

The

SHORT WAVE

Magazine

2/9

VOL. XIX

MAY, 1961

NUMBER 3

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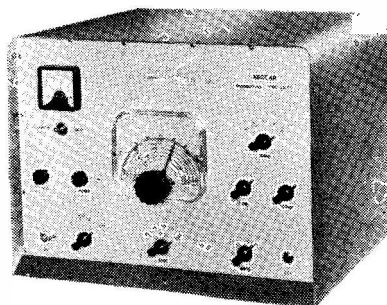
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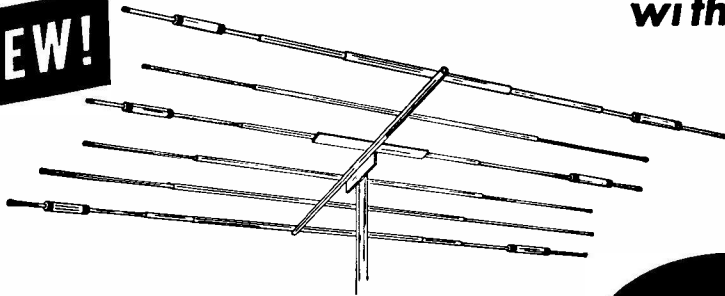
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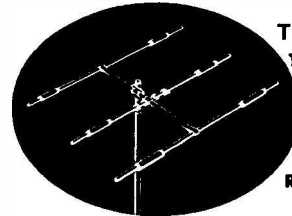
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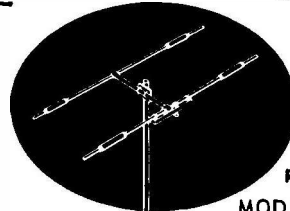
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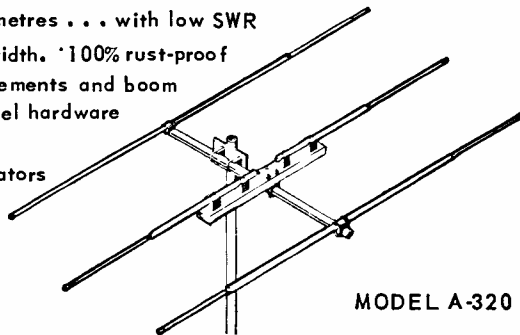
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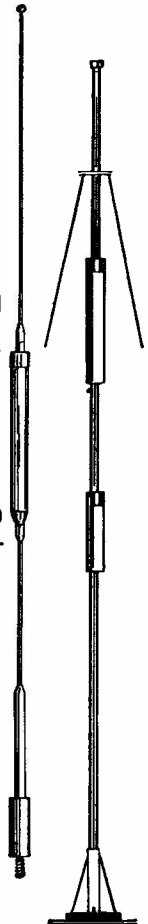
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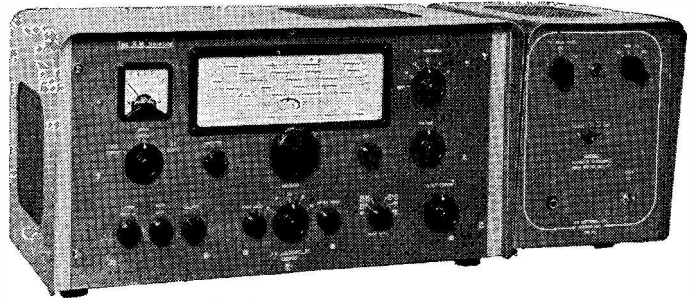
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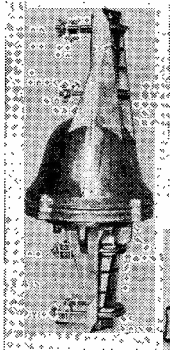
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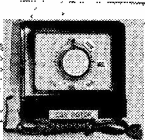
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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Portable *With the coming of spring and the prospect of a fine summer, the thoughts of many keen radio amateurs will be turning once again to the possibility of portable, mobile or field day operation, away from the home station.*

This side of Amateur Radio activity does not get quite the support or attention it deserves. To some, "going portable" means loading up a couple of large receivers, a 150-watt transmitter and a petrol-electric generating set on a lorry, together with several telescopic masts, and going forth accompanied by a band of willing helpers in a fleet of cars. To others, it suggests the business of getting specialised gear built up to take part in the various summer VHF activities.

But to a few, what portable work really means is the design and construction of miniaturised and simplified equipment, which is self-contained for power and, incorporating a universal output coupler enabling any available length of wire to be energised, can be operated on the regular communication bands with low-power CW and perhaps phone—the whole outfit being sufficiently compact (and portable!) for use from a car, in a boat or a caravan, or even in a hotel bedroom. The design of apparatus of this kind calls for much ingenuity and a fairly high degree of constructional skill. But unquestionably it will demonstrate that a watt or two of RF, when properly used, can be made to give the most surprising results. And going portable in the fullest sense will be found an undertaking of quite unusual fascination and interest.

Operation away from the home station has been given a new flavour and meaning by the great interest there is nowadays in mobile working. Some modern U.K. /M installations are sufficiently elaborate and well found to be used, as they stand, as portable stations at fixed sites, it being only necessary to run out a wire of suitable length from the vehicle to a convenient support to be on the air.

*Austin Fobell
G6FO.*

WORLD-WIDE COMMUNICATION

Snappy Change Over System

VERSATILE CONTROL
CIRCUIT FOR SINGLE-
SWITCH OR BREAK-IN
WORKING

M. A. SANDYS (G3BGJ)

IT might be argued that full "break-in" is not an essential feature of an Amateur Radio station, on the grounds that amateurs seldom use the professional procedure of interrupting the transmitting end when an error occurs in reception. This is indeed true. Apart from interrupting the initial CQ a good deal of what is called "break-in" in amateur working could equally well be achieved by a single transmit-receive switch placed near the key, and in fact this facility is favoured by many amateurs in preference to full "break-in."

There are occasions, however, when full "break-in" does make for more efficient operation, not so much by the ability to interrupt as by keeping the transmitting operator in constant awareness of the state of his frequency. For instance, the sudden appearance of interference becomes at once obvious. Needless calling is eliminated when a CQ'er promptly returns to another station.

A system which permits either single switch operation or full "break-in" to be employed at will should therefore have double appeal to the AT station operator keen on CW working.

General Requirements

No detailed instructions will be given as the system may be embodied in a variety of equipment. There are, however, certain features which the transmitter should possess if the modifications are to be performed with the minimum of trouble. Before outlining these, it is as well to point out that the receiver must employ a muting device of the type found in the CR-100. It is not difficult to incorporate this method of muting in most receivers; the modifications to the writer's R.1155 are shown in Fig. 2, of which more later.

The main requirement is that the transmitter should have at least one buffer or multiplier (with a standing current of not less than 9 mA) preceding the PA, and the latter should utilise a clamp tube or other means of limiting the PA current in the absence of drive; a pi-

section output is desirable though not essential; HT should be applied to both the PA and preceding stages by one switch, this becoming the transmit-receive switch. If these conditions—typified by the transmitter layout at a great many amateur stations—are fulfilled the modifications are easy to carry out; the original wiring needs to be broken into at only three points, to insert the "break-in" switch and the relay—see Fig. 1 opposite.

The relay is the only component to which the amateur may not have ready access. It is a G.P.O. Type 600 of 2800 ohms DC resistance and operating current of 9 mA, having one change-over, one make and one break contact. It keys extremely well at hand speed. The writer's specimen was obtained brand new and very cheaply from Abel Radio Ltd., 283 Edgware Road, W.2. Any other relay which can be arranged to perform the required switching functions with the control current available could equally well be used.

Other points of interest are that neither a separate receiving aerial nor separate relay supply are required.

Single Switch Operation

The essential features of the system as applied to the writer's transmitter are shown in Fig. 1. The relay, with by-pass capacitor C1 and potentiometer VR1, is inserted in the anode of V3, with the cathodes of V1 and V3 taken to the "break-in"/"normal" switch SW1 (shown at "normal"). In this position the key is placed in the VFO cathode and V3 cathode returned to earth.

In the absence of HT the relay A/3 is de-energised. Contact A2 connects the transmitter aerial *via* a coaxial link to the receiver aerial socket. Contact A1 is taken to the receiver by a screened lead, terminated at each end by a Bulgin screened jack, and shorts the muting resistance (VR1, Fig. 2), thereby allowing reception to take place. Contact A3 is out of circuit.

When HT is applied to the transmitter by the single HT switch, relay A/3 is energised. If not, VR1 in Fig. 1 should be adjusted, commencing with minimum resistance and increasing until the relay "pulls in." Contact A1 then opens, muting the receiver. Contact A2 disconnects the aerial from the receiver and earths the receiver input. The key may now be pressed and VR1, Fig. 2, adjusted for a pleasant note. V3 current, of course, should not drop appreciably when the key is down. (Before inserting the relay it should be ascertained that this is indeed so on all bands. If the relay should

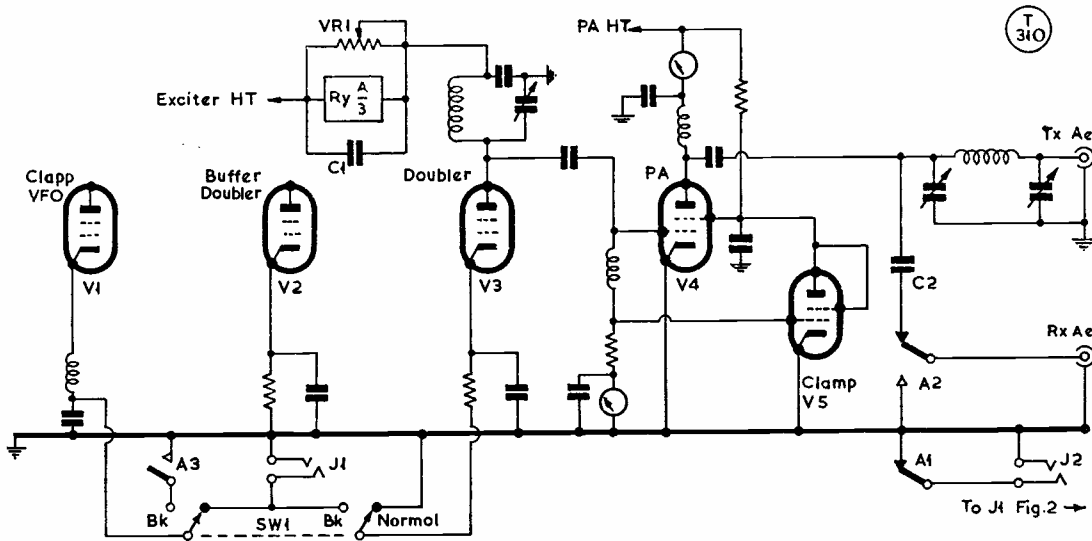


Fig. 1. Transmitter layout to which the BK system described by G3BGJ can be applied. The stage in which the relay Ry-A/3 is included should run a standing current of not less than 9 mA, with the PA clamp controlled. Switch SW1 selects for BK operation, as is shown at "normal"; keying is at jack J1. Values are: C1, .01 μ F mica; C2, 100 μ F mica; VR1, 2500-ohm wirewound potentiometer, rated one watt at least; J1, J2 are open circuit jacks; SW1 is 2-pole, 2-way.

"drop out" when the key is down, contact A2 may be damaged by excessive RF current.) Removing the transmitter HT restores reception immediately. (Not shown in Fig. 1 is the HT switch, as this is a matter of individual design, as is the netting switch for applying HT to the VFO alone.)

Break-In

Placing SW1 in the "break-in" position inserts the key in V3 cathode and transfers the VFO cathode to the contact A3. Switching on the transmitter HT does not now shut down reception as V3 cathode is open and the relay remains de-energised, but on pressing the key (at J1, V2) the relay functions described in the previous paragraph take place, with the addition that the VFO is now keyed by contact A3. Immediately the key is lifted reception is restored.

It should be noted that with HT on and the key up the PA is drawing current and any noise developed in this stage will appear at the receiver input, hence the double need for a limiting device. It is in the interests of noise reduction, too, that V3 is the keyed stage and not V2. It was found in the writer's transmitter that with V2 cathode open and V3 cathode earthed, noise generated in the latter would appear at the receiver, even with the PA screen voltage completely removed. As it is, there is no noticeable increase in receiver

noise when the HT is applied to the PA.

The Receiver

Fig. 2 shows how a receiver like the R.1155 can be modified to incorporate muting. The earth connections to the cathodes of the RF amplifier and two IF amplifiers are broken and the cathodes taken to the tap on VR1. C1, C2 and C3 are de-coupling condensers located at the valve pins. When contact A1 is open (the key-down condition) the voltage between the tap on VR1 and earth appears as additional bias to the three valves. The closing of A1, it will be noticed, does not completely short the muting resistance; the resistance R2 is still in circuit; this gives a small standing bias in addition to that provided by the receiver biasing system, and is included to prevent C4 discharging instantaneously through A1 contact, this producing a loud click at "break." The value of C4 should be varied to reduce key clicks to a minimum. Too small a value will produce a click at "break" but none at "make"; too large a value will reverse this condition. When properly adjusted key clicks are slight, certainly not enough to cause discomfort—but it does call for a little fiddling with capacities to get it like this.

Operation

It is advisable to keep switch SW1 at "normal" when first switching on the trans-

mitter or when changing bands. If necessary, then VR1 in Fig. 1 can be adjusted, before the key is pressed, until the relay "pulls in." If this precaution is not taken the relay contact A2 could be damaged by excessive RF current due to its still being connected to the PA tank when the key is down.

At G3BGJ, results so far have been very gratifying. Stations asked to comment on the system have been unable to detect any difference, either in frequency or keying characteristic, when changing from one mode to the other. No doubt, however, there is scope for variation of the basic idea. One improvement that suggests itself is the replacement of the A2 contact by an electronic TR switch of the type described in the October, 1958, *Short Wave Magazine* (unless the receiver is very effectively screened some muting is still required when employing an electronic TR switch if one is to enjoy a comfortable level of sidetone). Again, better keying might result on "break-in" if contact A3 was switched into V2 cathode and both the VFO and V3 keyed, thereby ensuring that the oscillator transient has disappeared when A3 contact closes.

However, the above suggestions must remain subjects for future experimentation, the writer's

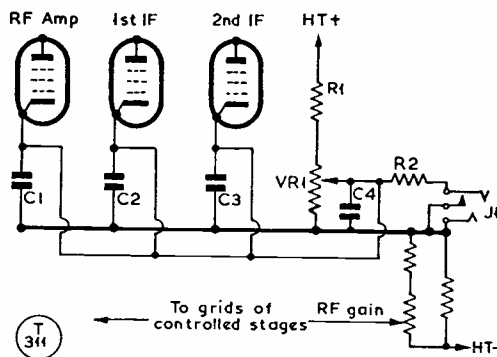


Fig. 2. Receiver muting modification as applied to an R.1155 for the G3BGJ method of control. The same principle is applicable to almost any receiver and allows full BK working. In this circuit C4 should be varied for minimum key clicking, 0.5 μ F giving best results in the writer's case. C1, C2, C3 are .01 μ F by-pass condensers right across the valve socket. Other values are: R1, 100,000 ohms; R2, 100 ohms; VR1, 10,000 ohm w/wound 1-w. potentiometer. J1 is a single close-circuit jack. The R.1155 RF gain control circuitry is included.

intention being to enjoy for some time the benefits conferred by the system as here described. Those who follow suit should agree that the small effort involved in carrying out the modifications has been amply repaid by the increased versatility of their operating.

WELL, PERHAPS . . .

The Russian cosmonaut Yuri Gagarin, who was space-borne for one circuit on the morning of April 12, may have been using the favourite Russian space frequency of 20-005 mc as his talking channel, if a report from New Zealand can be accepted as reliable. In fact, the Russians appear not to have disclosed the frequencies they were using for this experiment—like much else in the way of technical detail they have so far avoided divulging—so it is not possible to check whether "the slow but steady voice heard speaking in Russian by a radio amateur in Dunedin at 7.45 a.m. GMT on the 20 mc band" was, in fact, the gallant Yuri.

USE OF THE QSL BUREAU

In response to many enquiries, the use of the QSL Bureau we operate is, of course, open to SWL's under the same conditions as apply to holders of call-signs—these were explained on p.45 of the March issue of *SHORT WAVE MAGAZINE*, "Use of BCM/QSL."

"RADIO AMATEUR CALL BOOK"

The latest (Spring-Summer) edition of the Foreign Section—which means the world outside the United States—of the *Radio Amateur Call Book* is now available from us at 25s. post free. It gives the call-sign/addresses of more than 100,000 radio amateurs of the world, exclusive of the U.S.A., and since the

last (Autumn-Winter) edition appeared, there have been some 5,600 new licences issued, while the present edition also records nearly 4,000 changes of address. The U.K. section goes well down into the G30's, and the 50 or so columns devoted to British licensed amateurs make quite an impressive spread.

When ordering the *Call Book*, remember that the American section is a separate quarterly issue, costing 41s. 6d. post free, and that we can supply them both, if ordered together, at 60s., which represents a useful saving on the one-off price.

COVENTRY CIVIL DEFENCE EXERCISE

In connection with one of the biggest Civil Defence exercises in recent years—more than 1,000 C.D. workers were involved, with an additional 600 playing the part of "injured" and 70 ambulances were used—G3APA/P was set up in the local Coventry and Warwickshire Hospital; the station was staffed entirely by AT operators licensed in the Coventry district. The area of the exercise covered a large part of Warwickshire, and a number of AT stations were involved. In his report, G3APA says that "none of the Coventry operators had been inoculated with a dose of membership of something-or-other," yet the exercise requirements were met, apparently, to the satisfaction of the organisers. This proves, says G3APA, that radio amateurs can be relied upon to cope if called upon, without the aforesaid "membership inoculation."

Mobile Transmitter for Six Bands

RUNNING UP TO 50 WATTS
INPUT

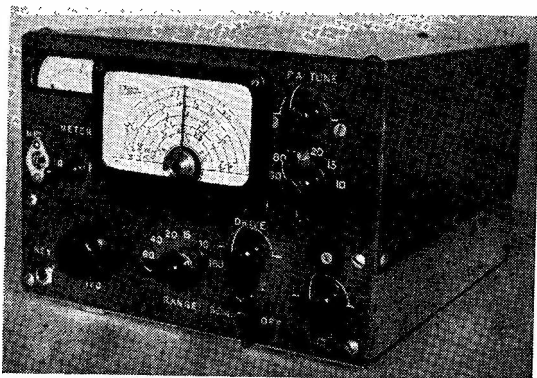
H. ELSWORTHY (G3GMN)

Here we have a sound practical design, of proven efficiency, for a mobile transmitter running reasonable input with ample modulating power. The prototype as described and illustrated here has been on the air 1M for some 18 months, and will have been heard by many who may read this article. And, of course, basically the design would make a very nice six-band talking box for ordinary fixed station phone working.—Editor.

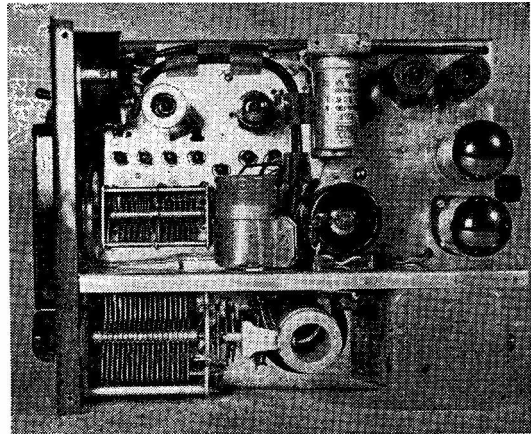
DURING the summer of 1959 the writer decided that it was time that something was done about the Mobile Rig. While the existing arrangements had proved very satisfactory from the efficiency point of view, a more streamlined approach with some reduction in size of the various units was needed. After considerable cogitation with pencil and drawing board, the transmitter as illustrated here was evolved.

The Circuit

It will be seen from the photographs that a Geloso 4/104 VFO unit has been used as the RF generator. Little need be said about this—it was described in the August 1958 issue of *Short Wave Magazine*—except with regard to certain modifications which were considered



General appearance of the G3GMN/M six-band mobile transmitter, seen fitted in his car on p. 78 of the April issue. It is VFO controlled and the bands are switch selected, the driver side being the Geloso 4/104. The dimensions and general construction are dealt with in the text.



Plan view of the chassis layout of the G3GMN/M transmitter, with the PA section in the lower compartment and the modulation transformer at lower right. The speech-amplifier/modulator side is at upper right.

necessary to obtain operation on the 160-metre band, and also some compressing of the unit to enable building within the smallest possible case dimensions. For use as the PA, a 50-watt miniature tetrode was chosen, the 5B/254M, for its high power to small size ratio; this feeds into a conventional pi-tank tuning circuit (Geloso) with modification for Top Band.

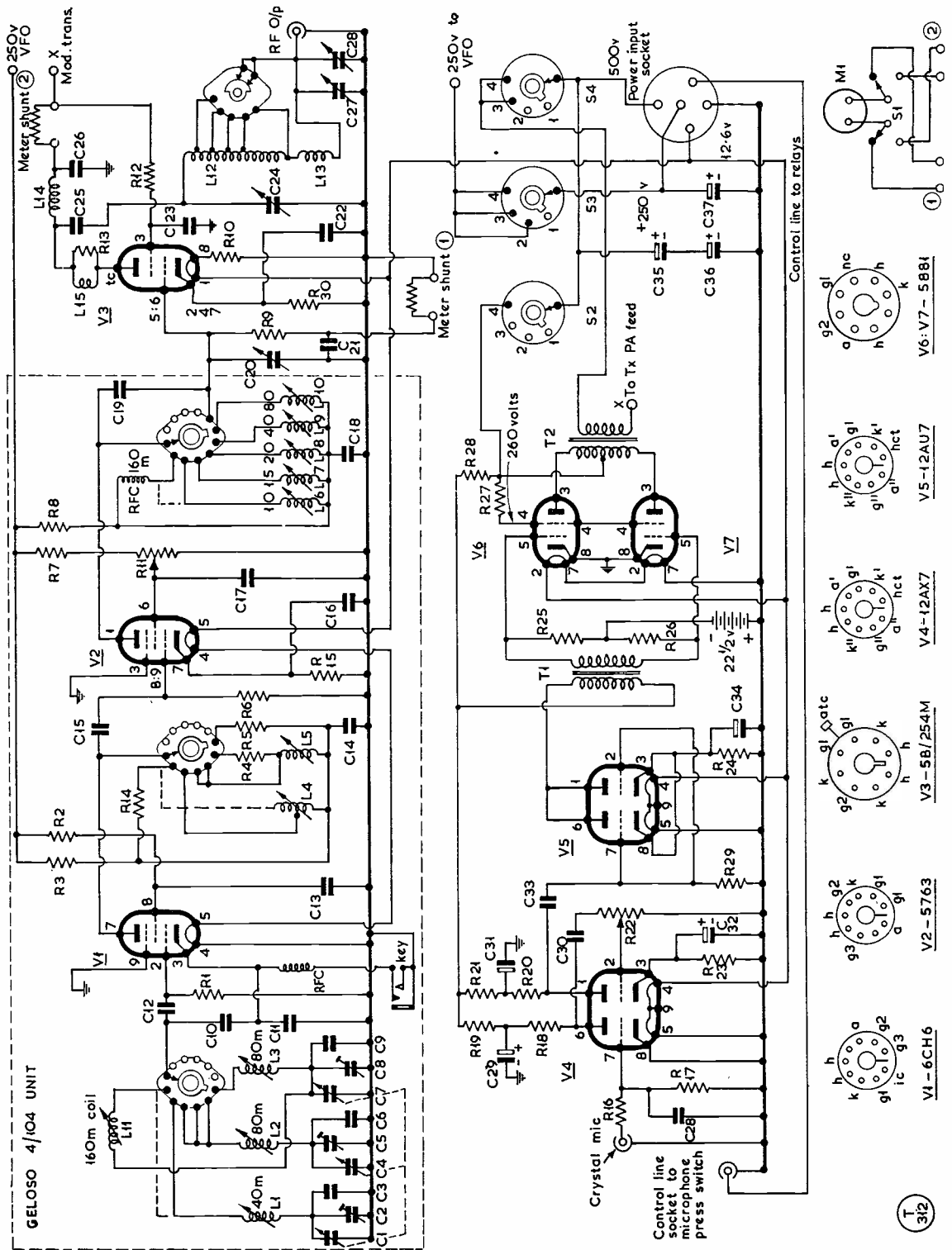
Modulation of the high-level type was considered a "must" for mobile working. After the crystal microphone there are two pre-amplifier stages, followed by the driver which feeds the modulators. These operate in Class-AB2. There is about 40 watts of audio available with a supply voltage of 450-500v.

Modifying the VFO

Upon receipt of the new Geloso unit (type 4/104) it was immediately apparent that something would have to be done about its height if the depth overall of the transmitter cabinet was not to exceed 6 inches. A start was made by removing the tuning condenser, and cutting and re-drilling the mounting brackets to reposition the frame of the condenser about ¼-in. above the chassis.

Next, it was found that the slow-motion drive pulley was much too large and would not fit into the scheme; its outer rim would no longer clear the wave-change switch on the underside of the chassis; the only solution was to make a new one. From a scrap piece of dural bar this was machined on the workshop lathe to have an outer diameter of 2¼ inches. The work was rewarded by now having a much more compact unit.

[over

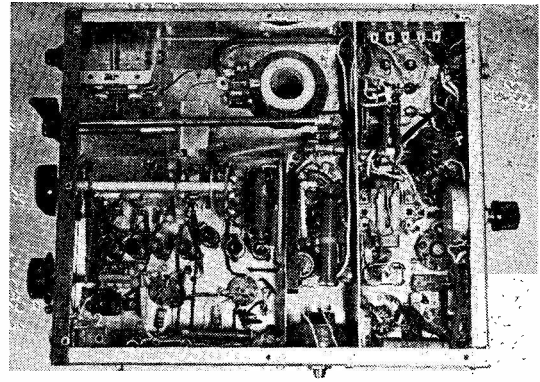


Circuit complete of the G3GMN six-band mobile 50w. transmitter, using a Geloso driver unit modified for Top Band and a miniature 807 as PA. The modulator gives about 40 watts of audio in the circuit and with the power supply shown. This ensures a well-modulated carrier on the HF bands; for power reduction on 160 metres, the screen voltage to the PA can be reduced by switching.

COIL DATA

- L1-L10 — Geloso 4/104 VFO coil pack, as supplied.
- L11 — 80 turns 36g. enam. close-wound on .406 in. dia. Alladin former, with slug.
- L12 — Geloso pi-tank coil assembly, No. 4/112 rated 50 watts.
- L13 — 20 turns 22g. enam. on LF end pi-tank coil former.
- L14 — Suitable pie-wound RF choke, for parallel fed operation over full frequency range.
- L15 — Part of anti-parasitic unit: 8 turns 20g. enam. space wound on R13.

NOTE: All items associated with the Geloso 4/104 VFO are as supplied on purchase, except the 160 metre coil assembly. See text. Function switch S2, S3, S4 positions are: Position 1, *Off*; Position 2, *Neg*; Position 3, *CH*; and Position 4, *Phone*. For Top Band operation at reduced power, either PA HF can be adjusted for a suitable resistor switched in series with R12, to reduce PA screen voltage.



Under-chassis view of the 6-band 50-watt mobile transmitter built by G3GMN. The Geloso 4/104 VFO is at lower left; the PA tank coil, tapped and switched, is let into the cut-away in the chassis and is supported by brackets.

Table of Values

Circuit of the G3GMN 6-Band Mobile Transmitter

C1, C4, C7	= 28-18-51 ganged $\mu\mu\text{F}$.	R19, R21	= 15,000 ohms, $\frac{1}{2}\text{w}$.
C2, C5, C8	= 20 $\mu\mu\text{F}$ trimmer	R22	= 0.5 megohm potentiometer, $\frac{1}{2}\text{w}$.
C3	= 75 $\mu\mu\text{F}$, s/m	R23	= 2,000 ohms, 1w.
C6	= 120 $\mu\mu\text{F}$, s/m	R24	= 680 ohms, 1w.
C9	= 91 $\mu\mu\text{F}$, s/m	R25, R26	= 10,000 ohms, $\frac{1}{2}\text{w}$.
C10, C11	= .001 μF , s/m	R27	= 3,000 ohms, 2w.
C12, C15	= 100 $\mu\mu\text{F}$	R28	= 5,000 ohms, 2w.
C13, C14, C16, C17, C18	= .0047 μF	R29	= 0.5 megohm, $\frac{1}{2}\text{w}$.
C19	= 470 $\mu\mu\text{F}$, s/m		Meter
C20	= 50 $\mu\mu\text{F}$, midget var.		Shunts = as required (0-100 mA on 0.5 mA meter)
C21, C22	= .01 μF , mica	S1	= DPDT toggle
C23	= .004 μF , mica	S2, S3, S4	= 3-pole, 4-way, rotary wafers
C24	= 300 $\mu\mu\text{F}$ var.	T1	= 3 : 1 ratio small inter-stage xfomer
C25	= .004 μF mica, 3000v.	T2	= Suitable mod. xfomer (Bendix, Collins, Woden)
C26	= .004 μF mica, 1000v.		
C27, C28	= 500 + 500 $\mu\mu\text{F}$, ganged		

Top Band Modification

For operation on the 160m. band a coil L11 was made for the oscillator grid circuit and positioned on the underside of the chassis, near the s/m drive; a small adjustment of the slug produces coverage of the 1.8-2.0 mc band with a little to spare each end of the scale length. To obviate the need for an additional wave-change switch for this coil, the "27 mc band" position, originally provided with the unit, was cut out; this is not a licensed U.K. band anyway. The switch connection shown dotted in the circuit should be removed.

Reference may be made to *Short Wave Magazine*, August 1958, p.300, where the original 4/104 VFO circuit is shown; this will enable comparison to be made with the modifications carried out by the writer.

A further VFO modification was that of changing the normally supplied 6CL6 for a 6CH6 with the result that the heaters may now be run in series or parallel according to the electrics of the vehicle in use. It is also necessary to re-wire the valve holder for use with the 6CH6.

The changes for 160m. to the connections of the pi-tank wave-change switch on the PA side were made as follows: Disconnect the 27 mc tap from the switch and move all the remaining connections up one contact each; this leaves a spare contact on one end of the switch which is reconnected to the junction of L12 and L13. An additional coil consisting of 20 turns is wound on the low frequency end of the pi-tank former and connected as shown in the circuit diagram.

Space for winding this coil is provided by removal of the mounting strap at one end of

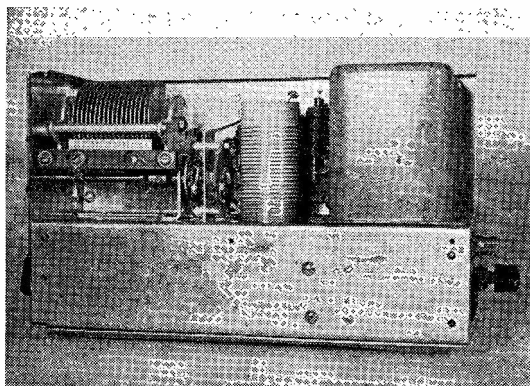
the coil and an additional piece made to fit inside the former.

The Modulator

This is due to a design by G2CDN, who felt that something better than the usual run of mobile modulators was required. So a pair of R.C.A. 5881 valves was obtained; these are similar to the 6L6 but are capable of working with a higher anode voltage, and when used in the Class-AB2 mode produce at least 40 watts of audio — more than sufficient for the 50-watt carrier.

The completed cabinet measures 10 inches deep \times $8\frac{1}{2}$ inches wide \times 6 inches high, a size which fits neatly under the parcel tray of the average small car.

In operation on the air during the past 18 months, this transmitter has been highly successful, with many hundreds of contacts made on the six bands.



Close-up of the PA section of the 50w. /M transmitter. The PA band switch is between the tank condenser (C24 in the circuit diagram) and the tank coil assembly, and is held on the tank coil bracket.

TWO DIFFERENT MAPS

So that there should be no misunderstanding or confusion, we should perhaps explain again that our *DX Zone Map* and the new *International Radio Amateur Map* are two different sorts of map. They both show the whole world, with a great deal of essential DX detail, but the *Zone Map* is great circle centred on the U.K., while the *International Map* is mercator projection. The *Zone Map* gives distances and beam headings from the U.K. only, while the other one will give distances between any two places with reasonable accuracy, but beam headings not at all. Hence, for serious DX work, particularly using a beam, both maps are really required. They are about the same size, both in full colour and intended for wall mounting, the price of the *DX Zone Map* being 11s. 9d. and of the *International Radio Amateur Map* 8s. 6d., both post free and obtainable from stock from our Publications Dept.

G9BF Calling!

All Clever Stuff

ENORMOUS response my important article last month—two postcards saying what's all this nonsense and one wanting know more about HSO mode what it is how it works etc—but still no QSL from phone station signing SUSIE. Have been trying years get card from SUSIE worked once on 40 phone.

But regret find some letters from readers show they barking up wrong tree entirely thinking this feature meant to be *hi! hi!*—this serious reflection on integrity me G9BF with sole objective help beginners work rare DX like DM, YO, ES, YL (under cover only), LY es other forgotten prefixes still in G9BF call book. This difficult stuff only possible with plenty pep at hot end ant—remember G9BF motto “Always give 'em Le QRO”—using latest Tx techniques like HSO mode invented by me G9BF.

In HSO all sidebands utterly suppressed es only half-carrier radiated (“You put back other half at Rx end just like SSB”). Thus all possible urge generated goes into half-carrier, with *unwanted* half (this where inventive genius and great cerebral capacity me G9BF come in) piped to earth down thick conductor. No use trying 7/22's for this part construction—wire must be *thick* not just thickish. Many xtals and xtal filters in antiphase cross-kick with negative amplitude generators involved this complex set-up too difficult beginners comprehend. Typical HSO signal characterised by key thumps only—if you can heterodyne those key thumps you are on to HSO, world's latest es most advanced form radio communication on any band sole inventor and patentee me G9BF copyright holder es concessionaire film TV rights all countries. Deeply mortified when old chum MOIFFI (chap with very splodgy note es permanently bloodshot eyes) said my HSO sig sounded like Chinese juggler playing Egyptian bagpipes. This just not true.

To go big on DX beginners must follow me G9BF. To get among komrades (es who does'nt these days) operating UA Klub stations kalling “CQ dx” all bands everywhere all the time, take ur beat from me G9BF well-known authority on really-rare stuff no spurious imitations offered. More good gen next month.

*(Well, perhaps—this stuff is the product of a disordered mind, so we must be careful.—
Editor.)*

CITY & GUILDS EXAMINATION PAPERS

Under the new procedure introduced by the City & Guilds for the handling of examination papers and the syllabus for the subjects they cover, for Subject No. 55, the Radio Amateurs' Examination, the charges will be: Pamphlet No. 55, with syllabus and list of text books, 1s.; Set of question papers for the last three years, 2s. Orders, with remittance, to the Sales Section, City & Guilds of London Institute, 76 Portland Place, London, W.1.

CANADIAN MARCONI 52 RECEIVER AND ARMY TRANSCEIVER W/S NO. 62

DESCRIPTIVE NOTES AND
AMATEUR BAND APPLICATIONS

J. Akehurst (GW3OAZ)

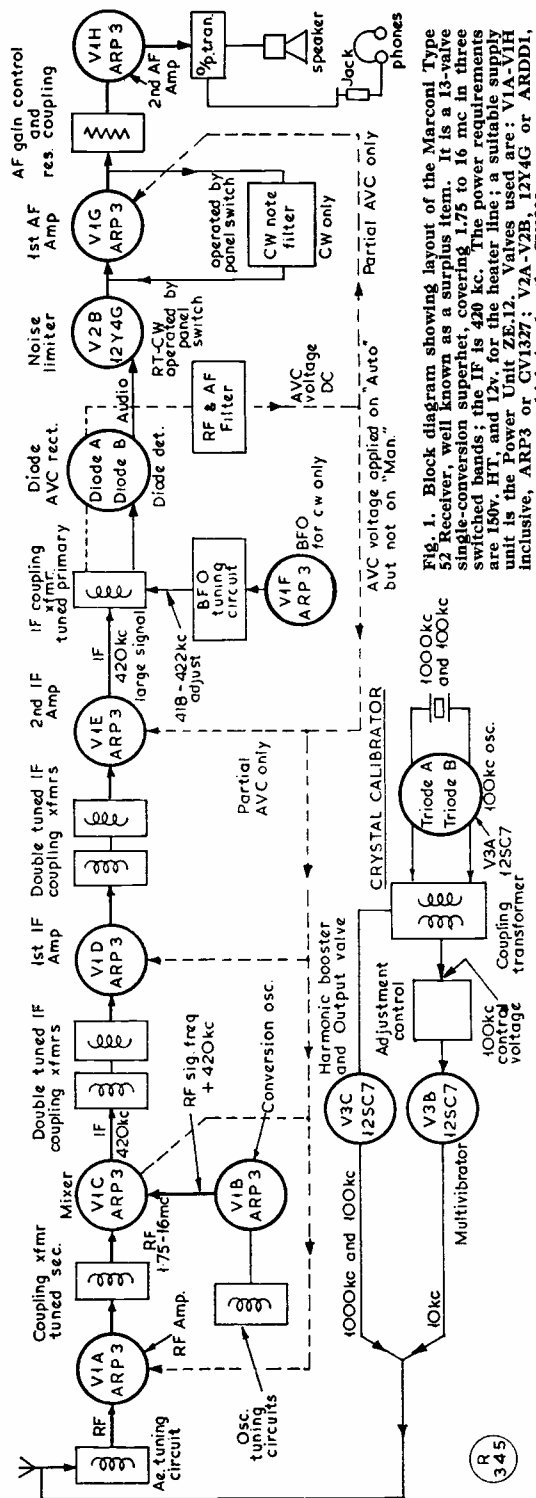


Fig. 1. Block diagram showing layout of the Marconi Type 52 Receiver, well known as a surplus item. It is a 13-valve single-conversion superhet covering 1.75 to 16 mc in three switched bands: the IF is 420 kc. The power requirements are 150v HT, and 12v for the heater line; a suitable supply unit is the Power Unit ZE.12. Valves used are: V1A-V1H inclusive, ARP3 or CV1327; V2A-V2B, 12Y4G or ARDD1, which is also the CV1300.

INFORMATION on items of surplus radio equipment is always in demand, details required normally being for valve line-up, frequency coverage, and IF's used. It is with these considerations in mind that this article was written; it is hoped that information on the Canadian-Marconi Receiver No. 52 and Army Transceiver W/S 62 will give a prospective user of these sets a fuller picture of their capabilities and possible applications in the unmodified condition. No attempt has been made to give modification details.

Marconi 52 Receiver

This receiver is now on the surplus market and offers an excellent chance of a good set for amateur and general short wave coverage, and as a tunable IF/AF for HF converters. The frequency coverage is 1.75-16 mc in three bands, thus four of the amateur bands are covered. The receiver employs 13 valves in a superheterodyne circuit using 12-volt indirectly heated types. The valve line-up and block diagram is shown in Fig. 1; the IF used is 420 kc—see diagram opposite.

Front panel controls include the following: Separate AF and RF gain, CW filter, noise limiter, BFO tone, sharp and flat selectivity, speaker on-off switch (a built-in speaker is incorporated in the set and also provision for two headsets); further controls are the CW/Phone Select, crystal calibrator switch (see later paragraph for details), a multi-position meter switch and meter giving an instant valve check, HT and AVC readings. When the 52 is used with its companion transmitter this meter also reads RF current, and transmitter PA and grid currents.

Power for the receiver is fairly easy to supply; a companion PSU is listed as Power Unit ZE. 12 and is available from the same source as the receiver. This enables the 52 Set to be worked directly from the mains. For those without this PSU, the receiver voltages required are 150 volts DC for the HT and 12 volts for the heaters. Connections to the receiver are made at a plug on the rear chassis drop.

A good feature of the set is a crystal calibrator with front panel control switch; the calibrator uses three 12SC7 valves, and a front-panel switch has 1,000, 100 and 10 kc positions, enabling accurate check points to be obtained through the whole tuning range of the receiver—a particularly useful facility when crystal-controlled converters are used. The 52 Receiver lacks in bandspread, as do most of the surplus types; however, a two-speed tuning

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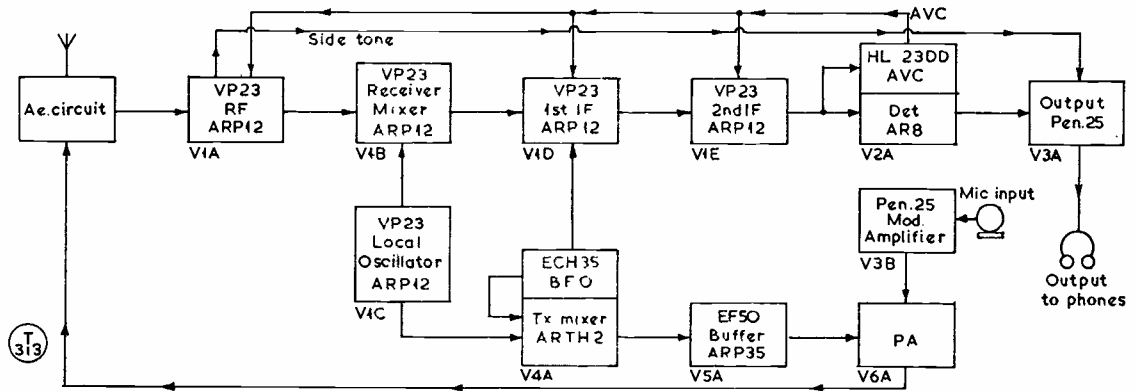


Fig. 2. Block diagram of the Army Wireless Set No. 62, which is a well-known surplus item. It is a low-power phone/CW transceiver with a useful frequency coverage, 1.6-10 mc, and quite a good receiving section. The set is designed for a 12-volt DC power supply, and some modification would be required to get it going on normal supplies. It can be operated either crystal or VFO-controlled. The valve equivalents are as follows: V1A-V1E, ARP12-VP23-CV1331; V2A, AR8-HL230D-CV1306; V3A, Pen 25-CV65; V4A, ARTH2-ECH35-CV1347; V5A, ARP35-EF50-CV1091; V6A, VT510-QVO4/7-CV1510.

control is fitted, also a knob marked "frequency adjust"; this varies the frequency of the main tuning control plus or minus 2 or 3 kc and is a fine-tuning device.

Army Transceiver W/S No. 62

This is the Army battery transceiver generally known as the 62 Set and is appearing on the market at various prices; it offers several possibilities—as a main station QRP rig, a stand-by, or better still, as a set for /P or /M working.

The set is a complete Tx/Rx in compact form, not very heavy, and including power supply unit, aerial tuning, and built-in modulator. Frequency coverage is 1.6-10 mc in two bands, with common tuning on Rx and Tx. The set thus covers our 160, 80 and 40-metre bands, with VFO control and provision for crystal drive for fixed frequency working.

Power required for the set is 12v. DC at approximately 2.8 amps. on "receive" and 4.5 amps. on "transmit." The built-in power unit incorporates a rotary transformer and the necessary smoothing circuit.

On the RF side, the ATU will match the transmitter into dipoles, $\frac{1}{4}$ - or $\frac{3}{4}$ -wave end-fed aerials and vertical rods such as a 16ft. whip aerial. Power output is 1-2 watts on CW and approximately one watt on telephony.

The Rx consists of RF stage, Mixer, local Osc., two IF stages, AVC, detector and AF amplifier. Valve line-up details and general arrangement are shown in the block diagram at Fig. 2. The valves are indirectly heated with 2-volt filaments, except that the BFO employs a 6-volt type; IF is 460 kc and the BFO is adjustable 2 kc either side of zero.

On the transmitter side, the arrangement is Master Osc., Mixer, Buffer Amp, PA and Mod. amplifier; the modulator is intended for a carbon microphone input. Valve line-up and block diagram are as in Fig. 2. Provision is made on the front panel for plugging in the Crystal Calibrator No. 10

which has been described in the *Magazine* previously—see January 1960. Power for the calibrator used with the set is taken from a socket also located on the front panel.

The writer has used the 62 Set in its original, unmodified form on the amateur bands with promising results. A 66ft. aerial produced QSO's with many European countries on 80 and 40 metres, using CW. On telephony using the same aerial and an unmodified 62 Set good U.K. contacts have been obtained on 160 and 80 metres. It is therefore reasonable to assume that with some modifications to meet more serious amateur-band requirements a really good /P or /M rig would result.

In conclusion, it is hoped that this article will have answered a few questions regarding the Canadian-Marconi No. 52 Receiver and the Army Transceiver W/S No. 62.

THE "HAM'S INTERPRETER"

For several years now, the booklet known as the *Ham's Interpreter* has been making steady progress because it succeeds in what it sets out to do—which is to provide a phrase book and pronouncing dictionary strictly applicable to Amateur Radio and AT station phone operating practice as we know it today. The *Ham's Interpreter*, produced by OH2SQ and DL1CU in collaboration, now gives you the clues in nine European languages. From it, you can learn how to say things like *It is very nice to meet you for the first time* and *Your report here is Q five and S seven* in Spanish and Russian, as well as in French and Italian and four other languages. Of some 48 pages, in stiff covers with a spiral binding enabling it to open flat anywhere, the price is 7s. post free, obtainable from our Publications Department, from stock.

Power On — Hands Off

CASE OF BCI

AND ITS CURE

A. W. Sheppard (G3JBS)

DESPITE the wealth of information available to the amateur on the subject of Broadcast and Television Interference it is sometimes interesting to hear an account of an actual complaint and the steps taken to remedy the situation.

The writer has been fortunate in receiving very few complaints, but each case has been dealt with as expeditiously as possible; shelving the problem or the use of delaying tactics are to be avoided as they serve only in aggravating the situation and will most certainly destroy any feelings of trust or the desire to co-operate on the part of the complainant. Likewise, any tendency to restricting transmission to periods when it is hoped that the victim will not be using his receiver(s) should be firmly resisted if only because it is a negative approach. Most amateurs already have their operating activities curtailed because of business and domestic commitments, so to reduce operating periods further is both frustrating and unnecessary.

Recently, a neighbour, having noticed that the G3JBS jalopy was unexpectedly "at home" on a weekday, called to say that he had been experiencing break-through interference on the broadcast band for the past *two months*; he had waited for this opportunity to call as he had not wished to be a bother at week-ends—a most unusual but very considerate, not to say satisfactory, manner in which to make a complaint.

After telling this most courteous victim that he should have raised the matter very much sooner, explaining that in the absence of a complaint an amateur would not be aware that he was causing interference, he was invited in and as much information extracted as he was able to give. After showing him the station and gear, at which he expressed great bewilderment and surprise, it was arranged to call on him that evening. After he had left it was decided that it would be only fair to attend to the complaint immediately, and avoid the inconvenience to his family of an evening call.

My neighbour's house was a few doors away and he had been receiving ten-metre signals from G3JBS on the broadcast band at a good S8. On inspection it looked as if the job would be a piece-of-cake, as the saying is—the receiver was of cheap pre-war vintage, a superhet with unshielded valves and grid leads, so with quite a degree of confidence an aerial filter was hooked in, this being a simple single-stage rejector unit; it really is surprising how effective these simple filters can be in certain cases. However, a test with the transmitter soon indicated that this was not one of them; the filter succeeded only in cutting down the level of the desired signal. So without more ado the set, together with its aerial (a yard length of lighting flex) was removed to the writer's QTH.

Finding the Answer

It was the intention to go right ahead with the screening of the Rx front end, and the severity of interference with the receiver mounted alongside the Tx was checked as a first step. The results were somewhat disturbing—not a trace of interference at any setting of the controls! Just to make sure, the receiver was plugged in at several points around the house with the same result; the piece-of-cake was beginning to lose a little of its flavour, particularly as on returning to the neighbour he remarked that he had forgotten to mention break-through also on a modern radiogram and a luxury transistor set.

Checking with Tx on confirmed his statement—the test modulating signal, an alarm clock, was competing only too well against "Music While You Work," at a good S7 to 8 on all receivers.

Unexpected Resonance

As the interfering signal was tunable it was obviously not mains borne, neither was it IF break-through. Just about then, at the head-scratching stage, the junior of the household came in from school; he volunteered the information that *he* received me best of all on his crystal set.

Before looking at it, the writer knew the lad's aerial would be 32 ft. long—it was, precisely. It was a simple case of re-radiation from the resonant (full-wave) length of wire he was using as his aerial.

A simple demonstration by earthing this wire to a convenient water pipe convinced all concerned. The results are now that the youngster is happy at receiving G3JBS loud-and-clear on his new 43 ft. wire, the neighbours are happy at receiving him not at all, and the writer is happy because there is no need to worry about BCI.

ANOTHER G.P.O. RADIO TOWER

The Post Office has been successful in getting planning permission to build a relay station in the Chiltern Hills at Stokenchurch, near High Wycombe, Bucks. From a flat building, a tower about 250 ft. high will protrude, carrying aerial systems for micro-wave communication links for emergency working, and for trunk P.O. services and TV relay channels. Objection was on the grounds of despoliation of the countryside. The G.P.O. pleaded the national interest.

COMMONWEALTH TECHNICAL TRAINING WEEK

By May 29, at local centres up and down the country, there will be displays and exhibitions all concentrating on the single main theme of Technical Training. Under the patronage, and the lively interest, of H.R.H. The Duke of Edinburgh, what is to be known as "Commonwealth Technical Training Week" is being organised all over the U.K., and many other parts of the Commonwealth as well, for the period May 29-June 4. Naturally, at many such centres, local radio amateurs will be assisting with displays and demonstrations—so, if an exhibition is advertised in your neighbourhood, your support will be appreciated.

BAND-WIDTH DETERMINATION IN HIGH-SELECTIVITY RECEIVERS

FINDING THE MAXIMUM
SWEEP-RATE — METHODS FOR
ACCURATE MEASUREMENT

R. Brown

Response measurements on high-selectivity receivers present quite a few problems. Where the bandwidth is not too narrow sweep methods can be used; but this means pushing the sweep technique to its limit, and the rate at which the frequency is swept has to be calculated with some care. The very slow sweep speeds called for usually necessitate the use of a long persistence screen on the display oscilloscope, and are often below the slowest speed at which general-purpose sweep generators will work. Point-by-point measurements using a signal generator have to be used for very narrow bandwidth receivers, and here the signal generator frequency drift becomes a problem. This frequency drift, even with the best of signal generators, makes it very difficult to carry out measurements on high-selectivity CW receivers, which have bandwidths of only fifty or a few hundred cycles. One is forced to use a technique such as locking the signal generator to a crystal, amplitude modulating it, and using one of the sidebands to measure the bandwidth.

Sweep Methods

An FM signal generator is probably the best instrument to use to produce the frequency swept signal. The time-base from the display oscilloscope is fed into the external modulation input of the signal generator, and sweeps the frequency across the passband of the receiver.

Frequency Calibration

It is usually rather difficult to arrange frequency calibration of the display. Most of the conventional methods of producing markers — beating the frequency-swept signal with the harmonics of a crystal oscillator, using an absorption wavemeter, etc. — seriously distort the display when used on narrow bandwidth receivers, as the marker takes up a considerable portion of the display. A single variable-frequency marker from a second signal generator, or accurately calibrated oscillator, provides the best means of frequency calibration. Instead of mixing the marker with the receiver output, however, minimum distortion will be produced if it is used to intensity-modulate the oscilloscope. Fig. 1 shows a complete set-up for this measurement, including the FM signal generator, and the marker circuits. Part of the swept frequency output from the FM signal generator is taken off and mixed with the calibrated marker oscillator. The beat which occurs when the swept-frequency signal passes the oscillator frequency is fed into shaping circuits which convert it into a very narrow pulse. This pulse is then applied to the "Z"

modulation terminals of the oscilloscope. When the pulse occurs it will cut off the oscilloscope beam, producing a blank spot on the displayed response curve. This blank spot can be made very narrow, and causes little or no distortion.

Sweep Rate

Having too fast a sweep-rate can give rise to very serious errors. If the frequency is being swept too fast the voltages in the tuned circuits do not have time to reach their maximum values. The displayed response curve has a lower amplitude than the actual response, and is usually shifted in frequency, in the direction of the sweep.

The maximum permissible sweep rate for any given tuned circuit can be found from the approximate formula:—

$$B = \sqrt{\frac{F}{T}} \dots \dots \dots (1)$$

Where B is the bandwidth of the tuned circuit, F is the sweep width, and T the duration of the sweep. Fig. 2 is a graph relating sweep speed to bandwidth. This formula, and the graph, are correct for simple single tuned circuits, where the response curve is a gaussian error distribution curve.

The response curve of high selectivity receivers is, however, the sum of a large number of tuned circuits. These are usually adjusted so that the response curve has steeper sides than would be the case with a single tuned circuit.

The graph and the formula can still be used in this case; but the sweep rate should now be slow enough to display correctly the response curve of a single tuned circuit which has sides as steep as the sides of the receiver response curve. This is shown in Fig. 3.

Where the time-base used to sweep the frequency is not a sawtooth, but a sine wave, a further correction must be made. The frequency band swept over in the course of each time-base will be the same in each case; but the rate at which the frequency is swept will now vary considerably during the time-base scan. At some points, the frequency will be swept much slower than with a sawtooth waveform but at other

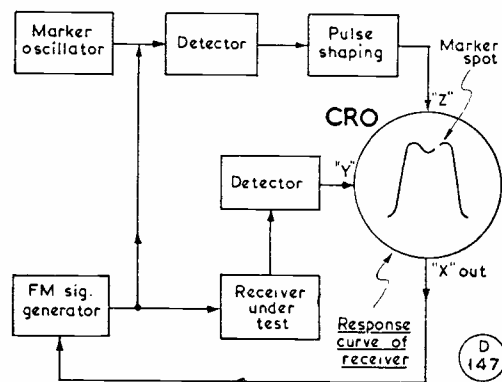


Fig. 1. Displaying the response of a receiver using an FM signal generator and intensity modulated markers.

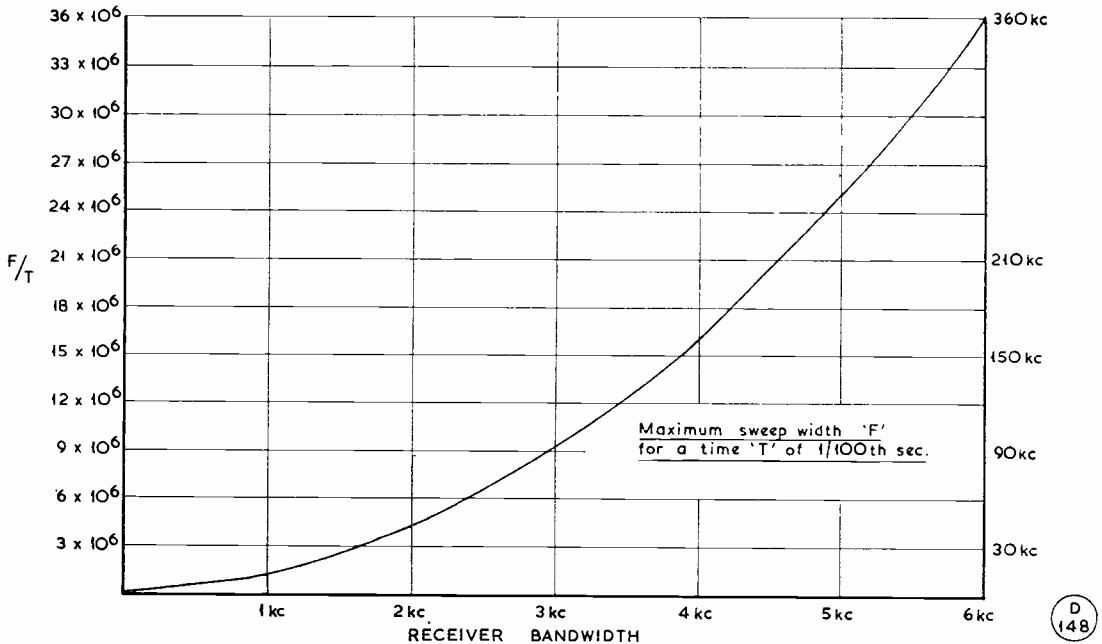


Fig. 2. Determining the maximum permissible sweep speed for any given receiver band-width. See text for discussion.

points the rate will be much higher. It is the *maximum rate at which the frequency is being swept* that is important, and it is this maximum rate which must be used when determining whether or not any given response curve will be correctly displayed.

For a sine wave time-base the frequency will be swept at a maximum rate at the points where the sine wave crosses the zero axis. At these points—at the beginning, the end, and the centre of the sine wave—the frequency will be swept 1.57 times faster than would be the case if a sawtooth waveform were used. Equation (1) must, therefore, be modified to

$$B = \sqrt{\frac{1.57F}{T}} \dots \dots \dots (2)$$

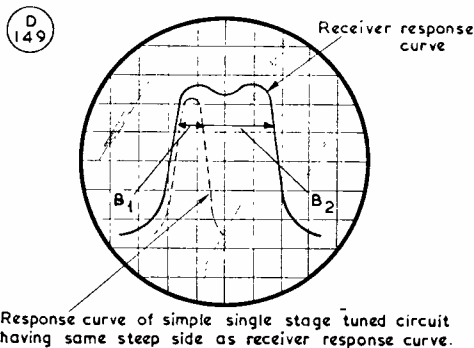


Fig. 3. The band-width B1, and not B2, should be used when determining the maximum sweep rate.

The graph of Fig. 2 can be redrawn, using this equation, and Fig. 4 shows the minimum bandwidth which can be correctly displayed for any given sweep rate when a sinusoidal time-base is used.

Point-by-Point Methods

Should the equipment to be aligned have a response curve with very steep sides it may well be found that the required sweep rate is much too low to allow a general purpose oscilloscope and FM signal generator to be used at all. In cases like this, and whenever sweep methods cannot be used, point by point methods using a CW signal generator must be employed.

Unfortunately, no matter how much care and expense is put into the design of a signal generator, the carrier will drift just that much. When using the instrument on high-selectivity receivers this drift can be a serious nuisance. This is particularly so when making measurements on the skirts of the response. With receivers designed to have a very high selectivity the signal generator drift can give rise to errors, and may make it impossible to carry out measurements at the operating frequencies.

Using a Locked Oscillator

The drift problem can be solved by using a set-up similar to the one shown in Fig. 5. The oscillator of the signal generator is locked to one of the harmonics of a crystal. This will reduce the drift to negligible proportions. The variable frequency signal for bandwidth measurement is provided in the following way:

The signal generator is amplitude modulated with

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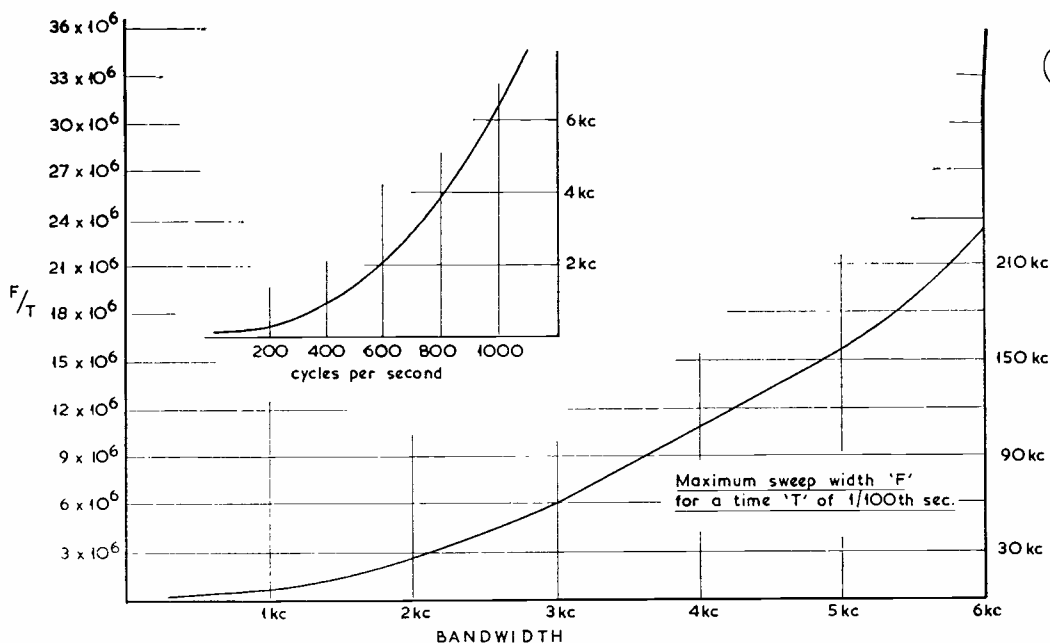


Fig. 4. This curve shows how the maximum permissible sweep speed can be determined when the sweep voltage is sinusoidal. As explained in the text, this voltage shape introduces a complication, not encountered where the sweep voltage is saw-tooth in waveform. Where the receiver bandwidth is less than 1000 c.p.s., the inset curve should be used.

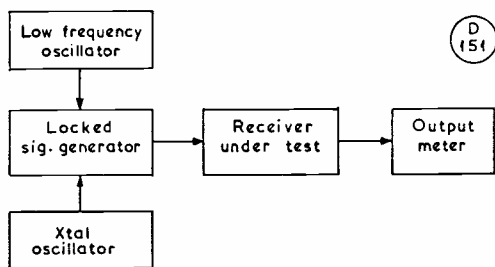


Fig. 5. A method of minimising signal generator drift while retaining the facility of variable frequency working.

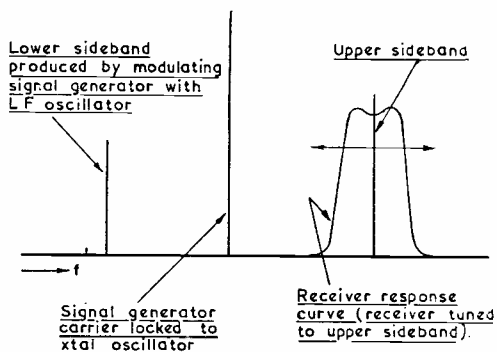


Fig. 6. Receiver response measured by the layout shown and discussed under Fig. 5.

an audio signal from an external variable frequency audio generator, the frequency of which is set to be much greater than the bandwidth of the receiver being tested. This will produce two sidebands, an upper sideband above the signal generator carrier frequency, and a lower sideband below the signal generator carrier frequency. The receiver to be tested is then tuned until one of the sidebands is within its passband.

Varying the frequency of the AF generator will cause the sideband frequency to vary across the receiver passband, and bandwidth measurements can now be made using this sideband as shown in Fig 6.

Really high-selectivity receivers certainly present problems to the serviceman and designer. But provided reasonable care is taken bandwidth measurements on such receivers can be carried out almost as easily as on wide-band receivers.

ORDERING THE MAGAZINE

You should be able to obtain SHORT WAVE MAGAZINE to order through your local newsagent, anywhere in the U.K.—after all, it is obtainable in the bazaars of Bahrein, Singapore and Chicago—and it should be available on, or within a day or three of, the date of publication, which is the first Friday of each month. In some parts of the country, newsagents dealing through wholesalers may not get their supplies till the Monday. A firm order with your newsagent should ensure your copy each month. In the case of any doubt, difficulty, delay or lack of interest locally, a cheque or postal order to us for 33s. will add you to our direct subscriber list.

STOP THAT NOISE!

THE SUPPRESSION OF AUTO-INTERFERENCE IN MOBILE RECEPTION

J. H. Jones (G3GBH)

This essentially practical article will be of great interest to all who are installing mobile equipment—or, having started up |M, are having trouble with noisy reception. Our contributor has for many years been professionally concerned with the problems of noise suppression in automobile radio-electrical installations. With the opening of the Mobile Season, his experienced guidance and suggestions will be of considerable assistance to those striving for quiet reception under |M operating conditions.—Editor.

TRAVELLING in cars fitted for amateur mobile operation, the author has been amazed at the number of installations, beyond reproach in other respects, that suffer from interference caused by the vehicle itself. This need not be so.

The suppression of interference is not always easy. Suppression cannot be classed as an "exact science," nor can it be taught in a "few easy lessons," but is rather an art made easier by experience. This experience takes the form of the ability to recognise the various forms of interfering noise, knowing where they originate and how they reach the receiver. It is also enriched by a good deal of patience. For these reasons, a definite approach procedure is essential if waste of time and temper are to be avoided.

Before tackling the actual interference, several basic considerations should be taken into account. Any vehicle radio receiver must be at a disadvantage, due to the limitation imposed by aerial facilities. It is therefore essential to ensure that the aerial system is as good as possible when viewed from the receiver. This aerial system has to be carefully matched to the transmitter to put out the best signal. The receiver input impedance may not be the same as that "seen" by the aerial when connected to the transmitter. It is therefore possible that a small aerial tuner unit between change-over switch or relay and receiver, carefully designed to match the aerial to the receiver, may increase signal input and improve signal-to-noise ratio.

Remember also that, in the radio sense, a car is a very good factory of noise; any aerial lead inside the car should be of good quality co-ax cable with the outer conductor well earthed at both ends. Also, any component inserted in this lead—such as aerial change-over device or the ATU already suggested—should be in shielded and earthed containers. Further, the receiver should be metal encased and efficiently earthed from an RF point of view. In this connection, it cannot be emphasised too strongly that where equipment, cables or suppression devices are connected to the metalwork of the car, both sides of the point should be clean and bright with all traces of

paint or dirt removed, and must be held firm and tight. Failure to ensure this can result in hours of unnecessary work in suppressing all sorts of random noises later on.

Other Noise Sources

Now to actual suppression problems. The larger part of the interference on vehicles comes from the ignition and charging systems. This arrives at the receiver, usually by one or both of two routes—noise produced in the ignition system, or the generator is radiated by the vehicle wiring and is picked up by the aerial and thence into the receiver, or the noise impulses flow along the vehicle wiring and enter the receiver *via* the supply input leads to the power pack. In either case, it is common sense to tackle the problem as near the source as possible.

Take the ignition first. The distributor rotor and the plug points are the centres of noise impulses. A resistor in the main HT lead as near to the rotor as possible will damp out these impulses; this is now fitted by the car manufacturer in this country to suppress interference to television receivers. However, as these noise impulses are passed to the vehicle wiring system *via* the ignition coil, it is also necessary to connect a condenser between the S.W. terminal of the coil and earth (vehicle chassis) and thereby by-pass a large proportion of these impulses; the value of this condenser should be 1 μ F with a voltage rating of 150 volts or more.

Commutator Noise

The noise coming from the generator arises at the commutator and travels to the vehicle wiring *via* the D-lead connecting the generator to the control box or regulator. A condenser between the D-terminal on the generator (*see* vehicle wiring diagram in handbook) and chassis offers a low resistance path to earth for the interference; again, the value should be 1 μ F, but higher values can safely be tried. These condensers are sometimes obtainable at good garages and are of a type designed for the job, being in metal cans with earthy tags fitted and a flying lead for the live connection. It is important that no attempt be made to connect condensers to the F-terminal of a dynamo or control box, or serious damage to the regulator will undoubtedly follow.

The foregoing should be standard basic suppression on all installations and should be in position before any other form of suppression is commenced.

We can then proceed to clean up any interference that is still troublesome, and this is where method and patience are required.

Suppression Procedure

Park the vehicle in the clear away from buildings and outside interference, and start up the engine. If the receiver is fitted for medium-wave reception it will usually be free of interference even when the engine is speeded up, but in the case of the 1.7 mc to 30 mc bands, it may well be that further efforts are needed.

If the main interference is a sharp popping or clicking noise directly related to engine speed, the

ignition impulses are the trouble. Remove the aerial lead from the receiver; if the noise ceases or is very much reduced, it is being picked up by the aerial. Next ensure that the bonnet is securely bonded to earth; the bonnet is part of the screening between the source of interference and the aerial, and if not effectively earthed (from an RF point of view) noise impulses will reach the aerial. Indeed, it may even collect these noise impulses and re-radiate them.

This bonnet bonding can best be carried out by "short circuiting" the bonnet hinges by flexible copper braid fastened securely to the bonnet at one side and vehicle body on the other. (Do not forget to close the bonnet before making any test with the receiver!).

The next step if ignition noise still persists is to fit plug suppression right at the plug terminals. These are specially-designed resistors of around 5K to 10K and are obtainable from most garages and auto-electrical service stations. Alternatively, special suppressed spark plugs are available.

By now most, if not all, the ignition noise should have gone, but if some still remains there is no cause for despair. More capacity between S.W. terminal on the coil and earth can be tried, followed by flexible copper braid straps shorting the rubber mountings on the *exhaust* system.

Check the receiver for improvement after each step; at this stage ignore any other forms of interference that may become audible as the ignition noise is reduced.

If the aerial is at the rear of the car, it is advisable to bond the boot lid in like manner to the bonnet.

From time to time unplug the aerial from the receiver, as direct pick-up by the aerial may have been cured but some power lead-borne noise may be left; if this is the case, a filter in the power feed to the receiver—on the lines suggested by G5JU in the March 1961 issue of *SHORT WAVE MAGAZINE*—is indicated, although various values of fixed condenser from $0.001 \mu\text{F}$ to $8 \mu\text{F}$ can be tried. Placed between the LT input to the receiver and earth (chassis), a value of condenser may be found to clear up the trouble. The flexible copper braid for bonding can be purchased from electric cable suppliers, but a cheaper source is to use the outer conductor stripped from odd lengths of a surplus $\frac{1}{2}$ in. coax cable; this should be flattened out to make a flat tape of braid, and when cut to the required length the ends should be heavily tinned with solder for about one inch, after which holes of the desired diameter can be drilled to take the securing bolts or screws.

Master Switch Interference

One special cause of ignition interference is worthy of mention here and concerns cars fitted with Battery Master Switches. Besides the terminals for the heavy battery earth cables a third terminal for lighter gauge wire will be found on these Master Switches. From this terminal a wire is taken to the C.B. terminal on the ignition coil. The purpose of this is to short out the contact breaker or distributor when the master switch is in the "off" position. (This is to make

sure the engine cannot be started by towing the car until the dynamo generates sufficient voltage to energise the ignition system.) When the master switch is in the "on" position this wire is open-circuit at the switch end and connected to the coil, which is a hot spot from an interference point of view, at the other end. The wire now acts as a good radiating aerial for interference impulses! The cure is, of course, to replace this wire with shielded cable, with the shield earthed at both ends.

Charging Circuit Noise

Having cleared up noise from the ignition side, next check for interference from the charging circuit. Noise arising at the generator is easily recognised, if present, by its whine, often slightly musical, rising and falling in pitch in sympathy with engine speed.

If this type of interference is present first check the generator brush gear with engine running fairly fast. If heavy sparking or flashing is evident at the brushes the generator requires attention and it is useless to attempt suppression until the machine has been serviced.

When commutation is satisfactory but interference is still causing trouble, various values of condensers up to $8 \mu\text{F}$ may be tried between the D-terminal on the generator and earth. More often than not a $1 \mu\text{F}$ at D on generator and another $1 \mu\text{F}$ at D on the control box will effect a complete cure. This type of interference is seldom severe or persistent and will respond to treatment fairly easily.

Interference from the regulator can best be described as a confused irregular chatter. It is entirely absent at tick-over speed but, when present, appears as the engine speed rises and persists to some degree at all higher engine speeds. It can be confirmed by finding the engine speed at which the interference is strongest, keeping this engine speed constant and switching all lights on. This varies the load on the charging system and alters the speed of the regulator contact points and thus the interference rate. Fortunately, this form of interference is not common and appears to take place most often with the RB type of control box. The only safe way to deal with this trouble is to obtain from Messrs. Lucas Ltd. (through any garage or auto-electrical service station) a proper suppressor unit designed by them for the job and fit it in accordance with the instructions supplied.

Another source of irregular chatter interference is the electrical type of instruments often used on modern cars. These include petrol, oil and temperature gauges, electric speedometers and rev. counters, and electrically controlled automatic chokes and similar devices. Which one is causing the trouble can be found by disconnecting each in turn until the interference ceases. Having found the culprit a cure can be effected by connecting a $0.2 \mu\text{F}$ condenser between the instrument terminal and earth; it is important that this value of $0.2 \mu\text{F}$ be not exceeded or the calibration of the system may be affected.

Interference from clock, flashing indicators, screenwiper, horn, etc., are self evident and respond to simple condenser suppression across the terminals of the unit causing the trouble. Values of 0.1 to $1 \mu\text{F}$

of the usual radio type tubular condensers may be used in such cases.

By this time suppression should be such that, with the car stationary but with the engine running at any speed, any readable signal will be free from serious interference.

Road Noise

The next step is a run on the road listening for interference that may develop when the vehicle is under way.

This type of noise is known as "rolling static interference." It arises because where two materials are in sliding or rolling contact static charges can be built up; a difference of potential is set up between the two materials, and is neutralised by a series of tiny discharges across them. Under some conditions the moving parts are producing the static charge all the time and the tiny discharges are taking place almost continuously: It is these tiny discharges which the aerial picks up and passes to the receiver as "sharsh" interference.

This form of interference is most troublesome in *fine dry weather* and may completely disappear in wet or damp conditions, because the wet or damp atmosphere provides a short circuit between the materials causing the static charge and prevents (a) The charge building up, or (b) The charge having to jump a high resistance to leak away. The most common form of this interference is known as wheel static and arises because the wheel bearings as they revolve produce a difference of potential between the wheel and the axle. It appears in the receiver as a rushing noise related to vehicle speed and often disappears when the brakes are held on.

Various parts of the transmission can cause static interference and it is very difficult to trace the exact point of origin. However, it is not very common and the treatment for wheel and brake static seems to clear it up.

The brakes also cause trouble. This form of interference is soon recognised by its harsh irregular noise often varying as the brakes are applied or released. In severe cases this harsh rushing noise can blanket the strongest signals.

Static developed by the tyres is now very rare indeed as tyre manufacturers have made great efforts to eliminate the effect by various processes during manufacture. If it should be present it again responds to the same treatment as brake and wheel static.

Now all these forms of interference occur because a static charge builds up and creates a difference of potential between the wheel and all that revolves with it, and the chassis of the vehicle. It follows that if we can provide an effective short circuit between these two parts then no static charge can build up.

In the case of the front wheel this is fairly simple. Remove the hub cap and fasten a "bee-hive" shaped spring, with the larger diameter end to the inside of the cap, arranged so that the smaller diameter end of the spring makes contact with the centre of the axle when the cap is refitted. These springs can be obtained from the car manufacturers

or may be fabricated at home without too much difficulty. In fact, some makes of car now have them fitted as standard; it is to be hoped more vehicle manufacturers will fit them in the future. (In any event, there is no reason why the buyer of a new car should not demand that it be fully suppressed electrically.)

The rear wheels are a little more difficult but not beyond the handy amateur or local garage. The treatment here entails fitting a spring-loaded carbon brush 3/16 in. to 1/4 in. in diameter in the brake back plate so positioned that it bears on the inner edge of the brake drum. A short length of metal tube, threaded on the outside and having an internal bore to take a 3/16 in. or 1/4 in. carbon brush and spring (as supplied for small universal type mains motors) is required for each rear wheel. One end of the tube is closed by soldering on a suitable disc or cap. The brake back plate is drilled to take the tube, which is held in position by a suitable nut either side of the back plate. The carbon brush is fitted and the inside edge of the brake drum is polished with a smooth file or emery paper before being refitted in position. A piece of copper braid from the brake back plate to the vehicle chassis, of sufficient length to allow for axle movement, completes the job. A convenient source of supply for the short lengths of screwed tube are spindle bushings taken from discarded radio volume controls.

Loose-Metal Noise

The only other form of static interference likely to be met is haphazard noise not in direct relationship to engine or road speed. This can be caused by two parts of the vehicle, which should be firmly attached to each other but which, for some reason, have movement taking place between them, such as loose mudguards, loose metal floor boards, and so on. Here the obvious is the cure. Searching them out and securing a firm joint again may take time and patience but does not call for any elaborate treatment here.

Few vehicles should require all the treatment discussed here, of course—but this article does cover most forms of interference likely to be encountered. In any event, it is suggested that suppression be tackled in the order suggested, to effect a cure in the shortest time. Some little effort may be involved in severe cases, but the satisfaction of noise-free reception will surely be adequate reward.

CABLE SHIP IN RESCUE OPERATION

The Post Office cable ship, H.M.T.S. *Ariel*, 1450 tons (Capt. C. M. G. Evans, M.B.E.), was on a cable repair job in the Irish Sea on April 19, when an SOS was received from the small Dutch vessel *Tuskar*, saying she was sinking. Capt. Evans immediately buoyed the cable and made full speed for the *Tuskar*, taking off her crew of six just before she went down. Post Office cable ships are out on repair, maintenance and cable laying in all weathers, and carry a comprehensive radio installation for CW and R/T working.

DX COMMENTARY

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

FROM nearly every point of view it has been a wonderful month. The LF bands have slipped a little, as one might expect; in particular, the real DX has vanished from Top Band. But the HF bands have come back with a real burst of Spring DX, much to the joy of the 'chasers, who have had a very exciting time of it.

DX-peditions such as VU2NRM (Laccadives) and HKØTU (Malpelo) have duly appeared, as promised, and have been handled very successfully. Other new countries have turned up, particularly on SSB; old, but rarish, ones have been there in profusion; and, much to everyone's relief, the early morning sessions on Twenty have at last come back to form with little or no worry from short skip.

"Suddenly, Twenty seemed to explode with rare DX, and I worked five new ones in a week," writes G13NPP, and his experience was shared by many others. Even the Aurora conditions around March 26/27 merely quietened the bands down for one night and then brought them back better than ever.

There has been very little doing on Ten, but Fifteen has been excellent at times; and, up at the other end, Eighty is far from dead as a DX band . . . those who thought the DX would fade out as winter passed have had their pleasant surprise, too.

If we go on like this, it might be mistaken for a write-up in a seed catalogue, so we will proceed to the factual account of the goings-on.

DX-Peditions

Under this heading we are trying to group all the "movable" rare ones, present and future as well as



HH2V

CALLS HEARD, WORKED and QSL'd

a few in the immediate past. News of these doings is often unreliable; very often we hear "8Q1ZZ will be operating from Bonus Island from May 1-8," followed, two days later, by "Bonus Island expedition now scheduled for May 9"—and so it goes on until, eventually, he arrives. (More often he doesn't!) However, take them for what they are worth, and these notes may help a few struggling 'chasers to find the one they are looking for.

A chronologically-arranged table is not feasible on account of the high proportion of cancellations or postponements, so we will simply retail everything that comes our way, and hope for the best.

Laccadives: The VU2NRM affair duly happened as planned, in late March. Signals were pretty weak and very few Europeans seem to have been lucky. **Malpelo Island:** HKØTU likewise appeared on schedule or thereabouts; reports say that there was "a great hush of expectancy" on 14 mc on March 30, but we can't say that we noticed it! They apparently started operating on April 1 and continued until the 3rd. First

contact, W8BKP on 14 mc SSB, with HKØTU operating on 14348 kc and listening for calls below 14300. Excellent service for Europeans, both 14 and 21 mc.

Dead Sea: 4X5DS was due to be on from "the lowest spot on earth" (1300 ft. below sea level) with four operators during early April. **Marcus Island:** JA7QQ/1 reported active on 7 mc.

Timor: CR10 keeps on cropping up in the news; now it is said that VK8TB has permission, visas and everything, and hopes to be there in early May for a short foray. **Liechtenstein:** HB1KU/FL worked SSB thence in early April. **Corsica:** F9QV/FC is on SSB—probably for quite a few weeks. **Gambia:** A ZD3 station is expected to show up on SSB very shortly; whether permanent or temporary is unknown.

Galapagos: The HC8JU sortie seems to have been postponed, and is now due for the end of May or beginning of June. **Cocos Island:** The TI9 one, not VK9, this time . . . it is still on, but postponed and no new date quoted.

Antarctic Expedition: VKØTC was heard during early April, and is due on again for three or four weeks in June; they are apparently operating from an ice field near Wilkes Base, on 7 mc. The Wilkes Base fixed station signs VKØVK, running 100 watts to a beam with an automatic keyer, coming on six times during each 24 hours for ten minutes; presumably this means they would like a QSL, but it's no use calling them!

Eastern Carolines: Truk may be on the SSB soon. At present KC6TM, at the Xavier High School, and operates a DX-40U; they now claim to have the biggest beam in the Pacific (on a 150-ft. tower!) and an SSB rig.

New "Countries"

Added to the ARRL's DXCC list are three new ones: Baja Nuevo Island (HKØ); Kure Island (KH6); and East Pakistan (AP). Accepted for credit from July 1.

We are still not in a position to publish an up-to-date list of DXCC countries, nor does it seem advisable to do so at present in view of the flexible situation in Africa and other parts. Every time we think of DXCC we are reminded of the proverbial Irishman who, when asked how many pigs he owned, replied that he didn't know, because the "little so-and-so's wouldn't keep still for him to count them."

News from All Over

5N2GUP (formerly ZD2GUP) now operates from Chelmsford as G3GUP and will not be returning to Nigeria; QSL chores in progress. The same goes in an even bigger way for 5N2AMS, who has the QSL's for his FD8AMS effort also on hand; when he returns to Nigeria he hopes to appear on SSB, and also as a mobile . . . ZS2MI (Marion Island) should soon be on again—CW this time . . . VK2FR (Lord Howe Island) is on SSB . . . VK9HX is putting Cocos on the map again, 14 and 7 mc CW.

Ham Whyte, VE3BWY, writes to say that he has the complete log of VU2GI and AP2F, who operated from October 18, 1947, until April 10, 1949. Anyone short

of a QSL for a contact 'way back then should send a QSL card, an s.a.e. and/or one IRC to VE3BWY, 214 Delaware Avenue, Toronto 4.

SSB in the USSR is spreading madly; UAØBP and UA9OI (both Zone 18) are already on, and UAØKAR (Dickson Island) will be active soon. The travelling SSB station, operated from UM8KAA during March/April, should have been on by now from UJ8 and UH8, and is due at UA2AO in May.

9N3PM, the Hillary Expedition, has been reported as signing /AC4, but latest information is that it has *not* been in Tibet, neither are there any plans to go there. Also "9N3PM/AC4" came from quite the wrong direction . . .

A new prefix is on the air—KR8! This has been allotted to Japanese citizens of Okinawa, now being issued with licences; KR8AB is already on the air.

Active from Senegal: 8W8AF, 8AP, 8CU, 8CY and 8BQ—the last-named on CW, the rest mostly on 2½ mc phone. Others from around those parts have included 7G1A/FF7, FQ8AL (Gabon), FQ8HB and 8HT (Central African Republic). No activity reported from the Mali Republic.

News snippets from G2DC: Franz Josef Land (UA1KED)—this station does exist, and is said to be active on 14 mc, but a sked arranged between KV4AA and UA1CB produced no results . . . FK8AS is planning another trip to Wallis Island (FW8) . . . HC1JU, 1KA and 2ND hope to visit Galapagos (HC8) during late May or early June . . . VU2CQ has been heard discussing AC5 operation with AC5PN . . . W8OLJ/PK, frequently heard causing pile-ups, is not as useful as he sounds, being on board a ship anchored half-a-mile off Bima Bumbara; QSL's to Project Hope, Washington, D.C.

Some of these from W6NTR: VQ8APB (St. Braddon Island) is reported on 14050 kc, T7 . . . LA1BF/P is on Bear Island, which counts towards WAE but has possibly never been submitted for DXCC . . . 5U7AH (Niger) on 14088 kc, around 1900 GMT . . . 6O2RS now back in U.K. as G3LOE, after creating a stir with

100 watts and a rhombic . . . 7G1A/FF7 was on during the ARRL Contest . . . AC4AX (or at least *one* of the stations signing thus) is genuine, and may be going to Sikkim as AC3AX. AC3SQ is in Bhutan and signing AC5SQ.

K3HVN will be on the air as PK1SX from Tjimahi, Java, starting in June and probably staying for more than a year; he is "FCC approved," so the pile-ups should be considerable . . . HB9TL has authority to operate from "one of the neutral zones," which sounds pretty mysterious, using the call 9K4A — first two weeks in June, frequencies to be announced later.

From ZC4CT: The JY (Jordan) trip is off—no permit possible . . . the Sovereign Base area will retain ZC4, but no news of the Republic's prefix as yet . . . ZC4DS will be a new call shortly active . . . Top Band operation promised for next season from ZC4PC as well as ZC4AK (both Club stations).

Top Band Topics

The real DX on One-Sixty has left us for the time being, as was to be expected. However, SWL Peter Day (Sheffield) reports that W1PPN was heard as late as April 6, when he was 559/569 at 0445 GMT. W8GDQ made the second 160-metre WAC on March 3 when he worked ZC4AK; others have probably followed by now. No W/9 contacts reported this month.

Everyone confidently expects next winter to show an improvement even on the excellent 160-metre season that we have just been through. Some of the regular DX'ers on this band have now vanished; were they still plugging away, it seems that the season might extend right through the summer.

Coming down to the more usual sorts of activity, we note plenty of changes of position in the WABC Table. G3NNO (Leeds) raised OK1ADX, OK1TJ, HB9QA and GM3LIG/A (Inverness), and three new ones on CW were Armagh, Montgomery and Carmarthen.

G3NAA (Chelmsford) still awaits his QSL confirming a *phone* QSO with ZC4AK. A recent multi-way contact was with EI3AE,

G16TK, GW3OFV and GM3AVA . . . a GD and a GC on the frequency would have made this just perfect. G4JA (Baschurch) raised several new ones and put his total up by eight during the month.

G3NYQ (Cambridge) was on for several months, /A from R.A.F. Gaydon, exclusively on Top Band; he raised Anglesey (GW3OCX) for his sixtieth county on his very last night in the R.A.F.! He now hopes to start Top Band operation from home . . . and he promises some activity from Hunts., for those who want it.

G3FS (Sidcup), who works them on phone, has got up to 73/76 and mentions GM3IQO/P (Dumfries), GM3NXA (Perth), GW3NWA/A (Carmarthen) and GW3IQO/P (Montgomery). Having worked all G and GW counties, G3FS is looking out particularly for GM's—in that country he still has 16 left to work on phone; he is on nearly every night, 2100-2300 GMT.

G3FZG (Liverpool) recently made a sortie into Merioneth, but had trouble with local noise (his own AC generator!). He and the other operators look forward to better luck on May 6/7, when a "full-scale operation" will be taking place—same county. Later on, the other Welsh counties within easy reach of Liverpool will be tackled.

GM3OM (Larbert) is another who reports "all set for portable expeditions," and he says that as there are about six "rare" counties within easy reach, the 'chasers should look out for GM3OM/P. Kinross, Clackmannan, Kincardine, Peebles, West Lothian and Berwick are all on the agenda. By the way, GM3OM had a report from Sweden on his Top Band phone—FB!

G3MXJ (Gravesend) has climbed nicely, thanks to four new counties and a "purge" on missing QSL's. He would like to know more about the peculiar stations between 1800 and 1900 kc "sending something which varies between ancient Hebrew Morse and an auto-keyer gone wrong." They always seem to zero-beat on the station one is working — is

something sinister happening here?

G3OHX (Alnwick) comments on the surprising GDx workable in daylight. Up there in Northumberland he has heard Beds. and Hants. on Sundays, later than 1100 GMT, peaking 5 and 7—but he can't raise them because they are working locals with the wicks turned down. However, he has made several contacts over 150 miles in daylight.

Eighty Metres

There has still been plenty going on at both ends of *Eighty*, but there is not much in the post to confirm it. However, GW5BI (Cardiff) upholds the honour of AM phone and CW; on the latter mode he connected with VE1ZZ, UA9CM and KV4CI, each of them being worked several times around mid-night or later. He worked AM phone with 5A2TD, who claims it as the first 5A/G contact on *Eighty* phone; and one night he "nipped down among the SSB boys" and raised PZ1AX.

G2DC actually worked Malpelo

AM PHONE DX WORKED

28 mc Band

G3NWT: 5U7AH, SV0WO, G3IPV/MM, VQ2, ZE, ZS.
G3NOF: CR6AT, 6BK, 7BC, 7ES, CX4CS, EL8D, FQ8AT, G3IPV/MM, HK3CF, KZ5FG, 5GH, LU, PZ1BW, VP6NW, VQ2HR, 2JW, 2SB, 2WM, VQ8AV, VS9ARC, ZC4, ZE, ZS (30), ZS3B, 3E, 9U5PD.

21 mc Band

G3NOF: EP1AD, 2AT, ET2VB, FB8CI, 8CT, FR7ZD, JA6BC, LA2DE/P, SV0WT, T12RFT, UA9, VP9DL, VQ2BK, 2GD, 4AA, 4ASC, VS1JX, VS6EC, VS9MB, XE1HHT, XW8AL, ZC4, ZD6DT, ZE8JZ, ZS, ZS3LW, 4X4, 5N2ATU, 2FNX, 9G1CC, 9K2AY, 9M2DW, 9U5NC.
G3NAC: CR6AT, 6LA, CE3RE, CO2UM, 8RA, EA9EJ, EP2AT, EL8D, ET2VB, FQ8, HH2R, 2GR, 2RB, HC2CB, 2DB, HK3VR, JA3GM, 6BC, KP4, KR6, KZ5BA, MP4TAJ, OX3DL, PZ1AR, 1BN, 1BE, 1BW, UN1BC, VP2ST/VP9, VP3YG, VP4BD, VP5RD, 5GS, VP7BG, VP8DW, VK9RO, VU2BK, VS5GS, VS9MB, XE2DO, XW8AL, ZS3LW, ZP5CF, 9M2AD, 2EZ, 2GV, 9G1CQ, 5N2ATU.
G3NWT: RF7ZD, EA9EJ, KA2JL, 9JD KZ5BA, VP5BL, VK6HK, VS9MB, 1DN, 5N2ATU, 9Q5YZ.
G3OAG: EP1AD, SV0WT, UL7FA, UN1BC, XW8AL, ZB2U, 9M2DW.

CW DX WORKED

14 mc Band

G3OAG: OD5CQ, HB1DX/FL, 3V8CA, UD6, UF6, UW9, PY.
G2DC: VU2NRM, HK0TU, HC1HV, HB1DX/FL, EP1AD, PJ3WA, T12PZ, VU2SOZ, VS6EC, VS9MB, 9ACC, W8OLJ/PK, ZD9AM.
G13NPP: HK0TU, HS2A, HV1D, VU2NRM, 6W8CW.
G5BZ: LA8YB/P, MP4TAC, HL9KT, HK0TU, 601MT, JA's, HH2OT, KH6's, KL7's, UA0KAE, 0EH, VP8DM, VQ51B, VQ8BC, VQ9HB, VK9GP, VR2DK, VS6DV, ZK1AK, ZS3DA.

21 mc Band

G3NAC: HK0TU, VS5GS, CR5AR, LU2DA, PY7LJ.
GW3AHN: FQ8HD, 8HK, HK0TU, W8OLJ/PK, PY7LJ, U18KAD, VS1FW, 6W8CW.
G5BZ: EP2AF, YA1BW, 9M2FS, FQ8HD, CR5SP, VP5BL, OA4HK, VQ3HD, 3HZ, VS1FW, 1GZ, XE1AZ, ZS7M, 7S, HK0TU, LU1ZO, CE4EC, U18KAD.
G13NPP: CR5AR, FQ8HD, HK0TU, KA9JD, VP5BL, VQ51B, T12WA, W8OLJ/PK.
G2DC: HK0TU, 5U7AC, CR5SP, 5AR, CE3RY, 4EC, PY7LJ, VP2AD, VS9MB, VS9AAC, VK1-6, ZL1-4, all W. States.
G3OAG: VS1KP, U18KAD, 6W8CW.

SSB DX WORKED

14 mc Band

G3DO: DU1SA, KA2SC, 2VT, 8LF, KC6UZ, KG6AJB, 6AJF, KM6BJ, KV4AA, KW6DB, K X 6 B Q, L A 1 L G / P, VE3BQQ/SU, SV0WT, TA2AR, UA9OL, 0BP, U18AG, UM8KAA, VK7AI, 8TB, VR2BJ, VU2NRM, 6O1DRS, 6W8BP.
G3NWT: UA0BP, KR6MH, 6GE, Z L 2 G X, F 9 Q V / F C, LA1LG/P, K22AM, KW6DB, KC6UZ, KM6BJ, VR2BJ, VK8TB.
GW3AHN: AP2CR, EP5X, FA8AN, F9QV/FC, HK0TU, KG1BO, KR6AJB, KL7, KP4AEB, KR6GH, 6KV, 6MD, LA1LG/P, MP4BCC, UA9OI, U18AG, UA41F/U18, UM8KAA, T12HP, VR2BJ, VS6EK, VU2NRM, ZS7P.
G3NOF: HB1KU/FL, KG1CX, LA1LG/P, UA41F/U18.
GM3BCL: AP2CR, DU1SA, F9QV/FC, HB1KU/FL, PZ1AX, UL7JA, UM8KAA, ZS7P, 9M2DB.

21 mc Band

G3NAC: VP5RD, KA2JL, CE3RC.
G3NOF: K A 2 J L, K L 7 A H X, K 3 C J M / K G 6, V S 6 C L, W2MAE/MM, 4X4DK.
GW3AHN: EA8CT, HC1KA, HK0TU, HZ1AB, KA2JL, KR6DO, U18KAD, QA5C, VS9APH, YN1TAT, ZD9AL.

(HKØTU) on this band—a real scoop! Others raised were all W districts (except 7), VE1-4, VO, PY, YV, HZ, UA9 and ZL—all on CW. He still handsomely leads the 3.5 mc column of the LF bands table, with 94 worked on this band; and we note from W4KVX's "DX" that the highest claimed score in the world for the band seems to be 117, from W8BKP.

Forty Metres

There's still plenty of DX on Forty for the asking, but nobody much seems to be doing anything about it! However, G2DC has hopes that we might get rid of the pirate broadcasting stations when the band assumes its new status, although it will only be 100 kc wide; he also raised HKØTU on this band, together with all W districts, VE1-4 and 7, ZL, VK, HZ, EP, PY, LU and YV.

G3NWF (Sidcup) thinks Forty has shown great promise but is apt to be temperamental (sounds like a school report!) In the late evenings he has worked SVØWI, VK5KO, UH8BI, 4X4MZ, JA6ACZ, KV4CI, UM8KAF and hordes of W's, VE's, VO1, PY1, 2 and 4; in addition, he has heard

LF BANDS TABLE
(Countries Worked)

Station	7 mc	3.5 mc	1.8 mc
G3FPQ	134	85	19
G2DC	127	94	12
G3IGW	95	51	19
G2YS	89	73	20
G3HZL	80	44	8
G2BLA	70	39	9
G4JA	57	40	7
GW3CBY	46	27	14
G3DRN	42	13	9
G2FQW	33	4	1
G2DHV	32	18	3
G3NFV	27	12	15
G3NNO	24	22	10
G3NFB	21	8	9
G3NYQ	21	4	10
GØDG	20	17	9
G3OQK	20	4	7

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



The "Antwerp CW DX Club" members are included in this group, all CW operators primarily interested in DX working. Standing, left to right, are ON4ES, ON4WB, ON4KU, ON4QJ, ON4NW, ON4SK, ON4JW, with ONL744, an SWL who looks after the issue of the Club's WOSA-HOSA awards. Seated left is ON4QX, who also holds the calls 3A2CZ, ON4QX/LX and DJØBG; he is chairman of the group this year. Others in the front row are ON4EX, ON4IT, ON4GT and ON4FU. The group can always be worked on 14040 kc for the WOSA award, details of which can be obtained on application to CW/DX Club, P.O. Box 331, Antwerp.

KV4AQ, HK's, HP1SB, LA8FG /P, FQ8AM, KP4ATG and JA's. His rig is for 7 mc only, running 90 watts, and the receiver is a BC-455; with this set-up he has scored 72 countries on Forty, which is nice going. (For the record, he remarks that he was called twice by the same chap, first signing ZM7AA and then CR7AL... and he heard people calling SLØB!)

SWL A. F. Notschild (Harlow) did some intensive listening and mentions JA8AAF (2100), LA1SH /MM and CT3AV (Ø100); and YN4AB, ZS1M, KP4CU, VK's, ZL's and SM5CBC/MM (all early mornings).

Twenty Metres

Quite the most reliable and stable band has been Good Old Twenty, which has been bursting its seams with DX in the mornings, not opening much before 0730 GMT or thereabouts. On one occasion (mid-April) we heard KM6, KW6, KH6, KL7, VR2 and VR6, all within the space of three minutes or so. VR6AC came up on SSB several mornings with a real crackerjack of a signal; VR2BJ and a net containing some exotics was also very reliable and strong. And at the CW end there

was no shortage of similar DX, together with a good selection of VK's and ZL's. And—best of all—hardly anything from Europe at more than S6 or so. The DX man's dream come true—at last!

Most of the stuff worked by the 'chasers appears in the usual tabulated form, but once more we give them an opportunity to air their views under the various band headings.

G3OAG (Prestwich) says "the SSB boys seem to be creeping all over 14 mc—now even down to 14150 kc"; and that is precisely what will happen. The phone band will become more SSB, and less AM, and more stations will be squeezed in as a result.

GW3AHN (Cardiff) mentions the fact that the promised SSB activity from UM8 and U18 duly materialised, and both stations were worked by most people who wanted them.

G13NPP (Dungannon), who booked in five new ones in a week, says that HKØTU worked W's solidly for two days, inspiring many uncomplimentary remarks over here; then, the third day, they turned their beam this way and "dished out European QSO's at six per minute"! [over

G3DO (Sutton Coldfield) spent most of his time on Twenty SSB, and the list of his doings, under the appropriate heading, shows that results were worth it.

G2DC thinks that by the way Twenty is behaving now, it will carry most of our daylight com-

munication for the next five years. Two new ones for him were the two DX'ers — VU2NRM and HKØTU.

Fifteen Metres

And so to the phone-users' favourite band, although there has been no shortage of CW DX—see the lists for proof. G2DC comments on the evening openings when African and Central American stations have come in well; fortunately, the W's are inaudible at these times (usually 1900-2100). Two new ones for him were HKØTU and 5U7AC.

G3NWT (Sandiacre) suggests that now that our friends have discovered how to put a man into space, they might one day discover how not to cover Fifteen with "jammer offshoots."

GW3AHN comments that real DX has been pretty easy to find and work on Fifteen owing to the absence of U.S. signals for quite long periods. G3NOF (Yeovil) found the band good to the Far East (1400-1600 daily), with regular signals from KA, JA and KR6 in the mornings.

G3NAC (Bourton-on-the-Water) listened just after the Aurora (March 26/27) and found Fifteen alive with DX phone. All on the same frequency at one time were VS9MB, VS1JX, XW8AL and SVØWO (the latter the only weak one). He snagged HKØTU on the last day, thanks to spies, QSP's and many patient hours of stalking; eventually he turned up on CW at 599!

Ten Metres

Not much here this time! The band still has plenty of possibilities, but everyone is forsaking it for the better conditions on Fifteen and Twenty. However, those who have the odd look at Ten usually find something worth while.

G3NOF says the band was open to Africa between March 19 and April 3 every day between 1200 and 1800; and on March 27, when those signals faded out, it opened to USA until 2100, and then even later to South America. He worked quite a long list of DX, including thirty ZS's and many rarer pieces (see lists).

G3NWT raised a 5U7 on this

band—a country that many are still chasing after. G2DC worked a few Africans and W's, but thinks we are really about to say goodbye to Ten for a few years.

Miscellany

MP4BDG is the newly allotted call of ex-G3LOL, who hopes to be active on Fifteen and Twenty, phone and CW, very shortly. QTH: F/Sgt. Livermore, Sgts. Mess, R.A.F. Bahrein, BFPO 63.

The Amateur Radio Club of Uganda will be running a special station between May 29 and June 3, when Kampala is putting on a "Commonwealth Technical Training Week"; the call is not mentioned, but the home station of VQ5AU will be used and operated from the Exhibition stand by VQ5AU and others; gear built by him and by VQ5IB and 5IH will be shown. They will be on the air—CW and phone—on Twenty, Fifteen and Ten (also probably on Forty), 1100-1500 GMT each day.

G3ILS (Birmingham), who tells us he has worked 400 W's on Fifteen since January 1 (as well as plenty of other DX) has been approached by K9QIZ (Chicago), who wants to fix a sked with someone in the region of Wembley Park, preferably on Fifteen phone.

G3OGO (Croydon), during a period of enforced listening only, says he has learnt that many foreign stations like working G's so that they can improve their English . . . so the fatuous remarks one hears such as "Your English is very fine, much better than my German" don't really help them very much. G3OGO also says that TG9BK is active on Fifteen and works G's; and that 9M2GX is QRT after an accident on his motor-bike.

Heard on the Air

G3OAG reports a Russian on Ten, covering about 30 kc on either side of him, saying "I am very proud of my modulation system, which I have just devised"—needless to say, he was only just intelligible . . . probably wide-band FM!

Heard on One-Sixty by your conductor—a G on rather ropey phone informing the other mem-

TOP BAND COUNTIES

LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
GM3OM	97	98
G6VC	96	96
G3APA	89	90
G2CZU	83	85
GM2UU (Phone)	80	81
G3NFV	78	78
GM3AVA	78	78
G2DF	77	77
G3MXJ	76	80
GM3OM (Phone)	75	79
GM2HIK	74	76
G3NNO	73	85
G3NPB	73	77
G3FS (Phone)	73	76
G3NVO	72	81
G3ISG (Phone)	72	74
G3LWQ	71	80
G3OCA	71	74
G2CZU (Phone)	69	69
G3NBT (Phone)	65	68
G3OAG	61	64
G3OGY	59	67
G3NNF	57	61
G3NJQ	56	59
G3OHX	55	59
G3NMZ (Phone)	55	58
G3NXQ	53	60
G3NAA (Phone)	52	60
G3NPB (Phone)	52	58
G3LZF	51	64
G3NNF (Phone)	49	51
G3IDG	42	47
G3NNO (Phone)	39	60
G3NOW (Phone)	39	42
GW3CBY	33	50
G4JA	30	40
G3OIK (Phone)	27	41

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

bers of the net "I have never had a bad report yet." He must have been quite shaken to receive one (ours) by first post next morning!

G3NWT heard a W, discussing the "Master of Ceremonies" system, remark: "It gets so you may as well hire someone to do the queuing-up." He adds: "I can envisage a time when anyone with 250 plus is allowed to appoint a squire, like the knights of old, to stick around the band and register with the M.C.'s while his master goes off and does something worth while. Alternatively, clubs could have robot transmitters working the DX-peditions by arrangement, the members' calls going in on punched tape at one end and reports on a standard QSL form coming out the other."

GM3BCL (Pitfodels) has some very trenchant remarks to make on the subject of M.C.'s and other operating points, but as his letter arrived right on the "tail end," we must keep them for next month.

HB1DX/FL, Liechtenstein, when asked why some stations used the suffix and others signed HE, replied that in his case the *Austrian* authorities wished him to use FL.

"CQ" World-wide DX Contest

Our preview of the results of the CQ Contest (*Phone Section*) shows that the U.K. has once again been poorly represented. Only ten G's appear in the list, plus two GM's, with the other prefixes not represented at all; the U.K. was outnumbered by the OK's, DL's, SM's, OZ's, PA's and others—we obviously just don't like this contest for some reason or other.

The leading G in the All-Band section was G2DYV (38,808) with G3LNG (31,408) as runner-up. By contrast, however, G3FXB made 103,818 on 21 mc only, and appears in the Roll of Honour as Continental Leader for Europe in that classification; c o n g r a t s, G3FXB.

All this refers to the single-operator category, in which the overall winner was VQ4DT (558,285) with no European in the Top Ten. CX2CO was the Single-Band Trophy winner with his score of 333,168, 14 mc only. Highest G score on this band came



G3OMH is operated by D. Hayward at 6 Larkhill Road, Yeovil, Somerset, and with the exception of the Eddystone 358X receiver, all gear is home-built and based entirely on "Short Wave Magazine" published designs; the main transmitter runs 80w. to a pair of 807's and covers 10-80 metres, for which the aerials are a 67 ft. wire and 20-40m. dipoles. Full BK facilities are provided for CW working, and the whole station is contained in the cabinet seen in the photograph. G3OMH/M is also constructed to Magazine designs, the transmitter being an adaptation of the "Top Band Talking Box" (October, 1956) with an 8 ft. centre-loaded whip and modified Command receiver.

from G3NNT (54,944).

In the Multi-Operator multi-transmitter section, GB2SM collected the honours with a score of 186,660, runner-up being G3HTA with 72,576. GB2SM has the distinction of appearing in the Honour Roll for this section, being third in the world. First was K2GL (383,112) and second ET2US (258,427).

Despite the poor U.K. entry overall, it is good to see three British stations in the Roll of Honour, and all credit to GB2SM, G3FXB and G3NNT for achieving this.

Late DX Flashes

Ivory Coast Republic, formerly FF4, is now signing TU2 . . . PK2HT is reported active on Twenty . . . XW8AL is the only station in Laos on phone; XW8AC is QRT, XW8AQ on Twenty CW only.

VS5GS is the only active station in Borneo—VS5JS is QRT . . . VQ4AQ was heard (by G3NWT) mentioning that he has 331 worked, and a few more still to chase!

HV1D (worked by GI3NPP and

others) said he was 111L—no news yet of whether this is genuine, but could be . . . CR10AA activity is *still* promised (has there ever been a month when it hasn't?) W8DPF, who is licensed also as VK8TB, hopes to get the necessary permit.

The future of the Yasme Foundation is still uncertain, but VP2VB is making *Yasme III* seaworthy again and she will soon be ready for trials.

HP1SB and MP4BBE have both been logged on 7 mc CW (by SWL N. E. Bethune); our regular reporter Peter Day (Sheffield) has diverted from this band to sample the joys of 14 mc SSB, having acquired a new receiver.

EIØAB Expedition

The boys who took EIØAA to Basket Is. last year—see *SHORT WAVE MAGAZINE*, August 1960, p.322—will be signing EIØAB from the Aran Islands during May 20-22 (Whitsun week-end). Bands used will be 15-20-40 metres, as they open, CW/AM/SSB, continuous operation from 1500 May 20 until 1200 May 22. Gear used will include a Heathkit DX-100U with SB-10 for Sideband, HRO

receiver, Mosley TA-33Jr. and V-4-6 antennæ, and various dipoles. All QSL's to EI6X, QTHR, and return cards *via* bureaux unless postage is sent.

For those who want to know, the Aran Is. are across the entrance to Galway Bay, off the west coast of Eire, and about 50 miles out from Galway itself. The QTH of EIØAB will be Kilronan, Inishmore, Aran Is. We imagine that this is one of those trips which could be affected by the circumstances of wind and weather.

Heading Photograph (p.136)

HH2V, Port-au-Prince, Haiti,

P & Z TABLE

STATION	PREFIXES WORKED	ZONES WORKED
	<i>CW Only</i>	
G2DC	440	40
G13NPP	394	40
G3WP	368	36
G3HZL	366	40
G3ABG	336	40
G2BLA	325	39
GW3CBY	266	23
G3LZF	238	34
G3IDG	232	28
G2BP	220	30
ZC4CT	199	29
VK6AJ	194	36
GW3MLU	189	31
G3OQK	105	12
	<i>Phone Only</i>	
G3DO	630	40
MP4BBW	439	40
G3GHE	386	39
GB2SM	370	37
G3LKJ	347	38
G3NWT	332	39
G3MCN	324	38
G3BHJ	315	37
G3NFV	292	37
G3ABG	261	32
G3HZL	138	26
G2BLA	110	21
GW3MLU	109	19
G2FQW	99	6
G3WP	80	25

has the distinction of having made 160-metre history by working W1BB on 1805 kc, for the HH/W first contact on that band; it was on both phone and CW. HH2V thereby holds the "W1BB 160-Metre DX Certificate." He runs a Viking II transmitter and HQ-160 receiver, and though the aerial is only a 120-ft. wire, HH2V is well located, with a good earthing system. The W1BB contact took much patient schedule-keeping over several months before they made it.

Proposition

The Malayan Amateur Radio Transmitters' Society is submitting the following proposal to the IARU: (1) Power input should be restricted to a maximum of 250 watts on Ten, Fifteen and Twenty; (2) CW should have an exclusive allocation of 200 kc at the LF end of Ten; 150 kc on Fifteen; 100 kc on Twenty; (3) Traffic handling on these three bands should be confined to CW except in the case of a national emergency.

The Ex-G Net

The Ex-G Radio Club in the USA now publishes a monthly bulletin, from which we gather that amateurs born in the British Isles and now resident within the *Commonwealth* are eligible for membership. The regular meeting of the Net is now on Sundays, 1900 GMT, on 14270 kc—not the previously-quoted frequency in the 21 mc band. Full details from K5QWZ or W3HQO, QTHR.

Procedure

Various correspondents have suggested, from time to time, that "procedure" (as one might laughingly term it) has not exactly improved during the last year or so. Generally speaking, the CW users come out best, but in contest work or the pile-ups even theirs goes completely haywire.

We have heard contest-style QSO's handled in a manner that doesn't contravene the terms of the licence, but the operators concerned wouldn't have a ghostly chance of winning . . . and at the other extreme we have heard the ten-second affairs that usually denote a winning score, sometimes

with only one call-sign from each during the whole QSO. (Those letters "BK" cover a multitude of sins—and as for signing-off, well, who ever bothers about old-fashioned stuff like that?)

And—best example of all—we have actually heard many snap contacts with rare ones, in the middle of a pile-up, in which the rare DX man didn't disclose his call-sign at all during eight or nine consecutive QSO's. True, he didn't need to . . . but is it *right*?

For those who have never got involved in this sort of thing, a specimen contact goes like this: (1) *CQ de ZQIA K*; (2) *de G3XYZ K*; (3) *G3XYZ 579 K*; (4) *R 579 73 SK*. So long as one can get the QSL . . .

On the phone side things are shocking, particularly among the SSB types, who will exist on "break" or "go ahead" for up to 25 minutes (actual observed time) without a vestige of a call-sign. Surely someone, somewhere, is due to come a nasty cropper before long, when the pink slips start to circulate. (Of course, if one never signs at all, the monitoring bods. don't know where to send the pink slip!)

It's odd to think that the snappy operator—even the genuinely *good* one—thinks of the man who signs over and over again, far too often, as a typical Lid; and yet these types at the other extreme who never sign at all qualify for the term even more handsomely.

Net procedure, too—have you never listened to a net and emerged without knowing who was whom, or *vice versa*? We always seem to be hearing stations announcing "G 3 amerka and the QSO from G 3 balobba," and an outsider never *would* guess. But don't, please *don't*, go the other way and roll out all those ghastly phonetics! A good clear enunciation of the call letters would make all the difference.

And so to our signing-off, with the usual acknowledgments and thanks to all sources of information; particularly W4KVX's "DX," the WGDXC's *Bulletin*, the Polar Bears Radio Club's *DX-er*, and W6NTR of the *Western Radio Amateur*. Also, of course, our regular correspondents,

a few of whom have dropped out this month owing to the early deadline. We hope they will all take due note of the next "fatal date," which is first post on **Friday, May 12**; for the airmail correspondents who want to catch July it will be **June 16**. Everything addressed, as usual to "DX Commentary," Short Wave Magazine, 55 Victoria Street, London, S.W.1. Until then we wish you all Good Hunting. 73 and—BCNU.

Short Wave Magazine DX CERTIFICATES

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

FBA	
No. 197	SM5BPI (Nykoping)
198	DJ3BB (Bottrop/Westfalen)
199	DL6UV (Stuttgart)
200	K2PFC (Canistee, N.Y.)
201	SM3VE (Gavle)
202	CT1CF (Lisbon)
PRA	
No. 12	W1NLM (Bethel, Conn.)
13	W9GFF (Chicago)
14	UA6UI (Astrakhan)
WABC (Top Band only)	
No. 227	G3NPI (Loughton)
228	G3OAG (Prestwich)
229	G3NRL (West Kirby)
230	GM3OM (Larbert)
	Phone No. 11.
WBC (Overseas only)	
No. 193	W6BYB (Sebastopol, Cal.)
194	HA5FO (Budapest)
195	DJ2XP (Wiesbaden)
196	HA5AM (Budapest)
197	W0MLY (Perry, Iowa)
198	W2NUT (Roosevelt, N.Y.)
199	DL1TA (Braunschweig)
200	OY7ML (Thorshavn)
201	SP6AAT (Warsaw)
WFE	
No. 48	XZ2TH (Rangoon)
WNACA	
No. 261	DJ1VS (Nueremberg)
262	UR2AR (Tallinn)
263	SM5ATK (Strangnas)
264	OK1AEH (Prague)
265	UA9CM (Riabchikov)
266	G2FAY (Chadderton, Lancs.)

Details of MAGAZINE DX AWARDS and CERTIFICATES and the claims required for them appear in full in the opposite column.

Overseas claimants may send either (a) A check list, without cards, duly certified by the Hq. of their National Amateur 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.

SHORT WAVE MAGAZINE DX CERTIFICATES

RULES

WNACA (Worked North American Call Areas)

Twenty-two cards to be submitted, for contacts with stations in ten U.S. Districts (W1-0); nine Canadian (VE1-8 with one 8 in Yukon, one in North West Territories); Alaska (KL7), Newfoundland (VO) and Labrador (VO). Contacts may have been on any bands, phone or CW. Operators in W, VE, VO or KL7 are *not* eligible for this Award (266 *WNACA Certificates issued to March, 1961*).

FBA (Four Band Award)

Cards to be submitted with confirmation of contacts with 20 different countries, *each* country to have been worked on four different bands. Any four bands will qualify, e.g. 160-80-40-20, or 80-40-20-10, or 160-40-20-15—and so on. Entrant's own country may count as one of the 20 countries. (202 *FBA Certificates issued to March, 1961*).

WFE (Worked Far East)

Eighteen cards to be submitted for 18 different countries selected from among the following: C (China), C3 (Formosa), C9 (Manchuria), CR9 (Macao), CR10 (Timor), DU (Philippines), FI (French Indo-China), HL (Korea), HS (Siam), JA/KA (Japan), KR6 (Ryukyu Is.), PK1-2-3 (Java), PK4 (Sumatra), PK5 (Dutch Borneo), PK6 (Moluccas), UA0 (USSR in Zone 19), VS1 (Singapore), VS2 (Malaya), VS4 (British North Borneo), VS5 (Brunei), VS5 (Sarawak), VS6 (Hong Kong) and XZ (Burma). All or any bands count. (48 *WFE Certificates issued to March, 1961*).

WABC (Worked All British Counties)

Sixty cards required, from sixty counties of the British Isles, all to have been worked on the 160-metre band since January 1, 1952. Counties to be as shown in any standard atlas, *not* "administrative counties" such as the three Ridings of Yorkshire, East and West Sussex, County of Bristol, and so on. Isle of Wight counts as Hampshire—not separately. Isle of Man does score separately, as do all the Channel Islands. Scilly Isles also count separately. For London the L.C.C. area scores as one County. (230 *WABC Certificates issued to March, 1961*).

WBC (Worked British Counties)

Open only to claimants *outside* the United Kingdom and Eire. Cards required from 50 different counties of the British Isles, worked on any band 3.5 to 28 mc inclusive, phone or CW. The definition of U.K. counties is the same as for the WABC Certificate above. (201 *WBC Certificates issued to March, 1961*).

PRA (Polar Regions Award)

Claimants must be able to show cards as follows: (a) Arctic—QSL's from six of the areas Alaska, Canada, Finland, Greenland, Norway, USSR *all lying north of the Arctic Circle*. Jan Mayen and Spitzbergen (incl. Bear Is. and Hopen Is.)—making eight possibilities from which the six cards can be derived. Also (b) QSL's from any six of the following eight Antarctic areas: Antarctica, Falkland Is., Heard Is., South Georgia, South Orkneys, South Sandwich Is., South Shetlands and Macquarie Is. Cards must not be dated earlier than January 1st, 1955, and contact can be on any band, CW or phone. (Award instituted September, 1957. Fourteen issued).

MDXA (Magazine DX Award)

To qualify for this Award it is necessary to have worked 3 continents, 15 countries on 160 metres; 5 continents, 40 countries on 80 metres; 6 continents, 80 countries on 40 metres; 6 continents, 180 countries on 20 metres; and 6 continents, 90 countries on 10 metres. (Eight Awards issued).

CONDITIONS

Claimants in the U.K. are required to send all cards in support, by registered post with a check list, when making their claims. Overseas claimants (only) may send either (a) A check list, without cards, duly certified by the Hq. of their national Amateur Radio Society, or (b) An uncertified check list, from which all or any cards may be called in for scrutiny by us. In no case will any Award be issued without proofs we consider to be good and satisfactory.

Claims, enclosing return postage (five IRC's in the case of overseas claimants) for all the above-mentioned Certificates should be addressed "DX Awards," Short Wave Magazine, 55 Victoria Street, London, S.W.1

(Overseas Amateur Radio periodicals please copy)

OBTAINING THE MAGAZINE OVERSEAS

Like most other British periodicals, the export sales of SHORT WAVE MAGAZINE are handled by wholesalers in the periodical trade who specialise in export business. While we can, of course, accept direct subscription orders in any convertible currency, it is probably just as easy for Continental readers, for instance, to obtain their copies through local newsagents, whose own wholesalers will know the sources of supply in this country.

GD6UW, EASTER VACATION

CAMBRIDGE UNIVERSITY
WIRELESS SOCIETY EXPEDITION
TO I.O.M., APRIL 5-12, 1961

C. D. H. LEWIS (G3NHL)

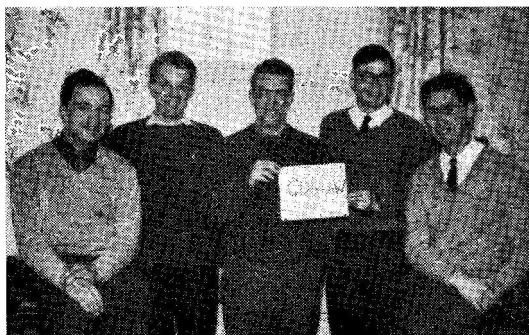
IT may be remembered that in 1960 a small C.U.W.S. expedition to the Isle of Man was mounted, involving gear and personnel for two stations. This year, the sights were set higher, and four stations were provided, to cover all bands Top to Two Metres, using mainly commercial equipment.

Most of the operation was from a boarding-house QTH in Douglas, but the two-metre rig was located at the M.T.C.A. Radio Station on the top of Snaefell (2034 ft.).

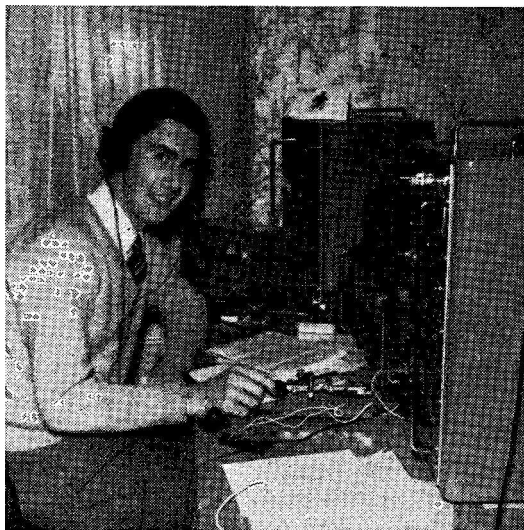
Equipment at the main station consisted of a Labgear LG300 transmitter with associated Mod/PSU, an Eddystone 888A receiver and a Mosley V-3 trap vertical aerial for 10, 15, and 20 metres; a 300 ft. wire was used for 80 and 40 metres. The two-metre station was a Withers TW-2 10-watt Transmitter, TW-2 Cascode Converter, and a J-Beam 4-over-4 slot fed. A Top Band transceiver (used with a 350 ft. wire), and a home-built SSB station for 14 mc completes the list of gear.

The interests of the operators were as diverse as the apparatus, and so whilst there were hectic sessions on 14 mc CW, there were also phone rag-chews on 80 and 160 metres. In addition, personal QSO's were made with several of the "indigenous population" of GD amateurs, and a fair amount of time was also involved in setting up the 2-metre station on Snaefell—and in getting up there for operating sessions; for the last occasion, two of us had to walk the four miles from Laxey (at sea level) to make it!

In spite of all this, taking all stations, over 700 QSO's were made in about 55 countries. The expedition was much enjoyed by all of us, and it was a very interesting experience to use a DX call-sign.



The GD6UW team, all members of the Cambridge University Wireless Society, who took equipment for all-band operation, including two metres, to the Isle of Man during April 5-12. Left to right: G3NHL, G3OSU, G3MDR, SWL Sykes, and G3OBT.



G3OBT operating GD6UW on the HF bands. The Eddystone S.888A is flanked by the two units of a Labgear LG.300 assembly, with its Mod/PSU. The LG.300 fed out through an ATU. For CW working, a Vibroplex key was mainly used.

The HF Station

The 21 mc band seemed fairly dead whenever checked, so operation was mostly on 14 mc, with occasional sorties to 3.5 and 7 mc in the mornings. Some 550 QSO's were made, of which about half were with U.S. stations. DX worked included HK1, JA9, KL7, SVØ, UA9, VK, VP2, and ZP5. Conditions on one or two mornings were good, producing VK and JA. Most evenings were average, with 14 mc open for DX until about 0130z.

VHF Station

The Douglas QTH proved useless, possibly because of an incorrectly assembled aerial, and not aided by a faulty valve in the home-made IF/AF unit. However, soon after all this had been sorted out, GD5SF offered to drive operators and gear up to Snaefell, and this time the station was set up with the J-Beam put together properly and a CR-100 was borrowed from the Civil Aviation Station staff to use as an IF/AF unit. On the Sunday, April 9, only eight stations were worked, perhaps because the strong gale blowing discouraged any idea of swinging the beam round (it was set up headed east). On the Monday, with only a breeze and the beam rotatable, 25 QSO's were made in about three hours, the aerial being frequently turned, and in addition being raised to 14 ft. instead of 4 ft. above the ground. On the Tuesday, the 11th, one of the M.T.C.A. Station staff, GD3IWP, had re-erected the aerial at its 14 ft. position before the operating crew arrived; this was fortunate as a 65 m.p.h. gale developed at the same time as our arrival. The beam was left on a S/E heading and another 25 QSO's were made during that evening.

The Withers equipment seemed to work very well

and excellent reports were obtained on modulation, quality and signal strength at distances up to 180-190 miles. Best two-metre DX was G5ML and G6XA (at Leamington Spa) and G3BNL (near Nottingham). Countries worked were G, GM, GW, GD, and GI, but no EI's were heard at all.

In strict accordance with "Murphy's Law" there was no sign of an opening during any of the VHF operating sessions. Also, there were several dead frequencies as far as we were concerned, due to break-through from the local M.T.C.A. and BBC stations within the site area. We would be interested to hear from any two-metre operator who called us without getting a reply. G5YV was missed the first evening due to the local break-through stations, but fortunately he had another crystal and worked us the next day on an alternative frequency. It is understood from reports received that the GD6UW/P frequency was about 144.98 mc, and not 144.87 as previously notified—so the crystal could not have been working on its nominal frequency. On the Wednesday, 12th, the last evening, the VHF gear was again tried at the Douglas QTH, but again without success. On the two-metre band, 58 QSO's in all were made from Snaefell.

Top Band

We seemed to get out well with the 350 ft. long wire; several stations in the south of England, e.g. G3GQS and G3FFL, were worked, with OK1ADX (579 both ways) as the best DX. About 100 QSO's were achieved, many on phone; the GD6UW/A series-gate modulation gained many favourable reports. Several 160-metre schedules had been arranged beforehand and about half of these duly came off.

SSB on Twenty

A 14 mc phasing-type Sideband rig, VXO-controlled, was built specially for the expedition. It functioned well and satisfactory reports were received on carrier and lower-sideband suppression. However, there seemed surprisingly little demand for a GD6 on SSB and very few QSO's were made. Possibly our 50 watts got lost in QRM as far as Stateside stations were concerned; only one, a K1, came back to a "CQ." It is perhaps ironical that the only South Americans worked on SSB were CX2CO and PY2CK, probably the two best known DX men on that continent, who no doubt had GD QSL's anyway. When this trend became clear, and since there was always a response to our CQ's on 14 mc CW, operation was continued on the key—both stations could not be run simultaneously without interference.

The operators, who shared the work on the various bands between them, were: G3MDR, G3NHL, G3OBT, G3OSU and SWL Ian Sykes. All are active members of the Cambridge University Wireless Society, for which the callsign G6UW has been in being for about 35 years—though during that time there have been long dormant periods, when no member of the University was available to take an active interest in amateur-band working.

As for the future, G3OSU and SWL Sykes



For Top Band, the GD6UW group had a transceiver built by G3MDR; the operator in this photograph is G3OSU.

(shortly to have a ticket, we hope) will almost certainly return next Easter, but the other three finish at Cambridge this year. They will be visiting W/VE this summer before taking up employment.

We of GD6UW would like to place on record our gratitude to the various manufacturers—Eddystone, Labgear, Mosley, J-Beams and Withers—who lent us excellent and most reliable equipment. Without their generous help the expedition would not have been possible.

NEW FLAW DETECTION TECHNIQUE

Electronic techniques have for long been used for the detection of flaws and failures in materials and processes, and there are many highly refined methods available. The Zenith Radio Corp. of America now describe a new approach—the use of gamma rays with an intensifier system permitting exploration for flaws in steel up to 4 ins. thick, with projection on a TV screen. Cobalt 60 is used as the gamma source, impinging on a new device known as the Rauland intensifier tube, placed behind the material under inspection. The action of the Rauland tube is to transfer some of the energy in the gamma radiation to electrons of more manageable intensity, from which the visible image is produced—either for direct viewing, or for TV presentation. The merit of the system lies in being able to use, and control by electronic methods, the high energy radiation from Cobalt 60, these rays having the very high penetrative power which is needed for dense materials.

GOOD LUCK IN THE R.A.E.

At this late stage, we can only wish those taking this year's Radio Amateurs' Examination "good luck" in their attempt to convince the examiner that they know enough about it to deserve a pass!

SWL ● ● ● ● ● ●

THE BC-348 RECEIVER — READERS' IDEAS AND OPINIONS — THE HPX LADDER

SHORTLY after the war one would have said that the BC-348 was one of the most popular of all the receivers available on the surplus market. It was an excellent piece of equipment in nearly every way, its chief shortcoming being the frequency limitation, since it tuned only up to 18000 kc at the HF end. Very well built, it was designed for use in American bomber aircraft.

Supplies must have been somewhat limited, for it has never invaded the amateur market in vast quantities, and the BC-348's one encounters nowadays are those that keep changing hands. In addition, quite a number are permanently tied up as "stand-by receivers" in stations where the normal equipment includes something a little better.

Those who know nothing of the BC-348, but have seen examples lying around and noted its compact size and unimpressive appearance, will be surprised to learn of its specification. There are two RF stages and three IF's—as in an AR88! But, of course, the power supply is not built in, and the audio end is normally intended for headphones only—hence the small dimensions.

As with so many American Service receivers, the BC-348 comes in a confusing variety of types. The BC-348 C, E, H, K, L, M, P and R use the valve line-up shown in Fig. 1, with 6K7's for RF stages and 1st IF, separate oscillator at the RF end, and combined third IF and second detector (a 6B8).

While retaining the same basic circuitry, other models are to the layout shown in Fig. 2, with 6SK7's for RF and IF, a 6SA7 for mixer/oscillator, a 6SR7 for second detector and BFO and so on. These are the BC-348 J, N, and Q.

Features common to all models are the IF of 915 kc and the design for use with 28-volt DC supply as found in aircraft. Thus, the first job for an amateur acquiring an unmodified BC-348—rather a rare thing nowadays, but they do come up occasionally—is the conversion of the heater wiring and the provision of a suitable power supply.

The heaters are naturally wired in series-groups of four. The most straightforward plan is to cut all the wiring out from the heater circuitry and to

rearrange the lot in parallel, running them from the normal 6.3 volts AC thereafter. There is a balancing resistor in series with the DC heater line, which must, of course, be removed. When they have been rewired in parallel, one side of the line may be earthed and the other brought out to a terminal on the output plug (pins 3 and 4 carried the 28-volt supply, so either may be used).

The output of the power supply should not be much over 200 volts, and certainly should not exceed 250. This, again, may be connected to the input socket, using terminal 2.

The audio will scarcely be adequate for operating a speaker, so, if it is essential to use one, a convenient overall modification is to build (a) the 200-volt power supply, (b) an extra audio stage and (c) the speaker all into one cabinet or metal box. You will then have the characteristics and advantages of a "big" receiver with the portability afforded by two reasonable-sized units. This is an important consideration for field day work.

A worthwhile modification if you are keen on CW and SSB reception is the separation of the RF and audio gain controls, which are mounted on a single shaft. Simply remove the leads from one of them and mount another of the same value (350,000 ohms if audio; 20,000 ohms if RF) somewhere else on the panel—not too far away.

Two tappings on the output transformer give outputs of 500 and 4,500 ohms, so a step-down transformer will be needed additionally for use with a speaker. The 4,500-ohm tapping is, naturally, suitable for use with high-resistance phones.

Many other modifications are, of course, possible to suit all sorts of individual requirements, but the BC-348 as it stands is still an excellent general-purpose receiver. Its dial is small by modern standards, but clear and easy to read, with quite a fine calibration. There is no bandsread in the accepted sense of the term, but a very highly-g geared reduction drive makes tuning easy over the whole of the frequency range. The oscillator supply is not stabilised, but drift is surprisingly small after the initial warm-up.

In short, the BC-348 makes a really excellent starting-off point for the relative novice; with intelligent modifications it can be turned into a very good receiver for the more knowledgeable; and it is always a most excellent "second receiver" or stand-by, the latter being the purpose for which very many of them are known to be given a place in the shacks of our transmitting colleagues.

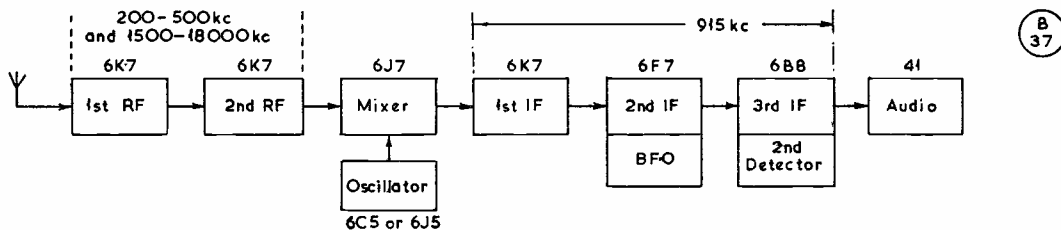


Fig. 1. Showing the line-up of the stages in the BC-348 receiver when its suffix is C, E, H, K, L, M, P or R. Note that a separate stage is used for the oscillator, but that the BFO and 2nd detector are combined with the 2nd and 3rd IF's.

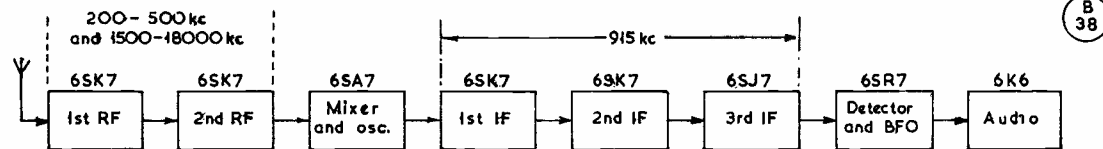


Fig. 2. A different arrangement from that of Fig. 1 is used in BC-348 models J, N and Q. There are still eight valves in all, but the oscillator and mixer are now combined, and the BFO goes with the 2nd detector, while all three IF stages are completely separate and not dual purpose.

READERS' FORUM

A very interesting letter from *Ian J. Kyle (Belfast)*, in which he says that this feature has been responsible for bringing him back to the fold after ten years' absence. Having started in 1947 with an 0-V-0 which grew into a 1-V-2, he was commissioned in a TA Signal Squadron and "went dormant" for awhile. Then, after getting married and "having to provide some way of listening to Mrs. Dale," he re-hashed a junk-box broadcast set and found he could also hear 80-metre amateurs again.

Round about this time he made his acquaintance with SHORT WAVE MAGAZINE and "SWL," the dormant "bug" revived and became virulent—and now he is awaiting his call-sign with both tests passed! Present gear includes an R.107, BC-454 and 455, two-metre converter, wavemeter and an "assortment of junk," the ultimate aim being SSB and nothing less—because rag-chewing is the chief desire and SWL Kyle does not approve of the "interminable monologues" of most AM contacts. We certainly wish him luck and many enjoyable years on the air.

J. Wooden (Kingston), who has been a high-scorer in the HPX Table for some time, is another who has now placed himself out of it—on February 28 he became G3OWA and so puts in his phone and CW scores (both near the top) for the last time. Incidentally, he says that he found the HPX Ladder excellent practice for CW—so take note, some of you phone-only listeners, if you hope one day to achieve a ticket.

Ken Scott (Birkenhead) has just acquired an R.208, which, he says, accounts for a good jump in his HPX figures. He asks: "Would it be possible to have a list of DX heard on the three HF bands, just for listeners?" The answer is that this *Magazine* just isn't big enough! These days a single keen and efficient SWL could fill a page with the DX—real DX—that he can log over one week-end, leaving out stations like W's, LU's, PY's, VQ2's VQ4's and the like. The really rare ones reported by listeners

are always mentioned in "DX Commentary," which is read, we have no doubt, by the SWL's who are keen on winking them out. We hope to keep mentioning anything of exceptional interest heard by SWL's, but ordinary DX-collecting means so little nowadays.

P. J. Weyell (Richmond) reports that the KN4's seem to be exhausted, as he has heard a WN4 on CW—another new prefix, anyway. He also gathers that the former CN2's now sign CN8.

Allan Stirling (Stevenston, Ayr) has been listening since he was thirteen—but that was only two years ago! He would like to see something on the lines of a Young SWL's Club, so that the "starters" could get together and share information and experiences. He has a BC-348 and a BC-221 frequency-meter, the latter being a great help. Together they comprise very nice gear with which to start on the air.

Nevill Bethune (London, N.14) also says he is fifteen and started two years ago, so he is obviously a parallel case. (The old story—"heard a local on an old BC set!") He now has an R.1155E with RF-24, RF-25 and RF-26 units, and a home-built Top Band receiver, but his main interest is Forty CW, on which he has heard more than 75 countries. He



Neat layout at the SWL station of D. Hanson, 26 Tomlin Avenue, Mirehouse, Whitehaven, Cumberland, and entirely home-built except for the Eddystone S.640 main receiver. Chief interests are in the 14-21-28 mc bands, for which a pre-selector (extreme right) is available, the aerials being 67 ft., 132 ft. and a dipole for 10 metres. Other items of equipment include a multimeter, stabilised power supply unit, and an 8-watt amplifier.

wants to correspond with another SWL of the same age (his address is 88 Whitehouse Way, London, N.14).

Is This a Record?

It is not all of our SWL's who regularly offer details of their prowess for publication, so it is pleasant to hear from *Geoffrey Watts* (Norwich) that he has 300 countries in 40 Zones *confirmed*! We have an idea that other SWL's around the world may have logged 300 countries (in itself is a terrific achievement) but to have them *confirmed* indicates that worth-while and appreciated reports have been sent to all of them. For the moment we are content to put this up for auction as a world record among SWL's. SWL Watts has recently heard 5U7AC in the Niger Republic—about the latest of the new ones; and has also logged KH6ECD (Kure Island, another new one) on at least fifteen SSB QSO's.

Robert Nixon (Liverpool) says he is now going on to 70 mc with his R.107 and RF-27; he would be pleased to hear from SWL's already on the band (at 2 Robeck Road, Liverpool 13). He thinks Twenty SSB the best spot for real DX these days, and finds the band open all the time to somewhere-or-other, though Central Americans such as XE's and TG's are scarce.

H. G. Shaw (Heswall) is also keen on SSB and has scored his century on that mode. He says: "I still hear folk saying SSB is the thing of the future—but it's already here, with AM rapidly becoming a thing of the past . . . though the SSB boys' procedure often leaves a lot to be desired, with no calls given in 20-25 minutes, and sometimes even signing finally without an identification." We agree, heartily—it's time some of them were "shook up" with a few pink slips or their equivalent.

DX on One-Sixty

Peter Day (Sheffield), although we always think of him as a 40-metre specialist, has been doing great work on Top Band, and has now logged 22 countries up there, including VP2VA, EL4A, ZC4, VO, VE and a long list of W's. Nice going—and a thrilling off-shoot of SWL as a hobby, to which we can strongly recommend those who are looking for a new challenge. It has been a very good DX season, and next winter should be even better.

Charles Harrington (Hounslow) puts in his first entry for HPX on CW, which puts him right at the head of the list, and no argument! He hopes it will encourage more listeners to read Morse. He has 305 prefixes and 166 countries confirmed, as well as 54 countries on Top Band, and has been "at it," with a long break, since 1935.

Barry Simpson (Stockport), who has just acquired a CR.100, is another who prefers CW to either AM or SSB, and deplors the lack of CW activity among SWL's. He got up to 14 w.p.m. in a matter of months, and has heard all his 177 prefixes since March 1 *this year*. He writes "used to wonder where all the VK's and ZL's were, but now I know—14 mc, CW, 0700-0800 GMT"—and he's dead right!

HPX LADDER

(Starting January 1, 1960)

Qualifying Score — 150

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
H. G. Shaw (Heswall)	524	I. K. Gurney (Chalfont St. Peter)	235
J. Wooden (Kingston)	468	A. Warburton (Aldershot)	235
J. E. Kennedy (Widnes)	443	H. M. Davison (Ashtead)	218
A. W. Nielson (Glasgow)	427	K. Scott (Birkenhead)	211
C. N. Rafarel (Poole)	420	C. J. Smith (Huddersfield)	176
D. G. Evans (Denton)	419	D. F. Catherwood (Huyton)	163
J. A. Share (Plymouth)	409	R. Ashby (Hinckley)	159
G. V. Moss (Greenhithe)	374		
B. M. Crook (Abingdon)	363	CW ONLY	
G. Brown (Bishop Auckland)	353	C. Harrington (Hounslow)	335
R. M. Nixon (Liverpool)	350	R. B. Headland (Liverpool)	323
M. T. Bland (Oakham)	317	J. Wooden (Kingston)	311
J. A. Myers (Felixstowe)	312	J. A. Share (Plymouth)	287
D. Hanson (Whitehaven)	302	H. Warburton (Aldershot)	277
R. J. C. Coats (Cowie)	300	D. G. Evans (Denton)	273
P. J. Weyell (Richmond)	298	P. J. Weyell (Richmond)	249
M. Phillips (Theydon Bois)	268	M. Phillips (Theydon Bois)	247
W. J. Atherford (Southwick)	251	P. Day (Sheffield)	
A. Griffiths (Solihull)	248		
J. Forsyth (Alvaston)	239		
			(7 mc only) 220
		H. M. Davison (Ashtead)	192
		B. D. Simpson (Stockport)	177

(NOTE: Listing includes only those who reported for this issue or the March issue. Failure to report for two consecutive issues will mean removal from the list. Next list — July 1961, continuing as above from January, 1960.)

A. W. Nielson (Glasgow) has been sticking to Twenty with his "aged CR.100," and SSB has brought him in some good catches, such as UA3FE/Ø (the Tannu Tuva expedition), KW6DB, KL7DKG (Aleutians) and many others. During the SSB Contest at the end of January he went on Eighty and increased his score on that band very nicely with some DX that included VE's, W's and KG4AP.

C. N. Rafarel (Poole) is another who comments on the way Twenty is "alive with DX" at 0800—from VK's and ZL's to VE8 and the Pacific. And he now has a hobby which has side-tracked him a little—looking for DX on TV! He has been getting regular pictures from Caen on Band I, Channel F2; and also "had his moments" on Band III under conditions of temperature inversion, when he found Lille and had a picture of "BBC quality" for six hours. Many other French stations have been identified, and SWL Rafarel says "there is a definite thrill in the first-time DX-TV; memories of the first Trans-Atlantic DX on short waves." Referring to the HPX Ladder, in which he scores 420, he says: "I certainly hand it to my rivals with higher scores—the going gets tough after the first 400."

Ronald J. C. Coats (Cowie, Stirling) is another with a liking for SSB, for which he finds his CR.100 quite suitable, the BFO being very stable. During the ARRL Contest he logged 81 prefixes on 21 mc phone, and he was lucky enough to get the Laccadive Islands DX-pedition (VU2NRM), logging them each day from March 23 to 27.

David Hanson (Whitehaven) visited a local two-metre enthusiast and has become "infected"—work is in hand on a cascade converter. But he also enjoys SSB listening, and in addition is trying to attain the necessary 12 w.p.m. on CW.

R. W. Pennells (Tunbrtdge Wells) finds he has logged 376 prefixes, mostly on CW and SSB, since

last Christmas Day—good going! With a small battery receiver he finds that he can resolve SSB with the RF gain well back and the detector just oscillating. Try this one out, you 0-V-1 owners!

Radio Astronomy!

S. T. Hobbs (Darlington) describes himself as a keen short-wave listener whose main interest is satellites and the tracking thereof. He doesn't give any details, but says he is building a radio telescope to put up in his garden, and wonders whether any other SWL's are doing likewise. He has an SX-24, R.107, R.208 and P.104 converted.

John Ingram (Halifax) queries "UP5RF" on 80-metre phone; we don't know of any UP5 prefix, but some of the Ukraine stations are now signing UT5.

Rod Lawson (Solihull), who has an R.107 and RF-24, has just started on Morse and has reached the stage when he knows he's missing something interesting by not being able to decipher it. That's the first step towards becoming really keen!

Graham Myers (Felixstowe) would welcome, for listeners, an LF Bands Table similar to that which appears in "DX Commentary." He has been hearing some good DX on Forty and Eighty, as well as a long list of W's, UB5WF, ZC4AK and VE1ZZ on One-Sixty. All these were heard on a modified R.1155 with a 140-ft. aerial. If there is sufficient demand for such a table we will certainly organise one.

Flying Doctor

VK2HV (Bargo, N.S.W.) confesses to reading this feature regularly and passes on the frequencies of the Flying Doctor radio service, as a matter of interest. They are 5100, 5300, 5360 and 5410 kc, and it would be interesting to know whether they have ever been logged in the U.K. There are also Australian broadcast stations with quite low power, many of which have been heard here; so the other might be possible.

F. Whitehead (Lytham St. Annes) has an R.206 Mk. I about which he makes some puzzling comments. He is worried because the manual says "With BFO on and strong CW signal tuned in, a whistle should be heard, varying as BFO is tuned," and so on. He says: "My BFO works quite well, injecting the necessary beat to make CW audible, but there certainly isn't any whistle—can anyone explain?" We should have thought the beat was the whistle—what goes on?

D. A. Newman (Ashford) has a "much-modified" CR.100, and heartily recommends the advice given in our issue of April, 1960, concerning the replacement of 6K7's in the RF stages by 6SG7's. He has added a crystal calibrator and removed the output stage to make room for it, finding that he still has more than enough gain.

New Type of Aerial!

G. Browne (Orpington) describes his aerial as "a 5½-in. diameter copper ball, suspended outside the house on a short mast"! We would like to know what the neighbours think . . . However, he says it

brings him excellent results on a pre-war R.G.D. four-valver.

David G. Evans (Denton) has found the 7 mc band "packed with DX" between 0100 and 0300 on various days, mostly CW, with the phone band almost dead. He asks about 5U7AC — this one, already mentioned, is in the Niger Republic. Also about the Norwegian suffixes, which are enough to baffle anyone! The suffix, if one is used, actually denotes the part of Norway from which the station is operating as a portable or mobile. Those on the rarer islands like Jan Mayen and Spitzbergen always sign /P.

J. Kennedy (Widnes) has replaced his original broadcast receiver with a BC-348, RF-24 and ATU; and he wants a ladder for Top Band only—but perhaps the already-suggested "LF Bands" affair would satisfy him. He mentions two strong dislikes—firstly, pirates; and secondly, all those who are discourteous on the air. With both of which, naturally, we heartily agree.

WPX Details

Quite a few readers, this month, have queried some of the slightly ambiguous aspects of WPX, and it is time to have an overall clear-up of these points.

One asks: "Can I count VE6/SU, K1/KL7, K8/VO1, W7/VO2, K6/3, W8/4 and so on?" Here, the answer is that you *can* count some of them, but the "and so on" has to be treated with reserve.

It is laid down that a VE6/SU, for instance, counts as "SU6." So, logically, a K1/KL7 would count as a "KL1"—and a W1/KL7 likewise. A W7/VO2 would count as if he were a "VO7"—although there's no such thing. But when it comes down to a W8/4 or a K6/3, they are simply a W4 and a K3, and nothing else.

So, with the KL7, or VO1, or VO2 suffix you have a whole lot to choose from, according to the figure in the prefix; but with stations operating in another district of their own country, such as the W8/4, you merely treat them as if they were using the prefix that they ought to have in any case.

This suffix business is the only feature that makes WPX a little bit confusing—in other ways it is an excellent system and works very simply. At any rate, there's no argument about whether so-and-so is really a separate country.

And that about brings us to the end of "SWL" for yet another month. Quite a number of useful and interesting points have been brought out by correspondents and the HPX table is being well supported, with a slow but steady expansion in the CW list.

Correspondence from short wave listeners is welcomed for this feature, the next appearance of which is in the July 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 May 31 and all mail should be addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

AFTER the fine spread of last month, we could hardly expect VHF conditions to hold up into the next period—and so it has happened. Though GDY has been fairly good at times, there has been nothing in the nature of a widespread opening.

The barograph trace opposite shows this quite clearly, and it is already very interesting to see how some of the reports this time correlate with the shape of the curve. It would be most helpful if, when reporting, correspondents generally would mention dates and times when to them conditions appeared to be good. We also hope that readers are following the suggestion made in this space last month—that, if far enough away to notice changes in signal level, they are doing regular checks on GB3VHF for comparison with the barograph trace. In the case of those who actually write in—and we hope they will be many—there can be no wishful thinking or inspired guessing about this, for the simple reason that they will not see the curve until after their report has been written in here.

At the same time, as implied last month, the barograph trace is not the final answer to VHF conditions—the barometric pressure or, rather, the trend of the barometer readings, is only one factor in the development of good tropospheric conditions; on the other hand, it is also true to say that unless the barometer is high, or is rising towards a higher-than-average reading, VHF DX by tropo. propagation will not be good. In other words, the atmospheric pressure becomes one of the control factors when various other purely met. conditions are fulfilled—such as a warm day followed by a cool evening, a relatively clear sky, and little or no wind, all associated with a wide and stable high-pressure area. In a word, what the met. people would call “anti-cyclonic conditions.”

Change in the Band

As you read this, there has been a subtle change in U.K. amateur operating conditions on the two-metre band — though the prob-

VHF BANDS

A. J. DEVON

Dull Conditions Prevail—

The Barograph Trace—

Band Plan Problems—

News, Views and Comment—

ability is that few people will have noticed anything very different about it.

Anyway, the area 145-146 mc becomes an exclusive AT preserve, while 144-145 mc is “shared,” with the R.A.F. holding a number of guard frequencies (*see* SHORT WAVE MAGAZINE, July 1960, p.264) which, though they are for emergency use and might never be needed at any time that matters to us, must nevertheless be kept clear. This proviso, and the sharing factor, makes the whole 144-145 mc area of doubtful practical value so far as amateur operation within defined zones is concerned.

Really, we are back again at the problem first raised in this space in November last (p.488), involving a re-thinking about the whole Zone Plan. It could well be that the Zone Plan (which was first advocated in these pages, and for years was the accepted system of frequency allocation) has now about outlived its usefulness, particularly as there is a tendency towards VFO control on two metres. While we still think that CC should be used, within defined zones, with 145-146 mc becoming an exclusive area it looks as if,

in any event, a new Zone Plan may be desirable; on the other hand, there are those who would say “Avoid another frequency upheaval, and let things take their course.”

There is already a marked tendency to disregard zoning on two metres and, if the VFO takes hold, we may save frequency space in one way; but we shall certainly lose a good deal in other ways.

Who's Doing What

G3OBD (Poole) says he will be signing /P in Cumberland during June 4-17, running 25w. to a 4/4, with the Tx on 144.12 mc;

TWO METRES

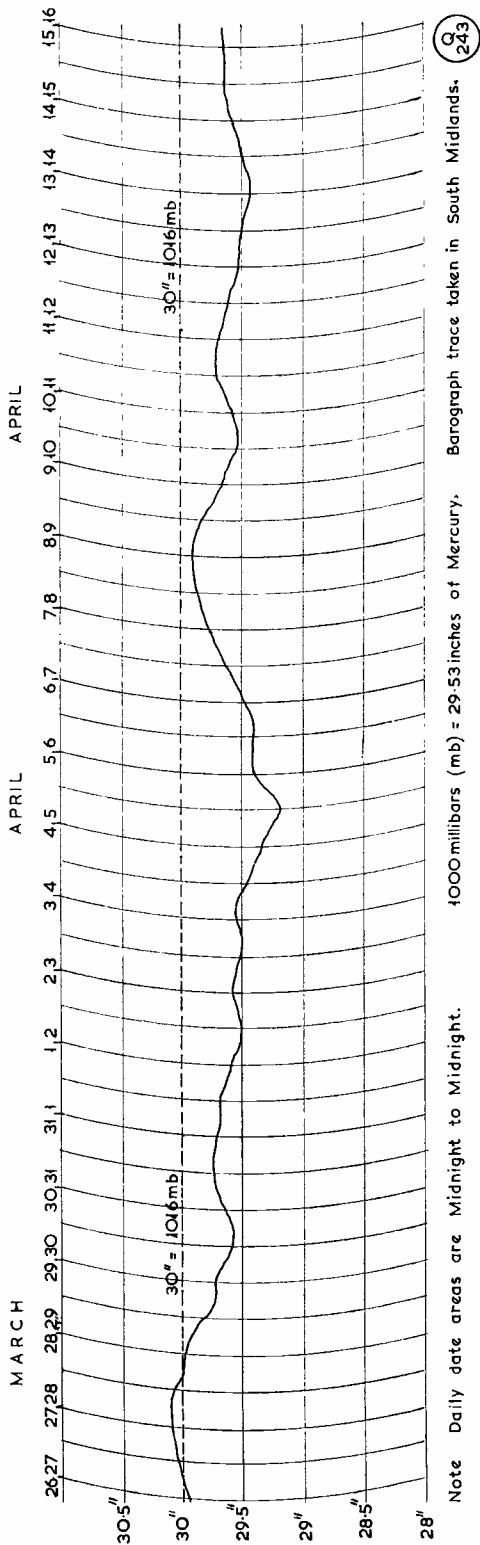
COUNTIES WORKED SINCE
SEPTEMBER 1, 1960

Starting Figure, 14

From Home QTH Only

Worked	Station
54	G3HBW
51	G2CIW
49	G6XA
42	G3JWQ
41	G3BNL, G3LAR
40	G6GN, G8VZ
37	G3MTI
35	G3KPT
33	G3OJY
32	G3KQF
31	G2BHN, G3NAE, GW3ATM
30	G3HWR, G5QA, GW3MFY
28	G3MPS
27	G2CVV
26	G3MHD, G3OBD, G5ZT
25	G3HS, G3OBB
20	G3GSO, G5UM
19	G3OSA
18	G3KMT, G3NNK
16	G2AXI
15	G3ICO

This Annual Counties Worked Table opened on September 1st, 1960, and will close on August 31st, 1961. 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 Daily date areas are Midnight to Midnight. 1000 millibars (mb) = 29.53 inches of Mercury. Barograph trace taken in South Midlands.

Chart showing barometric pressure trend in the South Midlands area for the period March 27 to April 16. Generally speaking, the curve is well below the (arbitrarily chosen) datum line of 30.0", and from the chart one could say with fair certainty that in the southern part of England at least, the periods of best conditions for GDX working — and then they would not have been particularly good — were the evenings of Monday, March 27 and Saturday, April 8. The fact that there was Aurora during March 26-27 was a coincidence which would not have any bearing on tropospheric conditions. As will be seen, in comparison with last month's chart (p. 93, April issue) the trend as shown above is generally lower, and this would tend to keep conditions at "average." It should be remembered that the curve here is not continuous with last month's — there is a period, not covered, between March 5 and 26 when the pressure was, in general, at or above the 30.0" level. The good EDX/GDX results obtained during that period were reported in the April issue.

activity will be "most evenings and all day June 11." G3OBD has already had quite a lot of portable experience locally, so, if conditions give him a break, it should be a useful and interesting expedition.

An interesting letter from G8RO (Tangmere, Sx.), who announces himself as settled on four metres and looking for contacts; G3EHY and G3CLW had been worked at Lewes, proving that the gear does function; the PA is an 832 taking 25w., the Rx is an RF-27 into an SX-24, and the beam a gamma-matched 4-ele at 27 ft. G8RO is there every Sunday 0930-1230 clock time, and after 10.30 p.m. in the evening for a band check; he would very much like to resume contact on 70 mc with G5MR, old friend of 56 mc days pre-war. So, if Vernon is listening . . .

G2CIW (Birmingham) noticed some Aurora in evidence on April 14, and heard GM2FHH with a fading signal at 2320. Otherwise, Jack has found it a dull period, and has been taking the opportunity to do some bench work; he is one of those several correspondents who express themselves as particularly interested in the barograph trace, as a useful innovation. From G5QA (Exeter) comes a note that he and G2XV (Cambridge) are now running a 70 cm. schedule—the first result was obtained on April 17, when G2XV was heard in Exeter at 339. For those who may be interested, the glass had started rising, being at nearly 30.0 ins. by midnight on the 17/18th and, according to another note we have on the file, it looked like being a "fairly good evening for some GDX."

G3OJY (Churt, Sy.) clocks in another two counties, and was beginning to notice an improvement in conditions by the 18th. G5ZT (Plymouth) also worked a couple of new ones—on April 17, G2NY, a very good contact for the distance; and on the 18th, G3KBS/P for Hereford.

A call-sign much mentioned in recent reports has been G3BNL; he writes in this time, from Keyworth, Nottingham, to say that he is on 145.36 mc about three evenings a week, running 50w. to an

829, with a slot-fed 4/4 at 25 ft., the Rx being an A.1714/A.2521 Cascade job, into a BRT-400E tuning 24-26 mc. G3BNL is also getting under way on 430 mc, and may have made himself heard on that band before this appears.

G3MTI, from his fine location at Malvern, Worcs., reports four of the rarer Welsh counties worked with GW4LU/M. GW5ML/M and GW3FKO out /P in Carm. and Pems.; he says his QSO with GW4LU/M (for Denbighs.) was a lucky one, because when '4LU moved a few yards into Merioneth, signals disappeared; GW3BA/M, giving Montgomerys., was missed. By April 18, G3MTI was finding conditions improving again; his total of stations worked is now 205S.

G2BHN (Yeovil, Som.) says he hopes to appear more regularly—for an hour, at least, most even-ings—with 60w. into an 829B in

the PA, and a 3-ele flat-top at 45 ft., his location being 260 ft. a.s.l. G6XA (Leamington Spa) puts in claims, represented by Welsh counties in which people have been /P or /M, and is now up to 57C in the All-Time.

G2AXI (Basingstoke) was actually AA 2AXI 'way back in 1936-'39, giving up altogether until last year, when he finally emerged as G2AXI, on the two-metre band. His Rx is a CC Cascade with A.1714 g.g. RF stage, into an Eddystone 358X tuning around 17 mc; the transmitter is, basically, the SCR-522 Tx unit modified to take a QQVO3-20A in the PA, at 15w., and the various aerials in use are all in the roof-space. With this lot, G2AXI has worked 79 stations in 16 counties since December 23, and the programme in hand envisages a better beam outside and a new transmitter running more power.

From Hendon, N.W.4, G2AOX writes that, being incapacitated, he is "able to get on the air almost every day and evening, and in the last 14 months has had over 700 QSO's on two metres, with 237 stations worked"—nice going. And in case anyone thinks G2AOX is "lucky" to be able to spend so much time on the air, let it be said that he suffers from an extremely trying spinal complaint. He is also to be heard on 4 metres, and would appreciate contacts with the new stations getting going on that band (*QTHR*). G2CVV (Derby) puts in claims, and is now at 27C in the Annual.

The Expeditions

The doings of GD6UW/P on Snaefell (also signing GD3OBT/P) during April 5-12 are chronicled elsewhere in this issue. Here, suffice it to say that the C.U.W.S. boys put up a good show; they made 58 contacts on two metres from the top of that mountain in the Isle of Man, mainly in very bad weather and with no vestige of an opening. A late report mentions that GD3OBT/P was heard in the Harwell district, which is nice DX for the conditions and the low-powered gear they were using. It is of interest to add that their Snaefell site was practically the same as that used

by the late G3DA just ten years ago.

For the I.A.R.U. Region I VHF Contest on May 7—this is your reminder, by the way—the Midland Amateur Radio Society will be operating G3MAR/P from Lickey Beacon, near Rednal, which is 8m. south-west of Birmingham. There will be many other /P's out and, given the weather and reasonable conditions, it should be a very good party.

The Contest runs from 11.00 to 20.00 BST on May 7, and your A.J.D. will be out on a convenient hill-top (listening for the CW stations!).

Tabular Matter

We must apologise for not being able to show All-Time Counties, as promised last month, but the melancholy event reported in the next two pages upset the space allocation somewhat.

Statistical Evidence—see this space, pp.599-600, January—is still very much required from all parts. Though a good number of readers (and not all regular correspondents, either) have responded very helpfully, we would like to see more before attempting to summarise the data.

Memorial Note

The late G2NM had a long period of activity on two metres in the mid-1950's, from Bosham, and could be heard most early evenings, during which he ran a regular schedule with G2YB, Reading. Though not too well placed for VHF, Gerry gave the band a thorough working over, and was very keen on making schedules. We are sure that readers will think it fitting that he should be remembered here.

And Finally—

Dreaded deadline for our next is **May 17**, by which time some interesting things could have happened; whether they do or whether they don't, send in your news and views, and any outstanding claims for the Tables, to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Till June 2, then, 73 de A.J.D.—and have a good Whitsun.

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 | G3CCH (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OH, ON, OZ, PA, SM, SP) |
| 18 | G5YV, G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP) |
| 17 | ON4BZ |
| 16 | G3GHO, G3KEQ, G5MA, G6XM, PA0FB |
| 15 | G2XV, G3FZL, G4MW, GM3EGW |
| 14 | G2FJR, G2HDZ, G3AYC, G3FAN, G3HAZ, G3IOO, G3JWQ, G3WS, G5BD, G6LI, G8OU, OK2VCC |
| 13 | G3BLP, G3DMU, G3DVK, G3PPT, G3KPT, G5DS, G6XX, G8VZ |
| 12 | EI2W, F8MX, G2HIF, G3EHY, G3GFD, G3GHI, G3LTF, G3WW, G5CP, G5ML, G6RH, GW2HIY |
| 11 | G2AJ, G2CIW, G2CZS, G3ABA, G3CO, G3JZN, G3KUH, G3LHA, G4RO, G4SA, G5UD, G6XA, OK1VR |
| 10 | G2AHP, G2FQP, G2HOP, G3BDQ, G3BK, G3BNC, G3DLU, G3GSE, G3GSO, G3JAM, G3KQF, G3MED, G5MR, G8IC, GW5MQ |
| 9 | G2DVD, G2FCL, G3DKF, G3FLI, G3FUR, G3IUD, G4LX, G8DR, G8GP, GC3EBK, GM3DIQ, GW3ATM |
| 8 | G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKX, G3GBO, G3HCU, G3HWJ, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB, GC2FZC |

THE LATE GERALD MARCUSE, G2NM

Passing of a Pioneer

ON April 7, a brief obituary notice appeared in the *Times* and the *Daily Telegraph* — it announced the passing, the previous day, of one of the pioneers of radio, who started as an amateur and remained until the end one of the most distinguished and best-known radio amateurs in the world.

In business life a Mincing Lane seed importer, Gerald Marcuse was one of the handful of keen radio experimenters of the early 1920's, busily engaged with others of his amateur contemporaries in exploring the possibilities of the then almost unknown, and commercially neglected, short waves — which meant wavelengths of less than 200 metres.

When it became clear that, in fact, world-wide communication by short-wave radio was feasible—the amateurs of 1926 were working round the world, but there was virtually no commercial short-wave occupancy—Gerry Marcuse had the great idea from which was born what became known as Empire Broadcasting.

World-wide radio broadcasting is common-place now, but in 1926 it was a bold and original conception—so much so, that neither the Government, the BBC nor the Post Office would touch it. All that anyone outside the official orbit could do about it, Gerry Marcuse did—he obtained a special one-kilowatt licence from the Post Office authorising him to conduct experiments in short-wave broadcasting on 32 metres; he also got the backing of certain manufacturers for the supply of equipment, in particular transmitting valves, which in those days were always the hard-to-get items.

Caterham Days

The station was established at Caterham, Surrey, in late 1926, and was in two distinct parts: The transmitter was designed, built, maintained and operated by Gerry Marcuse himself at his house in Queens Park—a one-kilowatt anode modulated short-wave Tx was a formidable piece of equipment in those days, and it needed constant attention—the control room and studio being the responsibility of his great friend P. W. S. Valentine, who also lived in Caterham, about two miles away. Private G.P.O. lines were installed between the two houses to carry the programme signal between studio/control room and transmitter, and for speech communication. The studio was the music room at the Valentines' house, and it had a small raised stage at one end; the acoustics were excellent and in addition to gramophone record programmes, the local music society provided instrumentalists for studio performances. A Rice (carbon) microphone, mounted in a block of marble, was used, with curtaining for "acoustic control." The control-room equipment (the control room itself was a bedroom) included microphones, gramophone pick-ups and amplifiers, mixers, faders, land-line terminating units, and receivers for picking

up BBC programmes for re-broadcasting, and monitoring—remember, this was in 1926!

Programme Schedule

Three evenings a week, from 10.0 p.m. until 1.0 a.m., G2NM was on the air with gramophone record programmes (the records were supplied free of charge, with a free performing-rights licence). Early on Sunday mornings, at 7.0 a.m., special programmes were given which were heard in Australia, New Zealand, India, Hong-Kong and other distant parts of the Empire (or Commonwealth, as it is now known). To make the programmes more "live," instrumentalists and solo performers were sometimes persuaded to appear—because of the early hour, they often had to be put up in the Valentines' house for the previous night.

A favourite late-night programme was the famous Savoy Orpheans Band, followed by the chimes of Big Ben, picked up in the control room by radio from the BBC and fed out by the landline to the G2NM transmitter on 32m., with its rows of bright-emitter triodes, ending in PA and modulator stages with glowing valves about the size of rugby footballs. Incidentally, one of the most difficult of their purely technical problems was to get this local landline to accept a reasonable range of audio frequencies; to check and calibrate the line, one of the earliest audio beat oscillators ever designed was used. All the valves in the transmitter and the control room were supplied free by Marconi-Osram and Mullards.

The operations of G2NM on the 32-metre band continued on this regular schedule until about the middle of 1928. Percy Valentine was getting married, and his studio and control room had to be closed down. Gerry Marcuse carried on single-handed for a short while, and it was not until some time after G2NM finally ceased transmitting his regular pro-



Eugen Gerald Marcuse, G2NM, at the age of 72. One of the last photographs of him, it was taken by G6FO at the Cheltenham Mobile Rally in May 1959.

grammes that the BBC started their own Empire broadcasting transmissions from Chelmsford, G5SW. In this particular connection, readers may remember that in the January-February, 1954, issues of *SHORT WAVE MAGAZINE* we had occasion to challenge the BBC and Sir Noel Ashbridge, the Chief Engineer at the time, on the fairness of the impressions given by a broadcast he made on the subject in December, 1953; those interested in the historical aspects of the matter are referred to these issues.

While Gerry Marcuse, G2NM, was a great radio amateur who made his mark in the purely amateur sense, he was also a true pioneer in the wider field of radio communication. Moreover, as a pioneer, he used largely his own resources to develop his theme, to pursue his objective and to prove his point—which was that short-wave broadcasting, world-wide, was a feasible proposition. In this, the BBC came long after him.

For what he did, he received neither thanks, recognition nor reward, financial or otherwise—indeed, as we have seen, there have even been official attempts to deny him the credit due to him.

The Later Years

His many other activities we can only touch upon here—he retired from business in 1942 (his office and premises having been blitzed) and joined the R.N.V.R. After the war, settling at Bosham in Sussex, and being a keen yachtsman, he ran a fine sea-going cruiser called *Irene II*, after his wife. He was active not only on the HF bands (more particularly 80 metres) but also on VHF, and in recent years he was operating mobile as G2NM/M. His public work included membership of the West Sussex County Council for



When Gerry Marcuse, G2NM, was in office as president of the First Class Operators' Club, he presented the Club's marathon cup to G3BDQ (right) at the F.O.C. annual dinner in November 1950. On G2NM's immediate left is the late G5PS, at that time hon. secretary of the F.O.C. In the centre background is G6FO, of "*Short Wave Magazine*."

12 years, and of the local Bosham Council up to the time of his death.

Gerry Marcuse made his last call over the air as G2NM on 80-metre phone on Wednesday, April 5. He died, suddenly, the following afternoon, in his 74th year. His funeral took place on April 10, at Bosham and afterwards at Brighton Crematorium, being attended by many old friends and several holders of old-timer call signs, including G2DX, G2FK, G2WJ, G4RD, G5VS, G6CL (representing the Radio Society of Great Britain, of which G2NM was a past-president), G6NZ and G6OT.

The deep sympathy of radio amateurs, not only in this country but in many other parts of the world, will go out to Irene Marcuse, the widow, who looked after him so well, and to David, the son, of Eugen Gerald Marcuse, G2NM, of Tidewaters, Bosham, Sussex.

A.J.F.



Photograph taken when Irene and G2NM, on the right, were touring in the West Country with G5VS and his xyl. G2NM's car was the Vanguard in the background, fitted mobile.

Brit.I.R.E. 1961 CONVENTION

This year's Convention of the British Institution of Radio Engineers, on "Radio Techniques and Space Research," is being held at Christ Church College, Oxford, during July 5-9. A number of interesting papers, to be followed by discussion, are to be read on this very important subject. The Convention is open to members and non-members of Brit.I.R.E., subject to reservation fees being paid in advance; residence in College, naturally with a limitation on numbers, can be arranged for those requiring it. Non-members of Brit.I.R.E. who are interested in the subject of this year's Convention should apply for the brochure to: The Secretary, British Institution of Radio Engineers, 9 Bedford Square, London, W.C.1. This gives details of papers to be read and the charges for the various sessions, as well as other information for Convention visitors.

• • • The Mobile Scene • • •

OPENING OF THE SEASON

We hope to be reporting the Trentham Gardens meeting of last Sunday in the next issue, as we had cleared for press before April 30. In the meantime, there is a report on the *Amateur Radio Mobile Society's* "Essex Mystery Mobile Rally" on March 26 which, though intended for local amusement only, produced some support from further afield; on arrival at High Beech, "somewhere in Essex," participants were issued with sealed instructions, giving route and clues for a 70-mile run through the lesser-known Essex villages. The winning team was G3ALK/G3IRL in a Ford Anglia—we are told that one starter in this event was not heard of again for a fortnight!

On June 11, A.R.M.S. is co-operating with the *Chiltern Amateur Radio Club* in an event to be called "The Chilterns Mystery Mobile Rally," involving a 60- to 70-mile tour of those parts, starting out from High Wycombe. Tea is being arranged for along the route and intending participants are advised to have with them a good map of the area, and a second operator or co-driver who can understand it. (See calendar for further details.)

For July 8-9, the *South Birmingham Radio Society* are organising what they call the National Late Night Mobile Rally, involving a test route starting from Park Hill School, Alcester Road, Moseley, Birmingham, and taking entrants on a course "in and around the Black Country," between 9.30 and about 11.0 p.m. The object of the competition will be for contestants to cover a pre-determined course, during which they must work six particular stations, the call-signs and frequencies of which will be given in the contest instructions. (See calendar for further details.)

* * * *

Following are the Mobile Rally events to take place during the next few months. In each case, those who intend to be present, either as visitors or participants in the competitions, should drop a card to the address given. This assists with the catering arrangements, and gives organisers some idea of what to expect in the way of numbers.

May 7: Cheltenham Mobile Rally, Montpelier Gardens, Cheltenham, and Thanet Radio Society Mobile Rally, at Hugin Site, Pegwell Bay, Ramsgate. For details, see p.78, April issue.

May 14: Rally and Hamfest at Cleethorpes, Lincs., organised by the Grimsby Amateur Radio Society. Full details and tickets from: P. Mason, G3NNN,

213 Clee Road, Cleethorpes, Lincs.

May 28: Northern Mobile Rally at Harewood House, near Leeds, organised by the Spen Valley Amateur Radio Society. Assembly from 12.30 p.m., entrance charge 1s. 6d. per head, harmonics half price; Top Band talk-in station G3MMK/A on 1981 kc will be on the air from 11.30 a.m. A special (free) Rally car park is being arranged, and there will be the usual competitions. Refreshments and teas available at the House, entrance to which is on the A.61, 7m. from Harrogate and 8m. from Leeds, at the A.659 junction. Harewood House is one of the finest of the stately homes and, with its magnificent surroundings, is well worth a visit for its own sake. For further information and Rally details apply: J. Charlesworth, G3IJC, hon. secretary, 23 Craven Lane, Gomersal, near Leeds, Yorkshire.

May 28: Mobile Rally at Hunstanton, Norfolk, organised by the Peterborough Radio Society—full details from D. Byrne, G3KPO, Jersey House, Eye, Peterborough.

May 28: Southern Counties Mobile Rally at Beaulieu Abbey, New Forest, Hants (B.3506 Lynhurst-Beaulieu). Attractions will include the Montagu Vintage Car Museum, boat excursions, mobile treasure hunt, prize draw and Beaulieu Abbey itself. There will be a reserved Rally car park, and there are ample catering arrangements on site. Talk-in stations G3IVP/A, 1880 kc, and G3ION/A, 144.14 mc, will be on the air from 10.30 a.m. The full programme can be obtained, for an s.a.e., from: L. H. Daish, G2FGD, 7 Bracken Lane, Shirley, Southampton.

June 11: Mobile Rally organised by Chiltern Amateur Radio Club in collaboration with A.R.M.S., starting at 2.00 p.m. from near High Wycombe, Bucks., and involving a Chilterns tour for those who wish to enter. Tea will be available along the route if booked in advance. For bookings and full details, apply: C. Simpson, G3OOZ, 2 Mead Street, High Wycombe, or N. A. S. Fitch, G3FPK, 79 Murchison Road, Leyton, London, E.10.

June 18: Amateur Radio Mobile Society's Rally at the Barford St. John U.S. Air Base, nr. Deddington, Oxon. Details from N. A. S. Fitch, G3FPK, 79 Murchison Road, Leyton, London, E.10.



*Organisers please note: Closing date
for Rally details for publication in June
issue is May 12*

June 25 : West of England Mobile Rally, at Longleat House, nr. Warminster, Wilts. (*Details later.*)

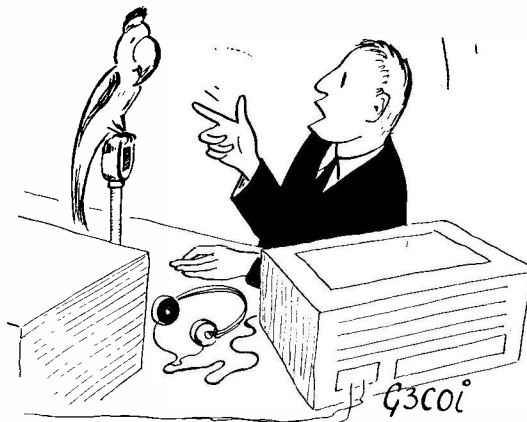
July 8/9 : South Birmingham Mobile Rally, taking place late evening as a tour under competitive /M conditions, using Top Band to find best /M rig. Assembly at Park Hill School, Alcester Road, Moseley, Birmingham, from 7.30 p.m., with G3OHM/A open on 1900 kc from 6.0 p.m. for talk-in. Ample parking facilities at the school, running buffet 8.0 p.m. to midnight, and care of children arranged. All interested in taking part, either as visitors or competitors, are asked to write: T. Legg, Flat 3, 80 Alcester Road, Birmingham, 13 (*South 2572.*)

July 9 : Mobile Rally organised by the South Shields & District Amateur Radio Club. Details from: D. Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham.

August 12/13 : Mobile Rally and Hamfest to celebrate golden jubilee of the Derby Wireless Club (1911). Events will include assembly on the Saturday, visit to an exhibition covering "50 Years of Radio," an outdoor dance and a barbecue (surely the first to be laid on for a radio rally). On the Sunday, there will be a mobile treasure hunt, a really good junk sale, children's sports, various radio displays, and a brass band concert! This promises to be quite a celebration, and full details can be obtained from: T. Darn, G3FGY, 44 Laurel Avenue, Ripley, Derbyshire.

September 17 : Annual Mobile Rally and Hamfest held by the Lincoln Short Wave Club. (*Details later.*)

* * * *



“ . . . Now again — ‘And Standing By For Any Possible Call’ . . . ”

Organisers are asked to let us have their report as soon as possible after the Rally, with details as outlined on p.78 of the April issue of SHORT WAVE MAGAZINE—it is often a good thing to make one member of the committee entirely responsible for the compiling and despatch, within a day or two of the event, of the press report.

We are always glad to see, for possible use to illustrate this feature, good photographs from Mobile Rallies; those sending in prints, which should be clear and sharp, are particularly asked to make sure that adequate details are given, and that call-signs in groups are complete, correct and unambiguous.

THE 1961 “RADIO AMATEUR’S HANDBOOK”

This is the new (38th) edition of the standard guide to the techniques and practice of Amateur Radio, which is sold throughout the world. As ever, it is a magnificent compilation of more than 700 pages, including 584 of extensively illustrated text (with diagrams and photographs on nearly every page), 32 pages of valve data, an 86-page catalogue section in colour, and a cross-reference index of 16 pages. The coverage is complete, from the beginner end to the most modern AT station equipment, in all departments from HF, Mobile, SSB and RTTY to UHF/VHF. Antennæ for all bands, and including Power Supply, Measurement, and Operating. The treatment throughout is practical, with the constructional work amply illustrated.

It is a fact that the *Radio Amateur's Handbook* is an indispensable reference manual for the radio amateur, and it is only because of its practical value making it a world-seller that the publishers—the American Radio Relay League, the U.S. amateur organisation—can attract sufficient advertising to help defray the very high overall cost of production. Any similar text, of the same scope and coverage technically, produced anywhere outside the United States would, unless heavily subsidised, call for a cover price of at least 90s. As it is, the *ARRL Handbook*, as the *Radio Amateur's Handbook* has been known for

nearly 40 years, costs but 34s. post free (or 44s. in the *de luxe* edition with buckram binding). It is more than one inch thick, weighs nearly 2½ lbs. and costs us 1s. 9d. to send you through the post. Obtainable from stock, from our Publications Dept.

SOURCE OF SUPPLY

Those looking for components and usable radio parts of a general nature should not forget that many radio/TV dealers have old receiver chassis which they would probably be glad to get rid of for a shilling or two—or even for taking away! The useful parts on these chassis are the variable condensers, valves and valve-holders, wirewound resistors, power supply items, coils and chokes, and the metal fittings, including the chassis itself. Unless they can be properly tested, it is best to throw away all fixed condensers and compression-type resistors, variable resistors and electrolytic condensers.

Aluminium pieces in odd shapes, but quite big enough for making chassis or panels of radio sizes, can often be obtained very cheaply from the larger garages specialising in car body repair work; ask the man for the offcuts left over from his last couple of jobs. And if you are wanting to make some really heavy low-resistance connections, such as for earthing or in RF tank assemblies, remember that the copper sheathing stripped from odd unwanted lengths of coax makes ideal material for the purpose.

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, 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.

DL2DB, Major D. Baynham, R. Sigs. (ex-G3DBH, VS1DB, XZ2DB, ZB1DB), Hq. 7 Armoured Brigade Group, B.F.P.O. 30, Germany.

G3OBX, D. H. Bemister, 69 Woodfield Drive, Gidea Park, Romford, Essex.

GI30FG, L. F. Garland, 32 Gilnairk Park, Belfast, 5.

G3OLD, R. Kilworth, 2 Wingfield Street, Belgrave, Leicester.

G3ORP, P. J. Pickering, 101 Chatham Road, Maidstone, Kent.

GW3OSV, J. P. O. Bushell, Park East Farm, Clarbeston Road, Pembrokehire.

G30WH, Amateur Radio Club, R.A.F. Station, Lyneham, Chippenham, Wilts.

G30WP, R. A. Hall, 38 School Approach, South Shields, Co. Durham.

G30WT, J. E. Podd, 52 Camden Road, Ipswich, Suffolk.

GM3OWU, V. W. Stewart, 2 South Oxford Street, Edinburgh, 8.

GM3OWZ, W. Gillespie, 29 Copland Road, Govan, Glasgow, S.W.1.

GW30XE, J. G. Lewis, 33 Vernon Close, Merthyr Tydfil, Glam.

G30XI, D. H. Mead, 41 Egley Road, Woking, Surrey.

G30XO, P. E. Morrison, Sherika, Fair Mead, Lower Cam, Dursley, Glos.

G30XP, M. H. M. Chamberlain, Flat 4, Hawley Park, Blackwater, Camberley, Surrey.

G30XR, P. Garthwaite, 7 Park Avenue, New Lodge Estate, Barnsley, Yorkshire.

CHANGE OF ADDRESS

EI3AE, EI7AF, R. Williams, Willfield House, Kinnitty, Birr, Co. Offaly, Eire.

G2AAN, J. H. Clarke, Arlington, Ashtead Park, Ashtead, Surrey. (Tel.: Ashtead 2626.)

G2BPW, I. W. K. Smith, Ignors, Compton, Surrey. (Tel.: Puttenham 464.)

G2VV, J. N. Roe, M.I.R.E., F.R.S.A., 53 Thames Street, Sunbury-on-Thames, Middlesex.

G3BLP, G. W. J. Haydon, Byron House, Slines Oak Road, Woldingham, Surrey.

G3DKC, J. E. Wagg, 29 Ascot Road, Weeping Cross, Stafford, Staffs.

G3DXA, C. J. Godden, 48 Parklands Grove, Ashford, Middlesex.

G3EUK, R. W. Curtis, 1 Fairlawn Avenue, Bexleyheath, Kent.

G3EZZ, J. Eaton, 24 Orchard Crescent, Merry Hill, Wolverhampton, Staffs.

G3FYV, H. G. Gosling, 79 Toot-hill Road, Loughborough, Leics. (Tel.: Loughborough 3938.)

G3HSV, D. E. Alesbury, 3 Marlborough Road, Swindon, Wilts.

G3HSY, R. J. Dixon, 6 Meadway Drive, Horsell, Woking, Surrey.

G3IZY, R. A. Parsonson, 22 Cobmor Close, Gossops Green, Crawley, Sussex.

G3JBG, S. E. Harding, 25 North End, Southminster, Essex.

G3JDO, H. Martin, 7 Nairn Street, Primrose, Jarrow, Co. Durham.

G3JME, M. Watson, 36 The Paddock, Boroughbridge Road, York.

G3JXW, W. J. Wills, 18 Kingsmead House, Homerton, London, E.9.

G3JZV, T. R. Mortimer, 72 Whitworth Road, Copnor, Portsmouth, Hants.

GM3KCY, G. I. Buchanan, 26 Fisher Crescent, Hardgate, Clydebank, Dunbartonshire.

G3KMQ, R. G. Heslop (ex-DLZ0/DL4FH), 8 Parsons Pool, Shaftesbury, Dorset.

G3LAS, J. B. Butcher, 12 Beech Avenue, Buckhurst Hill, Essex.

G3LFZ, G. Ellis, Mondaine, Fairholme Road, Newhaven, Sussex.

G3LXO, G. E. Southgate, 55 Salisbury Road, Maidstone, Kent.

G3MCK, G. P. Stancey, 61 Astley Lane, Swillington, Leeds, Yorkshire.

G3MLX, J. Bourne, 615a Holderness Road, Hull, Yorkshire.

G3NMW, T. Whateley, 57 Lower Beeches Road, Northfield, Birmingham 31.

G3NR, A. Birt, 37 Horsell Park Close, Woking, Surrey.

GI3NZZ, R. J. Copeland, 1 Dunaman Park, Kilkeel, Co. Down.

G3OAS, M. B. Fradley, 77 Copenhagen Road, Gillingham, Kent.

G3ODO, W. Buckett, 113 Gossops Drive, Gossops Green, Crawley, Sussex.

GM3UU, A. S. McNicol, 135 Kings Gate, Aberdeen.

G6MC, J. C. Martin, 151 Park Road, Bingley, Yorkshire.

AMENDMENT

G2HNU, D. M. Byrne, 89 Ferry Street, Stapenhill, Burton-on-Trent, Staffs.

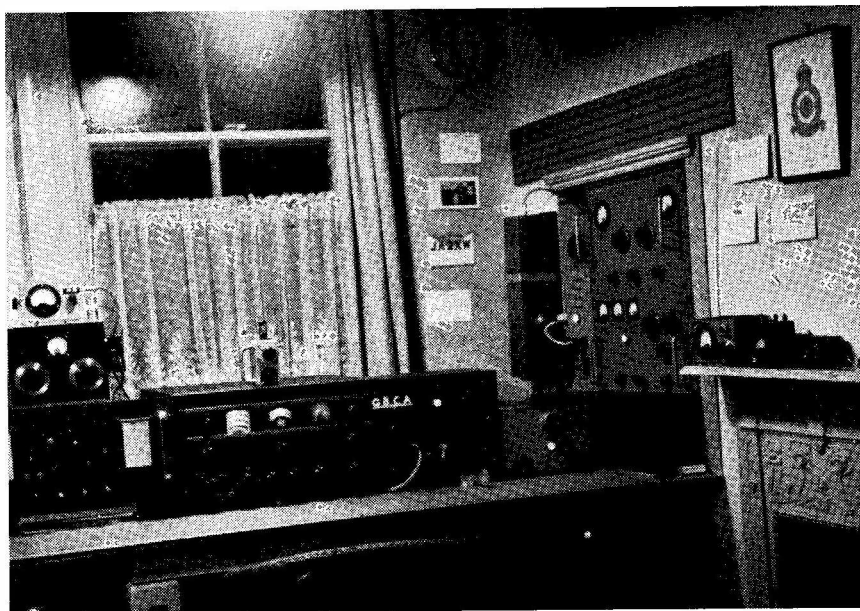
GENEVA DECISIONS IN FORCE

As explained in our review and summary of the 1959 Geneva Radio Conference in the February 1960 issue of SHORT WAVE MAGAZINE, the new regulations are now in force. This means that 40 metres is, for us, 7000-7100 kc only, while on the 80-metre band we can expect in due course an incursion of marine traffic, as 3500-3600 kc is allocated for Inter-ship

working, and 3600-3800 kc to Coast stations; thus, our 3500-3800 kc band remains shared, but with a different lot! The other HF band changes are not significant as regards U.K. amateurs, except that the 10-metre band is now 28.0-29.7 mc. Those interested will find the whole position stated in detail in our February 1960 issue.

THE OTHER MAN'S STATION

G8CA



HERE we have the layout owned and operated by A. J. Frisby, G8CA, at 26 Springcroft Avenue, Fortis Green, East Finchley, London, N.2, who started under the AA call 2BLK in the early 1930's and, having passed the Morse Test, was ready to come on the air with a full call just as World War II hostilities were breaking out—so the ticket was not then issued. He had to wait till after the war, during which he served in the Royal Air Force, before starting up as G8CA.

At first, operation was on 14 mc CW almost exclusively, running a neut'ed 35T in a crystal-controlled Tx circuit. With the advent of TVI, this rig had to be scrapped, and a completely new, fully screened and filtered, transmitter is now in use. This consists of a separate Clapp VFO, with two isolating stages, into frequency doublers using 6AG7's, followed by an 807 buffer amplifier with pi-section coupling into the PA, taking a pair of 807's. The PA is followed by a low-pass filter and suitable matching units. For phone working, a Class-B modulator (also using 807's) is available, with a separate speech amplifier and power supply, with MV rectifiers.

With this transmitter, the main activity has been phone working on the 10-metre band, on which quite a useful DX score has been compiled. Of great

interest have been aerial systems for 28 mc, the following having been tried: Windom, two $\frac{1}{4}$ -waves in phase, ZL Special, 3-element Yagi, and dipoles. Of them all, the array that has proved best for DX working is that at present in use—a Labgear Bi-Square, mounted on a home-built tower standing on the flat roof of the shack, the height to the top of the Square being 60 ft.

In the photograph can be seen the BC-221, with built-in power supply, and the aerial matching units (Z-Match and Mickey-Match); the station main receiver, an AR88LF, with a field strength indicator; the Clapp VFO with its own internal power pack; and speech amplifier with magic-eye modulation indicator. The power supplies and the modulator are under the desk.

G8CA says that he makes no claims for originality as regards his equipment, which, except for the AR88, is all home-built; however, he says he may have about the only transmitter actually built *in* the kitchen sink, as his gear is in a "suitably camouflaged wall recess under which is—the kitchen sink"!

A reader of SHORT WAVE MAGAZINE since the first issue (March 1937), G8CA is a keen and active member of his local group of AT station operators, the Barnet & District Radio Club, of which he is chairman.

*Short Wave Magazine is an Independent Publication with
a World-Wide Circulation*

THE MONTH WITH THE CLUBS

By "*Club Secretary*"

(Deadline for June issue : May 12)

(Address all reports for this feature to "*Club Secretary*")

WE note an increasing number of Clubs for whom the chief problem is poor attendance at meetings. Since the majority of Clubs, we imagine, make a charge for attendance at each meeting rather than covering themselves by an annual subscription alone, this also represents a financial problem.

Of course it is always difficult to lay on a sufficient number of interesting talks on varied subjects to attract a large gathering at every meeting. However, many Clubs do manage to go at least half-way to doing this, and then let themselves down because their members do not know exactly what is coming in the future. (We are permanently surprised at the small number of Club publications in which one can find any details of forthcoming meetings.)

Another essential item of policy which seems to be widely overlooked is the attracting of new young members. A Club which does not do this is facing a continual reduction in membership until it reaches the ultimate and the last member is recorded as a departure! Young SWL's, or even would-be SWL's, are the raw material of the Club's future prosperity, and no pains should be spared to draw them in. Their membership is essential for the maintenance of the healthy state of Amateur Radio as a whole, and the Club movement in particular.

Burslem held their first AGM at the Town Hall, and followed up on April 19 with a lecture-demonstration on Interference, by the GPO. They meet on the third Wednesday, and visitors are welcome. **East Kent** recently heard a lecture on Two Metres by G3LCK; and two of their members visited the Thanet Club to hear G4ZU talking on the Birdcage. Another item was a successful Junk Sale.

Paddington are growing rapidly and have already trebled their original membership. They have a Top Band station on the air and have also been working DX on the HF bands; they are still awaiting the call G3PAD to become available. Programme for the summer includes CW training (by W1BHZ); and talks on Circuit Interpretation (G3JEA) and Practical Construction (G3KNL).

Sheffield meet on the second and fourth Wednesdays at the Dog and Partridge Hotel, Trippett Lane, Sheffield 1, and a warm welcome awaits any interested visitors. A full programme is under way for the coming months; see new secretary's QTH, in panel.

South Birmingham will meet on May 18 for a lecture (subject yet to be decided) and on June 15 for a visit to Birmingham Airport. Meeting place is the Friends' Meeting House, Moseley Road, Birmingham

12. Apart from normal meetings, they are running a Late Night Mobile Rally on July 8/9, at Park Hill School, Alcester Road, Moseley, Birmingham. One of the attractions will be a competition to determine the most efficient rig and operator—see "The Mobile Scene," in this issue.

Clifton turned the tables on their rivals, Crystal Palace, and won the second round of their inter-Club Quiz by a narrow margin; they will hold the Dulwich and New Cross Shield for a year. On May 19, G3HGE will demonstrate "TW" VHF equipment.

Cornish held their AGM at Redruth, electing G2FQO president, G3AET chairman and Mr. W. Gilbert secretary. G3OCB won the G2AYQ Shield and G2FHB Cup; W. Gilbert Jr. the Sheila Locke Shield and John Bray Cup; and G3LPB the Norman Elliott Cup; G3OGT and G3OHB, of the local Cheshire Home, were jointly awarded the "Mullard Award" for 1961. Two Mullard Films were shown after the business meeting; next meeting was due for May 3 at Falmouth.

Crawley will devote their May meeting, on the 24th, to a discussion of field day arrangements; they recently visited the Croydon ITA transmitter; and they hope to organise a DX-pedition from Hereford in December, operating on One-Sixty and Two.

Guildford held their AGM on April 28, and their May meetings are booked for the 11th and 28th—subjects not announced. **Midland** have their monthly meeting on the 16th—likewise not announced at present.

Purley have a talk by G3OGO on May 5, the subject being The Gentle Art of Short Wave Listening; May 19 is the date for their AGM. **Southgate, Finchley & District** heard a talk from G2BVN on the subject of SSB during April.

Torbay, at their AGM in April, elected G5SY president; G2GK, 2GM and 3GDW vice-presidents; G3ABY chairman; G3LHJ vice-chairman; and Mrs. G. Western, G3NQD, secretary. The president reviewed an excellent year and reported that 26 members out of 45 were now licensed, with nine more taking R.A.E. in May. The business meeting was followed by a very successful Junk Sale.

Aberdeen are holding a "Grand Auction Sale of Gear" (something higher up the scale than a junk sale) on May 5; on the 12th there is a talk on Human Voice Characteristics; on the 19th one on "Uses of the lin. Surplus CRT," and on the 26th finalising and checking of field day arrangements; they report a steady increase in membership and invite visiting

amateurs to pay a call.

Acton, Brentford & Chiswick are holding their final briefing for field day on May 16, and all members taking part are asked to attend; their Tx is now in use on the first Tuesday, a CW practice class being held the same evening; all meetings at the AEU Club, 66 High Road, Chiswick, W.4.

Cheltenham are all set for their Mobile Rally, with a full and interesting programme laid on. The field day is the next big item on their agenda, and during June and July they hope to organise some D-F

**Names and Addresses of Club Secretaries
reporting in this issue:**

ABERDEEN: G. A. Roberts, GM3NOV, 111 Great Southern Road, Aberdeen.
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 CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
 CORNISH: W. J. Gilbert, 7 Poltair Road, Penryn.
 CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
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 ENFIELD: V. Croucher, G3AFY, 15 Nelson Road, London, N.15.
 FLINTSHIRE: L. W. Barnes, 1 Bryn Coed Park, Rhyl.
 GUILDFORD: Mrs. E. Bennett, The Inglebrook, Gravety Lane, Worplesdon.
 HARROW: S. C. J. Phillips, 131 Belmont Road, Harrow Weald.
 HASTINGS: W. E. Thompson, G3MQT, 8 Coventry Road, St. Leonards-on-Sea.
 LEEDS: D. Dinsdale, 69 Spen Lane, Leeds 16.
 MIDLAND: C. J. Haycock, G3JDJ, 360 Portland Road, Birmingham 17.
 MITCHAM: M. Pharaoh, G3LCH, 1 Madeira Road, Mitcham.
 NORTH KENT: D. W. Wooderson, G3HKX, 75 Mount Road, Bexleyheath.
 PADDINGTON: N. Lambert, G3LVK, 22 Sunderland Terrace, London, W.2.
 PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
 R.A.I.B.C.: W. E. Harris, G3DPH, 4 Glanville Place, Kesgrave, Ipswich.
 READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
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 SHEFFIELD: D. R. A. Hill, 16 Tynley Road, Sheffield 2.
 SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
 SOUTH BIRMINGHAM: T. W. Legg, Flat 3, 80 Alcester Road, Birmingham 13.
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 SOUTH YORKSHIRE: E. Brailsford, 15 Ayrsoe Walk, Cantley 4, Doncaster.
 SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
 STOKE-ON-TRENT: J. Brindley, G3DML, 40 Milehouse Lane, Newcastle, Staffs.
 SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
 SUTTON COLDFIELD: L. E. R. Hall, G3IGI, 24 Calthorpe Road, Walsall.
 THAMES VALLEY: K. A. H. Rogers, G3AIU, 21 Links Road, Epsom.
 TORBAY: Mrs. G. Western, G3NQD, 118 Salisbury Avenue, Barton, Torquay.
 WOLVERHAMPTON: J. Rickwood, 738 Stafford Road, Fordhouses, Wolverhampton.
 WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington.

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of the following Club publications: **South Birmingham** (*OSP*, Vol. 2, No. 3); **Surrey** (*Newsletter*, April); **R.A.I.B.C.** (*Radial*, Vol. 7, No. 1); **North Kent** (*Newsletter*, No. 44); **Derby** (*Newsletter*, April); **Southgate** (*Newsletter*, April); **Purley** (*Newsletter*, April); **Guildford** (*Monthly Natter*, No. 6); **Crystal Palace** (*Newsletter*, No. 62); **A.W.R.A.R.S.** (*Broadcast*, Spring 1961); **Enfield** (*Lea Valley Reflector*, Vol. 12, No. 11); **Reigate** (*Feedback*, No. 13); **Wirral** (*Newsletter*, Vol. 14, No. 1); **Hastings** (*Natter-Net Notes*, No. 18); **Northern Ireland** (*Gee-Eye*, Vol. 3, No. 1, Jan./Feb., '61); **Lothians** (*Lothians Radio Amateur*, Vol. 1, No. 6, March, '61); **A.R.M.S.** (*Mobile News*, March 1961).

tests—one on a Club night and two on Sunday afternoons. In September they are again running a stand at the Cheltenham Hobbies Exhibition.

Civil Service meet at the Science Museum on Tuesday, May 16; the proceedings will be informal, but a Tape Lecture on Receiver Design will be run at 6 p.m. Visitors welcome at all meetings, and prospective members are invited to contact the hon. secretary (*see panel*).

Derby are holding a two-metre field day with GB3ERD at Harborough Rocks on May 7; on the 10th they have a D-F practice run—7.30 p.m. at the Clubroom; on May 17 G8DD will talk about RTTY, and on the 24th G3JXL will describe an all-band SSB exciter. On May 28 they will be entering a D-F challenge match against the Burton-on-Trent Club.

Harrow discuss Top Band Converters on May 12; on the 26th there will be a 16-mm. Film Show. May 5 and 19 are Practical Nights; all meetings, which are at 8 p.m. at Roxeth Manor Secondary School, are preceded by a Top Band Net.

Hastings will be hearing about G3MQT's new 80-metre mobile on May 9; on the 23rd the subject of the talk will be Capacitors—one of a series of talks on the basic components of radio circuits. On June 6 G3MQT and G3HRI will describe their tour in DL-land.

North Kent will be operating G3ENT/A, phone on all bands, from Crayford Town Hall in connection with the Commonwealth Technical Training Week Exhibition. (Probably most of the work will be on Top Band in the evenings and Forty on the Saturday afternoon); May 11 is the date for their AGM, and May 26 is booked for a Junk Sale and discussion of field day arrangements.

Reigate will discuss NFD details on May 13, and on the following day will hold an actual rehearsal on the site (The Old Reigatian RFC ground in Park Lane, Reigate). There will be an informal meeting at The Tower, Redhill, on June 1.

Surrey (Croydon) held their 20th AGM and discussed the reason for the average 33 per cent attendance at meetings (50 per cent at Junk Sales); they, like many other Clubs, report a constant struggle to find suitable lectures sufficiently close to Amateur Radio. G8TB was re-elected chairman and G3FWR, hon. sec. for the past ten years, was "elevated" to honorary life membership. At the meeting on May 10 (Blacksmiths Arms, Croydon) the

Club Constructional Contest will be judged.

Thames Valley had a lecture-demonstration on 30-cm. work by G3FP at their April meeting, showing that anyone already on 70 cm. could get on the higher band quite easily; using a temporary beam just outside the Clubroom, a 10-mile contact was made. On May 3, G2CRD was due to give a talk on his Top-Band mobile gear. A number of new junior members are being gained, and the Club are anxious to make it known that young people are very welcome at their meetings; help will always be available to those wishing to improve their knowledge and gain their licences.

Barnet have a talk on Mobile Equipment by G3KVF on May 30; on June 27 G3HGE is the speaker, on VHF Equipment—both at the Red Lion Hotel at 8 p.m.

Bradford hold their Treasure Hunt on May 9, and on the 23rd visit the Granada Studios in Manchester. June 13 is booked for the subject of Model Aircraft (G3OGV).

Crystal Palace, on May 20, will be hearing about Three Years in New Zealand from G2RX; on June 6 their Morse class will be held at the QTH of G3IIR. **Flintshire** will discuss final field day arrangements on May 29 at the Bee Hotel, Rhyl.

Leeds have their NFD discussion on May 10; the Northern Mobile Rally will be keeping them busy on the 28th; and on the 31st there will be a description of a home-built transmitter.

Mitcham are hearing about The Grid System on

May 5, and on May 21 they hold their Dummy Run for NFD. **Slade** hear about the use of Electronic Devices in Industry on May 5, Map Reading for D-F on the 19th, and a Criss-Cross Quiz on June 2.

South Yorkshire have a free night on May 11, and a talk by G2BOJ on the 25th. **Sutton Coldfield** meet on May 11 for a discussion on Home-Built Receiver Design; on the 25th they have a Film Show and on June 8 the subject is Transistors.

Spen Valley have an open meeting for Rally arrangements on May 10; a visit to Copley Hill Railway Sheds on May 24; and a demonstration of radio-controlled boats on June 7.

Wolverhampton hold their first two-metre field day on May 7; the following day they have a Tape Lecture (Adventure in Tibet). May 15 is the day for their Annual Dinner at Newbridge Hotel, and on the 29th they have a ragchew at their Headquarters (Neachells Cottage, Stockwell End, Tettenhall).

Wirral report that their "DX-pedition" duly took place as planned. On May 3 they were due for a Junk Sale; on the 17th there is to be a talk, probably by G3AKW, on Modern Valves; and on the 24th they have an extra field day meeting.

Stoke-on-Trent elected as president G3EHM, chairman G3UD, treasurer G3COY and hon. secretary G3DML at their recent AGM; the assistant secretary, SWL A. Bucknall, looks after the interests of new members; the Club is in a sound financial position and is looking forward to another year of intense activity.

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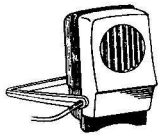
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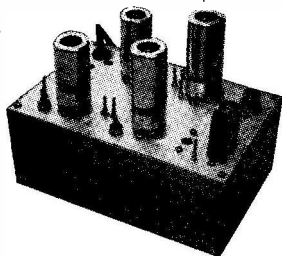
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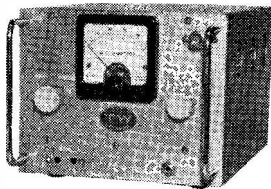
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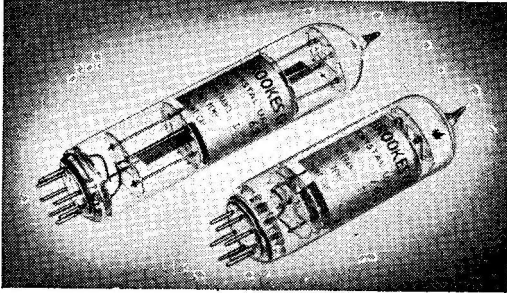
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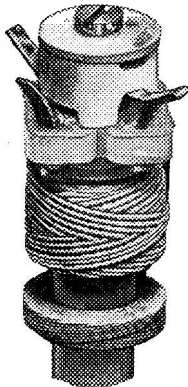
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WANTED: Manual for Collins TCS-6 Tx/Rx equipment; will buy or take on loan.—Reddington, Technical Wing, Baldonnell, Dublin, Eire.

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SALE: HRO-60, complete manual, matching speaker; 5 coils, all bands; mint condition; £170 o.n.o.? London area.—Box No. 2442, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

AVO ELECTRONIC TESTMETER, manual, £25. **AVO Widerange Signal Generator**, AC model, manual, £15. BC221-AK, modulated type, charts, manual, built-in AC supply, £16. Minibeam, latest type, 45 feet low-loss coaxial, £9. K.W. Trap Aerial, £4. Vacuum variable capacitor, valves, power supplies, crystals, meters, components.—G5RP, Old Gaol House, Abingdon, Berks. (Telephone Abingdon 380 after 6 p.m.)

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COMMANDER (RADIOVISION), 11 valves, full coverage 1.7-31 mc, separate calibrated amateur band scale, S-meter, matching speaker, manual; excellent condition; accept £30 cash.—Box No. 2443, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Short Wave Magazine, March, June, September 1959; RSGB Bulletin, April 1960. Also sundry Practical Wireless, 1951 to 1959. Please send list. — G3ODF, 4 Upton Road, Hounslow, Middlesex.

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WANTED: Eddystone S.640 Rx, must be in good working order; state price.—Coltman, 301 Micklefield Road, High Wycombe, Bucks.

EXCHANGE SX28, HRO, 10 x 40 binoculars, as new, in case. **WANTED**: Oscilloscope, test equipment. BC221 case. —G13GGY, 26 William Street, Londonderry.

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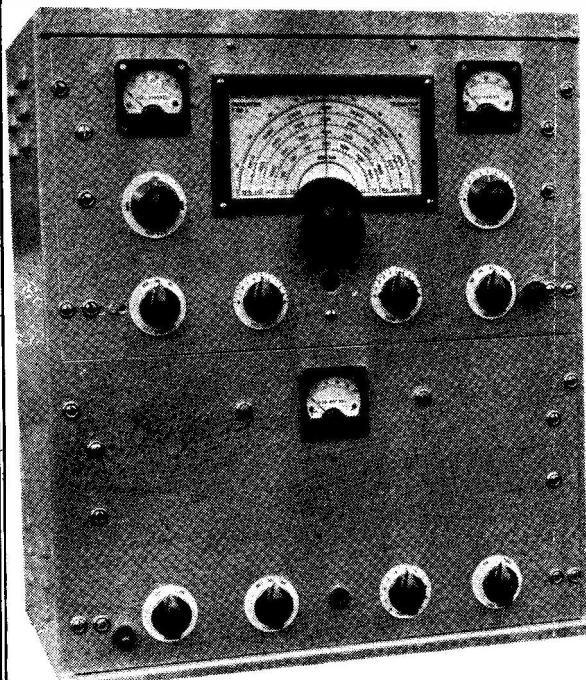
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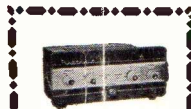
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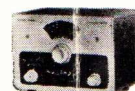
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