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The SHORT WAVE Magazine

VOL. XIX JANUARY 1962 NUMBER 11

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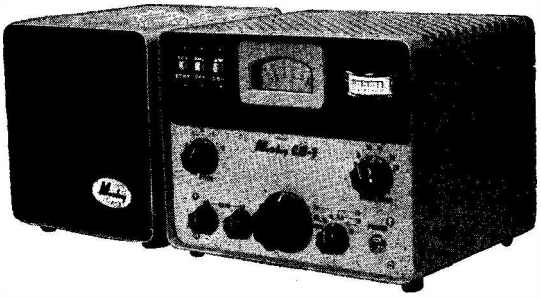

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

VHF *Elsewhere in this issue are discussed two matters of great technical interest and significance in the field of amateur VHF activity—a direction in which more and more AT station operators are now turning their attention.*

It is not to be supposed that orbital satellites transmitting on the amateur bands will become common-place in our time, nor that more than a very few individuals could contemplate building the equipment for a moon-reflection circuit — but the fact that these two things are now being done are significant in that they demonstrate what scope there is for advanced amateur experimental work on VHF.

Apart from this altogether, the VHF bands from 70 centimetres to four metres offer considerable attractions to those whose desire is simply to communicate. These bands are relatively interference-free (except when the big and very exciting DX openings occur); the gear these days is much simplified; no great space is required for an effective high-gain outdoor aerial system (it need be no larger than a multi-band TV array); from the average station, reliable contact under normal day-to-day conditions is possible over distances up to 50 or 100 miles (depending somewhat on location); and, for the mobile operator, two metres has many obvious advantages.

Much of the traffic now being carried on our LF bands — in particular, Top Band nets — could be transferred to two metres, or even to four metres. Greater occupancy of all three VHF bands would be to the advantage and in the interests of all concerned.

Fortunately, the tendency to " Go VHF " is already very evident, and it is not without significance that many newly-licensed operators are starting up on VHF, rather than on the traditional beginners' bands, 40 and 160 metres.

During the coming year, we may expect to see a great deal of useful and interesting work being done on VHF by U.K. amateurs — even if it is, on the part of many of them, simply re-finding the data for their own amusement and benefit.

To All Our Readers, a Very Happy New Year, with Prosperity and Good Health in 1962

Austin Forsyth G6FO.

WORLD-WIDE COMMUNICATION

Practical Monitor Oscilloscope

FUNCTIONING ON "TRANSMIT" AND "RECEIVE"

M. Allenden (G3LTZ)

This is a neat and very useful piece of test equipment, based on a proven design, and intended to work with the station transmitter to monitor outgoing signals, and with the receiver to check on incoming transmissions. A low-voltage tube is used, and our contributor suggests a suitable power pack to run the unit.
—Editor.

THE original version of this Monitor Oscilloscope had already been built and tested, when the author came across an article in *CQ* Magazine by WØBMW describing a more elaborate arrangement enabling received signals to be monitored and analysed in addition to transmitted ones. Modifications were put in hand immediately and the following is a more detailed description of the circuit and construction.

Circuit Description

The monitor is built around the Mullard cathode ray tube type DH3-91, which is a self-focusing one-inch green medium-persistence type. A special internal coating on the screen allows the tube to be used with a positive EHT, which of course simplifies matters concerning heater supplies. The signal is taken from the receiver *via* a 10 $\mu\mu$F condenser off the anode of the last IF stage; screened lead is used, and the receiver IF retrimmed if required. The signal is applied to V2 *via* Sk.2 and is amplified to produce the vertical deflection on the tube for the received signal function. L1, L2 and C1 in the "receive" condition do not appreciably attenuate the received signal. During transmit, however, T1 behaves as an RF choke and L1, L2, C1 tune to the incoming transmitted signal taken from the ATU or other suitable point. C1 can be used as a convenient height control and SW1 selects the appropriate inductance to resonate, with C1, to the transmitted signal. With the coil data given, it was found that a 75 $\mu\mu$F variable capacitor would tune 10, 15 and 20 metres at one setting of the switch SW1, whilst 40 and 80 metres were covered when L2 was switched in.

The foregoing explains the vertical deflection for a Tx or Rx function but now the horizontal must be considered. V3, the 6C4 triode, acts as an infinite impedance detector and from the cathode, an audio voltage is available of sufficient amplitude to give a full scan on the CRT. An alternative sweep can be derived from the power transformer secondary, and is of course 50 c.p.s., which can be obtained from a one or two megohm potentiometer, VR1 in Fig. 2, across any convenient source of 100-300 volts, the high impedance being perfectly satisfactory for the sweep.

Having now established two alternatives for horizontal sweep, SW1 can select either to give a trapezoid or envelope display. This works on Tx or Rx, and so in the interest of control simplicity, both band-switching and envelope/trapezoid display can be combined in a common switch, *viz.* SW1.

The remaining circuitry now covers the CRT and its network, but a glance at the circuit diagram will show this to be extremely simple. The brightness control is a 100K potentiometer, RV1, in the cathode of the CRT, one end of which is returned to HT + *via* a 1·8 megohm resistor, R9; this value gave a good control over brightness with a nice positive cut-off near the end of the brilliance potentiometer travel. The value may need altering, however, if the positive line varies much from 500 volts. Focusing is automatic with this CRT and so no control is required—similarly horizontal and vertical shift controls were not required as the undeflected spot lies near enough to the centre of the tube to enable the minute error to be neglected.

A final anode voltage of from 400 to 500 volts can be used, and because this is positive, it can be taken from the Tx power supply or, as in the author's case, the receiver power supply was modified to include a voltage doubler using small low-current rectifiers. The 200v. pos. can be taken from the Rx power supply, as can the 6·3v. for heater; the total consumption of current is made up as follows: 6·3v. AC, 0·9 amps; +200v., 12 mA; +500v., 2 mA.

Of course a small power unit could be constructed for the oscilloscope on its own, but this will be the choice of the individual constructor. (*See* Fig 2, p. 572).

Construction

The size of the original unit is 6·5 ins. x 3 ins. panel with the actual chassis-*cum*-case 6 x 2 x

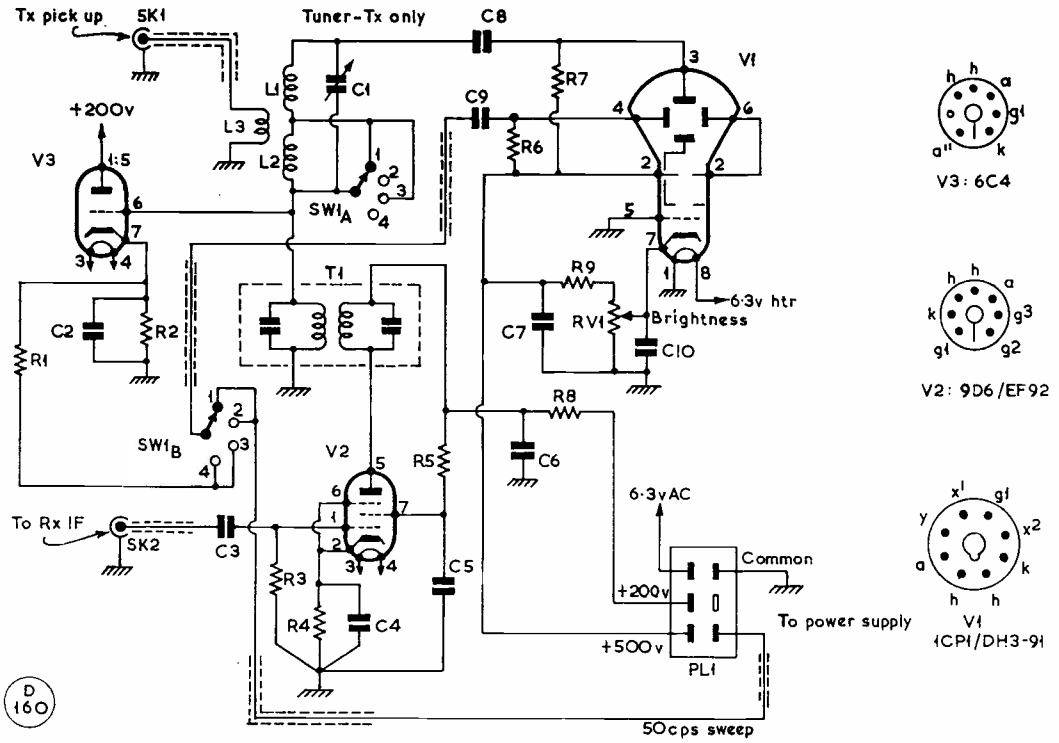


Fig. 1. Circuit of the Monitor Oscilloscope described in the article. It is designed to check on the outgoing phone transmission (Sk.1) and received telephony signals (Sk.2) — see text. The CRT used is a low-voltage tube, which could be energised from the station HT pack if it gives about 500v. Either envelope or trapezoidal display can be selected, and the tuned circuit covers the bands required in the " transmit " position. A suitable power pack is shown in Fig. 2 overleaf.

5·5 inches. The case is constructed from a piece of 2-inch channel aluminium supplied by Home Radio of Mitcham as one of their chassis parts; alternatively, if a bending machine is available, there are no problems in manufacture. By cutting 90° V-shaped pieces out of the 2-inch channel, the metal can be easily and neatly bent by inserting a block of wood inside the flange and with even pressure, pushing in to make the folds. The holes are all drilled first, of course, and the rectangular cut-out can be made with a fretsaw to accommodate PL.1. A look at the photograph will show that the small sub-chassis is simply a rectangular piece of aluminium held from the case by two ¾ in. spacers. This sub-chassis can be almost completely wired before its inclusion in the case.

Although a very small 455 kc IF transformer T1 was used on the original, a standard miniature type can be employed, but because of the dust cores being at both ends of the can, an extra hole will be required in the base for adjusting the lower core. The front panel can be painted, lettered and then

Table of Values

Fig. 1. Circuit of the Monitor Oscilloscope

C1	= 75 $\mu\mu$F, var.	RV1	= 100,000-ohm potentiometer, ½ w.
C2	= 200 $\mu\mu$F, mica		
C3	= 10 $\mu\mu$F, mica	T1	= IF xformer, to suit Rx IF
C4, C5, C6	= .01 μF, min.	SW1	= 2-pole, 4-way wafer
C7	= .001 μF, ceramic	PL1	= 6-pole chassis mounting plug
C8	= 500 $\mu\mu$F, ceramic	V1	= 1-in. CRT, Mullard DH3-91, or 1CP1
C9, C10	= 0.1 μF, tub.	V2	= Vari-*mu* pentode, EF92, 9D6 or CV131
R1	= 56,000 ohms	V3	= 6C4, or EC90, CV133
R2	= 100,000 ohms		
R3	= 1 megohm		
R4	= 560 ohms		
R5	= 47,000 ohms		
R6, R7	= 2 megohms		
R8	= 4,700 ohms		
R9	= 1.8 megohm		

COIL DATA

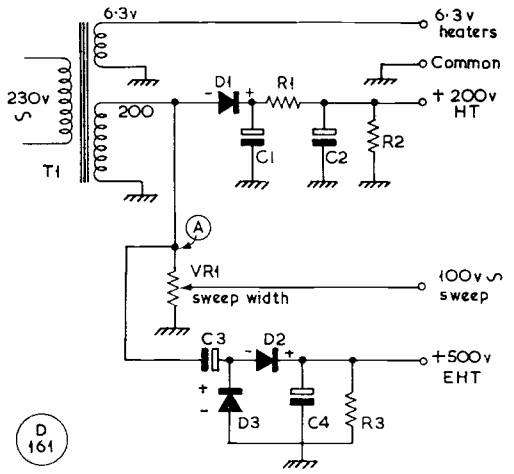
L1 — 8 turns 18g. enamelled wire, close-wound, self supporting, to ⅝-in. diameter.

L2 — 30 turns 36g. enamelled, close-wound on suitable ⅝-in. diameter former (paxolin or tufnol)

L3 — Link winding: 2 turns 18g. enamelled or p.v.c. wire, self-supporting, ¾-in. diameter (*see text*).

the components mounted before it is bolted to the case; the variable condenser has to be insulated both sides, so the hole must be large enough to avoid fouling the front panel.

The coils L1, L2 and L3 form a composite assembly and whilst L1 and L3 can be made



self-supporting, L2 will have to be wound on a small piece of tubular insulating material. L3, which is a two-turn link, forms a common coupling coil and therefore should be mounted between L1 and L2; the winding "sense" of these latter coils is in the same direction. Screen the wires as shown on the circuit diagram and there should be no trouble with stray pick up or interaction, but be sure to include the ·001 μF by-pass condenser C7 on the +500v. line.

Alignment and Use

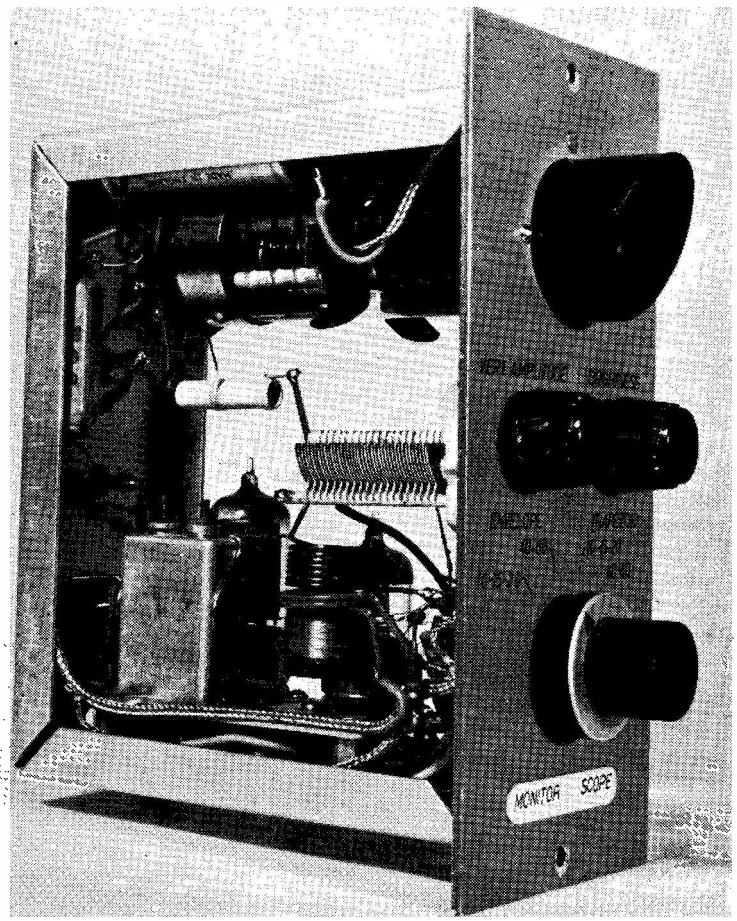
Before applying power and, using a GDO, check that the L1, L2, C1 combination is capable of tuning the required bands; L1 may be adjusted by squeezing or opening the turns just to cover 10 metres with C1 at minimum capacity; it will then be found that at maximum capacity, 20 metres can be covered. Power should then be applied and the brightness potentiometer checked for reasonable control of the screen brilliance and cut-off. Next, connect an input to Sk.2 from the station receiver as described earlier, turn the gain controls on the Rx to maximum and tune in a fairly strong signal; by adjusting the cores of T1 it should now be possible to peak the signal on the CRT screen, turning down the gain control on the receiver as overloading takes place.

Depending on whether "Envelope" or "Trapezoid" has been selected the following pattern will be observed on the CRT screen: *Envelope:* A 50 c.p.s. time-base with the

Table of Values

Fig. 2. Suitable Power Pack for the Oscilloscope

C1, C2	= 16 μF	R3	= 470,000 ohms
C3, C4	= 8 μF	T1	= Mains xformer, 200v. and 6.3v. sec's.
VR1	= 1-2 megohm potentiometer	D1, D2, D3	= 200v. rectifiers
R1	= 4,700 ohms		
R2	= 25,000 ohms, 3w.		



General view of the Monitor Oscilloscope designed and constructed by G3LTZ. A Terry clip holds the 1-in. CRT. The coils in the foreground are L1, L2, L3 — see Fig. 1. The instrument monitors on both incoming and outgoing signals.

envelope characteristic of the received signal clearly visible, from which modulation depth can be judged. The same information is displayed on the Tx function; the height of the display can be adjusted by the variation of C1. *Trapezoid:* On receive, as signals are tuned in, a trapezoid pattern will be seen during modulation, and a vertical line when no modulation is being applied. On Tx, provided C1 has been tuned to the frequency, a similar pattern will be obtained, and linearity and modulation depth can be ascertained from the display.

Because a tuned circuit is used for the Tx pick-up, the injection need only be very small, and a 5 to 10 $\mu\mu$F condenser from the coax lead at the ATU or other convenient point is all that is required. The station receiver gain control was found effective in setting the height of the display on receive, but if required, the cathode resistor of V2 could be made variable to give an independent control.

The monitor as described has been in use for several months now and has proved entirely satisfactory. The additional "receive" facility has also avoided having to turn the CRT HT on and off to avoid burning the screen as there is about the same brilliancy requirement for Rx and Tx. Finally, of course there are no clunking relays.

IMPROVING AERIAL COUPLING EFFICIENCY

USING SIMPLE INDICATING DEVICES

F. G. Rayer (G3OGR)

WHEN any form of all-band aerial is used an aerial tuning unit, Z-match, or other coupling circuit is often employed. This device is generally to match the aerial impedance to the transmitter, or to allow balanced or similar twin lines to be coupled to a *pi*-tank. Many aerial coupling circuits are available, and all can give good results if correctly adjusted. Some simple methods of checking adjustments are discussed here, and should produce optimum results.

Each of them has its advantages and its snags, which are in general quite well known, yet quite often overlooked. If a dipole is fed with coax directly from the transmitter *pi*-tank there is of course no coupler or tuner, and thus no unease that this unit may not be doing its job. Such an aerial is likely to be trouble-free and to work well—but, unfortunately, is generally for one band only.

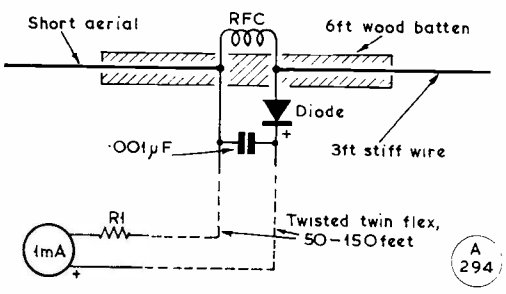


Fig. 1. Arrangement for remote-reading field-strength meter. The pick-up element can be placed anywhere within the field of the aerial, and the instrument line run back to the operating position — see text.

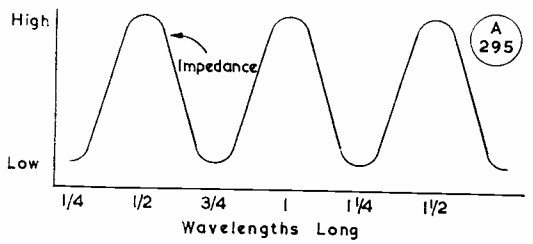


Fig. 2. Showing how impedance varies with resonant aerial length, considering the end-on condition; it is always desirable so to arrange matters that the aerial is fed at a low-impedance point.

If the transmitter itself is adjusted properly, it will be giving its maximum RF output, so the problem is simply to ensure that as much of this RF as possible is getting into the aerial. Any of the methods described here will help this optimum to be found.

Field Strength Meter

This is extremely useful, when it can be far enough from the Tx and aerial. It should not be near the Tx or feeder, as maximum field strength in these positions will almost certainly not coincide with maximum radiation from the aerial itself.

A useful remote-reading arrangement is shown in Fig. 1. Using a 6 ft. batten, to support two 3 ft. wires to form the pick-up, and 50 yds. of twin flex to connect to a 2,000 o.p.v. meter on a 15v. range, 50w. gave about 7v. on the meter scale. These figures are only a guide to possible readings. An 0-1 mA meter is indicated, but other instruments of reasonable sensitivity do as well. R1 is adjusted to obtain a suitable deflection. A fixed resistor is preferable, and can be found by trial, beginning with high values, or by temporarily inserting a variable component.

The pick-up aerial should be placed in the same plane as the transmitting aerial. RF pick-up by other parts of the circuit must be avoided, so the meter and line are kept clear of the Tx, coupler, feeder, and the aerial itself. The test here is that moving the meter or line should not change the reading. If it does, the meter or line may be picking up RF. PVC

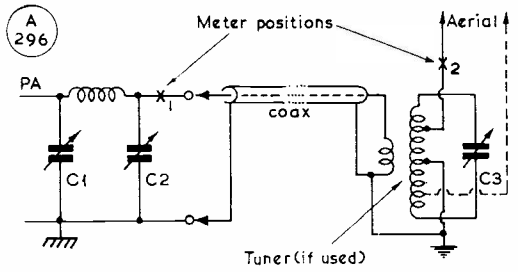


Fig. 3. Using an RF meter for aerial tuning, as explained in the text.

flex is cheap in 50 yd. or 100 yd. coils from cable suppliers, and can be buried. A slot to take the wire can be made in turf, in wet weather, by pushing in a spade, and this will soon be invisible again. The pick-up aerial can be in a shed, garage, or non-metal building, if convenient.

Aerial coupling adjustments are directed simply towards getting the highest reading on the meter. One type of coupler can be compared with another, Tx input and aerial remaining unchanged.

The field strength meter is not usually satisfactory for comparing the radiation efficiency of one aerial with that of another, because the aerials will probably be in different positions, or have different directivity. However, some comparison can be made by placing the FSM pick-up in the same relative position for each aerial tested.

RF Meter

An RF meter in the aerial is very useful, and perhaps the simplest device of all to fit ! The meter indicates current only, in I^2Z, and Z (aerial impedance) is dependent on aerial length, and other factors. When checking with an RF meter it is thus important to avoid changes in Z. This is fortunately easy.

Fig. 2 gives an indication of changes of impedance with wave-length. The variation in impedance is very great. Changing frequency within *one band* will cause a shift in impedance, and thus bring about changes in meter readings. Moving from one band to the next can cause a complete change in impedance conditions. Slightly changing the aerial length will have a similar result to shifting frequency in one band, and changes to the aerial position, shape or height will likewise alter the impedance.

For comparative readings, it is thus necessary that the transmitter frequency remain unchanged, and that the meter be at a point of fixed impedance.

Fig. 3 shows a *pi*-output circuit, and an end-fed aerial could be taken directly to the output socket, in which case the RF meter would be at the point X1, near C2. Provided the circuit from the meter to the aerial (and including the aerial) remains unchanged, an increase in meter reading will correspond to an increase in signal radiated. The aerial will, of course, have high standing waves, or excursions of voltage and current, and there will be large reflected currents. The *pi*-network will be able to handle these within the usual limits.

If a tuner is used, the meter must be transferred to the point X2 in the aerial. On a fixed frequency, with a given aerial, maximum current then again agrees with maximum radiation. The method is thus to tune for maximum aerial current.

If a tuner is used, the meter can *not* be included at X1 near C2, as its maximum reading will then agree with the lowest impedance to which the overall circuit can be adjusted, irrespective of efficiency.

When one coupler or tuner is compared with another, the circuit from meter to aerial must remain unchanged. Even adding an extra bit of wire for connecting purposes can change the impedance, and thus the meter reading. But provided the aerial, up to the meter, and the transmitter frequency, both remain unchanged, reliable comparisons can be made.

With a balanced feeder, one meter may be inserted in each, if wished. Currents in each side of a Zepp feeder can scarcely be expected to match.

Standing Wave Indicator

This is included in a flat line, such as the coax to a centre-fed dipole, or between Tx and tuner, as in Fig. 3. A circuit is shown in Fig. 4. The pick-up wire is inserted for a few inches under the brading of the coax. R1 is chosen to suit the impedance of the system. R2 is merely to get suitable readings, and may be variable. If a more sensitive meter than 0-0·5 mA is to hand, it is preferable.

The switch allows forward, or reflected, currents to be read. Adjustment of the tuner is directed towards securing the maximum forward current, and the *minimum reflected* current.

If the meter is included in a long coax feeder to a dipole, no difficulty should arise. But if the meter is in a short coax line between transmitter and tuner, its indications may require some interpretation. With an overall circuit such as in Fig. 3, the working impedance present between C2 and the tuner can be varied between quite wide limits, by adjustment of C1, C2 and C3. Some of these settings could give an increased forward reading on the standing wave meter, for no reason other than the fact that the impedance is being matched up to that at which the *meter* is most effective. In this case, the increased readings will not

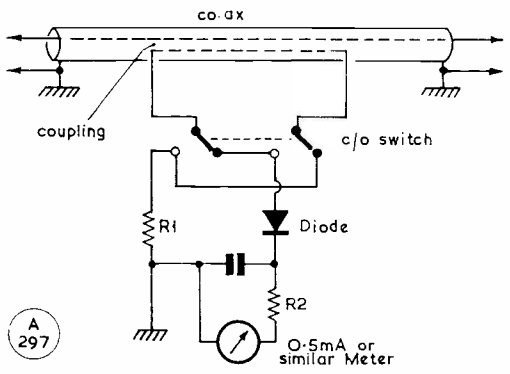


Fig. 4. The application of a standing-wave meter, discussed by G3OGR in his article.

coincide with an increase in radiated signal or field strength. Furthermore, a relatively high reflected power reading may not necessarily mean loss of radiation from the aerial, because the *pi*-network can deal with standing waves, exactly as when an aerial was connected to C2, Fig. 3.

To avoid these difficulties, the meter should be connected in a line of the correct impedance. When the load (tuner or aerial) matches this impedance it will take power without reflection, so maximum forward reading and minimum reversed reading will agree with efficient working of the system.

Comparison of Methods

As a check upon the results being obtained, all three methods described were used together—field strength meter, RF meter, and standing wave indicator.

When matters were arranged to avoid the causes of error mentioned, it was found that all meters were very closely in agreement. Maximum aerial current, shown by the RF meter, gave maximum reading on the field strength meter, and at the same time the standing wave indicator showed nearly maximum forward power and minimum reflected power.

Three-Stage Four-Band Exciter Unit

OUTPUT ON 10-15-20-40 METRES

G. W. McDonald (G2OX)

The prime intention of this article is to show a sound basic design for an HF-band exciter unit, capable of giving at least one watt of RF output, sufficient to drive any usual type of tetrode PA to 50-100 watts input. For a unit of this sort, various constructional layouts are possible, and can be dictated by the cabinet or chassis forms available. Provided the general arrangement follows the circuit diagram, with each stage adjacent to the next in frequency sequence, and the constructional points made in the article are heeded, there should be no difficulty in getting entirely satisfactory results.—Editor.

TO most amateurs the essential features of any piece of apparatus are simplicity and low cost. The Exciter Unit to be described certainly fulfils those conditions, but at the same time it is designed to drive a two-stage RF amplifier on four bands. Standard receiver-type components are used throughout and apart from some care required in the construction and layout, the unit is easily built.

Oscillator

The oscillator circuit around V1, 6CH6, is the well-known Hartley arrangement, the tuned circuit being between grid, cathode and earth. This allows the screen to isolate the input circuit from the output side, but has the disadvantage that the tuned circuit is actually across the heater-to-cathode insulation of the valve. In theory, this could cause the oscillator output to be modulated by 50-cycle hum should the heater-cathode insulation be low. The writer has used this circuit for many years, and in different forms, but has yet to experience this fault. It is, however, always a possibility and one which the valve manufacturers mention in their data sheets on some types of pentode.

The tuned circuit L1, C1 has a very high value of tuning capacity. This is to allow for any changes in the valve inter-electrode capacities which occur when the valve is warming up. These changes are small compared with the total capacity across the circuit, and therefore cause little alteration to the frequency. Frequency creep, a disturbing trouble in a VFO, is also minimised.

The tuned circuit operates over 3·5 mc to 3·73 mc, giving complete coverage of the higher frequency bands. Band-spreading is arranged by tuning the circuit to 3·5 mc on variable C2 with the variable main tuning capacity C3 at maximum. The value of the main tuning condenser is then reduced until the 3·73 mc point is reached. By observation the approximate value of capacity required to reach this point will be found, so that fitting a variable condenser of this value will spread the frequency range over the dial. (This procedure is much easier to carry out than to describe!)

The anode circuit requires some explanation. In the prototype oscillator an RF choke was used to form an untuned anode circuit but the drive was found to be somewhat low at the grid of the first multiplier. To increase the output from the oscillator a fixed, tuned circuit was substituted for the RF choke. The circuit

is wound to tune to 3·5 mc. The dust-core is adjusted to give maximum output from the oscillator. Details of the construction are given in the coil data table.

The valve used is a Brimar 6CH6 with the anode and screen fed from the 150-volt regulated supply. The 6CH6 works well at this low voltage and produces very stable RF output which is capacity coupled to the first multiplier, V2. The oscillator is not intended to be loaded at its fundamental frequency. It was found that if output was taken to drive a small amplifier at 3·5 mc, the frequency stability was affected.

Frequency Multipliers

These are identical as regards circuitry except for the values of the constants in the tuned circuits. The valves used for the multipliers are Brimar 5763. This is a most useful valve for amateur use. Its power requirements are modest, being 300 volts at 50 mA. It will work at full rating up to a frequency of 175 mc and will give an output of 8 watts as a Class-C amplifier. A point worth mentioning is that the valve should have good ventilation and not be placed too near tuned circuits. It runs very hot.

The circuits are parallel fed—that is, the valve, tuned circuit and the HT supply are all in parallel. This arrangement allows the stators of the tuning condensers to be earthed and HT to be kept off the coils; as well as being of great constructional convenience it is safer.

Grid leak bias is used and a protective bias obtained from cathode resistors is available in case of loss of drive.

Both multipliers have switches to cut off their output, S1 being the net switch. V2 is switched in the anode circuit, S2, by breaking the HT to the anode and screen. V3 is switched in the cathode circuit, S3. This is to prevent grid current flowing in V3 when taking output from the 7 mc multiplier; this grid current lowered the useful output at the 7 mc link. While on the subject of switching cathodes it is as well to remember that if the cathode circuit is broken the cathode potential becomes that of the HT supply; in this case it would mean that the heater-to-cathode insulation has to withstand 300 volts. The recommended maximum in the case of the 5763 is 100 volts; the resistor R10 connected between the cathode and heater of V3 is there to prevent the heater-cathode volts from exceeding the rated value.

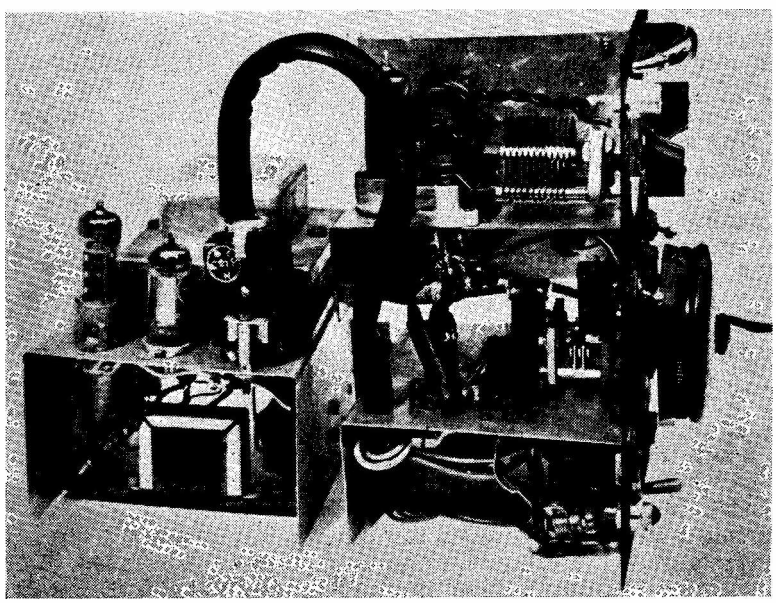
Details of the coils used in both multiplier stages are given in the coil table below. Output is taken from the circuits by means of two-turn loops wound over the earthy end of the coils L3, L5.

The tuned circuit of the 7 mc multiplier is designed for optimum output at the working frequency, but that of the second multiplier is a compromise so that reasonable output is obtained at all three frequencies 14-21-28 mc.

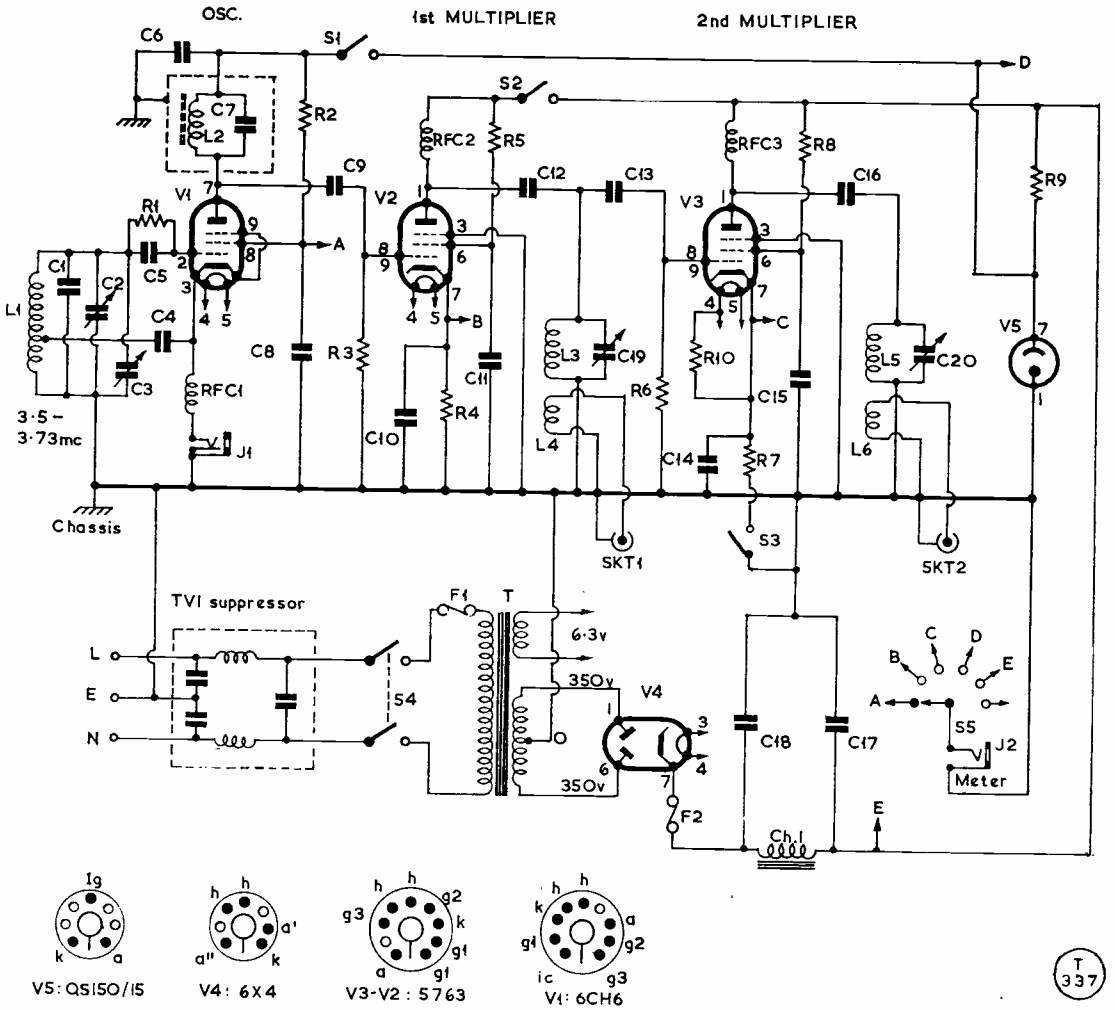
No permanent meter is fitted but various points in the circuits are taken to a multi-way switch and a meter jack. This arrangement allows the station multi-range meter to be used

COIL DATA TABLE

L1	16 turns, 22g. enamelled, tapped 7 turns from earthy end, close wound on ⅜-in. o.d. former.
L2	57 turns, 38g. silk covered, close wound on ¼-in. diameter former with adjustable core.
L3	22 turns, 22g. enamelled, close wound on ⅜-in. o.d. former.
L5	8 turns, 22g. enamelled, close wound on ⅜-in. o.d. former.
L4 and L6	2-turn link winding, insulated flex, wound over earthy ends of L3 and L5.
Coil Formers	Paxolin, or resin-impregnated paper tube, ¾-in. outside diameter. Varnished with polystyrene varnish before and after winding.



General mechanical arrangement of the VFO-Exciter described in the article by G2OV. The power supply section is on the left and the first multiplier on the upper deck to the right. The oscillator is in the compartment below.



The three-stage four-band Exciter Unit described in the article, for which all values are given in the table. Incorporating its own power supply, this Exciter will give 1-watt or more of drive, sufficient for a 50-100 watt RF amplifier. On the 5763's, pins 8-9 should be connected at the valve socket; on V5, the QS150/15 voltage stabliser, the ignition electrode pin 4 is not used. The mains filter is a standard unit and should be included in the interests of TVI suppression.

for tuning the various stages, and for routine testing when required.

Power Supply

A Brimar 6X4 indirectly-heated valve gives a smoothed DC output from a conventional capacity input filter C17, C18, Ch.1. A further supply rated at 150 volts at 15 mA is tapped off the 300-volt line and is regulated by the QS.150/15 stabiliser. This regulator valve gives a steady output of 150 volts at all current loads from 5 mA to 15 mA. The regulated HT is used for the anode and screen feeds to the VFO. There is no need for anything more elaborate than this simple circuit. The 300-volt output is capable of delivering between 80 and 90 mA, and no undue heating

Table of Values

Circuit of the Four-Band Exciter

C1 = 400 $\mu\mu$F, s/m
C2, C20 = 50 $\mu\mu$F, var.
C3 = 15 $\mu\mu$F, var.
C4, C6, C8, C10, C11 = .01 μF, mica
C5, C7 = 100 $\mu\mu$F, s/m
C9, C12, C16 = .001 μF, mica
C13 = .0015 μF, mica
C14, C15 = .01 μF, 350v.
C17, C18 = 16 μF, 450v. elect.
C19 = 100 $\mu\mu$F, var.
R1, R3, R6 = 50,000 ohms, ½w.
R2 = 20,000 ohms, ½w.
R4, R7 = 100 ohms, 1w.
R5, R8 = 20,000 ohms, 1w.
R9 = 10,000 ohms, 4w., w/wound
R10 = 220,000 ohms, ½w.
S1, S2, S3 = On-off, toggle
S4 = DPST, toggle
S5 = 6 pos., 1-way meter switch
J1 = Key jack
J2 = Meter jack
RFC's = RF chokes
Ch.1 = 5 Henry 80 mA
F1 = 750 mA fuse
F2 = 500 mA fuse
T = Mains xformer, 240v. pri.; 350-0-350v. 80 mA, 6.3v. sec.
V1 = 6CH6, Brimar
V2, V3 = 5763, Brimar
V4 = 6X4, Brimar
V5 = QS-150/15, or similar

of the transformer has been experienced. Amateur use can be considered to be intermittent and a component such as a transformer is always rated for continuous operation by the manufacturers; thus, it is usually safe to exceed that rating by a small amount.

The power supply was built by the writer as a separate unit, and connection is made to the Exciter by a multi-way plug and socket. Connection to the mains follows the usual three-pin practice in the interests of safety. TVI is minimised by providing a mains filter in the incoming power supply lead. This filter should be fitted close to the point where the power lead enters the chassis; the filter prevents RF from being passed to the supply mains where it can be picked up by television receivers in the immediate neighbourhood.

Construction

The writer favoured double-deck construction in order to keep the unit small in size. This layout offers no advantage electrically because all the valves are of the single-end type. The chassis is built of 16g. half-hard aluminium, professionally made to the required specification by a local metalworker. All boring and drilling is done with the normal tools found on the average amateur work bench. The front panel is made of the same material finished in crackle lacquer.

The wiring is point to point, a method long favoured by the writer. Its advantage is that short interconnecting leads are possible and that is a necessity for high frequency equipment; the tag board method is perhaps neater but in this case, not so efficient. All the earth return leads of a stage are taken to one point on the chassis, located near the valveholder. This prevents unwanted interstage coupling due to the impedance of earth return leads being common to more than one stage. If these general principles are followed, the inexperienced constructor should have no difficulties when building this Exciter Unit.

Keying

Oscillator keying is desirable, although it is really not good practice—the oscillator should be allowed to run undisturbed—but as break-in is a popular method of operating, the oscillator of this Unit is keyed, by breaking its cathode circuit as shown at J1. In actual practice the results are good; the oscillator keys cleanly with the minimum of frequency shift. This is mainly due to the good regulation of its HT supply.

If oscillator keying is not required, either of the Multipliers may be keyed. For those who wish to use this method of keying this next paragraph is important.

Keying the screen grid of the 5763 is not successful unless the screen is taken to a point of negative bias under key-up conditions. It will be found that simply breaking the screen supply will *not* completely cut the output from the valve. The cathode, however, can be keyed, providing one remembers that the maximum cathode-to-heater voltage recommended by the valve manufacturers is not exceeded; this figure is 100 volts. The recommendation by the manufacturers to avoid excessive strain on the cathode insulation is to connect a resistor not exceeding 0·25 megohms between the cathode and heater pins of the valve. The value used by the writer (R10) is 0·22 meg. and its insertion had no effect on performance.

The foregoing gives only the barest outline of keying methods and takes no account of key thumps and clicks that may occur. Methods of dealing with such problems are given in all the handbooks and in various articles that have appeared in the *Magazine*.

TEST DATA

Oscillator	V_a = 120 volts	I_a = 5 mA
	V_{sg} = 80 volts	I_{sg} = 1.4 mA
		I_g = 450 μA
First Multiplier	V_a = 290 volts	I_a = 20 mA
	V_{sg} = 215 volts	I_{sg} = 10 mA
		I_g = 1.5 mA

Power output approx. 1.5 watts

Second Multiplier	V_a = 290 volts	I_a = 20-25 mA
	V_{sg} = 220 volts	I_{sg} = 5 to 6 mA
		I_g = 3.0 mA

Values of currents vary slightly over the tuning range.

Estimated Power Output: 14 mc 1.7 watts; 21 mc 1.0w.; 28 mc 1.5w.

Conclusion

The writer hopes that this article will enable the more inexperienced amateur to get the pleasure of working on the DX bands at low financial outlay, with a reliable and properly-engineered Exciter. The next project would be to build an RF amplifier running 50-100 watts with an ever watchful eye on the cost.

DX COMMENTARY

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

OD5CN

FIRST of all, a very Happy New Year to all readers of this "Commentary"—the old faithfuls and the new hopefuls alike. May we all enjoy the coming year and get the best possible out of our bands—all of them. We all know that conditions are falling-off rather than improving, but we ought not to worry. There's always plenty to do, and making the best use of the bands that are open is an interesting challenge of the very kind that makes Amateur Radio what it is.

If the LF bands become congested, then we must improve our receivers. If competition for the DX becomes fiercer, we must do something about our transmitters and aerial systems. If you can't force the QRM to QRT, then you'll have to work through it, and find a way of beating it—even down to the old panacea of selective ear-drums. And (dare one say it?) if the conditions are really rugged, then there's a chance that CW will do things that phone won't. (If we were *all* on CW the QRM problem would be much less serious—but that's a rather touchy subject which we won't pursue, except to suggest that the phone-only man is not, in our opinion, the *complete* amateur.)

However—just one year ago we indulged in some Old-Moore-ish predictions, which were meant to be funny—one of them was to the effect that at least ten new countries would be "created" during 1961, and that the Top People would score over 310. Too conservative by far—the number of new ones was nearer to 20, and the top scorers are around the 318 mark. For 1962 there will be no predictions on these lines, except to suggest a possible figure of around 330. (But why should we worry—such performance is only possible for about six stations, out of the several hundred thousand active. For the rest of us there still remain many other goals—for the G3P - -, his first century, and good luck to him.)

December, 1961, turned out to be a pretty good month, and we have lots of reports and information, as usual. In particular, *Forty* and *Eighty* kept up to a high level of DX potential, and we note that more and more correspondents discuss those two bands. The *Forty* DX has been included in the tabular matter along with the HF bands, but *Eighty* has been treated under a separate heading.

One point of interest in these two bands is that those of us who can't get up ambitious beams (for the HF bands) can compete with others on more equal terms, especially on 40m., where a well-placed ground-plane can do wonders. On 80m. a dipole or a long wire will give you a signal that is up to the average.

There are exceptions, though, such as W8JIN with his full-sized three-element beam on *Forty* (100 feet up!), and the signal is proof of the efficiency. We doubt whether anyone in the U.K. has such a thing, however—they seem to have more room for such monsters in the States and, possibly, no town-planning committees who want to know if the "pole" will be more than 25 feet high.

So—on to the news of the month, and may the whole year continue to be as interesting as this finale from 1961.

CALLS HEARD, WORKED and QSL'd

DX Around the World

First, the news snippets supplied by our own readers, which are usually taken "off the air" and may be more up to date than the other information available.

From G2DC (Ringwood): The

Socorra affair was beset by many troubles, but did finally materialise, on SSB and AM only, as XE1CV/XF4 and XE1FJ/XF4; no G stations known to have worked them . . . Danny Weil was *en route* for the Marquesas group and due to show up as FO8AN, but now he has had trouble with *Yasme's* main engine with a crack in the cylinder block; however, he was last reported to be making good progress under sail. G2DC runs daily skeds with him and appeals to others not to call during the obvious "special transmission" periods . . . 5N2AMS hopes to put in some week-ends from TY2AA (Dahomey) and also to visit Gabon . . . ZL4JF back at Campbell Island, still awaiting gear . . . Tanganyika now signing 5H3, the old VQ3 prefix having been added to the list of "obsoletes" . . . KV4AA, having received cards from TY2 and VS9K, now has 319 confirmed.

From GW3AHN (Cardiff): First 5H3 heard was 5H3PBD, 21 mc AM on December 11.

From MP4BBW (Awali): Interesting movements around this time should include KS4BE, Serrana Bank (possibly late December); TI9SB, Cocos, January 8-10; YVØAA, Aves Island, January 6; VKØ, Heard Island, early January; UA1KED on SSB any time now; and the HB9TL portable SSB rig in Tobago, VP4.

Further DX gossip, collected from all over the place: G3LET's call, in the *South Orkneys*, is VP8GQ . . . AP5CP is in East Pakistan and causes a pile-up whenever he shows his call . . . FB8WW, Crozet Island, should be on by now . . . ZD1CM will be operating again soon.

XZ2SY is on 14 SSB . . . K6CQV/KS6 likewise, 0300-0600 . . . TL8AC has been heard, 14050 kc CW, 1900 onwards . . . TL8AE is on 14 mc AM, mobile . . . TR8AB on occasionally, 21 mc AM . . . Wallis Island effort (FW8AS) postponed until April next.

3V8CA has fired up again from Tunisia after being on leave. He now expects to be there for two years . . . A station signing 9Q5AAA turned out to be operated by DL7AH . . . ZS6PC and another operator expect to be signing ZS6PC/ZS8, but this may be all over by the end of December.

Past History

The DX-pedition to HV1CN, handled by W9IOP and W8DUS, piled up the points during the *CQ* DX Contest (CW). They made over 1700 QSO's — special QSL's forthcoming . . . SVØWI/R was a "quickie" to Rhodes, also very successful . . . The Caribbean SSB expedition fetched up at FY7YI early in December. Next port of call should be FM7WQ.

4W1AA was heard during the *CQ* Contest, working strings of W's; nothing known about him . . . JA1EEB/P/KG6 was on Marcus Island, 7 mc, during early December; probably left by now . . . YJ1MA was to have appeared on the air, operated by Mike, G3JFF, late November; but no reports at all to hand.

Top Band Topics

For normal usage the band seems to have been very lively once more. County-chasing continues unabated, and the G3O's and G3P's are all waiting to pounce and establish themselves on their special ladder, which has just been put up. We hope to see some good scores in its first appearance next month.

G3NBT (Sidcup) wonders how many Top Banders have received reports from HE9RAP, who puts in a lot of time listening and QSL'ing . . . G3PGN (Basildon) has now worked 60 (45 confirmed) and says most of the latest are the rarer GM counties, and permanent stations at that. On December 3 he heard about ten W's and VE1ZZ; and on December 2 he reports very queer conditions during the evening, with a very quiet band and QSB on even the locals. Yet he and G3OQT both had 599 reports from OK1ADX.

G3PHO (Sheffield) suffers from a poor aerial (only 18 ft. high), but has worked HB9QA and four OK's, as well as GM3PBA and GM2HIK on CW, with GW3OFV /P on phone. On December 3 (*see* above!) he did not hear any W's; but three were logged on November 19 and two on December 10. And on each occasion UO5AA and UB5WF were going strong.

GM3PBA (Dumfries) sends his first report and joins the ladder

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
	CW and Phone	
G2NJ	98	98
GM3OM	98	98
G3JEQ	98	98
G3IGW	97	98
G6VC	97	97
GM3COV	96	96
G3KOR	95	98
G3APA	92	93
GM3AVA	92	92
G2DF	91	91
G2CZU	90	90
G3LWQ	86	90
G3NFV	82	83
G3NNO	78	90
G3OHX	78	83
G3OSE	74	81
G3NTI	74	75
G3NNF	66	74
G3OIT	60	81
GW3CBY	54	65
G3MGI	48	60
G3ISX	48	54
G3IDG	46	49
G3PGN	45	60
G4JA	40	53
GM3PBA	36	49
G3PDM	35	59
G3PEK	6	35
	Phone only	
GM3AVA	90	90
GM3OM	87	89
G3FS	85	85
GM2UU	80	81
G3NPB	79	81
G3NBT	73	75
G2CZU	69	69
G3NAA	64	65
G3NNF	56	60
G3NNO	39	62
G3NFV	36	48

(Failure to report for three months entails removal from this Table. New claims can be made at any time.)

with 36/49. He has also worked two OK's, with 9 watts to a 200-ft. end-fed wire. GM3PBA started as an SWL in 1945 and is now tasting the joys of transmitting for the first time. *(Later:* He worked EI9J and EI3AH, giving him eight countries on 160m., and also increased the counties score.)

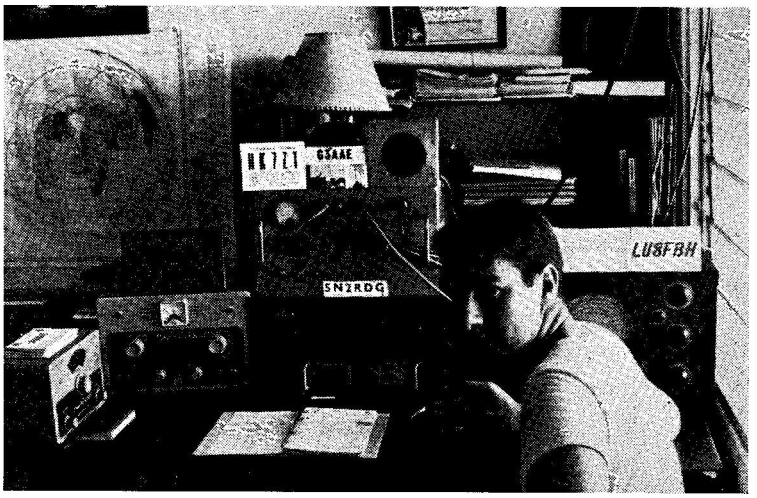
G3PEK (Stockport) raised eight OK's and HB9QA; during the *CQ* DX Contest he heard UO5AA and UB5KBB, both with good signals, and has also logged two EI's and a DL.

Top Band Contest

For the first time, there is a world-wide Top Band Contest in which G stations may take part with some hope of success. Even a British win against all comers is not out of the question. The *CQ* 160-Metre Worldwide CW Contest runs from February 24, 0200 GMT until February 25, 1400 GMT, and the rules are simple. For W/VE/VO contacts made with W/VE/VO stations, 2 points; for W/VE/VO contacts with other parts of the world, 10 points. Similarly, for all other countries—for contacts within the same country, 2 points; for contacts in other countries, 5 points *except* for contacts with W/VE/VO stations, which count 10 points.

A multiplier of one is allowed for each U.S. State, Canadian province or foreign country worked. Final score, total points times total multiplier. QSO's take this form: *From a W,* Nr 1 W2EQS 579 NJ; *From a G,* Nr 1 G7XX 579 Eng. And so on. We would have liked English counties to count for the multiplier, naturally! Perhaps next year?

However, by virtue of the large number of G stations that can be worked over such a week-end (particularly as it clashes with another Top Band contest on the Sunday night, all QSO's in which will count for points if suitably treated as above) the average G should be able to make quite a good score. Particularly if he can contrive a multiplier which includes GC, GD, GI, GM, GW, OK, HB9, DL and a few others (to say nothing of W's and VE's if conditions are right).



R. D. Gynn, c/o Cable & Wireless, Ltd., Box 173, Lagos, Nigeria runs 5N2RDG, active mainly on 7 and 14 mc CW. The transmitter is a Heathkit DX-40U with VFO and the receiver an HRO; aerials are dipoles for the bands worked. 5N2RDG is always on the look-out for U.K. contacts, particularly with stations in Cornwall.

Logs, by March 15, to *CQ,* 160 Contest, 300 West 43rd Street, New York 36, N.Y., with summaries to us, for advance mention in this space.

The Overseas Mail

From VK3CX: VK9AD had a very long session from Norfolk Island, but was not noted for QSL'ing. However, he has now passed his logs and stock of QSL's to VK3CX *(QTHR),* who will cope on receipt of s.a.e. or IRC's. What finally choked VK9AD off was the receipt of a parcel from the VK Bureau containing 800 cards! He thought he would never be able to answer them all, so gave up. VK3CX says he is hearing Europeans 0630-1030 GMT, and, from 0800 onwards, all the following Pacific stations are looking out for Europe: VR2AB, VR2DK, FK8AE, VS4RM, VR4CV (all 14 mc CW). VK5XK/VK9 has been on from Norfolk Island, but is no longer there; but VK9GP is up sometimes. VK8HW, 8NK and 8EW have all been on CW recently. AP5CP is active from East Pakistan every day, and AC5PN about twice a week. Finally, VU2NR has his AC3/AC5 licences and expects to appear in February or March.

From VK2AGH: FW8AS has postponed his trip to Wallis Island until April . . . CEØAD is on from Easter Island . . . KC6BD is active from Truk. (This message was passed on by a G, who did not sign his letter and therefore can't be acknowledged!)

From Bryan Bisley, G3OFI: The SM5ZS/ZG6 business has been causing confusion. He said he was no longer authorised to sign SM5ZS/4U, so changed to ZC6; however, when regulations were quoted to him, proving that a ZC call could only be used in countries for which the British Government was responsible for international affairs, he became slightly confused. And when a 4X4 pointed out that Palestine ceased to exist in 1948, and that 4X4's could not work stations signing either ZC6 or SU, it appeared that he would have to make an attempt to regain his permission from the U.N. to sign /4U.

Bryan has been signing MP4QAO on Forty CW recently, and has had plenty of contacts, mostly Europeans. He will be on from the various MP4 lands during January and, at the same time, Rundy will be active as ET3RS, Addis Ababa.

9G1DP (Kumasi), who created quite a nice little stir with his XT2Z operation from Upper Volta, writes as follows: "It was unfortunate to have such a call-sign on the occasion of the *CQ*

14 mc DX WORKED

SSB

G3NFV: VQ3GX, EA6AZ, HZ1TA, KV4CF, UM8KAB, PJ2MC, AP2AD, ZD6PR.

MP4BBW: TY2AA, CX2AX, FK8AC, XW8AS, DU7IM, 5N2JAH, HH2P, ZK1BS, VR2AP, VR1B, ZP5OG, KX6DB, KW6CGA, HS1K, VP3YG, KG1CC, OA4FM, 6O1DRS, XZ2AD, 2SY, XE1CV/XF4, 9M2CR, AP2AD, K6CQV/KS6, KG6AID, 6ALD, KM6BI, VP5BL, ZS7P, BV1IS, PJ2AA, VK1SB.

G2BLA: UA1DZ, CN8IK, HV1CN, UC2AA.

GW3AHN: TY2AA, PZ1AX.

GM3JDR: EL2V, KC4USE, KG1BA, LA1LG/P, TY2AA, W1TKL/VE8, VK5MS, VQ2AT, VS9APH, ZB1A, ZC4PC, ZS's, 5A3TY.

CW

G3LPS: W3DQN/KL7, YV5BJE, KL7BR, VR4CV, JA2JW, 9AA, EP2BB, 5N2RDG, VKØTC, 7G1A, FP8AP, UA1KAE.

G2DC: HV1CN, KC6BD, UL7KAA, JT1KAA, VQ3HZ, VK5XK/9, SV9WI/R.

GW3AHN: CR7IZ, CX2CO, HH2CE, HK1AAF, KH6CUP, LU1ZL, UM8KAA, YV5AGN, 5BJE, 6W8DF, 9Q5AAA.

G2BLA: VQ4RF, UA9KOA, 5N2LKZ.

GM3JDR: FB8XX, HV1CN, KL7's, LX2XG, LU1ZL, TU2AL, UAØKIB, YV5AGD, ZS3AZ, ZS7M, 5N2JKO, 2LKZ, 7G1A, ZS6BCZ (Queen Maud Land).

21 mc DX WORKED

AM Phone

G2BLA: 5A3TY, 5N2RSB.

G3NOF: CT2AI, EP2AT, SVØWZ, VE3BQL/SU, VP6WR, VQ2MS, 4GK, 5AU, VU2BK, ZL3UY, 5N2AMS, 2JKO, 2RSB, 5U7AC.

GW3AHN: VP6WR, 9AK, 9DL.

G3NWT: 5H3PBD, VP6WR, CO8JK, ZD1JWC, ZE's, ZS's, 5N2JKO, 2BRG, VQ2BK.

G3NOT: AP2MR, CR7's, CO8JK, 8RA, CT2AI, EP2BD, 2BK, 2AT, 3RO, 2BE, FB8XX, HI8ORC, 8DGC, HK3JK, HZ1AB, KZ5TD, PZ1BN, 1CF, SU1AS, TT8AD, VQ2, 4, 5, VU2BK, 2CQ, YN1WW, 6HH, YV1DG, 3EJ, 3BW, 4BG, 4EH, 5AGM, ZD1JWC, ZL3, 4, 5N2AMS/P, 5N2BRG, 2RSB, 9G1CC.

G2DC: CO8JK, CR6AK, CT2AI, EP2AT, EL5A, VE3BQL/SU, VU2BK, VP6HR, 6PV, 6WR, VP9AK, VQ2's, YV3BW, YN6HH, 5A3CAD, 3TY, 5N2JKO, 2RSD, 9G1CC, 1DO.

CW

GW3AHN: CX2CO, HK1AAF, 7BE, HZ1AB, KW6DG, TI2WA, TU2AL, UG6AW, VQ2WR, VS9AAC, VS9MB, YV5DE, 5N2LKZ, 6W8BQ, 7G1A.

G2BLA: CN8EU, KP4CC, 5A1TW, 5N2's.

G2DC: CE1AB, CX2CO, 2BT, EP2BB, FR7ZD, HV1CN, TI2CAH, UG6AW, UJ8KAA, VS9AAC, VS9MB, VU2MD, 2BK, YV5DE, 6W8BD, 7G1A.

G3LPS: UAØAZ, VK3SE, HK7BE, VK6RU, 5N2LKZ, 2RSB, HV1CN.

SSB

GW3AHN: HZ1AB, KG4AO, KP4ANZ, PJ2MC, VQ2AF, 2FF, TY2AA, VS9APH, ZL3LE.

28 mc DX WORKED

CW

G2BLA: 5N2JKO, 7G1A.

G3LWS: 5A3CAD, ZC4SG, EL4YL.

AM Phone

G3NOT: SV1AI, VQ2WR, VQ8AV, ZC4TJ, ZE's, ZS's, 5N2JKO, 5A2CX, 1TP, 9G1DF.

G3NOF: VQ2BK, 2MS, 2WR, VQ3PBD, ZC4AK, ZD6RM, ZE's, ZS's, 5N2JKO.

G2BLA: 5A3TY.

G3NWT: ZD6RM, 6PR, UO5AGD, VQ2BK, ZE, ZS.

7 mc DX WORKED

CW

G2DC: EP2BB, SVØWI/R, UM8KAA, UJ8KAA, HV1CN, PY5OF, UI8KAD, VS9AAC YV5ADG.

G3LPS: ZC4SG, SV1AB, ØWI, M1/HB1EO, YV1AD, ZB1FA, HK1AAF, VQ5IB, HV1CN, EA8CP, TA2LI, VP8GQ.

G2BLA: HV1CN, SVØWZ, ZB2AD.

DX Contest; QRMurder! Everybody was on the air and a number of weak and unreadable stations pushed up a more or less steady S6 QRM." Concerning the once-proposed TF8 prefix for Upper Volta—there is still a mix-up there. Some believe in TF8 still, others in TV8. Meanwhile, XT2A and XT2Z, between them, have clocked up thousands of QSO's! QSL manager for the XT2Z operation is K4TWF. A similar DX-pedition is planned for the Easter holidays (although there is a long chance that he may also have been on at Christmas).

From ZD6HK (Blantyre): ZD6HK was on SSB during October with borrowed gear (from ZD6GA, who is "mending" after a long illness). He is now on AM, all bands Ten to Forty, with prospects of SSB early in 1962. No QSL's as yet, but they will be along, and should be in demand, as there are only four active ZD6's.

From HB9EO (Zofingen): The recent operation from San Marino (signing M1/HB1EO) was very successful, and 1500 contacts were made between November 1 and 10. Conditions were only good for three days, but Ralph was in great demand, since Mario of M1B, the local resident, is practically off the air. The trip will be repeated this year, with SSB added to the repertoire. Ralph says that M1H is licensed, and operates 7 and 14 mc AM, but pretty rarely. There "is not one of them who makes CW." For the M1/HB1EO stint, the gear was a Viking Valiant (200 watts), an HQ-180 and two dipoles. QSL's direct, with IRC, to HB9EO's home QTH *(QTHR).*

From VQ8BT: This new station is operated by ex-G3GZM, and is on the air now with a DX-100U and a dipole only 10 ft. high (but the location is 1800 ft. a.s.l.), AM and CW, 14 mc only. Others active are VQ8BC, and 8BM, both on 21 mc with 100 watts. VQ8BT says: "I am willing to sked with any G—if I can hear him!"

From MP4BBW (Awali): Sending his usual spectacular list of 14 mc SSB DX, Ian comments that all the long-haul stuff was worked on the long path this month. (Note that Pacific DX: FK8, KG6, KW6, KM6, KX6, KS6, all of which is pretty well impossible for us in our latitudes. Tropical DX is quite a thing!) He adds that the antics of the Europeans in chasing XE1CV/XF4 were unbelievable. Two of them wanted to act as MC's and make lists, although they couldn't *hear* the XF4 . . . And a further comment on SSB whiskers from all those types who "talk up" the anode current to the tune-level, instead of about half that value. As a tailpiece—MP4BBW has had more than 18,200 QSO's on two-way SSB since May 1958. As he says, "it can't be entirely friends and influence, although these are most useful." There must be something special about propagation conditions in those parts.

Eighty Metres

For the first time for many months, *Eighty* really deserves a paragraph or two on its own. There are two separate worlds

concerned, since the types who work DX on SSB at one end rarely have any contact with the dedicated CW 'chasers at the other end. We will take the SSB business first.

G3FPQ (Elstead) has spent most of his spare time on Eighty, and writes "to dispel the impression some people have that 80-metre DX is only for those who never go to bed." He has worked the following between 1830 and 2359 GMT: HZ1AB, PJ2AA, VK3AHO (six times), VK3BM, VK3HG, VS9AAC, ZC4PC, ZL4OD, 3V8CA, 4X4AS, 4DK, 4IX, VO's, VE's, W's. All this around 3·79 mc. As we know, quite a number of G's have been in on this party, with G3FPQ and PAØFM doing the organising, and many successful QSO's made with the VK's. Have a listen from about 1830 onwards.

In two Sunday-morning sessions (early, we presume) G3FPQ raised HR3HH, PZ1AX, TG9AD and YV5ANS. Finally, just to disprove the remark in the first paragraph, he went to the other end and worked HC1AGI on CW.

G3NFV (Ashtead) is another devotee, and on SSB has worked 3V8CA, 4X4AS, VE1KQ/VO2, VK3AHO, VE2UI and HZ1AB.

G2DC stayed at the CW end, but was rewarded with HV1CN, giving him his DXCC on Eighty. Others worked were PY1ADA, YV3BD, all W's except 6 and 7, VE 1, 2 and 3, and ZL.

G3JVJ (East Grinstead) worked Eighty only for the *CQ* DX Contest (CW section) and claimed 3162 points, best DX being HV1CN, 5A1TW and W4KFC.

Forty Metres

Conditions for the real DX have been very variable on *Forty*. The normal stuff that packs the band is always with us, of course—including the creepy-crawlies, jammers, pencil-sharpeners and syphons (there was a pneumatic drill, too). But it has been very noticeable that one night will produce a crop of strong W's or PY's as early as 2130, while the next doesn't play until much later.

The early mornings have been disappointing for those who tear off to work, for conditions have often been poor around 0700 but have opened right up by 0800. (On one morning G6QB was getting better reports from W6 at 0845 than at any time previously.) W6 and 7, VE7 and 8 and even the odd XE have been showing up; sometimes there's not a trace of any of them, but a couple of ZL's instead. It all makes things interesting, anyway.

G2DC can't understand why hordes of Europeans come back to a very deliberate DX call—surely they're not that hard up for G contacts? (Maybe the answer is that word "deliberate"—a fast call seems to shut them out.) Jack worked four new ones—EP2BB, SVØWI/R, UM8KAA and UJ8KAA, as well as HV1CN.

G3LPS has returned to the band—his old love!—and is glad to find that his ground-plane still produces results, and has brought his band score up to 92; he is after the century before the end of the winter.

MP4QAO showed up on the band on December 15; he said he would also be on from MP4DAS on the 18th . . . G3LWS (Richmond, Yorks) worked FP8AS, ZS1JA, SVØWI, W's, VK and ZL, but reports M1H, ZD1FG and a KP4 as "gotaways." He complains about the amount of phone to be found below 7050 kc, even when there is clear space above that frequency; also about those who follow each other to the band-edge like sheep, and end up outside!

The HF Bands

As usual, most of the DX worked is presented in tabular form, and the behaviour of the bands can be judged from that. Plenty of AM activity on 21 mc, but again GW3AHN is the lone supporter of that band on SSB. Even 10 metres produced enough QSO's on AM to keep quite a few people amused, but it's getting to the "Africa-only" stage.

G3PEK (Stockport) heard one of his locals on 10-metre phone on a Sunday morning, hastily made his 14 mc PA do the doubling act, and in a little while they had a four-way net going, with far less QRM than on One-Sixty. He gets around with 10 watts of phone and 20 watts of CW; on 14 mc he raised VP8EG, CX1RY and 7G1A, and on 7 mc WA2WBH, TF5TP, with some Europeans. He is one of the few to send in a six-band report—Ten to One-Sixty.

G3OFU (Prestbury) worked FB8XX. who told him that FB8WW would definitely be on from Crozet Island, starting on

When HB9EO was in San Marino during November 1-10, he was signing M1/HB1EO and in 8 days' operating made some 1,500 contacts, of which 170 were with U.K. stations and about 40 with VK/ZL. His transmitter was a Viking Valiant running 200w., the receiver a Hammarlund HQ-180, and the aerials a trap dipole and 20m. doublet.

December 20, for about a month —probably 14 mc CW only.

G3PES (Innsworth) could be operating from ZC4 by the time this appears. No sooner was he licensed than QSL's began to arrive — but, unfortunately, for Top Band, which he doesn't use. He would like some gen. on a queer phenomenon with suffixes, having worked DM3DN/UPN and then, two days later, heard DM3DN/XPN, and finally worked DM3DN/TPN. We can't explain —didn't the DM station want to talk?

Norman Henry (ex-VU2RG and AP2N) is back home for good and hopes to be around as G3OFK from now on. Anyone still short of a card should contact him at 19 High Ash Avenue, Alwoodley, Leeds 17.

G3WP (Chelmsford) has the very common moan concerning DX calls being submerged in replies from unwanted Europeans. He heard and called 5H3UZ, but UB5 QRM was such that he didn't even find out that he was in Tanganyika. Regarding G3IDG's query about reports of "599 B," last month, G3WP suggests that some clever types may mean this for "blocking receiver." We doubt it, but it's an idea!

G2DC finds that band conditions on 14 mc have changed a lot in a month, with the early morning propagation to Oceania best over the long path, 0700-1000. The KH6 and KL7 signals that were so good in the autumn have mostly vanished. Between 1530 and 1630 the W6 and 7 stations are fairly good over both long and short paths. On 21 mc he finds a "bright period" around 1100-1300, during which one can find VK, VU, VS1, 9M2 and the like. In the afternoons and evenings, things are erratic and sometimes the W's are not heard for several day at a time (not always a bad thing!)

Our Heading Photograph *(p.579)*

This time it is Aref Mansour, Box 3245, Beirut, Lebanon, who runs a Collins KWM-1, a Johnson Pacemaker, a Gonset G-63 receiver and a ground-plane — all commercial gear by well-known American manufacturers. OD5CN was very active in the Phone Section of the recent *CQ* DX Contest.

Ground-Planes

VK6AJ started something last month when he mentioned that a station using a ground-plane will often make very solid contacts with someone similarly equipped. Lots of people give a brief confirmation of this in their letters. G3LPS suggests that polarisation has nothing to do with it, but it's more likely the low angle of radiation under certain propagation conditions. He even suggests (talking of Forty) that if you have a G/P and hear people with dipoles getting the best of the DX, you may as well go to bed; next night it could be the other way round.

Special Objective

G3PLH (Holt) says he acquired his licence mainly for the purpose of running skeds with Peru, where he lived for eight years. He asks for advice on how best to go about it, but since he says he will use 150 watts to a Quad, with an AR88, there's not much we can add except to say that it's now a matter of listening and skedding on various bands until the best formula is found. Meanwhile, he would like to hear from anyone who has recently worked OA4ED (mostly 28 mc), OA4AQ, 4GM or 4LX (21 mc). He was in Peru in August and met these chaps. (Incidentally, he tells us that he learnt his Morse in OA-land, "scrambling up to 14 w.p.m. in five weeks," and took his Morse test within one hour of landing at London Airport . . . another record of some kind?) All advice welcomed: J. P. Davies, G3PLH, Farfield, Holt, Norfolk.

G2HLU (Reading) has been rebuilding in a big way—the shack, not the gear—and it is now dignified by the title of the wireless room. He has three dipoles fed with a common feeder. He tells us that there are three things he has never yet used: an ATU, a microphone, and crystal control! He is pro-CW but not anti-Phone, and admits that SSB has removed several of the well-known arguments against phone. But when he is introduced to others as a CW-only man, he finds he is still regarded as some kind of curiosity. Finally, he suggests an easy Q-signal which means "Please don't bother to QSL." It would certainly be useful on occasions.

G3NWT (Sandiacre) has heard the suffix "X" used (by a YU6). What is *this* one? And 9M2GW, who spent a week-end with him, is now a G at Catterick. He confirms, by the way, that a certain VS1 undertook a self-financed

P & Z TABLE

(Final Placings)

STATION	PREFIXES WORKED	ZONES WORKED
CW Only		
G2DC	467	40
GI3NPP	456	40
G3ABG	435	40
G3WP	389	36
G3HZL	379	40
G2YS	379	40
G2BLA	332	39
GW3CBY	289	24
G3JWZ	271	38
G3IDG	248	28
G3LZF	238	34
G2BP	237	33
ZC4CT	223	29
VK6AJ	203	36
GW3MLU	202	31
G2HLU	167	28
ZC4SG	146	27
G3OQK	145	17
Phone Only		
G3DO	646	40
MP4BBW	490	40
G3GHE	413	39
G3NWT	406	39
GB2SM	370	37
G3MCN	352	38
G3LKJ	347	38
G3BHJ	336	37
G3ABG	288	32
G3JWZ	173	36
G3HZL	140	26
GW3MLU	138	26
G2BLA	118	21
G2FQW	99	6
G3WP	80	25

Note: This Table closes w.e.f. this issue.

air trip to Ceylon for the sole purpose of extracting QSL cards. The earliest acquired (presumably at gun-point) was dated 1951 !

Contests, 1962

The following list is incomplete and slightly provisional, but gives some idea of dates to watch:

January 20-21: WAE Contest (DARC).
February 2-4: ARRL (Phone), first leg.
February 16-18: ARRL (CW), first leg.
February 24-25: CQ 160-Metre Contest. REF CW Contest. YL/OM Contest (Phone).
March 2-4: ARRL (Phone), second leg.
March 10-11: BERU. YL/OM Contest (CW).
March 16-18: ARRL Contest (CW), second leg.
March 24-25: CW Worldwide DX (SSB).
April 14-15: REF Phone Contest. Helvetia 22.

CHC and HTH

The CHC (Certificate Hunters' Club) hold an annual QSO Party, the next one being booked for June 1-4. Basic membership involves the holding of 25 or more Amateur Radio awards, with gold seals added for figures up to 200. The HTH part of it is the " Hunt the Hunters " event, with awards for working from 25 up to 400 of the CHC types. Full details from Cliff Evans, K6BX *(QTHR)*, but we will keep you posted on the QSO party.

WAFOC Award

In case there are still some who are mystified by the letters " FOC " at the end of a QSO, the First-Class Operators' Club is a British institution which was founded before the war and is going very strongly at present with membership limited to 350. The WAFOC award involves working a certain number of fellow-members, using at least three bands, with bonus points for five-band QSO's, different countries and different continents. It is an award which takes anyone a long time to acquire, but W1JYH has an imposing score and may well be the first. Open to FOC members only, of course ; and you cannot apply to join FOC—you have to be invited.

Ladders for 1962

In answer to a plea from quite a few readers, we have altered our idea of running a " 14 mc DX Marathon " table for 1962. Instead, it is going to cover both 14 and 21 mc—mainly to encourage occupancy of the latter band. So our main table will be a **14-21 mc DX Marathon.** *Nothing from Europe will count.* So your scores, please, as follows:—*(a)* Countries worked on 14 ; *(b)* Countries worked on 21 ; *(c) Total* countries worked (meaning number of different ones, not the sum of the two columns). One ladder for *Phone Only* ; one for *CW Only* (this last change again in deference to readers). First scores will be published next month.

The other new appearance will be the **Top Band Counties Marathon** for G3O - - and G3P - - stations only. This will start from January 1, but will not, of course, have any bearing on their ordinary claims for WABC, and they may remain in the usual Top Band table as well. This 1962 Marathon is just a private battle that they can join, starting on an equal footing.

The P & Z Table makes its final appearance this month, and congratulations to G2DC and G3DO for holding their lead and finishing at the top of their respective columns — G2DC for CW and G3DO for Phone.

List of Prefixes

On p.586 in this issue we publish a completely up-to-date List of Countries by Prefixes—corrected right up to the minute and even including 5H3, the new Tanganyika prefix. This list has been compiled irrespective of whether the prefixes are recognised for DXCC purposes—*e.g.*, such separate ones as IL, IP and IT are shown, although it is realised that the DXCC organisers do not recognise them.

The list is not necessarily meant to serve as a guide for country-counting, but simply to present in compact form a *complete* list of prefixes for the guidance of everyone, including the many new operators coming on the bands. It also contains useful information about former prefixes which have now been superseded, and the details of starting and finishing dates, for DXCC purposes, of some of those which have come or gone over the years.

And so to our sign-off once again. Thanks to all who have contributed information to this month's effort, and may they all have even better and brighter DX to report in 1962. Next deadline is **first post on Friday, January 12.** Don't miss it, please, and there's no latitude. Address everything to DX Commentary, *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. Meanwhile, Good Hunting, 73, and " HNY " !

L F BANDS TABLE
(Countries worked)

Station	*1.8 mc*	*3.5 mc*	*7 mc*
G3FPQ	20	89	136
G2YS	20	73	94
G3IGW	19	51	95
G3NFV	16	25	27
GW3CBY	14	33	52
G2DC	12	100	135
G3NYQ	11	28	31
G3NNO	10	23	24
G3FXB	9	78	152
G2BLA	9	39	73
G3JWZ	9	52	62
G4JA	9	41	57
G3NYA	9	23	32
G3DRN	9	13	42
G3IDG	9	16	22
G3NPB	9	8	21
G3HZL	8	44	81
G3PEK	7	13	28
G3PDM	7	8	22
G3OQK	7	5	23
G2DHV	5	25	35
G2FQW	1	4	33

This Table derives from Countries Worked. Order is based on band in first column, changed monthly.

LIST OF COUNTRIES BY PREFIXES

(Corrected to December 1961)

CURRENT PREFIXES

AC3	Sikkim
AC4	Tibet
AC5	Bhutan
AP	Pakistan
AP	East Pakistan
BV	Formosa
C	China
C9	Manchuria
CE	Chile
CE9	*see* Antarctica
CEØ	Easter Island
CEØ	Juan Fernandez
CM/CO	Cuba
CN	Morocco
CP	Bolivia
CR4	Cape Verde Is.
CR5	Portuguese Guinea
CR5	St. Thomas and Prince Is.
CR6	Angola
CR7	Mozambique
CR9	Macao
CR10	Timor
CT1	Portugal
CT2	Azores
CT3	Madeira
CX	Uruguay
DJ, DL, DM	Germany
DU	Philippines
EA	Spain
EA6	Balearic Is.
EA8	Canary Is.
EA9	Spanish Morocco
EA9	Ifni
EA9	Rio de Oro
EAØ	Spanish Guinea
EI	Eire
EL	Liberia
EP	Iran
ET2	Eritrea
ET3	Ethiopia
F	France
FA	Algeria
FB8	New Amsterdam
FB8	Kerguelen Is.
FB8	Tromelin Is.
FC	Corsica
FD	French Togoland
FE8	Republic of Cameroon
FF	Mali (*see* TZ)
FF7	Mauritania (*see* 6T5)
FG7	Guadeloupe
FH8	Comoro Is.
FK8	New Caledonia
FL8	French Somaliland
FM7	Martinique
FO8	French Oceania
FO8	Clipperton Is.
FP8	St. Pierre and Miquelon
FR7	Reunion
FS7	St. Martin
FU8	New Hebrides
FW8	Wallis and Futuna Is.
FY7	French Guiana
G	England
GC	Channel Is.
GD	Isle of Man
GI	N. Ireland
GM	Scotland
GW	Wales
HA	Hungary
HB	Switzerland
HC	Ecuador
HC8	Galapagos Is.
HE(FL)	Liechtenstein
HH	Haiti
HI	Dominican Republic
HK	Colombia
HKØ	San Andres Is.
HKØ	Malpelo Is.
HKØ	Bajo Neuvo Is.
HM	Korea
HP	Panama
HR	Honduras
HS	Thailand
HV	Vatican City
HZ	Saudi Arabia
I	Italy
IL	Pelagian Is.
IP	Pantellaria
IS	Sardinia
IT	Sicily
JA	Japan
JT1	Mongolia
JY	Jordan
JZØ	Dutch New Guinea
K	*see* W
KA	*see* JA
KAØ	Bonin Is. (Iwojima)
KB6	Baker, Canton, Howland and American Phoenix Is.
KC4	*see* Antarctica
KC4	Navassa Is.
KC6	Eastern Caroline Is.
KC6	Western Caroline Is.
KG1	Greenland
KG4	Guantanamo Bay
KG6	Marianas Is.
KG6I	*see* KAØ
KH6	Hawaii
KH6	Kure Is.
KJ6	Johnston Is.
KL7	Alaska
KM6	Midway Is.
KP4	Puerto Rico
KP6	Palmyra Is.
KR6	Ryukyu Is. (Okinawa)
KS4	Swan Is.
KS4B	Serrana Bank and Roncador
KS6	American Samoa
KV4	Virgin Is. (U.S.)
KW6	Wake Is.
KX6	Marshall Is.
KZ5	Canal Zone
LA, LB	Norway
LA	Jan Mayen
LA	Svalbard
LU	Argentina
LU-Z	*see* Antarctica
LX	Luxembourg
LZ	Bulgaria
M1	San Marino
MP4B	Bahrein
MP4D	Das Is.
MP4Q	Qatar
MP4M	Muscat and Oman
MP4T	Trucial Oman
OA	Peru
OD	Lebanon
OE	Austria
OH	Finland
OHØ	Aland Is.
OK	Czechoslovakia
ON	Belgium
OR4	*see* Antarctica
OX	*see* KG1
OY	Faeroe Is.
OZ	Denmark
PA, PI	Netherlands
PJ	Dutch West Indies
PJ2M	Sint Maarten
PK1-3	Java
PK4	Sumatra
PK5	Dutch Borneo
PK6	Celebes and Molucca Is.
PX	Andorra
PY	Brazil
PYØ	Fernando do Noronha
PYØ	Trinidade Is.
PZ	Dutch Guiana
SM, SL	Sweden
SP	Poland
ST	Sudan
SU	Egypt
SV	Greece
SV	Crete
SV	Dodecanese Is.
TA	Turkey
TD8	Dahomey
TF	Iceland
TG	Guatemala
TI	Costa Rica
TI9	Cocos Island
TL8	Central African Republic
TN8	Congo Republic
TR8	Gabon
TT8	Tchad Republic
TU2	Ivory Coast
TV8	Upper Volta
TZ	Mali Republic
UA1-6	USSR (Europe)
UA1	Franz Josef Land
UA2	Kaliningradsk
UA9, Ø	USSR in Asia
UB5	Ukraine
UG2	White Russia
UD6	Azerbaijan
UF6	Georgia
UH8	Turkoman
UI8	Uzbek
UJ8	Tadzhik
UL7	Kazakh
UM8	Kirghiz
UN1	Karelo-Finnish Republic
UO5	Moldavia
UP2	Lithuania
UQ2	Latvia
UR2	Estonia
UT5	*see* UB5
UW3	*see* UA3
UW9	*see* UA9
VE	Canada
VO	Newfoundland and Labrador
VK	Australia and Tasmania
VK	Willis Is.
VK	Lord Howe Is.
VK9	Christmas Is.
VK9	Cocos-Keeling
VK9	Nauru
VK9	Norfolk Is.
VK9	Papua Territory
VK9	New Guinea
VKØ	*see* Antarctica
VKØ	Heard Is.
VKØ	Macquarie Is.
VP1	British Honduras
VP2	Anguilla
VP2A	Antigua and Barbuda
VP2D	Dominica
VP2G	Grenada
VP2M	Montserrat
VP2K	St. Kitts and Nevis
VP2S	St. Vincent
VP2V	British Virgin Is.
VP3	British Guiana
VP4	Trinidad and Tobago
VP5	Jamaica
VP5	Cayman Is.
VP5	Turks and Caicos Is.
VP6	Barbados
VP7	Bahamas
VP8	Falkland Is.
VP8	South Georgia
VP8	South Orkneys
VP8	South Shetlands
VP8	South Sandwich Is.
VP8	*see* Antarctica
VP9	Bermuda
VQ1	Zanzibar
VQ2	Northern Rhodesia
VQ3	Tanganyika
VQ4	Kenya
VQ5	Uganda
VQ7	Aldabra Is.
VQ8	Mauritius
VQ8	Chagos Is.
VQ8	Cargados Carajos
VQ8	Rodriguez Is.
VQ9	Seychelles
VR1	British Phoenix Is.
VR1	Gilbert and Ellice Is.
VR2	Fiji Is.
VR3	Fanning and Christmas Is.
VR4	Solomon Is.
VR5	Tonga
VR6	Pitcairn
VS1	Singapore
VS4	Sarawak
VS5	Brunei
VS6	Hong Kong
VS9	Aden
VS9	Sultanate of Oman
VS9	Maldive Is.
VS9	Kamaran Is.
VU	India
VU	Andaman and Nicobar Is.
VU	Laccadive Is.
W	U.S.A.
XE	Mexico
XE4	Revilla Gigedo Is.
XF4	*see* XE4
XT	*see* TV8
XU	Cambodia
XW8	Laos
XZ	Burma
YA	Afghanistan
YI	Iraq
YJ	*see* FU8
YK	Syria
YN	Nicaragua
YO	Rumania
YS	Salvador
YU	Yugoslavia
YV	Venezuela
YVØ	Aves Is.
ZA	Albania
ZB1	Malta
ZB2	Gibraltar
ZC3	*see* VK9, Christmas Is.
ZC4	Cyprus
ZC5	British North Borneo
ZC6	Palestine
ZD1	Sierra Leone
ZD3	Gambia
ZD6	Nyasaland
ZD7	St. Helena
ZD8	Ascension Is.
ZD9	Tristan da Cunha, Gough Is.
ZE	Southern Rhodesia
ZK1	Cook Is.
ZK1	Manihiki (Danger Is.)
ZK2	Niue and Aitutaki
ZL	New Zealand
ZL	Chatham Is.
ZL	Campbell Is.
ZL	Kermadec Is.
ZL5	*see* Antarctica
ZM6	British Samoa
ZM7	Tokelau Is.
ZP	Paraguay
ZS1, 2, 4, 5, 6	Union of South Africa
ZS2	Marion Is.
ZS3	South West Africa
ZS7	Swaziland
ZS8	Basutoland
ZS9	Bechuanaland
3A2	Monaco
3V8	Tunisia
3W8	Vietnam
4S7	Ceylon
4W1	Yemen
4X4	Israel
5A	Libya
5H3	Tanganyika
5N2	Nigeria
5R8	Madagascar
5U7	Republic of Niger
6O	Somali Republic
6T5	Mauritania
6W8	Senegal
7G1	Republic of Guinea
9G1	Ghana
9K2	Kuwait
9K3	Neutral Zone
9M2	Malaya
9N1	Nepal
9Q5	Republic of the Congo
9U5	Ruanda Urundi

Antarctica: CE7Z, LU-Z, KC4, VKØ, ZL5, 8J1, OR4, CE9, VP8 — *all apply.*

OBSOLETE PREFIXES

(*Replacements in Brackets*)

AR1	Syria (YK)	**FKS**	Austria (OE)	**MD7**	Cyprus (ZC4)	**VQ6**	Brit. Somaliland (6O)
AR8	Lebanon (OD)	**FN**	French India	**MF2**	Trieste (I)	**VS2**	Malaya (9M2)
C3	Formosa (BV)	**FQ8**	French Equatorial Africa (*various*)	**MI3**	Eritrea (ET2)	**VS7**	Ceylon (4S7)
CN2	Tangier (*now* Morocco)	**HL**	Korea (HM)	**MP4K, VT1**	Kuwait (9K)	**XV**	Vietnam (3W8)
CZ	Monaco (3A)	**I5**	Somalia (6O)	**NY4**	Guantanamo Bay (KG4)	**ZC1**	Jordan (JY)
EK	Tangier (*now* Morocco)	**KT1**	Tangier (*now* Morocco)	**OQ5**	Belgian Congo (9Q5)	**ZC2**	Cocos (VK9)
FB8	Madagascar (5R8)	**LI**	Libya (5A)	**OQØ**	Ruanda Urundi (9U5)	**ZC3**	Christmas Is. (VK9)
FB8	Comoro Is. (FH8)	**MB9**	Austria (OE)	**PK6-7**	Dutch New Guinea (JZ)	**9S4**	Saar (DL8, *then* DL)
FF8	French West Africa (*various*)	**MD1, 2**	Libya (5A)	**VQ3**	Tanganyika (5H3)	**ZD2**	Nigeria (5N2)
FI	French Indo-China (*various*)	**MD4**	Somalia (6O)			**ZD4**	Gold Coast — replaced by Ghana (9G1)
		MD5	Egypt (SU)				

Notes for DXCC

PREFIX/COUNTRY	*Claim Valid for DXCC if:*
CN2, Tangier	Prior to July 1, 1960
CR8, Goa, Diu, Damao	Prior to December 20, 1961
FF, TD8, Dahomey	From August 1, 1960
FF, Mali	From June 20, 1960
FF8, French W. Africa	Prior to August 6, 1960
FI8, French Indo China	Prior to December 21, 1950
FN8, French India	Prior to November 1, 1954
FQ8, French Equatorial Africa	Prior to August 16, 1960
I1, Trieste	Prior to April 1, 1957
IL, IP, IT	Do not count for credit
I5, Italian Somaliland	Prior to June 30, 1960
UN1, Karelo-Finnish Republic	Prior to June 30, 1960
VO, Newfoundland and Labrador	Prior to April 1, 1949
VQ6, British Somaliland	Prior to June 30, 1960
ZD4, Gold Coast	Prior to March 6, 1957
TL8, Central African Republic	From August 13, 1960
TN8, Congo Republic	From August 15, 1960
TR8, Gabon	From August 17, 1960
TT8, Tchad Republic	From August 11, 1960
TU2, Ivory Coast	From August 7, 1960
TV8, Upper Volta (XT)	From August 5, 1960
6W8, Senegal	From June 20, 1960
9G1, Ghana	From March 7, 1957
9S4, Saar	Prior to April 1, 1957
9U5, Ruanda Urundi	From July 1, 1960

Notes: There are many restrictions on claims for DXCC, contacts with some countries being valid only before or after some fixed date.

This list contains the principal complications, but we cannot guarantee that it is complete.

A mere change of prefix without change of status does not affect claims (*e.g.* ZD2/5N2, FB8/5R8, ZC3/VK9 and so on).

On the other hand the change from Gold Coast (ZD4) to Ghana (9G1) implies a fixed date of changed conditions.

Short Wave Magazine DX CERTIFICATES

The following have been issued since the publication of our last list, in the November, 1961 issue:

FBA

No. 218 HA1KSA (Gyor)
219 W1MD (Hingham, Mass.)
220 HA5KAG (Orion)
221 W3OCU (Boothwyn, Pa.)
222 VU2XG (Bombay)
223 GM3ASM (Glasgow)
224 DLØBH (Dietfurt/Bav.)
225 G5GH (Thornton Heath, Sy.)

PRA

No. 21 W3WU (Silver Spring, Md.)
22 G8KS (Farnborough, Kent)
23 VE3RE (Scarborough, Ont.)

WABC (Top Band only)

No. 247 G2HCP (St. Annes, Lancs.)
248 G3OHY (Liverpool)
249 G3OSE (Hereford)
250 G5PP/M (Coventry)
WABC/M No. 1
251 G3BIK (Gosforth, Newcastle)
252 G3ADG (Illingworth, Yorks.)
253 G3NMZ (Luton)
254 G3OIT (Billericay, Essex)
255 G3DRN (London, S.W.20)
256 G3JLA (Stevenage)

WBC (Overseas only)

No. 231 VP9AK (Bermuda)
232 K4IEX (Charlotte, N.C.)
233 SM5CAK (Motala)
234 W2FLD (Garden City, L.I.)
235 SM6AVM (Hjo)
236 LA5QC (Larvik)
237 W1MD (Hingham, Mass.)
238 ZP5CF (Ascuncion)
239 VE3BQP (Toronto)
240 W3OCU (Boothwyn, Pa.)
241 SVØWZ (Iraklion, Crete)
242 W3AYS (Baltimore, Md.)
243 *Cancelled*
244 W4BHG (Atlanta, Ga.)
245 VK3RJ (Box Hill, Vic.)
246 SP7HX (Lodz)
247 YU3IE (Maribor)
248 SM3AF (Sundsvall)
249 VU2XG (Bombay)
250 SM6ADQ (Kungsbacka)
251 DL3VJ (Eichenzell/Fulda)
252 SM3VE (Gavle)

WFE

No. 58 W3OCU (Boothwyn, Pa.)
59 VK3XO (Melbourne)
60 VK3RJ (Box Hill, Vic.)
61 XZ2SY (Rangoon)
62 GI4RY (Cushendun)

WNACA

No. 287 VP9AL (Bermuda)
288 OH9PF (Rovaniemi)
289 G3LPS (Blackburn)
290 G2FFO (Burnley)
291 G3WP (Chelmsford)
292 G2GM (Torquay)
293 OK1CG (Zbraslav)
294 GI3JEX (Belfast)
295 OK2QR (Ustredni)
296 G3VW (Edgware)
297 OE3WB (Klosterneuberg)
298 GI4RY (Cushendun)

Details of MAGAZINE DX AWARDS and CERTIFICATES and the claims required for them appeared in full on p.490 of the November, 1961 issue.

Overseas claimants may send either (*a*) A check list, without cards, duly certified by the Hq. of their National Radio Society, or (*b*) An uncertified check list, from which any or all cards may be called in for scrutiny by us. U.K. claimants must send the relevant cards for each award.

All claimants must include sufficient return postage for the cards and Certificate — five IRC's in the case of overseas claims.

SWL • • • • • •

DISCUSSING RECEIVER DESIGN, 1935-'61—THE NEW LOOK IN RECEIVERS—THE READER FORUM—QUESTIONS ASKED AND QUERIES ANSWERED—THE HPX LADDER

IN what some of us still regard as the "good old days," a short wave listener could start himself off with a simple TRF receiver, possibly with only one valve, and if he had the technical knowledge and the patience he could compete with all comers.

Several pre-war SWL's had logged *every country known to be active* with two-valvers of simple, but very sound design. And that was in the days when transmitters were less efficient, used far less power, and there were no such things as rotary beams—in fact, many transmitting aerials were just bits of wire cut to fit the garden.

Today the sensitivity of such receivers would still be more than adequate. Their signal-noise ratio was often excellent; the noise was just audible on headphones, and it was *not* receiver noise—it came in on the aerial. So the devotees of small receivers were apt to maintain that, if they could hear Ae. noise, they would also be able to hear any signal that was stronger than the noise. And this they usually did, some of their performances causing much embarrassment to owners of the latest things (the "Comet Pro," the "Sky Champion" and, of course, the daddy of them all, the HRO).

But we have spoken only of the sensitivity aspect; and, of course, it is on *selectivity* that they would all fall down flat today. You can doctor-up an 0-V-1 to give a beautiful signal-noise ratio, easy and smooth control, and really nice signals; but the one thing you can't do is to give it a bandwidth of 2 kc or better, which is absolutely essential under today's conditions.

There was a vogue for superhets as far back as the early 'thirties, but some of them were pretty rough. RF stages were not easy to handle in the early days, and some of the home-built superhets fed an *autodyne* detector-oscillator into a IF line-up, using transformers tuned to 115 kc, 105 kc or 95 kc. There was *no* image rejection factor whatsoever! Imagine this today, with signals from 200 kc away at equal strength to those one is tuned to. However, good mixer circuits were developed—in particular, the triode-hexode became fashionable when it was available—and stable RF pentodes began to appear. So superhets became more sophisticated, with at least one RF stage and a decent mixer and oscillator—but they still tended to use low-frequency IF's (compared with the 465 kc which had become popular for broadcast receivers) and therefore gave bad images.

Then James Lamb, of *QST*, first announced the "single-signal superhet," using the principle of sharply-tuned or filtered IF's to make it possible to receive one "side" of a CW signal while almost completely rejecting the other, and this produced the same effect as doubling the space available in the not-very-crowded bands. The final follow-up on this was the appearance of the HRO and other specialised superhets, producing their IF selectivity by means of a simple quartz crystal in a balanced circuit, somewhere in the IF chain.

The HRO, in particular, set a new standard among receivers, since it had two RF stages, a four-gang condenser, and its novel band-changing idea which avoided the very inefficient wave-change switches then available by using coil-packs for each band. The degree of bandspread provided, too, was quite out of this world compared with anything else then available.

And this set the general shape of communication receivers for about twenty years. Fig. 1 shows the block diagram of the original HRO, and who can deny that most communication receivers up to about 1956 were modelled on this line-up? The equally well-known AR88 used practically the same arrangement, except that it had *three* IF's and two audio stages. It also had band-switching, but no bandspread except the mechanical effect given by a beautiful dial mechanism. But refinements had crept in; the AR88 had a very efficient noise limiter (for those days), and it had a neon stabiliser for its oscillator voltages. And its rugged construction, so different from the rather flimsy make-up of the HRO, gave it a stability that became a by-word. (Drop 'em on a concrete floor—if you can pick 'em up—and the signal's still there!)

It has only been comparatively recently that new ideas have been making themselves really felt in receiver design. For many years people have been

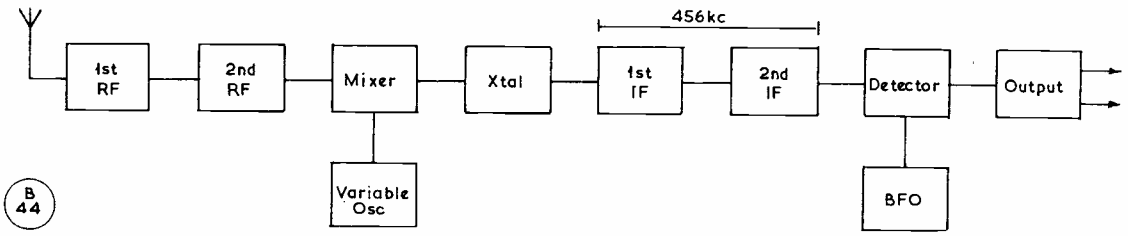


Fig. 1. Line-up of the original HRO. Many modern receiver designs are based on this general arrangement, the first commercial breakaway in communications receiver thinking. The main feature of the HRO is that it uses a plug-in coil pack, eliminating lossy switching. Those with band-spread coils, as distinct from general coverage, give exceptional spreading over the amateur bands.

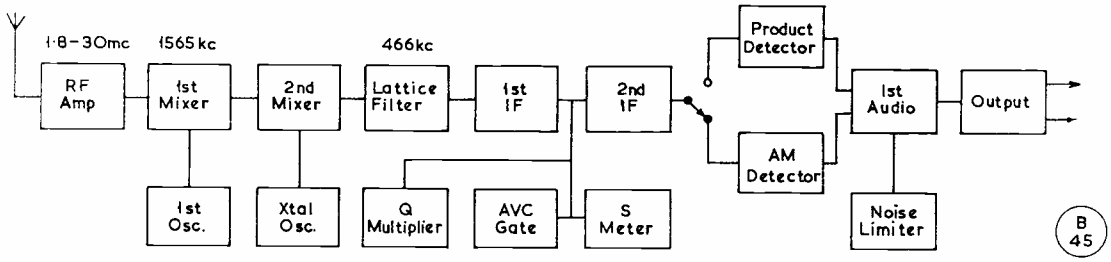


Fig. 2. Main circuit arrangement of a modern double-conversion superhet receiver — the Minimitter MR-44/II. It has a variable first oscillator and incorporates a built-in Q-Multiplier — see text.

using converters for the HF bands, in conjunction with communication receivers that were not too hot on the higher frequencies; and some of these converters have had a crystal oscillator beating with the signal, making it necessary to do the tuning at intermediate frequency (which had, of course, become the front end of the main receiver). Undoubtedly it was the successful use of converters that caused the big swing to double—and even triple—superhets.

So it became a good thing to use a fairly high frequency for the first conversion. For instance, one could build a converter with a 6 mc crystal oscillator; then, for 14 mc work, one would tune the receiver from 8 mc to 8·35 mc. The second conversion would most probably be to 465 kc, the normal IF of the receiver.

Up came the idea of using something like the Q5'er—a very sharply tuning IF strip at 85 kc or thereabouts, with its front end covering 465 kc—and if you had an oldish receiver with a crystal converter in front and a Q5'er behind, there was your triple-conversion superhet.

Today's designs are logical follow-ups on this lay-out, but they naturally combine all the units on the one chassis. The fashion for using two RF stages has died out, and the first oscillator is very often crystal-controlled, so the four-gang condenser can be scrapped and replaced by a simple two-gang component, to make trimming and tracking easier and more accurate. The extra selectivity made possible by the second RF stage is now left to the much-improved IF section; the single RF stage has a higher gain and lower noise than the early specimens; and the whole thing is becoming cleaner and simpler.

Fig. 2 shows a modern double-conversion superhet. In this particular one, however, the first oscillator is variable, to give a first IF of 1565 kc. The crystal oscillator comes next, beating with this frequency to give an output from the second mixer of the conventional 465 kc or thereabouts. Selectivity is increased in this case by the use of a built-in Q-Multiplier, that useful device which sharpens-up the IF from outside by means of regenerative circuits giving a very high Q to the overall stage or stages.

Proceeding onwards. we find a product detector available for CW and SSB signals—in other words, a heterodyne detector/mixer which has been well-proven for its efficiency on SSB, in particular. But the conventional AM detector must still be provided for the reception of amplitude modulated phone.

The receiver shown in Fig. 3 goes further still and has three intermediate frequencies, and here the *first* mixer works with a crystal oscillator. The variable oscillator feeding into the second mixer is the main tuning control, and the RF stage has its own tuning control for peaking at various parts of the bands. The third oscillator beats the signal to 50 kc, at which the really sharp IF operates. Here, again, we split for a product detector when necessary; and further refinements are an audio filter in the second audio stage, and a crystal calibrator.

One might think that such a receiver as this (which is only representative of many modern types) shows little in common with the old HRO; but start comparing it with an HRO preceded by a crystal-controlled converter and followed by a Q5'er, and

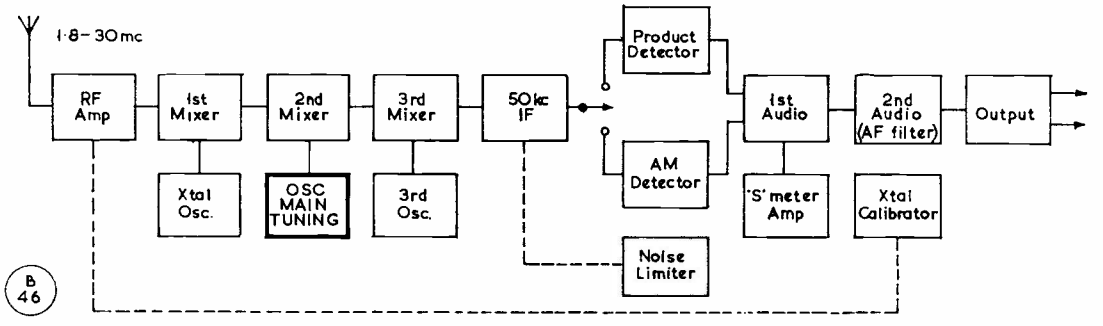


Fig. 3. The latest British amateur-band communications receiver is the K.W. Electronics KW-77, which is a triple-conversion superhet incorporating all the refinements necessary for close and accurate tuning of AM/CW/SSB signals on the amateur bands.

you will see the trend.

If you are worried about the casting aside of two RF stages, you can reflect in the same way; for when you put a modern converter in front of an HRO or AR88, the chances are that your converter will have only one RF stage (we know of very few with more)—and the two RF's of the receiver have now become the first IF stages. So there's nothing wrong with this trend of casting one RF stage overboard. (As a matter of fact, with the valves in use today, a pair of RF stages would be a terrible handful, giving more gain than one knew what to do with . . . but in the days of 6K7's, 6SG7's and such, things were different.)

So, next time you find yourself puzzled by the new look of modern receiver circuitry, hark back and imagine one of the old superhets complete with crystal-controlled converter on the left, Q5'er on the right, and possibly a Q-multiplier in the middle, and you will realise that the set-up is not so unfamiliar after all.

And, in parentheses, you will still be out of date. The possible shape of things to come is already apparent from a well-known receiver available in kit form, with ten transistors, four piezo-electric transfilters, Zener diode stabiliser and printed circuits! And how can any SWL hope to build that for himself (except with the kit provided)?

Meanwhile, you can interpret the last few paragraphs in reverse and console yourself with the thought that your R.109, R.208, CR-100, R.1155 or what-have-you is *not* out of date, provided it is equipped with crystal-controlled converter, Q5'er and Q-multiplier . . . but maybe it's a bag of tricks!

READERS' FORUM

There seems to be no particular topic for argument or discussion this month, but the usual varied batch of letters makes interesting reading and will be summarised to match the available space. Incidentally, those who report to this feature would help greatly if they would put some sort of heading on the various matters they bring up — a letter running to several pages and mentioning many different topics requires the attention of a sub-editor before it can be dealt with neatly in the concise form we have to adopt.

Please note, also, that we do *not* intend to publish lists of calls heard, but that when some unusual DX has been logged (particularly on an unusual waveband) we are always pleased to mention it.

We start, therefore, with *Neville Bethune (London, N.14)*, who has found the LF bands excellent. On Top Band (November 15, 2130-2300) he logged OK1WT, HB9T, DJ2HC and EI8J — a nice varied bag for One-Sixty. On Forty he finds the best times are from 2100 onwards and again between 0400 and 0730 (although we find the DX still there as late as 0830 or even 0900). SWL Bethune's log on Forty shows 4X4DH, VP9EP/P, HZ1AB, 6W8DD, VKØVK, UD6KAB, ZL1AV and many W's and VE's. (Oh, yes — he's one of those who can read Morse! As a result of which he has now booked in 220C in 40Z, with 143 countries on 14 mc SSB and 102 on 7 mc CW.)

H. M. Davison (Ashtead) is another who agrees that Forty should be taken seriously. During the *CQ* DX Contest he found VK5KO there (2000 GMT) and was even more surprised to hear K2DGT at 1945; his receiver is an HRO and the aerial an indoor 66-ft. wire. On 160m., H.M.D. has logged ZC4, UB5, W and VE, and says "many SWL's do not know how to listen . . . they have much better gear than myself, yet are unable to find DX which I can hear."

Robert Nixon (Liverpool) had a stroke of bad luck and lost his 8 ft. by 8 ft. square aerial in a gale; but he has just put up a "ten-metre single-element beam" (by which we imagine he means a dipole). In early October he found Ten very good, and on that band he has logged TU8, VQ8, CR5, VS9K and many other more common prefixes.

D. Gray (Easington, Co. Durham) is a new correspondent who started with an R.1155A and graduated to an AR77E, which he describes as "an unbelievable improvement"—we can imagine! He uses 10- and 20-metre dipoles with a common feeder, some 25 ft. high, yet says his best band is 15 metres! He now thinks in terms of a converter for Two; but he would like to see a description of a portable transistor receiver for Ten, Fifteen and Twenty.

Intruders

David Evans (Denton) refers to the interfering commercials and BC stations on 40 metres, and is especially annoyed by Teheran, around 7025 kc. The address to which you can send protesting letters is: N. Moinian, Deputy PM and Director-General of Info. and Broadcasting, Info. Dept., Teheran, Iran. (The only thing we *can* do about these pirates is to deluge them with complaints. If they get enough of them there may be some effect—but, if nobody writes, there certainly will not be a move.) Other comments

HPX LADDER

(Starting January 1, 1960)

Qualifying Score — 150

SWL	PREFIXES
PHONE ONLY	
H. G. Shaw (Heswall)	556
A. W. Nielson (Glasgow)	492
R. J. C. Coats (Cowie)	478
D. G. Evans (Denton)	448
C. N. Rafarel (Poole)	443
P. J. Weyell (Richmond)	429
I. K. Gurney (Chalfont St. Peter)	400
D. Edwards (Birkenhead)	395
R. M. Nixon (Liverpool)	378
B. M. Crook (Abingdon)	372
M. T. Bland (Oakham)	359
G. Shucksmith (Barton-on-Humber)	326
D. Quigley (Cowes)	318
R. K. Western (Torquay)	316
J. Forsyth (Alvaston)	309
A. Griffiths (Solihull)	286
H. M. Davison (Ashtead)	269
J. Lind (Solna, Sweden)	260
D. Bell (Nottingham)	252
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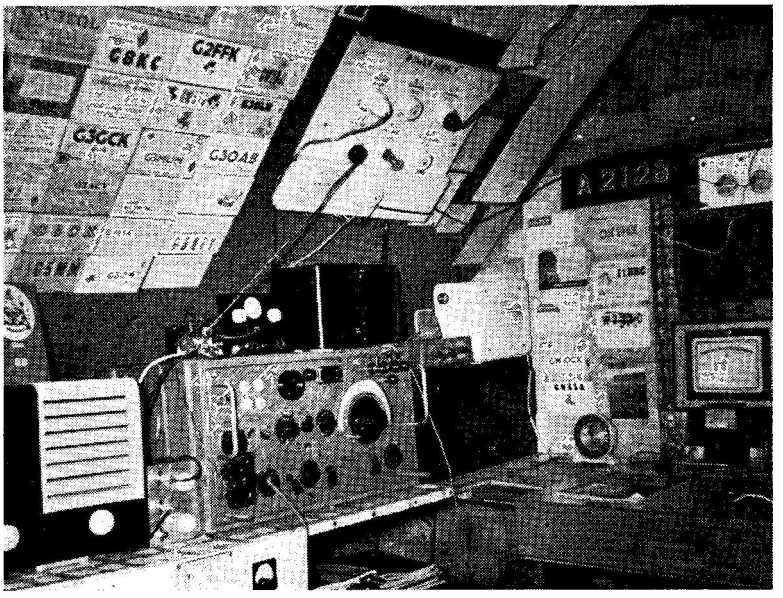
(NOTE: *Listing includes only those who reported for this issue or the November issue. Failure to report for two consecutive issues will mean removal from the list. Next list — March issue, continuing as above rom January* 1960.)

from SWL Evans: Twenty, excellent during afternoons to the West Coast USA and Canada; Forty, W's are very strong nearly every night, also many South Americans on both CW and phone. Fifteen, quite good to Central America, also afternoons.

Bill and *Robert Ferguson (Glasgow)* have changed QTH and have a 51-ft. wire, fed with 300-ohm line, 60 feet high. They have been listening a lot to Forty CW, and interesting loggings include 3V8AC, ZB2AD, YV's, HK, VP2SH, 5N2CPH, VE3BQU/SU and many others. And they wonder whether PX1BR (21 mc CW) is genuine.

Peter Lennard (Wartling) is another new correspondent with nice scores on both Phone *and CW*—on a G.E.C. domestic receiver. His CW total is well ahead of the Phone figure, too! He hopes to improve matters with a PCR-2, just acquired.

H. G. Shaw (Heswall) is building a Quad for Ten, Fifteen and Twenty, and plans to hoist it up to about 40 feet. Meanwhile, he reports plenty of DX and mentions UAØEH, Sakhalin Island in Zone 19, who gave him his 40th Zone.



This interesting-looking SWL station is operated by R. Lawson, 23 Yew Tree Lane, Solihull, Warwicks., who has as main item of equipment an R.107 modified for SSB reception; in addition SWL Lawson has various amplifiers, receivers and power packs, all ready for the day his AT licence comes through — he is taking the next R.A.E. Various aerials are available, sprung from a 30 ft. mast.

J. Edwards (Derby), yet another new reporter, has achieved a score of 53 prefixes on Forty and Fifteen with an ordinary Ultra BC receiver (band-spread on each band—¼-in.!) He has now got himself a 52 Set, but is puzzled because "on certain occasions it just pulled in a few signals and spread them nearly the whole way across the dial" (must make a change from that ¼-in. band-spread, anyway). He wonders whether other 52-Set users can help him over this one, and, if they would care to write, the QTH is 17 Friary Avenue, Allenton, Derby.

Dave Quigley (Cowes) wrote just too late to catch the November issue, but we mention his letter because he said it would be his last—he had passed the R.A.E. and was awaiting his licence. We congratulate him and hope to hear from him again . . . "for another place," as G3P - - ?

Martin Harrison (Oxford) is quite an old-timer among SWL's, but has been too busy on other projects lately to have much time for radio. However, he "surfaces" now and then, using a DB-23 and an NC-109, but with an aerial *below* ground level and just beside a bus stop. He is all in favour of a contest for SWL's, which he thinks should be synchronised with one of the big transmitting contests. On a visit to the States, he was much impressed by the Novice bands and the phenomenal congestion thereon, but says there is hardly any of the "non-amateur rubbish" that clutters our bands here. As far out as California, he could hear the BBC "bang in the W phone band, but heavily heterodyned, I'm glad to say."

Finally, he has some rude words to say about the present state of "country-counting," with which we heartily agree; and he hopes we will widen our horizons with such subjects as DX/TV *(see* November issue) and possibly even RTTY. Are there any RTTY SWL's? (We have an article with some suggestions in hand, by the way.)

P. J. Weyell (Richmond) made himself a "spiral aerial" as described in these columns some time back (66 ft. compressed to 33 ft.), but can't give a fair report on it because of the "ropey conditions" he has encountered since putting it up. He finds the only band for consistent DX is the SSB end of Twenty, and even there one has to be on the spot at the right time.

Second Generation

Philip Stevens (Wellington) just missed the boat for the November instalment, but is worth quoting here in view of his wide interests and interesting assortment of gear. His father was G3XV, who "went QRT" in 1958 and unfortunately sold his gear before "junior" was interested — all that remains is the transmitter. So SWL Stevens started off with a simple TRF job, then acquired an AR88D (for £12!) and has since got a BC-454 (modified for 28 mc) and various odds and ends. Next project is a two-metre converter for the AR88. A query about HPX, dealt with for the benefit not only of SWL Stevens, but for others who ask from time to time: the Prefix is the initial letter or letters *plus the figure* . . . thus, W1, W2, K1, K2, WN2, WA2, and all the variations *all*

count. No cards or log book needed—just send in a summarised list to start with and you will be on the ladder.

Jack Brookes (Blackpool) has not written since the second instalment of this feature was published (March '59); at that time he had a CR-100, R.208, PCR2, R.1392 and various RF units, but these have all been dispensed with and he now uses four transistor receivers, two covering Eighty and One-Sixty. He is at present building a transistor double-superhet incorporating two RF stages, crystal calibrator, Q-Multiplier and 1-watt output, all in a case 11 in. by 6 in. x 6 in.—which should be a neat and very useful job.

Richard Grindley (Carlisle) is another "first-timer," and uses an R.107 for Top Band to Twenty, and an RF-26 for Fifteen and Ten. He is fortunate in having a local transmitter (G3MNL), who helps him and another SWL on their way with theory, and they eventually hope to take the R.A.E. by storm. SWL Grindley says Carlisle is a dead loss for SWL's, but doesn't say why—probably lack of activity.

John Ingham (Halifax) would like to start tape correspondence with any other SWL's who are sitting for R.A.E. next May; he has a single-speed ($3\frac{3}{4}$) Philips recorder. He suggests that we might start a Top Band counties ladder in the New Year as another competitive feature. Maybe we will!

More DX/TV

Charles Rafarel (Poole) hopes that his DX/TV exploits will stir others to emulate them; he finds sporadic-E conditions finished for this year, but was still getting DX up to October 25. In order to receive Belgium and Holland (very difficult down in Dorset) he carted all the gear up to a friend's QTH at Ingatestone, Essex, where the two stations he was after were successfully received (Mohammed going to the mountain, as he says!) On the amateur bands, he says Ten has still been having its moments (ZD7SE was a good one); Fifteen produced 5R8AB, KA2SB, PZ1TF and others; and Twenty yielded one queer one in the form of YU6CB/X . . . QTH Herzgovina, Yugoslavia. Why the X?

George Docwra (Brighton) was pleased to find Ten wide open on November 12 around 1600 GMT. His aerial was the co-ax lead to a dipole, the connections up above having broken! In a 15-minute spell he heard CE1, VS1, W4, PY, all coming in like locals. A week later it was dead, although Fifteen and Twenty were quite good.

Michael Box (Weymouth) runs a CR-100 and a 52 Set, which is also the guinea-pig on which new ideas are tried. A converter for 14/21/28 mc and a two-metre converter also have places in the shack. Aerials are an 80-ft. wire and a five-ele. two-metre beam. Chief interests are Top Band, Eighty and Two.

L. F. Meikle (Hexham) has been an SWL for just over three years, and reports here for the first time. He started keeping a log in August, since when 104 countries have been entered. They come in *via* an S.640, modified, and, prior to that, on the home BC receiver. Listening is limited to week-ends, and generally about ten hours are found free for the purpose! Next job—two metres.

Correspondence from short wave listeners is welcomed for this feature, the next appearance of which is in the March, 1962 issue. Good photographs of SWL stations can be used and are paid for on publication; prints should be accompanied by adequate descriptive notes. The closing date is January 26 and all mail should be addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

W. S. Teanby (Scunthorpe) is yet another first-timer, who started with a one-valver and surprised himself by the amount of DX it brought in (they still do!) Then came a CR-100, still in use, but now with a Minimitter converter. Favourite bands are Fifteen and Twenty, with Forty and Top-Band to fall back on. A variety of wires—dipoles and long wires—is used. One of his interests is the sending of taped reports to broadcasting stations; another is contests, of which he would like to see more.

P. L. Ashley (South Croydon, Sy.), who asked here in November about curing TVI from an HRO-MX, says that he has been given modification details which have reduced the TVI by 95%! He also reports equally satisfactory results with an Ad. in our Readers' Small Advertisement section—it produced eight inquiries about some gear he was offering for sale. P.L.A. runs a tape recorder with the HRO, has a variety of aerials, and listens over all bands 15-160 metres.

A. W. Nielson (Glasgow) has heard some good stuff on Fifteen, such as EAØAB, TT8AD, TY2AA, CR5SP, TG9BX, FG7XL and an SL5 signing /ZC6. He gives an interesting tabulation of results in the *CQ* DX Contest as compared with last year's effort. Fewer Zones and Countries were heard on Ten and Fifteen, more on Twenty, and quite a few (as compared with none the previous year) on Forty and Eighty.

Anthony Nadauld (Ruislip) is $18\frac{1}{2}$ and in the RAF, but finds time for some listening. He started with a one-valve receiver, chiefly covering the locals on Eighty, but a visit to G3KRY gave him ideas and he bought an old R.107, with which he started DX-hunting. His first acquaintance with the SSB end of Twenty bucked things up considerably, and he has now logged 118 countries in 28 Zones. A Minimitter five-band converter has now been added to the gear, and he has been hearing several of the RAF stations abroad, such as VS9MB. We may not be hearing from A.N. again as an SWL, as he sat for the last R.A.E. — and we hope he was successful.

DX INFORMATION SERVICE

DX-chasers are invited to write to *Geoff Watts, 62 Belmore Road, Thorpe, Norwich*, if they hear first-hand details over the air of any forthcoming DX-peditions or *rare* DX. Details required are call-sign, frequency, AM/CW/SSB, time heard or date of forthcoming operation. Your form will be returned

to you with details of other DX information received ; and a supply of forms will be sent to you on receipt of an s.a.e. or a 3d. stamp, from the above address. *Note:* Send only current information actually heard on the air—SWL Watts already sees most of the DX magazines. And any reader who receives regular copies of W4KVX's *DX*, and who has back issues prior to No. 78 that he would sell, is asked to communicate with Geoff Watts, at the same QTH.

And, with that, it only remains for us to wish every reader of this feature a Happy and Prosperous New Year – *HNY*, as they say on CW.

MARCONI AND HIS ORIGINAL EXPERIMENTS

EARLY WORK, AND THE SPANNING OF THE ATLANTIC — AN HISTORICAL NOTE

DURING the early 1890's, many of the leading physicists were closely interested in the properties of "Hertzian waves," but none expressed a thought that these waves would be of the slightest value for the purpose of communication.

In 1895, Guglielmo Marconi, working at his parents' home at Pontecchio in Italy, discovered the great increase in range which could be obtained by the use of an elevated aerial. It was this discovery which paved the way for the use of Hertzian waves in a practicable system of wireless telegraphy.

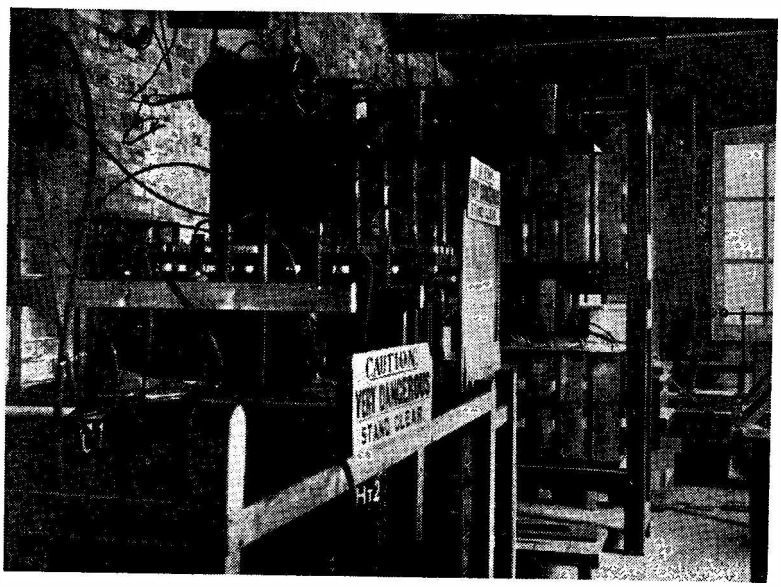
Early in the following year — 1896 — Marconi arrived in England and applied for the world's first patent for wireless telegraphy. He had chosen to come to England partly because this country was then the most powerful maritime nation in the world, and it seemed likely that wireless telegraphy would be of value to shipping, and partly because of a national affinity, his mother being Irish.

Marconi spent the next four years in an almost continual round of experiment, development and demonstration, his object being continually to improve the reliability and range of his apparatus. At first only covering a mile or so on Salisbury Plain, he was soon communicating regularly from Alum Bay near the Needles in the Isle of Wight to Bournemouth, and then to Sandbanks at the entrance to Poole Harbour, a distance of 18 miles. In March, 1899, he spanned the English Channel, and early the following year he obtained reliable communication between the Isle of Wight and The Lizard, in Cornwall, a distance of 186 miles.

The shipping companies had shown mild interest but very little enthusiasm to install wireless equipment on their ships. It seemed, in fact, that far greater ranges and a chain of land stations would be required before wireless telegraphy could make a real impact. Moreover, the scientists of the day were almost united in believing that wireless waves, like light waves, would not follow the curvature of the earth. Therefore, they said, really long ranges were impossible.

Marconi thought otherwise. Experiments had led him to believe that the key to longer ranges lay in the employment of larger aerials and higher transmitting powers. He therefore determined to build two super-power transmitting stations—one on each side of the Atlantic—and to attempt two-way communication. Accordingly, a site was selected at Poldhu in Cornwall, and the other at Cape Cod in Massachusetts.

It is difficult to visualise the stupendous problems which confronted him. The aerial system, at both Poldhu and Cape Cod, was of a size and complexity which had never been attempted before, for it consisted of twenty 200-ft. masts in a circle, with an inverted cone of about 400 wires leading down to the transmitter. As to the transmitter itself, it was to be 100 times more powerful than any hitherto built, and no precedents whatever existed for the design.



Marconi's first high-power spark transmitter at Poldhu, Cornwall, was rated at 25 kW. The condenser bank (see text) is in the foreground and the primary spark gap (PSG in the circuit on p.595) at right background. It was this transmitter that put the first signal across the Atlantic, on December 12, 1901.

(Photograph courtesy Marconi International Marine Communication Co., Ltd.)

Marconi delegated the responsibility for this to his scientific adviser, Professor J. A. (later, Sir Ambrose) Fleming, and Fleming carried it out brilliantly.

Transmitter Design

Some details of the transmitter may be of interest. The prime mover for the generation of power was a Hornsby-Ackroyd oil engine driving a Mather and Platt 2000v. 50 c/s alternator. This was capable of delivering 25 kW, although from a paper read by Fleming to the Royal Society of Arts in December, 1921, it would appear that the plant was considerably under-run at the time of the Trans-Atlantic tests.

The transmitter proper, which embodied a form of the new syntonic tuning with all its advantages, employed two 20 kW Berry transformers parallel-connected to step-up the input voltage to 20,000 volts. This was fed through RF chokes to a closed oscillatory circuit, in which a condenser discharged across a spark gap *via* the primary of a "jigger" or RF transformer. The secondary of this transformer connected to a second spark gap and capacitor and the primary of a second RF transformer, the secondary winding of this transformer being in series with the aerial. Keying was effected by the short-circuiting of the chokes in the alternator output—*see* diagram.

The condensers were made of 20 glass plates, each 16 ins. square, backed on one side with one square foot of tinfoil. The plates were immersed in linseed oil contained in stoneware boxes; each box had a capacity of approximately 0·05 μF.

Both the Poldhu and Cape Cod stations were all but ready when a double catastrophe struck: severe gales wrecked the aerial arrays and masts at *both* stations almost simultaneously.

With £50.000 already spent on the project, Marconi elected not to wait until both stations were repaired. Instead, a new aerial system was erected at Poldhu, consisting of 54 copper wires arranged fan-shape and held by a triatic slung between two 150-ft. masts. The current into the bottom of this aerial is stated by Fleming to have been 17 amperes and the radiated frequency is thought to have been between 100 and 150 kc. No one knows for certain, however, as no reliable means of measurement existed at the time and individual estimates made by those on the spot differ considerably.

With the encouraging news that Poldhu's signals were being strongly received at Crookhaven in Ireland, 225 miles away, Marconi, with two assistants —Kemp and Paget—took passage to St. John's, Newfoundland, the nearest landfall in the New World, taking with them large canvas kites and several small balloons, with which Marconi proposed to raise the aerial. This latter course of action was decided upon for two reasons: to avoid the public speculation that the erection of tall masts would bring, and to save time.

At St. John's all possible assistance was given them by the Governor of Newfoundland, Sir Cavendish Boyle, and the chief minister, Sir Robert Bond. Six hundred feet up on the clifftop of Signal Hill, overlooking St. John's harbour, was the disused Barracks Hospital; a ground-floor room in this building was placed at Marconi's disposal, and here he set up his instruments.

The Schedule

On December 9 a cable was sent to Poldhu instructing the engineers to begin transmissions on the 11th, between 3.0 p.m. and 7.0 p.m. GMT. The signals were to consist of repetitions of three dots (Morse letter "S"). This was chosen because—to quote Marconi himself—"the switching arrangements at Poldhu were not constructed at the time to withstand long periods of operation—especially if letters containing dashes were sent—without considerable wear and tear, and if S's were sent an automatic sender could be employed."

Heavy gales were sweeping Newfoundland, however, and the next two days were spent in unsuccessful attempts to keep an aerial aloft. A balloon and a kite were lost in these endeavours.

Receiving Gear

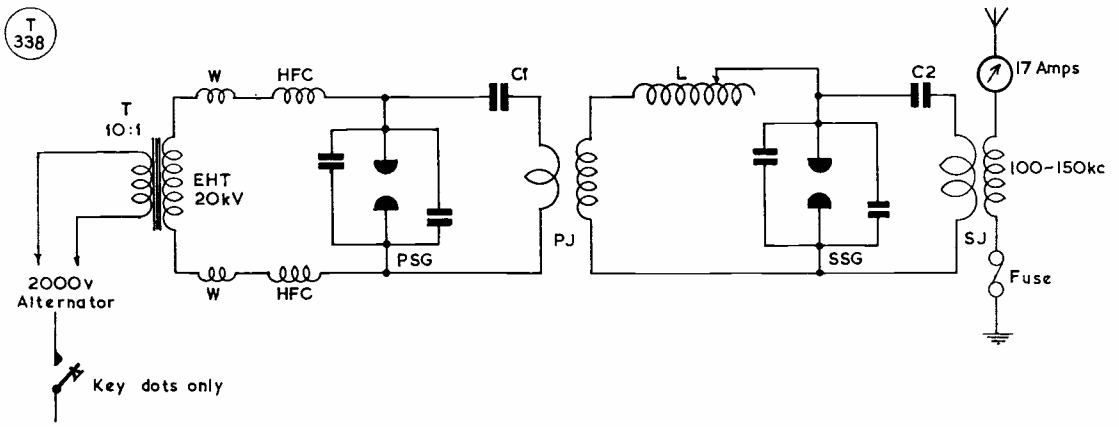
On December 12 a full gale was still blowing, but despite this, a kite was flown carrying an aerial to a height of 400 ft. Marconi began a listening watch, using his latest syntonic receiver, but could receive no signals because the erratic movements of the kite were continually altering the angle of the aerial to earth, and therefore its capacity. He decided, therefore, to revert to the older, untuned receiver, using a telephone earpiece in series with the coherer.

Various types of coherer were tried, one of which was the so-called "Italian Navy" device. This is of particular technical interest, in that it is described as consisting of a glass tube with a plug of iron at one end and another of carbon at the other, with a globule of mercury between them. The device was self-restoring and had to be used in conjunction with a telephone earpiece. It would seem, therefore, that what is described as a coherer was, in fact, a true semi-conductor rectifier with either the dissimilar plugs, or oxide film on the mercury, or possibly other surface impurities, performing the rectification process.

At 12.30 p.m., Newfoundland time, on December 12, 1901, Marconi heard, faintly but distinctly, the groups of three dots which could only have been emanating from Poldhu, 2,200 miles away. He passed the earpiece to Kemp, who confirmed that he had not been mistaken. (Paget, to his lifelong regret, was ill on that day and was not present.)

The feat was all the more remarkable when it is remembered that the onus was almost entirely on the transmitter, for no amplification was possible at the receiver, and so the received signal itself had to be strong enough to operate the earpiece.

The use of a telephone in place of a recording tape and the absence of any unbiased witness had unfortunate consequences, for immediately the news was made public, a stormy controversy arose as to whether Marconi and Kemp had been deceived into misinterpreting the noise of static as Morse signals.



Circuit arrangement of the original Marconi spark transmitter used at Poldhu, Cornwall, on 12 December 1901, to send the first trans-Atlantic signal. This consisted of three dots (" S "), repeated at prearranged intervals. It was not thought practicable to run the transmitting plant for any sustained signalling, since keying was in the reactor coils of the 2000-volt alternator, and there was some doubt as to whether the equipment would stand up to more than dot-sending! The actual wavelength was never measured, but from the values used can be taken as corresponding to a frequency of somewhere between 100 and 150 kc. Marconi himself, at St. John's, Newfoundland, was the first to hear the dots coming through the noise — see story. The transmitter parts in the circuit here are as follows: W, W, feedback chokes; HFC, inductance coils; PSG, primary spark gap, feeding through the primary condenser C1 (1.43 μF) into the primary jigger or RF transformer PJ; SSG is the secondary spark gap, coupled through C2 to the secondary jigger, thence into the aerial circuit. The periodic dots produced a current of 17 amps. in the aerial, which was a vast array of wires. The variable inductance L was adjusted to give a snappy spark at SSG, and in effect brought the system to resonance, as indicated by the aerial ammeter. The voltage across the primary spark gap PSG was in the order of 20,000 volts.

In this matter, events conspired against Marconi, in that the Anglo-American Telegraph Company, which had a message-carrying monopoly covering Newfoundland, threatened legal action if further experiments were carried out, and so there was no opportunity of giving a public demonstration. But, two months later, tests were carried out between Poldhu and the liner *Philadelphia* on passage from Southampton to New York, in which S's were received on the ship at a distance of 2,099 miles, and these were amply verified by witnesses. Ten months later—in December 1902—two-way communication was effected between Poldhu and a new high-power transmitting station at Glace Bay, Canada.

Theoretical Controversy

There remained the problem of reconciling the theories of the scientists with the practical results achieved by Marconi. At that time no one knew of the existence in the upper atmosphere of an ionised layer which serves to reflect radio waves and so to make long-distance communication possible. In 1902, Heaviside in England and Kennelly in America independently postulated the existence of such a belt to account for Marconi's achievement, but its actual physical existence remained a matter for controversy until the 1920's.

There were, in fact, many unknowns at the time. Until the tests between Poldhu and the *Philadelphia* in February 1902, it had not been realised that much longer ranges were obtainable at night. Indeed, it was only then that it was realised that for the Trans-Atlantic experiment a listening watch had been kept at the worst possible time of day! Again, the very success of the operation led to a universal acceptance of the rule, " the lower the frequency, the greater the range," and it was not until 1924 that the value of the short waves for long-distance communication was realised, largely as a result of the pioneering work of amateurs. The inauguration in 1924 of the Marconi-Franklin short-wave beam-radio service ushered in a completely new era in international radio communication. Incidentally, it was at the Poldhu site that much of the experimental work in connection with short-wave beam transmission took place.

In the same way as Marconi, by the introduction of the aerial/earth system, had taken wireless waves out of the laboratory into the realm of practical communications, so by the 1901 Trans-Atlantic experiment did he introduce the concept of high-power radio engineering and world coverage. And although the spark telegraphy of that day was not electronically generated, it did lead directly to the invention of the thermionic valve, and through this to the dawn of the electronics age.

CELEBRATING THE ANNIVERSARY

To mark the 60th anniversary of Marconi's great feat, amateur stations were established at Poldhu (GB3MSA) and Signal Hill, St. John's (VO1MSA), operating during the period December 9-17, with GB3MSA provided and manned by the local Cornwall group of licensed amateurs, and VO1MSA by the Newfoundland Radio Club, these stations being located at the original sites.

On the anniversary date, December 12, 1961, it was arranged to exchange suitable messages between GB3MSA and VO1MSA. Both stations were busy on all amateur bands during the whole period—

though VO1MSA was rather difficult to hear and to work from the U.K. However, the number of contacts made by both stations, and the world-wide interest taken in the event, amply justified the effort—entirely amateur—involved, and those concerned at GB3MSA and VO1MSA are to be congratulated on their enterprise.

DIAMOND JUBILEE EXHIBITION

In connection with the Marconi 60th Anniversary, the Science Museum has arranged a special exhibition of apparatus and original photographs of great historical interest. One item is a recording made by Marconi himself, telling how success was achieved.

This exhibition will continue at the Science Museum, South Kensington, London, S.W.7, until January 25. Admission is free, and all who can should see it.

(Editorial Note: We are indebted to the Science Museum; to G. R. M. Garrett, Esq. (G5CS), of the Museum; to the Marconi Company; to the publishers of R. N. Vyvyan's book, *Wireless over 30 Years;* and to those responsible for GB3MSA/VO1MSA, for the details written into this article.)

PANORAMIC RECEIVING RECORDER

The trade name "Panfax" has been registered by Racal Electronics, Ltd., to cover their panoramic receiving and recording equipment. This comprises a Racal RA.17 receiver, a panoramic adaptor, tone generator, control unit and a Muirhead chart recorder. The assembly has been designed by Racal to meet a major requirement in panoramic reception, which arises by reason of the fact that the CRT trace is of relatively short duration; this is solved by producing, by means of the equipment, a permanent record of the spectrum under examination. It is a facility of great value to communications authorities who require to record the activity in a particular band over a given period; help in frequency selection; or a check on random interference. Unattended operation up to 24 hours' duration is possible with the Racal "Panfax" recording apparatus.

BACK AGAIN AFTER 33 YEARS!

Writing in to notify his callsign/address for the "New QTH" page, G5IC (Ludlow) mentions that he was G5IV in 1926-'29. He gave it up in 1929, and his present callsign is a new issue so far as he is concerned. However, he is in rather an unusual location as regards radio—he has six 50 kW HF transmitters within a few hundred yards, and can light lamps off his receiver feeder line!

SPECIAL NOTICE — ALL READERS

When this issue went to press, it was not clear whether the dispute between the Postmaster-General and the Union of Post Office Workers would actually be brought to the point where chaos would be caused in the ordinary postal services. Should this situation have materialised, with the inevitable delays and dislocation, readers who may be inconvenienced are asked to realise that this issue went to press at the proper time to keep to our usual distributing and publishing schedule, for appearance on January 5.

If the Post Office dispute develops as was threatened and is continued for only a short time, it is possible that appearance of the next issue by the due date — February 2 — will be affected. Likewise, readers are asked to bear in mind that ordinary correspondence with our office may be considerably delayed.

At left Austin Forsyth, G6FO, managing editor of "Short Wave Magazine," having a word with Eric Cole, G2EC, president of the R.S.G.B., when the official party visited the Magazine stand at the recent Amateur Radio Exhibition. At centre is Mr. Henry Loomis (director, "Voice of America") who opened the Exhibition, turning away to speak to Phil Thorogood, G4KD, organiser and manager of the show.

VHF BANDS

A. J. DEVON

G2HCG Starts Moon-Reflection Tests—

"Oscar" in Orbit, Calling on 144·975 mc—

Interesting Results on Four Metres—

Reports, Claims, News and Comment—

SINCE our last appearance, two extraordinary happenings have moved across the VHF firmament: An active satellite radiating a signal on the two-metre band was put into orbit by the Americans on December 12, and by December 22 G2HCG, of Northampton, had begun to receive what were probably "pings" off the moon.

The OSCAR Project has by now been pretty well publicised. An American idea sponsored and supported by the ARRL, essentially it consists of a small 10-lb. vehicle carrying a 100-milliwatt transmitter radiating a distinctive signal on a nominal frequency of 145 mc, and having a life expectancy of about a month. Right up to the last moment, there was doubt as to whether Oscar could be made part of the *Discoverer 36* load due to be launched "early in December," and it was after we had gone to press with the December issue that firm assurances were received that Oscar would be included in the *Discoverer 36* undertaking, scheduled for firing on December 12; this was to take place from the Vandenberg Air Force Base, California, and the arrangement was that if separation was achieved and Oscar went into orbit successfully, the news would be "flashed round the world" so that radio amateurs could start listening for it. All this duly came to pass, and by Wednesday, December 13, Oscar had been reported from a number of sources.

First to hear and record Oscar was G3OSS (Finchley, North London), who found the signal at 00·50 on December 13, within a few hours of the launch at about 2030 GMT; G3OSS was getting a very good signal, varying from S6 to S9, using a 6/6 slot-fed J-Beam and a Withers Nuvistor Converter into an AR88, which also fed one track of a Ferrograph stereo recorder for getting it all on tape, with comments. As many readers will know, G3OSS got a spot on the BBC's "Radio News Reel" and on TV news, giving a very competent performance and a clear explanation of what it was all about. This probably did more than anything else to alert the clans, with the result that large numbers of VHF operators started to listen for Oscar, and the reports began to come in.

Before this, however, several U.K. amateurs had got the buzz, and G3JAM (Woodford Green, Essex) was on the ball, with his first reception logged at 0121 on December 14. G3EHY (Banwell, Som.) gives 0022 on December 15 as his first hearing, at S6-S9, with regular reception thereafter.

During the next few days, the Oscar signals were being well heard all over the U.K., but by Christmas Day the timing had become very erratic, and not at all in accordance with the orbit period as officially forecast. This had been given as 93 minutes, but it began to change fairly rapidly after about the first twenty circuits, until by December 23 the signal was arriving some 17 mins. ahead of the predicted time.

On the near-overhead passes, the Doppler shift is very pronounced (about 7 kc), and the hi-rate has varied from 6 to 12 seconds per 10 grunts, burbs or hi's. Incidentally, though the signal does contain four dots followed by two, the effect (to your A.J.D.'s old ears, at any rate) is more like "N" than "hi"; it is really only possible to get this clearly on a slowed-down tape. The other interesting thing is the signal strength—it can be up to

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1961

Starting Figure, 14

From Home QTH Only

Worked	Station
55	G5MA
52	G2CIW
43	G3KPT
40	G3NNG, G8VZ
38	G3OJY
37	EI2A
36	G2AXI
34	G5DW
31	GI3ONF
22	G3CO, G3PBV
21	GW3MFY
20	G3GSO
19	G3JWQ
18	G5QA, G8VN
17	G3LTF
16	G5UM
15	G3FIJ, G3OSA, GW3ATM

This Annual Counties Worked Table opened on September 1st, 1961, and will close on August 31st, 1962. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. QSL cards or other proofs are not required when making claims. The first claim should be a list of counties with the stations worked for them. Thereafter, counties may be claimed as they accrue. Note: ***While new claims can be made at any time in the period from now to end-June 1962, all operators are asked to send in amended scores as often as possible, in order to keep the Table running up-to-date. After June 30, 1962 (with two months still to run to the end of the 12-month season), only amended scores from those already standing in the Table at that date will be accepted, unless they are new claims from operators licensed w.e.f. June 1962.***

S7-8 on no more than an indoor halo, with an ordinary converter. The radiation appears to be mainly vertically polarised, but as the vehicle will almost certainly be tumbling more or less at random, the plane of polarisation would be constantly changing — hence, the signal can be received on any usual sort of amateur beam system. At A.J.D.'s, interesting results have been obtained with no more than a 4-ele Yagi pushed out of the window and held vertically. As the average passage time, from in to out, is not more than about 6 to 7 minutes, one has to move fairly fast if attempting to carry out tests with different aerial arrangements.

As the life predicted for Oscar was about 30 days, it will be getting near the end of its time when this appears, even if it has not already been lost. You can find out what the latest position is by listening any Tuesday to Sunday morning, 0330-0335 GMT, to one of the following American SW/BC stations: WLWO, 9765 kc; WDSI, 11790 kc; WBOU, 11830 kc; or WLWO on 15290 kc. The transmissions are called "Spacewarn Broadcasts" and give the latest information, including orbit data and radio frequencies, on all bodies known to be active in space. As this is a daily service, it is more accurate and up-to-date than the long-range predictions which have been made by the U.K. authority; these, apparently, have not taken into account the aberrations in the Oscar orbit.

MOON REFLECTION TESTS BY G2HCG, NORTHAMPTON

Of more lasting interest than the Oscar project—and in many ways a great deal more important —is the programme of work now being undertaken by G2HCG, Northampton, well known not only as an active and highly-successful AT station operator on the VHF bands, but also as an aerial engineer.

Briefly, he has installed a one-kilowatt transmitter (by special licence) on 144·32 mc, to feed into a high-gain steerable array that can be beamed on the Moon. The first tests, made just before Christmas, were with a complex of twelve 8/8 standard J-Beams giving together a gain of 26 dB, or $\times 400$ in terms of power. This set-up produced an estimated 300 kW E.R.P., horizontally polarised, and tests commenced by sending 1-sec. pulses every 5 secs. In terms of time, the path-distance to the Moon and back is $2\frac{1}{2}$ secs., during which the receiver was, of course, switched over to the aerial. The Rx is a special high-gain arrangement with a very narrow bandwidth, of the order of 150-200 *cycles*, so that the effect is of listening to high-pitched "sharsh."

According to the calculations—and Bill is tackling the whole job strictly as an engineering project, with no hit-or-miss or guess-work —the equipment as described should be just about capable of getting an echo back. Results so far obtained support this, in that about one in every 100 pulses sent has "pinged" in the receiver. It then became evident that the real problem was one of polarisation change, and that by choosing to start with a horizontal array, G2HCG has succeeded in making things more difficult for himself—however, as he says, the aerial system had to be tried that way first, if only to eliminate any doubts.

So now he is rebuilding the whole 26 dB beam system to produce circular polarisation, which should overcome the polarisation shift problem. If it does, and it ought to, the reasonable chances are that the percentage of received echoes will improve considerably.

The next step is, of course, communication, with the States (where similar tests are being conducted by K1HMU) as the objective. A very interesting further possibility —if the right sort of co-operation could be made available from the other end—is that, since there are positions of the Moon when she "sees" both the U.K. and Western Australia, a two-metre contact G/VK can at least be thought about.

Though it looks as if Bill Sykes, G2HCG, by his energy, initiative, skill and knowledge of what makes things tick on VHF will soon be in position to offer moon-reflection tests round the world, it is, unfortunately, not likely that there will be more than a few amateurs who will be able to co-operate with him. Apart from the know-how, anyone embarking on a project of this sort must command quite considerable resources in terms of time, money and space. But it can be done, and undoubtedly it will be in due course. In the meantime, all readers of this piece will want to congratulate G2HCG on his enterprise, and the results he has achieved so far.

Rest of The News

In spite of the exciting happenings already discussed, we must remember that most people on VHF are quite content just to communicate with whoever they can work. So, to get the positions up-to-date, all the tabular matter is shown this month—but we still have less than half-a-dozen offerings for the proposed 70 Cm. Annual Table.

A note from Harry, EI2W, says that he is now on four metres, 70·62 mc, using a 6-ele wide-spaced beam, and hopes to make some U.K. contacts. The latest listings show that EI2W holds no less than 17 VHF "firsts" for Eire, covering the four bands 50, 70, 144 and 435 mc. Harry has certainly done his stuff over the years, and is still as keen and as active as ever.

Talking of 4 metres, G5JU (Birmingham) reports unusually good, but rather odd, conditions on that band on December 17; he worked G3CLW, G3JHM/A and G3MWQ, and heard four other stations, some of this lot being at GDX distances; what Jerry found was that beam heading did not seem to matter much — signals appeared to be pouring down vertically!

G5QA (Exeter) is still going

strong on the 70-cm. front, and looking for contacts every Monday, Wednesday and Friday evening after his skeds with GW3ATM and G3OYM ; Herbert is now up to 24C in the Seventy-cem All-Time, and he is looking out for more Midlands contacts.

From Princes Risboro', Bucks., Jack, G8VZ, brings us up-to-date with his Table positions ; though he was able to get in on some of the openings reported in recent issues, he had bad luck when a feeder breakage at an awkward place compelled him not only to drop the stack, but also to lower the tower to get at it—so he took the opportunity of giving the whole works a thorough overhaul, with a repaint.

G8VN (Leicester) remarks on the spell of good tropospheric conditions during December 15-20, when we had that widespread anti-cyclonic effect, with the glass very high and steady—indeed, by mid-day on Tuesday, 19th, the barometer at A.J.D.'s was standing higher than it ever has done before! G8VN found conditions particularly good over that week-end, with distant G's banging in like locals. And GB3VHF, not normally much of a signal on G8VN's indoor beam, was a good S9 during the period.

Incidentally, this seems the point at which to mention that, temporarily, we have discontinued the usual barograph trace, due partly to lack of space, and partly because nobody has expressed any great enthusiasm for it lately. It would be appreciated if those writing in for the next "VHF Bands" would just say whether they would like it continued? The information is always available, even if the space is not—but that can be overcome if it is necessary.

G2AXI (Basingstoke) has made good progress in the Tables, and mentions that he has spent a good deal of time following Oscar, with interesting results. G2CIW (Birmingham) reports a short Auroral opening on December 2, 1530-1630, during which Jack worked GI5AJ and GM4HR, the only GDX heard. G3CCH (Scunthorpe) puts in claims, and is now

TWO METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14

From Home QTH Only

Worked	Station
82	G5YV
81	G6NB
80	EI2W, G3CCH
77	G5MA
72	G2CIW (348), G3KEQ, G6XM
71	GM3EGW (310)
70	G3HBW
69	G3EHY
68	G3BA, G3BLP (967), G3BW, G3GHO
66	G2OI (585), G3IUD (302), G3KPT*, *G5BD*
65	G6XA (333)
63	G2FJR (542), G3FAN (1,000)
61	G2HIF, G3HAZ, G6RH
60	G3DMU, G3IOO, G3JWQ (548)
59	G4SA, G8VZ
58	G8OU
57	G3DKF, G8SB
56	G3WW (770), G5DS (654)
55	G2HDZ (495), G5BM, GW5MQ
53	G2AJ (519), G3LHA (387), G4CI
52	G2NH, G3FZL, G6XX, GW2ADZ
51	G5ML
50	G3ABA, G3GSE (518), G3NAQ
49	G3CO (467)
48	G3AYC, G3FIH, G3LAR, G6TA (487), GW3ATM
47	G5WP
46	G3MTI (242), G4HT (476), G5BY, *G6YU*
45	G2AHP (647), G2DVD (362), G2XC, G3BJQ, G3GFD, G3MPS, G5JU, G6GN, GW3MFY
44	G3BK, G3DVK (282), G3LTN, G3NBQ (218), G8DA
43	G2DDD, G2FCL (322), G3BNC, G3COJ, G3DLU*, G3GSO, G3HWJ, G3KHA (262), G3KQF, *G3KUH*, G3NNG, G3OJY, G3WS, G4RO, G5DF
42	G2HOP, G3DO, G3IER, G6CI (220)
41	G2AXI, G2CZS (282), G2FQP, G3JAM (481)
40	G3CGQ, G5MR (366), G8KL
39	EI2A, G2IQ, G3GBO (434), G3LTF, G3OSS, G3VM, G8IL (325), GC2FZC
38	G3APY, G3CKQ, G3HTY, G3PBV, G5UM (768), G8VN (190)
37	G3FNW, G2FZU (180), G3DLU, G3MAX, G5UM (802), G8DR (482), GC3EBK (260)
36	G2DCI (155), G3CXD, G3DLU*, G3IIT, G6CB (312), G8IP
35	G3FYY (235), G3HCU (224), G3IOE, G4LX, G5TN, GI3ONF
34	G3AEP, G3HWR, G8IC, GM3DIQ
33	G2BHN (128), G3FIJ (392), G3FUR, G3HHY (125), G4JJ/A, G3OHD
32	G3HIL, G3OBB, G8QY, G8VR
31	G3HXO, G3ICO (118), G3KPT (180), G5RP
30	G2AHY, G3FRY, G3GOP (208), G3GVF (129), G3IRA, G3KEF (110), G3OBD, G5NF, GW8UH
29	G2CVV, G3AGS, G3AKU, GM3LDU
28	G3ITF, G8DL, GM3BDA
27	G3CVO (231), G3DAH, G3ISA (160), G3JGY, G3LTF/A, G6GR, G8NM, GI3GQB, GW3GWA
26	G2BRR, G3CFR (125), G3MED, G3NNK, G3SM (211), G3YH, G4MR (189)
25	G3JHM, G3JMA, G3JXN (220), G5SK, G6PJ
24	G3FD, G3FEX (226), G3FXG, G3FXR
23	G2DHV, G3BDQ, G3CWW (260), G3HSD (168), G3OPR (144), G5PY, G8VN (125)*
22	G2DRA, G3AGR (135), G3ASG (150), G3BPM, G5AM
21	G2AOL (110), G3DVQ, G3IWJ, G6XY
20	G3EYV
19	G2HDR, G3GCX, G5LQ (176)
18	G3DBP, GC2CNC
17	G3EGG, G3MHD (195)
16	G3FRE, G3MLS, F3XY (200)
15	G3IWA
14	G3CYY

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 accrue.

*** New QTH**

at 80C in the All-Time. GM3LDU (Glasgow) is up to 29C, with GI3OFT (Co. Antrim) and GI3ONF (Co. Armagh) worked for new ones.

Right up near the top of the All-Time comes Bill, G6NB (Brill), with 81C. G5UM (Knebworth) now records 802 different stations worked on two metres, and is the only new claimant for the 70-Cm. annual, with 8C worked since 1/9/61. Could we have a few more claims? G6NF (Croydon) adds two more for the 70-Cm. All-Time.

His total for the Two-Metre Annual, 55C, reflects the steady activity maintained by Bob, G5MA (Gt. Bookham, Sy.) who is often to be heard calling some interesting GDX item. Bob also did very well during the great *Ar* opening, reported in our last, which gave him no less than six GM counties at the one sitting.

GI3ONF (Portadown), writing in for the first time, gets into the tables, having had a good slice of the EDX during the October *Ar* opening, when he worked DL9GU and ON4CP for new countries. The gear at GI3ONF consists of a QQV06-40A in the PA, taking about 30w., with a slot-fed 6/6 at 37 ft. and a cascode converter with 6CW4 pre-amp. GI3ONF will be off to sea as a radio officer in the Merchant Navy by now, leaving Co. Armagh untenanted on VHF, though he says "other stations are preparing."

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
37	G2XV
30	G6NF
28	G3HBW
27	G3JWQ, G3KEQ, G3NNG G5YV
26	G2CIW, G3JMA, GW2ADZ
25	G3HAZ
24	G3LHA, G5QA
23	G3BKQ, G3KPT, G6NB
21	G3IOO
20	G3LTF
17	G3MPS
16	G2DDD, G3MED
15	G2OI, G4RO
14	G2HDZ, G3FAN, G3LQR
13	G3BA, G6XA
12	*G5BD*
11	G3AYC, G5UM
10	G3IRW
9	G5DS
7	G2HDY, G3JHM
6	G3KHA, G3WW, GW3ATM
5	G3FUL, G3HWR, G3IRA, G3IUD, G3JHM, G5ML
4	G3JGY

On working four Counties or more on the 70-Centimetre band, a list showing stations and counties should be sent in for this Table, and thereafter new counties worked notified as they accrue

Auroral EDX, 28/10/61

Harking right back to the 12-hour Auroral opening on October 28—fully reported here last month—we received, just too late for that issue, a very interesting summary of results as experienced in Germany. Some 20 DJ/DL operators are listed, with their contacts and stations heard. Among many other details, this list shows that DL1PS (Osnabrück) heard no less than 18 U.K. stations; that GM3HLH/A (who himself worked several DJ/DL's) was heard by SP3GZ; that SM7BAE worked UR2BU and OH2HK; and that DL6QS (Cuxhaven) logged about 12 countries. The Berlin stations on were DL7HM and DL7HR, who had 14 QSO's, including GM2FHH and GM3HLH/A.

Incidentally, one interesting fact that emerged during that Auroral occurrence is that it is possible to work SSB phone by *Ar* reflection—the speech quality sounds hollow and ethereal, like a voice from outer space (which, of course, in effect it is!)

CT1CO (Lisbon), who has been mentioned recently in this space, is ex-CS3VA of pre-war days, when he was active on 56 mc, the old 5-metre band—in fact, he was heard in the U.K. and most EU countries under that call—remember? He is working to improve his converter, a CC job with RF pre-amp., and his local out there on two metres is CT1KJ, at 35 miles.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

20	G3HBW (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP)
19	G5YV
19	G3CCH (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, OE, OH, OK, ON, OZ, PA, SM, SP)
18	G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP), G3LTF, ON4BZ
16	G3GHO, G3KEQ, G5MA, G6RH, G6XM, PAØFB
15	G2XV, G3AYC, G3FZL, G4MW, GM3EGW
14	G2CIW, G2FJR, G2HDZ, G3BLP, G3FAN, G3HAZ, G3IOO, G3JWQ, G3KPT, G3WS, *G5BD*, G6LI, G8OU, OK2VCG
13	G2HIF, G3BA, G3CO, G3DKF, G3DMU, G3DVK, *G3GPT*, G3NNG, G5DS, G6XX, G8VZ
12	EI2W, F8MX, G3EHY, G3GFD, G3GHI, G3JAM, G3PBV, G3WW, G5CP, G5ML, G8DR, GW2HIY
11	G2AJ, G2CZS, G3ABA, G3BDQ, G3GSO, G3JZN, *G3KUH*, G3LHA, G3OBD, G4RO, G4SA, G5UD, G6XA, OK1VR
10	G2AHP, G2AXI, G2FQP, G2HOP, G3BK, G3BNC, G3DLU, G3GSE, G3KQF, G3LAR, G3MED, G5MR, G5TN, G8IC, GC2FZC, GW3ATM, GW5MQ
9	G2DVD, G2FCL, G3FIJ, G3FUR, G3IUD, G3LTN, G4LX, G8GP, GC3EBK, GM3DIQ
8	G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKX, G3GBO, G3HCU, G3HWJ, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB, GW3MFY

Dead-line ——

For our next, this must be **Wednesday, January 17.** As it may be that the postal chaos (threatened at the moment of this writing) will have developed by then, please judge the situation from the mail delay you may be experiencing yourself, and post accordingly, addressed to: A. J. Devon, "VHF Bands," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. All being well, we shall be with you again on February 2 — so, a very happy New Year, and *73 de A.J.D.*

NEUTRALISING A TETRODE PA

WITH THE GELOSO 4/104 VFO

W. H. Fletcher, B.Sc. (G3NXT)

MANY of the newer high-gain transmitting power tetrodes are most easily stabilised by neutralisation. These notes discuss the author's experience with a transmitter using a Geloso 4/104 VFO into a TT-21 as PA.

The driver tank circuit of the Geloso VFO is unusual in that the tuning capacity is connected between the grid of the PA and earth, and not directly across the coils L6-10—*see* Fig. 1. This means that where the ubiquitous *pi*-tank circuit is used in the PA, the conventional neutralising circuits are not practicable.

The capacity bridge circuit may be adapted, however, as shown in Fig. 1. If the circuit is redrawn as a bridge (Fig. 2) it is evident that neutralisation is achieved when:

$$\frac{Cn}{Cb} = \frac{Cpg}{Cgc+Cv+Cout5763}$$

With the existing by-pass condenser in the anode circuit of the 5763, the required neutralising capacity is 32 $\mu\mu$F.(1) As a condenser of this value, in a suitable voltage rating, would be both bulky and expensive, the existing by-pass condenser (*Cb*) was replaced by a 470 $\mu\mu$F ceramic type, so reducing the required value of neutralising capacity to about 3·2 $\mu\mu$F.

Since the trimmer *Cv* forms part of one of the ratio arms of the bridge and not part of the *nul* arm as in the usual arrangement, any change in *Cv* when tuning up will, in theory, upset the neutralising adjustment.

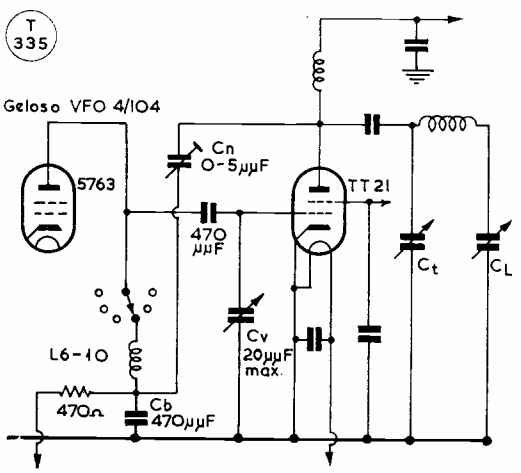


Fig. 1. Circuit illustrating the points discussed in the text, ensuring complete and accurate neutralisation of the RF power amplifier.

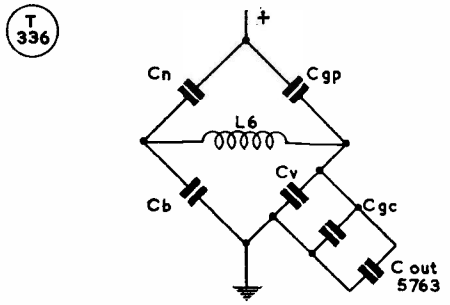


Fig. 2. The bridge circuit derived from the Fig. 1 arrangement — see text. Cn is the neutralising condenser; Cb, VFO by-pass capacity; Cgp, grid-plate capacity of PA valve (TT-21); Cgc, grid-cathode capacity of PA; Cv, trimmer; and Cout, plate-cathode capacity of 5763 driver stage.

In fact no difficulty was experienced. The cores of the coils L6-10 in the Geloso unit were peaked in the centre of the U.K. amateur bands, with *Cv* set at half mesh, so reducing to a minimum the variation in *Cv*.

The neutralising condenser *Cn*, Fig. 1, is adjusted in the usual way. With the HT supply to the PA disconnected, the VFO is allowed to warm up and then tuned to a frequency in the 28 mc band. The PA grid trimmer *Cv* is peaked for maximum grid current. With the *pi*-tank loading condenser *Cl* set to maximum capacity (minimum loading) the tuning condenser *Ct* is rocked through resonance. The neutralising condenser is then adjusted to minimise the change in grid current as the tank is tuned through resonance.

The HT voltage may now be reconnected and the *pi*-tank tuned in the usual way.

(1) This will vary with valves other than the TT21 and should be calculated from the formula given.

PUBLICITY FOR CLUBS

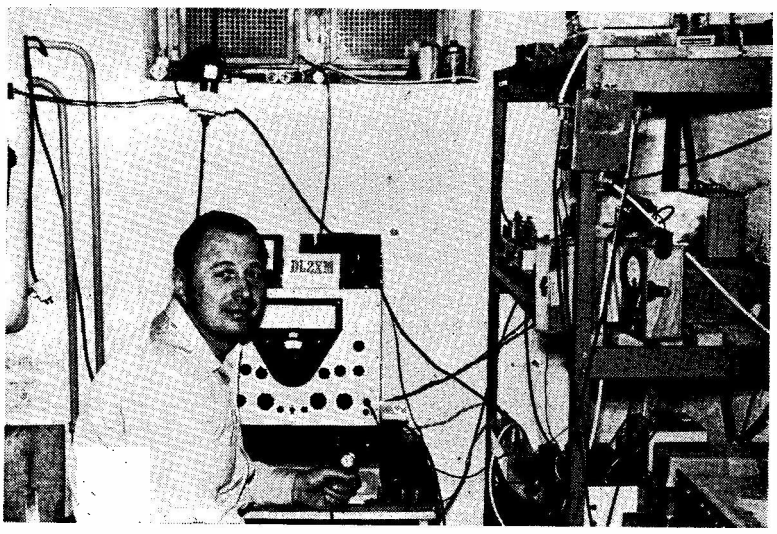
Though for many years now we have always devoted several pages every month to reports of Club activities, another factor that will keep Clubs alive and interesting to potential members is the support they can get from the local press. The editor of the *Brummapool Gazette & Advertiser* will always be glad to see short items, of two or three paragraphs, covering local radio club activities, particularly if the DX theme can be discussed. When sending them in, the name and address of the hon. secretary should be given, with the full title of the Club. This often will bring enquiries from many unexpected quarters.

RAYTHEON INTERNATIONAL SALES—W1WMZ

It is announced that J. F. Poplosky, who has been with the Raytheon Company of Lexington, Mass. since 1943, has been appointed assistant manager of the international sales and service department. He is active as W1WMZ, and has been licensed for the past 20 years.

THE OTHER MAN'S STATION

DL2XM



DL2XM is owned and operated by W. James (G6XM) and is located near München - Gladbach in Western Germany. Previous locations were at Farnborough, Hants., then York, and later Tollerton, Notts. He has spent more time travelling "in the interest of the Service" as a civilian than he ever did when actually *in* the Service during the last war!

G6XM says that most station photographs he sees are usually very tidy and laid out to the best photogenic advantage by the owner. However, judging from personal visits paid to stations, this general neatness seldom lasts, particularly if no advance notice of a visit is given!

The station of DL2XM is no exception. It is located in the cellar, where very little natural light ever filters through, but this is compensated for by always being at a temperature around 65°F., summer and winter. As the stint of duty with the British Army of the Rhine is for only three years, it was decided to keep things on a temporary basis. The main items of gear were packed on departure from England and installation commenced in October, 1960.

The operating table is an upturned packing case. Transmitters, modulator power supplies and other sundry items are carried on what is held on the QTH inventory as a "wine rack." The work-bench was installed by the previous tenant and consists of a heavy packing case lid. One end is screwed to the fuel bunker, the other end being supported on two legs! As no alterations or additions to electrical wiring are permitted, power is derived from a point in another room of the cellar and distributed *via* a long lead through the "octopus" hanging from the ceiling.

Proper safety precautions are, however, fully observed by the use of three-core cable and very thorough earthing of all units of the station.

All equipment is home constructed. The receiver is a 16-valve, 6-band single conversion superhet, and has been built primarily for SSB reception. It includes refinements such as audio and normal AVC, diode and product detectors, a 100 and 1000 kc calibration oscillator, variable band-pass crystal filter, and facilities for connecting a cathode ray oscillograph for modulation measurements. The dial calibration and S-meter readings can be corrected from the front panel. A power supply has not been included in order to reduce heat effects and to permit easier operation from portable supplies. The receiver is housed in an old CR-100 cabinet and also uses that receiver's original dial mechanism, but somewhat modified.

For reception on two metres, a cascode-type crystal-controlled converter is used, the IF range tuned on the main receiver being 28-30 mc. HT/LT for the converter is derived from the receiver power pack.

The station is controlled from the control unit on which the receiver is placed. This unit contains the power supplies for the receiver, converter and relays. Switches necessary to effect complete control are also included on the control panel. Subsidiary switches are fitted to the individual units to switch them off separately when not required.

The all-band, 10-80m., transmitter consists of a permeability-tuned Tesla VFO on 3·5 mc, cathode follower, the usual doublers, tripler and buffer amplifier driving the PA up to about 75 watts input. No wave-change switching is used except in the PA *pi*-tank, as the tuned circuits are of the multi-band type. Plate-and-screen modulation of the PA is by a three-stage audio amplifier driving a pair of 807's in Class-B. This speech unit is also used to modulate the two-metre transmitter, which is a very simple affair. Three valves are used, a 12AT7 overtone crystal oscillator and doubler to 48 mc, 5763 tripler to 144 mc, and an 829B in the final running about 50 watts input. Enough grid drive is obtained to ensure efficient CW and phone operation. Power

supplies for the transmitters are on a separate chassis and consist of three packs, one being regulated with a variable output of 175 to 350 volts.

Aerials at present in use are a multi-band doublet with a 102 ft. top, fed with 300-ohm ribbon and about 70 ft. of co-axial cable. The use of this run of coax cable is essential, as the shack is at the front of the house and the feeder has to go through another cellar to get there! For two metres, an indoor 4-over-4 slot-fed J-Beam is used, rotated by a CDR rotator from the controller on top of the receiver.

Most operating is on two metres, and although the aerial is indoors, over 130 stations in seven countries have been worked, including some in England. It is hoped to put the aerial outside before the winter, when much better results are expected. The HF bands are used mainly for regular schedules with U.K. stations, although DX is chased now and again.

Although in the trade in the sense of being a "professional amateur" and licensed—first for artificial aerial operation and later as G6XM in the early thirties—the bug still bites as strongly as ever. Many hours are spent on the bench trying out new ideas and building equipment. VHF operation has always been G6XM's first love and, in fact, the first transmitter ever built was for five metres, using a pair of "Cosmos" red spot valves in a push-pull TPRG oscillator.

Future projects include a filter-type sideband all-band transmitter, a fully transistorised all-band communication receiver, and a mobile/portable two-metre station, transistorised with the exception of the transmitter RF stages.

BUILDING A BAMBOO MAST

IN KNOCK-DOWN SECTIONS—USING NYLON GUYS—LIGHT AND STRONG

From notes by

C. M. PARRY (GW3PHH)

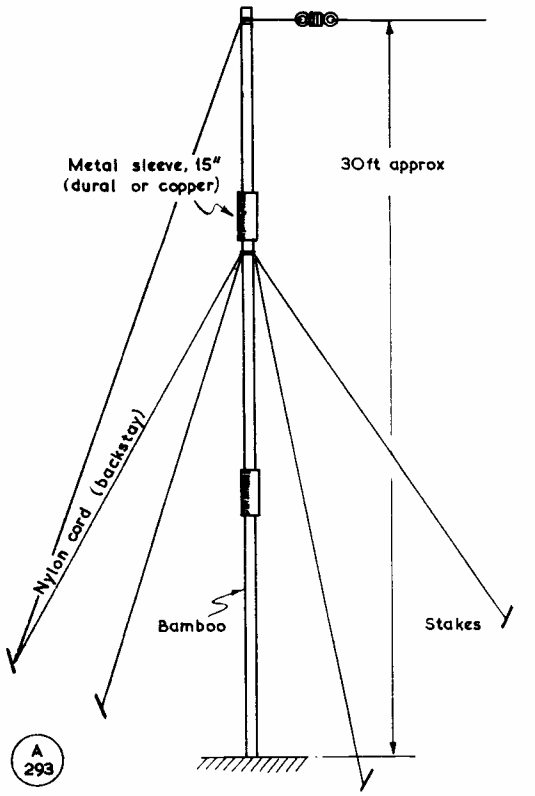
HAVING come up against the problem of finding suitable light, cheap masts for field-day operations and supporting temporary or experimental aerials, a number of ideas have been tried. The final result might be of interest to others, in particular Clubs.

The materials required are a number of stout bamboo poles—usually obtainable in 10/12-ft. lengths, and 1½-2 ins. in diameter—a few feet of copper or alloy piping of slightly smaller inside diameter than the bamboos, and a quantity of nylon cord for guys.

Procedure is to cut the pipe into 15-in. lengths, to form the collars to hold the bamboos; these are trimmed or sand-papered for about 7½ ins. at their ends, to make a force fit into the collars. Each piece of pipe should be tapped on to the bamboo length next below, so that when the upper length is pushed in, the joint is firm. So that the mast can be collapsed easily, for transport or stowing away when not wanted, obviously the idea is to have one section of bamboo with the pipe joint a fixture, into which the next length can be pushed in, or pulled out.

Four such 10/12-ft. sections, after cutting to make the joints and allowing for the footing, will make a mast about 40 ft. high—light, strong and portable. Two such masts, with their guys properly arranged, will support an aerial for any band. For masts of about 38-42 ft., only three guys of 200 lb. nylon cord, fixed at the upper joint, are required; they should be secured to stakes driven into the ground at an angle—*see* sketch. When raising the mast, another guy should be attached to the mast head, and secured to take the pull in line with the aerial. As the resultant of all the forces is pressure at the foot of the mast into the ground, it should rest in a shallow hole lined with stones.

A mast assembly such as that described here can be easily handled by two people—or, by working out approximate guy lengths beforehand, by one alone.



A simple transportable mast built up as described in the accompanying notes. Dural sleeves join lengths of bamboo, and all guy lines as well as the back-stays are of nylon cord. A mast on these lines knocks down to handy sizes, and is quickly erected for portable operation, or temporary experimental aerials.

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 U.K. section 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.

DL2IL, E. I. Owen *(ex-ZD1EO)*, 77 Spec. Tels. Wkshp., R.E.M.E., B.F.P.O., 34.

G3OPK, T. A. Proud, 11 Chesters Gardens, Crawcrook, Ryton-on-Tyne, Co. Durham.

G3OSE, C. Cookson, 28 Lingen Avenue, Hereford.

G3OWN, P. F. Winterburn, 74 Dickens Rise, Chigwell, Essex. *(Tel.: Hainault 6227.)*

G3OYM/T, W. E. Tomlin, 33 Severn Avenue, Tutshill, Chepstow, Mon. *(Stn. in Glos.)*

G3PBF, J. R. Orford, 48 Greville Road, Walthamstow, London, E.17.

G3PBV, W. D. Sellars, 9 Keppel Avenue, Haversham, Wolverton, Bucks.

G3PBY, The Elliott Amateur Radio Society, Airport Works, Rochester, Kent.

G3PDL, P. F. Linsley, 19 Taylors Avenue, Cleethorpes, Lincs. *(Tel.: Cleethorpes 63270.)*

G3PEK, B. D. Simpson, 48 Moorland Road, Woodsmoor, Stockport, Cheshire.

G3PFD, R. Nowles, 74 Rookery Road, Knowle, Bristol, 4.

G3PFR, Dr. M. W. Dixon, 19 Swarthdale Avenue, Ulverston, Lancs.

G3PFT, A. N. Heeley *(ex-VS9AAH)*, c/o 25 Edge Hill Road, Four Oaks, Sutton Coldfield, Warks.

G3PFX, C. Small, 51 Lower Woodside, Woodside, nr. Luton, Beds.

G3PGA, G. Dorling, 38 Settington Road, Fulham, London, S.W.6.

G3PGN, H. A. Buckenham, Steeple View Farm, Arterial Road, Laindon, Basildon, Essex.

G3PGQ, D. C. Yates, 19 Macleod Street, Nelson, Lancs.

G3PGS, J. W. Cooper, 5 Edgwood Road, Kimberley, Notts.

GW3PHN, S. B. Lord, 18 Maesgwern, Tumble, Llanelly, Carms.

G3PHX, J. Moore, 10 Loftos Avenue, Blackpool, Lancs.

G3PIH, F. R. Kent, 62 Longberrys, Cricklewood Lane, London, N.W.2.

GW3PIO, C. W. Owen, 1 Bron Graig, Treborth, Bangor, Caerns.

G3PIX, R. W. L. Jones, 24 Forest Avenue, Foresthall, Newcastle-on-Tyne.

G3PJL, J. H. Hampson, 72 Newall Road, Newall Green, Manchester, 23.

G3PJN, R. Hattersley, Hill Top, Gallery Lane, Holymoorside, Chesterfield, Derbyshire.

G3PJQ, A. E. G. Aldridge, 8 Bourne Avenue, Hayes, Middlesex.

G3PKR, K. E. Parker, 58 Lime Grove, Hayes, Middlesex.

G3PKT, A. F. Walker, 12 Devon Close, Rainham, Kent.

G3PMC, C. W. Kent, 146 Aldershot Road, Church Crookham, Aldershot, Hants. *(Tel.: Fleet 916.)*

G3PMD, A. Tranter, North Gloucestershire Technical College, Cheltenham, Glos.

G3PMR, A. H. Jubb, 18 Morton Terrace, Gainsborough, Lincs.

GW3PMR, A. H. Jubb, c/o Students' Union, University College of North Wales, Bangor, Caerns.

G3PMS, L. Ledward, 9a Birch Lane, Longsight, Manchester, 13.

G3PNN, W. Schaefer, 280 Longford Road, Cannock, Staffs.

G3POC, P. O. Cartwright, 55 Hermitage Road, Bridlington, E. Yorkshire.

G3POE, J. Simpson, 5 Berryfields, Melksham, Wilts.

G3POF, R. Whiting, 14 Rutland Crescent, Trowbridge, Wilts.

G3POG, D. V. Mawdsley, 7 Changford Green, Northwood, Kirkby, Liverpool, Lancs.

G3POI, C. Penna, 100 Grove Vale, East Dulwich, London, S.E.22.

GM3POK, E. J. Kelly, 101 Cluny Gardens, Edinburgh, 10.

CHANGE OF ADDRESS

DL2BA, D. R. A. Pontet *(ex-G3HAP/G3JTE/G3MRS)*, 19 Eugen Langen Strasse, Marienburg, Koln, Germany.

G2AKR, D. Barber, 16 Boxgrove Road, Sale, Cheshire.

G2COP, J. M. Foggo, Chesterfield Grange, Shenstone, nr. Lichfield, Staffs.

G2NV, H. Littley, The White House, Steephill Road, Ventnor, Isle of Wight.

G2TX, A. R. C. Johnston, Horsemans, New Brighton Road, Emsworth, Hants.

G2YU, S. R. Lowe, 23 Greenways, Bunwell, Norwich, Norfolk. *NOR.01.X.*

G3AVL, R. F. Reynolds, 15a Cranwell Road, Greasby, Wirral, Cheshire.

G3CEB, P. M. Scaddan, 1 Waltham Way, Frinton-on-Sea, Essex.

G3CIF, J. F. Rogers, St. George's Hotel, Truro, Cornwall. *(Tel.: Truro 2554.)*

G3CUZ, L. Keates, 15 Coniston Road, Hucknall, Nottingham.

G3DHB, D. H. Baynham *(ex-DL2DB / VS1GC / XZ2DB / ZB1DB)*, Tactics Wing, School of Signals, Catterick Camp, Yorkshire.

G3DIJ, L. Blackie, 66 Wantage Road, Carrville, Co. Durham.

G3DKK, B. Dobbert *(ex-DL2MK/VS2DX)*, 12 Command Workshops, Deysbrook Lane, Liverpool 12.

GM3EDZ, T. Hughes, 283 Bilsland Drive, Glasgow, N.W. *(Tel.: MAR 3227.)*

G3EIX, P. J. Naish, 6 Mildmays, Danbury, Chelmsford, Essex.

G3EKM, A. W. Tonkyn, 65 Treyew Road, Truro, Cornwall. *(Tel.: Truro 2629.)*

G3EPE, J. R. Smith, 84 Garstang Road West, Poulton-le-Fylde, Blackpool, Lancs.

G3EUJ, V. H. J. Potter, 23 Camp Road, St. Albans, Herts.

G3FTP, E. N. Davis, 379 Kings Road, Ashton-under-Lyne, Lancs.

G3FWB, P. L. Hunt, 10 Weston Way, Weston Favell, Northampton, Northants.

G3GHE, C. M. Nairn, Taharaa, Whitehouse Road, Woodcote, Oxfordshire.

G3HFJ, R. G. Wyatt, 20 Wyndham Crescent, Woodley, Sonning-on-Thames, Berks.

GM3HLH, J. Bishop, A.M.I.E.E., 7 Balcomie Road, Crail, Fife.

G3HMH, J. Shilling, 17 Longleat Crescent, Chilwell, Notts.

G3HSW, J. Cassidy, 23 Woodvale Gardens, Florist Hall Estate, North Wylam, Northumberland.

GW3HUM, H. W. Powell, 21 Tan-y-Bryn Estate, Valley, Anglesey.

G3ICH, P. N. Pitt, 40 Pirehill Lane, Walton, Stone, Staffs.

GI3ILK, H. C. Manning, Fairfield, Glenavy Road, Lisburn, Co. Antrim.

GW3INW, A. Davies *(ex-G3INW),* 2 Edinburgh Avenue, Caergwrle, Flintshire.

G3IUS, V. H. Emms, 30 Longleaze, Wootton Bassett, Swindon, Wilts.

GM3JGQ, A. Rossi, 9 Woodland Avenue, Kirkintilloch, Glasgow.

G3JSV, D. A. S. Holmes, Trees, Stock Road, Billericay, Essex.

G3KAJ, D. Jagger *(ex-GM3KAJ),* c/o 22 Welsh Street, Bishops Castle, Shropshire.

G3KLI, F. C. Beadle, 6 Uplands Way, Belgrave Road, Queenborough, Kent.

G3KMQ, R. G. Heslop *(ex-DL2ZO/DL4FH),* 19 Windmill Close, Shaftesbury, Dorset.

G3LQV, A. D. Eyers, Chel-Pamaldà, Horseshoe Lane, Leeds, Maidstone, Kent.

GM3LYY, J. T. A. Johnston, c/o Hurst, The Dunes, Munlochy, Ross-shire.

G3MDH, P. A. L. Shoosmith, 7 Fairfield Close, Hythe, Southampton, Hants.

G3MYS, H. E. Bagguley, Beechwood, Poplar Grove, Forest Town, Mansfield, Notts.

G3NAY, S. G. Whithorn, 53 Torbay Road, Allesley Park, Coventry, Warks.

G3NIK, J. M. Pattison, 33 Highfield Road, Cove, Farnborough, Hants.

G3NVP, B. K. Mapp, 33 Cotswold Drive, Kirkleatham Estate, Redcar, Yorkshire.

G3OFK, N. P. Henry *(VU2RG/AP2N),* 19 High Ash Avenue, Alwoodley Estate, Alwoodley, Leeds, 17.

G3OHM, South Birmingham Radio Society, c/o J. Harvey, 2a The Avenue, Rubery, Birmingham.

G3OJY, A. M. Laidler, Trevarrack Cottage, Rosudgeon, Penzance, Cornwall.

GM3OOI, D. S. L. Yeo, 28 Chalmers Street, Edinburgh 3.

G3ORY, R. G. Titterington, 8 The Coppice, Handsworth Wood, Birmingham 20.

G3OZT, R. A. E. German, 10 Beverley Road, Hythe, Southampton, Hants. *(Tel.: Hythe 3198.)*

G5RZ, A. G. Wood, Borderlands, Park Road, Leighton Buzzard, Beds. *(Tel.: Heath & Reach 305.)*

INTERESTING VLF PROJECT

To augment the communication facilities of NATO, work has just started on a VLF/CW station, sited on a disused airfield between the villages of Anthorn and Cardurnock on the Cumberland side of the Solway Firth. Reliability is the prime essential for this station and accordingly high power (500 kW into the aerial) and a very low frequency (19 kc) will be used to ensure that as far as possible transmission is immune from ionospheric disturbances. The gear will be duplicated to avoid interruption due to mechanical or electrical failures.

Aerial Layout

The site is particularly suitable for a VLF station. Of about 700 acres, it is on flat land of low resistivity. The transmitting plant will be located at the centre of the site, and the aerial system will consist of six separate radial rhombic-shaped sections suspended from thirteen masts about 700 ft. high. The aerial is to be built of cadmium-copper conductor of 1-in. diameter, to ensure not only the strength to carry a heavy coating of ice, but also to enable it to operate without perceptible corona effect at the working voltage of 120 kV. Twenty miles of this conductor will be needed, weighing about 100 tons. Insulation will be by compression-type insulators, and tension-limiting gear on the halyards will cause the winches to lower an aerial section automatically if icing or weather conditions produce overstress.

The transmitter building is to be extensively screened, and this screening will be connected to a radial earth-wire system consisting of O-gauge copper wires laid radially at 2° intervals to a depth of 12 inches, with all joints welded to obviate bi-metallic corrosion.

Aerial tuning will be by a fixed coil in series with a variometer, itself automatically controlled to compensate for variations in aerial capacity due to weather effects. An aerial circuit efficiency of 30% is expected. The transmitter output and aerial coupling circuits will be accommodated in a copper-lined room, with the lead-out to the aerial through a large bushing in the roof.

The transmitter itself starts with a 50-milliwatt driver stage, followed by five amplifiers to build up to the peak power of 500 kW into the aerial, on 19 kc ; a high standard of frequency stability will be maintained, and the transmitter will be capable of keying speeds up to 45·5 bauds, A1 (CW).

Associated with the design and provision of this station—the contract for which has been placed with an American concern—is the British firm of Redifon, Ltd., and other U.K. firms are sub-contractors for the aerial installation and power plant.

SOME NAMES IN OUR BOOK

During the recent Amateur Radio Exhibition in London, following are some of the overseas visitors who signed our visitors' book: DL2YU, DL2ZD, MP4BDH, OD5LX, PAØFB, SV1AC, SV1AD, VK4ZBA, VK5HA, VK9PJ, VS9XZ, VU2XG, 5N2LUP, 9G1CH, and 9M2DQ. We were also glad to welcome two ladies holding calls, G2YL and G3IYL.

THE SIXTEENTH MCC

The Magazine Top-Band Club Contest November 11-12 : 18-19, 1961

SOMETHING would be wrong if we were not able to report the setting-up of a new record for MCC entries this year, but we knew even on the first Saturday that activity was higher than ever before. Sure enough, the Sixteenth MCC produced 71 logs by the closing date (compared with 59 last year), and it is estimated that at least 80 Clubs put in some sort of appearance during the contest.

Scores cannot be compared with those of previous events, owing to the new "loaded" scoring system, but the pace of the contest was faster than ever before, and the top-scoring stations had to work really hard to make all the necessary contacts during the time available.

For the first time in the series, a Northern station carried off the honours, and handsomely at that: **Hallamshire (G3JHC)** topped the thousand mark and put themselves in leading position by a commanding margin.

1st: Hallamshire, G3JHC *(Northern)*	...	**1007**
2nd: Port Talbot, GW3KSQ *(Western)*	...	**938**
3rd: Harlow, G3ERN *(Southern)* ...	...	**905**

Port Talbot (GW3KSQ) were the runners-up, with **Harlow (G3ERN)** a fairly close third.

In fourth place was the "old reliable" **Stourbridge (G3BMY),** heading the Midland region with his score of 890. So those few who criticised the scoring system are asked to take note that in the first four we have one Club from each of the four main regions, N, W, S and M . . . which has brought a certain amount of satisfaction to the handicappers.

The new scoring system undoubtedly gave some advantage to the Northern and Western regions (which it was intended to do) but the interesting point is that *even under the old system the same Club would have won.* Table II shows that under last year's system we would have had *Hallamshire* and *Harlow* sharing top place, with *Stourbridge* only one point behind—a remarkable result.

So we are pleased to give credit where credit is due, and to state positively that G3JHC won the event by reason of a potent signal and good operating, and not because of the scoring system. And the said "potent signal" was no doubt helped by their half-wave end-fed aerial at a height of 70 feet!

The runners-up, *Port Talbot (GW3KSQ)* also had a half-wave aerial, but it was "bent" and they do not state the height. However, their own signal was always outstanding, at least in the south of England. *Harlow (G3ERN)* unfortunately do not mention their aerial, but from the signal put out we have little doubt that they, too, were using a half-wave.

Participation

It was a little surprising to note the marked preponderance of stations in the Southern region, where 32 Clubs took the air; Midland put up 19 of them, Northern 17, Western two and Far North (GM) only one (although we do know that a second GM was on the air at times).

As for several years, there was no activity from GD, GI or GC, which seems a great pity, since an energetic station in any of those areas would have been much in demand.

There is no doubt that the Scottish stations are still heavily handicapped by sheer distance, and it may be necessary in future to allow them 10 points per contact, or possibly to introduce a multiplier, to

The happy chaps of the Hallamshire Radio Society, Sheffield, who signed G3JHC and won the 16th Magazine Club Contest with the magnificent total of 1,007 points, in a field of 71 Clubs. Left to right: G3JHC, G3MFX and G3KVG. Their transmitter was a 6AG7-SP61-807 job, through an ATU into a half-wave aerial 70 ft. high at the centre (which took them three week-ends to erect). The receiver was an Eddystone S.640, using the Rx send-receive switch for change-over.

encourage others to go all out for a GM contact.

Conditions

The state of the band was excellent, except that the first night was slightly poorer than the other three. Even then, however, scoring was fast and furious and no one could have called conditions bad (except for one unfortunate club who operated on November 11 without an aerial on the transmitter!).

As viewed from the South, the Northern stations were coming in right from the start at good strengths, and one checking station, at least, was marvelling at the poor reports that some of them were being given in comparison with his own loggings. Can it be that too much emphasis has been put on transmitters for this event, with not enough trouble taken over receivers ?

As an indication of the variable conditions, it is noted that the winners scored 191 points on the first night, 237 on the second, 282 on the third and 297 on the fourth—obviously profiting from experience as they went along. The runners-up showed a

TABLE I: POSITIONS AND SCORES

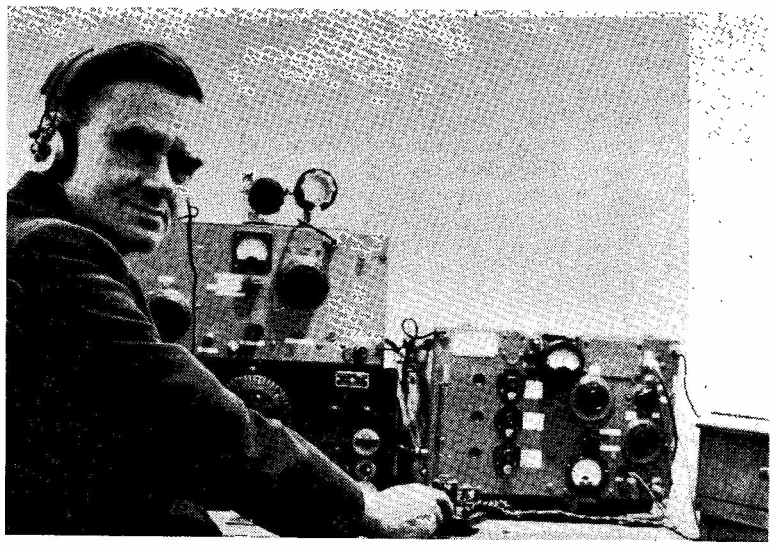
	CLUB	REGION	POINTS
1.	G3JHC, Hallamshire	N	1007
2.	GW3KSQ, Port Talbot	W	938
3.	G3ERN, Harlow	S	905
4.	G3BMY, Stourbridge	M	890
5.	G4JW, Sheffield	N	834
6.	G3KIN/A, Kingston	S	831
7.	G3LCS, Wolverton	S	793
8.	G3AHD/A, Liverpool	N	787
9.	G3OBR, Aldershot	S	781
10.	G3FM, Reigate	S	779
11.	G3EFX/A, Harrow	S	777
12.	G3KXT, Surrey	S	774
13.	G3NWR, Wirral	M	725
14.	G3IGW, Halifax	N	714
15.	G3EKW, Nottingham	M	709
16.	G3OCT, Mitcham	S	684
17.	G3MSZ, RAF Watton	M	669
18.	G3ASR, Edgware	S	659
19.	G3JLA, Stevenage	S	650
20.	G3GHN, Clifton (London)	S	649
21.	G3MHB/A, Bradford Grammar School	N	638
22.	G3KQH, Overstone (Northants)	M	627
23.	G3FNV, Chester	M	618
24.	G3WL, Plymouth	S	599
25.	G3NIS/A, Standard (Harlow)	S	597
26.	G8TA, Wolverhampton	M	592
27.	G3IDV/A, Hartlepools	N	575
28.	G3PIA, AERE, Harwell	S	557
29.	G2ASF/A, Coventry GW6GW, Blackwood	M W	550 550
31.	G2BOF/A, Sutton and Cheam	S	543
32.	G3NGZ, Little Rissington	S	541
33.	G5YC, City and Guilds (London)	S	514
34.	G3OAM/A, Rotherham	N	505
35.	G2FJA/A, Medway	S	501
36.	G3LRS, Leicester	M	500
37.	G2CUZ, Ainsdale (Lancs.)	N	482
38.	G3FRV, Crawley	S	477
39.	G3DDI, South Shields	N	467
40.	G3IIU, Acton, Brentford and Chiswick	S	456
41.	G3OXD, Albright and Wilson (Birmingham)	M	425
42.	G3ILO, Dursley, Glos.	S	404
43.	G3IYT, Grimsby	M	401
44.	G3AFT/A, Grafton (London)	S	379
45.	G3LST, Brentwood	S	378
46.	G3OHM, South Birmingham	M	377
47.	G3NJN, Blackpool	N	371
48.	G3FKF/A, Salisbury	S	369
49.	G3OUF/A, St. Benedicts (London)	S	362
50.	G3FVA, South Manchester	N	356
51.	G3FWW, Burnham-on-Sea	S	351
52.	G3ERD/A, Derby	M	330
53.	G3FTQ, Purley	S	328
54.	GM3LUM, Leven (Fife)	F	318
55.	G3LTY, East Kent	S	316
56.	G3ENT/A, North Kent	S	309
57.	G3LUU, Leeds University	N	305
58.	G3HEV/A, Ravensbourne (London)	S	293
59.	G3DOE, Thanet	S	287
60.	G3LDT, Macclesfield	M	283
61.	G4BP/A, Scarborough	N	281
62.	G3PHC, Painton (Northants)	M	274
63.	G2FCL, Morecambe	N	273
64.	G3NIB, British Timken (Northants)	M	267
65.	G3HVI/A, Burslem	M	216
66.	G3KUE/A, Preston	N	213
67.	G3OWM, Durham University	N	206
68.	G3COY/A, 238 Sqdn. ATC (Stoke)	M	203
69.	G3GBU, Stoke-on-Trent	M	192
70.	G3FZC, Guildford	S	154
71.	G5FK, GEC Research (Wembley)	S	114

similar pattern; but the third scorers *(Harlow)* were much more consistent, their four totals being 200, 228, 243 and 234.

Scoring Rate

Had any clubs been able to work all other contestants during one session, the possible *maxima* were heavily loaded in favour of the F and W districts. Maximum clubs-only points per session would have been 357 for an F station; 330 for the W zone; 298 for N zone; 266 for S zone; and 263 for M zone. The very close "possible" figures for Midland and Southern stations make it surprising that in the Top Twenty there are 10 Southern stations but only four Midlanders.

One can also measure the greatly increased *tempo* of the battle by noting that (on the old scoring system) anything over 600 points in 1960 would have put one among the first three; whereas in 1961 over 700 points were needed for the same sort of position. However, the old scoring system is now done with, and the present method will stand (possibly with small modifications) for future years. For this reason we have not set out the traditional "Roll of Honour" throughout the years, but will take 1961 as a landmark and start again.



A very fine single-operator effort by GW3KSQ — notice that determined look — put Port Talbot Radio Society into second place in this year's MCC, with 938 points. His Tx ran an 807 in the PA, the aerial was a 250 ft. end-fed wire, and the receiver a modified HRO-MX, with full break-in facility.

Operating

Many clubs made comments, caustic and otherwise, about the standard of operating. On the whole it was high; but there were two glaring faults being committed by many operators. First was the misuse of "BK"—if you call CQ and several stations reply, how are they all to know which one you mean if you go back only with "BK de G . . ."? Even if you *hear* only one reply, it doesn't follow that others have not also called; a really bad operating fault, this, and being committed all the time by several clubs. Second came the terrible waste of time by clubs signing off after a contact and immediately calling a long CQ, although others were QRX on the frequency and all ready to call at once. As a master-stroke for losing points, this practice could hardly be beaten. The leading stations found CQ calls almost unnecessary.

Crowding between 1820 and 1850 kc was again evident, and quite unwarranted; but clubs who tried to break the spell by calling CQ outside these limits met with so little response that they came back and joined the pack, swelling the QRM level again.

Stray Comments

We were glad to see so many comments on the way things went, especially in the matter of operation, and we quote here some of the most pertinent: "Conditions infinitely better than last year . . . reception excellent throughout; score of over 300 points this year makes us feel better" *(Leven)* . . . "Found that seven people in a seven-by-five shed cramps the style of the operator; the last Sunday was our best, with 48 Club contacts" *(Medway)* . . . "We found the hours rather awkward and think 1900-2200 would be much better" *Purley* . . . "We can find no fault with the new scoring system, although we expect the winners again to be from the Midland area" *(Liverpool)* . . . "Very exciting contest, and the scoring system gives Northern stations a better chance" *(Bradford G.S.)*.

"Located in our country shack, we were beset by many gremlins which could not be fixed on site" *(Stoke-on-Trent)* . . . "After the first session, we found that it was better to work with an antenna fixed to the transmitter!" *(Burslem)* . . . "Why did stations remain so bunched together?" *(Edgware)*

NOTICE TO ALL HONORARY SECRETARIES

Publication of the usual Club reports will be resumed in the February issue, for which the closing date is January 12. Appearance in this space is free to those Clubs who care to make use of it for publicity and the reporting of their activities. Hon. secretaries are asked to ensure that their reports, addressed "Club Secretary," Short Wave Magazine, 55 Victoria Street, London, S.W.1, reach us by the date given each month. It is impossible to write in late reports, received after we close for press. All reports must include the name and QTH of the hon. secretary, for publication in the address panel.

. . . "Inclusion in the Southern zone placed us at a disadvantage; suggest Devon and Cornwall be included in the Western zone for 1962?" *(Plymouth)* . . . "Scoring is a real good system, but our locals are not keen on One-Sixty" *(Scarborough).*

"We arranged the contest as a Club event, the 'old timers' taking two of the sessions and the newly-licensed members the other two; the 'old timers' won by 15 points" *(Grimsby)* . . . "A new rule should be added, limiting the number of CQ's before signing to three. We counted 25 from one station before we got fed-up" *(Surrey)* . . . "Unable to obtain entry into our Clubroom until 1930 on the first evening, and we only managed four contacts" *(Blackpool)* . . . "Our call-sign GW6GW was treated with suspicion by a number of stations; rather cut-throat tactics were used by some stations, but most managed a 'GL' or 'GE'" *(Blackwood)* . . . "Why must some people send about 35 w.p.m. on a bug when a short burst of QRM loses the whole report?" *(Leicester)* . . . "In view of the very strong signals being received by us, we considered some of the reports inward to be rather meagre, which suggested receiver troubles" *(Hallamshire).*

"A counterpoise gave us a fantastic improvement over last year's effort" *(Wolverhampton)* . . . "One or two operators adrift in contest technique—long calls and CQ's unnecessary. Midland stations, being bordered by 4-point zones, still retain advantage" *(Reigate)* . . . "Some really excellent operators from some Clubs, but others obviously scraping the bottom of the barrel" *(Kingston)* . . . "Main difficulty was in copying stations replying at high speed. The subsequent QRZ's and 'repeat Nr, OM' wasted a lot of time. The really *top* stations were not guilty of this fault" *(Albright & Wilson).*

G3ERN, Harlow Radio Society, came up again in the 16th MCC, gaining third place with 905 points. Here we see the operating team, with G3ERN at far right, G3IPG nearest camera, and G3JVI in the middle; their fourth operator, G3LIT, was not available when the photograph was taken. They had the largest number of club contacts.

Bad Technique

"Poor timekeeping by some stations; several were heard before 1700 and even more after 2000. And a big moan about the indiscriminate use of 'BK,' and poor acknowledgment of the other station's number . . . but a big bouquet for the excellent QRQ operating standards of one or two stations" *(Wolverton)* . . . "Cannot understand why we have difficulty in scoring if we get on a nice clear channel on the outskirts of the main bunch and call CQ. Do stations search over more than 20 kc? Or do they have trouble in re-setting Tx frequency? This only seems to occur in Club contests" *(Stourbridge)* . . . "Not many stations heard from the North, and none from Scotland" *(East Kent).*

"Tried several calls in the 1900-2000 kc section, but no contacts; all the Clubs seemed to be working between 1800 and 1850 kc and QRM-ing one another" *(British Timken)* . . . "Had we been one mile *east* across the river, we would have been in the Northern zone and our total would have been up by 97 points" *(Wirral)* . . . "The Harwell shack was extremely cold despite the numerous reactors about" *(AERE, Harwell)* . . . "Not a very inspiring effort, but we have to start somewhere and should do better next year"

TABLE II

Club and Non-Club Stations Worked by the "Top Ten"

	CLUB	CLUB CONTACTS	NON-CLUB CONTACTS	SCORE UNDER NEW/SYSTEM	(OLD)
1.	G3JHC, Hallamshire (N)	225	54	1007	(729)
2.	GW3KSQ, Port Talbot (W)	194	20	938	(602)
3.	G3ERN, Harlow (S)	228	45	905	(729)
4.	G3BMY, Stourbridge (M)	226	50	890	(728)
5.	G4JW, Sheffield (N)	189	31	834	(598)
6.	G3KIN/A, Kingston (S)	213	35	831	(674)
7.	G3LCS, Wolverton (S)	211	9	793	(642)
8.	G3AHD/A, Liverpool (N)	179	23	787	(560)
9.	G3OBR, Aldershot (S)	209	11	781	(638)
10.	G3FM, Reigate (S)	203	30	779	(639)

(GEC Research).

" Non-club stations should score as two points and be allowed to count on each day " *(R.A.F. Watton)* . . . " We would like to know where all these stations disappear to when there is no contest " *(Aldershot)* . . . " The new rules may favour the Midland clubs, but we are quite happy with them " *(Harrow)* . . . " Had planned to use a balloon aerial, but a series of mishaps prevented it " *(Sutton & Cheam)* . . . " Hindered by saw-tooth harmonics from an unlocated TV set " *(St. Benedicts)* . . . " Change of QTH gave us an inferior aerial " *(Leeds University)* . . . " Highest amount of local QRM ever encountered in an MCC " *(Grafton).*

We have not quoted the many entrants who merely said " Most enjoyable contest — looking forward to next year." We hope it really was, and that they really are. Comments on the scoring system were very favourable, with the few exceptions already mentioned. It was generally realised that it was a try-out of a new system and that it might succeed or fail. Fortunately, it seems to have succeeded—but various small changes may well be devised for next year. Our statisticians point out all sorts of strange possibilities: had there been *more* Northern stations on the air, the Midland stations would have had a better chance ; and it was the high activity in the South that made it possible for the North to win (at five points per QSO).

Organisation

There was a large number of single-operator stations, and in general they did better than the multi-operator efforts—which proves, if anything, that the latter should organise themselves a little better ! There were many cases of non-Club stations being worked on more than one occasion (for which points were duly docked), showing that log-keeping was not always clever. And of course there were the usual early-starters and late-finishers, most of whom were spotted by the invigilators and duly penalised. (Those who don't know the meaning of QTR ? might look it up !) As mentioned on previous occasions, MCC is always monitored for infringements—never mind who by !

Logs

The logs were uniformly good this year, and the scrutineers report with pleasure that not a single one of them caused eye-strain or trouble in deciphering. (The one from *Blackwood* was seven feet long, in one piece on teleprinter paper, which hardly came under the heading of foolscap or quarto, but it was nicely typed and passed the scrutiny !)

Late logs, received several days after the closing date, came in from G5BK, Cheltenham, claiming 783 points, and from G3PAD, Paddington, 362 points. To our great regret, it was not possible to check these for inclusion in the Tables. They could have brought the total entry up to the mystic figure of — 73 !

Check logs were gratefully received from D. L. A. Law (Leicester), G3FST (Gravesend) and G6HH (Hastings), the latter having made a dummy run only, on account of shortage of operating time on three nights out of four. SWL Law made several very useful comments—" too many long CQ's ; too many people sending faster than they were able to ; overcrowding," and so on. And had it been run concurrently as an SWL contest, which he suggests for the future, he would have had a tremendous score.

Thanks to all who took part and made such a success of this contest ; we feel sure that they will all be back next year, together with some new recruits.

Finally, a note to Club Secretaries to remind them that the deadline for next month's activity reports is **Friday, January 12, 1962.** They should be addressed to " Club Secretary," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. And meanwhile we wish all secretaries, officials and members a Happy and Successful New Year.

TABLE III

Top Scorers in the Regions

	Northern	
1.	Hallamshire, G3JHC	1007
5.	Sheffield, G4JW	834
8.	Liverpool, G3AHD/A	787
	Midland	
4.	Stourbridge, G3BMY	890
13.	Wirral, G3NWR	725
15.	Nottingham, G3EKW	709
	Southern	
3.	Harlow, G3ERN...	905
6.	Kingston, G3KIN/A	831
7.	Wolverton, G3LCS	793
	Western	
2.	Port Talbot, GW3KSQ	938
29.	Blackwood, GW6GW	550
	Far North	
54.	Leven, GM3LUM	318

SATELLITE COMMUNICATION DEVELOPMENTS

The Post Office has under construction an experimental station on Goonhilly Downs, The Lizard, Cornwall, to be operated in association with the Americans on a programme for testing communication across the Atlantic *via* satellite. A corresponding station is being built at Rumford, Maine, U.S.A. Known as projects " Relay " and " Telstar," the satellites are to be active repeaters (triggered from the ground) and will be launched by the Americans during 1962, in elliptical orbits inclined at 50° to the equator, out to a maximum distance of 3,000 miles. The G.P.O. station at The Lizard is being equipped with an 85 ft. steerable dish, automatically controlled to follow the satellite. The transmitter room is in " the eye of the beam," *i.e.* built into the aerial assembly. It will accommodate a transmitter, supplied by Standard Telephones, giving an FM output of 10 kW in the 2000 mc (15-centimetre) band. Target date for the station to be operational is April, 1962. A long series of tests will be necessary, and many problems will have to be solved, before a commercial satellite communication system can be established.

SMALL ADVERTISEMENTS

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SITUATIONS VACANT

AIR MINISTRY have vacancies for CIVILIAN RADIO TECHNICIANS at R.A.F. Sealand. Cheshire ; R.A.F. Carlisle ; and other R.A.F. stations throughout the United Kingdom for the servicing. repair, modification and testing of air and ground radio and radar equipment. Commencing salary (National) (according to age) is £630 to £810 p.a.; max. salary £930 p.a. Rates are subject to small deduction at certain provincial stations. A limited number of houses may be available for renting at West Kirby, some 15 miles from Sealand.—Apply to Air Ministry, C.E.3h, Princes House, Kingsway. London, W.C.2, or to any Employment Exchange, quoting City O/N 2427.

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QSL CARDS: Buff, blue, pink, green. 100, 14s. 6d.; 250, 23s.; 500, 40s.; 1,000, 75s.—Samples (s.a.e.): Reilly, Panxworth, Norwich, 56.Z.

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FOR SALE: FB Eddystone S.640; 6BA6 1st RF stage, extra IF stage, S-meter, handbook, £20 or near. Two-valve Preselector, 1·5 - 30 mc, £4 or near. Also 2-valve pre-amp., comm. built, mike-tape inputs, £4 or near.—Apply Cross, 38 Doncaster Road, Hatfield, Nr. Doncaster, Yorks.

BRT-400, speaker, handbook; very good mech. and elec. condx., unmodified (owner going abroad), £75 o.n.o.? Buyer may view and collect.—Wilson, 154 Park Road, West Hartlepool.

R.107, excellent, aligned, fitted S-meter, manual, £9 10s.; £1 carriage. Q5'er, new, 6v. heaters, £3 10s.—G3NEK, 151 Halifax Road, Brighouse, Yorkshire.

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SMALL ADVERTISEMENTS, READERS—*continued*

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S-88

FM TUNER

VF-1U

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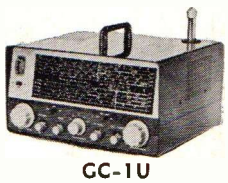

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