The SHORT WAVE Magazine

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The SHORT WAVE Magazine

EDITORIAL

Omission

In the B.B.C.'s Home Service at 9.15 p.m. on December 18, Sir Noel Ashbridge—the Corporation's distinguished Chief Engineer and until recently their Director of Technical Services—was featured to give a talk entitled "Service on Short Waves," in commemoration of the 21st anniversary of the B.B.C. Overseas Service. The talk was billed in the RADIO TIMES *as being for, among others, "fans and hams"* (sic). *In the course of his talk, Sir Noel reviewed briefly developments from the early days before 1914 to the present time—DX on 600-metre spark, the significance of the thermionic valve, the opening of vast new areas of ether space, the Marconi/Franklin experiments on short waves, the B.B.C.'s first short wave station at Chelmsford, culminating in their regular overseas service, established on December 19, 1932.*

Quite a comprehensive review, covering a lot of ground in a short time, in the space of which it was obviously not possible to mention everything. But to have heard this talk you would—if you did not happen to know otherwise—have been left with the clear impression that it was the B.B.C. that carried through all the experimental work to make "Service on Short Waves" possible.

What Sir Noel most regrettably omitted to mention, and what is far more important than many of the points he did discuss, was that all the experimental proofs as regards short wave propagation were furnished—not by the B.B.C., or Marconi's or any other such agency—but by the amateur transmitters of the day, and the amateurs alone. Further than this, the first experimental short wave broadcasting station in this country was established, not by Marconi's or the B.B.C., but by Gerald Marcuse, G2NM, then of Caterham, Surrey, who was specially licensed by the G.P.O. to transmit an experimental programme service to the Empire on 32 metres. Incidentally, he was also permitted to do this at his own expense. It was as the direct result of the success of these Empire broadcasts from G2NM that the B.B.C. went ahead with their experiments.

In view of the ground covered by Sir Noel Ashbridge in his talk, his eminence as a radio engineer, and the respect due to any pronouncement he may make in the field of radio engineering, it is much more than regrettable that he failed, by so much as a single phrase, to give any credit at all where the record proves it to be abundantly due.

It was the amateurs alone who first explored the short waves—this they did to such effect that they are now in process of losing the very territories they did so much to discover. Thus the wheel has turned against us—it must be accepted as part of the price of progress. But at least let the record be kept straight.

Austin Forbes G6FO.

A Miniature Oscilloscope

SELF-POWERED UNIT OF DIMINUTIVE SIZE AND GOOD PERFORMANCE

J. A. PLOWMAN, A.M.Brit.I.R.E. (G3AST)

The value of an oscilloscope, like that of a GDO, is not fully appreciated until it has been built and used. Apart from the interesting ways in which an oscilloscope can make itself useful, there are many tests and adjustments which can only be done properly with it. This article describes a neat and practical instrument, with all necessary refinements incorporated.—Editor.

DURING recent years there has been an increasing tendency to "miniaturise" equipment, and naturally this technique has spread to the world of Amateur Radio.

The oscilloscope described here and constructed with this end in view, while being reduced to small dimensions, can perform on an equal footing with instruments of much larger proportions. The idea of being able to build a complete oscilloscope in the space occupied by two QSL cards side by side was extremely intriguing, and much simpler than at first envisaged.

The obvious requirements, besides small dimensions, were that the instrument be entirely self-contained, *i.e.*, that the power supply be integral, and that Y-amplifiers and sweep circuits be available at the turn of a switch.

The oscilloscope as pictured here is built entirely from "surplus" components (with exception of the cathode ray tube) and was constructed at surprisingly small cost. What it might cost the individual depends entirely upon what parts he may have on hand, and where he decides to buy what he needs.

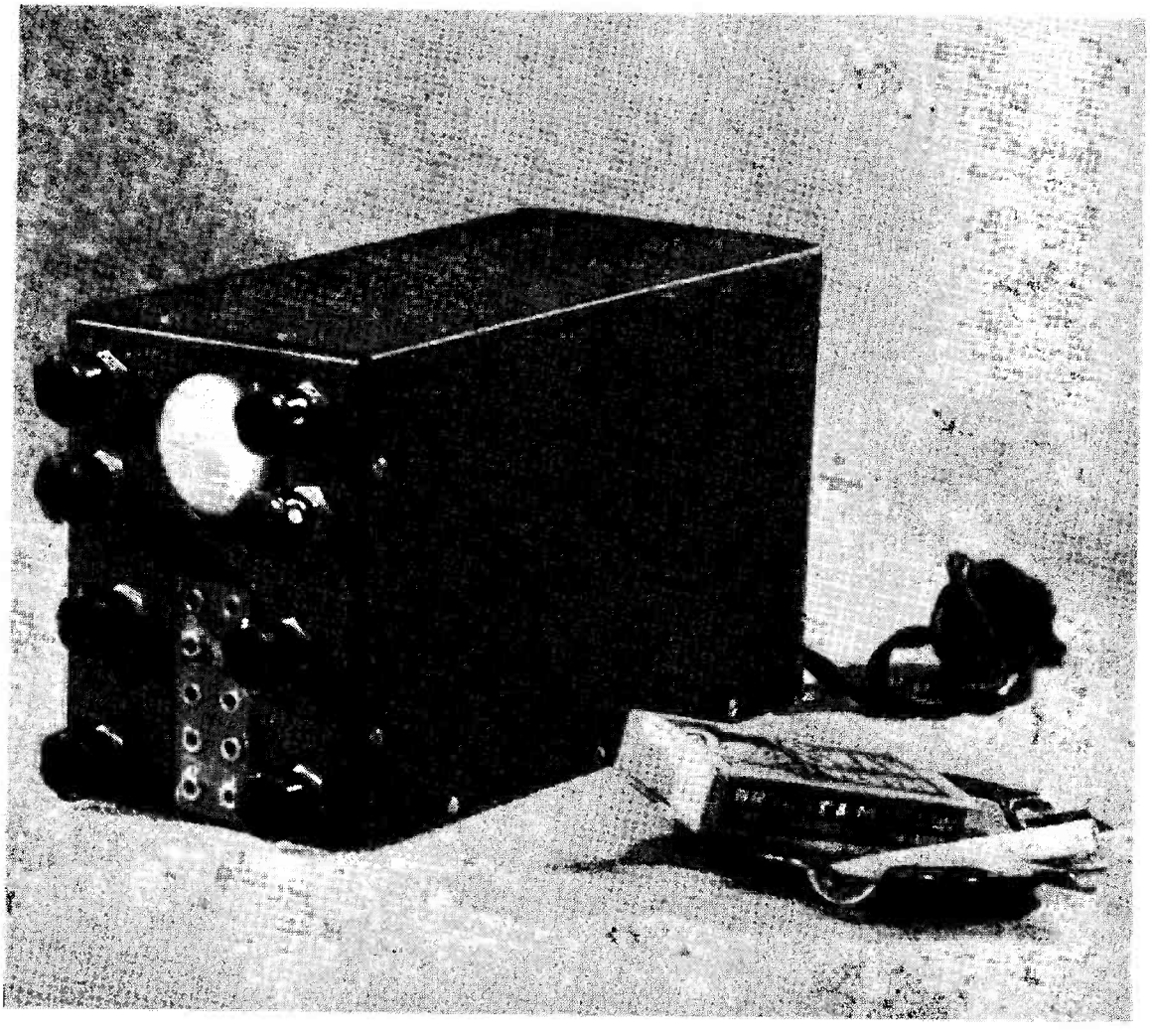
Basic Design

The design of the instrument was based on the G.E.C. cathode ray tube Type 4103 which has a 1½" diameter screen, and requires only 500-700 volts gun potential for satisfactory operation and spot size. There are two phosphors available for this tube, either green or pale blue; the latter is preferred by the writer, as it seems more pleasing to follow, and easier to watch in very light conditions. The pale blue phosphor is denoted by the suffix E4, which should be added to the tube type number when ordering.

By using peanut valves for the time base, X, and Y amplifiers, it was not necessary to resort to trick circuits in the interests of space. The sawtooth oscillator is a 6F12 pentode. The Service number of this valve is CV138, and multitudes of them are available as surplus. The oscillator is a Transitron, and is easy to get working; the amplifier is a 9002 triode used as an "inverter" valve. This provides an output identical in magnitude to the oscillator but in antiphase, symmetrical operation of the deflector plates then being possible.

The 9002 triodes are cheap enough and two more are used in a similar amplifier circuit for the Y-plates. The symmetrical operation of the tube eliminates any possibility of trapezoidal distortion, although this defect is barely noticeable even when operating one deflector plate only. The phase splitter circuitry is due to Carpenter, and provides an amplifier of very good characteristics for this type of work. For extended frequency ranges, pentodes would probably be preferable. The power supply is simplicity itself. The power transformer is a midget job and was originally intended for a bias pack. The ratings are primary 200-250v. tapped, 50 cycles, secondary 150-0-150 at 20 mA, 6·3v. 1 amp. 4v. 1·5 amps. The 4-volt winding, originally intended for a rectifier, is used for the tube heater, while the 6·3v. winding supplies the peanuts. The rather unorthodox smoothing circuit was incorporated to avoid interaction between the oscillator and amplifier *via* the power supply. Since the advent of sub-miniature electrolytic condensers it has been possible to be fairly liberal with the smoothing. The smoothing choke is a miniature pot type, and only carries a portion of the load current. The inductance is about 40 Henrys.

The rectifier circuit is rather unorthodox but nevertheless very effective, and in some respects may be original. Basically, the circuit is a standard voltage doubler, but it was thought possible to incorporate an asymmetrical scheme of rectification, as the current drain of the instrument is so low. The transformer secondary is 300 volts (ignoring the centre tap) and across the two secondary tags is wired the standard voltage doubler circuit. However, it will be seen from the table of values that one leg of the doubler circuit is a J50 rectifier, whereas the other leg is an STC 18 M/M rectifier stack. Similarly, the condensers are asymmetrical, one half being 2



General appearance of the Oscilloscope described by G3AST, with a size comparison. It is truly a miniature job, and yet will give excellent results as a workshop instrument. Full details will be found in the accompanying article.

μF, 600-volt paper, while the other is a 8 μF midget electrolytic. Due to the fairly high forward resistance of the STC disc rectifier, the *peak* charging current is kept down to tolerable value.

It will be seen from the circuit that neither the "top" nor the "bottom" of the CRT voltage divider network is earthed, but a point midway between this allows over twice the AC secondary voltage from the mains transformer to appear as rectified DC across the tube.

Construction

The whole unit measures 5" high, 3½" wide and 8" front to rear, excluding knobs.

The case is made of steel, but in order to assist folding up the various pieces the thickness was reduced to 20 SWG, and while it seems to be less rigid than might be desired when dismantled, it is quite a sound job when assembled. The mounting chassis is made of 18 SWG aluminium for easy working and is 2½" deep, running the whole length of the case. Only one side drop and one end are provided on this chassis, the right side (looking from front) being reduced to a ⅜" lip for stiffening purposes only. This proved necessary in order to gain easy access to the inside for wiring up! As the front panel space is severely restricted, the choice of potentiometers must be made with great care. The maximum tolerable

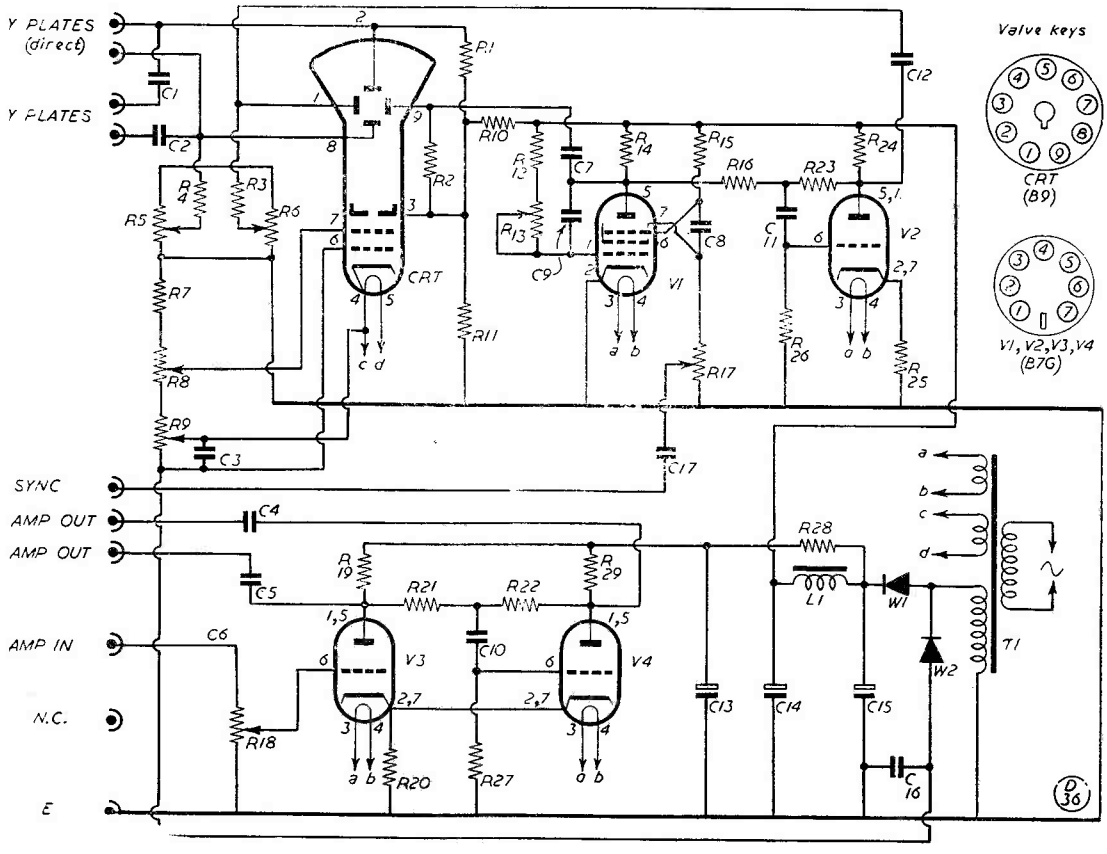
diameter for any of the potentiometers is a fraction over one inch. Only Morganite type J seemed available to meet this requirement, although types even smaller are on the retail market. Above the chassis, it was found only possible to fit four controls owing to the space required for the CRT screen. These four controls are X-shift, Y-shift, focus and brilliance, and are held together as a unit by a piece of 16 SWG copper wire that is sweated to the body of each. This allows the four potentiometers to be removed as a "unit." The connections to these potentiometers are made up into a cableform to improve the appearance, and avoid straggling wires. No interaction was experienced.

Three more potentiometers and one rotary switch are mounted below the chassis. These are: Amplifier gain, Sync. amplitude, and Time Base fine frequency adjustment. The time base "coarse" switch is an Oak pattern,

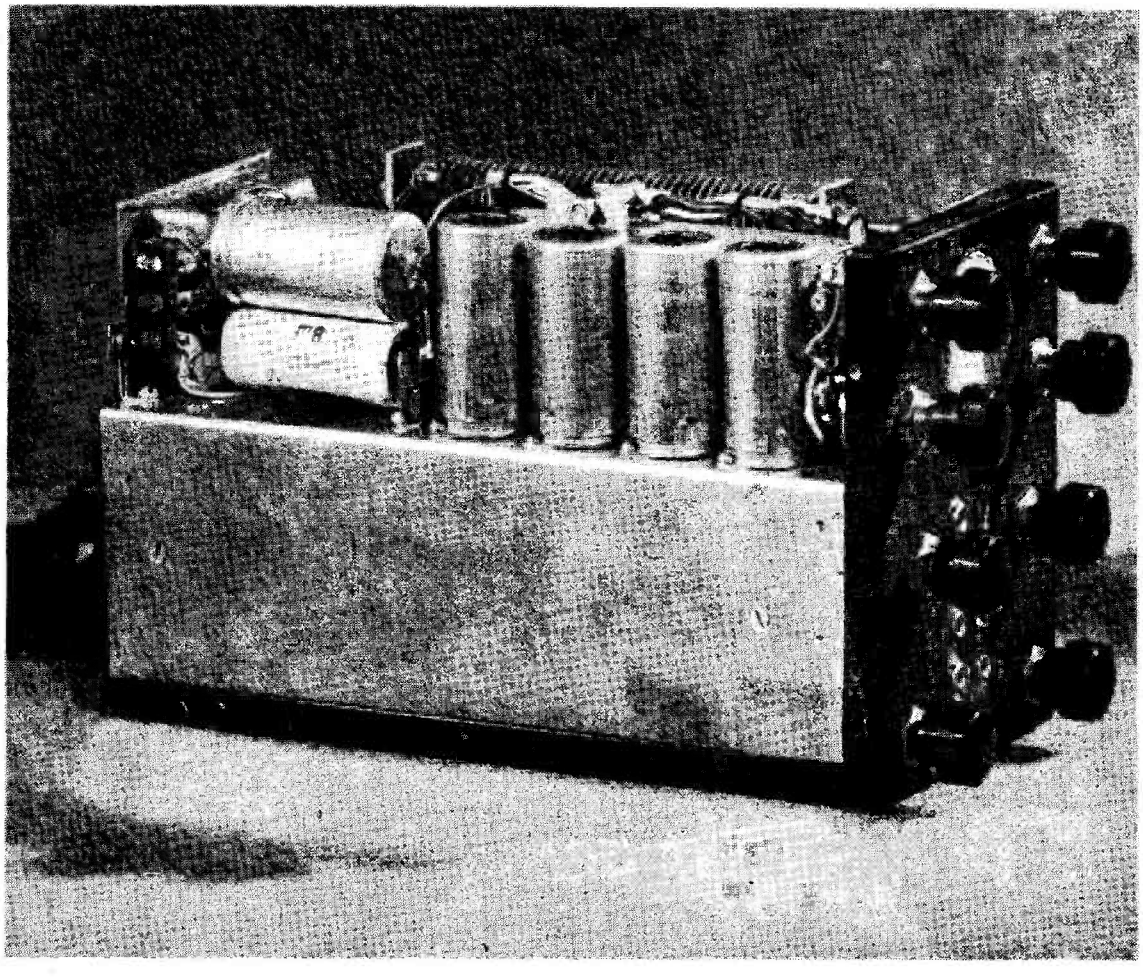
Table of Values

Circuit of the Miniature Oscilloscope.

C1, C2, C4, C5, C6, C7, C10, C11, C12, C17	=	.05 μF, 350v. wkng. (TCC).
C3	=	0.5 μF, 150v. wkng. (TCC).
C8, C9	=	*See table.*
C13	=	8 μF, 350v. "Dilitic" (TCC).
C14, C15	=	16μF/8μF midget.
C16	=	2 μF, 600v. paper.
R1, R2, R3, R4, R25, R27, R5, R6,	=	1 megohm, ¼-w.
R18	=	1 megohm, miniature pot'meter.
R7	=	500,000 ohms, ½-watt.
R8, R9	=	470,000 ohms, miniature pot-'meter.
R10, R11	=	330,000 ohms, ½-watt.
R12	=	250,000 ohms, ½-watt.
R13	=	2 megohms, miniature pot'meter.
R14, R19, R24, R29	=	47,000 ohms, ½-watt.
R15	=	22,000 ohms, ½-watt.
R16, R21, R22, R23	=	220,000 ohms, ½-watt.
R17	=	220,000 ohms, miniature pot-'meter.
R20	=	500 ohms, ½-watt.
R26	=	1,000 ohms, ½-watt.
R28	=	4,700 ohms, 1-watt.
T1	=	150/150v., 20 mA, 6.3v. 2 amp., 4.0v. 1 amp.
V1	=	6F12 (CV138).
V2, V3, V4	=	9002.
W1	=	H-18-30-IL rect., S.T.C.
W2	=	J50 rectifier.



Circuit diagram of the Miniature Oscilloscope designed and constructed by G3AST. For simplicity, the capacity switching round V1 is omitted, and necessary details are given in the table. The CRT used is a G.E.C. Type 4103-E4, which can be operated satisfactorily at a comparatively low EHT voltage.



An impression of the interior layout of the Miniature Oscilloscope. Careful use must be made of the available space if the size is to be kept down.

single-wafer 3-pole four-way—this type being the only one available locally. Actually, a two-pole switch was required, and thus the third set of contacts are left unused. The front drop of the chassis, being necessarily deep, is cut down the centre line and a narrow fillet of 16 SWG laminated fabric sheet inserted. This piece of insulating material carries the Clix sockets on the front panel; type 348 are suitable for this application, being of very moderate overall dimensions. Ten sockets are used in all, only one being "spare." This is a good thing as later developments may demand another socket. Y-deflector plates are brought out directly, as well as *via* two ·05 μF blocking condensers; this is a distinct advantage and greatly increases the versatility of the instrument. The remaining sockets are: Amplifier output, Amplifier input, and Sync. The original circuit was designed to use a 5 megohm potentiometer from the grid of V1, to HT +. However, it appears that this value of resistance is not standard in the miniature size, and it was necessary to use 2 megohms or wait for twenty weeks! The time constant of this resistance and the respective condenser from grid to plate of V1 at potentiometer extremities is a measure of the frequency range of each step selected by the "coarse" switch. Space

"TB COARSE" SWITCHING

Posn.	C8	C9
1	.01 μF	.001 μF
2	500 $\mu\mu$F	100 $\mu\mu$F
3	100 $\mu\mu$F	50 $\mu\mu$F

was obviously at a premium throughout the construction of the instrument, and it was not found practicable to employ 0·1 μF condensers for coupling owing to their bulk. The TCC ·05 μF condensers type 346, however, cause no appreciable attenuation and are considerably smaller. To avoid congestion immediately below the valve sockets, a large resistor board was installed down the left side of the chassis. On this board are mounted a large proportion of the condensers, and although such a step has resulted in rather longer leads than at first anticipated no trouble has been experienced. All resistors are miniatures.

It was almost inevitable that the tube should experience interference from the magnetic field of the transformer under such congested conditions, and it was necessary to shroud it with mu-metal. New mu-metal sheeting is rather expensive to buy, and the shroud in this instance was cut from half a shroud intended for a VCR97 CRT in a radar unit. Care should be taken to make a good magnetic joint at the seam, and if possible a $\frac{3}{8}$" overlap should be obtained, otherwise the shield partly loses its screening properties.

No difficulty was experienced in getting the unit working. Even at 700 volts EHT, the trace is thin and bright, showing up quite well, even when working on the operating desk or workbench, which is normally well illuminated. For this reason a light shield was not fitted in front of the tube. Should, however, the instrument be used in bright daylight, a screen may be fitted to avoid the strong light falling directly on the face.

It was necessary to use rather small knobs in order to avoid completely covering the panel, and the Eddystone type was found eminently suitable. The instrument is easy to handle and a joy to use, and while presenting a most diminutive appearance, has a performance equal to manufactured instruments very many times its size.

Noise Reduction in Station Design and Layout

WITH NOTES ON TEST SEQUENCES

J. C. BELCHER (G3FCS)

This article brings to an end a very useful series on the practical aspects of Noise Reduction as it affects most amateur stations. Our contributor has shown that it lies within the power of the sufferer to do a great deal to help himself in a location which is electrically noisy —that there is no need or excuse for accepting a high noise level if the principles set out in his series of articles are followed, so far as may be practicable. It is, of course, obvious that the ideal condition is not likely to be attainable at every location, since each case is different, and some are very difficult. But that is no reason for not taking such steps as are possible to obtain better reception. Previous articles in this series, dealing with receiver design and aerial-earth installations, appeared in our issues for November and December, 1953.—Editor.

IN previous articles the general design and constructional principles of the noise-free receiver and its associated aerial and earth system have been dealt with. It now remains to consider the general installation, and those items of auxiliary equipment used in conjunction with it.

The location of the noise-free receiver is of prime importance, and should therefore take priority over all other apparatus when deciding upon the layout of the amateur station.

It has been emphasized that the receiver earth lead should be as short as possible, in order to reduce the effect of possible noise pick-up. For the same reason it is also recommended that the length of the aerial feeder be kept to a minimum. Admittedly, if the feeder fulfils the requirements laid down in pp. 590-591 of the December *Short Wave Magazine* its length — especially in the noise zone—will be immaterial. At the same time, however, it is a sensible precaution to limit the possibility of noise pick-up wherever practicable and for this reason a short feeder connection between the lead-in and the receiver is desirable.

Conseqently, the receiver should be installed quite close to the lead-in point and the

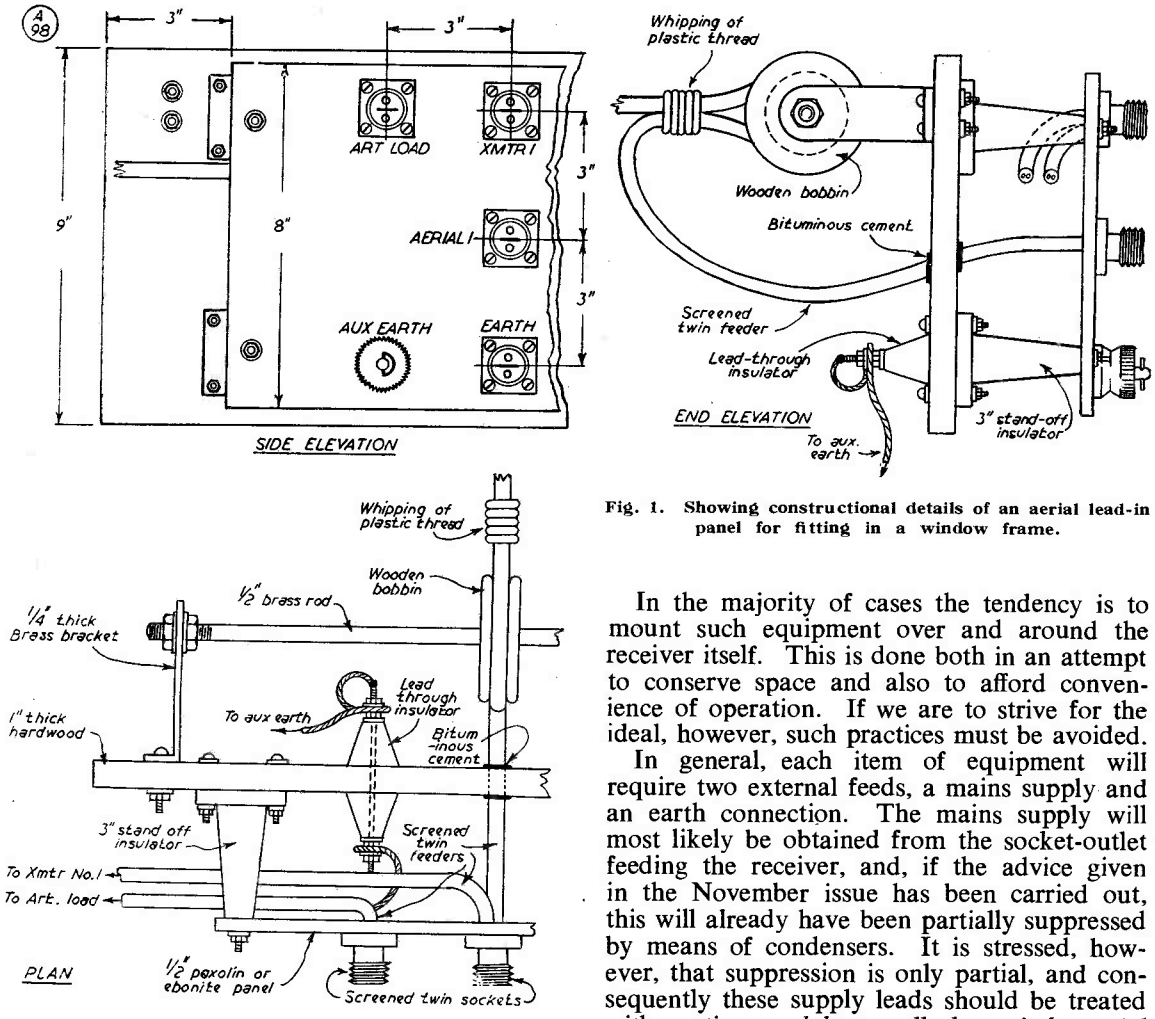


Fig. 1. Showing constructional details of an aerial lead-in panel for fitting in a window frame.

inter-connecting leads kept short and direct. This doesn't mean that the feeder should be stretched tightly between the two points; neither does it mean that about ten feet or so of spare cable should be coiled up behind the receiver for fear of spoiling a good length of cable by cutting it shorter! The happy medium should be aimed at, bearing in mind that every additional inch of feeder may mean an increase in noise level.

The Auxiliary Equipment

The location of the auxiliary equipment can now be considered. This equipment may include all or any of such items as the CW key, microphone and speech amplifier, exciter unit, freqency meter, monitor, control panel, beam rotating controls and position indicator, as well as the desk lamp and electric clock.

In the majority of cases the tendency is to mount such equipment over and around the receiver itself. This is done both in an attempt to conserve space and also to afford convenience of operation. If we are to strive for the ideal, however, such practices must be avoided.

In general, each item of equipment will require two external feeds, a mains supply and an earth connection. The mains supply will most likely be obtained from the socket-outlet feeding the receiver, and, if the advice given in the November issue has been carried out, this will already have been partially suppressed by means of condensers. It is stressed, however, that suppression is only partial, and consequently these supply leads should be treated with caution, *and kept well clear of the aerial feeder system.* As far as the earthing is concerned, the auxiliary equipment should be connected to a separate earthing system. In this way the receiver earth is left in isolation and the possibility of mutual noise potentials is obviated. It will be appreciated, of course, that to this end there must be no metallic contact between the chassis housing the auxiliary equipment and the receiver console.

In order to provide reasonable convenience of operation and to meet the above requirements, the obvious solution is to accommodate such equipment on a second console which is electrically insulated from the receiver console. It should preferably be L-shaped in plan and should be located on the right-hand side of the receiver, resulting not only in a logical layout but also in a comfortable operating position.

The Transmitter

In keeping with modern techniques, it is assumed that the transmitter proper, *i.e.*, power amplifier, aerial tuning unit, modulator and associated power supplies, is TVI-proofed. In other words, the mains supply will be filtered, all stages will be well shielded, and probably a screened-twin aerial feeder will be employed.

In spite of this, the fact should not be overlooked that this unit is connected to both the "noisy" mains supply and also to an external aerial system which is probably erected in the noise-free zone. As a result, therefore, it may be possible for the conduction of noise currents from the mains supply to the aerial system to take place—even when the transmitter is not supplying RF power to the aerial. It is advisable, therefore, to install a mains filter in the supply lead to the transmitter in order to attenuate such currents, and finally to keep the transmitter and receiver aerial feeders well separated, even if they are eventually connected to the same aerial as would be the case where simplex operation is employed. Needless to state—there should be adequate physical separation between the transmitter unit and the receiver console.

The Aerial Lead-In Panel

In the average amateur station the aerial lead-in panel — like the aerial tuning and coupling network—is usually in the nature of an after-thought. Consequently, the result is often neither pleasant to the eye nor in conformity with good engineering principles. In lots of cases the aerial feeder is brought in either by way of a hole drilled in the window frame, or else through a ventilation grille. Where several feeders are involved the effect is often chaotic, and flexibility of operation is very limited.

An aerial lead-in panel is desirable in the noise-free installation, however, for the following reasons:—

(a) It provides a junction point between external and internal feeder and earthing systems.
(b) It provides a jumping point for the selection of one of several aerials.
(c) It provides a relay switching point for transferring an aerial to the receiver or transmitter where simplex operation using one aerial is employed.
(d) It provides an earthing point for aerials not in use and where lighting protection is required.
(e) It provides a convenient point for applying an artificial load to the transmitter, or a short-circuit to the receiver input.

An example of such a panel is illustrated in Fig. 1. Incoming aerial feeders are looped around the wooden bobbins and made fast with a whipping of plastic thread. This ensures a safe anchorage and diverts any tensile strain from the feeder terminations. The wooden bobbins are threaded on to a brass spindle which in turn is supported by two brackets bolted to the lead-in panel. Each feeder is then led in *via* a close-fitting hole drilled in the panel, the hole sloping upwards from the outside in order to prevent the ingress of moisture. As an added precaution the feeder is smeared with bituminous cement before being inserted fully into the hole, so as to seal off any small gaps.

The screened socket termination of each feeder is mounted on a sub-panel which in turn is bolted to stand off insulators screwed to the main panel.

The noise-free receiver earth—in this case run in heavy gauge coaxial cable — is also brought into the room in a similar manner, except that an anchor point is not necessarily required.

The auxiliary earth is an unscreened conductor which is brought in *via* an ordinary lead-through insulator, care being taken to short-circuit electrically all pressure contacts as advised in the December article. In this case the termination on the sub-panel is a standard 0.BA terminal.

A schematic diagram of the panel is shown in Fig. 2. Jumpering sockets are provided for the transmitter outputs, receiver inputs and feeder earthing facilities as well as for the transmitter artificial load and receiver input short-circuit. Where an aerial change-over relay is provided, three screened sockets are fitted on the panel in order to give access to its contacts. The relay, of course, should be screened and the screen earthed, and here one may run into difficulty. The outer sheath of the aerial feeder must be connected to the outer sheath of the cable feeding the receiver, and this connction is afforded by means of the relay screen. This applies no matter whether an ordinary open relay is employed or whether a special relay designed for use with screened-in twin feeder, *e.g.*, a "twinaxial" relay, is used. A moment's reflection will confirm that if the sheath of the transmitter feeder is also connected to this screen, then a direct connecnection will be made between the auxiliary earth connected to the transmitter and the noise-free receiver earth. In order to overcome this a break is made in the sheath of the length

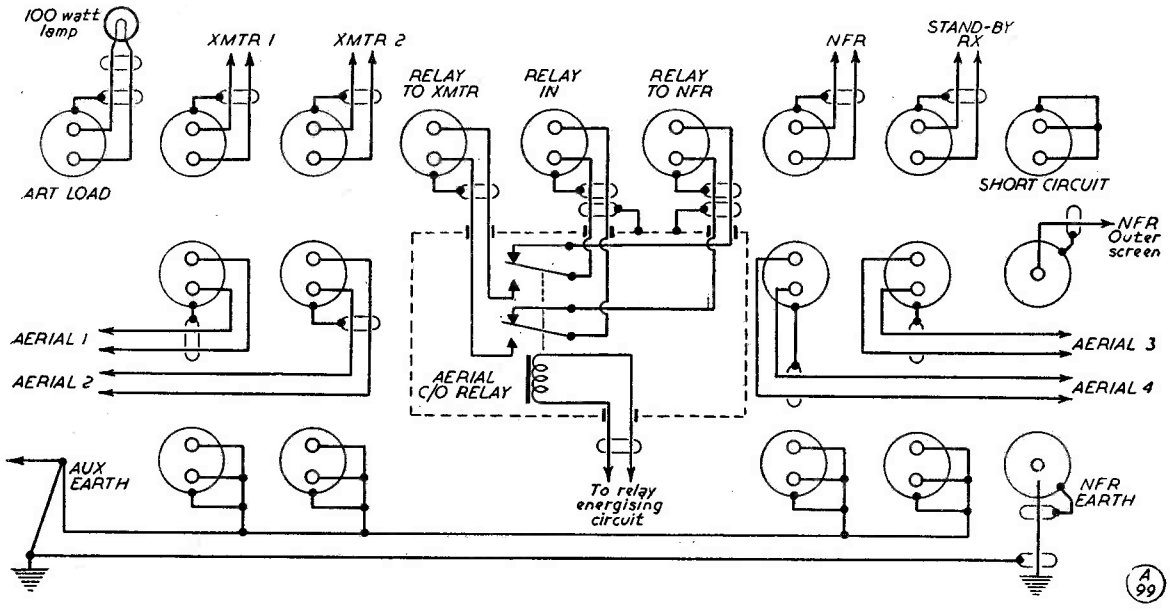


Fig. 2. Schematic diagram of an aerial lead-in panel, accommodating all usual requirements. The degree of elaboration to which the layout is taken obviously depends upon individual needs, but it is a good thing to provide terminations with a view to possible future development.

of feeder between the relay and the outlet socket to the transmitter. Similar precautions should also be taken with the screened control circuit cable feeding the relay solenoid.

The mounting of the panel depends to a great extent on the type of window fitted in the operating room. Where this is a casement window, the only solution is to remove a window pane and to fit the panel in its place. Where a sash window is employed, however, the scheme illustrated in Fig. 3 should be followed. To install the panel, the three wooden mouldings labelled " A," " B " and " C " are first of all removed. The inner window frame is then pulled to one side on its sash lines and the two wooden laths, " D " and " E," are taken out. The outer window frame is then lowered and the panel—which has been cut to fit the width of the frame—is then fitted in position, after which the window is re-assembled. In order to prevent draughts, the panel is made to fit closely between the grooves, and strips of rubber should be tacked along its top and bottom edges. Finally, a rubber draught-excluder is fixed to the bottom edge of the outer window frame, being cut to shape in order to allow it to fit snugly against both inner frame and glass.

The advantages of the above method—where the appropriate type of window is fitted—is that the lead-in panel is out of the reach of small inquisitive fingers, and that the window adjustment is not materially affected. Moreover, the fabric of the window is not damaged in any way, which is a big advantage over other methods.

Suppression of Aerial Auxiliaries

Apart from the aerial change-over relay, two other circuits auxiliary to the aerial are likely to be encountered. They are the beam-rotating mechanism (driven by a reversible electric motor) and the beam direction indicator circuit. These three circuits are important because, like the transmitter and its associated wiring, they represent conducting paths from the noise zone to the aerial system.

A suitable filter network to insert in each conductor before it leaves the noise-zone is shown in Fig. 4. In order to reduce any further possibility of noise fields being set up in the noise-free zone, all circuit wiring and associated components should be screened and the screens bonded to the auxiliary earth. In this respect, lead-covered cable is suitable for the circuit wiring, and has the advantage of immunity from the effects of weather, provided the sheath is not damaged during installation.

The next problem is that of suppressing the beam-rotating motor. This will normally be

a shunt-wound DC machine, the commutator of which will most likely provide a source of high-level interference in the vicinity of the aerial. This interference will, unfortunately, be most troublesome whilst heading the beam in the direction of a weak signal.

The noise level of such a machine is determined primarily by its electrical design. If this is poor, as indicated by a small number of commutator segments, ill-fitting brush-gear, and so on, then the noise level will be high. This will also be the case if the condition of the motor is poor, *e.g.*, dirty commutator, bouncing brushes, broken brush pig-tails and low insulation in general. Hence the first step in decreasing the noise level is to install a motor of good electrical design and to ensure that it receives regular maintenance.

One aspect in the design of the motor, which is important in this case, is the employment of a metallic frame or shell as this provides a useful degree of shielding which is absent if a plastic frame is used.

Preliminary suppression consists of connecting two condensers of values 0·1 μF and 100 $\mu\mu$F respectively, between each brush-holder and the frame, keeping the leads as short and direct as possible. If further suppression is required, RF chokes, suitable for the frequencies concerned and of adequate current-carrying capacity, should be inserted in the field and armature supply leads at a point close to the motor, the whole unit being enclosed in a screening box.

Overall Station Layout

Having considered the installation of individual items, we can now devote our attention to the layout of the station as a whole.

The noise-free receiver is mounted close to the window and to the right of it, providing a short feeder run from the aerial lead-in panel to the receiver aerial socket. Sufficient space should be left to the rear of the receiver console so as to afford easy access to the internal units *via* the doors at the back. The mains supply is obtained from a socket-outlet, partially suppressed by means of a condenser filter, which is mounted on the skirting board.

The auxiliary equipment can be carried on a console placed to the right of the receiver and sharing the same mains socket-outlet. The CW key, and the microphone are on the desk portion, with the electric clock and the adjustable bracket lamp installed on top of the raised back. The panels in this console would be for the exciter unit, the frequency meter, the control panel, the beam direction indicator, the speech amplifier, and the transmitter monitor. For signal pick-up purposes, the frequency meter and the transmitter monitor should be provided with short rod aerials mounted on the panels.

The (two) transmitter(s), situated, let us suppose, behind the operator's chair, obtain their mains supplies from a separate, condenser suppressed socket-outlet. In addition, mains filter networks should be provided in each transmitter supply lead. The transmitter RF outputs are taken *via* harmonic filters and screened-twin feeders to the aerial lead-in panel in the window, the lamp used for the artificial load being fixed nearby on the wall.

A layout along these lines, adapted to the space available, would be reasonably comfortable ; the important thing is to have the receiver and auxiliary controls within convenient reach of the operator. This also applies where the transmitters are concerned, and in a restricted space, a swivel chair or stool is very convenient.

It will be noticed that apart from headphones, the only items present on the receiver console would be stationery and log-books. (Additional items, such as pencils, pipes, matches, ash-trays, cups of coffee and aspirin tablets are permissible if required, but in the case of electrical equipment the emphasis is on prohibition !)

Fig. 5 shows the general electrical layout of the station including important cable runs. Where an ellipse is drawn enclosing one or more conductors, this infers that they are screened, while if the ellipse is not connected to an adjacent earth point it means that the screen is left " floating." An example of this is given by the receiver earth lead, the screen being left floating near the receiver and connected to the auxiliary earth at its opposite end. Apart from this one point, the diagram is more or less self-explanatory.

Tests and Adjustments

From time to time, whilst assembling the noise-free installation and later when fault-tracing or checking its performance standard, a series of tests by which investigations can be carried out in a logical and methodical manner is always desirable. By the use of such tests, ways can be found of improving the standard of performance of the installation and, of equal importance, steps can be taken to ensure that this standard is maintained.

The programme of tests given below has been arranged with this object in view. Nearly all types of faults are covered, with one exception—that of internal noise caused by faulty

valves and components, it being assumed that such noise is non-existent. This assumption is reasonable insofar that the fault-finding techniques employed are common-place and can be referred to in most text-books. Hence there is little point in unnecessary duplication. At the same time, one should not overlook the possibility of a fault of this nature being present.

As a preliminary to the tests, all equipment should be disconnected from the mains supply and earthing systems, and all aerials should be be grounded to their earth-points at the aerial lead-in panel.

(1) Disconnect the short length of aerial feeder between the aerial-input socket on the receiver panel and the RF stage sub-chassis. Short-circuit the input to the sub-chassis. Remove the head-phone jack from its socket. Set all gain controls to zero gain, selectivity controls to maximum bandwidth and switch off the AGC and BFO. Connect the noise-free earth and mains supply, and switch on.

(1a) Nothing should be heard in the loud-speaker. If mains-hum is at all discernible, then steps should be taken to eliminate it, resorting to hum-bucking methods if necessary. This is important, because noise at this stage of the receiver will be present under all conditions.

(1b) Set the AF gain control to its maximum position. Again, no hum or low-level hiss should be noticeable, especially if a reasonable level of AF negative feedback is employed.

(1c) If a "Selectojet" is used, check its frequency and bandwidth controls over their entire range, both in the "select" and "reject" position. No trace of AF instability should be apparent.

(1d) Switch on the BFO. If mains-hum is discernible, this could be caused by (i) Ripple on the BFO HT supply; (ii) Hum pick-up in the BFO grid circuit, which is modulating its output. The presence of hiss denotes

(i) Excessive BFO injection.

(ii) Poor oscillator wave-form.

(1e) Set IF gain control to its maximum position. With a high-gain IF amplifier, valve noise will most likely be discernible, but a high level of "mush" denotes instability. If two or more IF channels are employed, then the possibility of noise arising from the appropriate conversion oscillator should not be overlooked. The location of the noisy stage can be confirmed by short-circuiting the succeeding grid, by which the noise level should show a substantial decease.

(1f) Set the RF gain control to its maximum position. Only valve noise or thermal noise should be audible, this representing the minimum noise level possible for the existing settings of the controls, irrespective of external noise conditions.

(1g) Tune the receiver throughout each waveband. If any carriers are heterodyned with the BFO, their presence can be caused by any of the following:—

(i) External transmissions being picked up as a result of inefficient shielding or ineffective operation of the mains filter at the frequency concerned.

(ii) The presence of harmonics from the BFO or conversion oscillators.

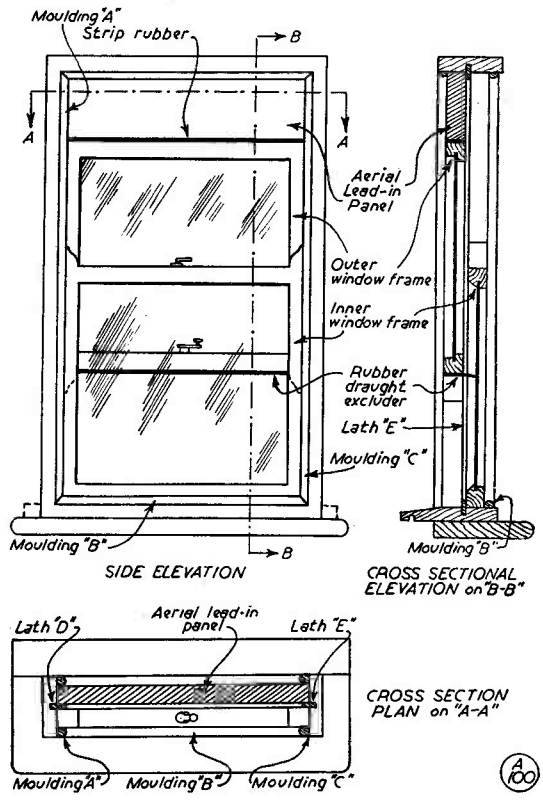


Fig. 3. Method of installing an aerial lead-in panel in a sash window, allowing its normal use.

(1h) Plug in the headphones and note whether any increase in the level of the noise or heterodyned signals is apparent. If so, the phone lead filter is not wholly effective.

(1i) Switch on the AGC. No increase in noise level should be noticeable and no hum should be introduced.

(1j) Assuming that the noise level of the receiver has been satisfactory up to this point, make a careful note of its value by referring to a visual indicator such as the S-meter. This is important because, being a measure of the *inherent receiver noise,* it affords a convenient reference level with which to compare the effect of *external* noise.

(2) For this test, a signal source is required which will provide an output of about 1.0 volt at any point over the intermediate and radio frequency spectrum of the receiver. If a signal generator is not readily obtainable, either a modulated oscillator or a buzzer wavemeter can be used, provided that a low-impedance output is available.

The receiver controls should be set as for (1). Connect the output of the signal source, *via* suitable

blocking condensers across the mains supply leads to the receiver.

(2a) Tune the signal source throughout its entire range. If any trace of modulation is heard in the loudspeaker it indicates that the following faults exist:

(i) The modulated signal is gaining access to the AF stages by way of an ineffective mains filter and/or faulty shielding.

(ii) Rectification is taking place at one of the AF stages due to non-linear operation. The use of grid-stoppers and/or RF by-pass condensers is indicated.

(2b) Increase the AF gain to maximum, and check for break-through, at the appropriate intermediate frequency, to the demodulator or final detector.

(2c) Increase the IF gain to maximum and check for break-through at the appropriate intermediate frequencies and any spurious response frequencies where applicable.

(2d) Increase the RF gain to maximum, and check for break-through throughout the entire tuning range.

(2e) Switch on the BFO. Repeat tests (2b), (2c) and (2d). If the mains filter proves to be ineffective at any particular frequency, or band of frequencies, the use of quarter-wave chokes in the mains leads or additional by-pass condensers across these leads should be considered. These components should, of course, be mounted in the filter screening compartment.

(3) The receiver controls should be set as for (1). Connect the output of the signal source to a plug inserted in the headphone jack. Repeat tests (2a) to (2e).

Here, of course, the remarks applied to the mains filter in test (2) are equally applicable in this test to the phone lead filter.

(4) The transmitter should be connected up, switched on, and adjusted for full power output to the aerial. A test transmission should now be made with the aid of an automatic Morse key or gramophone recording. (It will, of course, be essential to use the stand-by receiver during this test so that correct operating procedure can be carried out.)

The receiver controls should be set as for (1).

(4a) Set the AF gain control to its maximum position. The presence of modulation from the transmitter indicates the following faults:

(i) Faulty shielding of the receiver and possibly faulty earthing.

(ii) Rectification is taking place as given in (2a) (ii).

(iii) Failing (ii), the transmitter is causing break-through at an intermediate or associated spurious response frequency.

(4b) Set the IF gain at maximum. If break-through increases (4a) (iii) seems to be evident.

(4c) Set the RF gain to maximum. Tune the receiver to the transmitter frequency. Signs of break-through again suggest poor shielding of the receiver, or possibly a defect on the noise-free earthing system. Check all single point earthing, screen continuity, RF filters in power supply leads to individual chassis units, and finally the receiver earth itself. This test is, perhaps, subjecting the receiver to exceptional equivalent noise conditions, but even so, the resulting signal level should be no greater than S1. After all, we are striving for the ideal!

(5) Remove the short-circuit from the input to the RF stage sub-chassis and replace the length of feeder to the aerial input socket. Set all gain controls to maximum and switch on the AGC. Connect the output of the signal source to the aerial input socket.

(5a) Inject a signal at the final intermediate frequency. If break-through occurs, fit parallel or series tuned rejector circuits where appropriate in the final mixer grid circuit and, if necessary, in the power supplies feeding the final IF strip.

(5b) Inject a signal at the final IF "second channel" frequency. Overcome any break-through by using treatment given in (5a).

(5c) Inject signals at frequencies given by harmonics of the final conversion oscillator plus or minus the final IF. If break-through occurs, reduce harmonic output of conversion oscillator.

(5d) Repeat tests (5a) to (5c) for any other intermediate frequencies used by the receiver.

(6) Connect the aerial input socket of the noise-free receiver to the aerial input socket of the stand-by receiver. Check for local oscillator radiation on both fundamental and harmonic frequencies of the noise-free receiver. This should be at a minimum.

(7) With all other equipment disconnected from the mains supply and earthing system, connect the noise-free receiver to its aerial system. External noise heard now can be caused by one of the following:

(i) Aerial or feeder affected by local noise induction or radiation fields.

(ii) Intermittent earth connection on nearby aerial or conductor. This will produce noise over a band of frequencies.

(iii) Intermittent disconnection in the noise-free aerial circuit. This will only be noticeable when the receiver is tuned to a signal.

(8) Apply power to transmitter on artificial load. If receiver noise level increases, the transmitter mains supply filters are not fully effective.

(9) Switch transmitter to a separate aerial and make a test transmission. Meanwhile, tune the receiver to a strong local signal in the same amateur band. It may be found that the modulation from the test transmission can be heard superimposed on the local signal, disappearing when the carrier of the latter is switched off. In such a case, external cross-modulation is taking place, and all suspicious-looking

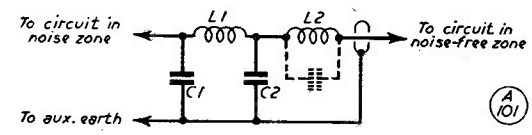


Fig. 4. Filter network suitable for mains leads to a beam rotator, which usually presents a noise-suppression problem. Values for the filter are: C1, C2, 0.1 μF; L1, 2 mH; L2, quarter-wave choke for highest frequency band.

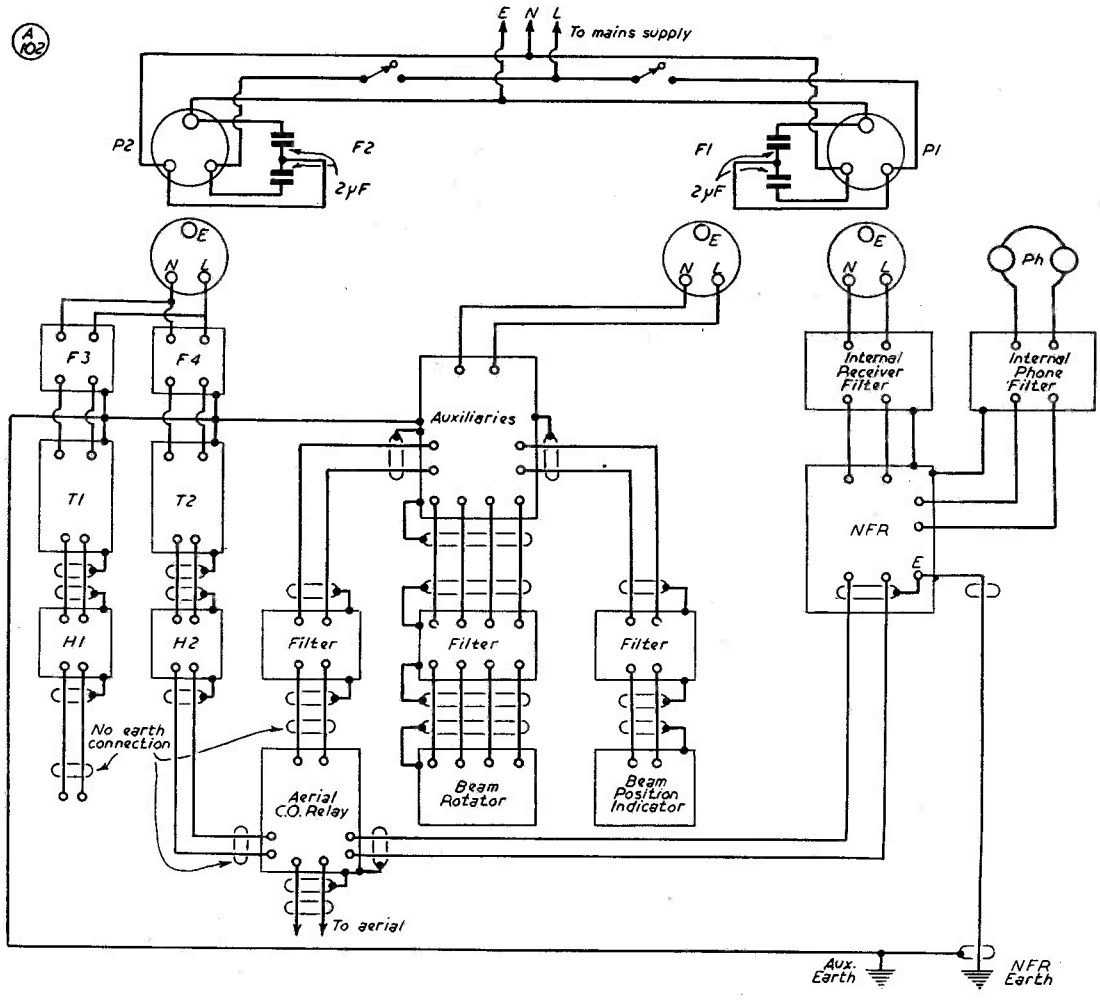


Fig. 5. Showing a block diagram for a mains supply layout, with the aerial and earthing systems, for a noise-free receiving installation. This is again what might be regarded as the ideal, not always attainable, but there are several points about it which could be applied at almost every station.

pressure contacts which show signs of oxidization, whether in the aerial and earth systems or in wire fences, etc., should be examined and properly bonded.

(10) Switch on all items of auxiliary equipment in turn, and note whether the receiver noise level increases. If this does occur, it may be caused by either or both of the following:

(i) The item of equipment concerned may be generating interference, in which case it should be suppressed and even shielded if necessary.

(ii) The circuit wiring associated with the equipment may be conducting noise to the noise-free zone. In this case, the circuit should be filtered and wired in screened cable.

Conclusion

The road to *perfection* in noise reduction—as in other things—is fraught with disappointment, the ultimate object only being achieved after considerable expenditure of time and perhaps money.

Fortunately, the economics involved favour the frustrated and needy. The higher the level of interference, the more effective becomes simple and inexpensive treatment! The erection of a more efficient aerial, a slight re-arrangement in apparatus layout, and the adoption of a simple mains filter will, in *most* cases of this nature, permit the individual to enjoy quiet reception for nine-tenths of his time spent on the air, whereas previously reception may have been noisy and uncomfortable at *any* time. In order to improve conditions still more, so that clear reception is guaranteed at any time, more drastic treatment may be required. If

this involves redesign of the receiver, modification of auxiliary apparatus, and a complete overhaul of the aerial and earth systems, the outlay would be several pounds as opposed to a few shillings.

On the other hand, no two cases are identical, even though they may have many similar characteristics. Consequently, the use of improved receiver shielding in one instance may be quite ineffective at another location, owing to the existence of a noisy earthing system. Simple treatment should be employed in the initial stages and the importance of the inevitable trial-and-error approach cannot be overemphasized.

Finally, in spite of the post-war increase in the use of electrical gadgets in the home, there may be some very fortunate readers who enjoy perfect reception under installation conditions which are positively appalling. To them the author can but add these few closing words—may your DX continue to be clear of QRN, but remember, you yourself are partly to blame if your neighbour's new vacuum cleaner creates havoc on "Forty." Suppression—like charity—still begins at home.

VFO for the Beginner

ESSENTIALS OF A SIMPLE DESIGN

W. N. STEVENS (G3AKA)

Many of those coming on the air for the first time start, rightly, with a crystal oscillator as driver—and then progress to a VFO in order to be able to join in the frequency hopping which is eventually necessary because of the generally accepted procedure of single-channel working. There are several different variable frequency oscillator circuits and many ways in which they can be constructed, particularly where LF band operation is all that may be required. This article discusses a simple two-stage VFO unit, the construction of which can be left to the ingenuity of the individual, depending as it does mainly on parts available and constructional ability. In other words, so long as the principles laid down are followed, entirely satisfactory results should be obtained.
—Editor.

THE unit to be described has no trick circuitry. It does not do anything extraordinary and no extravagant claims can be made for it in any way. It is, in fact, just a straightforward piece of apparatus, using conventional components and circuit.

But while our hobby enjoys a steady influx of newcomers, such readers will be interested in details of simple, practical and effective gear. For it is far better to begin with simple equipment and progress with experience to more complex apparatus.

Let that, then, be the excuse for presenting this article. The more experienced readers will frankly find nothing much of interest here—but we hope that some of the newer hands will obtain some help on how to get a simple VFO going at low cost.

The Circuit

The unit consists of two stages—a VFO operating in the 1·7 mc band and a frequency doubler providing RF output in the 3·5 mc band. The VFO uses a 6SG7 high-slope RF pentode, but this could be substituted by a 6AC7 or any other similar valve. The circuit is a series-type Colpitts (Clapp) oscillator of a type familiar to many; various articles on it have appeared in *Short Wave Magazine* from time to time. RF at 1·7 mc is taken from the anode of V1 since a higher output can be obtained in this way than from the more usual cathode-follower coupling. In this case, then, the anode is not by-passed direct to chassis, but an RF choke is inserted in the anode supply lead to prevent RF filtering into the power supply; the "cold" end of the choke is by-passed to close the RF circuit.

The second stage is a 6F6 tetrode operating as a frequency doubler to 3·5 mc. Here again, alternative valves may be used if convenient—the 6V6, 6AQ5 (the miniature 6V6), or any similar beam tetrode being quite suitable. The circuit is quite conventional, the cathode lead being broken to provide for keying. The output from this stage makes possible alternative coupling arrangements to the following power amplifier or frequency multiplier. Ordinary low-impedance capacity coupling can be used,

in which case the RF is taken off terminal "A." It is then necessary to short out terminal "B" with a shorting strip to terminal "C" so that the coil L2 is grounded and condenser C15 shorted out. In this way C14 and L2 are in parallel between the anode circuit and chassis, providing normal tank tuning facilities.

If, however, pi-coupling is required, output is taken from terminal "B" (which is, of course, not then shorted out to the chassis connection "C."). This type of coupling is recommended where it is important to reduce unwanted harmonics in the interests of TVI prevention. Also, the provision of the pi-coupler enables the unit to be operated as a complete low power transmitter on 3·5 mc, it being necessary only to connect up a random length long-wire aerial. The unit has, in fact, been used quite successfully in this way on test.

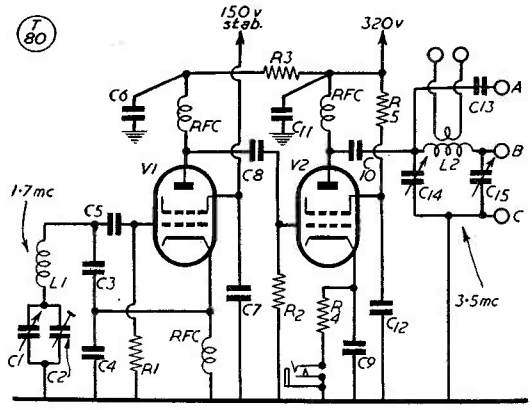
A third output feed arrangement is link coupling. Here the various terminals are arranged as for capacity coupling ("B" shorted out to "C"), but the RF is taken from the coaxial socket which is connected to a link winding on the tank coil L2.

That completes the general description of the circuit. It should be mentioned that the idea of making both C1 and C2 variable in the oscillator grid circuit is to enable the actual control condenser C1 to cover as much of the band as possible—or, if required, to provide band-edge limits over the range.

To do this entails a certain amount of experimental juggling between the setting of C2 and the number of turns on L1. The table of values gives the number of turns as 62, but it is best to wind L1 first as an experimental coil, putting on about 68 turns and providing tapping points at one or two-turn intervals down to about 56 turns. It then becomes a matter of cut-and-try experiment to determine the number of turns required so that C1 tunes over the whole band—and no more.

The procedure is simple. With C1 at maximum capacity and the receiver tuned to 3500 kc, set C2 until the note is heard on the receiver. Then rotate C1 to minimum capacity and tune the receiver down the band to check the frequency at which the oscillator is now radiating. If it is *more* than 4000 kc, increase C2 and tap down (less turns) the coil L1. Repeat the operation with C1 at maximum capacity, the receiver tuned to 3500 kc and C2 adjusted so that the note is heard in the receiver.

If, on the other hand, the first test shows that when C1 is at minimum capacity the oscillator radiates on a frequency *less* than



Circuit of the VFO-Doubler for 3.5 mc operation. Points to watch in the construction are rigidity in the RF wiring round V1, shielding of the grid side of V1, and a good slow-motion control on C1.

Table of Values

Circuit of the Two-Stage VFO Unit.

C1	= 60 $\mu\mu$F, variable.	R5	= 22,000 ohms, 1-w.
C2	= 150 $\mu\mu$F, variable.	RFC	= 2.5mH
C3, C4, C10	= 0.001 μF, mica.	V1	= 6SG7, or similar.
C5, C8	= 100 $\mu\mu$F, ceramic.	V2	= 6F6, or similar.
C6, C7, C9, C11,		L1	= 62 turns, 22 SWG on 1½" diameter former, spaced to approx. 2" (*see text*).
C12	= 0.01 μF, paper.		
C13	= .001 μF.		
C14	= 160 $\mu\mu$F, variable.	L2	= 60 turns, 22 SWG, on 1⅛" diameter former, spaced to approx. 1" long. Link winding, 5 turns.
C15	= 500 $\mu\mu$F, variable.		
R1	= 47,000 ohms, ½-w.		
R2	= 47,000 ohms, ½-w.		
R3	= 4,700 ohms, 5-w.		
R4	= 1,000 ohms, 1-w.		

4000 kc, it will be necessary to decrease the capacity of C2 and tap up the coil (put more turns in circuit).

In either case, C2 and L1 are adjusted together — checking the minimum and maximum frequencies covered by C1—until a point is reached where full scale on the C1 sweep tunes 3500-4000 kc. This requires care and the exercise of some patience, but if calibration is carried out in this way the effort expended is certainly well worth while. If exact band-edge calibration is not desired, this simplifies matters considerably and the adjustments of C2 and L1 need only be made to ensure that the sweep of C1 covers the whole band with a certain amount of "spare" at each extremity. In these tests, especially if band-edges are set at the minimum and maximum of C1, it is advisable to use an accurate frequency meter in conjunction with the receiver.

Construction

The VFO was built up on a chassis measuring 7" x 4" x 2". A screen was fitted in the under-chassis dividing the shell into two equal

partitions. On top, a screening compartment for the oscillator components was made up of a "box" 3½" wide and running the whole depth of the chassis (4"). A front panel was fitted; this measures 8½" x 6". The complete unit then fits into a suitably dimensioned metal cabinet.

Although the unit is quite compact, it is possible to cut down the size if required. But one of the objects prompting the construction of the VFO was the use of odd bits and pieces lying around in the spares boxes! Thus, in the original model some of the components are larger than those which could be used if it was considered important to reduce the overall dimensions of the assembly.

The disposition of the main components are approximately as follows: Inside the VFO box (above chassis) are L1, C1 and C2. The variable control capacity C1 is a normal ceramic - insulated air spaced condenser mounted on a small bracket and fitted with a simple epicyclic drive on the front panel. C2 can be placed anywhere convenient so that it can be adjusted without trouble during alignment. It should be fitted vertically so that the spindle points upwards; this enables it to be adjusted with a long non-metallic trimmer tool to prevent hand-capacity effects which would upset calibration. The coil used was an ordinary 1½" daimeter component of the plug-in type.

The two valves are mounted at the rear of the sub-chassis so that they protrude at the back. So far as the VFO itself is concerned this prevents heating of the valve from affecting the temperature (and hence operating frequency) of the grid components. The remaining parts are easily wired in to the valve-holder terminals. The output lead from V1 is taken through the sub-chassis partition by a ceramic feed-through insulator to the grid of V2.

The frequency doubler section is equally simple to wire. On top of the chassis are placed the variables C14 and C15 and the tank coil L2. Below chassis a small tag board mounted centrally in the partition accommodates those components not wired directly to the valve-holder.

Power Supply

The power input for the VFO is supplied from an existing unit. This provides a main HT rail of 320 volts, with a stabilised line of 150 volts for the oscillator screen-grid. Any similar supply will be suitable—the HT voltage not being very critical so long as it is not less than 250 volts. The total HT consumption, at 320 volts, is 40 mA.

Final Comments

For a newcomer, the unit described will be found a simple solution to the question of getting a VFO going easily. Apart from its uses as a low power transmitter for 3·5 mc, it will provide adequate drive for almost any PA—certainly anything within the power inputs to which the newly-licensed amateur is limited. It can, of course, also be used to drive a series of multipliers where multi-band operation is contemplated. Although no special temperature compensating components have been used frequency drift is quite small. After the initial warming up period of some five minutes, drift is negligible. The note is clean and should give no trouble at all in that direction. As a first VFO, this instrument is simple and cheap to build.

CARDS IN THE BOX

Listed below are those operators for whom, holding cards in our QSL Bureau, we have no forwarding address. The cards will be sent on the next G clearance after receipt of a large stamped, addressed envelope, with name and call-sign, at the Bureau, the address for which is: BCM/QSL, London, W.C.1. This is a full and sufficient address from any part of the world. If publication of the call-sign/address in "New QTH's" and in the *Radio Amateur Call Book* is also required, this should be mentioned at the same time.

G2UO, 3DK, 3DMD, 3FNO, 3GWA, 3IOJ, 3IOU, 3ITU, 3JAT, 3JDL, 3JEJ, 3JES, 3JFH, 3JFX, 3JHK, 3JRW, 3JUP, GI5HZ.

ANOTHER TRANSISTOR TRANSMITTER

Arising from the note on p.625 of the December issue, we hear from G3CCA (Leicester) that he has had on the air, for the past four months on the 1.7 mc band, a five-transistor transmitter using GET-1's, with which he is working local CW and phone with an input of half-a-watt at 50 volts. Ten CW and fifteen phone QSO's have been made with this equipment, on which we hope to publish full details in an early issue. G3CCA is preparing a lecture, "Transistors and their Applications to Amateur Radio," for the Leicester Radio Society. This will be available to any other society on an exchange-lecturer basis. Interested honorary secretaries should get in touch, *not* with G3CCA, but with the Hon. Secretary of the Leicester Radio Society: W. N. Wibberley, 21 Pauline Avenue, Belgrave, Leicester.

More about Clamp Control

DETAILS ON A PRACTICAL UNIT

F. W. V. BUCKLAND, A.M.Brit.I.R.E. (G3DIR)

This article will be of great interest to those who want a simple modulator system, on economy lines. Screen control is not the most effective method of modulating the carrier—in the amateur field there is as yet no substitute for high level amplitude modulation. But it is true to say that screen control, as used here, will enable very good results to be obtained without expensive equipment.—Editor.

HAVING for some time used the type of modulation described by G5RZ in the March, 1951, issue of *Short Wave Magazine*, it has been suggested to the writer that his experiences might be useful to others who might wish to try this simple and inexpensive piece of apparatus. The opportunity is taken to add to some of the points made by G5RZ —and perhaps to disagree with him over some of his statements.

The circuit is identical with that suggested by W6CXM in *Radio and Television News*, excepting that a 6SN7 is used in the first stage in place of the 6SL7 recommended. The 6SL7 is primarily a HF valve of high gain, and it was found that the 6SN7 was more docile in the circuit as constructed. Ample gain is available with this valve. A crystal microphone is used in the grid of the first half of the 6SN7, with a 2 megohm load across the microphone. Carbon microphones have been tried in the same position, and also with and without transformer in the cathode of this stage, but the crystal remains in use having been given the best " quality " reports. Several modifications to the circuit were tried, but eventually the circuit as finally rebuilt on a permanent basis remained as the original according to W6CXM.

Early trouble was experienced due to wiring faults, for which the writer accepts all blame. Severe hum was cleared by by-passing the heater winding in the usual manner—a couple of condensers value 0·01 μF across the winding with centre point earthed. The best position for these condensers is probably right at the heater tags of the 6SN7 valve holder. Recordings of the transmission, as played back from G8DU, confirmed the reports received from other listeners that the transmission left little to be desired. It was rather noticeable that hard consonants, especially at the beginning of words, appeared to be emphasised somewhat. Such consonants, of course, consist of transients, and the transmission of these is usually an indication of high quality, *i.e.*, the passing of frequencies up to 10 kc or so. In this case though, it is thought that these transients appear as a form of momentary distortion. The carrier, normally held at low level, takes a finite time to rise on the application of modulation, and if speech commences with a consonant, then the carrier tries to rise far more quickly than it is able to do, and consequently, for a few milli-seconds, severe distortion occurs. This is the only occasion when this system might allow for over-modulation, as normally the system is automatically proof against over-modulation. As the possibility of such distortion occurs for an extremely short time only, it is not considered to be a great disadvantage—it should be remembered that this opinion is that of the writer, and is certainly subject to argument.

Practical Points

In the final of the PA on Top Band, the writer has a 6L6, running at 30 mA with 300 volts on the anode, but arrangements are made, by cuttting down the drive from the previous stage, to reduce input to 3 watts. When adjusting this drive, no difficulty is found. In fact, transmission has continued during the process of reducing power, and beyond the expected drop in S-meter reading at the receiver, no other change has been noticed. Power output can also be controlled by gain adjustment in the modulator itself, the effect of which is merely to limit the maximum to which the screen volts of the PA can rise. This can be done, in addition, by speaking more softly or more loudly, as the case may be, thus vocally doing the work for the gain control. In fact, as W6CXM says, " Whisper for locals, shout for DX."

The opinion is held by the writer that the system is essentially a controlled carrier arrangement, and should be used as such. It depends upon how much control is used, of

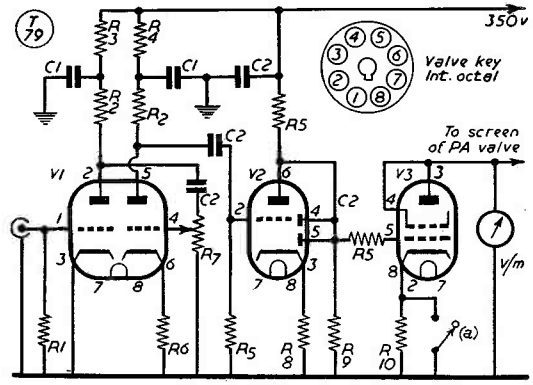
Table 1

VALVE	ANODE VOLTAGE	TEST CONDITIONS
6F6	57	*In each case : Grid grounded, screen and anode strapped ; 350v. HT supply through 22,000-ohm resistor. No resistor in cathode.*
6V6	51	
6L6	38	
6Y6	25	

course, as to whether the statement by G5RZ, that "quality suffers," is acceptable. Even with a very small carrier swing, it can no doubt be proved mathematically that there is distortion. The question is, where is one to stop? When in QSO with G5RZ it was found that both carriers were controlled by about the same amount—modulation increasing the carrier to three times its quiescent state. Nevertheless, it is agreed that as the Top Band is so notoriously noisy, a smaller carrier swing would give more pleasant transmission on that band, reducing the amount of "inter-speech" noise which could make listening difficult. An improvement in reception often comes from switching *out* AGC when listening to the transmission. It is a remarkable thing that occasions have occurred when this type of transmission has got the intelligence through to the listener in spite of very severe QRM, when another station, putting the receiver S-meter further over, has been unreadable. So far the writer has been able to find no satisfactory explanation for this.

Some Theoretical Considerations

The advantages of the system have been listed by G5RZ, but the following are also suggested. If any valve is not run at maximum, it follows that it can, during that period, suffer some over-running *for short periods*, the factor "t" (time) being a function of the amount of heat that a valve anode can stand. When using this modulator the PA stage is run at low input for a much longer period than it is at full input. Why not, therefore, arrange that a higher maximum than normal is available for the period of modulation only? Under these conditions, an 807 can stand 1,300 volts, or even up to 1,500 volts, and much more than the average 50 watts or so from a single 807 can be obtained, *during the time that it is actually required for the transmission of intelligence.* (Think of the watts wasted by carriers which use power to get themselves along while they are carrying no information!) This itself makes the Clamp system of modulation worthwhile to the "little man." Then there is the advantage of having a modulator capable of working—without the slightest modification—into any rig on the station that might be on the air, be it high or low powered. Where G5RZ, in his modulator, has fitted a 45,000 ohm variable resistor in the anode of the last valve, the writer prefers to place this resistor—really the screen dropping resistor of the PA valve—in the RF section. Provision is thus made for connecting the modulator to any transmitter on the station as each one has the proper screen dropper fitted to work this system. While on the subject of screen dropping resistors, it is as well to mention that quality can be varied a great deal by changing the value of the screen by-pass condenser. Nothing greater than 0·001 μF should be used, but at G3DIR this condenser is 0·0005 μF. Experiment should be made here.



The Clamp Modulator in use at G3DIR is almost identical with that originally suggested by W6CXM, except that a 6SN7 takes the place of a 6SL7 in the first stage.

Table of Values

Fig. 1. Circuit of the Clamp Modulator by G3DIR.

C1 = 0.1 μF.
C2 = .01 μF.
R1 = 2.2 megohm, ½-w.
R2 = 270,000 ohms, 1-w.
R3 = 33,000 ohms, 1-w.
R4 = 22,000 ohms, 1-w.
R5 = 330,000 ohms, ½-w.
R6 = 3,500 ohms, 1-w.
R7 = 500,000 ohms (with switch as marked "a" in diagram).
R8 = 2,500 ohms, ½-w.
R9 = 820,000 ohms, ½-w.
R10 = 1,250 ohms, 10-w.
V1 = 6SN7.
V2 = 6SQ7.
V3 = 6Y6.

There is a great advantage in having no iron in the audio circuit, and there is no matching problem either. Only three condensers are in the speech chain, and the negative feedback introduced by the omission of cathode by-pass condensers improves both quality and stability. Even so, there is adequate gain. Using carbon microphones the gain control is only one-third, and with the crystal microphone it is three-quarters of full up when overloading of the modulator stages begins.

Design and Construction

Experience has shown that the modulator is easily built, easily operated and presents few snags. During early tests G8MX carried out some experiments to determine which type of valve would best serve as a "voltage dropping" valve in the last stage of the modulator. Results are given in Table 1, and the 6Y6 is

obviously the valve for the job. Of course if it is not desired to swing the carrier so much, then one of the other types would be perfectly satisfactory.

It is hoped that these few remarks will encourage others to build and use this little piece of apparatus. With it, they would be able to carry on with schedules and general QSO'ing while completing and testing out the more elaborate, more troublesome, and certainly more expensive speech amplifier of up to 75 watts output, to modulate the "big rig" of 150 watts. Perhaps, on finding that this will do the job equally as well, the QRO modulator might not materialise at all !

Finally, the interest shown, the helpful comments and criticism given by local amateurs is very gratefully recorded, and the permission of G8MX to publish his results also acknowledged. Life would be hardly worth living without the spirit of friendly co-operation such as is found among the amateur fraternity.

TELEVISION SOCIETY EXHIBITION

This takes place in King's College, London, over January 7-9. Among those exhibiting are British Insulated Callender's Cables, Ltd., showing a new range of quad cables. These have polythene insulated cores, are screened with a lapped copper tape, and sheathed with polythene. Designed for TV relay service, a feature of this range is that all sizes have the same nominal impedance. Also displayed are polypole couplers and multi-unit cables, having wide applications at the higher frequencies.

"THE MONTH WITH THE CLUBS"

All honorary secretaries are asked to note that this feature will be resumed in its usual form with our next issue. This month the Club space is taken by the report on the recent *Short Wave Magazine* 1.8 mc Club Transmitting Contest (MCC). Closing date for Club reports for the February issue is Friday, January 15, addressed "Club Secretary."

THE SIXTH F.O.C. DINNER

The Annual Dinner of the First Class Operators' Club, held in London on November 28, was attended by 43 members. Amongst the diners were the Vice-President, G5PS, and Mrs. Catt, G5PS/2. Overseas members were represented by PAØXE; many of those present made long trips to attend, the record probably being shared by PAØXE and GW3ZV. G3DQ, in proposing "The FOC," mentioned the fact that some members are still reluctant to identify themselves in QSO, thereby making things even more difficult for operators seeking sponsors. G5PS replied to the toast and gave the membership as 280, including 80 overseas in all parts of the world. On behalf of overseas members, PAØXE told how keen interest is maintained in Club affairs. The FOC Marathon Cup, suitably inscribed, together with the FOC Marathon Medallion, were presented amidst acclamation to a very worthy winner, G3BRV, of Great Missenden, Bucks.; he has twice been runner-up in this event. G3ESY took second place with 109 points to the 119 made by G3BRV. More than 130 FOC members in 18 countries came on the air to exchange points, on all six bands. This year's Marathon event inaugurated the pennant awards for the leading European and non-European station; the latter went to ZC4IP (ex-G8IP), of Cyprus, with 75 points, and the European pennant to F3NB with 48 points.

Sponsoring by five FOC members is now one of the requirements for FOC membership; Club QSL's are planned for 1954, and these will include, on the reverse, the rules and qualifications.

The Club officials are: *President,* Gerald Marcuse G2NM; *Vice-Presidents,* Capt. A. M. H. Fergus G2ZC, and H. Catt G5PS; *Joint Honorary Secretaries,* S. G. Mercer G2DPY, and V. Penfold G3JZ; *Chairman of Committee,* Capt. W. H. Windle G8VG. All communications respecting the First Class Operators' Club should be sent direct to the Honorary Secretary: S. G. Mercer G2DPY, 160 Old Shoreham Road, Shoreham-by-Sea, Sussex.

CHAIN OF CIRCUMSTANCES

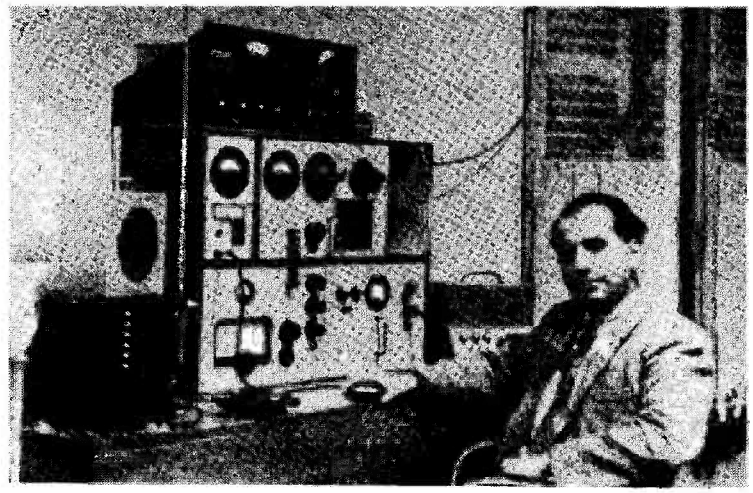
F8WL of Bourges, Cher, France, tells us an interesting story. During 1944, he was living in Bayeux, which was right in the path of the battle after D-Day. A British soldier came in one morning for a drink, and F8WL gave him a collection of French stamps. A long time afterwards, these reached the soldier's brother, with whom F8WL eventually corresponded and who now sends him *Short Wave Magazine* every month. In various issues, he has found articles by G2NS; this has enabled F8WL to re-establish contact with G2NS, whom he knew years before the war when, as a boy, he used to spend his holidays in Bournemouth. Others from whom F8WL would like to hear are G5OH and G6WX.

RICHARD ROBERTSON, WIRELESS OPERATOR

On December 1st, 1953, off the Shetland Islands, the trawl of the Fleetwood fishing vessel *Hildina* caught on the sea bed in heavy weather. Before it could be cut loose, the ship heeled over and became unmanageable. Richard Robertson, radio operator of the *Hildina*, went on the air and raised a sister ship, the *Velia*. When she reached the scene, the *Hildina* had gone down; some of the crew got clear, but she took Skipper G. Clarkson and Richard Robertson with her. True to the traditions of the sea, they had remained at their posts to the end. No VC's or George Crosses are given for such simple acts of gallantry, which nevertheless shed lustre on those who, in achieving them, add something to the long story of heroism in the face of peril. Richard Robertson went off on his last trip a few days after the birth of his first child. His widow will have a proud story to tell her son.

DX COMMENTARY

L. H. THOMAS, M.B.E. (G6QB)



F8WL

CALLS HEARD, WORKED AND QSL'd

WE open the year with a very unexciting batch of reports. Conditions, after their very obliging lift for the DX Contest in November, tailed off again rather badly. So December has been a dull month—particularly so because the bands from 14 mc up have been almost useless by 1800 GMT. This has been responsible for some increased activity on 7 mc, 3.5 mc and particularly the Top Band. But none of the so-called DX bands has really been good.

The non-amateur QRM on 7 and 3.5 mc has frightened many would-be occupants away (and who can blame them?), leaving only the grimly-determined spirits in possession. Some of these have extracted a few prizes, but have had to bury their arms up to the shoulders to do so.

However, our job is to take the DX as it comes, and not to try to spirit it out of nowhere, so we will consider the month's batch of mail with a slightly sympathetic outlook. In passing, we would like to make public this Solemn Thought: However bad the conditions, there's always someone to retort that they have been quite good. And, conversely, however good they are, someone crops up who thinks they have been shocking. So we accept the majority vote of the time, and that describes the month of December as . . . . awful!

Operating Thought

Many, many years ago, in one of our lighter moments, we proposed that all routine QSO's should be shortened by a "P" code (P for Platitude), in which a group like "P 103" could be taken to mean "GE OM psed to QSO, ur sigs RST 599, QSL *via* Bureau, 73 and hope cuagn, tks for QSO, GN." A labour-saving device, a QRM-reducer and a *reductio ad absurdum*!

Now, with all seriousness, we suggest that a "P" code could serve a useful purpose in cutting out useless verbiage and, therefore, in reducing QRM. We suggest that it should be used by those who are in the habit of making *frequent* contacts with certain friends on the air—such as the very friendly QSO's that one hears on the Top Band. Why shouldn't the formula of "GE OM, glad to cuagn, Ur sigs RST 589 here to-nite" be shortened to "P 8"? To those in the know ((and it would soon get round) "P 5" would mean "all the usual, and RST 559"; "P 6"—ditto, but 569; and so on.

Thereafter the contact could go ahead as usual; but at least it would have saved a rather useless preamble. And why should not the sign-off read as "P 73"? Those who adopted it would know that all the usual salutations were meant and understood. As a matter of fact, a friendly little "P Club" might well form around this time-saving device; and a QSO need be no less friendly for the cutting out of the stock formulae. After all, we all say the usual things, whether the contact has been with an old friend or with someone we never met before.

Comments welcomed — but we hope to be greeted with "P 9" on the air, and then we shall know that it has arrived! And let us not think of the "P" as standing for Platitude any longer; let's say "Pleasure to QSO."

Top Band Progress

It is too soon to report on the first of the Trans-Atlantic early morning sessions on One-Sixty, but we do know that the W's have been coming over all through December. Our old friend DL1IX, as keen as ever on the band, writes to say that W1BB, 1LYV, 2GGL and 3RGQ were logged on November 29; Decem-

ber 6 showed up even better with W1BB, 1DBE, 1LYV, 1TMA, 1VDB, 2EQS, 2GGL, 3RGQ, 8GDQ, 9PNE and VE1EA all heard.

DL1IX has been trying hard for a special ticket for Top Band operation, but it seems impossible. He asks how it is that HB9's are heard up there, although he has been told that they are *not* licensed for One-Sixty. The answer is that one or two of them were granted permits for the band a long time ago, and are making good use of them (HB9T and HB9CM are well-known examples).

From G5JU (Birmingham) there is a very interesting 1.7 mc DX report, also for the morning of Sunday, December 6, 0600-0800; of the eleven DX stations heard, he worked W1BB, W1DBE, W1LYV, W1TMA, W1VDB, W2EQS, W2GGL, W3RGQ and W9PNE — those missed were W8GDQ (who kept calling CQ) and VE2WW, who did not come on till late. Several of the W's worked are well known Top Band performers, and will be on again for the Tests. Reports on G5JU's contacts averaged RST-449 each way, and W1VDB remarked that it was his first European QSO on 160 metres. The following Sunday morning, December 13, conditions were very poor, with only W1BB and W3EIS heard and the former worked; after 0700, however, conditions appeared to improve. We may take it that once again the Top Band is open for DX business!

G3HIS (Ashbourne) heard W1BB, 1LYV, 2GGL and 3RGQ on November 29—but no QSO. On December 4 at 2115 he logged ZC4GF at RST 449, but here, again, a lengthy call met with failure. The ZC4 was heard again the following evening (and has been coming through at various times ever since). 'HIS also comments on the number of OK's on the band; he has worked ten of them, mostly more than once. HB9T has also been raised at the hour of 0640.

G2HKU (Sheerness) heard G5JM working W1BB on the morning of December 13, but could not find 1BB. Other interesting things logged were LB7YB/MM, a North Sea trawler, working G's; and a station calling SU1XZ. 'HKU tells us that HB9CM works on the band from 0530-0545 GMT week-days, and at various times during week-ends,

TOP BAND
TRANS-ATLANTIC TESTS
1953-54 SEASON

Dates:

January 17 and 31
February 14 and 28
March 14

Times:

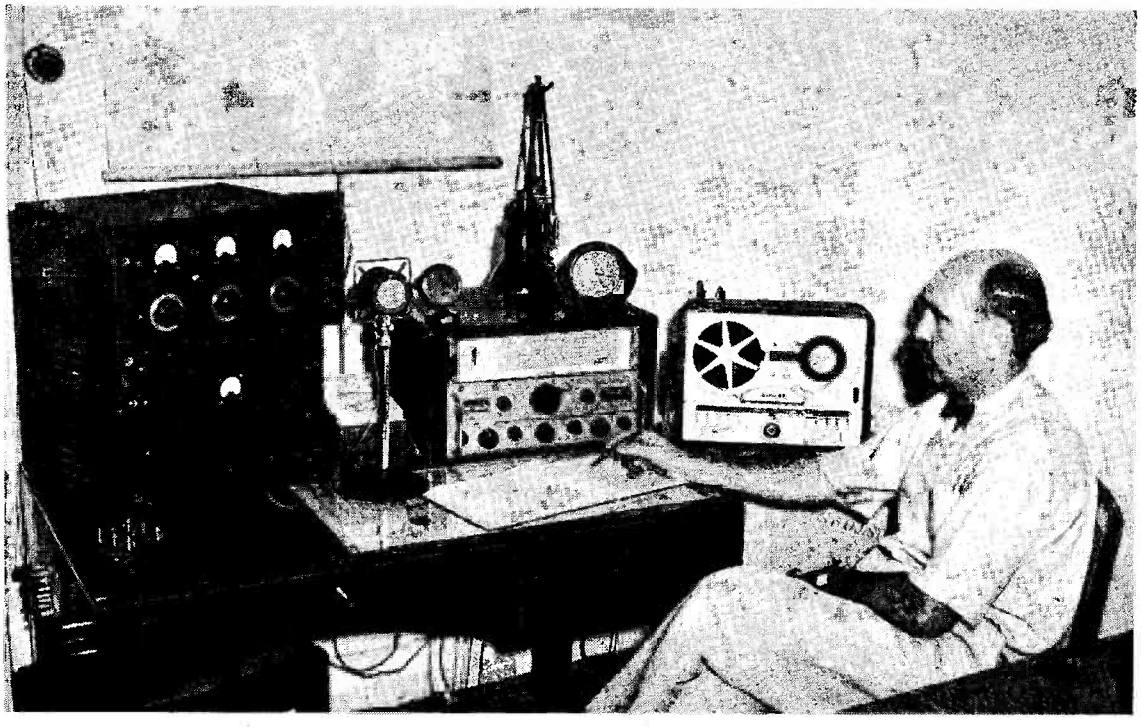
0500-0800 GMT

DX stations call at 0500, 0510, 0520 and so on; Home stations call at 0505, 0515, 0525 and so on. Clocks should be synchronized by WWV on 2500 kc.

Frequencies:

U.K. Stations: 1830-1870 kc

W/VE Stations: 1800-1825 kc, 1875-1900 kc, 1900-1925 kc and 1975-2000 kc, according to location.



The attractive set-up at VS2DB ("Double Brandy") of Kuala Lumpur, Malaya, whose chief interest is 20-metre phone. In the last two years, he has had over 1,000 contacts in 99 countries, using only about 75 watts input to the transmitter, an 8VB-Tiger; the receiver is a G.E.C. BRT-400D and the tape recorder a Grundig. Aerials in use are folded dipoles.

from a beautiful mountain QTH in Les Planchettes, some 3500 ft. up. He runs 20 watts to a 400-ft. aerial.

GM3IGW (Alloa) also raised HB9T and HB9CM for his thirteenth country, and heard W1BB at 0515 on December 13. During an OK contest he logged twenty of them in fifteen minutes! 'IGW is another who has heard ZC4GF (at 2000 GMT), and he tells us that GW3CTU in Cardigan is active.

21 mc MARATHON

(Starting July 1, 1952)

STATION	COUNTRIES
VQ4RF	98
G5BZ	91
G3GUM	90
DL7AA	89
G4ZU	85
G2BW	82
G2WW	80
G2BJY	77
DL2RO	75
G2YS	73
G6QB	72
G3HCU (Phone)	71
G2VD	70
G3DO	67
ZS2AT	65
G3CMH	61
G3TR (Phone)	57
G3FXB	57
G6QX	56
G8OJ	53
ZE3JO	52
G8KP	50
VK2AWU	47
G3ABG	33
GM2DBX (Phone)	32
G2DPY	32
G5FA	31
G3WP	26
GW3CKB	19
G8VG	18
G2DHV	11
4S7XG	11

G3ESY (Hereford) sends in his latest and improved score, and seems to be yet another one to whom ZC4GF is a Gotaway! G3ITY (Chester) has not been very active, but is now on the band again.

GC3EML (Jersey) has collected his WABC—the first GC to do so. He says that his activity on the Top Band was entirely due to reading this Commentary . . . .

G3ABG (Cannock), while working in the recent *Short Wave Magazine* Club Contest, logged UA3KAA on the band. G8TS (Farnham) is another new qualifier for WABC, despite seven counties which have consistently refused to QSL. He, too, has worked the OK and HB contingent, but missed the activity from Monaco.

G5FA (London, N.11) has had an SWL report from the Canal Zone, SU—so he has now been encouraged to have a crack at the Trans-Atlantics! It would be nice to find some 1.7 mc transmitting activity from SU, too.

G5MP (Hythe), who operated 3A2BM in Monaco, tells us that he expects to be down there again at intervals, and hopes to work G's in plenty with a more favourable static level. His first contacts were G5MR, 6LX, 3GGN, 8JR and OK1AEH, in that order. Static was S7, but a few mornings earlier G3GGN and 8JR were fine signals, standing right out from the noise.

G3IVH/A (Norwich) worked HA4Q at 2350 one night, and anxiously awaits a QSL. They *were* allowed to use the band—we had a QSO with HA4EA some time back, and a card, too. HA5BB was another one who showed up three or four years ago.

And for those who want the County of Nairn for WABC (!), GM3HLQ hopes to be /P in that rare locality on the evenings of January 11-13 — working from the back of his car, and using a box-kite aerial with 300 feet of wire. He should be kept fairly busy!

Eighty-Metre Activities

Everyone knows what a shocking noise goes on in this band, without our rubbing it in. Nevertheless, DX has been worked, and we have heard QSO's with VK and ZL proceeding at the most surprising hours. Unfortunately, the successful operators have not written to give us the details ; but they are definitely the types who have evolved electronic ears with built-in crystal filters. The average user of the band would just not have been conscious of the DX until he heard one of these signals working it. W's and VE's are there most nights by, or before, midnight.

G3FXB (Hove) raised EA9DD, EA6AF, 3A2BM, W, VE and ZL, to name a few. G3ESY collected OY1P and MF2AE, both on CW.

G3ABG (Cannock), turning to local phone, tells us that many

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
GM3IGW	85	85
GM3EFS	82	83
GM3JDR	82	82
G6VC	81	81
GI3HFT	80	80
GM3OM	80	80
G5LH	79	80
GI6YW	79	79
G3ELZ	77	78
G2NJ	76	76
G3HIS	74	77
G4XC	73	74
G3ESY	69	69
G3GZJ	65	67
G2AOL	64	75
G2YS	64	74
G3IVH/A	64	65
G3HIW	63	69
G3HTI	63	66
G3BRL	62	62
G3AKY	61	64
G8TS	60	67
GC3EML	60	62
G5JM	54	77
G3ABG	51	65
G3ITY	43	53
G5FA	33	50
G8VG	30	40
G3CFG	29	51
G3FZS	23	39

school stations are active, including G3ABG/A, 3GTD, 3IHZ, 3AYZ/A, 5YC, 3GUV/A, 2KO, 3HMO and 3DTC.

G5LH (Horbury) heard UA3AF calling CQ DX, called him and raised him! Later he heard him working UQ2's and UR2's in Russian, so this appears genuine. We seem to remember UA3AF as one of the very few Russian stations "privileged" to work foreign countries. W's and VE's were also worked, some of them as late as 0810.

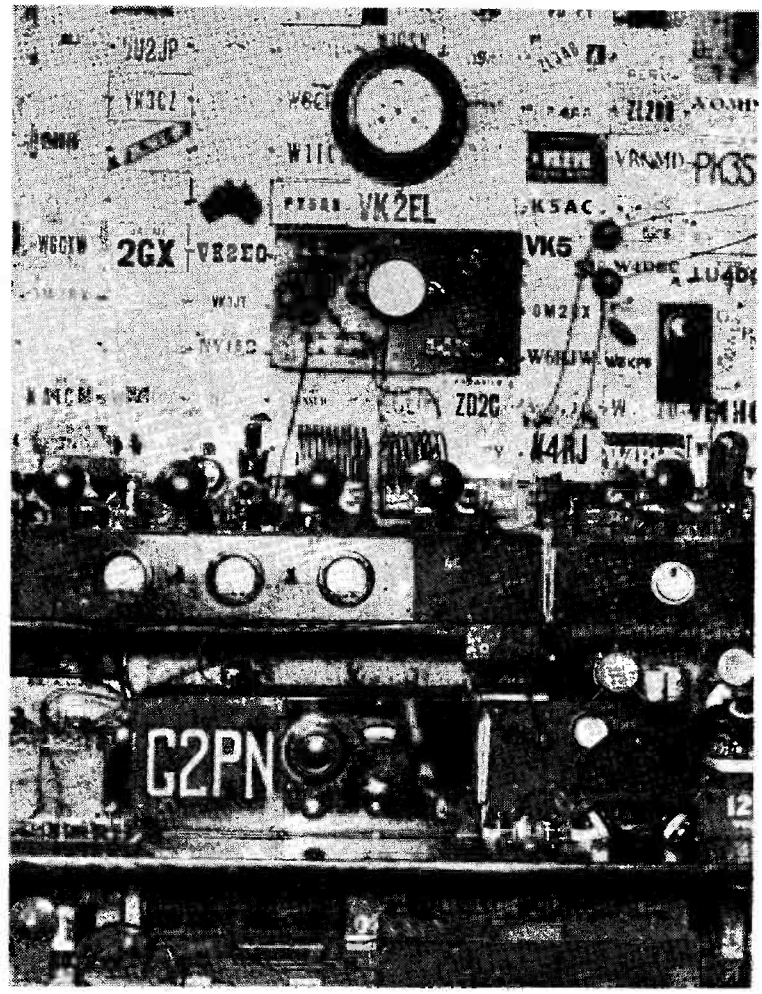
DX on Forty

G3JWR (Scunthorpe), looking for his WAC (he would like a VK or ZL!) encountered an LU around midnight—quite a reward for a casual visit to the band. G3JHC (Sheffield) raised AP2K (1630) and MP4BAF (1530)—both with a 10-watt crystal oscillator and 66-ft. of wire draped across the garden. Others worked were W1ONX, MF2AG and I1BLF/Trieste. 'JHC says that one particular HK station peaks S7-8 most evenings, but is outside his "service area."

G5BZ (Croydon) has found Forty quite fair and has worked two new ones — 3V8AN and OQØDZ, apart from ZS, ZL and ZD4. G5FA collected LB8YB for an all-time new one, heard VS1FZ at 2340 GMT, and thinks he might have worked OQØDZ, but a Russian jammer finished that QSO.

G3FXB has been on the band between 1600 and 1730, and the reward has been 3V8AN, CN2AP, ZS, MP4BBD, FR7ZA and VS2EF. Heard, but not worked, was ZS7D. At other times on the band 'FXB raised VQ2, TI, VE8, VP8, EA9, EA6, VP9, ET and others of less rarity-value.

GC3GS (Jersey) writes to say that there is still one who sticks to "poor old forty-metre phone." So much so, that on October 2 at 0825 GMT he worked VK3ALL —phone both ways, the VK being RS 58/9 and GC3GS RS 56. This is quite probably the first GC/VK phone contact on the band, and 3GS would like to claim it as such. He thinks too many G's are scared of the conditions on the band, and he suggests that instead of sitting back and moaning about it, they should put out more short CQ calls, with plenty of signing.



Station of G2PN, North Shields, Northumberland, as it was just 20 years ago — the gear and general layout will evoke nostalgic memories for many an Old Timer. The transmitting equipment is along the upper shelf, with a T25D neutralised triode PA driven through a CO-FD chain; the receivers are at desk level, and of the 1-V-1 variety, with which holding DX was a matter of careful adjustment of the reaction control. The cards are typical of the DX that was possible in those days, using simple equipment of this sort. Does anybody do a great deal better today?

By the way, the QSO with VK3ALL was GC3GS's No. 20,105—and most of them have been on 40-metre Phone!

G2YS (Chester) comments on the early hour at which DX has been appearing; he heard VQ4AQ from 1830 and worked VQ3EO at 1920.

Twenty Metres

Whan *can* one say about this band? Conditions seem to be good, and yet nothing exciting comes through—and this happens for day after day. Then suddenly it is full of good DX, for perhaps one day only. One rather remarkable feature is the arrival of the W's at mid-day, *every* day. Some of the signals are terrific; and yet no other DX materialises. W2BCR, helped by a Vee-beam and 750 watts, never fails to put through an S9 signal day after day; and his echo, arriving by the Far Eastern path, is often S7. It almost seems that there is a minimum power and a minimum aerial gain needed to break

through the barrier—after which there is no trouble.

G3FXB managed to raise HZ, YV, OY, CR6, HR and VP8, with nice gotaways in the forms of KX6, VR2AS, FU8AA and MP4BEN (Qatar). G3GUM (Formby) has always found the band closed by his return from work (one of the main troubles this time of year) and thinks himself lucky to have worked W6, VK, ZL, VS6, VE5 and ZS. He has heard "certain parties," with the aid of a VK4, trying to raise FW8AA and VR4AB.

G2DVD (Slinfold) worked various VK's, strings of W's, and F9QV/Corsica, for whom he has been looking for years. The latter station has been QRT for some time, and 'DVD made the first QSO after his return with a new transmitter and aerial.

G5BZ collected the "usual stuff" and had lots of ragchews with W's. He missed KAØIJ again (so did we!) and heard VR4AE causing a minor stir, but didn't bother to join in, having worked VR4.

G3JWR collected some new ones in the shape of ZC4, 5A, 3A, 4X, YI and SU. G3CMH (Yeovil) managed nothing much except some MD5's on phone. Gotaways were KG6ADY, VE8YT and ZS3B.

Failure of Fifteen

Under this gloomy heading we report the worst month that has yet been experienced on 21 mc. It showed us what it could do in early November, but apparently the effort was too much for it, and the band has been in a coma ever since.

G3CMH worked CN8, EA8, KP4, TA, YI and ZB1 on phone, and among those that escaped him were CX5AF, HK4FV, MP4KAC, VK3YK, VS1's, ZD4AE and ZS9G. This represents a terrific achievement, relatively speaking, compared with what anyone else has to report on this band.

G5BZ heard MP4KAC, but *he* got away! But 'BZ passes on a little bulletin from W6VX, who is about the most active W6 on the band. He reports two openings to Europe this autumn, the only G's heard being G2DPY, 3AHN, 6GN and 8II. But the following have all been heard or worked *recently*, and are active on 21 mc: KG6ADY, KR6AA, KX6AF, JA1CR, 3AC and 3AF, KB6AY, DU7SV and HR1AA. (*Interval for recovery after shock . . . .*)

G3GUM has worked nothing new on the band — ZD4AB got away. But on December 6 he thought the band was open, for there were plenty of commercials and phone; the only CW signals, however, were VQ3JO and ZS6AHU, the latter being the loudest ZS ever heard on 21 mc.

G3FXB made our eyes pop by reporting good conditions and giving a long list of DX worked—until we realised that his letter was a late arrival for last month and refers mostly to November! Among the contacts were ZD4AB, VU2JP, ET2US, VP6FR, HP3FL, with plenty of ZE's, VQ's, ZS's and the like — mostly on phone. 'FXB, by the way, is at a new QTH, with a better aerial, now consisting of a 137-ft. centre-fed wire, and a 7-mc ground-plane is on the way.

G3HCU (Chiddingfold) has been active on 21-mc phone, as usual, and collected CR7AG, EA6AT, EA8AZ and ZS9G for new ones. Other QSO's included six VK's, two ZL's and ZD9AA. He also made the only 28-mc contact mentioned this month—with Kurt Carlsson of W2ZXM/MM, off on another world cruise; Capt. Carlsson wishes to be remembered to all his old friends on the band.

News from Overseas

ZS2AT (East London) tells us that VQ4NZK (remember VQ1NZK?) is planning a visit to VQ7 and VQ9 for about twelve days, probably at the end of February. 'AT laments the fact that ZS seems to be a very bad spot for 21 mc work, except for the usual North-South path. It opens up sometimes in a westerly direction, but never, it seems, for the East or North-East. He would like to be on or near the Equator, where, he says, operators get both the Northern and Southern hemispheres "on a plate."

AP2R (Karachi) will be QRT by the time you read this. He has QSL'd everyone by Air Mail, but in case of any slip-ups he can be contacted henceforth as G3GJQ.

VS2CP (Kedah) entered the Worldwide Contest (his first ever) and, working on 14 mc, raised 57 countries and 27 Zones. But his power was cut off for most of the day, and the total time of operating was only about nine hours out of the forty-eight.

SU1FX sends a cutting from the *Egyptian Gazette* stating that Egyptian nationals will shortly be able to operate again, subject to passing a technical exam. and a Morse test. Maximum power will be 100 watts, with 50, 25 and 10-watt categories. Foreign QSO's will be allowed only "by written permission from the E.S.T. & T.

FIVE BAND DX TABLE

POST WAR

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
DL7AA	639	84	146	216	89	104	221
G6QB	584	52	106	219	72	135	234
G5BZ	548	58	109	225	91	65	231
G2VD	493	47	89	178	70	109	187
G2WW	469	23	70	189	80	107	196
G2BJY	459	48	77	141	77	116	179
G3FXB	439	60	109	172	59	39	174
G3DO	439	24	46	195	67	107	221
G4ZU	426	11	15	195	85	120	203
G5FA	406	34	118	150	31	73	166
G6QX	399	51	92	143	56	57	168
G2YS	366	45	62	142	73	44	158
G2BW	350	24	57	144	82	43	155
G3ABG	331	36	82	150	33	30	157
G3GUM	328	31	38	168	90	1	177
GM2DBX*	319	21	31	154	32	81	163
G8VG	278	35	76	123	18	26	140
G2DHV	174	20	21	107	11	15	111
4S7XG	135	1	21	98	11	4	98

* (Phone)

Director, provided no objection is made by the foreign power concerned." SU1FX is no longer worried about MD5 licences, as he will be back in G-land by Christmas.

VS9AD is no longer in existence (the *station*, we mean!) and the operator thereof hopes to become a G very shortly.

4S7XG (Colombo) reports activity on 14 and 21 mc, usual frequencies being 14025, 14033 and 21060 kc—all crystal. On 14 mc he got RST 599 from VK, 589 from C3BF and VQ4EI and 569 from TI2TG, so his new folded dipole seems to be working nicely. But conditions have been grim, and although he is all ready to put out a signal on 3.5 mc, he thinks it would be a complete waste of time at present. He returns to U.K. next August.

G3IGU, one of the ops. at ZB2A is bound for the Middle East on a 2½-year tour, and hopes to be operating from somewhere out there. He promises to keep us informed.

General Patter

G3GUM would like to see a new ladder, with emphasis not on ability to catch the rare ones, but for regular, all-year-round consistency of operating. He suggests the award of one point for each WAC-within-24-hours, and the winner will be the man who makes the most one-day WAC's during a year's operating. We are easy over this one—what do the clients think? If there are sufficient "Ayes" by next month we will start it.

'GUM doesn't agree with complicated scoring (even to the tune of the 5-Band Table) and wants something that doesn't require the services of an accountant or a pools-perm expert. Well, this WAC affair should be simple enough—how about it?

An Old Timer returning to radio after many years drops a line. He has no call at present, but from 1926 to 1934 was the first amateur in Nigeria, working first with the call KM1, then FN2C, and finally ZD2A (we worked him rather more than 20 years ago!) Portable operation from a caravan is the present set-up.

If you look carefully, you will find that the harmonics of G2HJT (Ashton-under-Lyne, Lancs.) have stacked some of his DX QSL's to spell out "All good wishes DX es vy 73 1954." Well, it's seasonable, anyway!

Talking of Nigeria, G2HKU would like to know the present QTH of ZD2LMF, who operated around June 1950. (Yes, he's after a QSL, naturally!)

G3JWR laments the complete lack of CW activity on 28 mc, and suggests some local gatherings "just to keep the band open." How many readers would be prepared to support another 28-mc Activity Sunday, this time on CW?

G2DHV has had a letter from VR2CG, who is using SSB on 21 mc with 150 watts input. VR2AS is also active on 14 mc phone. 'DHV has had QSL's from VK1RB and VP8AP.

G3JBR (Scarborough) has been receiving cards for Top-Band contacts, though he has never been on the band—could they be intended for GM3JDR? If not, there are pirates about.

DX Gossip

From KV4AA and his column we learn that FR7ZA is active again; that ZC5VM is putting Labuan on the map on 14108 kc; and that a possible expedition is supposed to take place to Trinidade Island, PYØ, participants including PY2CK, 2BEN, 1AQT and 4IE. Nothing further has been heard.

A strange character signing AX8BA, apparently in "the Far East," has been heard once or twice, but we don't yet know where he is supposed to be. No one else seems to mention him.

FW8AA (Wallis Is.) is known to be active, but no one seems to hear him. Don't confuse him with XW8AA in Laos, French Indo-China, and don't forget that XU is Cambodia and XV Viet-Nam. But none of these states will count towards your DXCC, being still on the black list.

The phenomenal tour of G2RO throughout the Colonial Possessions is continuing, but keeping very quiet. Around the time of publication he is successively due in VP2, VP4, VP3 and VP5 in that order. The transmitter is QRP and generally on 14060 kc, when he can get the time to operate.

Rumours of sundry other stray expeditions come along from time to time, but are not authenticated; so we don't propose to tantalise you by retailing them. Rest assured that you will be notified of any genuine out-of-the-way spots that are likely to come to life.

Contests

Nothing big looms on the horizon until the annual B.E.R.U. event, taking place this year much earlier than usual—January 30-31. Let us hope that conditions are

TOP BAND
TRANS-ATLANTIC TESTS
1953-54 SEASON

Dates:

January 17 and 31
February 14 and 28
March 14

Times:

0500-0800 GMT

DX stations call at 0500, 0510, 0520 and so on; Home stations call at 0505, 0515, 0525 and so on. Clocks should be synchronized by WWV on 2500 kc.

Frequencies:

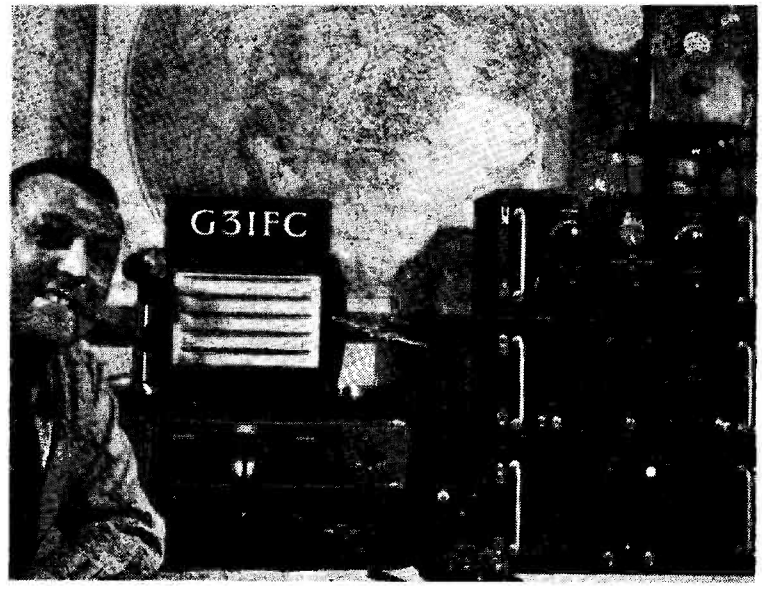
U.K. Stations: 1830-1870 kc

W/VE Stations: 1800-1825 kc, 1875-1900 kc, 1900-1925 kc and 1975-2000 kc, according to location.

kinder by then, and, in particular, that the 21-mc band will be some use.

Meanwhile, in the box is a reminder of the Trans-Atlantic Top Band Tests, which will do their best to keep you out of bed from 0500 onwards on certain winter mornings. We expect great things again this year, judging by the way the band has been shaping of late.

Finally, a note to thank, most sincerely, all those who have sent us Christmas Greetings and all kinds of good wishes through the post. Up-to-date they have arrived from no fewer than fifteen countries; already we are considering selling the AR88 and buying a grand piano to make room for them all. To these, and all other readers, our heartiest good wishes for the New Year. May 1954 bring in everything you wish.



G3IFC (Alford, Lincs.) was licensed in September 1951 and now runs a 50-watt general-purpose transmitter with a valve sequence of 6AG7-6V6-6V6-6AG7-807, using wide-band couplers. The modulator is a pair of 6L6's and the receiver an AR77E. For aerials, he has a 132-ft. long-wire, with a dipole and a ground-plane for Twenty. Operation is also possible on 160 metres, with separate equipment not shown in this photograph.

Closing date for the next issue is **first post on Friday, January 15.** Address everything, as usual, to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1 73, BCNU and—Happy New Year!

PHONE AT LAST!

GETTING GOING WITH THE NEW TICKET

J. G. MILLINGTON (G3JGM)

WHETHER he is a member of one of the CW clubs, or whether he is at heart a hater of Morse, the spirits of every G3-plus-3 lift quite appreciably when authority for phone and QRO finally arrives, and interest in Amateur Radio receives a considerable fillip.

When the phone ticket fell through the letter-box at this QTH, things were all set to go on 20 metres. All that had to be done was to lift out the sub-chassis mounting a KT8 in the final of the big rig and insert an 813 in the holder which had been awaiting it patiently for the last twelve months. A quick change of tappings on the power transformer supplying the PA, and 1200 volts were waiting to push us out to the ends of the earth. Or so we hoped!

The modulator, a pair of zero-bias 807's, arranged to give 75 watts of audio, was already in circuit, and the first CQ call went into the lovely crystal mike, followed by an eager combing of the band for DX replies. An answer came quite soon—a knock at the door, and the gentle tones of a kindly neighbour explaining tactfully that he was taking the transmission R5 and S9 plus on his TRF television set! It is always nice to know you are getting out, but since the TV aerial proved to be precisely one yard from the end of the transmitting Windom, it was felt that DXCC was still a long way off!

Sadly the "big switch was pulled," and a rueful eye cast over the rig. The transmitter was well screened, each stage had a separate power supply, and there was a harmonic trap in the PA. It looked as though a new aerial was the most likely solution, but that would have to wait a day or two. A local schedule was arranged out of TV hours—and speech quality reported poor. Instability was also encountered until the phone jack acting as a microphone plug was replaced by a co-ax socket, and the entire input carefully screened by wrapping earthed tinfoil

round the wires. Quality was still not good, however, so without expecting much, the expensive new microphone was replaced by a small deaf-aid crystal insert, bought for one-twentieth the price. Quality OK, was the report, and the deaf-aid job has been in use ever since! It is not always the most expensive gear that gets the best results, even if it should.

Better Progress

At the week-end a dipole centre-fed with 80-ohm twin replaced the Windom, the original aerial being hooked on to the receiver to save aerial switching. With the neighbour listening on his TV set, the carrier was switched on and modulated, giving the station location and telephone number in case other viewers also wanted to QSL! Some minutes of suspense, and then a knock at the door reported TVI cleared! A few weeks of operating brought S9 reports from all over Europe, but no DX, the aerial being only 15 feet high and screened by houses. Dropping one side of the dipole down to tip the lobe over a little brought similar reports from North Africa, and that is the best so far. Aerials are a headache at this QTH, and really efficient ones out of the question. It was also found that the receiver which had done good service for CW reception was not bringing them in so well on phone, so it was replaced by a Canadian 19-valve VRL — a receiver electrically similar to the popular AR88, but incorporating also a crystal calibrator for 1,000, 100 and 10 kc checks.

Top Band Trials

When Twenty succumbed to one of its periodical doldrums, and listening to nothing grew tiresome, thoughts began to turn to 160 metres, where familiar voices were to be heard discussing interesting topics. The transmitter was all ready, but no modulator was available. 75 audio watts is a bit much for a ten-watt carrier, so obviously a QRP modulator had better be slung together. A carbon microphone into a 6J5 and a KT66 seemed reasonable, but as no mike transformer was to hand, a new one was purchased. Modulating plate and screen, reports indicated about 20% modulation, with the impression of a still, small voice like a distant conscience! The modulator was rebuilt twice with no improvement, and the only component unchanged was that new microphone transformer, which had seemed beyond suspicion. Finally, however, it too was replaced by a "surplus" specimen on loan from a friend, and modulation at once rose to the required percentage!

Quality was still rather rough, however, so an extra stage (6SJ7) was added in front of the 6J5 to permit the use of the crystal microphone. Speech is now reported good, though somewhat attenuated in the lower register, so the next step will be attention to matching and coupling in the modulator to produce a more linear response, athough a predominance of top is a help in getting an intelligible signal through QRM.

At last, however, 160 metre rag-chews with the locals are now a pleasant and useful feature of radio activity, especially when Twenty is dead. It had been hoped to do something on 40 metres, where much useful CW work was previously carried out, but BC stations have rendered that band almost hopeless for phone operation. One wonders if it might be any use for local working, to relieve One-Sixty and assert our right of occupancy, since what is not used is always liable to be lost.

RAID OVER THE BORDER

TRIP /P ON TWO METRES

R. W. H. BLOXAM (GM6LS)

IN early May the snows melt in the Northlands, filling the burns with clear water rushing down the glens and sparkling in the Spring sunshine. (Unless, of course, the sparkle suffers QSB due to fogs, such as we had this year). Salmon and trout leap fast and high, mocking the optimists standing waders-deep in the icy waters, trying to lure them with flies phonier than skull and crossbones call-signs. Sometimes one wonders which demands more patience and skill: 144 mc DX or fly-fishing.

Thawing out during the ensuing months of good Wx, there comes to GM6LS—exiled G that he is—an irresistible urge to head the car southward across the Border to raid some of the good friends whose signals have from time to time broken forth from the HRO-and-Converter on both VHF and LF bands.

This year the wish could not be fulfilled until September, and in the first week the 144 mc handie-talkie (described in the June 1953 issue of *Short Wave Magazine*) was loaded aboard and course set for Newcastle-upon-Tyne. About 20 miles north of that city there is good 144 mc high moorland territory on the edge of Rothbury Forest, from which one can practically see the Geordies sitting in their shacks down in the Tyne valley. Pause was made to hear if G3CYY, G4LX, or any others were about, but United must have been playing at home that Saturday afternoon.

Stockton was reached at tea-time in heavy rain—incidentally, the only rain of the trip—and after wandering a bit, there being nobody to misdirect one in that deluge, G6LS/P stood dripping pools of water in G2FO's hall, and thereafter a FB personal QSO was enjoyed with Dick, who, among other GM's, has worked our T1 144 mc CW.

Next morning the sunshine was brilliant again, and a detour was made to Redcar to see SWL Odell, who was footing it round the band, as always, and was his usual amazingly cheerful self. There are not many active call-signs that he has not logged, on LF bands, anyway, and every voice, "handle," and most of our doings Peter knows by heart.

In the late evening a small hotel was reached in the backwoods of Grantham, far enough from the

Great North Road for some sleep. Listening at the top of a hill behind the village G3DSR/P, the station of the Derby Radio Society, was heard at S7. They were operating 15 miles north of Derby, and reference to the map showed this was some 40 or more miles distant and out of range of the handie-talkie's 0.45 watt and ¼-wave rod aerial. Pity; it was a nice signal.

The following day found us heading eastward through Kings Lynn to Holt, where G3DRL and his brother, G3HRK, were found hidden in a corner of their wilderness testing out the 80-m. flood-emergency rig (let's hope they never need to use it), aided by W4HXI (Camilla, Ga.), who had escaped from a neighbouring USAF Stn. After tea, and much rag-chewing, the trail was struck for Mundesley, where anchor was dropped for a few days with G3EGR, Chieftain of the Skylarks on 3.7 mc, Principal Comedian of the County of Norfolk, and all-round-good-fellow. The mainbrace was duly spliced to the accompaniment of much discussion on topics ranging from commercials on the bands to bikinis on the beach.

North Norfolk is somewhat in the wilds, but the natives *are* friendly. It does not seem particularly good VHF/P country, possibly because VHF population is rather sparse. Attempts to QSO Norwich drew blank. A really nice volcanic eruption is needed, to provide some hills akin to those in GM for /P 144 mc work. However, we couldn't wait for this to happen.

Into East Anglia

The Cambridge area seemed to bristle with two-metre stations. By 3.7 mc from Mundesley it was arranged to call G2XV from some miles outside Cambridge. Unfortunately, a lead had come off the mike battery, so there was no modulation, but G2XV reported the carrier S8, and we homed on Gerry's shack; here, the trouble in the handie-talkie was soon diagnosed and rectified, after which good QSO's were made with G2CNT, G3IIT, and G4MW from inside G2XV's shack. Later, we went in Gerry's car to the Gog Hills, that slight eminence outside Cambridge, from which vantage point further QSO's were made from the roadside "nae bother at a'."

Left to right: G3HRK, G3EGR and G3DRL, all from the East Coast area.

Many an old timer will recognise this as Gerry Jeapes, G2XV of Cambridge, a very active and successful operator on the VHF bands.

Next day G6LS/P was headed for London, but a stop was made at Wisbech, a quaint place with railway lines in the streets, and wild bullocks milling round the car in the market place, giving a western-movie atmosphere. The object was to find G3HVF, who, we learned from one of the round-up men, was "on the railway." As far as we noticed, trains around these parts run like they do in North Norfolk and North Scotland—just now and then. Anyway, we found Bob on his allotment, pulling beans, though it seemed he had a schedule to try some possible-train-running (if there are possible-calls, why not possible-trains?) after 1400 BST. The ensuing ragchew ran things close, and we have heard from him since on 3.7 mc that Bob had to pull the big switches with one hand whilst eating his lunch with the other.

London-wards

Wimbledon Park was reached that afternoon, where G6LS joined son Wallace, designer of the handie-talkie. We consulted maps, and the highest ground within our radius of operation seemed to lie in Richmond Park, so, having sent off another tiresome-telegram to the Postmaster-General, we proceeded thence, and, amid the bracken and the deer, put out our first /P London CQ. In this sylvan setting it seemed for a while like the wide open spaces of home among the Scottish hills. There must be a catch in it. There was. The aerial was hardly fixed on when a uniformed individual on a bicycle appeared from nowhere, being in fact a Keeper armed with a Book-of-Words on what could or could not be done in this 'ere Park; and behold, Rule 18 says no Hams may pollute the ether thereof with radio equipment sited therein.

Well, it was nearly chucking-out time, anyway, so we went QRT. Pity, because that was a nice QTH commanding most of London. Next day we

relegated ourselves to the common level—Wimbledon Common. G8OU (Ashtead) was coming in S7, but no luck. From that nice hill at Richmond—oh, well.

In the evening we squeezed through the skylight of the house in Wimbledon Park and out on to the flat roof, and from this point we had fine contacts with G2DUV (Streatham) and G3FSD (Wandsworth), both of whom reported S9, and we worked them again other nights.

A visit was made to G3FQU at Twickenham, whose 3.7 mc 12-watt 6L6 PA, CC Tx reaches Edinburgh with miraculous regularity; FB Charles, OM. FB coffee, too, Stella!

Holiday time was up all too soon, and G6LS/P had to head North again, to revert to the GM prefix across the Tweed, but a call was made at York to see G3HSZ. Harold owns what can only be described as a sheet copper mine and, incidentally, is a GM so long resident in Yorkshire that he now prefers pudden to haggis.

No spectacular DX was worked with the two-metre handie-talkie; indeed, none was expected—and it was seldom possible to operate after TV hours whilst on tour. However, a good deal of interest and enjoyment was had from the QSO's obtained, which confirmed the belief that the Tx has a fairly reliable range up to 10 miles with reasonable siting, and somewhat more on points of vantage, whilst the Rx is capable of good reception over considerably greater distances with the one-way gain of the fixed-station beams.

G3HVF, of Wisbech in the open Fen country, with his 144 mc handie-talkie, as described by GM6LS in our June 1953 issue.

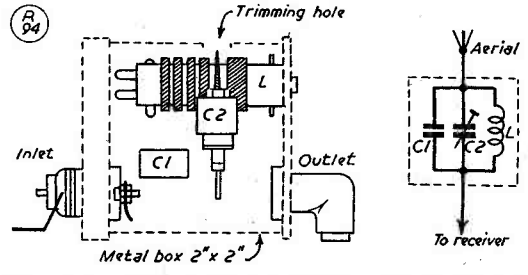
Most enjoyment of all was derived from meeting old friends and acquaintances of the amateur fraternity in personal QSO's, and the only regret was that time precluded more diversions to see others whose call-signs are writ within the Log.

Wave-Trap for the S.640

ELIMINATING THAT 1600 KC BEAT

N. P. SPOONER (G2NS)

WHILE a modern receiver will collect signals from a few feet of flex draped round the picture-rail most Top Band users will agree upon the necessity for a good outdoor aerial. For low-frequency working this suggests, logically, the combined use of the transmitting aerial with a change-over relay for reception. Improvements in signal strength however, often bring with them an increase in interference and—as pointed out by G6FB in the December, 1950, issue of *Short Wave Magazine* — the 100 kilowatt station now operating on 1602 kc can definitely come in on the S.640 IF of 1600 kc. This is particularly tiresome when the S.640 is being used with a VHF converter. In some cases with the BFO on only muttering in a high-pitched whine will perhaps be audible during the daytime, but by the late hours of the evening this may well have become too much for comfort.



Circuitry and general arrangement of the 1600 kc trap to keep interfering signals out of the S.640 on its 1.6 mc IF. The broadcaster on 1600 kc is very powerful, and direct breakthrough can be troublesome, particularly with VHF converters, as every VHF phone station carries a weakly-modulated heterodyne. Values for the trap are: C1, 50 $\mu\mu$F; C2, 3-30 $\mu\mu$F trimmer for tuning trap; L, Wearite PA2 or any similar medium-wave BC tuning coil.

The considerable alleviation produced by G6FB's suggested reversal of the connections to the fixed and rotor vanes of the crystal phasing condenser is very helpful. To those amateurs who find that, as mentioned in his article, there may also be a tendency for pick-up from the aerial itself the shielded wave-trap

about to be described—which has been in use at the writer's station since the interference started—should prove to be of additional interest. As the majority of transmitting systems on 1·7 mc resolve themselves into the use of the existing radiator *plus* an earth connection or counterpoise for Marconi working, only a single wire is needed for connection to the receiver and even with the twin feeders of the Zepp or 300-ohm type both are usually strapped together to form one. A single wire also lends itself more readily to the good screening so necessary for a wave-trap and it should accordingly be extended to reach as far as the receiver and there be terminated in a Pye plug.

Construction

While no difficulty will be experienced in winding a suitable coil, its physical size should be small, and this requirement is fulfilled and much time saved if a cheap medium-wave BC aerial coil is used—such as that manufactured by Wearite and catalogued as the PA2. This fits comfortably inside any small tin about two inches deep and of the same diameter, and it can be conveniently bolted to the bottom into which should also be screwed a Pye plug to serve as the trap outlet. The two horizontal tags on the coil are ignored and in parallel across the coil windings and to the two remaining vertical tags are soldered a fixed 50 $\mu\mu$F mica condenser (shown as C1) and a 3-30 $\mu\mu$F trimmer C2, which can be set through a small hole bored in the side of the tin. Into the removable lid of the tin is screwed a Pye socket to serve as the trap inlet, the connection between it and the coil being made flexible. The aerial and earth terminal strip at the rear of the 640 receiver should be removed and the internal wires unsoldered from the terminals. The place of the "A" terminal is now taken by a Pye socket, and the Earth and "AE" terminals can then be remounted on a small piece of paxolin or other insulating material and replaced on the receiver for the internal wires to be soldered back to them. Setting the trap is carried out simply by plugging its outlet into the receiver socket just mentioned and plugging the aerial into the trap inlet. Through the hole in the side of the tin the trimmer is tuned with an ebonite or other rod hollowed to fit its top. A point will be be found where the interfering heterodyne, with the receiver BFO switched on, will either completely disappear or be reduced to its minimum strength. No further attention need be paid to the trap and evenings that previously ended in general uproar with the shack littered like a gypsy encampment should from then onwards be enjoyed in comparative peace with much winkling-out of faint DX.

* * * *

On this same topic of suppression of the 1600 kc interference, H. S. Stevens (Nr. Aylesbury, Bucks.) suggests shielding the spindle of the crystal phasing condenser on the S.640, as in his case it was found that the signal was getting into the IF chain that way. An aluminium cap, fitted over the control knob and earthed by means of flexible lead, provided a complete answer. This might be enough at some locations, but in others it would probably be necessary to take the measures suggested by G2NS.

ARE YOU ON DC?

G3LS, having moved to 21 Kilwick Street, West Hartlepool, Co. Durham, finds himself on DC mains. He puts out an urgent plea for contacts with other readers who may be similarly afflicted, as he wants some ideas about how to make use of DC mains. Actually, DC mains are not quite such a disadvantage as they may appear at first blush. The usual 6.3 volt heaters can be run from a good 6-volt car battery, kept up through a trickle charger; on the communication bands input powers up to 50 watts or so can be obtained by running a PA consisting of valves such as the 6AQ5 in parallel push-pull; 230 volts is ample for the driver stages. Smoothing, which is always necessary, by the way, is simply a matter of a hefty choke with 8 μF either side. If the distribution happens to be three-wire, it is possible to obtain twice the nominal DC voltage by getting across the two outers—but this is a matter which must be arranged with the local supply authority. For real QRO operation, a motor generator is the only answer—these are quite cheaply obtainable as surplus. The machine can be DC/DC, or DC/AC, and two such, one to give LT and the other either high-voltage HT or AC for treatment in the usual way, can be installed in the basement (or somewhere out of the way to eliminate noise), with switching by remote control. The suggestions outlined here are based upon practical experience with 230-volt DC mains, which did not prevent a complete full-power installation from being put on the air, at no great expense on the power supply side.

* *

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Selsyns, Magslips and M-Motors

SELECTION, APPLICATION AND CIRCUITRY

P. D. CRISP (G3BNC)

This article will give a practical working knowledge of an electrical remote control system with several useful applications in Amateur Radio. It will enable suitable types of machine to be chosen for such purposes as beam rotation and remote indication.—Editor.

THE term Selsyn is a General Electric Co. trademark and is a name for self-synchronous apparatus. The function of a Selsyn system is to transmit motion by electrical means between two drives which cannot be readily connected mechanically. It is much used in aircraft control systems.

Selsyn equipment can be utilised either for position indication or for synchronizing power drives. When so used Selsyn equipment operates in many respects as electrical remote gearing and can be employed to obtain synchronous rotation of shafts some distance apart. It may also be used to secure different but proportionate speeds of different shafts when the Selsyn units have the appropriate number of poles.

Selsyn Indicators

The first use of the Selsyn principle was for indicating remotely the setting of some item of equipment. This service requires units having a relatively low torque, but usually a high degree of position accuracy free from creeping tendencies. Indicator units are made in the small bipolar salient pole type with three uniformly distributed windings.

In construction and operation these units are similar to the usual type of synchronous machine except that single-phase AC instead of direct current DC is applied to the field windings of both the generator and motor Selsyns, usually known as " transmitter " and " receiver " respectively. The relative position of transmitter and receiver must be kept in step or there will be a tendency for the remote unit to start up as an induction motor when power is applied to the rotors. A damper is normally fitted to the receiver unit to avoid this happening.

The voltages induced in the stator windings are in phase but have different magnitudes depending upon the relative position of rotor and stator windings. Single phase field voltage is desirable as it permits the development of synchronous torque between the two units at standstill and at low operating speeds, which is clearly impossible with the stationary field structure. Stator voltages of one unit may be matched with the stator voltages of the companion unit in such a matter as to provide synchronizing torques to assure correspondence of position even at standstill.

Although the torque obtained with a single phase rotor is sufficient for indicating purposes, larger amounts of synchronizing torque can be developed by means of a 3-phase winding, distributed in the usual manner. Units of this type are used in Power Selsyn equipment. But for the purpose of this article it will suffice to concentrate on single phase Selsyns.

Summing up, a Selsyn generator can be considered as a transformer and by the application of single phase AC to the rotor the three stator winding voltages are produced by transformer action. Fig. 1 is a block schematic to show the electrical interconnection between the units, transmitter and receiver, and in most applications these units are interchangeable.

Magslips

The theory and operation of these motors is similar to the Selsyn, but it will be found that the field is wound in delta rather than in star. The Magslip is constructed like a miniature 3-phase synchronous generator. The rotor has two salient poles with the winding connected to two slip rings, or they may be brought out to flying leads, but they are always marked X and Y. The stator is wound in slots like an ordinary 3-phase generator, with windings connected in delta. Both the rotor and stator are laminated. If the rotor were excited with direct current, and rotated by external means,

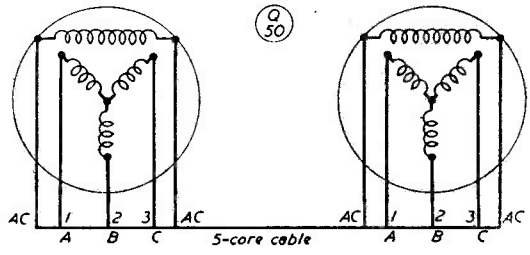


Fig. 1. Showing winding layout and a possible system of inter-connection. The markings are arbitrary, to assist in wiring through from " local " to " remote."

it would generate 3-phase AC in the stator winding, but the unit is not intended to be used in this fashion.

In normal use the *rotor* is stationary (which is a contradiction in terms but in accordance with design theory) and is supplied with single phase AC; the 3 stator winding voltages are produced by transformer action, as in Selsyns.

However, whilst the Selsyn units are interchangeable—that is, the receiver can be used as transmitter and *vice versa* — this is not usually the case with Magslips. An exception is the "Magslip Hunter Mk.11 (3")" reference AP 6548, which is in fact a Differential Magslip Control unit. The Mk.1 and Mk.11 units operate from 50v. 50 cycle AC, and if it is desired to transmit to several different points a Magslip transmitter is connected to corresponding smaller units. The 2" Magslip Mk.1, AP 6550, and the 3" Magslip, Mk.11, AP 6551, will drive up to 6 and 12 Mk.11 AP 6549 Magslip receiver units respectively, should it be required. In addition to the Magslip receiver units the Mk.1 and Mk.11 transmitters will drive the Mk.10, AP 9298, "M" motor receiver units as indicators.

"M" Motors

As in the case of Magslips, the receivers and transmitters are not interchangeable. (The transmitter unit is not dealt with in this article, but can be considered to be a DC operated rotary switch.) The "M" motor receivers are made in various sizes, but we will concern ourselves here with the Mk.10 AP 9298 unit. This unit differs from the Magslip receivers in as much as there is no connection between the rotors. The stator is delta wound, and is rated at 24v. DC, and the approximate size is 2" diameter and $2\frac{1}{2}$" long. It has a terminal strip fitted to its base, and the connecting screws are marked 1, 2, 3. It will be found that the numbers are similar on the Mk.1 and Mk.11 Magslip transmitters, and all that is required is to connect the two units in parallel, and then apply 40v. or 50v. AC to the X and Y terminals on the transmitter; when the rotor of the Magslip is turned the "M" motor unit will follow in the same way as the Magslip receiver unit, *but* it will be remembered that the "M" motor is a DC machine and it may be that the spindle of the motor will be 180° out of phase with the Magslip. This can be corrected by giving the shaft of the "M" motor a turn through 180° to bring it into step with the Magslip. By using this type of indicator one can save a pair of wires in the cable form from the remote position. It will be seen that at the top end of the "M" motor unit a small cog is fitted to the shaft; this can be used to drive a pointer through gearing, or it may be found more convenient to fit a pointer directly over the cog.

APPLICATION

Selsyns

The operating position at G3BNC being in the basement it was found to be an advantage to be able to rotate the beam by some more positive electrical method than by hand or by a loose system of rope and pulley. The answer came in the shape of a pair of type 5J/2512 Ref. W325A Selsyn Motors. These units are available on the surplus market at the present time for a mere 40s., a chance not to be missed if one is faced with the problem of remote control of beams.

The rating of these units is as follows: 230v. AC, 50 cycle, single-phase input, the torque being 45 lb. ins., with $\frac{3}{4}$" long by $\frac{1}{2}$" diameter keyed shafts, protruding from each end of the motor cases. These motors are powerful enough to rotate any beam that one is likely to have in operation at the present time.

The star wound stator windings are brought out from the motor case through an insulated grommet and the three wires were marked ABC on both units and then connected together *via* the remote control cable. The 230v. AC input wires from the rotor slip rings were brought out from another similar grommeted

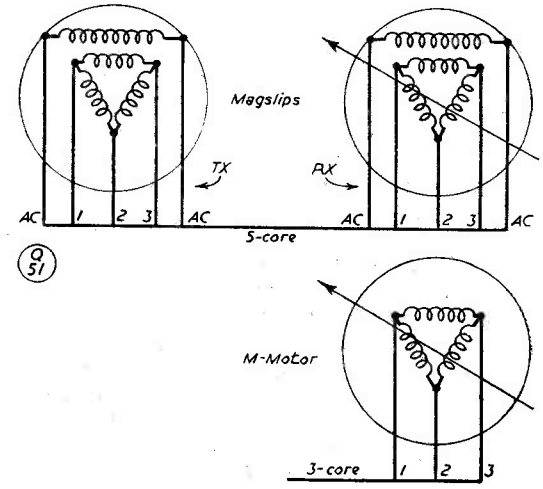
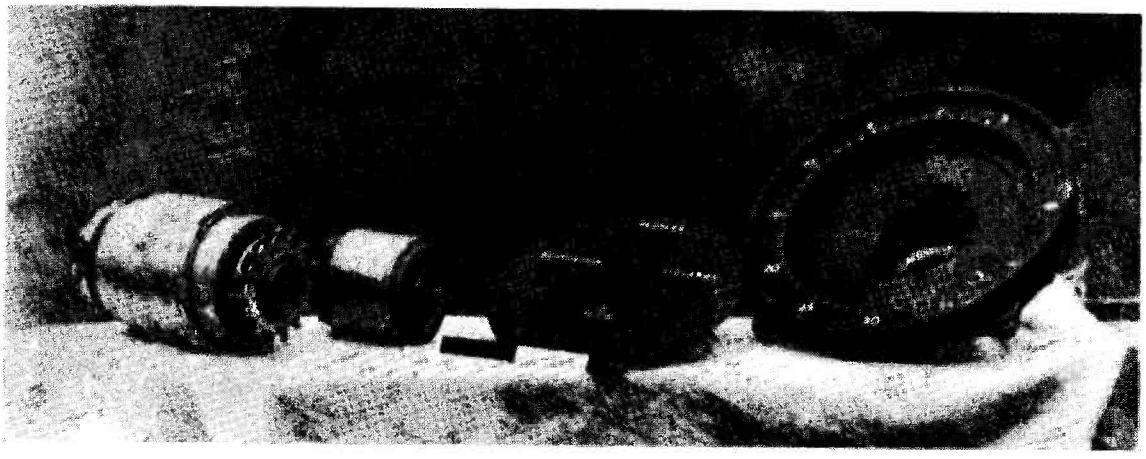


Fig. 2. Layout of windings in Magslips (5-core connection) and in M-motors (3-core) the latter being used for instrument indication, such as the pointer on a rotary beam direction map.



Some of the units discussed by G3BNC. Left to right: 3-in. Magslip Mk. II Transmitter, AP1372; Magslip Mk. II Receiver, AP6549; Dial and Pointer; at right, casting into which the Magslip Receiver Mk. II fits. This illustration, and the notes given in the article, will aid in the identification and purchase of these items.

hole, but these wires were not marked. These wires also must be connected in parallel *via* the remote line, and it is important to check the phase relationship before they are put into use or it may be that the receiver unit will take off as an induction motor.

Once the units are connected together in the correct way it will be seen that, as soon as AC is applied, if one rotates the transmitter motor shaft the receiver will follow, and if the receiver shaft is rotated the transmitter shaft will turn at the same speed and in the same direction. So far so good. The next thing to do is to arrange for the receiver motor to drive the beam. This is obviously a matter for individual preference, but at G3BNC the motor is mounted adjacent to the base of the mast, and with the aid of some cycle chain and sprockets, using 1 : 1 gearing the mast rotates within its own guy points very nicely. At the station end a circular plate is attached to the end of the motor case and marked off in the various points of the compass and a pointer fitted to the end of the shaft that protrudes through the circular plate, the whole being lined up with the beam headed North and connected *via* the drive chain to the receiver motor.

At the station end the pointer is set on the North position as indicated by the circular plate. When the transmitter shaft is rotated the receiver motor will follow, turning the beam. Fig. 3 shows the connections for all units in a practical system.

Lining up Selsyns and Magslips

It might be helpful here to give the procedure for setting up Selsyns and Magslips when the units are located at a distance apart, such that it is not possible to see them both.

First, connect the X lead to the lead marked 1, and the Y wire to the lead marked 2, and then disconnect lead 3 on both units. Thus, in effect, the rotor and half the stator are in parallel. This applies of course to Magslip connection numbers, and in the case of the Selsyns the AC leads and those marked AB. Now set the Magslip transmitter-rotor in the position where it is possible to lock it by placing an $\frac{1}{8}$" rod through the flange on the top end of the rotor and the hole situated in the casing of the motor. When the rotor is thus locked, apply 50v. AC to the X and Y connections, or to the AC leads of the Selsyns; it will then be seen that the two units will set up in the correct phase relationship to one another. Once this is done the motors may be reconnected and arranged to rotate the beam.

Braking System

If it is required to have a braking system on the receiver motor shaft to stop the beam moving when the wind blows, it can be done very easily by fitting a slotted wheel to the bottom end of the shaft. A wheel of 3" diameter and $\frac{1}{2}$" thickness, with slots 5/16" cut out around its edge at 30 degree intervals, 12 in all, will do. This has a $\frac{1}{2}$" hole drilled in its centre and is fitted to the lower end of the shaft. One can then obtain or make a 230v. AC solenoid to operate a spring-loaded rod, which in the "off-power" position will engage in one of the slots cut in the wheel.

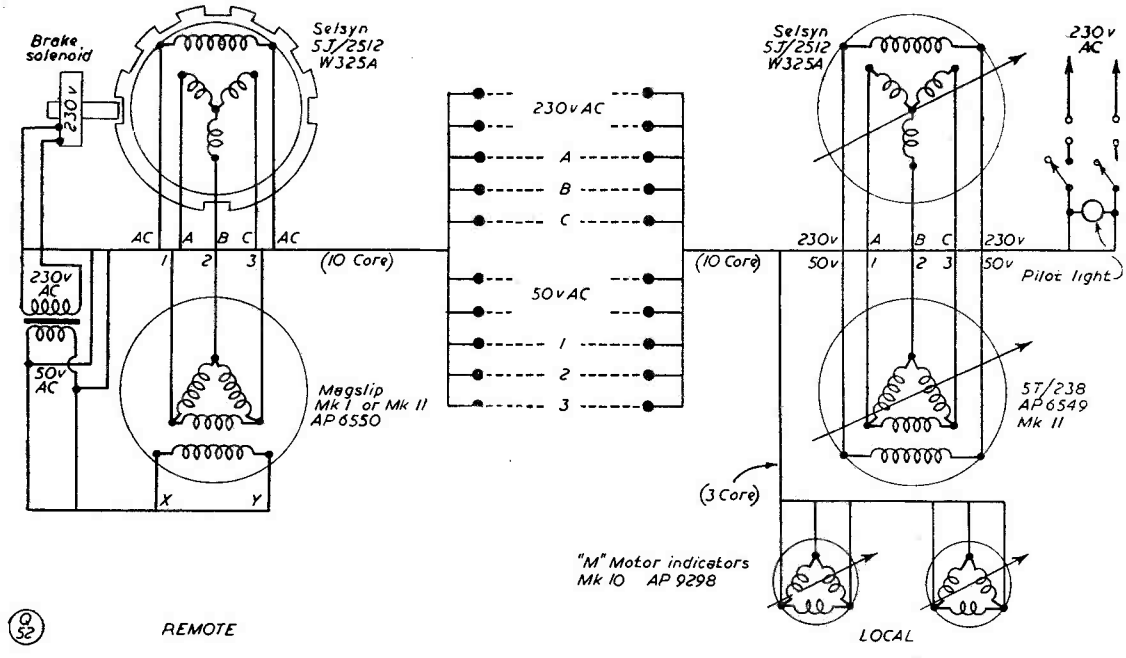


Fig. 3. Layout of a practical remote control system, showing transmitter-receiver and motor indicator units, as actually used at G3BNC. The brake solenoid slips in when power is off, preventing windmilling of the beam head when the station is shut down. The various items discussed in the article as being suitable for these applications are obtainable as surplus.

When the AC is applied to the motors it will be seen to pull in the rod, which will disengage the slot and allow the motor shaft to rotate. When the power is switched off the rod will spring back against the outer edge of the wheel. If the rod is not opposite a slot, then with movement of the beam due to windage it will lock as soon as it comes in line with one of the slots. When AC is again applied to the Selsyns it will have been impossible for the receiver motor shaft to have moved more than 30 degrees and the chances of the slave taking off as induction motor is *nil*.

If it is desired to have a more elaborate system of indication—that is to say, a Great Circle map centred on the U.K. with pointer centred on the home QTH—then it will be necessary to gear a Magslip transmitter Mk.11 to the receiver Selsyn at the remote position by the same ratio of gearing as that used to rotate the beam. It is possible to clamp the Magslip to the case of the Selsyn by a mild steel band suitably joined. Once this is done it will be seen that all one has to do is to wire up a Magslip receiver motor, and the unit to obtain is the Ref. 5T/238 indicator. This unit has a large face of $7\frac{1}{2}$" x $1\frac{1}{2}$" and the case is of light cast alloy with a housing at the back for the small receiver motor about $2\frac{1}{2}$" x $3\frac{1}{2}$". The five connections for X and Y (rotor) and the 1, 2, 3 (stator) leads are readily accessible at the rear of the unit. In the original, the spindle is brought out through a dial marked in degrees for depression and elevation, and is fitted with a pointer. It is no problem to replace the dial with a map, or if one is interested in Two Metres a map of the U.K. and Northern Europe. To get this receiver motor (Magslip) at the rear of the dial out of its housing all one has to do is to remove the pointer and the four holding screws. It can then be replaced with a small "M" motor. The small cog that is attached to the spindle can be removed and the pointer refitted. It is then necessary to run three wires from the Magslip transmitter to the stator windings of the "M" motor in order to make it operate. However, the 40v. or 50v. must still be applied to the X and Y connections of the Magslip transmitter, and the transformer for this can be located at the remote position, its primary being supplied from the 230v. AC that feeds the solenoid and energises the receiver Selsyn.

It will be now seen that if one has a composite beam assembly and an indication is required for 10 Metres and 2 Metres—and perhaps also 70 cm.—two more type 5T/238 units can be put in parallel with the first,

making three in all. It is a matter of choice. The "M" motors type Mk.10 AP 9298 are available at a very moderate price, and it is possible to build indicating devices to suit one's self. It is as well to mention that the Magslip receiver units will always re-set themselves to the position of the transmitter once they have been set up in the first place as described.

Finally, when purchasing Magslip transmitter units Mk.1 and Mk.11 make sure that the motors are fitted with *black* bakelite covers; the Mk.11 Hunter unit has a *red* bakelite cover and the operation of this unit was discussed by G5RZ in the October, 1953, issue of *Short Wave Magazine*.

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TV TRANSMITTING STATION IN GD

The BBC has established a low-power booster TV station near Douglas in the Isle of Man; it was brought into service just before Christmas. This station operates on Channel 5, the frequencies being 66.75 mc for Vision, and 63.25 mc for Sound, with vertical polarisation. Now for a new crop of TVI problems!

COMPONENTS BY SIEMENS

At the Amateur Radio Exhibition in November last, Siemens Electric Lamps & Supplies, Ltd., and Siemens Bros. & Co., Ltd., showed as the main feature of their stand a marine receiver, Type G.2, designed for ships down to 1,600 gross tons. Built to comply with the G.P.O.'s Merchant Shipping (Radio) Rules, 1952, this general-purpose receiver has a frequency range of 15-20 kc and 100 kc to 30 mc; it is in two separate units, and can be operated on either AC or DC. As one of the well-known manufacturers of magnetic and thermal delay relays of the type designed to meet exacting Service and G.P.O. specifications, their range of relays on view was also of particular interest. These included the hermetically-sealed miniature high-speed relay capable of operating at a speed in the region of two milliseconds, and an aerial switching relay embodying novel features and having low capacity and inductance at frequencies up to about 20 mc—this we hope to review in an early issue. Keying relays having the special characteristics required for fast automatic repetition of Morse signals without distortion were also shown. A representative display of Siemens radio batteries was included on the stand, and in the selection of Tungsram valves was their type 807, with an interesting range of miniature valve types.

OUR YOUNGER OPERATORS

On p.569 of the November issue, we mentioned Eddie Wright, aged 15, as awaiting his licence. This has now been issued, under call-sign GI3JGZ—may it bring him many happy years of interest and achievement. On the same theme, we have heard from G3DIR (Baldock, Herts.) about his son Dennis, also 15 years old, who—having taken the prescribed examinations—now holds call-sign G3JKM. He passed the R.A.E. before his 15th birthday, and in 14 days on the air (operating father's Top Band transmitter) he made 50 contacts in the six G call-sign areas. G3JKM is in the fifth form at Baldock Grammar School, and has to get his prep. done before he can go on the air. To him, too, we offer congratulations and good wishes. G3DIR suggests that perhaps the time is ripe for the formation of a Young Operators' Net—or even a Young Operators' Club—and we shall be glad to support this if all YO's under the age of 17 next birthday care to let us have name, address and call-sign.

G.E.C. GENERAL-COVERAGE RECEIVER

A new table radio receiver introduced by the G.E.C., the BC-5444, is a 5-valve AC design in the popular price range, incorporating several features not usually found in its class. Three short-wave bands have been given bandspread tuning for ease of operation, and the scale is floodlit so that it can be accurately read. The BC-5444 has three main wave-ranges, providing continuous tuning on the Long, Medium and Short (15-50 metre) bands and, in addition, three fully electrical bandspread ranges covering the 19, 31 and 49 metre bands, with calibration across a large tuning scale. The price of the BC-5444 is £19 19s. 0d. (inc. p.t.).

BROADCAST RECEIVING LICENCES

By the end of November, the G.P.O. had collected the doubloons on 13,153,314 broadcast receiving licences, of which 2,727,000 were for TV receivers and 200,286 for sets fitted in cars. In spite of a rise of 111,811 in the number of TV licences, these still represent barely 20% of all licences in issue in the U.K.

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VHF BANDS

A. J. DEVON

Wide Openings November 20-23, December 1—

DL7FS (Berlin) Worked, HB9CB Heard—

Many Good European Contacts Made—

Survey of Conditions, and The Tables—

Cheltenham VHF Meeting in March—

Reports, Notes and News—

AS appeared probable when we left off last month, conditions started to improve from about the third week in November. There was a very good, and extensive, opening to the Continent during the few days around November 20-23, after which conditions subsided again; this was followed by another EDX appearance on December 1st, since when, and up to the time of writing, things have been rather flat.

Some outstanding two-metre contacts were obtained during the openings. GM3EGW (Dunfermline) worked ON4BZ (Brussels) at 2215 on November 21, it being a "First" for them both—nice work. During the QSO, ON4BZ was also heard by GM3ENJ and signal levels were 569 for ON4BZ, with GM3EGW up to S8 in Brussels. This success was indirectly due to G5YV, as it was Harold who suggested that GM3EGW should try for ON4BZ. By its result, GM3EGW gains the distinction of being the first Scot to qualify for Countries Worked—a very difficult feat for any GM, by reason of their geographical disadvantage—his eight countries being EI, G, GD, GI, GM, GW, ON and PA. Holland is represented by his contact with PE1PL on April 4 last.

Other very fine contacts were G6NB-DL7FS (Berlin), and G5YV-DL7FS on November 22, with the latter's phone peaking S9 at Brill and S8 in Leeds. The distance is 600 miles, near enough, and DL7FS is probably about the furtherest-East station on the two-metre band; at any rate, it would only be a matter of a few yards still further East for the Iron Curtain to have been penetrated on VHF. Incidentally, G6NB's list in the Activity Report is worth looking at—he shows 26 different stations worked in eight DX countries in the three weeks to December 8. And his grand total of different Continental stations QSO'd on two metres is now 107, with cards held from more than 80 of them. This is without doubt a record, making G6NB one of the outstanding DX operators on the band. It is quite true—and he himself would agree—that it is all much helped by a particularly favourable location. But any experienced VHF man will know that to go with a good location there must also be a high degree of receiver efficiency and general operating know-how for such results to be achieved. On VHF, as on any other band, it is still true that you must be able to hear 'em before you can work 'em. Perhaps even more creditable to Bill than these top-line achievements is the fact that any newcomer to the band, at whatever distance and whether he is working phone or CW, can be sure of a helpful and interesting QSO with G6NB for the county of Bucks.

While on this theme, it should be said that G5YV is included in the same bracket. Harold is a consistent and reliable operator, always a good signal over the whole country, and he never lets an opportunity slip past. He gets his full share of EDX, and was rolling them in during the November - December openings. Stations worked by G5YV include DL1LS, DL3VJ, DL6FV, DL6SV, DL6WU, DL9LU, F3GL, F8BY, F8OL, F9DI, OZ2FR, PAØHAK, PAØNL, and PE1PL, all from 1100 a.m. and onwards into the evening of November 21—with HB9CB heard at 1815. Many of these contacts were repeated on the 22nd, with the addition of DL7FS *at 0950*. Signal levels were so high, S9+30 at DL1LS, that the latter was able to play back a recording of one of Harold's contacts with another DL. Conditions held up over November 23, and at lunch-time that day PE1PL was raised again.

During the opening on the evening of December 1st, G5YV worked four DL's, three ON's and PAØFB—about all there was time for while it lasted!

Arising from these EDX results, met. man G3EGB has prepared a chart (*see* p.693) showing the structure of the reflecting layers over Northern Europe on November 22, on which are marked some of the EDX paths worked by G5YV, G6NB and others. Naturally, on this scale it is not possible to show everything without confusing the whole picture with a lot of lines—but readers will agree that this chart, the first of its kind ever published, does give a clear idea of the coverage achieved and the possibilities. In round terms, the whole of Northern Europe was within easy VHF range of the U.K. during the evening of November 21.

Other Interesting Results

Now, what else has been happening? Guy of ON4BZ writes, and G5YV confirms, that their nightly schedule continues with almost 100% regularity. ON4BZ goes up two countries, GM and LX, in that Table, and for those who will want to know, the Luxembourg station is LX1MS on 144.6 mc, who was worked by ON4BZ on November 23.

On the topic of who's-done-what, other operators whose results are of particular interest over the period we are discussing are: G3WW (Wimblington, Cambs.), who worked 51 different stations in 7 countries in a fort-

TWO METRES
ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14
From Fixed QTH Only

Worked	Station
64	G6NB
63	G5YV
61	G3BLP (630), G3BW
60	EI2W (194)
59	G3EHY
57	G2OI (349)
56	G8SB
55	GW5MQ
54	G2HIF (200)
53	G2AJ (519), G2HDZ (416), G3WW, G4CI, G4SA
52	G2NH, G3GHO
51	G5BM
50	G3ABA, G3FAN, G5DS (510), G6XX (238)
49	G3IOO
48	G5BD, G5MA
47	G5WP
46	G4HT (476), G5BY, G5ML (280), G6YU (205)
45	G2XC, G6XM (356)
44	G2FJR, G3BK, G3CCH, G3HAZ (262)
43	G3BA, G3COJ, G4RO, G5DF
42	G2AHP (428), G3GSE (424)
41	G2FQP, G3DMU, G6CI (184)
40	G3CGQ, G5JU, G8KL, G8OU
39	G2IQ, G3GBO (434), G3VM, G8DA, G8IL (325)
38	G2FCL (234), G3APY, G3HBW
37	G2DDD, G2FNW, G2FZU (180), G3BNC, G6TA (277)
36	G2HOP, G3CXD, G6CB (312), G8IP
35	G2DVD, G3FZL, G3HCU (224), G3HWJ
34	G3BKQ, G3WS (153), G8IC
32	G2FVD, G5MR (192), G8VR, G8QY
31	G3HXO, G5RP
30	G3DO, G3GOP (208), G3FRY, G5NF, GW8UH
29	G3AGS, G3AKU, G3BJQ, G3FIJ (194)
28	G8DL, GM3BDA
27	G3DAH, G3FIH, G3ISA (160), G6GR
26	G2DCI, G3AEP, G3CFR (125), G3SM (211), G4MR (189), G8VN
25	G3FYY, G5SK
24	G2CZS, G3FD, G3FXG, G3FXR, GM3EGW
23	G3CWW (260), G3DLU, G3IUD, G4LX, G5PY, G6PJ, GM3DIQ
22	G3AGR (135), G3ASG (150), G3BPM, G3HIL
21	G2AOL (110), G3IWJ, G6XY
20	G3EYV, G3HSD, G3IRA, G3YH
19	G3FEX (118), G3GCX, G5LQ (176)
17	G3JMA
16	G3FRE, GC2CNC
15	G3IWA
14	G2DHV, G3GYY

Note: Figures in brackets after call are number of different stations worked on Two Metres. Starting figure for this classification, 100 stations worked. QSL cards are not required to verify for entry into this Table. On working 14C or more, a list showing stations and counties should be sent, and thereafter added to as more counties are worked.

TWO-METRE ACTIVITY REPORT

(Lists of stations heard and worked are particularly requested for this section. set out in the form shown below.)

G3HSD, Bristol.

WORKED: G2FJR, 2HCJ/P, 3CKX, 3DLU, 3FAN, 3FIH, 3FKO, 3FRY, 3GHO, 3GMN, 3GNJ, 3IFV, 3YH, 4SA, 5JU, 6VX, 8DL, GW2ACW, 8SU, 8UH.
HEARD: G2BMZ, 2HCG, 3BLP, 3BW, 3DKQ, 3EHY, 3FMO, 3HWF, 3IER, 3WW, 4GR, 5MA, 5ML, 5TZ/A, 5YV, 6NB, 6XX, 8OU. (*September* 20 *to November* 22).

G2DVD, Slinfold, Sussex.

WORKED: G2DD, 2DDD, 2FQP, 2HDZ, 2MV, 2UN, 2YB, 3AWY, 3BKQ, 3BNC, 3DO, 3FAN, 3FIH, 3FQS, 3FYY, 3GOP, 3GVF, 3HCU, 3IAM, 3IIT, 3ION, 3IRA, 3ISA, 3IUK, 3JHM, 3WW, 4MW, 5DS, 5ML, 5NF, 5TP, 5TZ/A, 5UD, 5UM, 5US, 8OU, 8KZ, GW8UH, PE1PL. (*November* 10 *to December* 1).

G3WW, Wimblington, Cambs.

WORKED: DL3NQ, 3TD, 3VJ, 6EP, 9LU, EI6A, F8BY, G2AVR, 2BMZ, 2CZS, 2DVD, 2HDZ, 2YB, 3AWY, 3AZU, 3BK, 3DMU, 3DOV, 3EEL, 3EPW, 3FAN, 3GGJ, 3GJZ, 3HCU, 3HTY, 3HXJ, 3IIT, 3ION, 3IOO, 3JHM, 4GR, 4KO, 5US, 5YV, 6AG, 6CI, 6NB, 6RH, 6UJ, 6VX, 6XA, 6XX, 8HY, 8OU, 8SC, 8SK, GW2ADZ, ON4BZ, 4HN, PAØFB, ØWI.
HEARD: G2FJR, 2HOP, 2MV, 2OI, 2XV, 3AMM, 3BKQ, 3CFK, 3FMI, 3FMO, 3HBW, 4PV, 4SA, 5BD, 5JO, 5ML, 5TP, 5VN/A, 6LI, 6MI, 6YU, PAØFP. (*November* 17 *to December* 1).

GM3EGW, Dunfermline.

WORKED: G2FO, 3GHO, 5BD, 5GX, 5YV, 6LI, 6NB, 6XX, GI5AJ, GM2BUD, 3BDA, 3BQO, 3DDE, 3DIQ, 3ENJ, 3EQY, 3FJG, 3FYB, 4HX, 5YW, 6SR, 6LS, 6ZV, 8FM, ON4BZ.
HEARD: GM3INK, 6WL. (*November* 11 *to December* 7).

G3JFR, Basingstoke, Hants.

WORKED: G2BMZ, 2DDD, 2FJR, 2UN, 2YB, 3BNC, 3BKQ, 3DO, 3EGV, 3FAN, 3FQS, 3FUW, 3GUF, 3IRA, 3ITF, 5NF, 5TP, 5TZ/A, 6CI, 6NB, 6OU, 8DL, 8DV/A.
HEARD: G2GG, 2IT, 2NM, 3CCP, 3GHO, 3HAZ, 3IUK, 3JHM, 5YV, 6CW, GW8UH.

G3FUW, Hinckley, Leics.

WORKED: G2AHP, 2FWW, 3BKQ, 3CKQ, 3CUZ, 3DBP, 3DLU, 3DO, 3FAN, 3FFC, 3GHI, 3GVF, 3GWL, 3HAZ, 3IRA, 3JFR, 4OT, 5ML, 5TZ/A, 6AS, 6CI, 6XA, 6XX, 8QY, 8SC, 8VN.
HEARD: DL6EP, ON4BZ. (*November* 15 *to December* 7).

G2HDZ, Pinner, Middlesex.

WORKED: G2DDD, 2DVD, 2HCG, 3BVG, 3CGE/A, 3CUZ, 3FAN, 3FMO, 3FYY, 3GBO, 3GJZ, 3MI, 3WW, 4OT, 4RO, 5BC, 5DS, 6JP, 8OU, 8UQ, GI3GQB, GW2HQ/P, 8UH. (*October* 20 *to December* 8).

G2CZS, Chelmsford, Essex.

WORKED: DJ1VK, DL3VJ, 6EP, G2FJR, 3CZY/A, 3DNL, 3DO, 3DOV, 3GHI, 3GJZ, 3IAI, 3IIT, 3WW, 4KO, 4MW, 4OU, 4PV, 4SA, 5AM, 5YV, 6AG, 6WU, 6XX, 6YP, 8AO/MM, 8LN, GW2ADZ. (*October* 27 *to December* 12).

G3JHM, Worthing, Sussex, NGR 51/125047.

WORKED: F3JN, 9DI, G2AIW, 2DVD, 2UN, 2YB, 3ANB, 3AVO, 3DO, 3FAN, 3GAV, 3GVF, 3HCU, 3HWF, 3WW, 5DS, 5MA, 5MR, 5NF, 5US, 6UH, 8DV/A, 8SM, ON4IE.
HEARD: F8EC, 8GH, 8OB, 9CQ/P, G2BMZ, 2DDD, 2DSP, 3AWY, 3BNC, 3CGE/A, 3CGQ, 3GHO, 3GOP, 3ION, 3ITF, 3JFR, 4RO, 5UF, 5YV, 6NB, 6OU, 6RH. (*November* 15 *to December* 13).

G3JGJ, Plympton, Devon.

WORKED: F9LL, G2BAT, 3AGA.
HEARD: F8MG, G2BMZ, 3FIH, 3HFG, 5TZ/A. (*November* 16 *to December* 6).

G6NB, Brill, Bucks.

WORKED: DJ1VK, DL1FF, 1LB, 3TD, 3VJ, 6EP, 6FX, 6SV, 7FS, 9LU, EI6A, F3LQ, GI3GQB, GM3EGW, 3ENJ, 3FYB, ON4HN, OZ2FR, 2IZ, PAØBN, ØFB, ØLDG, ØMU, ØNEL, ØNL, ØRK. (*November* 16 *to December* 8).

G3DO, Sutton Coldfield, Warks.

WORKED: DL3VJ, F8XT, G2AHP, 2AIW, 2ATK, 2ATT, 2BVW, 2COP, 2CZS, 2DCI, 2DDD, 2DVD, 2FNW, 2FTL, 2FXK, 2HOP, 2IZ, 2NM, 2NV, 2OI, 2YB, 3AEX, 3BNC, 3BVU, 3CCH, 3CKQ, 3DMU, 3DOV, 3FIH, 3FSD, 3FUW, 3FYY, 3GBS, 3GHI, 3GHO, 3GMX, 3GVF, 3GWL, 3HCU, 3HSC, 3HWJ, 3IEX, 3IIT, 3ISA, 3ITF, 3IUD, 3JFR, 3JHM, 3SM, 3WS, 4PS, 4RO, 5MA, 5ML, 5NF, 5TP, 5TZ, 5UM, 5US, 5YV, 6AG, 6CI, 6CW, 6MN, 6NB, 6OU, 6RH, 6XX, 8MZ, 8VN, ON4BZ. (*November* 13 *to December* 6).

BRITISH ISLES
TWO-METRE ZONE PLAN

(This is reproduced here for the benefit of newcomers to the band).

Zone A & B: **144.0 to 144.2 mc.**	All Scotland.
Zone C: **144.2 to 144.4 m.c.**	All England from Lancs. Yorks., northward.
Zone D: **145.8 to 146 mc.**	All Ireland.
Zone E: **144.4 to 144.65 mc.**	Cheshire, Derby, Notts., Lincs., Rutland, Leics., Warwick and Staffs.
Zone F: **145.65 to 145.8 mc.**	Flint, Denbigh, Shrops., Worcs., Hereford, Monmouth and West.
Zone G: **144.65 to 144.85 mc.**	Northants., Bucks., Herts., Beds., Hunts., Cambs., Norfolk, Suffolk.
Zone H: **145.25 to 145.5 mc.**	Dorset, Wilts., Glos., Oxon., Berks. and Hants
Zone I: **145.5 to 145.65 mc.**	Cornwall, Devon, Somerset.
Zone J: **144.85 to 145.25 mc.**	London, Essex, Middlesex, Surrey, Kent, Sussex.

TWO METRES
COUNTRIES WORKED

Starting Figure, 8

15 G4MW (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, ON, OZ, PA, SM).
G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, ON, OZ, PA, SM).

14 G3GHO, G5YV, ON4BZ

13 G3BLP, G3CCH, G6XX

12 G2HDZ, G2HIF, G3WW, G5BD, G6LI, G6RH.

11 G2AJ, G2XV, G3ABA, G3IOO, G5UD.

10 EI2W, G2FQP, G3BK, G3EHY, G3GHI, G3HAZ, G4RO, G4SA, G5DS, G5MA, G8IC, GW5MQ.

9 G2AHP, G3BNC, G3FAN, G3FIJ, G6XM.

8 G2XC, G3GBO, G3GSE, G3HCU, G3VM, G3WS, G5BM, G5BY, G5ML, G5MR, G8SB, GM3EGW

night; G3DO (Sutton Coldfield), who in three weeks managed 71 two-metre stations in four countries; G2HDZ (Pinner), who caught GI3GQB on November 20; and GC2CNC (Jersey, C.I.), back again on the band, who on November 17 raised F9OK (Nantes) for the GC/F "First."

After the early part of December, conditions went flat again, and though early-evening activity was quite good, with many local QSO's going on, there was little in the way of DX to be worked.

SEVENTY-CENTIMETRE STATIONS — Ninth List

CALL	LOCATION	FREQ. (mc)	EQUIPMENT
DL3FM	Mulheim-Ruhr	434.2	Tripler, 32-ele stack, SEO Rx
EI2W	Dublin	432.54	Tripler, 16-ele stack, (? Rx)
G2BFT	Solihull	433.17	Tripler, 16-ele stack, (? Rx)
G2BVW	Leicester	432.60	Straight PA, 5-ele Yagi, Special Rx
G2CNT	Cambridge Airport	435.2	Tripler, CC Rx, 12-ele stack
G2DCI	Sutton Coldfield	433.05	832 Tripler, G2DD C'vrtr, 20-ele stack
G2DDD	Littlehampton	435.6	Tripler, 16-ele stack, CC Rx
G2DHV	Lewisham	434.97	Tripler, CC Rx, 16-ele stack
G2DVD	Slinfold, Sussex	434.58	Tripler, G2DD C'vrtr., 16-ele stack
G2FCL	Shipley, Yorks.	433.134	Tripler 15E, G2DD C'vrtr., 6-ele Yagi
G2FKZ	London	435.95	*no details*
G2FNW	Melton Mowbray	?	Tripler, 5-ele Yagi (? Rx)
G2HCG	Northampton	434.00	*no details*
G2HDZ	Pinner, Middx.	435.17	Straight PA, SEO Rx, 20-ele stack
G2MV	Kenley, Surrey	435.22	*no details*
G2RD	Wallington, Surrey	435.57	*no details*
G2WJ	Great Canfield, Essex	436.00	Straight PA, CC Rx, 16-ele stack
G2XV	Cambridge	435.10	Tripler, CC Rx, 12-ele stack
G3ABA	Coventry	?	Tripler, 16-ele stack (? Rx)
G3AOO	Denton, M'cr.	433.13	Tripler, 4/4/4, CC Rx
G3AYT	Hyde, Ches.	433.13	Tripler, City Slicker, CC Rx
G3BKQ	Blaby, Leics.	434.05	Tripler, 48-ele stack, CC Rx
G3CGQ	Luton, Beds.	434.10	*no details*
G3DA	Liverpool	432.6	Tripler, 6-ele Yagi, CC Rx
G3EOH	Enfield, Middx.	436.03	Tripler, G2DD C'vtr., 12-ele stack
G3EUP	Swindon, Wilts.	433.9	Tripler, 3 stk'd dipoles, CC Rx
G3FAN	Isle of Wight	435.80	*no details*
G3FFC	Leicester	?	Tripler, 16-ele stack (? Rx)
G3FIJ	Colchester	435.18	Tripler, SEO Rx, 5-ele Yagi
G3FP	Sidcup, Kent	436.04	*no details*
G3FZL	Dulwich, S.E.22	435.24	Doubler, CC Rx, 12-ele stack
G3GDR	Watford, Herts.	435.39	*no details*
G3GOP	Southampton	435.00	*no details*
G3GZM	Tenbury Wells, Worcs.	?	Tripler, 16-ele stack (? Rx)
G3HAZ	Northfield, Birmingham	433.59	Tripler, CC Rx, 4/4 Yagi
G3HBW	Wembley, Middx.	434.61	Tripler, 12-ele stack, CC Rx
G3HHY	Solihull, Warks.	433.93	Straight PA, 21-valve Rx, 4-ele Yagi
G3HTY	Kidderminster, Worcs.	?	Tripler (? beam array and Rx)
G3IAI	Northampton	433.80	*no details*
G3ILI	London, S.E.22	434.97	Tripler, 6-turn Helix, R.1294 mod.
G3IOO	Oswestry, Salop.	432.54	Tripler, 16-ele stack, SEO Rx
G3IOR	Hellesdon, Norwich	?	Tripler, SEO Rx, 4-ele Yagi
G3IRA	Swindon, Wilts.	436.05	Tripler, SEO Rx, 8 d'ples stk'd
G3IRW	Hoddesdon, Herts.	434.3	Tripler, SEO Rx, 16-ele stack
G3IUD	Wilmslow, Ches.	432.41	Tripler, CC C'vrtr., 6-ele Yagi
G3IVF	Kirk Langley, Derbys.	433.78	Tripler, Rx various, 16-ele stack
G3JGY	Malvern, Worcs.	436.00	Tripler, SEO Rx, 12-ele stack
G4AP	Swindon, Wilts.	436.50	Tripler, CC Rx, 3 stk'd D'ples
G4CG	Wimbledon, London.	435.07	CV53 PA, CC Rx, 9-ele yagi
G4OT	Maldon, Essex	435.240	Tripler, G2DD C'vrtr., 4/4 Yagi
G4OU	Sheerness, Kent	432.414	Tripler, Superhet, 3-ele Yagi
G4RO	St. Albans, Herts.	434.16	Tripler, 16-ele stack, CC Rx
G5CD	Hendon	435.66	*no details*
G5DS	Surbiton, Surrey	435.61	Tripler, G2DD C'vrtr., 16-ele stack
G5DT	Purley, Surrey	436.02	*no details*
G5YV	Leeds	432.72	Tripler, 8-ele stack, G2DD C'vtr.
G6CW	Nottingham	?	*no details*
G6NF	Shirley, Surrey	435.47	Straight PA, 5-ele Yagi, SEO Rx, ASB8 cavities
G6RH	Bexley, Kent	434.7	Tripler, 16-ele stack, ASB8 C'vtr.
G6YP	London, S.E.5	435.75	*no details*
G6YU	Coventry	434.10	Tripler CC Rx, 16-ele stack
G6ZP	Malvern, Worcs.	435.78	Tripler, SEO Rx, Corner reflector
G8QY	Birmingham	?	Tripler, 24-ele stack (? Rx)
G8SK	Enfield, Middx.	433.15	Tripler, G2DD C'vtr., 8 ¼-waves stk'd
G8VR	London, S.E.22	435.0	Tripler, SEO Rx, 12-ele stack
GM6WL	Glasgow, W.1.	?	P/P CV53 PA, CC Rx, 20-ele stack
GW2ADZ	Llanymynech, Mont.	432.84	Doubler SEO Rx, 32-ele stack
GW5MQ	Mold, Flints.	432.58	Tripler, 3-ele Yagi (? Rx)
ON4UV	Fayt-lez-Mange, Nr. Charleroi	434.7	Straight PA, CC Rx, 32-ele beam

This list is incomplete as regards some stations known to be equipped for the 70-centimetre band. All 430 mc operators are asked to forward details for inclusion in this Table, under the headings given.

Movements and The Tables

Movements claimed this month total 42 in all Tables, and the picture shown is as up to December 17—anything notified after that will not have got through in time. Your A.J.D. was banging this out under pressure of the "Christmas rush" (which, as he gets older, seems to come round at ever-shortening intervals) with its unavoidable delays in the post and the scramble to get this piece set in time for the January issue. A.J.D. would gratefully record that, almost without exception, the calls h/w lists *were* "on separate sheets, with call-signs in aphabetical and numerical order" and that most of the claims were "on separate pieces of paper for each table, with call-signs." All of which added up to the fact that instead of taking about 12 hours' concentrated work to puzzle out, the tabular matter was prepared for the printer in one afternoon. *Thank* you!

Some Station Reports

G2DCI (Sutton Coldfield) goes up to 26C and has sent QSL's for all his 93S worked—but only 40 cards back as yet. G3DO in the same neighbourhood got three additional counties for the All-Time, including the new station for Norfolk, G3DOV (Scoulton). G3DO's total for the Annual Table goes up by 13; he is now using a 16-ele stack at 50 feet, with 85 watts into an 829B, and is therefore a very much more potent signal than with the old arrangement; his Europeans were DL3VJ, FX8T and ON4BZ.

G5ML (Coventry) also advances in the Tables, and is now laying round him with two stacks of skeleton slots at a height of 50 feet. G3WW (Wimblington) was able to hold G2BMZ (Torquay) for an hour on phone on November 19, and at long last has succeeded with EI6A (Wicklow), a nice QSO for direction and distance. During the December

1st opening, it was interesting to hear G6NB telling the DL's they were in deep QSB, while at G3BK and G3WW they were strong, steady signals with no fading either way. As his list in the Activity Report shows, G3WW got some good European contacts during both openings.

G3JFR (Basingstoke, Hants.) advances in Annual Counties, and suggests that the Activity Report should include a "Stations Called" section, or alternatively that we should rename the "Heard" lists as "Called." While it is hardly true, as he implies, that all stations heard are called for a QSO, it is undoubtedly of interest to newcomers to know from where they are being heard *and* called. On the other hand, as we want to avoid any further complication in the listings carried in this feature, it is your A.J.D.'s suggestion that the calls h/w lists be left as they are unless there is any strong demand for the alteration proposed by G3JFR—in which case, of course, we shall be happy to adopt "called" lists.

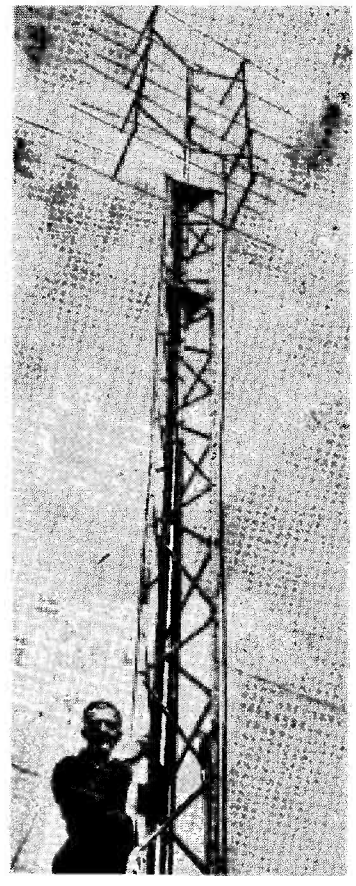
G2DVD (Slinfold, Sussex) says he is "very glad to show a satisfying jump in both Counties Tables," and in the hope of finding some of the more elusive counties, he is keeping his beam headed NW. A regular lunchtime schedule established with G3DO on November 19 over their 130-mile path has not yet failed, and only once have they had to resort to CW. G3FYY (London, N.W.2) writes to adjust his pegs on the ladders, and G6CI (Kenilworth) says that though he has not reported recently, he is still active and "knocking 'em off up and down the country." Good show! But Brian missed GW2HQ/P for two new counties, in spite of much diligent calling.

A first report from a new station on the band comes from G3JGJ (Plympton, S. Devon), who has a 16-element stack and a 6J6 converter into an HRO. Being well placed for working in southerly directions, he would be particularly pleased to open a schedule with the Channel Islands. As our next letter off the pile is from GC2CNC (Jersey, C.I.) asking that South Coast stations look for him on 145.13 mc at 1915-2000 and around 2215 daily, it looks as if this schedule is as good as made! GC2CNC found conditions good during November 17-22, and again on November 27 and December 1st; G5TZ/A is a consistent S9 phone signal with him, and is a very useful indicator of band conditions in the GC area; a schedule GW2ADZ/GC2CNC is running at 1915 nightly, but no dice up to December 4.

G4SA (Drayton, Berks.) is very pleased with results off his 16-ele stack, and can work G5YV "5 and 9 both ways under any conditions." Up in Goole, Yorks., G6XX was there for the November 20-22 opening, and got himself DL1LS, DL3VJ, DL3VQ, ON4BZ and PAØNL—good going, and very nice contacts. An interesting GDX QSO was with G2BMZ, for Devon, and the total at G6XX is now 238 different stations worked.

Though G3GHO (Roade, Northants.) was able to work GM3EGW on November 21, and could hear G5YV and G6NB ticking off the EDX on the 22nd, at G3GHO not a single Continental station was heard during the opening! This is a most extraordinary thing — and if anyone should think "Rx trouble, of course," the answer is that on the 21st GI3GQB and GM3ENJ were both 579 at Roade. It would be enough to make anybody fidgety, especially having regard to Bernard's previous EDX results, so it is not surprising that he signs himself "Frustrated McCall"!

The good conditions reached



The 16-element stack at G4SA, Drayton, Berks., now at 48ft. Yes, that's Ted, holding on tight at the 24-foot rung.

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1953

Starting Figure, 14

Worked	Station
43	G3GHO, G4SA, G5YV
42	G6XX
40	G3IOO
39	G3WW
34	G2DVD, G5MA
32	G2AHP, G5BM, G5DS
30	G2FJR, G5ML
29	G3DO, G3EPW
27	G2DDD
26	G2FCL, G3CUZ
23	G2HDZ
22	G3FYY
21	G3JFR, G3WS, G4RO
20	G2CZS
19	G3FUW, G6TA
18	G5MR
15	G2AOL, G8VN
14	G3FIJ

Note: This Annual Counties Worked Table opened on September 1st, 1953 and will run for the twelve months to August 31, 1954. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. The first list sent should give stations worked for the counties claimed; thereafter, additions claimed need show only stations worked for each county as they accrue. QSL cards are not required for entry in this table.

G5MR (Hythe, Kent) earlier than they did the rest of the country, and between November 15 and 23 he was able to work "a number of new French stations" for some of whom Vernon was their first G contact; two good QSO's were with F8XT at Chillac, in the neighbourhood of La Rochelle, at 385 miles, and on December 1st he got DL6EP at 2125. G5BM (Cheltenham, Glos.) goes up in Annual Counties, and G3JHM (Worthing, Sussex) is another South Coast station to have found F's and ON's to work during November 19-22; he would very much like a schedule with somebody in East Anglia or the South Midlands, any time 1900-2000 daily, just to exchange RST and weather conditions.

G3IOO (Oswestry) seems to have missed out altogether on the EDX, he only having heard ON4BZ at 559 on December 1st; taken with G3GHO's result, this is interesting, but we do not know if G3IOO was there during November 20-22. If so, it looks as if there *were* blank areas—or perhaps skip effect? G2CZS (Chelmsford, Essex) can now get 100 watts into his 829B on CW, and has a suitable modulator in hand; he worked his first DL's on December 1st, with DJ1VK, DL3VJ and DL6EP. G4OU (Sheerness, Kent) has been busy on constructional work, and is very anxious to see greater occupancy of the band, irrespective of conditions—that goes for all of us, but the fact is that there *is* quite a reasonable level of activity during the early evenings nowadays, and there is a good deal of local work going on even under flat conditions.

Yet another to have had the mortifying experience of hearing Continentals being worked, without being able to receive the EDX, was G3CUZ (Leek, Staffs.), who has decided, therefore, that his most pressing need is a better receiver—may be, but enough has already been said to suggest that the Midlands area might have been a "dead spot" during the openings. G3FKY, also Leek, will be on again shortly, and G3CUZ himself is available most evenings during TV hours. G2HDZ (Pinner, Middx.) reports a "slight upward trend in the Tables," and G3FUW (Hinckley, Leics.) writes in for the first time; his transmitter has only an RK-34 in the output for the time being, but an 832 PA is available; the beam is a 5-ele Yagi at 45 feet, and the receiver a 6J6 push-pull job with a CC oscillator; G3FUW has managed 19C since September 1st, and enters the Tables accordingly.

". . . . I said CW is on its way out—OUT, dahdahdah dudduddah dah—Did you get that? Dah-de-Dah . . . ."

The calls h/w list put in by GM3EGW (Dunfermline) — *see* Activity Report—not only includes some good DX, but also reads like a directory of active GM's. GM3EGW reports that '3FYB's contact with G6NB is particularly creditable, as "GM3FYB has an atrocious QTH and he must fire straight into a hillside to work South." G3HSD (Bristol) puts in claims for the Tables, and remarks that G3WW and G5YV, both of whom he would like to work, are very fine signals with him; he takes us up on the point about SEO's and super-regenerative receivers on the 430 mc band, to which the answer is, of course, that A.J.D.'s comments were made before the Band Plan was agreed; now that it has been settled, no harm will be done so long as the self-excited transmissions are kept within the area allotted to them, outside the 432-438 mc band agreed upon for controlled transmitters and sensitive receivers.

Some Seventycem Items

The 70 cm Activity List has again been brought up to date, and it is probable that nearly all stations equipped now appear in it—but there are, no doubt, some that are not included (or for whom we have no complete details), and they are asked to write so that the listing will remain a reliable

guide to potential 430 mc activity.

In response to our request in November "VHF Bands," G3DIV/A (Eastbourne) writes to fill in some gaps in the 70-Centimetre Firsts Table; he holds cards for all QSO's with which he is credited in this table. G2HDZ (Pinner) is trying to blast a way through to G3MI on 430 mc, without success so far. G2DVD (Slinfold, Sx.) comes in with details of cross-band contacts with G2DD (Stanmore) and G2DDD (Littlehampton).

TWO-METRE FIRSTS

G/DL	G3DIV/A-DL4XS/3KE	5/6/50
G/EI	G8SB-EI8G	23/4/51
G/F	G6DH-F8OL	10/11/48
G/GC	G8IL-GC2CNC	24/5/51
G/GD	G3GMX-GD3DA/P	29/7/51
G/GM	G3BW-GM3OL	13/2/49
G/GW	G5MQ-GW5UO	22/10/48
G/HB	G6OU-HB1IV	12/9/53
G/LA	G6NB-LA8RB	29/6/53
G/ON	G6DH-ON4FG	25/9/48
G/OZ	G3WW-OZ2FR	1/6/51
G/PA	G6DH-PAØPN	14/9/48
G/SM	G5YV-SM7BE	1/6/51
GC/DL	GC3EBK-DL3VJ/P	22/3/53
GC/EI	GC2CNC-EI2W	8/10/51
GC/F	GC2CNC-F9OK	17/11/53
GC/ON	GC3EBK-ON4BZ	4/3/53
GC/OZ	GC3EBK-OZ2FR	2/3/53
GD/EI	GD3DA/P-EI2W	30/7/51
GD/GM	GD3DA/P-GM3DAP	29/7/51
GD/GW	GD3DA/P-GW5MQ	28/7/51
GI/EI	GI3GQB-EI2W	13/6/51
GI/GD	GI2FHN-GD3DA/P	29/7/51
GI/GM	GI2FHN-GM3OL	1/7/49
GI/GW	GI2FHN-GW3ELM	8/7/49
GM/EI	GM3BDA-EI2W	12/6/51
GM/ON	GM3EGW-ON4BZ	21/11/53
GM/PA	GM3EGW-PE1PL	22/4/53
GW/DL	GW5MQ-DL4XS	22/9/51
GW/EI	GW2ADZ-EI8G	19/4/51
GW/F	GW2ADZ-F3LQ	14/5/50
GW/HB	GW2ADZ-HB1IV	14/9/53
GW/ON	GW2ADZ-ON4YV	13/5/50
GW/PA	GW2ADZ-PAØHA	13/5/50
GW/SM	GW2ADZ-SM6QP	1/7/53
DL/OZ	DL6SW-OZ2FR	4/3/51
DL/SM	DL2DV-SM7BE	10/3/51
EI/DL	EI2W-DL3VJ/P	29/8/52
EI/ON	EI2W-ON4BZ	21/9/51
EI/PA	EI2W-PAØFC	10/10/53
ON/EI	ON4BZ-EI2W	21/9/51
ON/GM	ON4BZ-GM3EGW	21/11/53
ON/LA	ON4BZ-LA1KB	4/7/53
ON/LX	ON4BZ-LX1MS	23/11/53
ON/OZ	ON4BZ-OZ2FR	3/6/51
ON/SM	ON4BZ-SM7BE	2/3/53

G2ATK operating the two-metre transmitter/receiver unit mentioned on p.615 of December "VHF Bands." On the right is G6AS.

G5YV hoped to be on 430 mc before Christmas, with a better receiver and a transmitter giving 15 watts RF *out*. G3IVF (Kirk Langley, Derbys.) reports himself as fitted up for 70 centimetres, and G2DCI has had two-way contacts on the band with G3BKQ (30 miles) and G3HAZ (12 miles).

Proposed VHF Dinner

As the result of discussions round the *Short Wave Magazine* stand at the Amateur Radio Exhibition, it has been decided to hold a VHF Dinner in Cheltenham on a Saturday night in March — the arrangements being in the hands of the Cheltenham VHF group. Final details have not, at the moment of writing, been quite settled, but those who think they can make it (and we hope they will be many) are asked to get in touch direct with G2AJ or G6VX.

Cheltenham is well situated for a wide area of VHF population and, the word having already got round that this meeting was in prospect, we are assured of support from London, Oxford, Birmingham, Oswestry, Cardiff, and perhaps even further afield. Much depends upon travelling conditions when the time comes, but Cheltenham is on main-line routes (and is a nice place for a week-end) even if the Cotswolds are snowbound. So do not let the weather deter us.

All further details will appear in this space next month, in ample time for the event. But to give the organisers a chance, let them know, either by post or over the air, that *you* are coming. Write G2AJ at Denewood, Post Office Lane, Cleeve Hill, Cheltenham.

Talking of the Exhibition, it was a great pleasure to find so many well-known VHF call-signs in our visitors' book at the Stand. And in the equipment displays, VHF was well represented with some exhibits outstanding for their design, construction and workmanship. Who could have failed to

BRITISH ISLES SEVENTY-CENTIMETRE ZONE PLAN

FULL BAND, 420-460 MC

Area (mc)	*Service*
420-425	SEO Transmission (MCW and Phone).
425-432	Amateur Television.
432-438	CC Communication Band, Station Frequencies tripled from Two-Metre Zone.
438-445	Amateur Television.
445-455	Future Amateur Development.
455-460	SEO Transmission (MCW and Phone).

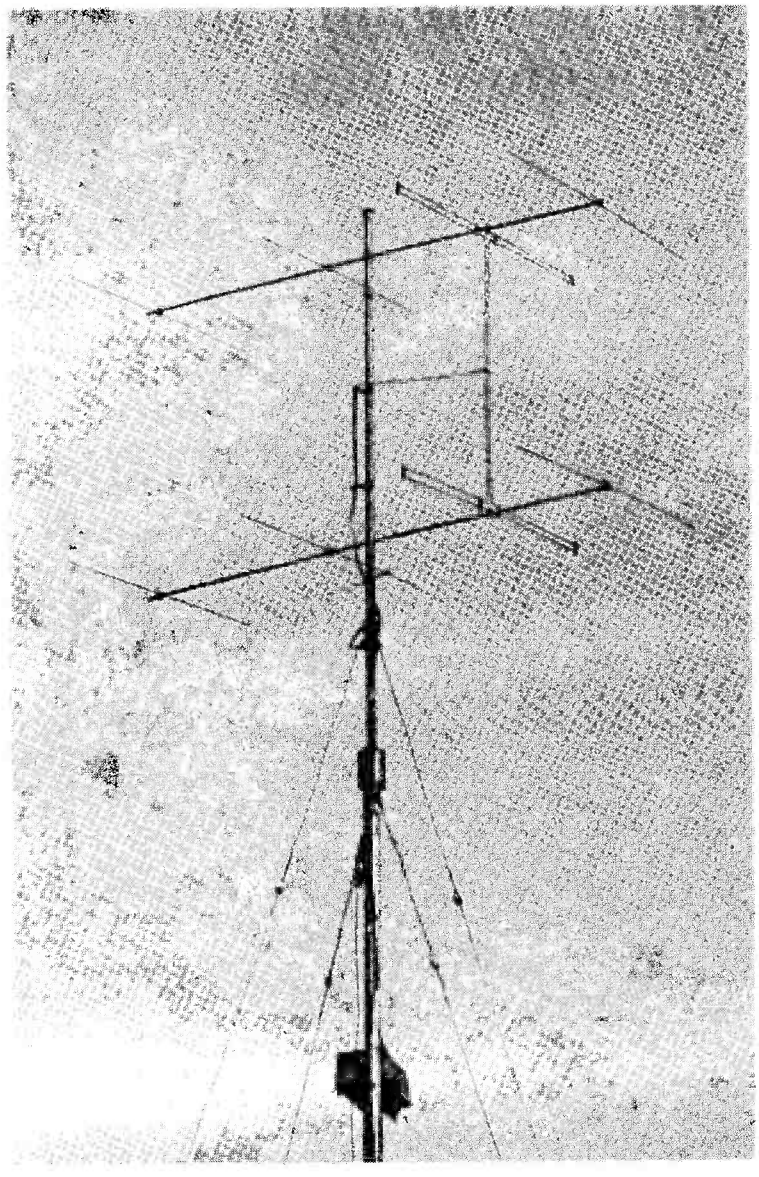
admire that 144 mc transmitter/receiver unit by G6VX, or the 70-centimetre PA. pumping RF into a lamp load, shown by G3GZM? An interesting receiver design was that by G2UJ, and there were also some nice pieces of auxiliary VHF equipment. Altogether, a most creditable display of the VHF art.

VHFCC Elections

Since our last appearance, the following have satisfied the conditions and are duly elected to membership of the VHF Century Club: G5JM, Buckhurst Hill, Essex, No. 156; G2HOP, Wothorpe, Northants., No. 157; GM3EGW, Dunfermline, No. 158; and G3DLU, Compton Bassett, Wilts., No. 159.

Of interest to old timers, in the VHF sense, will be the fact that in the case of G5JM, only seven of his cards were for two-metre QSO's—the remaining 93 were all for contacts on the old five-metre band! This is, of course, perfectly legitimate, as the award of the VHF Century Club Certificate is for 100 or more stations worked two-way on any band from 50 mc up—or six metres down—since the resumption of amateur activity in 1946.

The cards sent in by GM3EGW show that he has worked, on two metres, no less than 38 GM's; even including the /P's, this will be a great many more than the number of Scots most G's would have thought active on VHF. In contrast to G5JM, GM3EGW shows only five cards for 58 mc QSO's.



The 4-over-4 for two metres at G3GBO, Denham, Bucks., who was featured as "The Other Man's Station" in the December issue.

For the year 1953, this makes a total of 24 VHFCC Certificates issued—so they cannot be said to be "easy," even if they are easier than two years ago.

So Now—

We stand upon the threshold of another year, with all the opportunities there will be for VHF exploration and the trying-out of new equipment. Your A.J.D.'s prophecy is that 1954 will be a year of great achievement in developing two metres and 70 centimetres as communication bands. The reason for this is that VHF interest is growing, not only in this country but also on the Continent; as we now have a much better understanding of the mechanism of VHF propagation over Continental distances, there will always be more stations

70-CENTIMETRE FIRSTS

G/DL	G2WJ-DL3FM	10/8/53
G/F	G3DIV/A-F8GH	5/9/51
G/GD	G2JT-GD3DA/P	26/8/51
G/GW	G4LU-GW2ADZ	5/7/50
G/ON	G3DIV/A-ON4UV	15/10/51
G/PA	G3DIV/A-PAPON	15/10/51
GD/GW	GD3DA/P-GW5MQ	29/7/51
GI/GD	GI3GQB-GD3DA/P	14/6/53
GM/GI	GM6WL/P-GI3FWF/P	9/9/53
GW/ON	GW2ADZ-ON4UV	3/3/53
GW/PA	GW2ADZ-PAONL	1/7/53

equipped (not only with the gear, but also with the weather sense) to grasp the opportunities offered by good conditions than ever there were before. On 70 centimetres, particularly, this will be the case, and after a few good openings in 1954, we expect to be reporting the sort of results on 430 mc that we have recently been discussing for 144 mc.

That, at least, is what your A.J.D. is looking forward to—but he will not venture to prophesy when the openings will be. Even weather man G3EGB won't be drawn on that one!

And to all those followers of "VHF Bands" who have been kind enough to send cards, good wishes—and even some complimentary words about this feature—sincere thanks. A.J.D. did think of you all on Boxing Day, because that was the day on which this issue of *Short Wave Magazine* was finished for press!

Final date for the February issue will be **Monday, January 18,** certain, with everything addressed A. J. Devon, "VHF Bands," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. All Good Wishes for the New Year, and with you again February 5.

VHF WEATHER REPORT

PERIOD NOVEMBER 12 TO DECEMBER 14

A. H. HOOPER (G3EGB)

ANOTHER major spell to report, with two-thirds of the November period offering EDX, and then a short improvement early in December—the last for the year?

The high-pressure belt lying from France to Austria carried on from the last period and extended north-westwards over our southern areas in time to inaugurate EDX on the evening of November 15. Good conditions then continued, with minor fluctuations, peaking for GDX on November 20 and for EDX on the evening after. It was not until November 25 that the high-pressure belt had drifted far enough to the east for cyclonic weather to affect us. Even this was not the end, however, for another anticyclone in mid-Atlantic, extending eastwards over the U.K. during November 28, brought a four-day spell. Then followed southerly winds blowing from the Mediterranean around the periphery of an anticyclone centred over eastern Europe. The final evening of the period saw the end of this regime with the passage of a frontal system.

Interpretation

The change with height of modified radio refractive index (MRI) over East Anglia has been determined from the results of twice-daily radio-soundings reported in *The Daily Aerological Record* of the Meteorological Office, London. Abrupt changes (discontinuities) in the MRI structure were found at times, and their presence suggests the likelihood of "reflection" of low-angle radiation to places well beyond the horizon. Fig. 1 shows the levels for each day at which significant discontinuities were observed. The layer which, with fluctuations, sank earthwards between November 16 and 24 can at once be seen. On a number of occasions the discontinuity was sufficiently intense to be classified as a duct and has been identified with a double ring. Two of them had sufficient vertical extent to duct two-metre energy, but were scarcely low enough for amateur aerials to exploit them as ducts. The dashed lines are used on occasions when identification of a layer and its changes is uncertain. Such occasions arise when discontinuities undergo fluctuations of intensity such that they are sufficiently weak at times to cast doubts on their significance.

From a similar study of radio soundings over other areas of the British Isles, the probable direction and extent of GDX working has been ascertained. UK conditions began to improve with a northward excursion from France as far as Lancs. of the widespread Continental layer mentioned last month. This was on the evening of November 14. By the next evening it had receded again, but on the 16th reappeared as far as 53°N. Then followed progressive extensions northwards, as far as Lancs. on the 17th and 18th, further to GI on the 19th (but with a weakening over the SE) and finally on November 20 strongly marked and below 4000 feet over all areas. The following evening was good, too, but by then a weakening was setting in from the extreme West and peak conditions had passed. This continued during November 22 with the slow advance of a cold front, and by the evening GI, EI and the south-west had lost the layers. For most of the mainland it proved to be just one extra evening's grace, for the cold front's continued advance had cleared the layer from all areas except the SE by the 23rd. Another layer advancing from the south affected our SE districts for November 28 and, with an extension to include the S and SW on the 29th, suggested the possibility of more GDX. Apart from steeply sloping extensions over Lancs. on the 30th, nothing developed, however, and after the evening of December 1st it disappeared. Apart from localised patches, there was nothing to record until December 10, when again the SW, S and SE were lucky. This was a long, narrow layer over these areas at about 2000 feet, sloping steeply upwards from the Midlands to 6500 feet above Lancashire; it subsequently proved to be non-persistent.

Although the value of barometric pressure as a

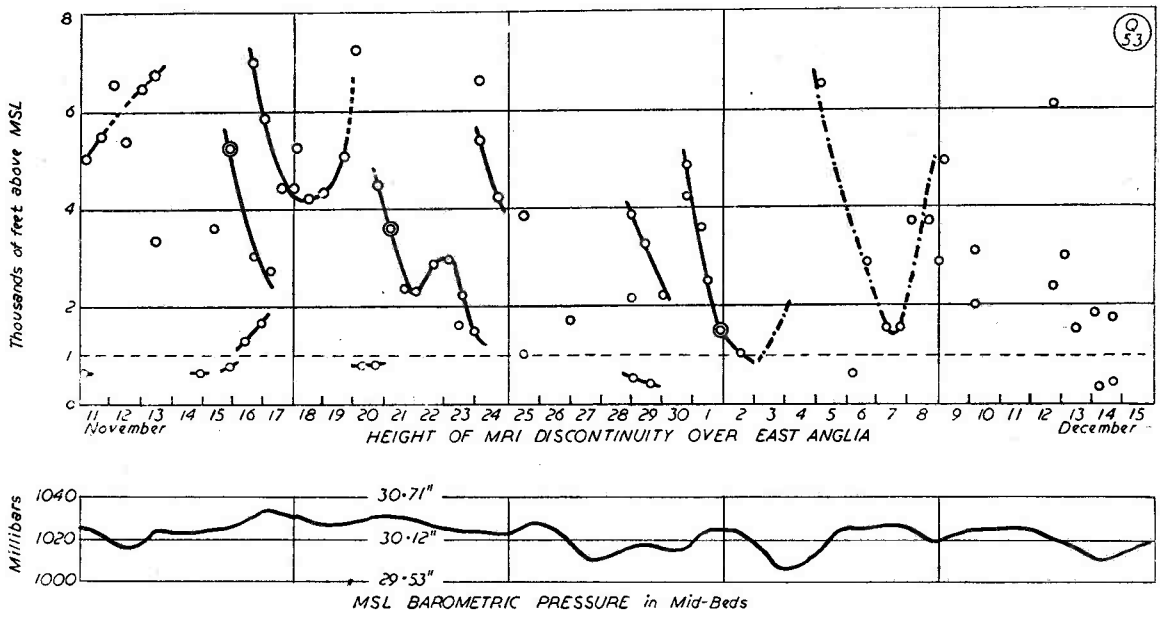


Fig. 1. Showing the reflecting layers that developed over East Anglia during the period November 11 to December 15. The level of activity — in the meteorological sense — is immediately evident, while the gradually sinking layer that gave such good results about November 22, and the shorter spell of early December, can both be seen.

pointer to anomalous propagation is not established—the author expects to be able to comment on this topic next month—the usual graph of MSL barometric pressure is included in Fig. 1, and equivalent values in inches of mercury are shown. It should, perhaps, be mentioned that to derive an MSL value from observations at other heights involves corrections for a variety of factors, of which the first two, in order of magnitude, are height above MSL and outside air temperature. Although *relative* values obtained for personal use from the usual type of home barometer hardly call for such modification, they *must* be corrected to a standard level (preferably MSL) before comparison or use, one station with another, can become effective. Correction is not a difficult process, and the writer could deal with this if enough observers so wish.

Table I is partly derived from the weather charts of *The Daily Weather Report* of the Meteorological Office. All entries refer to the evenings of the dates listed. From the second line can be found the evenings when enhanced propagation over inland paths could be expected because of radiation cooling in the surface layers of the atmosphere. The figures suggest the time when the effect faded away. We have already seen how closely the effect is associated with anticyclonic conditions at other times of year, but of late, with a weak sun unable to break up the low-lying cloud during day-time, nocturnal cooling has been very slight. It seems that the expression "anticyclonic gloom" associated with winter should apply, even to VHF! However, clear nights would have been frost nights, and we can at least be pleased by our mild and prolonged autumn.

While our weather did not lend itself to medium-distance working by means of radiation cooling, it produced another very good spell of DX *via* reflecting layers aloft. (It is to be hoped that the rebuilding referred to last month by A.J.D. did not limit activity!) The remaining lines of Table I show, in the usual manner, EDX results that are thought to have been possible by means of reflection from MRI discontinuities aloft. The good spell during the second week of this period is at once apparent, followed by a brief spell at the end of November. It can be seen, for example, that the SE path has had possibilities as far as Austria on several occasions and that both the NE and the S paths have been open much more frequently than during the last period. There are a number of interesting features not brought out by the Table. The openings shown for November 12 are conditioned upon successfully beaming *underneath* an MRI layer which failed to reach the UK. Did any stations in the extreme South manage it? On November 24 an occlusion (a combined warm and cold front) was advancing slowly from the West. It formed the boundary of the excellent layer extending over the Continent, and passed Gloucester near 1800, London near midnight, and cleared the East coast at about 0600 next morning. This last chance of EDX depended, therefore, upon site and time, and further East and the earlier, the better. On a previous occasion of a slowly-moving front QSO's were achieved on either side of, but not across, the zone. Reports would be welcome on this occasion, too. Finally, the opening to eastern DL on December 4 required the right location for its exploitation. The writer is anxious

to carry out a detailed investigation of these last two cases which have especially interesting features, and asks that all who write in to "VHF Bands" be kind enough to mention their results for these two evenings, whether *nil* or otherwise. The information sought is: Direction of QSO's or signals heard during November 24, and QSO's or signals heard ex-Europe on December 4, quoting times in every case. Reports will be very welcome, and if the location of the far point can be given, it will help.

Correlation

In Fig. 2 is shown the contours (heights) of the MRI discontinuity of mid-November when at its peak over Europe. Conditions peaked over the UK one day earlier, but it is only in the extreme West ahead of the cold front (shown) that much deterioration has set in. Superimposed are straight lines ruled to show some of the outstanding QSO's achieved by its presence. Without pretence to prediction, this is, in the nature of things, likely to be the last really good spell for several months, and so worthy of note in this way. Despite a complex structure, a vast area was covered at a general level of 3500 feet with excellent effect. The southern path, however, involved a slope down to a lower level of 1000 feet over France. It is particularly in such cases that the inadequacy of the idea of simple reflection is apparent. To the SE the layer extended as far as the Alps. But for their presence there appears to have been no reason why Italy could not have been worked.

In Retrospect

Under this heading, it is usual to investigate the previous month's discrepancies between prediction and results. Subject to any instrumental inaccuracies of the radio soundings and borderline cases, the writer thinks of them as lost opportunities. There seem to have been several last month. In view of the EDX worked and heard by G6RH, which included DL and an SM, the predictions of last month's Table I for the first three weeks seem quite satisfactory. As indicated in the text, the last week found occasional extensions northwards at a high level over our southern districts from excellent Continental conditions. It may be that the extensions northwards were too limited, weak and high to help

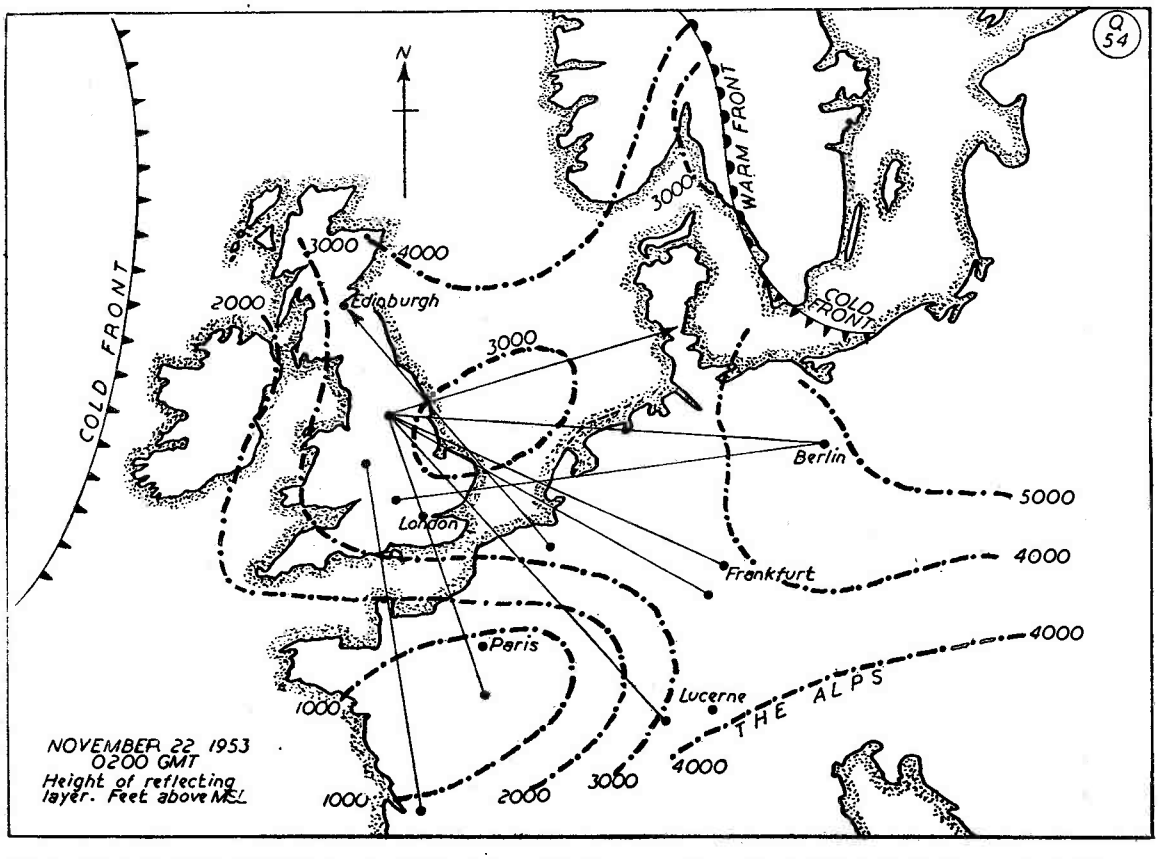


Fig. 2. The peak period during the survey covered in the current "VHF Bands" was the evening of November 21, when some very fine EDX contacts were obtained. This chart, plotted for two hours after midnight on that evening, shows the extent of the MRI discontinuity that made such a wide coverage possible. The straight lines indicate some of the paths over which contacts were obtained or EDX signals heard. To avoid confusion, only a selection of these contacts is shown — there were many others, over the same area.

Date		Nov 12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Dec 1	2	3	4	5	6	7	8	9	10	11	12	13	14
Pressure system over Southern England		A	D	A	A	A	A	A	A	A	A	A	A	D	D	D	D	C	C	A	A	A	D	C	A	A	A	C	C	C	A	A	A	D
Radiation over Bedfordshire, GMT		—	—	—	04	22	—	—	00	—	—	—	—	—	—	—	—	23	—	04	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Discontinuities aloft, suggest propagation to the countries indicated	NE	—	—	—	—	OZ	—	OZ	—	—	SM	**OZ**	OZ	SM	—	—	—	—	OZ	—	OZ	—	—	—	—	OZ	—	—	—	—	—	—	—	—
	E	—	—	—	DL	DL	DL	DL	—	DL	**DL**	DL	DL	DL	—	—	—	PA	DL	DL	**DL**	—	—	DL	—	—	DL	—	—	PA	—	PA	DL	—
	SE	OE	—	—	DL	OE	DL	DL	DL	ON	**OE**	DL	OE	OE	—	—	—	—	DL	DL	OE	—	—	—	—	—	DL	—	—	ON	—	ON	—	—
	S	43°	43°	43°	43°	43°	43°	43°	43°	43°	**43°**	43°	43°	43°	47°	—	—	47°	47°	43°	47°	—	—	—	—	—	—	—	—	—	—	—	—	—

The possibilities for EDX working at VHF from November 12 to December 14. Country prefixes show approximate directions and distances from South-East England to which good conditions are thought to have extended.

Table 1

Notes:—(1) *Conditions listed are for the evenings of the dates shown.*

(2) *D = Depression. A = Anticyclone. C = Col. slack pressure gradient.*

(3) *Times in the second line mark the fading of inland super-refraction.*

(4) *Country prefixes indicate the approximate limit of conditions.*

(5) *For the southern path, which is wholly over France, it has been necessary to indicate limits in two-degree steps of latitude. The latitude of Paris is about 49°N, and that of Marseille 43°N.*

(6) *Occasions of particularly marked discontinuities are printed in heavy type and are underlined.*

any but those near the South Coast, but there are other stations in Kent as well as G6RH. Perhaps the rebuilding already mentioned was mainly in this area! By the time this is in print, we shall be in 1954. Dare we hope for our first opening on March 1st *this* year?

The permission of the Director, Meterological Office, London, to quote information derived from the official publications mentioned is acknowledged.

EASY RECEIVER FOR THE LIGHT PROGRAMME

R. G. Otter (Kirkby-in-Ashfield) reminds us that receivers Type W are readily available on the surplus market for around 25s. A Type W Receiver is spot tuned to 500 kc (600 metres), the international calling and distress wave. To convert it into a portable for the Light Programme, all that is required are two 500 $\mu\mu$F fixed condensers. One is fitted across the input from the frame aerial, and the other across the tuning condenser. Output is sufficient to load a small speaker—just the sort of thing to keep the XYL happy while you are after the DX.

CUTTING ALUMINIUM SHEET

To cut ali-sheet easily and cleanly, do *not* use a hack-saw. Since aluminium is a soft metal, the better way is to scribe deeply—with an old pen-knife or any other similar tool with a blunt edge—along the desired line of cut, using a straight edge. Then, holding the sheet along the bench or table edge at the scribed mark (clamps may be necessary with a wide sheet), make a succession of gentle 10-15° bends, upwards and downwards. The sheet will break away evenly and cleanly, and the slightly roughened edge can be touched up by light use of a file. This method is not by any means a new one, but worth repeating for the "new hands," as it is easier, tidier and quicker than ploughing through the metal with a hack-saw. (G2HIF).

Random Jottings by the Old Timer

WHAT is the average life of an amateur? By which we do not mean his earthly existence in terms of Anno Domini, but his life as an active occupant of one or more of the bands—a privilege for which he went to considerable trouble at the time of taking out a licence. The number of real Old Timers who can justly be described as "active" is pretty small, but we are not thinking so much of them as of the post-war graduates. A census of the G3's heard on the air nowadays would certainly reveal a preponderance of G3I's and G3H's; a couple of years ago the G3F's would have been in the majority. This, of course, proves nothing except that enthusiasm runs high during the first year or so of holding a ticket. But after that—what? A sign of what we mean is that there are only about a dozen G3A's to be heard on the air these days—and if our arithmetic is correct, there must have been over 600 of them issued. What happens to the others?

SHORTAGE OF IDEAS

Our own theory is this: That now we are officially "communicators" rather than "experimenters," the attraction of the hobby does not last so long. This is borne out by remarks heard on the air, and by the contents of letters received. Sheer communication palls sooner or later—but the whole attraction can be revived by building something new and seeing how *that* behaves. Sooner or later the QSO-happy type realises that he is only repeating the same actions over and over again, especially as at least half of the average QSO consists of the usual rubber-stamp formula. There are some outstanding cases of amateurs who maintain the interest of communication by a highly specialised bent for DX working; they make their communication difficult, and therefore interesting, by setting themselves the hard tasks. Others, who have not this interest in DX, either go off the air and start some experimental work of their own, or they just allow the whole thing to lapse for a time. Some come back, and some fade away.

THE OLD BRIGADE

Those of the genuine Old Timers who are still active on the air owe their continued interest to versatility. They have the memory of the old "experimental" days still with them, and this prevents them from becoming stale and simply using their gear as what we heard described recently as a "natter-factory." Some of them, we know, spend more time rebuilding and re-designing than the hours spent on the air would seem to warrant; but that is nobody's business but their own. Others manage to indulge in local Top-Band phone, DX on the HF bands, and VHF operation, thus becoming true all-rounders on the communication side of the hobby. Some of the old originals, however, have allowed their licences to lapse, feeling that they cannot compete with the "new look" that Amateur Radio has acquired since the war; and a few, most sad to relate, have become "Silent Keys." Probably the young amateur of to-day will never realise what he owes to some of the real pioneers—the Grand Old Men of Amateur Radio. Happily, many of them are with us yet.

RELIABILITY

Talking about the old days reminds us that we all take the present-day reliability of components for granted, and it is therefore a bit of a shock to be let down. This happened to us recently when a mica condenser labelled "1000v. working" broke down in the most light-hearted way when confronted with a mere 350 volts. Nobody minds replacing a small condenser—but to spend an hour or two tracing it and then to have to conduct a search to see (*a*) What could possibly have caused it, and (*b*) What damage the breakdown left in its train — all this is A Bit Much. We should have said that modern broadcast and television receivers were marvels of reliability, too, but recent consultation with the manager of a servicing organisation hardly confirms that theory—he is far too prosperous! Breakdowns on cars and other moving machinery are often the result of ill-treatment by the owner, but one can hardly say this about radio sets. All the same, we regard modern components as pretty reliable—and we have a long memory.

PERENNIAL POSER

This is dangerously like a silly-season topic; like the sea-serpent, it comes up from time to time. But what has happened to our medium of propagation in the last thirty years? When the B.B.C. opened their two first provincial stations—5IT at Birmingham and 2ZY at Manchester — listeners in London with single-valve receivers had quite marvellous results on them at once, and the transmitter power was a mere 1 kW. Nowadays we hear of "booster stations" running two or three times this power which do not give satisfactory service at a distance of twenty, or even ten miles. Our own Top Band used to be the haunt of one-valve transmitters and one-valve receivers; is the standard of communication so much better nowadays, even with all the modern knowledge about aerial systems and the almost universal use of 12- or 14-valve superhets? The shorter waves, we know (or we hope!) will come back with the sunspot cycle, but has the whole standard gone down for some obscure reason?

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the quarterly issue of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

EI2X, M. Beazley, 6 Cartron, Sligo, Co. Sligo.

G3BA/A, T. P. Douglas, M.B.E., c/o 37 Willmott Road, Little Sutton, Sutton Coldfield, Warks. (*Tel.*: *Four Oaks 735*).

G3IVF, H. E. Smith, White House, Radbourne, Kirk Langley, Derbyshire.

G3IVX, G. D. Birtwistle 81 Chester Road, Huntington, Chester, Cheshire.

GM3IVZ, W. E. Stephen, 109 Den Walk, Methil, Fife.

GD3JAE, J. Corlett, 35 Viking Road, Willaston, Douglas.

GW3JBH, J. S. Hammond, 46 High Street, Abersychan, Pontypool, Mon.

G3JBI, H. W. Parnell, 414 Hedgemans Road, Dagenham, Essex.

G3JCJ, C. L. Antrobus, 53 Stanground Road, Sheffield, 2.

G3JCU, J. Craven, 23 Green End Road, Clayton, Bradford, Yorkshire.

G3JDK, H. N. Kirk, 54 Allendale Road, Rotherham, Yorkshire.

G3JEB, G. Bartle, 6 Stoddart Road, Folkestone, Kent.

G3JEM, J. Wallace, 37 Westmorland Road, North Harrow, Middlesex.

G3JEV, Dartmouth and District Amateur Radio Society, Montpelier, Lower Contour Road, Kingswear, Devon.

G3JFS, P. C. Cole, 146 Cambridge Road, Hounslow, Middlesex.

G3JFT, B. R. Dare, 3 Westminster Street, Alvaston, Derby.

G3JFZ, A. C. Phillips, 23 Plantsbrook Road, Walmley, Sutton Coldfield, Warks.

GM3JGG, R. J. Smith, 21 Eskdale Drive, Rutherglen, Lanarkshire.

G3JGJ, J. R. Wordsworth, Boringdon House, Plympton, S. Devon. (*Tel*: *Plympton 3054*).

GI3JGK, R. Todd, 6 Rosewood Street, Belfast. (*Tel.*: *Belfast 44652*).

G3JGO, B. Priestley, 12 Mather Drive, Rudheath, Northwich, Cheshire.

G3JGR, Dr. G. S. Rockwood, 2 Orford Court, Elmcourt Road, London, S.E.27.

GM3JGU, Freda Wickham, 46 Greenhill Road, Rutherglen, Glasgow, Lanarkshire.

G3JGX, S/Ldr. H. W. Taylor, D.F.C., 59 Ramsbury Drive, Earley, Reading, Berks.

G3JGY, T. Wood, St. Vincents, Cowleigh Road, Malvern, Worcs.

G3JHM, D. T. Hayter, 16 A'Becket Gardens, Worthing, Sussex.

G3JHV, J. C. Sutherland, 97 Haig Avenue, Southport, Lancs.

G3JIE, D. Youngs, 53 Salisbury Road, Thorpe Road, Norwich, Norfolk.

GM3JIG, K. R. Hodge, Rusken, Seamill, West Kilbride, Ayrshire. (*Tel.*: *West Kilbride 2296*).

GM3JIH, A. M. M. Speed, Baptist Manse, St. Catherine's Place, Elgin, Morayshire.

G3JIJ, J. D. Hague, 111 Charlbury Road, Radford Bridge Road, Nottingham.

G3JIS, R. V. Heaton, 114 Great Stone Road, Firswood, Manchester, 16.

G3JIW, P. Wotton, 15a Langdale Road, Wallasey, Wirral, Cheshire.

G3JIZ, J. M. Read, 4 Wendover Drive, New Malden, Surrey. (*Tel.*: *MALden 4459*).

G3JJA, E. F. Steventon, 16 Rope Lane, Wells Green, nr. Crewe, Cheshire.

G3JJD, E. W. Hall, 39 Rokeby Drive, Kenton, Newcastle-on-Tyne, 3. (*Tel.*: *Gosforth 53833*).

G3JJX, A. J. Jeffrey, 16 Birkbeck Road, Sidcup, Kent.

G3JKM, D. Buckland, 21 The Leas, Baldock, Herts.

G3JKN, M. C. Sparrow, 100 Grosvenor Avenue, Hayes, Middlesex. (*Tel.*: *HAYes 2973*).

G3JMI, A. McLean, 139 Willingale Road, Loughton, Essex.

G3JZQ, H. G. Wells, 43 Arlington Crescent, Waltham Cross, Herts.

CHANGE OF ADDRESS

G2DMT, A. C. H. Waters, 56 Spring Leaze, Knowle Park, Bristol, 4.

G2FFY, W. A. L. Evans, 10 Normanhurst Avenue, Bexleyheath, Kent.

G2HL, J. G. Woodage, c/o The Car Park, 27 Redhill Street, London, N.W.1.

G2PX, H. H. Lassman, 3 Overton Drive, Wanstead, London, E.11.

G3DJL, B. Shortland, 58 Bracebridge Drive, Bilborough, Nottingham. (*Tel.*: *Nottingham 79811*).

G3EGB, A. H. Hooper, 202 Totternhoe Road, Dunstable, Beds.

GM3EGW, J. F. Shepherd, 1 Transy Place, Dunfermline, Fife.

G3GJJ, P. B. Watson (*ex-GM3GJJ*), 8 Charman Road, Redhill, Surrey.

G3GZF, A. E. Brown, 187 Felmongers, Harlow, Essex.

G3GZO, H.M.S. Ariel Amateur Radio Club, c/o The Training Commander, H.M.S. Ariel, Worthy Down, nr. Winchester, Hants.

G3HCQ, R. T. Gabriel, 188 Porter Road, Derby, Derbyshire.

G3IKT, W. R. Midgley, 66 Smith House Lane, Stoney Lane, Lightcliffe, nr. Halifax, Yorkshire.

G3IKY, K. C. Young, 147 Castlewood Drive, Eltham, London, S.E.9.

G3IUU, J. Elliott, 158 Herringthorpe Valley Road, Rotherham, Yorkshire.

THE EIGHTH MCC

• The Magazine Top-Band Club Contest •

NOVEMBER 14-15 · 21-22, 1953

THE Eighth MCC produced one of the most ferocious struggles for top place that we have yet seen in the series. Last year, it is true, the Chester and Neath Clubs actually dead-heated for the leading position, but this time a clear-cut result emerges. Not until several re-counts had been made, be it added, for the winning scores differ by two points only!

Neath and Port Talbot scooped the pool this time, with *Chester* right on their heels and two other clubs within snapping distance. Here are the top scorers, given their usual position of honour:

1st: Neath and Port Talbot Radio Club GW3EOP (393)

2nd: Chester and District Amateur Radio Society, G2YS (391)

3rd: Surrey Radio Contact Club, G3BFP (370)

3rd: Salisbury and District Short Wave Club G3FKF (370)

The scores are almost exactly half as large as those turned in last year, when operating time was twice as long. The number of entries was 28—the same as those of the 1952 *and* 1951 Contests.

All the way down from the winning 393 to the score of 317 made by the sixteenth Club, figures were extremely close, with ties for the 3rd and 12th places.

The Winners

The winning team at *Neath* consisted of G2DTQ, GW2AVV, GW3FSP, GW3INO, GW4NZ and Mr. Havard. They used a three-stage transmitter and an AR88D receiver, to a half-wave Zepp-fed aerial running North and South.

The runner-up, *Chester*, again used G2YS's station, their Club equipment not being available for all the working hours required. G2YS's team consisted of himself, G3ATZ, G3EXT, GW3HEU and GM3JFJ. The transmitter was a two-stage affair, the receiver again an AR88D, and the aerial a half-wave running NE-SW.

Half the third place went to *Surrey* (*Croydon*), using G3BFP's station with an HRO, a 132-ft. Marconi and an "eight-to-ten watt transmitter" about which no further details were given with the entry form. The other half was claimed by *Salisbury*, G3FKF, who unfortunately supplied no information at all as to gear with their entry.

And so we run down the list, with very creditable scores of 367 *(Brentwood)*, 359 *(Coventry)*, 357 *(Medway)*, and 355 *(Cheltenham)*, all of whom might well have been up in that box of honour if they had managed another dozen QSO's.

Winning Technique

It seems to have been the single-point (non-Club) contacts that clinched the deal for the leading stations. Since 28 Clubs were competing, each one could, in theory, have worked the other 27 four times each, giving a total, from Clubs, of 324 points. (Actually, one Club did not operate until the second week-end, thus reducing this total by 6.)

Out of this possible 318, GW3EOP scored 306 (plus 87 singles); G2YS made 309 (plus 82 singles); G3BFP made 306 (plus 64 singles); and G3FKF 315 (plus 55 singles). This surely proves that the single points from all and sundry using the band are not to be despised!

The operating standards were pretty high throughout, with nice snappy QSO's and no waste of time. There were a few exceptions, which can best be put down to lack of Contest experience. One or two non-competing stations deserve a rocket for calling "CQ MCC" and leading some contestants to believe that they were Clubs. Next year we must have "QRA . . . . *Club*" as the formula for exchanging three-point reports. At the same time, whereas some of the competing Clubs did not make a single mistake in this way, others were incredibly optimistic and claimed half the stations on the band as Clubs, including G3IAF/A, who was operating from a hospital bed, and G6QB, who was acting as an unofficial "observer"!

As always, we say that this business of identifying the true Club stations is not so difficult as it is made out to be in some quarters. Otherwise, how does one account for the high percentage of "clean" logs from which no points have to be deducted?

After all, part of the Contest is to find out who is being worked.

Most of the claimed scores have been marked down by numbers of points varying from a mere three or four to as much as 30 or 40. Points have been deducted by the judges for the following faults: Incorrect logging of call-signs; incorrect QTH's; RST reports failing to check with the other end of the contact; discrepancies in time. Also one or two Clubs who were heard by the judges to be making contacts after 1830 GMT, and who craftily logged them as 1828 or 1829 GMT, have *not* got away with it! All entrants will agree that it is only fair to everybody that times and RST reports should be entered accurately. This does mean setting clocks and watches by the Greenwich pips at the opening of each session.

Opinions

For the first time in the history of the series, there is unanimous approval of the rules! The afternoon week-end sessions pleased everybody more than the long week of evenings, and the total of 16 hours' operating time proved ample.

Neath, the winners, suggested that they probably suffered more from the change in operating times than anyone else, owing to being remote from any centre of activity. But as we have already shown that they made more single-point contacts that any other contestant, this can hardly be taken seriously!

Chester also suggested that entrants in or near big cities would have an advantage by being able to work lots of locals during the daylight hours. Theoretically, this is true—but the "big city" people obviously did not take advantage of it. The single-point scores show this conclusively.

Salisbury suggest that the turn-out is poor; the 28 stations on the air this year are not the same as those taking part in 1952 and 1951, and if none of the latter had dropped out we would have had a fine muster. They would also like to see extra points allotted for DX contacts (outside the U.K.).

Comments in Brief

"Hours of operating just right, and a good time was had by all" . . . *(Medway)*; "Thoroughly enjoyable Contest, with less doubtful Clubs than in previous years" . . . *(Sutton)*; "Standard of operating has dropped in comparison with previous years" . . . *(Clifton)*; "Thoroughly enjoyed every moment" . . . *(Grafton)*; "Heard several OK's at good strength between 1700 and 1730, also UA3KAA was RST 559 at 1713 hrs on November 15" . . . *(Cannock)*.

"Really enjoyable contest with quite respectable conduct throughout" . . . *(Barnsley)*; "Very interesting and enjoyed it throughout—no complaints from members" . . . *(Scarborough)*; "All keen to participate in future contests" . . . *(Stoke-on-Trent)*.

The Nottingham University Radio Society, G3DBP, was dogged by bad luck. The transmitter, admittedly, was not built until the Friday night before the last week-end; then, when it was put on the air, the PA was not working, and in the second stage of repairs a misleading meter was responsible for the station being run at 1-watt instead of ten! But they did finally get going well enough to give many other stations some points, and sent in their own "token" score of 78. Next year we shall doubtless see them well up the ladder. Anyway, it was a gallant effort on their part.

TABLE I

POSITIONS AND SCORES

	CLUB	CALL	POINTS
1.	Neath and Port Talbot	GW3EOP	393
2.	Chester	G2YS	391
3.	Surrey (Croydon) / Salisbury	G3BFP / G3FKF	370
5.	Brentwood	G3FSM	367
6.	Coventry	G2ASF	359
7.	Medway	G2FJA/A	357
8.	Cheltenham	G3GPW	355
9.	Sutton	G2BOF	341
10.	Clifton	G3GHN	333
11.	Grafton	G3AFT	326
12.	Gravesend / Cannock	G3GRS / G3ABG	325
14.	Sheffield	G4JW	322
15.	Leicester	G3AFZ	320
16.	Isle of Thanet	G3DOE	317
17.	Barnsley	G3ABS	303
18.	Edgware	G3ASR/A	295
19.	Wirral	G3CSG	277
20.	Eccles	G3GXI	235
21.	Nottingham	G3EKW	211
22.	Scarborough	G4BP	208
23.	Torbay	G3GDW	203
24.	Southend	G5QK	188
25.	South Manchester	G3HMF	187
26.	Stoke-on-Trent	G3GBU	181
27.	Bristol	G3GIS	154
28.	Nottingham University	G3DBP	78

In the six front places this year are four Clubs—Neath and Port Talbot, Chester, Surrey and Coventry—who were among the first six last year. . . . First place for the London group of Clubs (led by Clifton last time) is taken by Surrey this year. . . . Compared with the 1952 Contest, Medway pulled up eight places, while Gravesend lost six and Edgware eight. . . . . Cheltenham, 8th this year, last appeared in the Contest as far back as 1946, when they were 2nd. . . . . A number of Clubs have steadily supported MCC ever since its inception. . . . . Ten of the 1952 entrants did not take part this year.

The points table, allotted on a 3, 2, 1 basis to the first three and taking the Contest over the whole

eight years, brings out an order as follows: Coventry, 11; Neath, 10; Rhigos, 9; Chester and West Cornwall, 5 each.

Judges' Summing-Up

Once again it was a pretty evenly-contested struggle. As we have already shown, most of the leading stations approached saturation among the three-point QSO's, by working practically all the Clubs available; therefore it was the single contacts with non-competing stations that lost or won the battle. Any Clubs that passed over a single one of these without going for it will know better next time!

Operating, as heard by outsiders during the event, was pretty good, especially when the "chief op." was at the key. One or two novices were heard to slow things down, but, as we asked last year, if a novice does not start in *some* Contest, how does he ever gain Contest experience? In fact, it might be mentioned here that some Clubs make a point of putting their not-so-experienced operators on so that they can get their hands in for a future occasion.

Notes and keying were good; the Morse characters themselves varied from the shapely output of an "El-Bug" to all kinds of things, including Baghdad and Chinese Morse! Operating was pretty fast on the whole, and not much time was wasted over QSO's, except when the other man would not make it clear whether he was a Club or just a person.

Logs varied somewhat; some entrants had to be penalised for not having read the rules. The same Clubs send in faultless logs year after year, but some of the newcomers fall short of the high standard set by the old-stagers.

"DX" was not a part of the Contest, nor was it sought after; quite a few Clubs did, however, manage to work HB9T and some OK stations without difficulty. The occasional GI, GD, GC and GM station showed up, but it was a pity that there was no entry from these areas. G's and GW represented the sum total.

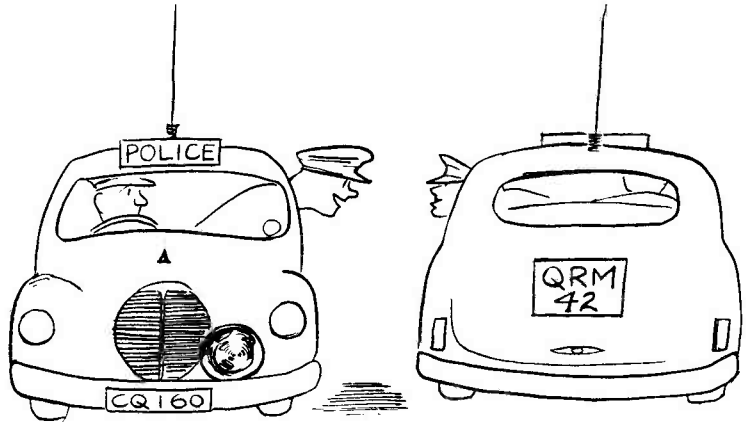
TABLE II

ROLL OF HONOUR

Year	1st	2nd	3rd	Total Entries
1946	Coventry	Cheltenham	Grafton	20
1947	West Cornwall	Warrington	Coventry	14
1948	Rhigos	Coventry	Wirral	28
1949	Rhigos	Neath	Coventry	25
1950	Rhigos	Neath	Coventry	36
1951	Coventry	West Cornwall	Surrey	28
1952	Chester / Neath	—	Clifton	28
1953	Neath	Chester	Surrey / Salisbury	28

We must thank all the entrants for doing their part in this Contest so well, and, of course, we congratulate the winners on the fine show they put up. We look forward to an equally satisfactory Contest next year, when, circumstances permitting, the rules will remain substantially the same. We hope to show photographs of the leading stations in this space next month.

Club Secretaries please note than the deadline for next reports has now been extended to **first post on Friday, January 15,** for the February issue. Address them to "Club Secretary, *Short Wave Magazine*, 55 Victoria Street, London, S.W.1.



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SMALL ADVERTISEMENTS, READERS—*continued*

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