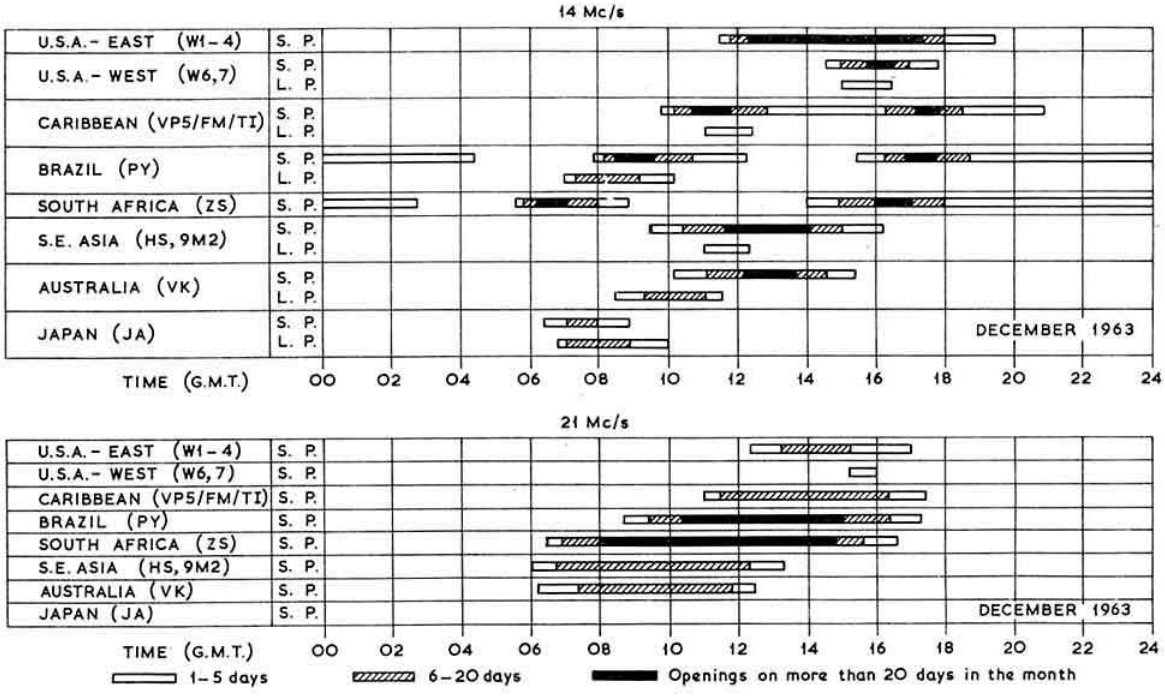
MP4QBG will be the call of G3NMQ/MP4DAH when operating from Qatar during the period December 10 to 20. Activity will be on 7, 14 and 21 Mc/s using crystals of 7,005 and 7,013 kc/s (G5GH).

PROPAGATION PREDICTIONS

Conditions on the h.f. bands will be less favourable during December than during October and November as the daytime *F2* m.u.f. will be lower and the shorter winter days will reduce the length of the periods during which DX contacts may be possible. 28 Mc/s will be open only occasionally from 10.30 to 14.30 to South America and from 08.00 to 15.00 to Africa. The 21 Mc/s band will only be reliable for contacts with South America and Africa. In general DX conditions on 28 and 21 Mc/s will be better in South Europe than in the north of the continent, but the earlier sunset will mean that DX contacts on 21 Mc/s will cease by 17.00 at the latest. All continents will be workable on 14 Mc/s but because of the winter days the periods of activity will be relatively short, and with few exceptions DX QSOs will not be possible after 19.00. The most profitable period for working 14 Mc/s will lie between 07.00 and 13.00. Contacts over the long path may be possible especially with South America and East Asia during the mornings. In the evenings South African and South American stations will be well heard on 14 Mc/s but QSOs will be difficult because of the higher noise level in the southern hemisphere during the summer months. QRM permitting stations from Eastern USA will be heard on 7 Mc/s after 19.30, after 21.00 from South America and after 13.30 from Japan. The lower noise level on 3.5 Mc/s during the winter months will give better conditions for DX contacts.

It may be possible to make contacts on the 28 and 21 Mc/s bands by means of auroral reflection when both stations turn their aerials to the North. Special investigation of this phenomenon is being made during the IQSY, and reports of QSOs by auroral reflection will be welcomed. C.w. signals will exhibit a characteristically rough note.

The provisional sunspot number for October was 36 with the period of greatest activity lying between the 14th and the 30th of the month. Predictions of the smoothed sunspot numbers for January and February, 1964 are 20 and 19 respectively.



Awards

In order to speed the processing of awards issued from **Okinawa** a form is now available for applications for the Okinawa Award and the Cotton Pickers' Award. This form may be obtained from the Awards Manager at Box 37, Kadena, Okinawa, which is also the address of the KR QSL Bureau.

The **Budapest Radio Club** have instituted the **Budapest Award** of which two classes may be obtained by transmitting stations and short wave listeners. Leaflets giving full details of these certificates may be obtained from G2BVN by sending a s.a.s.e., or direct from Radio Club of Budapest, Dagaly u.ll/a, Budapest XIII, Hungary, to whom award applications should be sent.

The November issue of *CQ Magazine* contains the full rules governing the **USACA** (Counties Award), the latest recipient of this award in the UK being G8PL who gathered award No. 272.

The **Cotswold Radio Contest Club** are sponsoring the **" 15 on Top "** award to encourage DX activity on 1·8 Mc/s. It is necessary to produce proof of contact with 15 countries on Top Band after January 1, 1960. Applicants should send a copy of the log entries witnessed by a representative of the appropriate national radio society. The fee is 2s. 6d., five IRC, 50 cents or the equivalent, and applications should be sent to the club, c/o G3OLN, 250 Gloucester Road, Cheltenham, Glos. (W1BB).

The *Sideband Certificates* programme of *CQ Magazine* has been taken over by the DX Editor, W2DEC. The previous arrangements that cards from UK stations may be sent to **G2BVN** for checking still apply, or QSLs and lists may be sent direct to W2DEC.

Contests

Leading UK stations in the two sections of the 1963 *ARRL International DX Competition* were as follows:

Telephony		C.W.	
G3DO	58,032 points	G4CP	266,580 points
G3MEA	26,244 points	G2QT	155,268 points
G3PEU	21,390 points	G2DC	151,632 points
G3AS	7,326 points	G6BQ	97,146 points
G3PRP	1,120 points	G2RO	80,136 points
G3KFX	58,345 points	G3EYN	51,944 points
		G3APN	28,256 points

G3KFX was a multi-operator station (G3s JOC and KFX) whilst **G4CP** was the leading European station on single operator c.w. listings. From Northern Ireland **GI3OQR** obtained 143,100 points, and from Wales **GW3JI** 251,883 points, both in the C.w. Section.

The weekends for the **1964** ARRL International DX Competition are:

Telephony: February 8-9 and March 14-15.
C.W. February 22-23 and March 28-29.

A summary of the rules will appear in the January issue of the BULLETIN.

The results of the C.w. Section of the *1962 SAC Contest* show the following leading stations from England:

G5GH 2788 points; G3NFV 1872 points; G3KMA 1547 points; G3MEA 1485 points; G3POI 1184 points and G2WQ 1044 points.

In presenting the results of the *1963 PACC Contest*, PA0LOU, the Traffic Manager of VERON, expresses his disappointment with the number of Dutch stations active and promises increased activity for the next occasion. From England, G3EYN scored 825 points and G2WQ 216 points, both in the C.w. Section.

Reporting on the C.w. Section of the **RSGB 7 Mc/s DX Contest, VP8GQ** mentions poor conditions which restricted his number of UK contacts to about 40. In direct contrast, conditions during the phone section of the *CQ WW DX Contest* were extremely good as witness the performance of **G3FXB** who worked 35 zones and 113 countries for a score of some 270,000 points on 14 Mc/s only. This is not an isolated case and there are several other stations believed to have made scores approaching the 250,000 mark.

Of possible interest to those operators who take part in contests and thereby receive a large number of incoming QSLs, is an inexpensive QSL card designed by K6BX on which the call and QTH are placed by a rubber stamp. Printed on a thin card, these QSLs represent good value at 43s. per 1000.

Conditions during the recent **Jamboree-on-the-Air** were reasonable bearing in mind the state of the sunspot cycle and there was considerable activity from Scout stations located overseas. One of the UK stations, **G3GSR**, representing the 1st. Herstmonceux Scout Troop, worked 41 stations on 3·5 Mc/s of which 21 from 11 different countries represented Scout troops. Equipment used included a home-built transmitter running up to 150 watts input and feeding a 270 ft. Zepp fed long wire. Local Scout members, including A.3550, assisted with log keeping.

The **OK DX Contest 1963** will take place between 00.00 and 24.00 on December 8, 1963, and participation is limited to c.w. only. Leaflets giving full particulars of the rules may be obtained by sending a s.a.s.e. to G2BVN.

5N2JKO took part in the *CQ WW Contest* (phone section) and made 769 QSOs totalling some 550,000 points. On 21 Mc/s only **5N2CKH** made about 39,000 points, whilst 5N2JKO heard **5A1TW** mention that he had made 850 QSOs, this at a time three hours before the end of the Contest.

Around the Bands†

Considerable activity has been reported this month. The l.f. bands have shown an improvement: 21 Mc/s has provided some excellent openings to Africa, whilst even 28 Mc/s has produced DX, stirred up no doubt by the *CQ* WW contest.

On 1·8 Mc/s, B.R.S.20317 (Bromley) found UA3NB (00.17) at 589, VE1ZZ, W1BB and W1BB/1 with signals varying from 44 to 69. W2KHT was present but weak. This band should show steady improvement in November and December for DX working.

5N2JKO (Zaria) has been unable to be active for any length of time on this band but has heard **G3GRL** and **DL1FF** at RST589 with **G3OUV** and **G3OQT** other strong UK signals. 5N2JKO reports **W1BB/1** as putting in a superb signal with his new aerial 250 ft. up at the apex, and being always the last North American station to fade out.

There are a number of useful reports for **3·5 Mc/s** this month. **A.1798** (Winchester) found EA9AZ (20.12), VO1BR (20.35), 4X4IX (20.40), and VO1EC (21.59) all on s.s.b. **A.2111** (Ilford) logged s.s.b. UA9KCE (20.55), VO1EC (05.59), VE1IE (06.04), VE3CFU (06.06), K5ECI (06.10) and many other W call areas. He also heard 5A1TW (05.05), LX3BW (05.24). **B.R.S.20317** (Bromley) observed that DX was frequently being masked by the CQ callers who do not listen, but found on c.w. UA3YI/ZA (23.15), VE3BGV/SU (23.07)—the first genuine SU heard on this band, UA9CR (01.10), UA9KAG (23.30), ZB1CR calling VK/ZL at 18.05 with no return, 9A1NU (00.25), W2RND (23.00), W9WJB (00.18), TF3CJ (23.07), YV5DN (01.18). Schedules arranged with VS1LP and 9N1MM were both negative.

5N2JKO found the best time for Europe was 04.00 to 06.00 but is unable to be active after 05.15 as work for him commences at that time. Prefixes worked during the last month on s.s.b. include: DL, F, G, GI, HB, I, OK, PA, SM, K/W, VE, ZB1, ZD7 and his first 5N2 on 3·5 Mc/s s.s.b. in 5N2RSB.

On **7 Mc/s** conditions improved during the month with more DX to be heard. **A.1798** (Winchester) heard s.s.b.

† Compiled by J. G. Cottrell, G3PSY.

QTH Corner

DL2PB	D. J. Quigley, C Sqdn., 10th Royal Hussars, BFPO 16
FK8AH	R. Garbe, BP 23, Noumea, New Caledonia
FM7WQ	via W4OPM, C. J. Hiller, 2208 Dinwiddie Road, Bayside, Virginia Beach, Va., USA
FP8DA	via DL2OV
FS7MB	via W3ZQ
FU8AG	Box 104, Santo, New Hebrides
HSII	via W8JVP
IS1VAZ	Via Marconi 137, Quartu, Sardinia
KG4BX	via W2CTN
KV4DE	via W4SWN
MP4DAH	B. Crosbie, c/o Schlumberger SA, Adma, Das Is., via Bahrein, Arabian Gulf
MP4QBF	PO Box 73, Doha, Qatar, Arabian Gulf
PJ5MC	via W3ZQ
TL8SW	S. Wagoner, Box 302, Bangui, Central African Republic
TT8AN	via W0LYQ
VP2KI	via W2YTH
VP7NX	Box 913, Nassau, Bahamas
VP8GR	via IRTS QSL Bureau, 24 Wicklow Street, Dublin, Eire
VQ4I	via RSEA, Box 30077, Nairobi, Kenya
VS9HAA	via W4ECI
YA1A	via W4ECI
YK1AA	Box 35, Damascus, Syria
YV0AA	Hammarlund Mfg. Co., PO Box 7388, GPO New York, NY, USA
ZS7R	V. V. Parkhouse, PO Box 99, Mbabane, Swaziland
6O1BW	B. Walton, c/o Paul Smith Construction Co., PO Box 1393, Mombasa, Kenya, East Africa
3A2AF	via W6SAI (home call)
9L1HX	c/o Police HQ, Freetown, Sierra Leone
9L1TI	T. Lloyd, Fourah Bay College, Freetown
9Q5TJ	via DJ4OP

* * *

RSGB QSL Bureau: G2MI, Bromley, Kent

from OH0NI (11.12), UA6MK (17.48), VS1LP (19.48), MP4BBW (22.55), 5A1TW (23.48) and VK2AVA (19.42).

A.2111 (Ilford) logged a.m. from YV4JOP (05.51) and ZK1AG, and also s.s.b. from VS1LP (19.50) and OH0NI (06.11). **OZ5S** (Copenhagen) heard several North and South American stations but aerial limitations prevented any contacts being made. **B.R.S.20317** (Bromley) reports good all-round DX conditions for 7 Mc/s, with plenty of DX and five new countries (score now 209 c.w.). The best results came from Asia during an opening at 13.00 through to 01.30. Stations heard included JT1CA (14.56), MP4QBF (15.25), YA1A (00.52), 9N1MM (17.20), BY1DX (15.10), VS9AAA/P (01.20) in the Yemen, VS1LP (14.45), EP2AO (15.11), JA6YG (17.15) and other JA's but were all rather weak as were eight UA0's. Also heard were 4X4DH and 5B4TC; both very active (14.00 GMT onwards).

Oceania provided stations in the VK/ZL contest including VK3AOY (15.00) at S8, VK5ZP (15.26), VK3JF (13.42), VK6RU (16.13), VK2EO (07.55), VK5KO (07.44). New Zealand stations were less numerous, but ZL2AWJ (14.45), ZL4GA (16.04) at S4 to S5, and finally KG6AAY (14.40) who soon went off due to QRM, were heard.

Africa provided ZD3A (22.34) in Bathurst, 9Q5AB (23.50), UA1KAE in the Antarctic at 17.21, 5N2LAF (23.50), ZS5KI and ZS5FQU at 21.00 working Japan. Nearer home, fine signals were received from 5A3CJ and 5A5TW.

There were plenty of signals from North America, with the long path to W6 opening during the month. Central America gave VP2KT in Anguilla at 00.58, PJ5MF (23.00), VP2VS (23.43), and VP3YG (00.15). KP4/KV4 was also logged.

5N2JKO has noticed a considerable change in conditions on this band and Europeans are now audible at all hours of the day and night although only the stronger stations are able to penetrate the QRM during the afternoons. North American signals come through well during the period 20.00 to 08.00 with the Near East and Far East during the afternoons and early evenings.

The **14 Mc/s** band continues to provide signals from all directions. Notable points this month are the excellent openings to VK after noon, and the early close down to North America. **G8JM** (Chingford) reports phone contacts with VP8GQ (18.45), ST2AS (17.45), VK4JQ on Willis Is. (11.30), PJ5MF (21.00), HZ1AB (07.00), 9A1CWN (07.00), MP4MAP/HZ (15.45), VP2KT (19.30), ZD7BW (19.00), YA1A (16.00), 3A2AF (16.00), YV0AA/MM (18.20), MP4DAS (07.30), 9N1DD (16.30), KZ5BD (09.00), CE0ZI (08.00), TT8AN (16.30) and TT8AJ (17.00). In addition, c.w. contacts were made with 5R8AB (16.00), KC6BO (14.00), VS1LV (15.30), 6W8AB (18.45), YA1A (15.45), VQ8AI (17.00), FS7MB (16.00) and 4S7WI (10.40) completes the picture. G8JM says that he does not think this standard can possibly continue through November! **G3POI** in London also did well making c.w. contacts with PZ1BW (20.31), KC6BO (12.41), KG6AAY (13.52), ZD6OL (19.18), IS1ZUI (21.57), HM4AQ (12.38), JT1AG (13.16), TN8AF (18.12), ZD8HB (21.40), TL8SW (22.27), DU5DM (15.12), CR6JJ (17.27), TC3ZA (15.10), FB8ZZ (16.03), FB8XX (15.45), HZ1BF (16.05), and many others. **OZ5S** (Copenhagen) reports c.w. with KL7FBK (07.48), KP4CU (10.48), ZL1AV (07.15), ZL2RZ (10.30), VS9AAA (20.08), and W1EJT/VE8 and all W areas at appropriate times. On s.s.b. YA1A (15.30) and YV4FD (20.05) were worked.

G3YF (Chingford) found plenty of interest including s.s.b. with 9A1CWN (15.30), DU1BSP/C (15.20), VS4RS (14.20), DU1AP (14.15), ZD7BW (09.20), CX2CO (11.15), VP2AY (06.40), VK4JQ (13.15), VU2CQ (14.55). The c.w. mode yielded many good ones including VK9DR (15.15), KC6BO (14.55), CT4AR (15.15), JT1AG (14.45), VR2DK (09.05), VK0VK (16.00), K4OXP/KG6 (10.30), HL9KH (11.00), KG6SA (10.00), ZD8HB (19.05), ZS2MI (18.15), VK9MD (15.05) and TN8BE (19.10). **A.2111** (Ilford) confirms many of the above and adds VP9BJ (18.12), PJ3AO (18.59), 6O1WF (05.53), KL7EKB (07.53), KX6BD (08.55), CE1FX (09.03), VR4CU (11.11), CR6CX (18.43), OA4PD (20.35), OX3JV (18.46), HK4AHT (20.54), HI8XBG (21.08), YV6AX (21.09), HC5EJ (21.10), XE1AE (21.14), EL2F (21.39), all on s.s.b. **A.2498** (Easington) found plenty of s.s.b. including DU5DM (13.00), HL9KH (15.10), HB1UE/FL (13.10), LU1DAB (12.45), MP4MAP/HZ (12.30), TI2HP (13.55), VP7NS (12.05), W9UDF/MM, off Java at 14.55, XW8AL (16.15), ZL4LZ (12.20), 5U7AC (18.05) and a large host of VK's!

5N2JKO has found that the early morning pattern on this band has changed and on most nights the North American signals remain until sunrise (05.00) to be replaced by stations from Eastern Europe. The long path to Australia has been good around 07.00 GMT and VR1B was worked at that time. The pick of the month on s.s.b. were: CE1FX (07.55), HL9KH (08.00), KC6BK (15.00), KC6BO (15.00), KX6AE (13.25), LX3BW (07.25), OA4BI (19.45), PJ5MF and TC3ZA (05.50), TT8AN (18.00), VK9DR (15.20), VP3HAG (23.20), VP7NS (19.50), VP8GQ (07.00), VR1B (06.40 c.w. to s.s.b.), YS1RRD (23.20), ZD7BW and 3A2AF (07.20), 5U7AC (19.50) and 9A1AIJ (06.30).

C.w. from **G3AAE** (Loughton) was heard by FG7XC (20.30), FU8AG (09.40), KC6BO (12.05), KG6SA (11.30), KG4BX (18.30), JT1AG (12.00), VK4JQ (12.50), VP3YG (20.20), VS6EY (15.30), YA1A (16.15), ZS2MI (19.10) and 7G1IX (18.15).

The **21 Mc/s** band has been erratic with conditions varying from day to day. Nevertheless plenty of activity has produced the DX. **G3NQD** (Torquay) reports a.m. from CX2CO (11.03), CX3BH (10.38), PZ1BK (10.22), TU2AE (11.30), VP7NX (13.50), VP8GQ (17.14), 4X4ON (14.29), and others from 5N2, 5H3, 6W8, 9G1 and ZD3A (08.59). C.w. contacts were made with FY7YF (17.56), MP4DAH (13.50), HK7AJP (18.32), PZ1CK (18.00), SU1IM (14.28), TI2LA (18.07), TC3ZA (13.14), ZE1BK (13.57) and many South African stations. **A.1798** (Winchester) reports a.m. from 9G1EZ

(16.15), ZS2OM (16.15), W6VSS (16.20), KP4BKW (12.26) whilst s.s.b. yielded TT8AJ (15.53) and ZS7R (12.38). **G2BJY** (Torquay) provides a comprehensive review pointing out that short skip Europeans and late in the month, a flood of W's produced considerable interference. Stations worked included CR7AD (16.40). Many others were heard including ET3ZC (12.10). **OZ5S** (Copenhagen) reports c.w. with HK3LX (16.08), MP4DAH (17.32), VK3AZY (09.35) and many Europeans.

G3AAE made c.w. QSOs with LU3ZI (12.00), FB8ZZ (13.40), TL8SW (12.10), VK9SB (11.45), 5U7AC (17.15), and 9N1MM (12.15).

A.2461 (Torquay) reports some activity on **28 Mc/s** produced mainly by the *CQ* WW Contest. The DX heard included CX2CO, CX3BH and ZE1JA on c.w.

5N2JKO has found conditions good on this band, and this is most noticeable on Sundays when activity is so much higher. No outstanding DX has been worked, but contacts with the following prefixes were recorded during the month: CE, CR6, DL, EA, ET, F, G, GI, HB, I, LU, LX, OE, ON, PZ, UA, UB5, UF6, VE1, VQ2, W1-5, W8-0, YO, ZB1, ZD7, ZE, ZS, ZS7, 5A and 9A. A very creditable list bearing in mind the state of the sunspot cycle, although at this time conditions are known to be better in latitudes approaching the Equator; however activity is obviously the key.

Finally, all members are requested to send their reports in as early as possible.

DX Briefs

OZ5S (Copenhagen) would be glad to hear from any member who has succeeded in extracting a QSL from **TI2PZ,** who apparently does not respond to usual QSL approaches.

Syria, never easy to work, has been recently represented on 14 Mc/s a.m. by **YK1AA,** giving the name of Raschid and reported as active around 15.00 on the high end of the band.

VS4RS now has two crystal controlled frequencies in addition to his original spot of 14,301 kc/s and these are 14,120 kc/s and 14,260 kc/s. QSLs come very swiftly from this station.

Two suspect calls heard recently on 14 Mc/s c.w. are **7G1IX** giving a QTH in Conakry, and **CT4AR** saying that his district was Flores. Both have been extensively worked and it will be interesting to see if QSLs duly appear.

Confirmation comes from **ZD3A** that ZD3AL is definitely a pirate and that QSL pleadings will be a waste of time.

ZS2MI on Marion Island has been intermittently active around 18.00 on 14 Mc/s c.w. and asking for QSLs via ZS1OU. Usually the openings are of short duration with signals not of good strength.

DL2PB (address in *QTH Corner*) would be pleased to have QSOs with stations in his home area of the Isle of Wight and Hampshire.

The following snippets from **4S7IW : ZK1AR** is active on a.m. from Aitutaki in the Cook Is. **VR1G** is again on from Ocean Is., this time with s.s.b. from an HX20. **VR4CM** is active from Guadalcanal, and Ali, **YA1AN,** is often heard with promised operation by **YA1AF. HL9KH** is leaving Korea and returning to the USA via **YJ1** (New Hebrides) and may also visit Cambodia.

QSLs for **HZ2AMS** and the various **MP4** calls of Angus Murray-Stone may now be sent direct to the Hammarlund DXpedition QTH, GPO, Box 7388, New York, 1. All cards received direct will be answered in the same way, and other QSOs will be answered via the Bureaux at the end of each month.

* * *

Correspondents are thanked for their co-operation and aknowledgement is made to the West Gulf DX Club *Bulletin* (W5IGJ), the LIDXA *Bulletin* (W2MES), *DX'pres* (PA0FX), the *Florida DX Report* (K4IIF), the *DX'er* (WA6TGY) and *DX* (W4KVX). Please send all items to RSGB Headquarters to arrive not later than **December 6** for the January issue and **January 10** for the February issue.

Group Visits by air to USA

Mr. John Brodsky, G3HQX, 2 Greenhill, Sutton, Surrey is considering a scheme whereby a group of RSGB members and their friends would spend two weeks holiday in the United States next year.

The cost of the return air fare by Boeing 707 jet air liner is expected to be about £70 for a party of about 100 while the overall cost is expected to be about £150 a head depending upon the hotels chosen.

Members interested in the project are invited to write to Mr. Brodsky for further particulars.

It is understood that the Region 1 visit to USA mentioned in the November issue of the BULLETIN has been cancelled.

CONTESTS DIARY

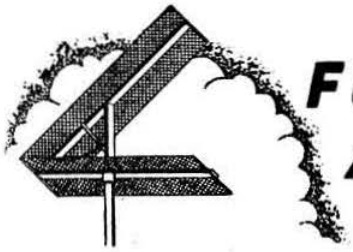
December 7-8 - OK C.W. DX Contest.

1964

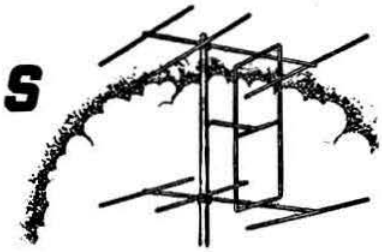
January 25-26 - CQ WW 160m Contest.
January 26 - 144 Mc/s C.W. Contest. (See page 321, November 1963.)

February 1-2	— Affiliated Societies' Contest (see page 380).
February 8-9	— ARRL DX Contest (Phone).
February 15-16	— BERU. (For rules, see page 261, October, 1963.)
February 15-16	— QCWA Party.
February 22-23	— ARRL DX Contest (C.w.).
February 29-March 1	— First 1·8 Mc/s Contest.
March 7-8	— ARRL DX Contest (Phone).
*March 7-8	— 144 Mc/s Open and Listeners' V.H.F. Contests.
March 21-22	— ARRL DX Contest (C.w.).
March 28-29	— REF (C.w.).
April 4-5	— PZK (C.w.).
April 4-5	— Helvetia 22 Contest.
April 5	— Low Power Contest.
April 11-12	— CQ WW DX SSB Contest.
April 12	— D/F Qualifying Event (Rugby).
April 18-19	— PZK (Phone).
April 18-19	— REF (Phone).
April 19	— D/F Qualifying Event.
April 25-26	— PACC (C.w.).
April 26	— D/F Qualifying Event (Newbury or Oxford).
*May 2-3	— First 144 Mc/s Portable Contest.
May 2-3	— PACC (Phone).
May 2-3	— USSR DX Contest (C.w.).
May 9-10	— OZ CCA (C.w.).
May 10	— D/F Qualifying Event (Manchester).
May 16-17	— OZ CCA (Phone).
May 30-31	— CHC/HTH Party.
*May 30-31	— First 420 Mc/s Contest.
June 6-7	— National Field Day.
June 14	— D/F Qualifying Event (High Wycombe).
June 20-21	— 70 Mc/s Contest.
June 28	— D/F Qualifying Event (Derby).
June 27-28	— RSGB 1250 Mc/s Tests.
*July 4-5	— Second 144 Mc/s Portable Contest.
July 12	— D/F Qualifying Event.
July 19	— D/F Qualifying Event (Wirral).
July 26	— D/F Qualifying Event.
*September 5-6	— V.H.F. National Field Day.
September 13	— D/F National Final.
September 19-20	— Low Power Field Day.
October 3-4	— RAEN Rally.
October 21-22	— Second 420 Mc/s Contest.
October 31-November 1	— RSGB 7 Mc/s DX Contest (Phone).
November 21-22	— RSGB 7 Mc/s Contest DX (C.W.).
November 28-29	— Second 1·8 Mc/s Contest.
December 5-6	— RSGB 21/28 Mc/s Telephony/Receiving Contests

** To coincide with Region 1 IARU dates.*



FOUR METRES AND DOWN



By F. G. LAMBETH, G2AIW *

AN outstanding auroral opening occurred on October 29 which affected communication over a wide area. Although the main emphasis was on Southern England and Scotland, there is at least one report of an SM5 station being worked.

G3OBD (Poole) heard G3ILD, G3JYP, GM3UU, GM3GUI, GM3LDU, GM3JFG, GM2FHH, GM3FYB, GM3OFY, GM4HR and a G5. After hearing all these it was unfortunate that not one was raised! G3OBD's transmitter runs 60 watts to a QQV06/40A—with a 6-over-6 slot aerial at 43 ft.

GM3LDU (Clarkston, Glasgow) found activity high during this aurora, and was kept very busy with QSOs. The opening was already going strong at 22.40 GMT, and from then until 01.45 many stations were worked and heard including Gs in the South, GW3MFY and GW5BI, with SM5BSZ as a crowning achievement at the end. LA6CG was heard, as also were ON4BZ, ON4TQ, DL3YBA, PA0FB, F8VN and SM6PU. G3LTF, G3CO, G3BLP and G6OX were probably the most southerly Gs worked, but Gs all over the country were heard and worked. Others heard frequently included GM3FYB, GM6XW, GI5AJ and GW2HIY. A few stations were still audible at 02.00 GMT, but they were then weak. GB3VHF was received on a number of occasions but was generally weaker than in September.

G4LX (Newcastle-upon-Tyne) who is always to be found when an aurora is imminent says that auroral conditions became apparent on 14 Mc/s at 17.00 GMT when G stations developed a T1 note. There was no sign of aurora on 144 Mc/s then, however, but this could have been due to lack of activity. G4LX was unable to return to the band until 23.30 GMT. G5YV and G3ILD were heard with T9 notes, and no auroral reflection could be obtained on their signals from any direction. GM2FHH was then heard at T0. During the following half hour, the band was wide open, and when G4LX closed down at 01.00 GMT, plenty of auroral signals were evident with full auroral reflection on both G5YV and G3ILD.

The following stations were heard: EI2A, PA0FB, ON4BZ, OZ1WQ, SM5BSZ, G2XK, G3CIW, G3CCH, G3EHY, G3FMZ, G3ILD, G3JYP, G3LLE, G3LRP, G3LTF, G3NEO, G3NUE, G3RME, G5YV, G6GN, G6NB, GI5AJ, GM2DRD, GM2FHH, GM3FYB, GM3GUI, GM3JFG, GM3LDU, GM4HR, GW2HIY.

G3BA (Sutton Coldfield) very much regrets he did not search the band thoroughly enough during the aurora. From what he has gleaned since, it appears that many Midland stations took advantage of the auroral propagation to Scotland in particular, and also to the odd LA and SM. It was a coincidence that Fs, ONs, PAs and also an HB9 station were being worked by tropo at the same time.

GW2HIY (Holyhead) has been mentioned in many previous auroral stories and it was a great pleasure to receive a report from him. On October 19, auroral reflections were noticed on TV Channel 2, but there was no effect on 2m until 21.00 GMT when G3ILD, G2CIW, GM3GET, GB3CTC, GB3VHF, G3LRP, EI2A, GM3GUI and G3ARX were heard. At 21.23 the auroral effect disappeared. From 21.55 to 01.50 the following were heard: G3LRP, G6NB, G3ILD, G3JYP, G3FMZ, F8VH, G3BLP, G3KEQ, GM3DRD, G3GWL, G3FDG, G3DKF, G2XK, GI5AJ, DL1NO, G6XX, G2XK, GB3VHF, G3LTF, G3KMS, GM3OFY, G3CCH, GM2FHH, GM2DND, GM2JFG, GI3GXP, GM3FYB, SM5BSZ, G6GH, G3LTF, G5MA, plus a host of other Gs.

A lot of time was spent calling European stations, but the opening remained mainly G-to-GM apart from the few exceptions listed. However, a QSO was made at 01.02 GMT with SM5BSZ, 58A (Stockholm), who reported GW2HIY as 55A, for a new country both ways at approximately 1010 miles. G3ARX, G2XK and GM3JFG were also worked. The band was full of G/GM signals with a level of QRM rarely experienced before. On October 11, F3XY was worked (tropo) 59 both ways and GC2FZC was also heard for the first time. Apart from hearing a weak signal from F9XL this tropo opening did not affect North Wales, although Gs could be heard calling European stations. Southern stations have not been coming through very much this year; even when GB3VHF can be heard at S1/3 there are virtually no signals to be heard from London.

G5MA (Great Bookham) worked four GM stations during the aurora: GM3OFY (Monkton, Ayr), GM3JFG (Invergordon, Ross-shire), GM3PIB (Forres, Morayshire) and GM4HR (Dundee). Ross and Morayshire are two very acceptable rare new counties for G5MA. All the signals were strong and the QSOs solid. GI5AJ, GM2DRD, GM2FHH, GM3FYB, GM3GUI, GM3LDU, GM3SBC and SM5BSZ (Stockholm) were heard. Both sides of a QSO between GI5AJ and SM5BSZ (all aurora) were heard, and G5MA believes that a tropo opening was running simultaneously.

GW3MFY worked GM3LDU and also F8VN during the aurora.

G3LTF (Galleywood) had an exciting month in both tropo and auroral modes. On October 11 he worked DM2AEH, SP3GZ (599), DL9AR, DL7FU (Berlin), DM2BFD, DM2AIO (Berlin), DL6SS, DL9CU, OK1KMU (Pilsen), DJ6LX, F3GL, DL3SPA (nr. Nuremberg) and HB9RG on s.s.b. for the first G/HB two-way s.s.b. QSO.

On October 12, Dresden TV was stronger than ever before at S9+, with sidebands from 146 to 144 Mc/s, but no QSOs were made that morning. F2TU/M (Vosges) was, however, worked that evening. Meteor scatter tests with UA1DZ (Leningrad) on October 21 brought many "pings" and

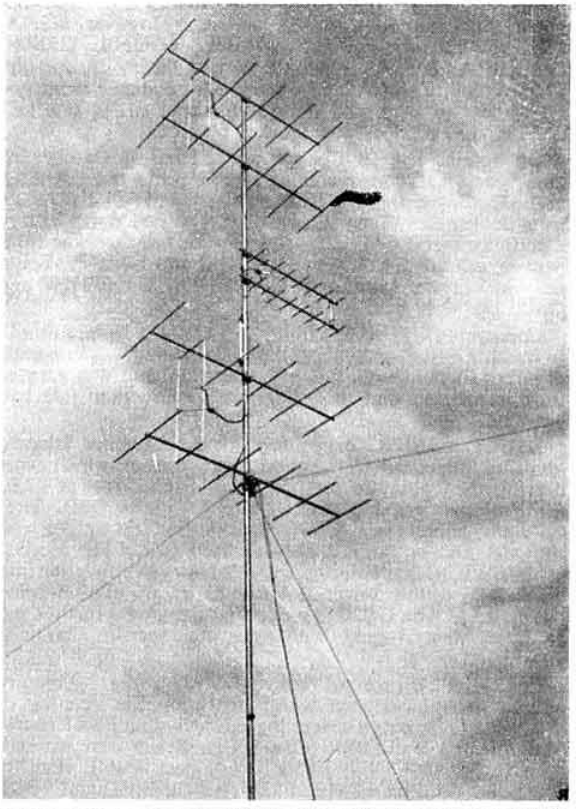
* 21 Bridge Way, Whitton, Twickenham, Middlesex. Please send all reports for the **January** issue to arrive by December 6 and for the **February** issue by January 10.

on October 22 there was a 1½ minute burst with both calls and reports, but unfortunately no QSO. On October 23 there were some very loud bursts (S9), and a QSO was nearly achieved. On the evening of October 27, SM6AWR was worked both on 2m and 70cm, where he was stronger at 589. SM7ZN and LA9T were also contacted. October 29 brought the big opening to the south, and QSOs with F9BP, F7GX, F8LF, F8AT, F9XQ, F9YO, F8SM (all in the Bordeaux area). F2TU/M (Vosges) was worked on 70cm at S9, and DL6EZA on the German/Swiss border was also worked on both bands.

The auroral opening was then discovered and GM6XW, G3JYP, OZ5BK, SM7OSC, GM3LDU, LA8MC and GM3JFG were worked, which necessitated retiring at 02.30 GMT.

Stations heard by G3LTF via aurora included OZ7LX, OZ5CE, OZ3M, GI5AJ, GI3GXP, G2FO, DL3YBA, OZ1WQ, SM7ZN, LA8RB, SM4CLO, GM2DRD, GM3BCB, SM5BSZ (Stockholm), G6GN, G3NUE, G4DC, GM4HR, LA6CG, SM6CZ, G3ILD, G3LRP. G3JXN also heard LA and OZ stations calling OH0 and UR2CK.

GI3OFT (Belfast) has submitted a report on GI5AJ's (Bangor) activity in the aurora of November 3. Coming on the band at 21.30 GMT and realizing that an aurora was in progress, GI5AJ proceeded to call "CQ-A" on the normal frequency of 145·85 Mc/s. After calling CQ, and various European DX stations for an hour with no result he moved to approximately 144·5 Mc/s and immediately raised a host of stations: SM5CAY (lost in QSB), SM6PU, GM3PIB, DL9PC, PA0SAS, ON4TQ, SM5BSZ, and later completed the QSO with SM5CAY. Much time was wasted in calling HB1QQ who was heard working G2XA. The LA stations being called by northern G and GM stations were not audible to GI5AJ. The frequencies used throughout the opening were between 144·5 and 144·8 Mc/s. GI3OFT says that this is the first time GI5AJ has worked out of zone, having previously resisted the temptation and that the end justifies the means. It is felt, however, that the cure lies at the other end, and effort should be directed to getting European and British stations to tune the whole band.



The new 24 element slot fed J-Beam 144 Mc/s array at G3HGE, Goffs Oak, Hertfordshire. The site is 350 ft. a.s.l. Between the two 144 Mc/s 6-over-6 sections is a slot fed 432 Mc/s 8-over-8 aerial. It is regretted that this photograph appeared incorrectly captioned on page 298 of the November issue of the Bulletin.

(Photo by G6LL)

Two Metre News and Views

G3JGJ (nr. Newton Abbot) sends a report covering the period from September 10 to October 31, listing reception reports of PA0PAL, PA0JOP, F1DC and GC3OBM, and also some of the strongest signals ever heard at G3JGJ. GB3CTC was heard on many occasions, sometimes weak and fluttering, and often with a strong signal. During the opening of October 11-12, G2DQ (S9) was heard working GC2FZC who was also heard, working stations as fast as he could. LX1SI was heard S9 at 09.30 (October 12) and G3DVQ was heard calling G3IEA.

G3BA (Sutton Coldfield) has completed a two band (2m and 4m) transverter which is now working on 2m and has been tested on load on 4m. G3IOE and G3BA have a sked at 22.30 each evening whenever possible, and the path is good even under poor conditions. G3IOE has erected an outside 4-over-4 and finds, as one would expect, a great improvement over the loft beam.

A very consistent signal these days, when conditions are reasonable, is **G3BJD** (Seascale), who recently commissioned a large outside beam and a first class converter. He is usually active with an electronic key around 145·95 Mc/s.

A newcomer is **G3EHG** (Penn, Wolverhampton) with a 7 watt transmitter to a "home-brew" quad. G3ILD, G3EGK, G8SB, G3AOO, G3OVQ and G3BA are all on s.s.b. and find growing enthusiasm particularly among many h.f. amateurs who are growing tired of the "rat race" on 20m. It is pleasant to hear old timer G3FW from Market Harborough and also G6XJ/M who is usually to be heard on Sunday mornings from the Midland hills, often accompanied by G5JU. G3LLS is another portable wanderer with a Withers station and he operates from Hereford on occasions. A surprise contact from Caernarvon on October 27 was GW3ENY/M who put a good S7/8 signal into Birmingham. G4LU, G3EJO and G3BA still keep the lunch time skeds going at 13.15 each week day, and are always glad if other operators join in. On October 27 there was a slight lift in conditions and G3BA worked GM3FYB (c.w., also s.s.b./a.m.) and heard GM3EGW working Continentals.

G2BJY (Walsall) reports the opening of October 11 to be most notable. Switching on at 22.15, he found the band similar to 80m on a Sunday morning. F9II and F2TU/M were quickly worked, S9 both ways. On October 12, conditions were above average for G stations, but no DX was heard. G3FEX/P in Northants was S9+, the loudest station ever heard from that county, which is normally a difficult path. October 22 began a period which has been good to both south and north. London signals being so easily and consistently received, they are generally now not mentioned, but some first QSOs were G3CXM (S.E.15), G3SHK (Ruislip) who is a newcomer and puts out an outstanding signal with 12 watts from a five element Yagi. G3PSA (nr. Cambridge), G2DZH (Welling), G3GOZ (Herts.), G4GM (Accrington), G2AMX (nr. Slough), G3CKG (Leics.). There are many others but *out of zone operation is still on the increase.*

During the weekend October 26 to 27, conditions were pretty good for G-DX, and a PA station was heard at 19.45 and 21.45 on Sunday. A Continental opening was expected, but it did not materialize at G2BJY. Many stations have been

heard calling PA, ON, DL, and even HB, none of which were audible either. However, first QSOs were made with G4HQ (Loughton), G3HXS (Tring), G3IZA (London S.W.9), and G3BNE (Bexley Heath). F8VN (nr. Chartres) was worked (both 599) on October 29, and several contacts to the south including a new one, G3PSH (Harrow). Conditions then fell below average. During the evening of October 31, G6NB (in QSO with G8VZ) was heard to say that he had not been very active during the previous 10 days, but had still found time to work the following countries: HB, ON, LX, PA, F, DL/DM, including DL6EZA 50 miles south of Stuttgart. G2BJY would like to contact G6NB and discover how it is done!

G3OCB (nr. Truro) found conditions quite good at about 17.00 GMT on October 9, but after about 21.00 GMT they were much better to the east. GB3VHF was S1 at 17.00, but peaked S6 at 23.00—the first occasion in 1963 it has been heard by G3OCB. On October 11, GB3VHF was peaking S2 (17.30) and G2JF was heard at fantastic strength: stronger off the back of the beam than he had ever previously been heard off the front. By 17.50 the beacon was S8 and several G stations were very strong. A few ONs and PAs were heard among the Fs and Gs. The first German was heard at 18.40, but was not raised. S.s.b. was impossible with Continentals, and the carrier had to be inserted. One ON station who was 5 and 9 was heard to say that he could hear an s.s.b. signal on 144·08 Mc/s, but could not resolve it. After inserting the carrier, a call to DJ5HG (Hamburg) was rewarded with a 57 report over 720 miles. DM2BGD was heard later, and a few sporadic moments of operation yielded QSOs with F9NJ, G3OQH and LX1SI, who was 58. By 22.00, however the Continentals had faded out except for a few Fs. On Saturday morning, conditions were still fair, however, and LX1SI was heard at about 20db over S9 working G2JF, and returned to an s.s.b. call with a similar report for G3OCB. This was followed by an S9 QSO with G3RMB (nr. Coventry). Both these contacts were over hills which normally have a considerable effect on 2m QSOs.

The above results prompted portable working, and from the hill site about a mile away, some weak Gs, ONs and PAs were audible during the morning. The only German heard was DJ3GF (Cologne) who was worked for his first G QSO. Other QSOs during the morning were G4LU and PA0JWL. During the opening, G2BHW (Falmouth) worked many Fs whilst beaming south for CT or EA. Some QSOs were right down to the Spanish frontier region of France, but nothing was heard from Spain. Had there been any serious activity from the San Sebastian area a QSO must surely have resulted.

The following calls were heard by G3OCB during the opening; PA0LB, PA0AI, PA0PMQ, PA0GE, PA0UBB, PA0JWL, PA0LX (the latter two also worked), ON4TQ, ON4FG, ON4WW, ON4HV, ON5DK, ON4DR, ON4LF, DJ7HT, DM2BGD, DJ3ZQ, DJ5HG, DJ3GF (the latter two also worked), LX1SI (worked twice), and many French stations. The country score is now nine worked and 13 heard during 14 months, from a difficult county.

G2JF (Wye, Ashford) experienced both the bright spots (October 11 to 12 and 27 to 29) when normal tropo up to 650 miles was possible. October 27 was exceptional to both SM and OZ when 18 contacts were made, with GM3EGW heard calling on the side of the beam. October produced 52 new Continental stations for G2JF, and also the following: G3PHN, G3BHW, G3KYH, G3KUJ, G3JYP, G3PTU, G3BJD, G3KYH, G2FO, G3GBH, G3FWW, G3FGR, G3OZT and G3DOV. An extended tropo scatter schedule has been arranged with SM6PU at about 630 miles, although up to the present only occasional signals have been heard, but numerous bursts of varying lengths and intensities have been recorded at both stations, together with many pings.

G3OSS (London, N.3.) worked LX1SI on 2m at 59+ during the October opening. He also worked GC2TR on 144·921 Mc/s after a struggle with QRM from the London area, bringing his score of counties to 62.

G3BLP (Woldingham) was operating during the October 11/12 opening and worked many Southern French stations including F1CY (Lorient, Brittany), GC2TR (Jersey), LX1SI and many DL and PA stations. Between October 18 and 27 the band was regularly open to the north although somewhat patchy and at times with low activity. However, G5HA, G3IUF, G3RND, G3FCY, G3PSL, G3ONB, G3JZN, GW3LJP and G3BA were all worked during the period. The evening of October 27 opened spasmodically with two DLs and two PAs, and then after about 21.30, one OZ, one LA, and six SMs were worked on c.w.

On October 28, HB9LN was worked and on October 29, many French stations including F9BF 85km from Bordeaux in the Dordogne Dept., F7GX (Poitiers), and F8XT (Chillac) were contacted. When the beam was turned north aurora was noticed, and GM3FJG (Invergordon) was worked for a new county but GM3OFY, GM3FYB and GM6XW could not be raised, although GM2DRD, GM2FHH and GM3LDU were worked.

Concerning G3HRH's remarks on October being a month to watch, G3BLP remembers that the first major 2m opening occurred in October, 1948, just after the band was granted to amateurs, so that this situation is more than just two years old!

G3OUF (GB2GC expedition to the Channel Islands) sends an interesting SWL report from Dundee, which notes hearing the operators on August 9, from Sark, at 21.03 GMT over a period of about an hour, with no QSB. They were also heard from Alderney on August 13 and 15 with no QSB, and on August 14 with deep QSB. The receiver at the SWL station comprises a TW Nuvistor converter into an AR77E with a 5-over-5 slot at 85 ft., the station being 625 ft. a.s.l. The GB2GC group are planning a further trip to Jersey next August, with apparatus for 4m, 2m, and 70cm.

GW3MFY (Bridgend) concludes that the whole of France must have been within reach on the opening of October 11. Twenty Fs were logged, including F8XT (north of Bordeaux), and F9BR (Côte d'Or). Seven were worked: F1AX (Paris), F3NG, F8NB (Versailles), F8UL (Belfort, nr. Swiss Border), F8ME, F2TH (Chaumont), and F3RL (Caen). Three ONs were heard, two of whom were worked, ON4MV and ON4TQ (c.w.) both at Antwerp. PA0COB (The Hague) was also worked. There was a QSO with G3NEO (Sheffield) on October 16, solely because they both used c.w., and there was no other signal on the band.

V.H.F./U.H.F. BEACON STATIONS

Call-sign	Location	Nominal Frequency	Emission	Aerial Direction
GB3CTC	Redruth, Cornwall	144.10 Mc/s	A1	North-East
GB3VHF	Wrotham, Kent	144.50 Mc/s	A1	North-West
GB3GEC	Hammersmith, London	431.5 Mc/s	A1	East

RSGB V.H.F. BEACON STATION GB3VHF

The frequency of the Society's v.h.f. beacon transmitter at Wrotham, Kent, when measured by the BBC Frequency Checking Station, was as follows (nominal frequency 144.50 Mc/s):

Date	Time	Error
October 29, 1963	11.13 GMT	955 c/s high
November 5, 1963	16.30 GMT	790 c/s high
November 12, 1963	15.15 GMT	880 c/s high
November 20, 1963	11.22 GMT	1760 c/s high

GW3MFY suggests an activity night for c.w. only, and any offers and promises will be welcomed.

GC2FZC (St. Peter Port, Guernsey) had a full session during the opening of October 11. Among 50 good QSOs were the following: PA0CML, PA0JSK, F1AY, F2IV, F1DC, F2NB, LX1SI (the first ever GC-LX on 2m), EI2W, EI4Q, GW5BI, G3GTN, G3EKP, G3SNM, G3LRP, G3US, G5IG and G3HCT. Heard and called, but not worked were PA0OOY, ON4WW, F9NT, and F2BS. It was disappointing not to have worked any GMs, but apparently the opening did not extend that distance, and was actually in the direction of the high pressure system, i.e., east/west. GC stations do keep watch on the top of the band, as they are most anxious to work into Scotland. To any who called GC2FZC in vain, apologies are tendered as there were so many.

F3SK (Biarritz) reports a QSO with G3JZN (Manchester) (with valve equipment) on October 11, and on October 29 G3BSU, G2DQ and GC2TR were contacted on phone. Then, with transistors, F3SK worked F8VN (nr. Paris) on c.w., and G3BSU (Rochester) on phone and c.w. on October 29. F3SK hopes that a G/EA QSO will be possible when Spanish amateurs receive their long awaited portable licences and are able to travel into the mountains near Bilbao.

G3JGJ (Pepperdon, 10 miles south west of Exeter) noticed the sky bright to the north (November 4, 03.00/03.30) suggesting an aurora. GB3CTC has been heard on several occasions, and on November 5, G3IEA and G5ZT were heard louder than usual. GB3CTC was 569 at 13.30 GMT on November 6, and G2KF (Totnes) was heard for the first time (58) whilst working G5ZT.

Seventy Centimetres

G3OSS has returned to 70cm, and through the addition of a new aerial cable, his 1 watt transmitter is capable of propagating a signal as far as G5QA in Exeter, with a report of RS57. Similar results have been achieved with G3NQB and two Midland stations, and F8MX has been reached.

GW3MFY is now on 70cm with a QQV03/20A tripler, G2DD converter, A.2521 preamplifier, and a 4-over-4 slot aerial. His operating frequency is 433·08 Mc/s. Newcomers to the band are GW4CG and GW3DFF.

The following list, provided by the Contests Committee, gives the claimed scores for the Second 420 Mc/s Contest. These are *not* confirmed results and they are subject to scrutiny.

G3LTF	4766	G2RD	1358
G3NNG/P	2521	G3OXD/P	1313
G3LHA/P	2349	GW3ATM/P	1279
G3LQR	2136	G5DF	1095
G3JWQ	2070	G3KEF/P	745
G3EGV/P	1972	G3EKP	388
G2KV	1869	G3JDM/A	155
G2CIW	1842	G3YH	101

G3LTF (Galleywood) worked 47 stations in the 420 Mc/s Contest on October 26. QSOs over 100 miles included G3JWQ, PA0COB, G3OXD/P, G3ILD, G2BDQ (Newcastle), F9NJ, G2CIW, PA0EZ (Nijmegen), G3BNL, G3KEF/P, GW3ATM/P, F9LD, DJ7HY, PA0TBE, PA0MSH, PA0KT, DL1JN, ON4ZK.

Earlier, on October 11, LX1SI was worked for the first G/LX on the band (S7 on phone), and this was followed by contacts with F8LO (Paris), and DL1LB (Emden, 599).

G3EKP (nr. Blackburn) started well in the 420 Mc/s Contest by working G3EGV/P (Wilts.), followed by G3NNG/P (Berks.). When he resumed at 23.00, conditions seemed to have deteriorated and the limit of working was then the Manchester area.

LONDON U.H.F. GROUP

will meet at the

Bull and Mouth Tavern

corner of Bloomsbury Way and

Bury Place, London, W.C.1,

at 7.30 p.m. on Thursday, December 5, 1963

" R.F. Front-ends "

and at 7.30 p.m. on

Thursday, January 2, 1964

All v.h.f. and u.h.f. enthusiasts welcome

Four Metres

G3BJY (Seascale) hopes to be on 4m soon, having built a transmitter for the band. G3BA has informed us that Rugby and Daventry amateurs are very interested in 4m, although no calls are quoted. G8VN and G3IKL are among the enthusiasts who have Pye PTC112s in use but the question of polarization is still a subject for argument.

The following Northern Ireland stations are currently active on this band: GI3NFM, GI3HJA, GI3ONF, GI3NSU, GI3HXV, and GI3OFT hopes to be active soon.

Topical Notes

QTC, the journal of the Swedish Society SSA, reports a 2m QSO on September 29, 1963, between **SM7TI**, with SM7TT, and **HA5AM/AM** (aeronautical mobile). The aircraft was nearly 23,000 ft. above Helsinki, and the Swedish station was operating from a motorcycle.

G3KPT has recently moved into his new shack and is active on 2m and 70cm.

The Coventry V.H.F. Group, along with CARS, arranged a " Sausage and Mash " evening on October 4, and a very good attendance resulted. These informal evenings are always enjoyed by Warwickshire v.h.f. operators and many good ideas are exchanged.

RTTY is represented in the Midlands by **G3CRH** (Lichfield), with a.f.s.k. and f.s.k. **G6CW** is active on both s.s.b. and RTTY on 2m. Other RTTY stations are **G3LAY** and **G3GCR** who are on every evening around 20.00 using f.s.k.

Nuvistor Converters

With regard to the notes on Nuvistor converters, published on page 301 of the November, 1963 issue, G3BLP points out that he omitted to mention that the bandpass effect of the output coil contains pronounced peaks at approximately 2·2 Mc/s and 3·7 Mc/s. It is therefore necessary to damp the circuit with a 3·3 K ohm resistor to obtain a fairly smooth response over the range 2-4 Mc/s. This is due to the fact that the coil possesses two resonances, which is not unusual for a coil wound in this fashion. On the original coil these were at 1·6 Mc/s and 5·5 Mc/s.

432-434 Mc/s ACTIVITY NIGHT

SATURDAYS at 7 p.m.

(Photo by Sport and General Press Agency

The RSGB International Radio Communications Exhibition 1963

THIS year's Radio Communications Exhibition, held at the Seymour Hall, London, from October 30 to November 2, was without doubt one of the finest since the first RSGB show in 1947. It was a major event worthy of Golden Jubilee Year. How many visitors to that first exhibition at the Royal Hotel could have foreseen the size and scope of the 1963 show?

There has been criticism in the past that these exhibitions are neither amateur nor international but if the number of visitors and the variety of exhibitors is anything to go by, there should be no fears about the future. The fact that manufacturers, and British manufacturers in particular, are prepared to develop and build relatively elaborate and expensive equipment for the amateur market shows the general good health of the hobby. It is encouraging, too, that the attendance was up by about 1000.

The Exhibition was opened on Wednesday, October 30, by Mr. F. C. McLean, C.B.E., Director of Engineering of the BBC, in the presence of distinguished guests from the Radio Industry, representatives of the technical press and broadcasting and many members from all parts of the country.

In his speech Mr. McLean spoke of the pioneers of broadcasting, all of whom were either amateurs or had close association with the Wireless Society of London. He referred to the first broadcast to schools (which were sponsored by the RSGB in 1924) and to the prominent members associated with the Society in the early days—Campbell-Swinton, Marconi, Lodge and Jackson. He mentioned the move down to the short waves and to the pioneer efforts of the late Gerald Marcuse, G2NM, in the field of Empire Broadcasting, the forerunner of the present Overseas Service of the BBC.

Mr. McLean referred to the Geneva Radio Conference, 1959, and to the fact that as an outcome of the Conference amateurs were now authorized to operate on frequencies up to the gigacycle range. He paid a tribute to Mr. John Clarricoats, G6CL, the Society's General Secretary, particularly in connection with his work at International Radio Conferences and at meetings of the PMG's Frequency Advisory Committee.

He concluded with a reference to the keen interest in Amateur Radio within the BBC.

Following the official opening, Mr. McLean, accompanied by the President, Mr. Norman Caws, G3BVG, toured the exhibition and discussed with many exhibitors the equipment on show.

The Amateur Stands

There was an excellent display of equipment on the main **RSGB stand**—the largest in the exhibition and excellently sited. The first prize for an exhibit for a member living outside the London area was won by G3CSG with his Top Band mobile transmitter/receiver. The second prize in the same category went to G3NOC for his single sideband transceiver covering 40, 80 and 160m. The award for the best home-constructed all-amateur equipment was won by G3BYY who exhibited a 2m transmitter-receiver. The

Horace Freeman Trophy for the most original piece of equipment on show was won by G2AMV for his six band mobile transmitter-receiver.

Other exhibits included a single sideband transmitter for 10-80m using a 4X250B in the p.a., shown by G3HRO. This transmitter is unusual in that it has no frequency changers but includes vox facilities and a transistor operated aerial change-over system. G3HBW is a regular exhibitor and this year he again stole much of the limelight with an incredible piece of construction which can only be described as a mechanical and electrical masterpiece: his transistor a.m./f.m./c.w./s.s.b. single channel transceiver, giving 10 watts p.e.p. on all bands from 10 to 160 metres. An impressive display was the Wirral Group's NFD " B " station, G3NWR, which comprises a power unit with keyer, a six band transmitter, and an elaborate aerial tuning unit with special switching and matching facilities for a variety of aerials. G6JP exhibited two pieces of equipment to be described in the BULLETIN next year: an s.s.b. transceiver using a mechanical filter and a TT21 linear amplifier for 10-80m capable of an input of 200 watts p.e.p. G2UJ's receiver pre-amplifier was another exhibit.

A number of interesting instruments were on show: a *Q* meter built by G3PTA, an absorption wavemeter by B.R.S.19427, a miniature oscilloscope by G3IRM, a transistor crystal activity check meter by B.R.S.20533 (who also exhibited a 2m transistor preamplifier, transistor converters for 1.8-25 Mc/s, 70 Mc/s and 430 Mc/s). G3FNZ showed two bridges, one for 14, 21 and 28 Mc/s and the other for 144 Mc/s.

RTTY terminal units were exhibited by G2UK and J. C. Vears who also displayed an a.f.s.k. oscillator unit. G2BP's transistor electronic bug-key capable of operating up to 30 w.p.m. was another interesting unit. G3FZL exhibited a 70 Mc/s transmitter using a 6146 in the p.a. and a 144 Mc/s transmitter using a QQV03/20A. Both these transmitters are based on large Eddystone diecast boxes. An unusual item was an 80m ferrite loading coil for a mobile whip aerial shown by G3FSL. The prototype of the new Princess transmitter, a photograph which was published in the November issue of the BULLETIN, aroused great interest.

There was a most interesting display on the **RSGB QSL Bureau** stand showing the work of the service. In addition to an amusing illustration of the advantages of cards of normal size, there was some good advice on keeping the Bureau well supplied with adequate envelopes for the dispatch of incoming cards.

The President, Mr. Norman Caws, G3BVG, at the Official Opening on October 30, 1963. Seated, from left to right, Council Member Eric Yeomanson, G3IIR, Chairman of the Exhibition Committee, the General Secretary, Mr. John Clarricoats, G6CL, and Dr. J. A. Saxton of the Radio Research Station, Slough.
(Photo by Tella Photography Ltd.)

The Society's **Exhibition Station GB3RS/GB2VHF** was a complete dual installation mounted in one large operating console. It contained no commercially-built equipment whatsoever, and was the work of a group of members of the Crawley Amateur Radio Club. The Exhibition Organizer's Silver Plaque was a well merited award.

Operation on the h.f. bands was with a 120 watt table-top transmitter built by G3LBH. The receiver was constructed by G3FRV and is a much modified version of the original G2DAF design. The Top Band transmitter was built by G3TR and runs at 10 watts input on 'phone and c.w., with full break-in facilities.

The Exhibition Station arranged by members of the Crawley Amateur Radio Club. From left to right, G3TR, G3PHG, GW3PSM and G3FRV. *(Photo by Tella Photography Ltd.)*

The 2m transmitter was built by G3FRV and runs at 90 to 100 watts input on 'phone. The associated receiver was built by G3TR. G3PHG built the 4m equipment, the general design of which blended with the rest of the station.

GB3RS was unable to maintain the published schedules: operation was only possible for the first 20 minutes of each hour owing to the time sharing arrangement with two other stations also operating at the Exhibition.

An excellent demonstration of **RTTY** was given by G3IIR/A in conjunction with G3BPT at Gravesend. Both page and tape printers were shown working. The quality of copy received over the air was excellent.

Part of the display of antique wireless equipment arranged by Council Member L. E. Newnham, G6NZ, with the assistance of Mr. S. Jones, B.R.S.23442.
(Photo by Tella Photography Ltd.)

On the stage there was an extremely interesting **Golden Jubilee Year display of antique equipment** tracing the development of wireless from before 1900. It was anticipated that the exhibit would be of interest principally to older visitors, but in fact many hundreds of young people showed great interest. The collection was by Council Member L. E. Newnham, G6NZ, and the display was arranged by S. Jones, B.R.S.23442. Most of the equipment was in working order.

Live demonstrations of amateur television, arranged with the co-operation of G3OUO/T, were given by the **British Amateur Television Club.** Amongst the equipment on show were a low power 70cm vision transmitter built by G3NDT/T, and a 150 watt power amplifier using a 4X150A, built by G3PJE/T.

The **Amateur Radio Mobile Society** had some well built and interesting equipment on show including the Courier s.s.b. transceiver for 10, 15, 20, 80 and 160m built by G3BXI, and the Courier Mk II built by G3NMR and intended for fixed or mobile use. The Project Chieftain all-transistor double superhet receiver covering 175 kc/s to 31·5 Mc/s was also on show. This receiver was designed and constructed by G3KVF.

A most interesting display of how Amateur Radio is being introduced to those lucky enough to be members of the **Roding Boys' Society** was to be seen at the room at the rear of the main hall. Among the exhibits were a ripple tank using optical methods of showing the propagation of waves and an excellent demonstration, using a wobbulator and oscilloscope, of the effects of varying degrees of coupling in i.f. transformers. Other equipment on show included units built on G3JIX's " Chassilet " system and many examples of gear built by members for use in their own stations. Of particular interest to field day operators was a petrol electric generator set built for £5 2s. 6d.

The Armed Services

The Army was represented by the **65th Signal Regiment (T.A.), Royal Signals,** which displayed some of the equipment used in the modern army. A daily Morse competition created considerable interest and prizes were awarded as follows:

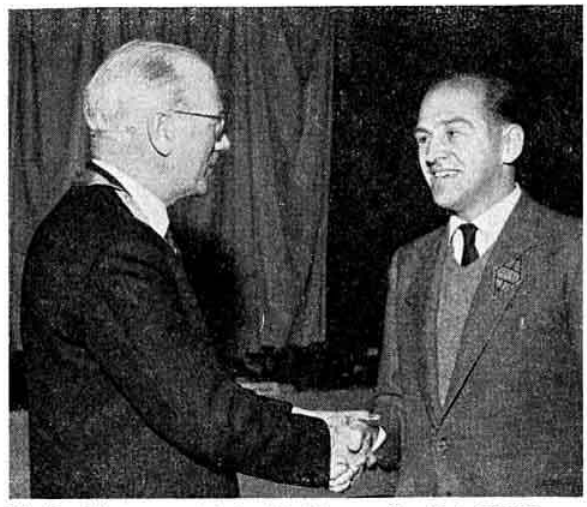
Wednesday	—J. P. Hawker G3VA.
Thursday	—J. Keyser, G3ROO.
Friday	—J. A. Bonser, G3GRL.
Saturday	—R. Troughton, G3SFP.

The Royal Air Force stand displayed vintage aircraft radio equipment which must have brought back memories to older visitors. The Royal Air Force Amateur Radio Society was operating GB3RAF from the stand using a Heathkit DX100 transmitter.

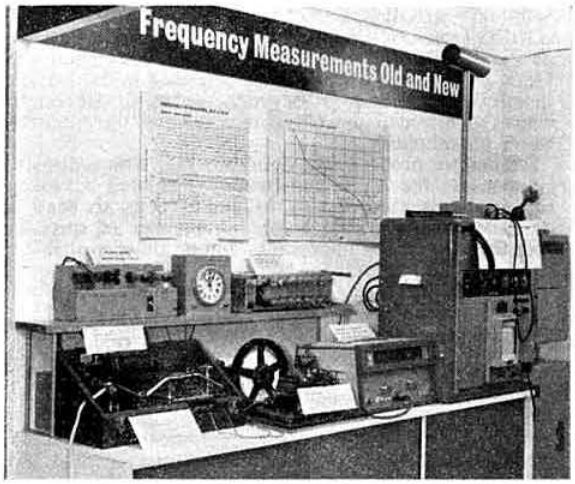
The **Royal Naval Reserve** was operating a typical naval radio station and in addition publicised the activities of the Royal Naval Amateur Radio Society.

The GPO and the BBC

Old and new methods of frequency generation and measurement were demonstrated by the GPO using equipment which included a valve maintained tuning fork oscillator of the type used at the original Rugby GBR (16 kc/s) transmitter. This was shown driving a phonic wheel motor which was geared down to operate a one-second impulse mechanism which in turn operated an impulse type electric clock. An Essen ring quartz crystal oscillator frequency standard was being compared against GBR which now uses



The President congratulating Mr. Norman Kendrick, G3CSG, one of the prizewinners in the home-constructed equipment section.
(Photo by Tella Photography Ltd.)



The frequency measurement display on the GPO stand.
(Photo by Tella Photography Ltd.)

the same type of frequency control. Any drift between the received signal and the standard was shown by a pen recorder as a change in phase difference between the two. The GBR frequency control unit also provides the drive for the MSF standard frequency transmissions and, by means of frequency dividing circuits, also produces the pulses which are superimposed on the MSF signal.

A direct reading digital frequency meter was shown measuring the frequency of a crystal oscillator, the frequency of which was being altered slightly for demonstration purposes. Another interesting exhibit was a model of a triple aerial feed for the Goonhilly space satellite station. Of historic interest was a Poulsen Arc unit and a mercury vapour rectifier of the type used in the power supplies of multi-kilowatt transmitters. By way of comparison there was a small semiconductor high-voltage high-power rectifier unit.

The **BBC stand** laid particular emphasis on trends and achievements from the early days of broadcasting to the present day. In one showcase was displayed an array of various types of microphones; representing the present day was an AKG condenser microphone that costs a little less than £150. A typical Overseas Service short wave aerial site was represented by a scale model, complete with sheep.

Mr. Tom Withers, G3HGE, describing the design of the TW Electronics 430 Mc/s converter to Mr. F. C. McLean, Director of Engineering of the BBC, who opened the Exhibition.
(Photo by Tella Photography Ltd

The Commercial Stands

The Silver Plaque for the most interesting new piece of manufactured equipment in the Exhibition was awarded to **K. W. Electronics Ltd.** for the new KW2000 single sideband transceiver. This unit covers all amateur bands from 1·8 to 28 Mc/s in ranges of 200 kc/s. Provision is made for varying the receiver tuning by 10 kc/s with respect to the transmitted frequency. A mechanical filter in the common i.f. chain provides a bandwidth of 2·1 kc/s at 6db and 6 kc/s at 60db. On show for the first time was the KW707 eight band communication receiver which also employs a mechanical filter for s.s.b. and an additional half-lattice filter for c.w. Provision is made for receiving both sidebands of an a.m. signal or alternatively the upper or lower sideband. Like the KW77, this receiver uses a crystal controlled front-end—stability is stated to be better than 100 c/s after warm up.

Another new item on the K. W. Electronics stand was the Vespa three band s.s.b. transmitter which uses the same s.s.b.

The KW Vespa three band s.s.b. transmitter.
(Photo by G2AHL)

crystal filter as that in the Viceroy and a 6146 in the p.a. stage (90 watts p.e.p. on s.s.b. and 75 watts input on c.w.). The 2m Vanguard, capable of 50 watts input to its 6146 p.a. stage, employs a 12 Mc/s crystal oscillator; the modulator comprises a pair of 6L6G's preceded by a 6BR7 speech amplifier and 12AX7 phase splitter. Among the wide range of smaller items for the amateur station to be seen on this stand were three new Shure microphones, the most expensive of which, the Model 444, is claimed to cut off sharply below 300 c/s and above 3000 c/s, and GPO pattern Morse keys.

Although hardly an " amateur " piece of apparatus at the present time, the gas Laser demonstrated on the **Withers Electronics stand** was an interesting and unusual exhibit. Of more immediate application in the amateur station was a Varactor diode frequency multiplier giving 4 watts output on 430 Mc/s for 6 watts input on 144 Mc/s. The TW 70cm converter, believed to be the first commercially manufactured unit of its type in the UK, uses an A2521 grounded grid triode r.f. stage with a condensed trough line circuit, followed by a 6DS4 Nuvistor grounded grid mixer and 6BQ7A cascode i.f. stage. The crystal oscillator chain uses a 6J6 and 6DS4. The TW Topbander is a neat little transmitter similar to the TW2 intended for mobile operation and uses a 5763 in a pi-network tank circuit which is high level modulated by a pair of EL84's. The v.f.o. is claimed to be extremely stable and demonstrations on the stand were

A corner of the Electroniques of Felixstowe stand showing the bandpass crystal filter demonstration, with a display of Codar air-spaced coils on the right.
(Photo by G2AHL)

certainly most convincing. Another new item for the v.h.f. enthusiast was the TW 2-120 transmitter employing a QQV06-40A (driven by a QQV03-10) capable of 120 watts input on a.m. and 150 watts on c.w. The p.a. uses silver plated tuned lines. The built-in modulator comprises a pair of KT77's in class AB2 coupled to the p.a. by a Woden type UM2 transformer. Power requirements are 600 volts at 300-400 mA, 250 volts at 100 mA, −15 volts bias and 6·3 volts at 8 amps. A very small but interesting item was a transistor pre-amplifier using a 2N1742 and capable of 18db gain at 144 Mc/s priced at only £1 18s. 6d.

Electroniques demonstrated with the aid of an oscilloscope their new 1·6 Mc/s full lattice bandpass crystal filter which is stated to have a shape factor of 1·5:1 in the narrowest of its three switched bandwidths. Another new product, manufactured by Codar Radio Co., was the range of Codar-Qoil air-wound coils available in a wide variety of diameters, lengths and inductances, and suitable for many uses in home-built equipment including the pi-networks of p.a. stages. In addition, the full range of Electroniques Stabqoils, including those for the G2DAF, G3RKK and G3BDQ receivers, the new " Princess " transmitter exhibited on the RSGB stand, and the G2DAF s.s.b. transmitter (the Mark 2 version of which will be described in the BULLETIN shortly) were on show. Other products of the Codar company displayed included the CR66 receiver and the Codar h.f. bands pre-amplifier.

The re-styled Minimitter converter type MC64 covering all bands from 1·8 to 28 Mc/s.
(Photo by courtesy of Minimitter Co. Ltd.)

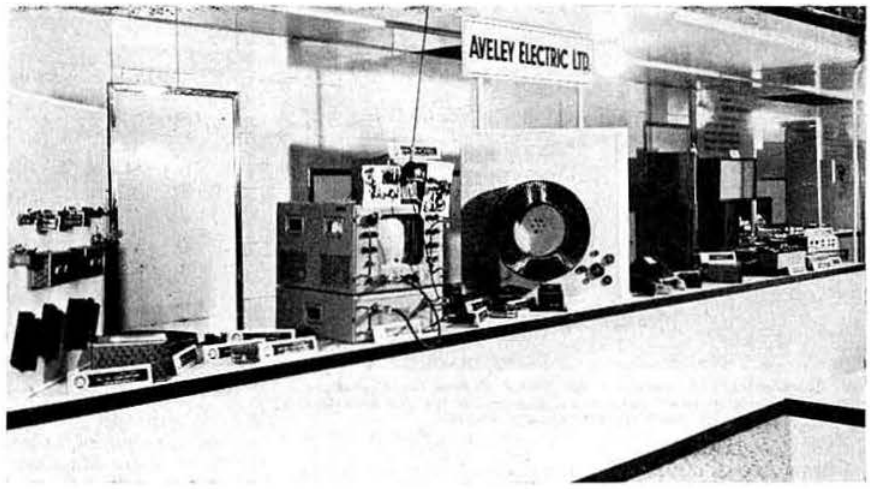
Minimitter broke new ground this year with a display of components for home construction including a range of equipment cases and chassis, r.f. and i.f. coils, six band coil sets and miniature r.f. chokes. A number of specialized transformers looked interesting: among those available are driver and output units for both valve and transistor mobile modulators and a transistorized power supply transformer giving 300 volts output at 55 watts from a nominal 12 volt supply when used with such transistors as the OC35. The Minimod 20 employs a 12AX7 and two 6AQ5's and is intended to be used with transmitters of up to 20 watts input. The Minimitter half-lattice crystal filter unit measures only 2⅜in. × 1½in. and is intended for use with receivers with an i.f. of 465 kc/s. Other equipment again on show included the Minimitter mobile transmitter and the " Top 2-7," both of which cover Top Band, 80 and 40m, a transistorized mobile power supply, whip aerials and the F.B.5 multiband aerial.

The new Heathkit Model RG-1 general coverage eight valve receiver.
(Photo by courtesy of Daystrom Ltd.)

Heathkit (Daystrom Ltd.) showed a range of radio, audio and amateur equipment including the new Model RG-1 general coverage eight-valve receiver which is similar in specification to the RA-1 amateur bands receiver reviewed in the BULLETIN in June, 1963. The RG-1 covers 600 kc/s to 32 Mc/s in six bands. Two items from the American Heathkit range caught the reviewer's eye: the HX-20 90 watts p.e.p. s.s.b. transmitter which uses an h.f. crystal filter (5 Mc/s) and the Monitor Scope Model HO-10 for continuous monitoring of amateur signals on the h.f. bands. Perhaps the biggest surprise on this stand was a model of the new Heathkit lattice mast which is supplied in kit form. Erection is stated to take two men one day.

Green and Davis exhibited a number of additions to their range of h.f. and v.h.f. equipment for the amateur. The Mk IV 144 Mc/s converter employs two 6CW4's in a cascode r.f. stage, followed by a 6CW4 mixer and a 6060 in the oscillator chain using a miniature high frequency crystal. A QQV03-10 is used in the p.a. stage of a compact 144 Mc/s 15-20 watt c.w. transmitter or exciter unit. The Falcon 144 Mc/s transmitter complete with modulator and a.c. mains/battery power supply was shown in a restyled form. Other v.h.f. equipment included the 2M1000, a high power transmitter for 144 Mc/s incorporating the 2M90 r.f. section with a forced air-cooled QQV06-40A p.a. and the LM100 high power modulator. Both sections incorporate their own power supply units using silicon diodes. For the h.f. bands,

Green and Davis showed the Sonar four band s.s.b. transceiver which uses a Collins mechanical filter and is capable of 200 watts p.e.p. The firm's linear amplifier, shown for the first time, incorporates an RCA7094 beam tetrode in a passive grid configuration with a pi-network output circuit for all bands from 10 to 80m. An aerial change-over relay is built into the unit and a small r.f. signal is available at a coax socket mounted on the rear panel for monitoring purposes. The built-in power supply, which uses silicon diodes, is built as a separate module and can be supplied separately for use with other equipment if required. On the adjoining stand, a wide range of imported meters, microphones and other components were displayed.



Transistorized d.c.-to-d.c. converters, toroidal transformers and high fidelity audio equipment were among the exhibits on the Aveley Electric stand.
(Photo by courtesy of Aveley Electric Ltd.)

Aveley Electric displayed their transistor d.c.-to-d.c. converters for amateur applications and a well selected range of audio equipment made by Bang and Olufsen of Denmark. Stereo demonstrations of this equipment using American Acoustic Research loudspeakers were most impressive. Also on show were Canadian Bach Simpson meters of various types.

Salford Electrical Instruments exhibited an attractive selection of components including toroidal cores, plastic film capacitors, quartz crystals and ovens, and some very neat selenium rectifiers. Among the new products were three types of self-contained plug-in transistorized crystal oscillators in the ranges 500 c/s to 30 kc/s, 30 kc/s to 20 Mc/s and 100 to 200 Mc/s. Prices vary but it is understood that a 100 kc/s oscillator on a B9A base would cost about £8 10s.

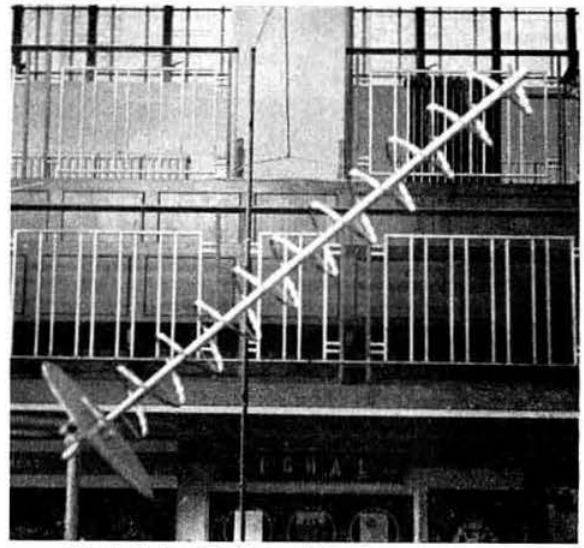
All types of chassis, panels and cabinets for the amateur were displayed by **Philpott's Metalworks** who made a special feature of their products for the new RSGB "Princess" transmitter developed by G3JJG. In addition to standard designs, this firm is always prepared to make equipment to the individual constructor's requirements.

Without any doubt, the new products on the **Webbs Radio** stand which attracted most attention were the new Eddystone EA12 amateur bands communication receiver and the EC10 transistorized receiver described in the November issue of the BULLETIN. A panoramic display unit for use with the EA12 is available. In addition to examples from the Eddystone range of components, high quality hi-fi and transistor broadcast equipment was also exhibited.

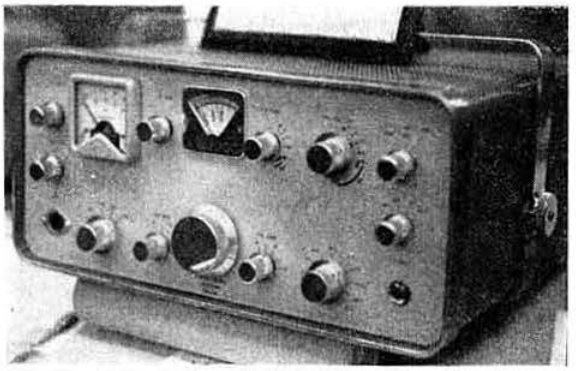
The Hammarlund Manufacturing Company (represented by K. W. Electronics Ltd.) had their own stand for the first time. For general coverage reception the HQ180A, HQ145X, and HQ100A were on show, and for amateur bands only there are the HQ170A and HQ110A. All these receivers can be used on s.s.b., c.w., and a.m. In matching style is the HX-50 s.s.b. transmitter, and for high power operation there is the new HXL-1 linear amplifier. The display also included accessories such as clocks, loudspeakers, and crystal calibrators.

K. W. Communications exhibited the Drake 2B receiver, the Collins 32S3 transmitter, 30L1 linear amplifier and 75S3 receiver.

The new Eddystone type EA12 amateur band communications receiver.
(Photo by courtesy of Stratton & Co. Ltd.)



The helical aerial displayed by J-Beam Aerials Ltd.
(Photo by G3BVG)



K.W. Electronics Ltd. received the Silver Plaque for the most interesting piece of new commercial equipment for the amateur with the KW2000 s.s.b. transceiver.
(Photo by G2AHL)

J-Beam Aerials displayed a wide range of v.h.f. and u.h.f. aerials for the amateur as well as commercial types. Among the new products was a 2m turnstile in which the dipoles are spaced at 0·66 wavelength. The elements are made of $\frac{1}{2}$ in. seamless tubing and separate baluns are used on each stack. A most impressive sight was an example of a helical aerial which, built to individual specification, costs just under £70.

Making their first appearance at the Exhibition under their new name were **Stern-Clyne** who showed many types of equipment for the home constructor and audio enthusiast, including amplifiers, pre-amplifiers, pickups and microphones, and tape recorders. Two four band communication receivers shown on this stand were the HE-30 covering 550 kc/s to 30 Mc/s with an illuminated slide rule scale for the amateur bands from 10-80m. The receiver uses eight valves and has a built-in *Q* Multiplier. The HE-40 is a somewhat simpler receiver with a built-in telescopic whip aerial.

Enthoven Solders introduced a new 90 watt soldering instrument (known as the Miniscope) similar to the Superspeed iron shown at previous exhibitions but considerably lighter, and intended particularly for use on printed circuit boards. The on/off switch on the new model is in the form of a long lever, which can be easily operated by the forefinger. Solders for all types of applications were also exhibited.

The technical press was represented by **Wireless World** (Iliffe Electrical Publications Ltd.) who displayed a number

The picture received on the BATC stand from G3OUO/T.
(Photo by G2AHL)

G3PPI's Top Band transceiver exhibited on the RSGB stand.
(Photo by G2AHL)

of books published in association with *Wireless World* and by **Short Wave Magazine Ltd.** who exhibited a wide range of British and American publications for the amateur. **Selray Book Co.** showed technical books by many leading publishers including the " Common Core " series on basic electronics and allied subjects.

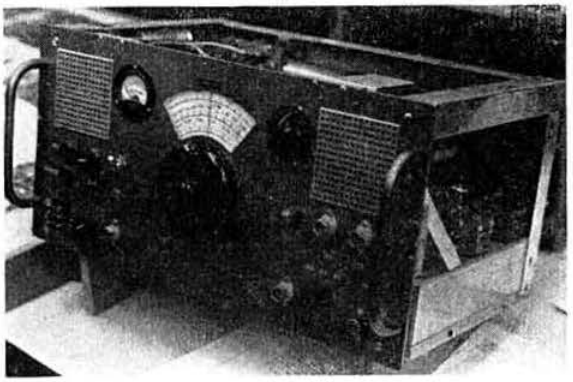
Prize Winners

The winner of the Hammarlund HQ170 receiver in the free draw was D. Braham, G3OJS, of Ilford, Essex. Other winners in the same section were H. G. Cavill of Heygoed, Glam., J. Parr of Pinner, Middlesex, L. H. Luscombe, G8NY, and G. Cooper, G3HJP.

In the Building Fund Competition, the winners were F. A. Jefferies, G8PX; P. Simmonds, G3IZC; A. W. Parker, G3LEV; G. L. Flint, G3IIH; N. A. F. Hammond, B.R.S. 24741; E. Faloon; J. M. Kelly; A. E. Seymour, G3GNS; S. I. Almond, G3NUY; M. A. Pyle, G2BLA; E. G. Kendall, G3APA; J. L. Meddermmen, G2CKW; F. A. Pride, G2NP; J. J. Padley, G3NHJ; and T. J. Brooke, GW3GHC.

Organization

The Exhibition Organizer for the RSGB was Phil Thorogood, G4KD, Region 7 Representative. The Society's own displays were arranged by the Exhibition Committee: Messrs. E. W. Yeomanson, G3IIR (Chairman), L. E. Newnham, G6NZ; J. C. Graham, G3TR; G. W. Norris, G3ICI; F. F. Ruth, G2BRH; A. J. Worrall, G3IWA; C. Waterman, G3NKX; C. R. Emary, G5GH; R. G. B. Vaughan, G3FRV; A. J. Gibbs, G3PHG. Mr. F. F. Ruth, G2BRH, acted as stand manager of the Society's main stand.



Second prize in the Home Constructors' Competition was won by G3NOC for his s.s.b. transceiver covering 40, 80 and 160 metres.
(Photo by G2AHL)

Society News

Death of President Kennedy

As soon as news of the murder of President John F. Kennedy became known, a telegram of sympathy was sent on behalf of all members of the RSGB to the President of the American Radio Relay League.

Rules for the V.H.F. Manager's Trophy

The Council has accepted with much pleasure an offer made by the Society's V.H.F. Manager, Mr. R. C. Hills, G3HRH, to donate to the Society a trophy for annual award. The rules governing the award are as follows:

(i) The Trophy shall be known as " The V.H.F. Manager's Trophy."

(ii) The Trophy shall be awarded annually to the contestant adjudged by the RSGB Contests Committee and confirmed by the Council to be the winner of the annual 70 Mc/s Open Contest.

(iii) In the event of this Contest ceasing to be held, the Trophy shall (*a*) be used as an award in a major Society v.h.f. contest.
or (*b*) be used as an award for v.h.f. operating proficiency.
or (*c*) be used for some other purpose in connection with v.h.f. activity.
The decisions in (iii) shall be made by the Council on the advice of the V.H.F. Committee.

(iv) The Trophy will be available for presentation at the Annual General Meeting of the Society.

(v) The Council reserve the right to award the Trophy for some purpose other than that laid down in Rules (ii) and (iii).

Braaten and Milne Trophies

Mr. C. R. Perks, G4CP, with a score of 266,580 points, was the leading RSGB English station in the ARRL DX Contest 1963 and is thus the winner of the Braaten Trophy for 1963.

Mr. R. Jones, GW3JI, with a score of 251,883 points, was the leading RSGB station other than English in the same contest and is thus the winner of the Arthur Milne Trophy for 1963.

London Lecture Meeting

Mr. W. E. Sutton, G3FWI, of Associated Rediffusion gave a most interesting lecture on Television Sound Production on November 8 at a meeting of the Society held at the Institution of Electrical Engineers.

The talk was illustrated with high fidelity tape recordings and a display of microphones ranging from a " bazooka " directional type nearly 6 ft. long for outdoor use to small portable varieties. Studio microphones of various designs were also on show.

From the fact that over £2,000 worth of equipment was used for this lecture it will be realised what a tremendous amount of work is required to get sound in general, and sound effects in particular, just right. Television viewers may tend to look upon the audio aspect as of secondary importance, but from the production angle this is certainly not the case. One sound effect demonstrated only occupied a few seconds of transmission time but took two hours to produce and record. The sound engineer needs the qualities of musician, artist, and technician.

Recordings showed the effects of natural and artificial reverberation, and compared the acoustic qualities of concert halls, studios, and churches.

A point of particular interest to phone operators was a recording demonstrating the right and wrong methods of using a microphone. Close speaking gives clarity and " presence " to the voice, whereas talking from several feet away may still give full modulation but there is a surprising lack of speech quality coupled with an increase of various unwanted background noises.

At the end of his lecture, Mr. Sutton answered questions from members who were also able to examine all the equipment for themselves.

The chair was taken by the President, Mr. Norman Caws, G3BVG, who had the support of Council Member R. C. Hills, G3HRH. A vote of thanks to the lecturer was proposed by Mr. J. W. Matthews, G6LL.

It was unfortunate that this most interesting lecture did not receive better support from the membership.

Ballot for Region 11 Representative

Mr. J. E. T. Lawrence, GW3JGA, of Prestatyn, and Mr. K. Schofield, GW3KYT, of Rhos-on-Sea, having been nominated for the office of Region 11 Representative a ballot now becomes necessary. Corporate Members resident in Region 11 are invited to record a vote *on a postcard* in favour of one of the candidates so that it reaches the General Secretary not later than December 18, 1963. (Region 11 covers the counties of Anglesey, Caernarvonshire, Denbighshire, Flintshire, Merionethshire and Montgomeryshire.)

Retirement of the General Secretary

Presentation Fund closes December 12, 1963

On December 31 this year our General Secretary, Mr. John Clarricoats, O.B.E., G6CL, retires after over 30 years' service with the Society. It is a great tribute to him that we are a thriving and vigorous Society today, for if it had not been for his foresight and enthusiasm, we should in all probability have ceased to exist during the war years.

I believe that many members would like to contribute towards a presentation to be made to him on his retirement. This is of course over and above the pension arrangements already made by the Council. If you wish to make a donation please send it to Mr. A. O. Milne, G2MI, who has agreed to act as a treasurer for this presentation, at 29 Kechill Gardens, Hayes, Bromley, Kent, marking the outside of the envelope " G.S. Presentation." Cheques should be made payable to A. O. Milne, No. 2 A/c. No list of donors or individual contributors will be published.

Norman Caws, G3BVG,
President

The President, Council and Headquarters Staff send Christmas Greetings to all Members of the Society

Region 17 Representative

Mr. M. Nicholson, G2MN, has notified Headquarters that as Mr. L. H. F. Southwell, G3JLS, of Southampton, has been nominated for the office of Region 17 Representative he does not wish to force a ballot. He will therefore be retiring as Region 17 Representative on December 31, 1963.

Headquarters Fund—List No. 22

The following is the twenty-second list of those who had contributed to the Headquarters Fund up to November 22, 1963: W. R. Sharples (B.R.S.20859), P. J. Parker (B.R.S.24554), C. R. Fry (G3NDI), J. H. Hargreaves (G5VO), D. C. Mills (G3KUT), J. Barker (G3SAZ), P. K. Laycock (B.R.S.25255), A. F. Webb (B.R.S.21770).

Total amount contributed to date: £1,864 17s. 2d.

The above amount includes a collection of £102 7s. 6d. made at the 1963 RSGB International Radio Communications Exhibition.

RSGB Bulletin
Volume 40 to commence with January, 1964 Issue

Future volumes of the RSGB BULLETIN will coincide with the calendar year and for this reason Volume 40 will commence with the January, 1964, issue. The Index to Volume 39, covering the period July-December, 1963, is bound into this issue.

RSGB Amateur Radio Call Book 1964 Edition

The following are amendments and corrections to the 1964 edition of the *RSGB Amateur Radio Call Book*.

G2ATT	Name is J. Tourtel (not J. W.).
G3AJX	Address is **44** Lynford Way, Winchester.
G3FBR	Address is 42 Garthorne Road.
G3HSC	Name is (Stan) N. Bennett.
G3OQD	Address is **35** Hartfield Crescent.
G3OUF	Address is 80 Argyll Road, London, W.13.
G3PPW	should read **GW**3PPW.
G3REZ	Address is 51 **Linden**thorpe Road.
G3RIY	should be shown as G3RIX.
G3SGR/M	should be added to the Mobile List.
G2ABB	H. F. Nell, Beckbury Cottage, **Beckbury**, nr. Shifnal, Salop.
G3OFI	B. A. Bisley, 53 Ommaney Road, London, S.E.14.
G3BXI/M	should be added to Mobile List.

* * *

Region 8 Meeting

The Region 8 O.R.M. was held in the Sun Lounge of the Leas Cliff Hall, Folkestone, Kent, on October 20, 1963, commencing at 2.20 p.m. Those present included Messrs. N. D. Mattock, G2DFG, Regional Representative (in the Chair), John Clarricoats, O.B.E., G6CL, General Secretary; Council Members L. E. Newnham, G6NZ, E. W. Yeomanson, G3IIR, and John C. Graham, G3TR; Mr. R. G. B. Vaughan, G3FRV, Deputy Regional Representative, and 47 members.

The R.R. welcomed members to Folkestone and introduced the Headquarters party. Members were then addressed by the General Secretary, who spoke on a range of subjects, concluding with a warning of the serious threat to Amateur Radio which had arisen as a result of the emerging nations in Africa and Asia. It was pointed out that each member nation had the same voting power at International Telecommunication Conferences as for example the UK or the USA. Mr. Newnham stressed the need for keeping open the 7 Mc/s band. Messrs. Yeomanson and Graham also addressed the meeting. Then followed questions by members which were answered by Council Members and the General Secretary.

The guest speaker was Mr. W. H. Ingle, G3IOZ, who, after making a plea for aerial efficiency, described some simple equipment necessary for achieving it. He concluded his talk with a suggestion to the Council members that the Society should consider the establishing of week-end schools for radio amateurs. The meeting ended at 4.30 p.m.

Afternoon tea was provided by The Worshipful the Mayor of Folkestone, Miss D. Moody, J.P., who welcomed members and their wives and friends. The General Secretary on behalf of local members presented her with a miniature transistor radio receiver as a souvenir of her visit.

An interesting range of radio equipment was on display in the hall, including many home-constructed items. A raffle and several competitions also contributed to a most successful meeting.

Installation of President

Mr. G. M. C. Stone, A.M.I.E.E., A.M.Brit.I.R.E., G3FZL, will be installed as the 30th President of the Society during the course of a General Meeting and Social Evening to be held at the

Kingsley Hotel,

Bloomsbury Way, London, W.C.1

on

Friday, January 17, 1964

Commencing at 7 p.m.

Admission will be by ticket, available on request (with s.a.e.) from Headquarters. (Tickets restricted to two per member.)

Northern Regional Meeting

Ninety-two members and guests assembled for luncheon at the Belgrade Hotel, Stockport on October 27, 1963, for the North Regional ORM. The Representatives of both Northern Regions, Mr. B. O'Brien, G2AMV and Mr. J. R. Petty, G4JW, were present.

At the end of the luncheon Mr. O'Brien welcomed those present and introduced the Council delegates—Mr. E. G. Ingram, GM6IZ (Immediate Past President), Mr. R. F. Stevens, G2BVN, Mr. L. N. Goldsbrough, G3ERB (Zonal Representative) and Mr. John Clarricoats, O.B.E., G6CL (General Secretary).

The Region 1 Trophy was presented to Mr. R. Halhead, G3KOR, of the Liverpool and District Amateur Radio Society, winners of Region 1 Field Day. The Regional Representative's Trophy for the leading station in Region 1 National Field Day was presented to Mr. J. Wylde, G8BM, who accepted it on behalf of the Wirral Amateur Radio Society.

Sixty-six members were present for the Business Meeting

Mr. E. G. Ingram, GM6IZ, addressing the Northern Regional Meeting at Stockport. Seated, left to right, Mr. Jack Petty, G4JW (Region 2 Representative), Mr. Basil O'Brien, G2AMV (Region 1 Representative) and Mr. John Clarricoats, O.B.E., G6CL (General Secretary)

which opened at 2.45 p.m. Mr. O'Brien, in his brief opening remarks, expressed his disappointment that the attendance was not larger. He then invited Mr. Ingram, as senior Council Member, to take the chair. Mr. Ingram stressed that the whole point of the meeting was to enable members to raise any relevant issue with the Council members present. He commented that attendances at Official Meetings seemed to be dropping and that similar signs of apathy were evident throughout the country. Mr. Petty apologized for the very poor support from Region 2 in spite of all his efforts to publicise the meeting. Mr. Goldsbrough invited comments on Region 1 Field Day and the appointment of Deputy Regional Representatives in Region 1.

Mr. Clarricoats then addressed the meeting. Apart from some nostalgic reminiscences, as befitted his last appearance at a Northern ORM, he concentrated on the important work of IARU and of the RSGB as a Member Society. He stressed that at the next Frequency Allocation Conference amateur frequencies would be under greater pressure than ever since many new and uncommitted nations would then have voting rights. It was essential that they should be made aware of and become sympathetic to Amateur Radio. Every opportunity must be taken to present our case at International Conferences. For example, useful contacts had been made during the recent Space Communication Conference in Geneva.

These remarks had clearly impressed the meeting and prompted discussion and questions about IARU, during which Past President R. Hammans, G2IG, made a plea for increased financial assistance from RSGB to the IARU Region 1 Division Secretariat, which Mr. Clarricoats will continue to handle after his retirement from RSGB. A number of members discussed the possibility of getting greater publicity for Amateur Radio within UK, and Mr. Ingram commented that the appointment of a Public Relations Officer by the Society might pay dividends.

Discussing the Scheme of Representation, several members felt that the appointment of Club Secretaries as ASR's was an effective move since the strength of Amateur Radio depended on thriving local clubs and groups. They were doubtful about the value of Deputy RR's. These points were noted by the RR's since the Representation Scheme was due to be discussed at the RR's Conference.

Mr. Stevens made a plea for BULLETIN articles which would appeal more to the younger and less experienced members than the advanced articles which were in good supply.

Before the meeting ended at 5.15 p.m., Mr. O'Brien thanked the Council delegates for their attendance and the Stockport Radio Society for their very capable organization arrangements.

The members were then joined by the ladies and guests for tea. The latter had spent the afternoon in a programme of games and competitions.

After tea Mr. O'Brien handed over to the Stockport Amateur Radio Society who were to act as hosts for the remainder of the evening and who invited those still remaining at Stockport to supper. Mr. R. Phillips, G3FYE, Chairman of the Stockport society, then took over. He endorsed the numerous tributes which had been paid during the course of the day to Mr. Clarricoats and presented him with a microphone on behalf of the Stockport society.

After the draw, an excellent lecture and demonstration on Commercial Recording Techniques was given by a member of the Pye organization. The meeting concluded with supper.

Experimental Station GB3LER

In the 1964 edition of the *RSGB Amateur Radio Call Book* GB3LER is listed as the call-sign of an RSGB v.h.f. beacon station located at The Observatory, Lerwick, Shetland, Scotland. In point of fact GB3LER is the call-sign of an *experimental v.h.f. station.*

The Region 8 Meeting was held at Folkestone on October 20. In this picture Mr. E. W. Yeomanson, G3IIR (Zone C Representative) is speaking. Seated, left to right, Mr. W. H. Ingle, G3OIZ, Mr. John Graham, G3TR (Member of Council), Mr. John Clarricoats, G6CL (General Secretary), Mr. Norman Mattocks, G2DFG (Region 8 Representative), Mr. L. E. Newnham, G6NZ (Member of Council),. and Mr. R. G. B. Vaughan, G3FRV (Honorary Secretary, Exhibition Committee). *(Photo by N. Naish)*

GC2CNC

For about 10 days or so from January 6, **GC2CNC** will be in the Lourdes Nursing Home, Greenbank Road, Sefton, Liverpool, for an eye operation. During this period, he will much appreciate visitors.

RAEN Membership Registration

At its meeting on August 31 the RAEN Committee resolved that membership of RAEN shall be on an annual basis from January 1 to December 31 each year.

Members are therefore requested to send their membership cards to the Honorary Registrations Secretary, F. C. P. Flanner, G3AVE, 40 Parkhouse Drive, Birmingham 23, by December 31 so that their cards may be franked as being valid for 1964. A member who fails to remit his card by December 31 will be deemed to have relinquished his membership.

It will be appreciated if members will send a s.a.e. for the return of the card to them after franking.

CCs and independent ACs may collect their members' cards and send them to the Honorary Registrations Secretary in bulk if they find this convenient.

Silent Keys

J. C. HOWARTH, G2AUF

It is with deep sorrow that we record the sudden death of Jack Howarth, G2AUF, on October 11, 1963.

Jack always paid considerable interest to amateur radio matters, although during the past few years his appearance on the air had been limited by illness. He will be sadly missed by his friends on the air, in particular on 160m and in the Denton and Greater Manchester area.

We extend our deepest sympathy to his widow, son and daughter. G3HZM

G. F. JACKSON, B.R.S.22377

It is our sad duty to report the death of G. F. Jackson, B.R.S. 22377, of Mawneys, Romford, Essex. Although a relative newcomer to Amateur Radio, he was particularly interested in the various proposals for a new Headquarters. Unfortunately pressure of work prevented him from becoming active on the transmitting side.

We extend our sympathies to his widow.

H. J. MERRIMAN, G6GM

We record with much regret the death on September 17, 1963, of H. J. Merriman, G6GM.

He was a very enthusiastic radio amateur, and spent much time in his shack, notably during the past 12 months, building new equipment.

He is, and will continue to be, sadly missed by all who knew him. His widow and daughter would particularly like to thank the many amateurs who paid tribute by sending numerous letters of sympathy, which were deeply appreciated.

R. A. NAPPER, G5GT

Amateur radio has suffered another loss in the death of R. A. Napper, G5GT, of Taunton, Somerset, on October 1, 1963, at the age of 62.

G5GT was first licensed in 1937, and was well known in amateur circles throughout the West Country.

To his widow and son we offer our sincere condolences.

P. J. O'BRIEN, VS6AE

Pat O'Brien, VS6AE, died suddenly in Hong Kong on his 60th birthday on September 30, 1963. He was first licensed in 1925 as AC1PA, and for a time held the call-sign XU1B in 1934. It was, however, as VS6AE that he became well known in Amateur Radio circles not only in Hong Kong and the Far East, but also throughout the world. He was a founder member and had served as President, Secretary, Treasurer and Council Member of the Hong Kong Amateur Radio Transmitting Society, to which he gave many years' service.

He will be sadly missed by his many friends in Hong Kong and elsewhere.

Our sympathies are extended to his sister and family in Hong Kong. G.A.C.

D. SEARLE, G3RPF

It is with deep regret that we report the death of Dennis Searle, G3RPF, on September 4, 1963, at the age of 42 years.

Although he had not been long in the amateur ranks, he was always willing to help others as and when the opportunity offered.

He will be sadly missed by the many friends he made both inside and outside his new hobby. To his widow we extend our sincere sympathy. W.H.W.

JOHN SIMPSON, GM4QV

With much regret we report the passing of John Simpson, GM4QV, at the age of 52 years, following a long period of illness.

John was an ex-Merchant Navy Radio Officer whose interest in amateur radio began during his schooldays and covered many aspects of the hobby from constructional work to RTTY and 3cm.

He leaves a widow and two daughters, to whom we offer our deepest sympathy. GM3JUH

C. V. WOOD, G6NN

It is with regret that we record the passing of C. V. Wood, G6NN, on September 23. He died suddenly whilst in hospital at Brighton.

We extend our condolences to his widow.

W. SCOTT, B.R.S.10166

It is with sorrow that we report the death of Walter Scott, B.R.S.10166, on September 26, 1963.

His interest in amateur radio was maintained right until his death. He had been a short wave listener for many years and was, in fact, one of the first people in Cheshire to build receiving apparatus.

We offer our sincere sympathy to the members of his family.

Society Affairs

A digest of the business discussed at the September, 1963, meeting of the Council

The September meeting of the Society's Council was held at Headquarters on September 30, 1963, and was attended by Messrs. Norman Caws (President), H. A. Bartlett, R. C. Hills, E. G. Ingram, J. Douglas Kay, A. O. Milne, L. E. Newnham, F. K. Parker, A. D. Patterson, R. F. Stevens, G. M. C. Stone, J. W. Swinnerton, E. W. Yeomanson (Members of the Council), John Clarricoats (General Secretary), and A. J. Reynolds (Secretary/Accountant).

Apologies for absence were submitted on behalf of Major-General E. S. Cole, Mr. L. Goldsborough, Mr. J. C. Graham and Mr. A. C. Williams.

* * *

Annual Accounts

The Acting Honorary Treasurer, Mr. Norman Caws, presented the Annual Accounts which were approved for printing and circulation to members prior to the Annual General Meeting on December 20, 1963. It was agreed that the audited accounts should be signed by the appropriate officers of the Society in due course.

Annual Report

The draft of the Annual Report of the Council, prepared by the General Secretary, was approved for publication in the November, 1963 issue of the RSGB BULLETIN.

Membership

The Council approved 139 applications for membership (106 Corporate and 33 Associate). In addition, 14 applications for transfer from Associate to Corporate grade were accepted. It was agreed to waive for one year the subscriptions of three members who suffer from blindness.

The Council granted affiliation to the Weald Radio Club.

Regional Representatives Conference

It was reported that 16 Regional Representatives had accepted an invitation to attend the conference to be held in Birmingham on November 23, 1963. No additional agenda items had been received.

Terms of Reference

Terms of Reference for the Society's Honorary Organizer of Slow Morse Practice transmissions were approved.

Group Visits to USA

It was reported that members in the North of England and in the London area proposed arranging group visits to USA in 1964. It was agreed to suggest that it might be desirable for the members concerned to collaborate in arranging such trips.

70 Mc/s Contests Trophy

The Council accepted with thanks an offer made by Mr. R. C. Hills to donate a trophy to the Society for use as a major award in connection with 70 Mc/s Contests.

Operating Awards

It was agreed to set up a small *ad hoc* Committee to examine the rules for the Society's operating awards for the h.f. bands and to make recommendations to the Council to bring the rules into line with modern trends.

Staff Matters

The appointment of an editorial assistant was approved.

New Headquarters

It was reported that planning permission for the use of premises at Streatham as a new Headquarters could not be obtained.

International Amateur Radio Club

It was agreed that Mr. Arthur Milne, G2MI, who was to be at the Conference on Space Communications in Geneva at the time, should convey the greetings of the Council to the International Amateur Radio Club's Hamfest to be held on October 19-20, 1963.

South Wales Golden Jubilee Convention

A report on the Convention prepared by the Region 10 Representative, Mr. Cyril Parsons, was tabled.

It was decided to refer to the Membership and Representation Committee a controversy which had arisen over the decision of the Contests Committee to regard Monmouthshire as an English County for contest purposes. It was decided not to accept a suggestion that the miniature gold lapel badge should be made available in the form of a charm for ladies as it was felt that the Society's badge should be worn only by members. Further information was awaited in connection with a complaint of interference from the super-grid.

Lerwick Experimental Station

It was reported that the GPO had issued the call-sign GB3LER for use by the experimental v.h.f. station at Lerwick.

Reports of Committees

The Mobile Committee met on July 26 to discuss arrangements for the RSGB National Mobile Rally at Woburn Abbey in September.

At a special *ad hoc* committee meeting on August 19, 1963, the operation of the British Isles Two Metre Band Plan was discussed.

The problems of a number of members relating to TVI and aerial masts were considered by the TVI/BCI Committee at its meeting on August 21. Two of the cases related to wired television services.

The Finance and Staff Committee at its meeting on August 27, considered new designs of notepaper for headquarters' and members' use, additional office equipment, staff matters, and arrangements for the purchase of a new addressing machine for BULLETIN wrappers when the present machine becomes unserviceable.

At its meeting on August 29 and September 12 the Contests Committee gave final approval to the report and results of National Field Day, 1963, recommended that a second 70 Mc/s contest be held in December, and dealt with matters relating to the 1250 Mc/s Tests, the Second 144 Mc/s Portable Contest and the Second 1·8 Mc/s Contest.

On August 31, the RAEN Committee discussed arrangements for the renewal of RAEN membership cards and for the East Midlands RAEN Meeting in Lincoln on September 15. Consideration was also given to the proposed production of an RAEN manual which would include information on operating procedure.

The meeting of the Exhibition Committee held on September 6 was devoted exclusively to arrangements for the Golden Jubilee Year Radio Communications Exhibition.

The GPO Liaison Committee met on September 16 to consider a number of matters relating to licensing in the UK, the setting up of an IARU Region I Working Group to investigate the possibility of producing unified licensing rules and operating arrangements for amateur stations in Region I, the examining of blind candidates for amateur licences and certain aspects of the operation of the Society's stations under the call-signs GB3RS and GB2VHF.

* * *

The Council was in session from 6 p.m. to 10.53 p.m.

Claims for RSGB Certificates

Members are reminded that claims for RSGB Certificates should be sent direct to Headquarters. Claims are acknowledged on arrival and passed to the Honorary Certificates Manager for attention.

Representation 1964-65

The Corporate Members listed below have been duly elected to serve, in the offices indicated, as from January 1, 1964.

Regional Representatives

Region	Name, Call-sign and Address
1	B. O'Brien, G2AMV, 1 Waterpark Road, Prenton, Birkenhead, Cheshire.
2	J. R. Petty, G4JW, 580 Redmires Road, Sheffield 10, Yorkshire.
3	W. A. Higgins, G8GF, 33 Cedars Avenue, Kingswinford, Brierley Hill, Staffs.
4	F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
5	S. J. Granfield, G5BQ, 47 Warren Road, Cambridge,
6	L. W. Lewis, G8ML, 34 Cleevelands Avenue, Cheltenham, Gloucestershire.
7	P. A. Thorogood, G4KD, 35 Gibbs Green, Edgware, Middlesex.
8	N. Mattock, G2DFG, 70 Bouverie Road West, Folkestone, Kent.
9	R. E. Griffin, G5UH, 13 Alexandra Road, Uplands, Bristol 3.
10	C. H. Parsons, GW8NP, 90 Maesycoed Road, Heath, Cardiff, Glamorganshire.
11	Ballot Pending.
12	G. B. Woffinden, GM3COV, 9 Hakon Road, Thurso, Caithness.
13	G. P. Millar, GM3UM, 8 Plewlands Gardens, Edinburgh 10.
14	D. R. Macadie, GM6MD, 154 Kingsacre Road, Glasgow S.4.
15	J. William Douglas, GI3IWD, 21 Wellington Gardens, Bangor, Co. Down.
16	P. J. Naish, G3EIX, 6 Mildmays, Danbury, Chelmsford, Essex.
17	L. H. F. Southwell, G3JLS, 15 Hollybank Road, Hythe, Southampton, Hants.

The present Region 17 Representative (Mr. M. Nicholson, G2MN) accepted an invitation extended to him by the Council to stand for election but withdrew his name when Mr. Southwell was nominated.

Area Representatives

Region	Town or Area	Name, Call-sign (or B.R.S.) and Address
1	**Lancashire East**	
	Bury and District ..	T. C. Platt, G2GA, 64 Holcombe Avenue, Bury, Lancs.
2	**Yorkshire East**	
	Scarborough	P. B. Briscombe, G8KU, " Roseacre," Irton, near Scarborough.
4	**Northamptonshire**	
	Peterborough Area ..	D. Byrne, G3KPO, Jersey House, Eye.
	Nottinghamshire	
	Worksop	H. S. Chadwick, G8ON, 25 Raines Avenue, Worksop.
7	**London East**	
	Brentwood	R. A. E. Fronius, G3MCW, 169 Coxtie Green Road, Brentwood, Essex.
	Ilford	L. A. Crane, G3PED, 114 Blythswood Road, Goodmayes, Essex.
	London South	
	Norwood and South London areas ..	G. D. Gaunt (B.R.S.19261), 394 Upper Elmers End Road, Eden Park, Beckenham, Kent.
	London West	
	Acton, Brentford and Chiswick	W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W.3.
8	**Kent**	
	Canterbury and Ashford	Dennis N. T. Williams, G3MDO, " Seletar," New House Lane, Canterbury, Kent.
	Folkestone, Hythe and District	F. C. Richardson, G3MYX, 7 West View, Folkestone.
9	**Gloucestershire**	
	Cheltenham	J. J. Yeend, G3CGD, 30 St. Luke's Road.
	Somerset	
	Bath	J. Russell, G2ZR, 45 Shakespeare Avenue, Bath.
10	**Glamorganshire**	
	Cardiff	T. J. Brooke, GW3GHC, 32 Elgar Crescent.
	Port Talbot and District	Ronald Edwards, GW3BQY, 9 Macgregor Row, Maesteg, nr. Bridgend.
13	**Fifeshire**	
	Dunfermline and District	A. Lawrence, GM3IQL, 40 Blake Street, Brucefield.
17	**Hampshire**	
	Southampton ..	G. J. Meikle, G3NIM, 34 Victoria Road, Netley Abbey.

Affiliated Society Representatives

The following Corporate Members of the RSGB have been nominated and elected as Affiliated Society Representatives for the year 1964:

Basildon and District Amateur Radio Society
Alan P. Carpenter, G3RQT, 59 Waldegrave, Basildon, Essex.
Scarborough Amateur Radio Society, G4BP
P. B. Briscombe, G8KU, " Roseacre," Irton, near Scarborough, Yorkshire.
Lothians Radio Society
W. J. H. Eaton, GM3KIG, 100 Craigleith Hill Crescent, Edinburgh 4.
Stockport Radio Society
E. C. Wigzell, G3RQL/T, 54 Clarendon Road, Hazel Grove, Stockport, Cheshire.
Yeovil Amateur Radio Club
B. J. Clark, G3BEC, 107 Eastland Road, Yeovil, Somerset.
Verulam Amateur Radio Club
A. Rowley, G3JWZ, 1 Selby Avenue, St. Albans, Herts.

Receipts

Receipts for subscriptions paid by cheque, bankers' order or postal order are not now issued unless specially requested.

GB2RS SCHEDULE

RSGB 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
	10.15 a.m.	Belfast
	10.30 a.m.	North Midlands
	11 a.m.	North West England
	11.30 a.m.	South West Scotland
	12 noon	North East Scotland
145·30 Mc/s	10.30 a.m.	Beaming north west from Sutton Coldfield
	10.45 a.m.	Beaming south west from Sutton Coldfield
145·50 Mc/s	11.00 a.m.	Beaming north from Leeds
	11.15 a.m.	Beaming east from Leeds
145·8 Mc/s	11.30 a.m.	Beaming west from Belfast
	11.45 a.m.	Beaming north east from Belfast
145·10 Mc/s	12 noon	Beaming north from London area
	12.15 p.m.	Beaming west from London area

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.

CLUBROOM

A Monthly Survey of Group and Club Activities

HP or Down Payment.

As a variation from the traditional annual subscription, a number of clubs have adopted the Meeting Fee as a means of meeting their financial commitments, sometimes combining it with a small annual due or entrance fee. The idea has a number of advantages: there is a steady income without the necessity of " painful extraction " of a large sum when the member is faced with Junior's birthday or a vital valve replacement; the principle of paying according to the benefits received by way of attendance at meetings is maintained. The Treasurer does not need to keep large sums of money lying about, since he can pay room fees and refreshment charges " on the night," while he can approach junior members for their small fee without fear that they will be too embarrassed to admit lack of funds and so fail to turn up at the next meeting.

On the other hand, the system has its difficulties, not least of which is the need to complete a members' register and to ensure full payments—a chore which often disturbs a lecturer and overworks a willing officer of the club. The less popular lectures and activities tend not to pay their way, and there is no incentive to a member to get his money's worth, especially when snow is falling and there is a good TV show to watch.

Annual income is easier to gauge when it is in annual units, and many clubs prefer to base their plans and projects on this certainty, but it is well to bear in mind the relative merits of the attendance fee—often a composite charge will prove a workable arrangement.

News from the Newsletters

Wolverhampton *Newsletter* introduces three new items in the eight-page November issue. There is a report on the National NC155 receiver and a brief description of the diode clamp—both illustrated with circuit data. Meetings planned for the month of December take place on the 9th and 16th, the latter having the intriguing title of " The History of the Big Switch." The *Cornish Link* runs to 16 pages and more than twice as many " newsy " items of varying length. For RTTY fans the BARTG has already reached *Newsletter No. 25*, and reports increasing activity in the mode on 2m. For Methodist Amateurs WAMRAC continues a well produced double sheet for its 401 call-sign holders—G3NZK will enrol any members of the Church into the fold. An HQ station is planned. For the Cray Valley *Newsletter* G6QB gives " The Voice of the Expert " or " How to try at DX without really succeeding." The West Kent *QLF* reminds all members of the " outside " venue of a factory visit on December 13 and the Christmas Party on December 20. The Reigate *Feedback* announces the interesting idea of *three* club stations competing in a forthcoming contest—just imagine *that* on Top Band! At least they will gain good experience—perhaps they might even be on speaking terms afterwards.

The Club at the Hub

Midland clubs report in force this month. **Mid-Warwicks RC**, having just passed its first birthday, will honour its Honorary Secretary by making him give a lecture—he will demonstrate hi-fi stereo on December 16 at the Civil Defence HQ. **Stratford-on-Avon** society has a new idea for the festive season—a " Boasters Evening " when members are given the freedom of the clubroom for three minutes to gloat over their pet project: a prize " under £1,000 " is offered to the best entertainer. **Burslem ARC** meets in the Town Hall on the third Wednesday each month and promises a programme full of interest for the coming year. **Peterborough ARS** made over a hundred contacts at a local Radio Show station—apparently even penetrating a lead roof with their indoor 80m dipole. Meetings are on the first Friday in each month at the Technical College Electronics Block. **Derby DARS** reports a comprehensive programme until mid-February—usually on Wednesdays at 119 Green Lane—G2CVV will supply details. **Dudley ARC** now meets in the Art Gallery —G3PWJ will put intending members in the picture. **Midland RCC** plan a whole Hamfest for December 21-22 at the HQ 10 miles South of " Brum," one mile off A435. Lectures, mobile contests, fun and food are promised for OM and YL or XYL: there is even a trained nanny to mind the kids! (Perhaps there is goat on the menu??) **Stourbridge DARS** will be meeting informally on December 20 at " The Bell," Market Street—give G3BMY a ring for details. Finally " on (but perhaps not beyond) the fringe " is the **Salop ARS**, formed recently in Shrewsbury and meeting on the second Thursday each month at 7.30 at the Harlescott Tennis Club. Honorary Secretary G3RRN is happy to report promise of success for this new venture. Meetings so far have included a display of gear, a " Top Band " night, and Morse instruction. The December 12 meeting subject has yet to be decided, but there is plenty of talent among the 35 members. Even more on the perimeter (Midland-wise, as the saying is these days) is **Stroud DARS**, now installed in its new premises at Arundell Mills, London Road, and sporting the club call-sign G3SDR. G3GEW is the Secretary. **Ilkeston DARS** is now renamed **Heanor DARS**—meetings are held weekly on " term " Tuesdays at the Heanor Technical College. G3RWN (ex B.R.S.24750) is the Honorary Secretary.

" Town " and Around

The London area also provides a large batch of reports this month. **Surrey RCC** mentions that 17 members are studying the RAE Course at Croydon TC. As a tribute to YLs and XYLs, they will be " wined and dined " at Selsdon Park Hotel on December 14. On the previous night, **Clifton ARS** will be holding a Constructional Contest. **Dorking DARS** will meet informally at the Wheatsheaf on December 10, and adjourn to the Parrot Inn, Forest Green for a Dinner on December 17. **Barnet RC** were favoured by a colour film on NFD shown by G3KRC, and are now in training for the Party fixed for December 7 at Oakfield House, Potters Bar.

Mitcham DRS will range from Amateur Radio to the Norfolk Broads in a December 6 Film Show given by G3LCH. Constructional efforts will be judged at the December 20 meeting at The Canons, Madeira Road. **Grafton RS** are happy with increased attendances, and have introduced a " Morse Confidence " half-hour. G2MI lectures on December 6, and the Party at the Bedford Corner Hotel is to take place next day: ring CAN 7003 for tickets from Honorary Secretary A. Bristow. **Welwyn** group visited the local County Police Radio Room, and enjoyed a 3½-hour meeting with other Groups on October 17. **East London Group** heard G3AAE talk on H.F. Propagation to the SWLs, and found the OTs just as intent to know " how it's done." **Harrow RS** rejoices in scoring a membership century for the third year running. **Reigate ATS** will be assessed by Crawley visitors at its annual Constructional Contest on December 14. The **London Members' Luncheon**

Club recently presented G2FUX with a table lamp to mark his completion of ten years as Honorary Secretary: G3IKC has succeeded him and will be working hard to organize the Christmas Lunch on December 13 at the Bedford Corner Hotel. **Crawley ARC** received the award of the Plaque for the best home-constructed equipment at the Radio Communications Exhibition—the stations GB3RS and GB2VHF. To crown this successful year, the AGM will be held on December 18.

Points North

Barnsley DARC held its Golden Jubilee event on October 12—this club claims the distinction of having the longest continuous existence of any club in the country. **Northern Heights ARS** visited the RSGB Exhibition by special coach: the club has its third Annual Dinner on December 11: tickets from the Candy Cabin, Ogden, Halifax. On the following night **Spen Valley ARS** will be seeing a Film Show at the Grammar School HQ in Heckmondwike. **Liverpool DARS** says " Bring your own bottles " on December 17—do they sell Scotch on Scotland Road? No mention is made of a free distribution of " scouse." Region 1 Field Day winner, G3KOR, received his award at the Northern Regional Meeting. GW3PCZ/T talked on home-constructed s.s.b. gear at Prestatyn, where members of **Conway Valley ARC** were visitors.

Sole contributor from North of the Border—**Lothians RS**—has instituted a 2m Activity Time for a midday hour on Sundays.

The Southern Side

Torbay ARS now meets on the first, instead of the second, Saturday in each month. **Southampton RSGB** Group keeps to the latter date: in December G3HUA will present a slide show view of the world. **South Dorset RS** heard G5QA talk on RSGB matters in November, when **Yeovil ARC** members were also present. **Reading ARC** will meet on December 28 at the Palmer Hall for a " Questions and Answers " session. **Salisbury DSWC** operated at the American Patrol Adventure Camp and on special station GB3USA paraded the joys of Amateur Radio before the Scouts of a dozen countries.

Services Corner

Royal Naval ARS sends Christmas Greetings to all members, especially those serving overseas. This is the cue for your columnist to sign off with Seasonal Good Wishes to all club and group members, and to wish you happy and successful clubbing in 1964. Material for the **January** issue must reach HQ by **December 7** and for the **February** issue by **January 10.** Please keep comments as brief as possible, since with more and more contributions coming in space is at a premium. If you have a new idea, or an original slant on an old topic, report it in full so that it can be passed on to other clubs; in this way you are helping the entire club movement. 73—and don't forget the Affiliated Societies' Contest!

Club of the Month

THE WIRRAL AMATEUR RADIO SOCIETY

In most of the contests organized by the RSGB—and in many others of international repute—the " Mersey sound " can be heard in the Amateur Radio sense in the excellent signals put out by the participants from this progressive north-western society. It serves the populous area of that peninsula bounded on the north by the Mersey and to the south by the Cheshire Dee—a sprawling conurbation with interests as widely separated as shipbuilding and entertainment, but never quite out of touch with the sea.

Members of the Wirral Amateur Radio Society working on "Operation Multimitter."

The society was formed in 1934, when a courageous company of three founded what was to become in the immediate post-war years a flourishing organization with 96 members. At present stabilized at 80, this membership enjoys fortnightly meetings on the first and third Wednesdays of each month. With no permanent headquarters of its own, the society meets in the Boy Scouts' HQ in Birkenhead, to enjoy a programme of lectures, demonstrations and contest participation. Every effort is made to cater for individual needs, and no " slant " to any particular activity is claimed. For several years a RAE course has been conducted by G3EGX, and the present total of 50 licensed members includes many that he has " nursed " through their first acquaintance with the intricacies of the syllabus. In spite of the counter-claims of homework, a Junior Section flourishes, and provides instruction geared to younger needs.

A large quantity of field equipment has been accumulated which includes generators, masts, tentage and even a large marquee! These items are regularly " aired " in the summer months to support club station G3NWR. The society participates regularly in NFD, D/F Contests and inter-society events: each year an expedition is mounted to put " rare " counties on the air on 160 and 2m. Led by G3BOC, an increasing number of members essay the delights of the 2m band from home locations. One member—G3CSZ—claims the unusual interest of making his own transistors from germanium diodes, while his transistorized 160m transmitter achieved a high total of DX contacts on the band.

As its contribution to the IGY projects of the RSGB, the Wirral group made useful recordings of artificial satellite transmissions, and members hold RSGB certificates for a number of achievements in this field. Such work is typical of its interest in RSGB affairs, and it is hardly surprising that Basil O'Brien, G2AMV (Region 1 Representative) and more recently Les Goldsbrough G3ERB (Council member representing Zone A) have been prominent workers for the national society.

Not lacking in enthusiasm for social activities, the Wirral club welcomes nearly a hundred members and guests to its Annual Dinner (where this year the General Secretary, John Clarricoats, G6CL, was an honoured guest). A monthly *Newsletter* keeps members in touch and provides a timely reminder of meeting dates and subjects. While priding itself on its independence, the society is proud to be affiliated to the RSGB and is appreciative of its efforts in promoting the hobby in national and international fields.

A new venture by the Wirral organizers is " Operation Multimitter," to which reference has already been made in these columns. This is a group constructional scheme believed to be unique in scope and magnitude and involving

(Continued on page 380)

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.

Headquarters Fund

DEAR SIR,—*Current Comment* in the November BULLETIN made very sad reading indeed, in bringing home the very poor response to the Headquarters fund.

In asking myself why this should be, I came up with the answer that the amount of money required is so large that the individual member says, " What can I do about it, I'm not a millionaire," and turns over the page.

Remembering the old saying " United we stand, divided we fall," let us get united and see what we can do.

I can say my circumstances are average, so let everyone of our average members do what I am going to do; those above average might do better.

SEND 10s. NOW, AND COMMENCING ON JANUARY 1, PUT INTO A BOX ONE PENNY A DAY FOR A YEAR.

This is not very much to ask, a few packets of cigarettes now, and a penny a day next year. Our 12,000 members could produce £6,000 by next week, and £18,000 at December 31, 1964, making a total of £24,000.

We would soon forget such a small sacrifice, but remember for years to come what we have achieved by unity.

Yours sincerely,
J. BAKER, G3SAZ

Ashford, Middlesex.

(Mr. Baker was as good as his word: his first donation to the Fund was enclosed with his letter.—EDITOR.)

RSGB Radio Communications Exhibition

DEAR SIR,—I hope this letter will reflect the opinions of a goodly number of members regarding the Communications Exhibition this year.

The central position of the Society's stand stood out and advertised our work just as it should and the stage display of old equipment must have brought back many a memory. This display was useful too in the case of the youngsters brought up on transistors and TV sets. I was able to discuss the old detectors with them, even though I cannot claim to have been " there " at the time!

All together, it is surely felt that this was a very good show, and once again many thanks are due to Phil Thorogood for his efforts and, in many cases personal help, which produced the 1963 exhibition.

Yours faithfully,
K. L. SMITH, G3JIX

Walthamstow, London, E.17.

DEAR SIR,—It is now almost 30 years since I became a member of the RSGB (as B.R.S.2450), but I do not remember writing to you before regarding your efforts in connection with the exhibitions. I thought on this occasion I would just add my congratulations and thanks for your Seymour Hall effort.

Having seen them all, including those held at the Royal Hotel, I found this year's show even more interesting than usual and, with no lack of very willing workers manning the main stands.

As I started on radio, or " wireless " as we called it then, of course, at the age of 12 in 1920, I was very pleased to see the old type gear on show. Getting it there must have involved quite a lot of work. There cannot be much of it left now, and the owners would, no doubt, be rather reluctant to part with it even for a short time.

I should think there must have been many others thinking, as I did, that in spite of the excellent, compact new equipment to be seen, the old gear reminded quite a lot of us pre-war amateurs of spending many hard earned shillings and much midnight oil on the construction and use of it.

It was an exhibition in which we could not only see the present stage of Amateur Radio, but also have a quick look into the past. Some lucky ones could even afford to acquire equipment suitable for use in the future—in short something of interest for everyone, whatever their age.

So congratulations to all concerned, not forgetting all those willing workers not always known or seen by the visitors.

Yours faithfully,
R. BRAND, G2ANB

Hockley, Essex.

Phone NFD: A New Angle

DEAR SIR,—May I, with some temerity, raise once again the question of phone in NFD? In the past, whenever the suggestion has been made to admit A3 operation in NFD there has been violent protest, with the incidental result that Field Day has proceeded from year to year much in the same pattern as before.

My suggestion is to allow s.s.b. operation during the June event but quite definitely not a.m. The advantages of so doing are numerous, and a few which may be mentioned are:

The considerable number of operators who have no time for c.w. would be allowed a look in on NFD.

Scoring rates might in fact be increased if a given station were allowed to use s.s.b. or telegraphy at will, dodging from one end of the band to the other as tactics dictated.

Operation on s.s.b. is to-day as quick and efficient as c.w., and it occupies little more space in the spectrum. Finally, not to penalise the art of c.w., one would suggest that double points should be allocated for all telegraphy contacts.

Presumably it is too late to adopt any such suggestions for the 1964 event, but if they are considered for 1965 the Contests Committee would at once be arresting the declining value of NFD as we know it now, and recognising the potentialities of sideband as one of the best contemporary modes of communication that exist.

Yours faithfully,
BRIAN GIBBS, G3OZH

Welwyn Garden City.

Soldering Aluminium

DEAR SIR,—Contrary to widespread opinion, aluminium may be soldered with an ordinary soldering iron and radio solder. The use of special fluxes or ultrasonic irons is not necessary for the occasional joint.

The action of the air forms a thin and invisible layer of aluminium oxide on the surface of the metal, and this must be removed before it will "tin." The area to be tinned is covered with a layer of ordinary lubricating oil (most types seem suitable, though probably the more viscous and less volatile are more so). Through the oil the surface of the aluminium is scraped away with a knife, removing thin slivers of the metal and with it the oxide. The oil prevents the air reaching the exposed metal and, if a hot, well tinned soldering iron is pressed against the cleaned area, by the time the oil has boiled away the metal will be tinned. Once tinned, it is of course no trouble to place another piece of tinned material against the aluminium and the application of heat will result in a sound, strong joint—just as good as that obtained with tinplate.

Particularly useful applications are the soldering of feed-through capacitors directly to aluminium chassis, and the bonding of screens.

Yours faithfully,
M. C. W. SANDFORD, G3PIT

Topsham, Exeter, Devon.

Receivers

DEAR SIR,—Mr. Austin does our communications equipment manufacturers little service when he compares the cost of producing cars and receivers. He's trying to equate chalk and cheese! Let him try to make a BC transistor portable (including the case) for 30 per cent of the shop price!

But Mr. Austin and Mr. John appear to overlook a few facts. The overall cost of buying commercial equipment is not so fearful. Let us take a receiver costing £150 and amortise it over five years, and sell it at the end of that period for, say £60.

£150 minus £60 divided by five equals £18, or in round figures seven shillings per week!

Those of us who, for a variety of reasons, do not have the time to build the sort of equipment modern conditions demand are very grateful to manufacturers willing to take the risk of putting into production high quality equipment for a very limited market.

Your sincerely,
E. ARNOLD MATTHEWS, G3FZW

Lichfield, Staffs.

CONTEST NEWS

RESULTS — REPORTS — RULES

Owing to increased pressure of work it is proposed to enlarge the Contests Committee. Members who are prepared to attend meetings at Society Headquarters are invited to forward their names to the General Secretary. The Committee usually meets at least monthly on Thursdays at 6.30 p.m.

Affiliated Societies' Contest 1964

The rules for the Affiliated Societies' Contest to be held on February 1-2, 1964 are as set out below. The attention of non-contestants is called to Rule 6.

1. The contest is open to all Societies in fully paid-up affiliation with RSGB at the time of the Contest.
2. The General Rules to be published in the January 1964 issue of the RSGB BULLETIN relating to RSGB Contests will apply except as superseded by the rules of this Contest. For the purpose of this Contest **all entries are classed as multi-operator** stations.
3. The Contest will be in two periods:
   19.00 to 23.00 GMT February 1, 1964 and
   19.00 to 23.00 GMT February 2, 1964.
4. Entrants must operate in the 1·8-2 Mc/s band on c.w. only, and operate in such a way as to minimize interference with other users. Contacts with telephony stations are not permitted.
5. Fifteen points will be scored for contacts with Affiliated Society stations, and 10 points for all other contacts. Contact may be made once only with a station during each operating period. The contest score will be the sum of the points obtained in both periods, and the combined log will be prefaced by a cover sheet made out in accordance with RSGB General Rule 4.
6. Affiliated Society stations **only** must send AFS to identify themselves as contestants, after the report serial number groups, e.g. 559004AFS. Serial numbers will advance throughout the entire contest.
7. Call-signs which have been issued to Societies must be used, but their use at an alternative address is not debarred. If no Society call is held, the call-sign of a member may be used.
8. Entries must be postmarked not later than **February 17, 1964,** and must be submitted in the following form:

Date/ Time GMT	Call-sign of station worked	Our report on his signals and serial no. sent	His report on our signals and serial no. received	Enter AFS if received	Call-sign of operator	Points claimed

Cover sheets and log forms are available from RSGB Headquarters on request.

9. The declaration must be signed by an officer of the Affiliated Society, who will be held responsible for the conduct of the station.
10. At the discretion of the Council of the RSGB, the **Edgware Trophy** will be awarded to the Affiliated Society submitting the highest total checked score.

Low Power Field Day 1963

This contest, held on September 22, still maintains its interest for a small band of enthusiasts; activity was helped on this occasion by the holding of Region I Field Day on the same day.

This year's event is noteworthy for the clear lead established by D. G. Alexander, G3KLH, whose score exceeded that of runner-up M. Byars, G3PIF, by nearly 20 per cent.

Using an all-transistorized transmitter from a site near Staines, G3KLH/P employed an input of 15 watts to a v.f.o./f.d./b.a./p.a. combination using 2N1710 transistors in the final stage. His receiver was a five valve superhet, but it is clear that the economy in weight and battery consumption meant a much greater all-round weight-efficiency ratio. G3PIF/P used 1·4 volt battery valves throughout, as did most other competitors. His transmitter was a v.f.o./p.a. rig using 3A4's at more than 3·5 watts input; a simple superhet receiver completed the station. Only four points separated G3PIF/P from the fifth competitor. One more portable contact by any of these stations could have meant a lift to second place.

Two departures from the trend were by XYL competitor, G3GOX/P, who used low consumption 6G6's in a two stage transmitter, and G3BY/P whose gear was transistorized throughout and weighed only 12 lb. G3BY's transmitter used a TK202A transistor at 6 watts input preceded by a TK252A driver and OC170 v.f.o. and doubler. The receiver was a "straight four" using OC170's in the h.f. section. These transistorized entries have been described because the wider understanding of transistor techniques suggests that this event might now draw support on an all-transistor basis. Comments and suggestions on this proposal are invited: some competitors have already put forward this idea.

LOW POWER FIELD DAY 1963

Position	Call-sign	Contacts	Points
1	G3KLH/P	56	138
2	G3PIF/P	40	116
3	G3CGD/P	42	114
4	G3BZM/P	33	113
*	G3JKY/P	40	112
5	G8NN/P	33	97
6	G3GOX/P	26	90
†	G3JVJ/P	20	76
7	G3JKA/P	17	63
8	G3BY/P	21	60
9	G3IGU/P	15	54
10	G3CWL/P	5	21

* No weight declaration. † Entry in BST.

Half-wave aerials were the most popular choice, although G3CGD/P used two at right angles and G8KB a Windom only 15 ft. high on the G8NN/P site. Some continental stations were worked, but this is not surprising; as one competitor observed, it is possible to run up to twice the power permitted in NFD!

Check logs from G3CIO and G3SEN are gratefully acknowledged.

Competitors who were kind enough to add comments to their logs are thanked for their interest: these are most useful for arranging next year's event. See you in TFD '64?

Bulletin Stencil Plates

Stencil plates used for the preparation of BULLETIN wrappers occasionally become worn or lose ink, with the result that the Post Office experience difficulty in tracing the address.

Members who notice that the address on the wrapper used for their copy of the BULLETIN is indistinct, or in any way faulty, are asked to advise Headquarters.

Clubroom (Continued from page 378)

nearly £1,000 of outlay by members. Completion of the project is planned for next spring, and an account of the venture is promised for a future issue of the BULLETIN. Such an experiment is typical of that spirit which has kept the Wirral society in the forefront of Amateur Radio activities —it has a well-balanced organization, keen to promote new ideas and looking to new members as well as to "old timers" to carry on its good work in this industrial and "dormitory" peninsula of Cheshire.

Rules for National Field Day 1964

Complete rules for NFD 1964 are as follows (RSGB General Rules do *not* apply):

1. **Duration.** The contest will commence at 17.00 GMT on Saturday, June 6, and end at 17.00 GMT on Sunday, June 7, 1964.

2. **Eligible Entrants.** Any group of members within the British Isles, which for the purposes of the contest comprise the prefix zones G, GC, GD, GI, GM and GW, may enter. The group may be a local RSGB group, a group of RSGB members, a club or an Affiliated Society. Entrants must operate within the terms of their licences. Contacts with unlicensed stations will not count for points.

3. **Operators.** Operators of portable stations competing in the contest must each hold a current British Isles (GPO) Amateur (Sound) Licence or a valid PO Amateur Radio Certificate and must be fully paid-up Corporate Members of the RSGB at the time of the contest.

4. **Stations.** Each competing group will be permitted to place two stations ("A" and "B") in operation. The station operating on the lowest frequency employed shall be designated the "A" station. Each station must operate in not more than three of the bands 1·8, 3·5, 7, 14, 21 and 28 Mc/s; the other three frequency bands will be allocated to the "B" station, i.e., no group may operate two stations on any one frequency band. Both stations may operate from the same site or from different sites, provided that they are located within the agreed limits of the area covered by their Regional Representative. It will be permissible for two groups within a Region, or adjoining Regions, each operating a single station, to amalgamate for the purpose of scoring; if this is done, frequency bands must be allocated between the two stations as detailed above. Single-station entries will be accepted from stations operating on not more than three of the frequency bands listed above.

5. **Licences.** Each station must be licensed to use a different call-sign.

6. **Applications.** Each group intending to compete must notify the RSGB Contests Committee, 28-30 Little Russell Street, London, W.C.1, of the name of the group, location and the name and full postal address (in **BLOCK LETTERS** please) of the AR, ASR, or member, responsible for their entry, not later than **WEDNESDAY, APRIL 29, 1964.** Stationery and the latest information on the contest will be sent to this member.

Details should be set out as follows:
Call-sign station "A"..... Call-sign station "B".....

The bands to be used by these stations are:

Band	1·8 Mc/s	3·5 Mc/s	7 Mc/s	14 Mc/s	21 Mc/s	28 Mc/s
Call-sign						

7. **Tents.** Stations must be operated from tents.

8. **Apparatus.** No apparatus may be erected on the site prior to 12.00 GMT on June 6, 1964. This rule includes aerials and aerial fittings as well as tented accommodation for the stations, but does not apply to a tent to be used for storage purposes.

9. **Aerials.** Any aerials may be used, subject to the following limitations:
   (*a*) All aerials must be constructed from wire of total cross-sectional area not greater than 14 s.w.g. with the exception, however, that vertical radiators of any construction may be used.
   (*b*) No part of the aerials shall exceed a height of 45 ft. above ground level.

10. **Transmitters and Receivers.** Equipment at any "A" or "B" station must not exceed three transmitters and one receiver. Reserve equipment may be kept available, but not connected.

11. **Power Input.** Total d.c. input power to the anode circuit of the valve or valves energizing the aerial, or to any previous stage of the transmitter, **shall not exceed 10 watts.**

12. **Power Supply.** Power for any part of the station must not be derived directly from supply mains.

13. **Type of Emission.** The contest is restricted to the use of c.w. (A1) only.

14. **Contest Exchanges.** An exchange of reports must be made and acknowledged before points may be claimed. In contacts made by competing stations the report must include a rising serial number commencing with 001 and increasing by one with each successive contact, irrespective of band, made by the station (e.g. RST579001, etc.), and such serial numbers, both incoming and outgoing, together with signal reports, must be entered on the log sheets. Proof of contacts may be required.

15. **Contacts.** Only one contact with each station, as defined by its basic call-sign, may count for points on each band during the contest. Duplicate contacts **must** be logged without claim for points.

16. **Group Contacts.** Points must not be claimed for contacts made by a competing station with other stations within its own town or area or with members of its own group, whether fixed, portable or mobile.

17. **Scoring.** Points will be scored on the following basis:

(*a*) Fixed stations in the British Isles	**1 point**
(*b*) Fixed stations in the rest of Europe including Eire ...	**2 points**
(*c*) Fixed stations outside Europe	**3 points**
(*d*) Fixed stations in the British Commonwealth ...	**6 points**
(*e*) Portable and mobile stations in the British Isles ...	***3 points**
(*f*) Portable and mobile stations in the rest of Europe including Eire	**4 points**
(*g*) Portable and mobile stations outside Europe ...	**6 points**
(*h*) Portable and mobile stations in the British Commonwealth	**12 points**

* An additional **2 points** may be claimed on **1·8 Mc/s ONLY** for contacts with a portable or mobile station in any other British Isles prefix zone (e.g., GM-G, GM-GD, G-GI, GW-GC contacts on **1·8 Mc/s** score 5 points). The six British Isles prefix zones are listed in Rule 2 (HB1 is a Swiss portable prefix).

18. **Summary Sheets.** An entry will be accepted as valid only if the complete summary sheet has been signed by the member solely responsible for the conduct of the event within his group, however constituted.

19. **Operators' Signatures.** Contacts made by an operator whose personal signature does not appear on the cover sheet(s) of the appropriate log(s) will be disallowed. Operators' call-signs must be shown on the logs against all contacts made by them.

20. **Entries.** Each station's entry shall consist of a copy of the station log on the printed log sheet, **a separate sheet being submitted for each band worked,** together with a cover sheet for each band, and a summary sheet. The points claimed must be totalled for each band. Forms for this purpose will be supplied by Headquarters. Entries must be addressed to the RSGB Contests Committee, 28-30 Little Russell Street, London, W.C.1, **postmarked not later than June 21, 1964. LOGS MUST BE KEPT AND ENTRIES SUBMITTED IN GMT.**
In the event of any dispute the ruling of the Council of the RSGB shall be final.

21. In addition to the ***National Field Day Trophy*** and miniature replica, which will be awarded to the group obtaining the highest combined score, **miniature replicas** will be awarded to the groups with the highest score on each frequency band.

22. The ***Gravesend Trophy*** will be awarded to the runner-up.

23. The ***Scottish NFD Trophy*** will be awarded to the Scottish group scoring the highest number of points.

24. The ***Bristol Trophy*** will be awarded to the group which, having entered only one station, shall obtain the highest number of points in comparison with other groups entering on a similar basis.

25. **A certificate** will be awarded to each of the following:
   (*a*) The chief operator of the overseas station whose check log shows that he contributed the most points to competitors.
   (*b*) The non-transmitting British Isles member whose check log is adjudged the most useful by the Contests Committee. This log should show: Date/Time (GMT); call-sign of station heard; call-sign of station worked; report and serial number sent by station heard. Where both sides of a contact are heard they should be recorded on separate lines.

26. **Care of Trophies.** The Trophies will be handed to the representatives of the groups concerned, who will be responsible for their safe keeping until their return is requested by RSGB Headquarters.

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives by the first of the month preceding publication. A.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.

REGION 1

Ainsdale (ARS).—December 11, Russell Road Methodist Church Hall, Southport.
Blackburn.—Fridays, 8 p.m., West View Hotel, Revidge Road.
Blackpool (B&FARS).—Mondays, 8 p.m., Pontins Holiday Camp, Squires Gate.
Bury (BRS).—December 10 (AGM), 8 p.m., Knowsley Hotel, Kay Gardens.
Chester.—Tuesdays, 8 p.m., YMCA.
Eccles (E&DAC).—Tuesdays, 8 p.m., The Congregational Mission Church, King Street.
Liverpool (L&DARS).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.
Macclesfield.—December 10, 24, January 7, 42 Jordongate.
Manchester (M&DARS).—Wednesdays, 7.30 p.m., 203 Droylsden Road, Newton Heath, Manchester 10.
Manchester (SMRC).—Fridays, 7.45 p.m., Rackhouse Community Centre, Rackhouse, Daine Avenue, Northenden.
Morecambe.—December 4, January 1, 125 Regent Road.
Preston.—December 10 (" Two Metres," Darwin Evans, G3JAH), St. Paul's School, Pole Street. (All meetings start with a Morse practice at 7.30 p.m.)
Southport (SRS).—Wednesdays, 8.30 p.m., Sea Cadets Camp, The Esplanade.
Stockport.—December 4, 18, January 1, 8 p.m., The Blossoms Hotel, Buxton Road.
Wirral.—December 4, 18, January 1, 7.45 p.m., Harding House, Park Road West, Claughton.

REGION 2

Barnsley.—December 13 (Discussion on " Modern Trends in Amateur Radio "), 7.30 p.m., King George Hotel, Pee Street.
Catterick.—Tuesdays and Thursdays, 7.30 p.m., The Clubroom, Vimy Road.
Bradford.—December 17 (Quiz Night), 7.30 p.m., 66 Little Horton Lane. January 7 (Visit to N.S.F. Ltd., Keighley).
Northern Heights.—December 18 (Ragchew), January 1 (" Building a 10-80m Transmitter using a Geloso v.f.o." by H. Makin, G3FDC), 7.30 p.m., Sportsman Inn, Ogden.
Scarborough.—Thursdays, 7.30 p.m., Chapman's Yard, North Street.
Spen Valley.—December 12 (Film Show), January 9 (Display of members' gear), 7.15 p.m., Heckmondwike Grammar School.
York.—Tuesdays, 7.30 p.m., (Learners and Morse Training), Thursdays, 8 p.m. (Club Night), Club Room, Fetter Lane.

REGION 3

Birmingham (MARS).—December 17 (Christmas Party and Equipment Sale), 7.30 p.m., Birmingham and Midland Institute, Paradise Street. **(MRCC).**—December 6, 7.30 p.m., Windmill House, Weatheroak, Wythall, Birmingham. **(Slade).**—December 13, 7.45 p.m., The Church House, High Street, Erdington.
Cannock (CCARS).—December 5, 8 p.m., George Hotel, Walsall Road, Cannock.
Coventry (CARS).—Mondays, 8 p.m., Westfield House, Radford Road, Coventry.
Redditch (East Worcestershire).—December 12 (Constructors' Evening), 8 p.m., Old People's Centre, Redditch.
Shrewsbury (SARS).—December 12, 7.30 p.m., The Tennis Club, Harlescott Crescent, Harlescott Lane, Harlescott, Shrewsbury.
Stourbridge (S&DARS).—December 20 (Informal), 8 p.m., Bell Hotel, Stourbridge, January 14, 7.45 p.m., Foley College, Stourbridge.
Stratford-upon-Avon (ARS).—December 6 (" Tape Recorders "), December 13 (" Operating Techniques "), December 20 (Boasters' Evening), December 21 (Cocktail Party), Flat 1, Birds Commercial Motors, Stratford-upon-Avon.
Sutton Coldfield (ARS).—December 13, 7.30 p.m., 92 The Parade, Sutton Coldfield.
Wolverhampton (ARS).—December 16 (" A History of the Big Switch "), December 23 (Ragchew), December 30 (Film Show), 8 p.m., Neachells Cottage, Stockwell End, Tettenhall.

REGION 4

Burton-on-Trent (ARS).—Wednesdays, 7.30 p.m., Club Room, Stapenhill Institute, Burton-on-Trent.
Chesterfield (C&DARS).—December 11, January 10, 7.30 p.m., Newbold Observatory, Newbold Road, Chesterfield.
Derby (D&DARS).—December 4 (Surplus Sale), December 11 (" 1963 In Retrospect," Members' and Club Slides), December 15 (GSYY Trophy Contest), December 18 (Christmas Party), January 1 (Surplus Sale), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.
Derby (DSWExp.Soc.).—Fridays, 7.30 p.m., Sundays, 10.30 a.m., Club Rooms, Nunsfield House, Boulton Lane, Alvaston, Derby.
Grantham (G&DARS).—Mondays, 7.30 p.m., Club Room, rear of Manners Arms Hotel, London Road, Grantham.
Grimsby (GARS).—December 5 (Visit to GPO Telephone Exchange), December 19 (Open Night, Distribution of Christmas Gifts), 8 p.m., Model Engineers' Club Room, Fletchers Yard, Wellowgate, Grimsby.
Heanor (H&DRS).—Tuesdays, 7.30-9.30 p.m., Heanor Technical College.
Leicester (LRS).—Mondays, 7.30 p.m., Club Room, Old Hall Farm, Braunstone Lane, Leicester.
Lincoln (LSWC).—First Wednesday in each month, 7.30 p.m., Lincoln Technical College, Cathedral Street, Lincoln.
Loughborough (RCL).—Fridays, 7.30 p.m., Corporation Hotel, Wharncliffe Road, Loughborough.
Magnus (SWC).—December 6 (" QSL Cards "), December 10 (" The Superhet "), December 13 (" The Communication Receiver "), December 17 (Practical), 4 p.m., Physics Laboratory, Magnus Grammar School.
Mansfield (MRC).—Fridays, 7.30 p.m., Hope & Anchor Hotel, Union Street, Mansfield.
Melton Mowbray (ARS).—December 19 (" Transductor Control by Transistors," L. Fisher, G4MK), 7.30 p.m., St John Ambulance Hall, Asfordby Hill.
Nottingham (ARCN).—Tuesdays, Thursdays, Room No. 3, Sherwood Community Centre, Woodthorpe House, Mansfield Road, Sherwood.
Northampton (NSWC).—Thursdays, 7 p.m., Allen's Pram Works, 8 Duke Street, Northampton.
Peterborough (P&DARS).—December 6 (" TVI Prevention "), 7 p.m., Room 13, Electronics Block, Peterborough Technical College, Eastfield Road, Peterborough.
Worksop (NNARS).—Tuesdays (Beginners), Thursdays (Informal), 7.30 p.m., Club Room, Victoria Institute, Eastgate, Worksop, Notts.

REGION 5

Cambridge (C & DARC).—December 6 (" Scandinavian Journey," film and slides by R. C. Hills, G3HRH), December 13 (Informal), Fridays, 7.30 p.m., Club Headquarters, Corporation Yard, Victoria Road, Cambridge.
Cambridge University (CUWS).—Tuesdays, 8.15 p.m., Psychology Department Lecture Room, Downing Site, Cambridge.
March (M & DRAS).—January 14 (Film Show), Tuesdays, 7.30 p.m., rear of Police Headquarters, High Street.
Royston (R & DARC).—December 4 (" Use of Test Equipment," talk and demonstration by C. E. Abrey, G3RZY), December 18 (Film Show), Wednesdays, 8 p.m., Manor House Social Club, Melbourne Street, Royston, Herts.
Luton.—Mondays, 7.30 p.m., Surrey Street Schools, Luton.
Shefford (S & DARS).—December 5 or 6 (Annual Dinner), December 12 (RSGB Recorded Lecture), December 19 (" Two Metre Transceiver Conversion," by D. Weaver, G3LOY), Thursdays, 7.45 p.m., Digswell House, Hitchin Road, Shefford (*No meeting on December 26*).

REGION 6

Cheltenham.—First Thursday in each month, 8 p.m., Great Western Hotel, Clarence Street.
Oxford (O & DARS).—Second and fourth Wednesday in each month, 7.30 p.m., Cherwell Hotel, Water Eaton Road, N. Oxford. (Newcomers and visitors welcome.)
Wolverton (WDRC).—December 6 (" Filters " by G3NOC), 7.30 p.m., Wolverton College of Further Education.

REGION 7

Acton, Brentford & Chiswick (ABCRC).—December 10 (" A.T.U.'s for Top Band "), 7.30 p.m., A.E.U. Club, 66 High Road, Chiswick.
Bexleyheath (NKRS).—December 12, 7.30 p.m., Congregational Hall, Chapel Road, Bexleyheath.
Barnet (BRC).—December 7 (Sixth Christmas Party), Oakmere House, High Street, Potters Bar.
Chingford (SC).—Fridays (except first in the month), 8 p.m., Chingford Community Centre, Enday Hill. **(Group).**—December 8, G3NQT, Loughton 2397.
Croydon (SRCC).—December 10, 7.30 p.m., Blacksmiths Arms, South End, Croydon.
Dorking (D & DRS).—December 17 (Annual Dinner), Parrot Inn, Forest Green, Dorking.
East Ham.—December 17, Tuesdays fortnightly, 8 p.m., 12 Leigh Road, East Ham.
East London District.—December 15 (AGM and " DXpedition to Eire "), 2.30 p.m., Ilford Town Hall, High Road, Ilford.
East Molesey (TVARTS).—December 4 (" Nuclear Power," by A. Taylor, B.Sc.Eng., A.C.G.I., A.M.I.Mech.E.), 8 p.m., Carnarvon Castle Hotel, Hampton Court.
Edgware & Hendon (EARDS).—December 9, 23, 8 p.m., John Keble Hall, Church Close, Deans Lane, Edgware.
Enfield.—December 19 (AGM), 7.30 p.m., George Spicer School, Southbury Road, Enfield.
Gravesend (GRS).—December 18, 7.30 p.m., RAFA Club, 17 Overcliffe, Gravesend.
Guildford (G & DRS).—Second and fourth Fridays in each month, 8 p.m., City Cafe, Onslow Street, Guildford.
Harlow.—Tuesdays, 7.30 p.m., rear of G3ERN G. E. Read), High Street, Harlow. **(SRC).**—Wednesdays, 7 p.m., Edinburgh Way, Harlow.
Harrow (RSH).—Fridays, 8 p.m., Roxeth Manor County School, Eastcote Lane, Harrow.
Holloway (GRS).—Mondays and Wednesdays, 7 p.m. (RAE and Morse), Fridays (Club), 7.30 p.m., Montem School, Hornsey, N.7.

LOOKING AHEAD

December 7.—Barnet Radio Club Annual Christmas Party.
December 7.—Grafton Radio Society Christmas Party, Bedford Corner Hotel.
December 20.—RSGB Annual General Meeting.
April 5, 1964.—RSGB National Mobile Rally, Texas Instruments Ltd., Bedford.
May 24, 1964.—RSGB National Mobile Rally, USAF, Wethersfield.
May 24, 1964.—Northern Mobile Rally.
June 21, 1964.—Longleat Mobile Rally.
August 16, 1964.—Derby Mobile Rally.
September 13, 1964.—RSGB National Mobile Rally, Woburn Abbey.

Hounslow (HADRS).—Mondays, 7.30 p.m., Canteen, Mogden Main Drainage Dept., Mogden Works, Isleworth.
Ilford.—Thursdays, 8 p.m., 579 High Road, Ilford (nr. Seven Kings Station).
Kingston.—December 12, 8 p.m., YMCA, Eden Street, Kingston. (Morse Classes weekly on Fridays at 2 Sunray Avenue, Tolworth).
Leyton & Walthamstow.—December 31, 7.30 p.m., Leyton Senior Institute, Essex Road, E.10. Interested new members contact A. Rix, 17 Forest Drive East, E.11.

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Fridays, December 13, 1963 and January 17, 1964

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

London U.H.F. Group.—December 5 (Discussion on "R.F. Front Ends"), 7.30 p.m., Bull & Mouth, junction of Bury Place and Bloomsbury Way.
Loughton.—December 6, 20, 7.30 p.m., Loughton Hall (nr. Debden Station).
Mitcham (M & DRS).—December 6 (Film Show by G3LCH), December 20 (Construction Contest), 7 p.m., The Canons, Madeira Road, Mitcham.
New Cross (CARS).—December 13 (Construction Contest), January 3 (Demonstration by Green and Davis), Wednesdays and Fridays, 8 p.m., 225 New Cross Road, S.E.14.
Norwood & South London (CP & DRC).—December 21, CD Training Centre, Bromley Road, S.E.6.
Paddington (P & DARS).—Wednesdays, 7.30 p.m., Beauchamp Lodge, 2 Warwick Crescent, W.2.
Purley (P & DRC).—December 13, 27, 8 p.m., Railwaymen's Hall (side entrance), Whytecliffe Road, Purley.
Reigate (RATS).—December 14 (Constructional Contest), 7.30 p.m., The Tower, High Street, Redhill.
Romford (R & DRS).—Tuesdays, 8.15 p.m., RAFA House, 18 Carlton Road, Romford.
Science Museum (CSRS).—December 2 ("Transistors, their manufacture and operation," by E. Nicholson, Mullard Ltd.), December 16 (Christmas Gathering, Tape Recording on "Receivers" by R. H. Hammans, G2IG), Mondays, 6.30 p.m., Science Museum, South Kensington.
Sidcup (CVRS).—December 5, 7.30 p.m., Congregational Church Hall, Court Road, S.E.9.
Slough (SARS).—First Wednesday in each month, 8 p.m., United Services Club, Wellington Street, Slough.
Southgate & District.—December 12, 8 p.m., Atlasta School, Tottenhall Road, N.13.
St. Albans (Verulam ARC).—December 18, 7.30 p.m., Headley Road, St. Albans.
Sutton & Cheam (SCRS).—December 17, 8 p.m., The Harrow, High Street, Cheam.
Uxbridge (UDRS).—December 9, 23, 7.30 p.m., St. Andrews Church Scout Hall, Uxbridge Road.
Welwyn Garden City.—December 12 ("The G2DAF approach to SSB," by J. Kirby, G3JYG), 8 p.m., Vineyard Community Centre, Digswell Road, Welwyn.
Wimbledon (W & DRS).—December 13, 8 p.m., Community Centre, St. George's Road, S.W.19.

REGION 8

Crawley (CARC).—December 11 (Informal: for details contact G3FRV), December 18 (AGM), 8 p.m., West Green Centre.

REGION 9

Bath.—December 11, 7.30 p.m., Committee Room, Bath Technical College.
Bristol.—December 13 (AGM), 7.15 p.m., Royal Fort, Bristol University, Woodland Road, Bristol 8.
Burnham-on-Sea.—December 10 (Question Time and Grand Draw), 8 p.m., Crown Hotel, Oxford Street, Burnham-on-Sea.
Camborne (CR & TC).—First Thursday in each month, Staff Recreation Hall, SWEB Headquarters, Pool, near Camborne.
Exeter.—First Tuesday in each month, 7.30 p.m., George and Dragon Inn, Blackboy Road, Exeter.
Plymouth (PRC).—First Tuesday in each month, 7.30 p.m., Guild of Social Service Building, Plymouth. Other Tuesdays, Virginia House Settlement, St. Andrews Cross, Plymouth.
South Dorset (SDRS).—First Friday in each month, 7.30 p.m., alternately at Waverley Hotel, Westham, Weymouth and Labour Rooms, West Walks, Dorchester. December meeting at Weymouth.
Torquay (TARS).—December 7 (Christmas Draw and Social Evening), Club H.Q., Belgrave Road, Torquay.
Weston-super-Mare.—First Tuesday in each month, 7.15 p.m., Technical College, Lower Church Road.
Yeovil (YARC).—Wednesdays, 7.30 p.m., Park Lodge, The Park, Yeovil.

REGION 10

Port Talbot.—December 17 (Lecture), 7.30 p.m., Trefelin Workmen's Institute, 8/10 Jersey Street, Port Talbot.
Cardiff.—December 9 (Christmas Informal Meeting), 7.30 p.m., TA Centre, Park Street, Cardiff.

REGION 11

Prestatyn (FRS).—January 27, 1964 (AGM), 8 p.m., Clubroom, Railway Hotel, Prestatyn.

REGION 15

Belfast.—Third Friday in each month, 8 p.m., Toc H Room, 73 Lisburn Road, Belfast.

REGION 16

Basildon (BDARS).—Details of meeting may be obtained from the Honorary Secretary, G3RQT, 59 Waldegrave, Basildon.
Chelmsford (CARS).—First Tuesday in each month, 7.30 p.m., Marconi College, Arbour Lane, Chelmsford.
Great Yarmouth (GYRC).—Fridays, 7.30 p.m., "The Old Power Station (Manager's Office)," South Quay, Swanstons Road, Great Yarmouth. Details of meetings may be obtained from L. Jackson, G3HPR, 8 Arnott Avenue, Gorleston-on-Sea, Great Yarmouth.
Norwich (Norfolk ARC).—December 9, 8 p.m., "The Branford Stores," Branford Road, Norwich. Further details may be obtained from J. D. Simpson, G3NJQ, 50 Vicarage Road, Norwich.
Southend (SDARS).—Fridays (fortnightly), December 13, 27, etc., 8 p.m., in the Executives' Canteen of E. K. Cole Ltd., Priory Crescent, Southend-on-Sea. Further details from the Honorary Secretary, Mrs. P. M. C. Collop, 53 Beedell Avenue, Westcliffe.

REGION 17

Southampton.—December 14 (slide show of other countries by G3HVA), 7 p.m., the Engineering Lecture Theatre, Southampton University.

A revised catalogue of handles and accessories for instrument cabinets has been published by Alfred Imhof Ltd., Ashley Works, Cowley Mill Road, Uxbridge, Middlesex. The range of 30 attractive styles, which covers a total of 68 handles of various sizes, is comprised of types manufactured from mild steel, brass, diecast aluminium and diecast alloy finished in polished chrome, cadmium plate, or, for the diecast handles, silver anodised. Many accessories of hinges, locks, castors, mounting feet and screws are also listed. Drawings, and a full description is given of each part.

Further **Miniature Imlok** extrusions, corner connectors and accessories have been added to the existing range produced by Alfred Imhof Ltd. Extrusions are now available that will accept sliding panels and recessed panels, and additional angles of 15°, 45° and 75°, in both internal and external forms can now be accommodated. Various mounting brackets, threaded blocks, locks and hinges and additional corner connectors and mitring jigs are available.

Can You Help?

● D. Byrne, G3KPO, Jersey House, Eye, Peterborough, who requires details of the Valve Voltmeter No. 2?
● L. Miles, GW3IMQ, 76 Vicarage Road, Morryston, Swansea, who requires the circuit or any details for the ex-US Navy Indicator Unit, Type ID84/TPS-1B?

Closing date for the January 1964 issue
December 6

Closing date for the February 1964 issue
January 10

Copy received after these dates may be held over to the following issue if still topical

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OTHER BRITISH PUBLICATIONS

RADIO AMATEUR OPERATOR'S HANDBOOK. Contains a list of Amateur Prefixes with provision for heard/worked record, W.A.S. chart, Zones record, Counties Heard or Worked record, Call Areas, Directional bearings, Standard Frequency transmissions, etc. Published by Data Publications Ltd. 48 pages. **Price 5s. post paid.**

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WANTED.—All types of communication receivers, test equipment, tape recorders, amplifiers, etc. Prompt cash payment.—Details to R. T. & I. Electronics Ltd., Ashville Old Hall, Ashville Road, London E.11. (LEYton 4986).

WANTED: Two Air System Sockets for 4X150A's. Preferably without screen capacitor but with chimneys. Also heavy duty five way ceramic switch similar Ex TU5-B. G3NXC, 178 Clay Lane, South Yardley, Birmingham 26.

WANTED: Grid dip meter. **FOR SALE:** Class D. Wavemeter (AC Mains), £4. Jones, 24 Forest Avenue, Foresthall, Newcastle-upon-Tyne.

OFFICIAL APPOINTMENTS

VACANCIES IN
THE COMPOSITE SIGNALS ORGANISATION

A number of vacancies, offering good career prospects, exist for:—

RADIO OPERATORS (MALE)

Write, giving details of Education, Qualifications and Experience to:—
Recruitment Officer (CSO/43), Government Communications Headquarters,
'A' Block, Priors Road, Cheltenham, Glos.

LANCASHIRE CONSTABULARY
WIRELESS DEPARTMENT

Vacancies exist in the Lancashire Constabulary Wireless Department for civilian radio engineers in the following grades:—

SUB-SECTION LEADER, GRADE II

Qualifications desirable are H.N.C. (Light Current), or City & Guilds Full Technological Certificate in Telecommunications Technical Course.

WIRELESS ENGINEERS, GRADE III

Qualifications desirable are O.N.C. (Light Current) or City & Guilds Telecommunications Technicians Certificate.

Candidates for above posts should have recent experience of installing and maintaining VHF and UHF radio and electronic equipment.

Salaries—Grade II: £1,215-£1,380 p.a.
Grade III: £896-£1,215 according to age.

RADIO TECHNICIANS

Candidates should have a sound fundamental knowledge and practical experience of Frequency Modulated VHF radio telecommunications engineering. Salary £769 at age 21, rising to £1,036 subject to an efficiency bar at age 25.

A contributory pension scheme is in operation for staff.

Forms of application and Conditions of Service may be obtained on application to: The Chief Constable, Lancashire Constabulary, Hutton, Preston, quoting this advertisement.

OFFICIAL APPOINTMENTS—contd.

VACANCIES IN THE DIPLOMATIC WIRELESS SERVICE OF THE FOREIGN OFFICE

The Diplomatic Wireless Service has vacancies for radio engineering staff at Hanslope Park near Wolverton in North Bucks.

The work involves the use of HF, VHF, UHF and microwave receivers, associated test equipment, recorders and audio amplifiers.

Selected candidates must be prepared if necessary to undertake trips overseas of three to six weeks duration, unaccompanied by their families, up to three or four times a year.

Appointments will be in the grade Engineer Technician Grade III £886 (at age 26 and over)—£1,059.

Reduced starting salaries apply to younger candidates.

Good opportunities exist for advancement to Grade II (£1,059-£1,208) and Grade I (£1,208-£1,487) and, for the exceptional officer, to higher grades.

Applicants, who should be at least 22 years old, should hold one of the following, or an equivalent qualification.

(*a*) O.N.C. (Electrical) or,

(*b*) City & Guilds Intermediate Certificate in Telecommunications Engineering (old syllabus), plus Radio III, or

(*c*) City & Guilds Intermediate Certificate in Telecommunications (new syllabus), plus Mathematics B, Telecommunications Principles B, and Radio and Line Transmission B.

Applicants must have had an apprenticeship (or its equivalent) giving a good comprehensive training and having experience in skilled work in the radio communications field. Training and experience together must amount to 8 years: higher qualifications and an understanding of radio propagation at all frequencies would be an advantage.

Selection will be by interview.

Appointments will be on an unestablished basis but there will be opportunities for candidates to compete for establishment at a later date.

Candidates and both their parents must have been British subjects at all times since birth.

Candidates must be prepared to undergo medical examination.

Applications in writing giving age, qualifications and experience to the Personnel Officer, Diplomatic Wireless Service, Hanslope Park, Wolverton, Bucks, and quoting Box F.S.I.

FOR SALE

STATION OF THE LATE G3COT. K.W. Vanguard (built from kit); K.W. L-pass Filter; HRO (miniature valves) and P.S.U. with 7 coils; Eddystone Bug Key; Acos Mic; Z-Match (needs wiring); Class D Wavemeter; BULLETINS from Volume 24. No reasonable offers refused. Equipment viewed at 44 Lancaster Road, New Barnet, Herts. Enquiries to G3GMY, 48 Borough Way, Potters Bar, Middlesex.

IMMACULATE LABGEAR LG50 TX, ready for operation £28 (Owner now QRO).—V. W. Stewart, 9 Belmont Avenue, Juniper Green, Midlothian.

GONSET TRANSCEIVER. S.76—6 band with mobile power supply, ideal for desk or mobile. Cost £350, accept £175. Eastell, 9 Prod Lane, Baildon, Yorks.

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

FOR SALE—contd.

EDDYSTONE 840A AC/DC RECEIVER 480 Kc/s to 30 Mc/s. New 1961 in excellent condition. Owner deceased. Buyer collects Nottingham. £40 or offer. Box No. T.7107, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

EDDYSTONE 840A RECEIVER—almost unused, for sale. Offers, please, to M. J. White, 34 Hillview Crescent, Newport, Mon.

HRO with five coils, also Hallicrafters S38B ·5 to 30 Mc/s. Any offers to Buchanan, 26 Fisher Crescent, Clydebank, Dunbartonshire.

MULTIBAND ANTENNA TRAPS, 80 thro 10m, high efficiency and superbly finished, only 45/-. Silicon Diodes 500 mA 1000 PIV, 9/- each. OC.44, 45, 81, 81D, 3/6d. each. OC 170, 4/-. OC.171, 4/6. Plus P. & P. Wakeley, 70 Arnold Road, Binstead I.O.W.

EDDYSTONE 888, Speaker, " S " Meter—mint condition, £65.0.0. Eddystone 358 type Rx, some coils, requires attention, £6.10.0. Minimitter 150 watt Tx. Mint condition £50.0.0. Power packs—relay rack mounting—1500 volt 500 ma., 1400 volt 500 ma., 800 volt and 550 volt 500 ma. £6.0.0. each. Two power packs 350 volts 250 ma. 90 volts regulated bias £5.0.0. each. TZ40 Modulator relay rack mounted £5.0.0. Minimitter 10/15/20 beam, 30 ft. Telescopic mast, Rotator, Selsyn Indicator, power supply £25. 0. Buyer collects. G2COP, Chesterfield Grange, Lichfield, Staffs. Tel.: Shenstone 230.

K.W. VICEROY, late Mk II little used, perfect condition, separate power supply £95. EX 20 Beam £7.0.0. G3AZT, " Woodcote," Tubney, Abingdon, Berks.

VICEROY SERIES II, with xtal mike and DOW COAX C.O. Switch. DRAKE 2B with Calibrator—Q Multiplier and Speaker. Complete station in mint condition £200—going QRT. G4BL, 48 White Street, Derby.

PANDA PR 120V TX, Eddystone S640 with matching speaker, G4ZU BEAM, MAST (2 in. Alloy), MOTOR (Prop-Pitch) and INDICATOR £80. G13OAU.

NATIONAL NCX3 SSB Transceiver—full coverage 80/40/20 metres—200 watts P.E.P. with NCXD Mobile Transistor Power Supply. Demonstration London, £185. Box No. T.7108, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

EDDYSTONE 888A, mint condition, little used. Best offer over £70 secures. G3HS. (Telephone Faringdon 2225 after 6 p.m.)

500 yds of lead covered 3 core solid drawn ·01 core, equal to 7-044, with tracer colours. Offers—Thomason, Foxley Lodge, Higher Lane, Lymm, Cheshire. Phone Lymm 155.

CR300 RECEIVER 15 kc/s-24 Mc/s, continuous coverage. Good condition. With external hook-up P.S.U., £15. Will deliver N.W. London, otherwise buyer collects. Write G3DCS, 215a, Woodbridge Road, Ipswich.

C.C.T.V. CAMERA ready for use with any T.V. set any channel and Band 1 with 1 in. bloomed f/2·5 lens and 14 yd. monitor cable, £59. Radar Video and Sync generator, £18. Eddystone 680, £48. SX28 for rack mounting, £22. AR88LF S-meter aligned to specification, £38. All band 150W in 6 ft. enclosed rack, supplies, modulator 5RV exciter ZL linear PA connections for SB-10U, £68. G3CTR/T, 29 Aspinden Road, London, S.E.16.

DEPENDAPAC Transistor power supply, as new, £15. No. 62 Transceiver 1·6-10 Mc/s. 6V6 P. & S. modulated by 6BW6, less power supply, £12. Heathkit Q Multiplier, £5, or offers to—GM3PZR, 5 Rosselm Cottages, Rossie, Auchtermuchty, Fife.

FOR SALE—contd.

WALKIE-TALKIE, Marconi Type H19, suitable four-metre band, present crystals Tx 85·875 Mc/s, Rx 72·375 Mc/s, complete with accessories and handbook. Offers to Hanley, Westmead, Bridport, Dorset.

MOBILE. Heathkit Cheyenne Tx, Comanche Rx, 10-80m, with 12V transistor and mains power supplies, manuals, lot £50. KW Valiant Tx 10-80m., new unused, no psu, £25 o.n.o. B & W 2Q4 Audio Phase Shift (2) 30s. each. New Valves, Pair 811A, £2; TT21, £1; 6146 (4), 15s. each. Geloso Ham Band Converter 4·6 Mc/s IF, £10. Japanese transistor intercom, master, two slaves, mint, £10. Numerous new components, valves.—Roberts, 14 Woodlands Close, Swanley, Kent. (Swanley 3602 after 7 p.m.).

LATE GM3HGU gear must be disposed of: HRO Rx 5 coils; Eddystone Rx S640; Power unit Type 247; Home built Tx's; lots of other gear.—Melville, 7 Munro Street, Kirkcaldy, Fife. Call Wednesday night or Sundays. Buyer collects.

TAYLOR VALVE TESTER TYPE 13A, incorporating multi-range meter—good condition, £10. Signal Generator by Test Gear (Acton) Ltd., £4.—Hayes. Vines Cross, Horam, Sussex.

AR88D CHASSIS. Dirty but probably working. No valves. £10. SX 28. Cabinet recently re-sprayed and in working order, £25. Airmec C864 Receiver, perfect, £65. The White Cottage, Plymbridge Road, Crownhill, Plymouth.

LG300. H.B. P.P. & Mod.—UM3—small rack—spare 813—immaculate condition, £50. Hallicrafters SX28, £25. Buyer collects or carriage extra.—GM3NIO, 10 Burdiehouse Drive, Liberton, Edinburgh.

ALL TYPES of modern and obsolete valves at low prices. S.a.e. lists/enquiries. Radio/Television books. Service sheets.—Hamilton Radio (B), Western Road, St. Leonards, Sussex.

BAMBOO POLES FOR CUBICAL QUAD ANTENNAS, ETC. ALL SIZES. S.A.E. BRINGS LIST.—WHINES & EDGELER, BAMBOO PEOPLE, GODMANSTON, DORCHESTER, DORSET.

CATALOGUE No. 15.—Government Surplus Electrical and Radio equipment. Hundreds of items at bargain prices for the experimenter and research engineer, 2/6 post free: catalogue cost refunded on purchase of 50/-.—Arthur Sallis Radio Control Ltd., 93B North Road, Brighton.

K.W. VANGUARD—Built K.W. Electronics, as new, little used, interior untouched since purchase, £45 o.n.o. Cost £66 3s.: Station (London) QRT. Gift Panda L.P. filter, perfect. List £4 17s. 6d. Box No. T.7106, c/o RSGB BULLETIN, 4 Ludgate Circus, London, E.C.4.

QRT. Elizabethan 150W 6 band TX with P.U., £20. BC221, perfect, £15. Many components. Buyer arranges collection. G3MWY. 16 East Way, Shirley, Surrey. SPR 4110.

WANTED

WANTED: Type "A" Mk III and other resistance movement radio equipment. Only complete and original items considered. 32 West Belvedere, Danbury, Essex.

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