

The SHORT WAVE Magazine

VOL. XIX

APRIL, 1961

NUMBER 2

a new concept from hallicrafters

a complete AM/CW station in KIT FORM

The latest hallicrafter transmitter (HT40) and receiver (SX140) are available in HALLIKITS—kits which can be constructed by YOU. Thus, at minimum expense, you can own a station built by yourself, backed by hallicrafters' unparalleled design experience.



HT 40 TRANSMITTER

This handsome transmitter gives excellent CW and AM performance with easy tuning and neat styling.

Price : HT 40 KIT, £43 Fully Wired and Tested, £52

FEATURES

D.C. output 75 watts T.V.I. filtered. Fully band-switched covering the 80, 40, 20, 15 and 10 metre amateur bands.

VALVE LINE UP

6DQ5, PA; 6CX8 crystal Osc. and driver; 12AX7 speech amp.; 6DE7 modulator; silicon H.T. rectifiers.

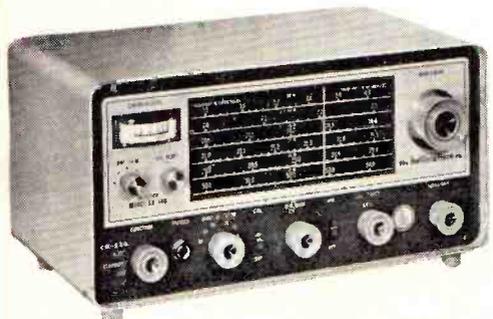
CONTROLS

Function switch (A.C. off, tune, standby, AM., CW); band selector; drive control plate tuning; plate loading crystal V.F.O. switch; grid/plate current metre; pilot lamp.

SX 140 RECEIVER

This receiver has been designed as a matching unit to the HT 40 transmitter and covers the amateur bands from 80-10 metres and also the American 6 metre band.

Price : SX 140 KIT, £50 Fully Wired & Tested, £56.10.0



FEATURES

High sensitivity; sharp selectivity; complete with R.F. stage, S-meter, aerial trimmer and crystal calibrator; tuning ratio 25 : 1.

VALVE LINE UP

6AZ8 tuned R.F. amp. and crystal calibrator; 6U8 oscillator and mixer; 6PA6 I.F. amp. and B.F.O.; 6T8A 2nd detector, A.V.C., A.N.L., and 1st audio; 6AW8A audio power amp. and S-meter amp.; silicon H.T. rectifiers.

CONTROLS

Tuning; aerial trimmer; cal. reset; function; band selector; cal. on/off; R.F. gain; A.N.L. on/off; selectivity/B.F.O.; audio gain; S-meter adjust; phone jack.

SCOTT'S

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JAMES SCOTT (ELECTRONIC ENGINEERING) LTD.

68 Brockville Street,

Carntyne Industrial Estate, Glasgow, E.2.

Tel: Shettleston 4206

Signals,
Royal Air Force,
Linton-on-Ouse,
York

20th January, 1961

Messrs. Stratton & Co. Ltd.,
Alvechurch Road,
Birmingham, 31.

Dear Sirs,

After five years of use, you may be interested in hearing of the "exploits" of my Eddystone "888" receiver. Since 1956, it has accompanied me on journeys to Malta, Libya, Cyprus, Aden, Ceylon, Singapore, Australia, New Zealand, Malaya, Hong Kong, India, then back to U.K. via several other countries. It says a great deal for the receiver that, using nothing more than odd lengths of wire as aerials, on no occasion did I fail to hear R.A.F.A.R.S. HQ G8FC on schedule.

Operating from Singapore in 1957/58, I obtained DXCC, Empire DX, and many other certificates, with a total of 214 countries and 40 Zones. In Ceylon in 1959, and compelled to listen only, I won the B.E.R.U. "Rose Bowl". Later I made 2,522 contacts, DXCC and other awards including "DX Station of the Month", in the remaining seven months operating from Ceylon.

You will gather that I am well pleased with the results obtained, and look forward to further enjoyment with the "888". The mechanical and electrical design of the receiver is such, that it stands up to and remains stable under extreme climatic and voltage fluctuations, and can be relied upon to give the best performance from any given aerial.

Yours faithfully,



F. Johnstone (Flight Sergeant),
G3IDC, VS9GT, MP4BAB, VS1FJ, 4S7FJ, ZL1IDC, ZL2IDC, etc.



Another fine appreciation of the EDDYSTONE "888"

The Model "888A" has all the fine features of the "888" which it replaces, plus the advantages of a product detector and all international type valves. The wonderful bandspread; the high sensitivity and selectivity; the low inherent noise level; and the ease of control are the chief factors which will enable you to obtain results such as those achieved by F/Sgt. Johnstone: and you get a really sound, solid, well engineered product at the sensible price of £110 (U.K.). Comprehensive information is provided in an illustrated brochure, free on request.



Please write for full Technical Specification to

STRATTON & CO. LTD · BIRMINGHAM 31 · ENGLAND



CQ . . . CQ . . . CQ . . . HAMS

QTR ?

**Time you
bought a**

MULTIMINOR

OM !



THIS is an ingeniously designed yet inexpensive rectifier/moving coil instrument of pocket size and sturdy construction. It is extremely well made and simple to use.

Two models are available, Model 1 for use in temperate climates, and Model 2 for use under adverse climatic conditions.

It is fitted with a high-grade rotary selector switch of quite unique design, in which a series of 18 fixed silver-plated contacts, embedded in a moulded ring, are wiped by a double-contact rotor arm.

Full advantage has been taken of the latest printed resistor techniques to achieve compactness of size and economy of weight.

Specially designed extremely accurate test gear has been made to ensure that every Multiminor measures up to the prescribed standards of accuracy, and the final testing is of a particularly rigorous nature.

List Price : **£9 : 10s.** complete with Test Leads and Clips.

Leather Case if required 39/-

● Write for fully descriptive leaflet.

Pocket Size : 5½ x 3½ x 1½ inches.
Weight : 1 lb. approx.

RANGE SELECTION :

Range selection is by means of a substantial switch, there being only two connection sockets for any measurement. The instrument has 19 ranges, a single scale being provided for current and voltage measurements and another for resistance measurements.

D. C. Voltage	A.C. Voltage	D.C. Current
0— 100 mV.	0— 10 v.	0— 100 micro A
0— 2.5 V.	0— 25 v.	0— 1 mA
0— 10 V.	0— 100 v.	0— 10mA
0— 25 V.	0— 250 v.	0— 100mA
0— 100 V.	0— 1000 v.	0— 1 A
0— 250 V.		
0— 1000 V.		

Resistance
0—20,000 ohms
0— 2 M/ohms

Sensitivity :

10,000 ohms per volt on D.C. voltage ranges.
1,000 " " " " A.C. " " "

Accuracy :

On D.C. 3% of full scale value.
On A.C. 4% " " " "

To meet special requirements, instruments can be supplied to a higher degree of accuracy for a small additional charge.

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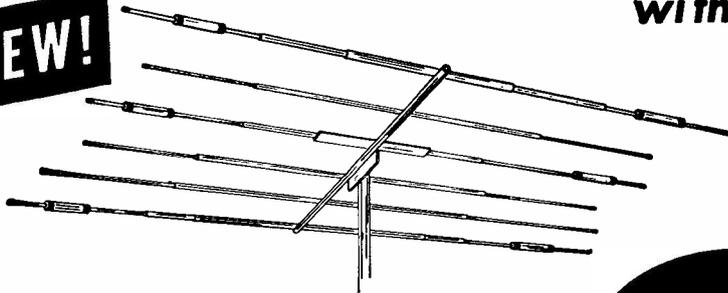
AVOCET HOUSE . 92-96 VAUXHALL BRIDGE ROAD . LONDON . S.W.1

M A MEMBER OF THE METAL INDUSTRIES GROUP OF COMPANIES

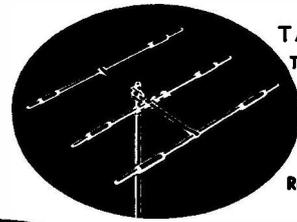
OUTSTANDING PERFORMANCE

with MOSLEY AERIALS

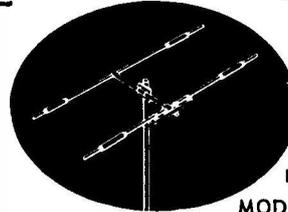
NEW!



The Three Band Beam that will give your signal that DX punch . . . for 10, 15 and 20 metres. Maximum legal amateur power. Low SWR with high gain and front-to-back ratio. Fully rust and corrosion proof.
MODEL TA-36



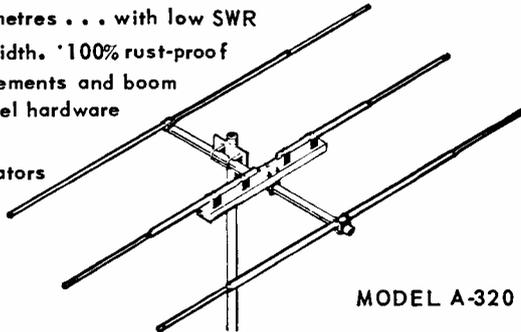
TA-33 Jr.
Three-element rotary beam aerial.
10-15-20M.
Rated to 300W.



Two-element rotary beam aerial.
10-15-20M.
Rated to 300W.
MODEL TA-32 Jr.

COMMAND YOUR BAND with a MOSLEY POWERMASTER AERIAL

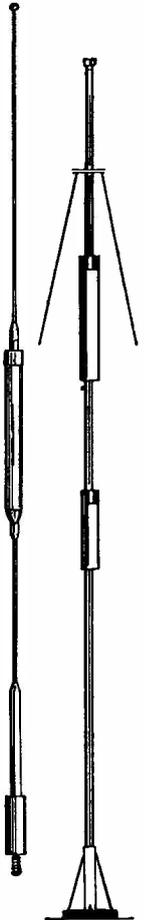
For 10, 15 or 20 metres . . . with low SWR over entire bandwidth. 100% rust-proof . . . aluminium elements and boom . . . stainless steel hardware . . . high impact polystyrene insulators . . . all the finest . . . all built to last!



MODEL A-320

3 Band Mobile Whip Aerial for 10, 15 and 20 metre bands. Use with standard base loading coils for 40 and 80 metre operation.
MODEL MA-3

Vertical Aerial, 10 thru 40 no bandswitching is necessary.
MODEL V-4-6



V-4-6

new! 7-Band SWL/DX Dipole Kit for 11-13-16-19-25-31-49 meters

Here's a low cost 7-band receiving dipole aerial kit that will pick up those hard-to-get DX stations. Everything included . . . just attach the wires and you're on the air! Weatherproof traps enclosed in Poly-Chem for stable all-weather performance.
MODEL SWL-7

Complete with
8 Trap Assemblies
Transmission Line Connector
Insulators
45 ft. No. 16 Tinned Copper Wire
100 ft. of 75 ohm twin lead

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Mosley Electronics Ltd. 15 Reepham Road, Norwich, Norfolk, Telephone 45069

O. J. Russell, G3BHJ, Manager

TRANS-RECEIVER No. 22. 2 megacycles to 8 Mc/s. Built almost exactly as Number 19. Set much more economical in battery consumption. Complete in fully working condition with power pack for 12 volts, head-gear and microphone assembly, key, £9/19/6. Carriage 15/-.

U.H.F. SIGNAL GENERATOR TYPE TS14 3,200-3,370 mc/s., power measuring range 20-200 mW. R.F. output power—10 to—100 dbm below 1 mW. Power supply 115 w. A.C. Price £15. Carriage 15/-.

TELEPHONE HANDSET. Standard G.P.O. type new, 12/- . P. & P. 1/6.

MARCONI SIGNAL GENERATOR. TF 144G, 85 Kc/s.—25 Mc/s. Made up to new standards, £70. Delivered free.

SCR 522 RECEIVERS (BC624), 100-156 Mc/s., no valves, 7/6. P. & P. 5/-.

H.T. CHOKES made by Bendix Radio (U.S.A.) 3 henrys .600A D.C. 25 ohms D.C. resistance 18 volts R.M.S. 60 cycle test £1/12/6. P. & P. 6/-.
Disto 10 henrys 250 amps. D.C. 90 ohms D.C. resistance 1500 R.M.S. 60 cycle test 16/6. P. & P. 3/6.

CARBON INSET MICROPHONE, G.P.O. type 2/6. P. & P. 1/-.

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PRE-SET DOUBLE POTENTIOMETERS, 2 x 3,000 ohms linear 4 w., 5/- . P. & P. 1/6.

VACUUM CONDENSER. 32,000v., 50pF, 12/6. P. & P. 3/-.

SPECIALY BUILT POWER PACK for TCS Receiver. 230 volts A.C. mains, including 6X5 GT valve. £3/10/- . Carriage 5/-.

COMPLETE SET OF STRONG AERIAL RODS (American). Screw-in type MP9, 50, 51, 52, 53, total length 15ft. 1 1/2" top diameter 0.615in., bottom diameter 0.185in., together with matched aerial base. MP37 with ceramic insulator, ideal for car or roof insulation, £2/10/- . Post free.

BRAND NEW ORIGINAL SPARE PARTS FOR AR88 RECEIVERS

I.F. TRANSFORMERS. 1st, 2nd, 3rd, 4th (for type D), 12/6 each or complete set of 6, 60/-

I.F. TRANSFORMERS. Crystal Load, 12/6 each.

PLATES escutcheons (for D and LF), 15/- each.

DIALS (for type D), 10/- each.

LOGGING DIAL (for D and LF), 10/- each.

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OUTPUT TRANSFORMERS (for LF), 30/- each.

CRYSTAL PHASING (D), 2/6 each.

ANTENNA TRIMMERS (LF and D), 2/6 each.

FILTER CONDENSER 3 x 4µF, £2/10/-.

CONDENSERS 3 x .25µF (D and LF), 2/6 each.
3 x .01µF (D and LF), 2/6 each.

RF ANTENNA INDUCTORS (D and LF), 7/6 ea.

MAINS TRANSFORMERS (LF), £3 each.

Small mica condensers, various values, 1/6 each.

INSTRUCTION MANUAL FOR AR88D, £1.

TCS RECEIVERS made by Collins of U.S.A., in fully guaranteed working condition. 1.5-12 Mc/s. Line-up: 1257 (1), 125Q7 (1), 12A6 (2), 12SK7 (3), power requirements 12 volts L.T., 225 volts H.T. £11/10/-, carriage 12/6.

VARIOMETERS for W/S No. 19. Fully tested and working 12/6. Post and packing 2/6.

R109 RECEIVERS. 1.8 Mc/s.—8.5 Mc/s. working from 6V D.C. Complete with all valves and built-in speaker. In excellent, guaranteed working condition, £5/5/- . Carriage and packing 15/-.

A HUGE SELECTION OF VALVES AT VERY LOW PRICES

Write or phone your needs.

MARCONI CR-100 COMMUNICATIONS RECEIVER. 60 Kc/s.—30 Mc/s. with noise limiter. Completely reconditioned £25. Carriage and packing 25/-.

LABORATORY PRECISION VARIABLE CONDENSER. Manufactured by General Radio Co., U.S.A. 50-1, 500pF with micro metric drive and calibration chart. Overall dimensions of case 9" x 8" x 7". Price £15. Carriage and packing 15/-.

R209 RECEPTION SET. A 10 valve High-Grade Super Heterodyne Receiver with facilities for receiving R/T (A.M. or F.M.) and C.W. Frequency 1 Mc/s.-20 Mc/s. Hermetically sealed. Built on miniature valves and incorporating its own vibrator power supply unit driven by a 6v. battery (2 point connector included). The set provides for reception from rod, open-wire or dipole aerial with built-in loudspeaker or phone output. Overall measurements:—length 12", width 8", depth 9". Weight 23 lbs. In as new, tested and guaranteed condition, £23/10/-, including special headphone and supply leads. Carriage and packing £1.

SUPPLY UNIT RECTIFIER, No. 21. Fully sealed enabling all sets built for 6v. (R209, R109, etc.) to work from A.C. mains. Input 90v.-260v. A.C. (Taps at 10v. intervals). Output excellently smoothed up to 10 amps with meter indicating exact output voltage. Measurements 12" x 9" x 10". Price £8. Carriage and packing 15/-.

19 SET OWNERS. To increase output of your set 6 to 10 times use RF AMPLIFIER No. 2 with built-in rotary converter for 12v. input. Four 807 valves output. Simple connection with transmitter. Fully tested condition £9/15/-, including necessary connectors and instructions. Carriage and packing 15/-.

AR88's. Completely rebuilt with new PVC wiring Type "D" £75; Type "LF" £70.

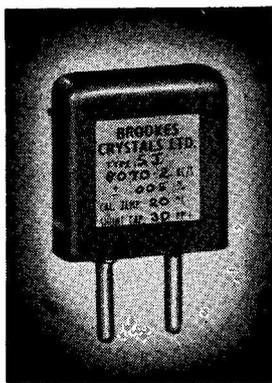
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● Illustrated above is a Type SJ Crystal Unit from a range covering 3-20 mc/s and on the right is a Type SM Crystal Unit from a range covering 3-20 mc/s.

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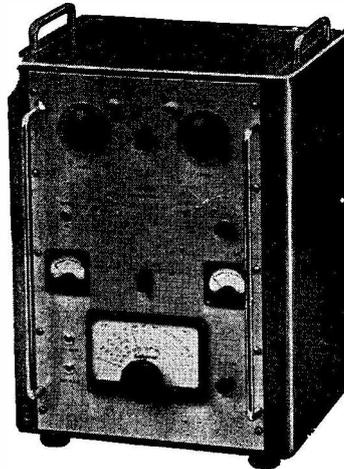
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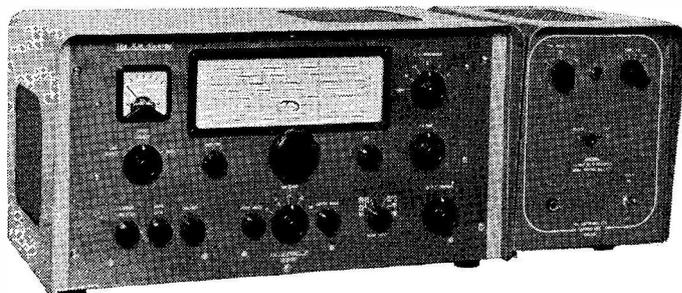
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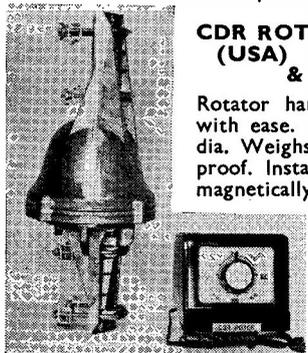
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SHORT WAVE MAGAZINE

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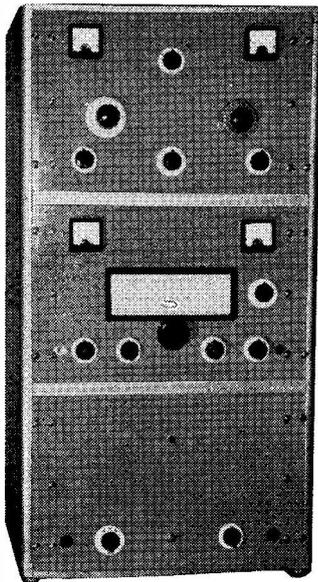
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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The
SHORT-WAVE
Magazine

E D I T O R I A L

Behaviour *One might usefully comment on the wide variety of individuals—privileged to call themselves amateurs and to use our bands—truly, a remarkable cross-section of the community.*

But they are each individuals, with their own ideas (and in some cases, ideals) as to how they can (or should) conduct themselves when on the air. The factor of personality is always evident, particularly that of the operator of a telephony station. We all sub-consciously form a mental picture of the man at the other end of a phone contact. The remarkable thing is how often one's impression is quite wrong, not only as to what he looks like (which is understandable) but also as to what sort of a chap he is—which is not so satisfactory, as it proves that one must be very careful not to allow impressions so gained to influence one's judgement.

We are moved to these remarks by the increasing tendency for some phone operators to criticise over the air the behaviour (and sometimes even the character) of another operator not in the QSO, apparently on no other ground than the manner in which he conducts his contacts. These opinions are conveyed by an interchange of sniggering remarks intended to make "somebody's ears burn."

Well, behaviour of this sort over the air is not in the spirit or the tradition of Amateur Radio, and it is particularly to be deplored that some of the worst offenders are those old enough or sufficiently responsible to know better, even if they have not had much operating experience.

It is a clear obligation on every operator, whether using CW or phone, to avoid anything which could be construed by a listener as a rude or ill-natured reflection on another amateur.

*Austin Foshell
G6FO.*

WORLD-WIDE COMMUNICATION

Remote VFO Tuning

AND NOTES ON TRANSMITTER STABILITY

S. WOOLLEY (G8RQ)

AMATEUR station operators are not all too particular about the stability of the carrier, though many take pride in producing one that is really stable, *i.e.* T9x, whether on phone or CW. A quick look round the various amateur bands with the BFO switched on will reveal that more than 25 per cent of the signals checked are unstable in degree varying from slight to severe, particularly so in the case of phone stations using amplitude modulation, which is sometimes accompanied by frequency modulation. CW stations with chirpy or rough notes are in the minority. It has been observed that there has been a decline in the stability of transmitters since the G.P.O. dispensed with the qualifying period of 12 months on CW only. The writer believes that this regulation when part of the condition of licence was in the interests of *all* amateurs; the use of CW for the year did tend to make the operator try to produce a stable signal, *i.e.* the T9x carrier so essential for good telephony.

In a recent QSO, when the operator's attention was drawn to the heavy frequency modulation on his AM signal, the reply received was "I am getting out and that is all that matters."

The VFO

The heart of the transmitter is the drive source, and it is obvious that great care must be taken in the construction and layout of this circuit. Apart from the stability, either long or short term, of this instrument in itself, it must be realised that the purpose of the VFO is to "drive and not be driven." The average constructor usually makes a good job of his VFO but fails very often to see to it that RF is not fed back from the PA or capacity added to the VFO tuned circuit when the PA or other stages are switched on.

Where the VFO is to be used on the same frequency as the PA it is essential that the isolation provided by the stages following the VFO is really excellent, if high stability is the aim. This condition is very difficult to achieve and amounts to nothing short of (1) Completely screening the VFO, (2) The use of a cathode follower, *plus* one other buffer stage (two stages of isolation), (3) By-passing of all HT and LT leads at the VFO, (4) Voltage

regulation of the VFO HT supply, (5) The PA itself to be made stable—that is, not take off, and be free of parasitics.

Failure to comply with these conditions will most probably mean a shift in frequency when the PA or other stages are switched on, or the transmitter is AM modulated. The note will be chirpy or rough on CW and the operator will be unable to net correctly with the PA switched off.

Checking Transmitter Stability

To check the transmitter for carrier stability first switch on the station receiver and allow it to warm up thoroughly for say, 20 minutes or so. Now switch on the VFO only and check the quality of the beat-note and the degree of drift, if any.

If the note is not T9x it is useless to proceed further. If all is well, tune the receiver to *zero beat* with the VFO, with the aerial off the receiver. Now reduce the RF gain control to prevent overloading and switch on the buffer stages (if any) and the PA.

If the receiver is still on zero beat with the VFO, then and only then is the transmitter stable. This is the condition necessary to produce a T9x signal.

When AM is applied, a shift in frequency may be apparent if the modulator is powered by the same supply as the VFO; if this does occur, it will be necessary to use voltage regulation of the VFO HT supply, or to have a separate power supply for the modulator.

These suggestions will sound very elementary to the advanced radio student and the operator with years of practical experience—but it is obvious when one listens to the signals produced by some amateurs they are not out of place.

Stable VFO Design

The remotely controlled VFO is becoming increasingly popular in the U.S.A., and with the SSB fraternity where a high degree of stability is desired. This system offers the following advantages over the more usual type:

- (1) The VFO tuned circuit is easily screened completely, and the coil, being well clear of the metal, can be made large and have a high Q.
- (2) No HT or LT leads enter the compartment. These leads, therefore, cannot conduct RF from the PA back to the VFO tuned circuit—*see* Fig. 1.
- (3) Changes in temperature can only be room temperature changes, apart from the RF circulating current in the coil, which will be small in the case of a

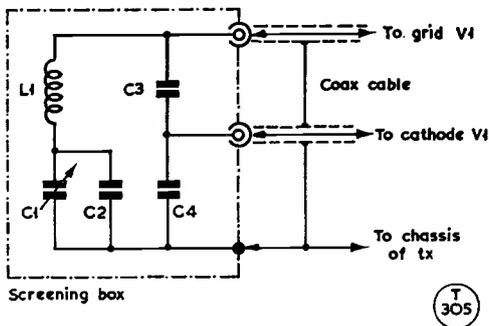


Fig. 1. Remote control box for Clapp or series-tuned Colpitts oscillator unit. Normal values are used, as given in any standard VFO design for the oscillator chosen, the difference being that this coil assembly is built up separately in a screened box, and coupled into the VFO valve (on the transmitter chassis) through TV coax cable, which can be several feet long. The box is mounted conveniently at the operating position, and in effect gives remote tuning control of the transmitter.

high-Q inductance. The coil is not exposed to heat, as is often the case with a 150-watt cabinet or table-top transmitter.

- (4) Once constructed, it will be permanently available, because if the transmitter is to be reconstructed, the "control unit" (or VFO tuned circuit) does not require rebuilding.

It is suggested that a unit of this sort should be made to cover 875-1000 kc where the VFO is required for use on Top Band and all other bands up to 28 mc. If 160 metres is not required, then 1750-1900 kc can be used.

The remotely-controlled VFO circuit has appeared in various American periodicals and is shown here for the information of those who do not know it—see Fig. 1.

The unit can be built in a strong aluminium case of say 7 x 7 x 7 inches with a tight-fitting lid. The tuning condenser from the TU5B with its thumb-controlled vernier drive would be found excellent if available. Two 80-ohm coax cables are used to connect the unit into the transmitter; these are soldered in at the unit end and capped with coax plugs at the other end for plugging into the osc. valve on the transmitter chassis. This VFO stage is placed in a convenient position inside the transmitter; it is most important that good solid connections be made between the two coax sockets and the grid and cathode of the VFO valve.

Buffer Amplifiers

The use of a cathode follower is strongly recommended. If the best results are to be obtained the valve must not draw grid current. The cathode resistor or output from the VFO should be adjusted until the voltage across the cathode resistor, R3 in V2, when measured with a 20,000 o.p.v. meter (using a 2.5 mH choke in the positive lead) is the same with or without excitation.

The VFO anode circuit L1, Fig. 2, is tuned

Table of Values

Fig. 2. Circuit of the Isolating Stages

C1, C2, C5, C7, C8, C9,	R4, R6 = 22,000 ohms
C11 = .001 μF	R5 = 220 ohms
C3, L1 = To tune 1750-1900 kc	RFC1, RFC2 = 2.5 mH
C4, C6 = 100 μμF	V1 = 6AC7, 6AG7, EF50
C10 = .01 μF	V2 = 6C4, or similar
R1, R2 = 47,000 ohms	V3 = 5763, buffer/driver stage
R3 = 10,000 ohms	

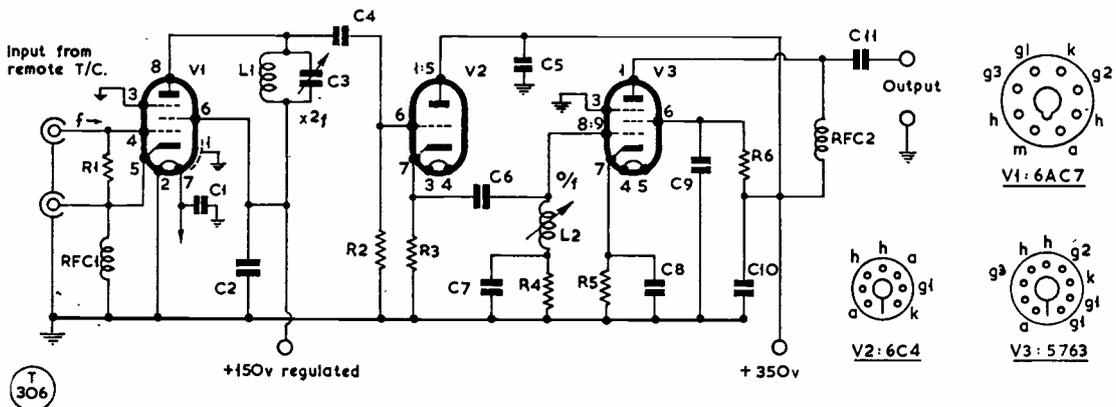


Fig. 2. In the remote-tuning VFO arrangement, the VFO valve itself is part of the transmitter or driver unit — only the VFO tuned circuit is at the remote position, coupled into the valve through coax cabling (which may be 4 or 5 feet long). In the circuit shown here V1 is the VFO valve, V2 is an isolating stage and V3 the amplifier-driver; with a 5763 in the latter position, plenty of RF drive would be available. The plate of V1 is always tuned, by L1-C3, to twice the VFO fundamental frequency. Values are given in the table.

to the second harmonic of the frequency determining circuit, but a wideband coupler is advisable here, especially when 900 kc is chosen as the fundamental frequency, in order to prevent break-through of the 900 kc output in the medium-wave band and also to provide good bandwidth. This precaution will also prevent a signal being radiated on 160 metres when the transmitter is on the 80-metre band—as

often occurs when the PA tank is a pi-network, with no aerial tuning unit used in addition. The wideband coupler is not shown in the circuit of Fig. 2 and its inclusion is left to the constructor should he experience these troubles.

Coil L2 in the buffer grid circuit should be wound to be self-resonant at the output frequency of the VFO and a grid dip oscillator could be used for this purpose.

Adjustment and Operation of Linear Amplifiers

IN SIDEBAND TRANSMITTERS

D. J. BIRCH (G3A00)

The author of this article has been active on SSB for many years — he was one of the first G operators on Sideband — and the points he makes are the fruits of much practical experience.—Editor.

NOW that SSB is becoming a popular form of telephony transmission, the time may be right for a check-up on the quality of the signals being radiated on the bands. One of the commonest complaints of the AM fraternity about SSB was that it produced splatter. In the majority of cases this was more often than not a deficiency in the receiver rather than in the SSB transmitter. In some instances, however, there *were* grounds for complaint and it is an unfortunate truth that a badly adjusted SSB transmitter can create more trouble on the air than a badly adjusted amplitude-modulated outfit.

Let us consider first what factors are responsible for this splatter. In a linear amplifier, as the description suggests, the output signal must be a perfect reproduction of the signal which is being applied to the grid (or cathode in the case of the grounded grid type of amplifier). If for any reason the original waveform is altered (or distorted), something else is now contained in the signal. If a waveform of this type is analysed, it will be seen to contain the original signal *plus* harmonics of its components in varying amounts. Taking a very simple case in order to illustrate this, harmonics of a 600-cycle modulating tone will be transmitted at 1200, 1800, 2400, 3000, 3600 c.p.s. and so on; since these frequencies are actually generated in

the final amplifier, *i.e.* after the SSB signal generator, it will now be clear that they will be transmitted on *both* sides of the carrier frequency. They appear as normally recognisable distortion of the speech on the transmitted (or “wanted”) sideband and as unintelligible garble, or “crud,” on the “unwanted” sideband. Since there is no limiting factor except the selectivity of the PA output circuit (which in most cases is very poor) they can extend to as much as 30 or 40 kc on either side, and indeed the writer can confirm that spread of this extent does appear, particularly on 20 metres.

In many cases, therefore, a perfectly clean signal out of the exciter is spoiled by the final amplifier. Let us now consider the principal causes of non-linearity in a final amplifier.

Too Much Grid Bias

This seems to be about the commonest cause owing to having too much faith in “what the book says.” The writer can say from experience that there are some “facts” printed in certain American publications which, to put it mildly, are misleading, yet these are read and put into practice without personal checks as to whether everything is in order. If we consider for a moment what factors influence the amount of bias needed, we will see more readily how trouble can occur.

Consider a typical anode current curve for a valve such as one might use in a PA and from it can be seen that as the current rises from a low value its increase forms a curve, but as it continues this becomes a straight line until it eventually reaches a maximum value. If the swing of current can be limited to the straight portion, then the amplified signal will be a faithful reproduction of the swing of voltage applied to the input. If the grid bias level is set too high, the anode current will be swinging over the curved bottom portion and will result in a distorted reproduction. In the writer's experience, the only guaranteed way of not getting “bottom-bend” distortion is to operate the PA in Class-A, but in this mode,

the efficiency is very poor and only low output is obtainable. In Class-B quite bad distortion will be present, so the solution is to set the bias so that the valve operates in Class-AB. There is an obvious limit to how little bias voltage can be applied—the maximum anode dissipation rating of the valve. This rating is therefore the yardstick by which we calculate the bias voltage.

To quote actual bias figures, or anode current figures, therefore, is of little help as these are entirely dependent upon the anode and screen voltage. The approach is, therefore, to apply sufficient bias voltage so that the standing power (the standing anode current multiplied by the anode voltage) is just a little below the maximum anode dissipation rating for the valve. For example, for two 807's the standing power should be about 40 watts, and for a single 813 about 100 watts. Experience shows that as one tries to obtain more power RF out for a given DC input, the result is more distortion, and any experienced operator will agree that a very clean S7 signal is easier to copy than an S9 distorted one. The motto is "Quality rather than quantity." Here must be mentioned the fact that, as with all the supplies used on an SSB transmitter, the grid bias voltage must be very stable, otherwise trouble can occur from this source.

Incorrect Aerial Loading

Once again, it appears that certain information gleaned from Trans-Atlantic publications has misled people into believing that one can tune up the transmitter by any method for maximum output, and the loading of the aerial will automatically be correct. How wrong they can be is plain enough from the number of signals that are heard with insufficient aerial loading. As we have already seen, it is essential that the swing of power at the anode be a perfect reproduction of the swing applied to the input. If the aerial is not loading the anode of the valve sufficiently, the current at the anode will reach a certain value above which it does not go in spite of the fact that the grid voltage is still rising. For example, with a grid voltage applied of 10 volts, the anode current shows (let us say) 70 mA, with 20 volts it rises to 120 mA, but with 30 volts on the grid it stays at 120 mA, and any further increase of drive volts does not lift the anode current above this limit. If we now look at the anode current with the anode circuit detuned (off resonance) we will see that each increase of drive is producing a corresponding increase in anode current up to the

maximum value of current that the valve is capable of passing. This fault is referred to as limiting and the resultant distortion is easily seen on an oscilloscope, appearing as flat tops on the peaks of the waveform. On the signal, it shows as "edge" or harshness of speech and produces a lot of spread on the unwanted sideband. Here is a tried and reliable procedure for loading which is useful:

(a) Apply a signal sufficient to determine the position of resonance in the anode circuit,

(b) Whistle into the microphone with the audio gain *full on*,

(c) Quickly tune the anode circuit through resonance and make a note of the two anode current readings (maximum and dip currents).

[N.B. A "saturation drive" signal is essential for this test—7 or 8 mA of grid current is not too much.*]

(d) Still maintaining this heavy drive condition, the aerial loading is now increased until the dip in anode current is only barely perceptible (say from 300 mA to 280 mA),

(e) Completely ignore any indicator of output other than an oscilloscope, otherwise one may get a false impression that all the output has gone. An RF ammeter was good enough on AM, but for SSB it actually does not work as a useful output indicator at all, as it only shows average power, whereas we are concerned with *peak* power for loading. A meter cannot move fast enough to show the peak readings.

(f) Now (and only now) adjust the drive level until on normal speech, the anode current as indicated on the anode meter is swinging up to about half the value it was showing under the full steady drive condition.

It cannot be over-emphasised that an oscilloscope is the *only* instrument which will follow the instantaneous peaks of an SSB signal.

Over-Drive of an Early Stage

It is an unfortunate state of affairs that most SSB operators have "come on to Sideband" from AM, where it has always been an indisputable fact that "increasing the mod." has resulted in a corresponding increase in strength at the far end. In other words, the audio gain-control was a sort of volume control (usually left in the "loud" position). In our SSB rig,

* Not referring to special AB1 types such as the 4X150 and similar.

however, the situation is very different. The audio is one of two components being applied to a low-level mixer stage and the amount of audio voltage is quite critical for correct operation of the mixer. Once the correct audio setting has been obtained for any particular microphone, the audio gain control should never need to be touched for any reason whatever. The writer has long maintained that the audio gain control on an SSB transmitter should be a pre-set control inside the cabinet and made fairly inaccessible! Any drive variation required should be made at an RF stage such as the drive amplifier. The correct audio level can be determined as follows:

Turn the audio gain to the top and whistle steadily into the microphone. Gradually back off the gain until the anode current just begins to fall off. This is then the correct level for speech, although in some cases the operator will think he has lost all his output. If there is any doubt whether you still have a signal on the band, call someone and ask him!

This article is intended to help people who are not too happy about the adjustment of

their SSB final amplifiers, and not a technical treatise for the expert (he will have everything right anyway and will not need any advice). It has been prompted by the number of occasions the writer has been in a contact where the application of these principles in actual on-the-air tests has shown a very great improvement, not only in the generally cleaner speech, but also in the reduction of distortion products radiated in the unwanted sideband, to the benefit of other stations close by the frequency.

In conclusion, it should be pointed out that in view of the fact that a linear amplifier, in order to remain linear, must always be lightly biased, heavily loaded and never driven hard, it is asking much to expect it to produce a lot of power as well. This means that a PA which is capable of being whistled up to 600 watts is a much better proposition for 150 watts of clean SSB than, say, a pair of 6146's attempting to produce the same power. The consistently clean signals on the bands usually come from stations using linear amplifiers with a high power capability being operated in an easy unstressed way—loafing, in fact.

G9BF Calling!

Happy Days Here Again

SOME weeks back had long letter old friend Popov (inventor wireless of course) saying what you been doing all these years still need ur help pse QSL. Gave him full gen my new suppressed sideband sliced carrier CW rig—known as Half Signal Only, or HSO, mode—of course using 813's all through adding p.s. whasson your telly these days? Am wondering if my letter too technical as no answer yet is only reply from Popov.

Many other keen DX operators also worried by long silence me G9BF wanting know if famous station still working the stuff what call sign used es other hard questions. Quick answer is G9BF always making steady progress like ditching old T20 SEO rig to try latest circuits viz. crystal control on cascaded 813's (with each heater lit by RF from valve in front) for broad-band effect—all bands of course not just one—to produce real wipe-out DX signal with pleasing T9x note.

As old readers well know I G9BF firm believer maximum power with minimum theorising about conversion efficiency, angle of radiation, keeping signal in band and all that slide-rule stuff—motto at G9BF is “Wheel out big PA from under stairs and let 'em have it.” Never fails work as frustrated competitors listening rarer DX like UA, LZ and YU coming back exclusively to me G9BF no-trouble-at-all will confirm.

But station G9BF always operated with due

respect basic principles; have great reverence old maxims like “Half-inch blister off ant terminal sure sign RF going up spout OK” and “Never draw arc off tank coil with soldering iron—always use screw-driver with *insulated* handle.” Many years operating with max power—“If you can see shadow of grid through plate of PA then you are running full input”—has brought me G9BF international reputation as DX worker convincing all doubters if you want DX you must have bags urge in PA always pushed to limit. Rig with pair 813's—in parallel, push-pull, both together, against or reversible, doesn't matter which—ideal demonstration this theory.

So old pal G9BF very glad back again to advise readers this magazine. Editor unable withstand large demand technical advice column by me G9BF. Now to light gas under new rig, press starter button es call “CQ DX” to begin new series. P.S. wonder if 40-metre phone stn signing SUSIE still active—need her QSL badly.

It makes you sick.—Editor.

THE EXHIBITION SEASON

This is now upon us, with the very successful and most interesting Electrical Engineers Exhibition just concluded. The next is the Radio & Electronic Component Manufacturers' Federation (R.E.C.M.F.) Show, to be held during May 30-June 2, at Olympia for the first time; this is always a very useful exhibition, the more so as it is two years since the last was held. The 1961 Radio Show, quite a different sort of exhibition from that staged by the R.E.C.M.F., will be during August 22-September 2, at Earl's Court.

IMPROVING THE 358X RECEIVER

SOME WORTH-WHILE MODIFICATIONS

J. R. Dowson

THERE are large numbers of the now-obsolete Stratton 358X receivers still in use all over the world; as with many such of the older but still very worthy designs, there are certain improvements possible that will increase the usefulness of this receiver quite considerably.

Audio Modification

The output stage of the 358X varies according to the particular batch from which the receiver originally came; some have a pentode in the output stage, in which case only the output transformer need be changed. Others, as in the writer's case, have a 6J5 triode. A useful modification is to change the 6J5 for a 6AQ5, as shown in Fig. 1. This does, of course, mean blanking off the old octal hole and fitting a B7G valveholder in its place; the increase in audio output enables a speaker to be fully loaded, for which purpose the output transformer needs to be changed; any transformer having a primary of about 5000 ohms can be used.

If a lead is taken from the anode of the 6AQ5 to the headphone jacks on the front panel via a .01 μ F condenser C5, high-impedance phones can be used as well as the speaker.

Fitting a Noise-Limiter

It is understood that in some batches of the 358X, a noise-limiter was not fitted. This can easily be remedied by the circuit of Fig. 2, in which an EA50 is mounted next to the 6AQ5 and a toggle on-off switch fitted between the audio gain control and the BFO-AVC switches. Then, using screened lead, the noise-limiter should be built up to the circuit of Fig. 2.

This limiter was found to be extremely efficient on ignition and other pulsy noises and is well worth

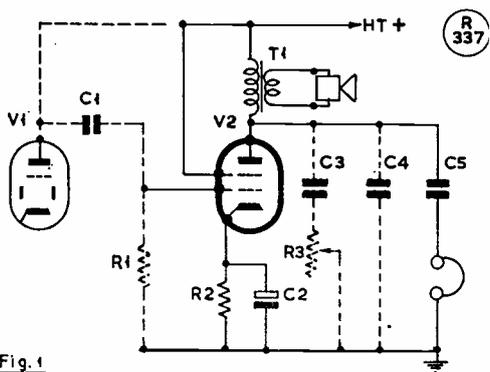


Fig. 1. Suitable audio modification for the 358X, as described in the text.

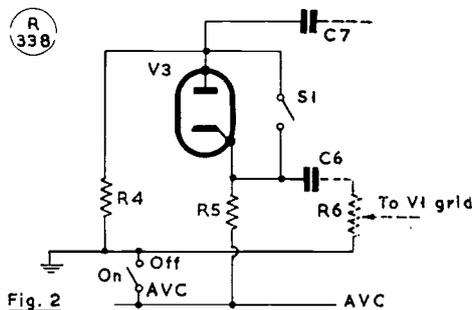


Fig. 2. A noise limiter circuit for the 358X, controlled by the switch S1. Some production receivers may have a noise limiter already fitted.

Table of Values

Fig. 2. Noise-Limiter for the 358X

C6 = .01 μ F	R6 = 500,000-ohm pot' meter
C7 = 0.1 μ F	S1 = Toggle on-off
R4, R5 = 1 megohm	V3 = EA50

Note: Components shown dotted are as in the original

incorporating. In effect, it goes between the (original) AF gain control R6 and the condenser C7 feeding it—so it is only a matter of breaking the appropriate connections to insert the limiter unit.

A Suitable S-Meter

If the S-meter is wired to the circuit of Fig. 3, on the HT side of the first IF stage, it will be found that if properly calibrated, it will be accurate enough. The meter is wired as a voltmeter across the resistor R7 and when it is in operation R9 should be adjusted so that under no-signal conditions the meter is zero'd; then R10 is adjusted to allow full-scale deflection on a very strong signal, which can be called "S9 + 40 dB." It is important that the HT for the meter comes from the "off" side of the HT on-off switch, otherwise the full HT supply will be put through the meter when band-changing.

RF Stage Modifications

After having run his 358X for some time, the writer found that at the 30 mc end of the tuning range, the sensitivity left a good deal to be desired. So the RF valve was changed to a 6SG7.

Unfortunately, the base connections of the 6SG7 are quite different from those of the 6K7 originally fitted; after this valveholder change, the only other alterations are to remove the old 300-ohm resistor and 0.1 μ F condenser in the cathode of the 6K7, and

Table of Values

Fig. 1. Audio Stage Modification for 358X

C1 = 0.1 μ F	R3 = 50,000-ohm pot' meter
C2 = 25 μ F	T1 = O/p xformer, 5000-ohm pri.
C3, C5 = .01 μ F	V1 = EBC33
C4 = .002 μ F	V2 = 6AQ5
R1 = 1 megohm	
R2 = 470 ohms, 1-w.	

Note: Components shown dotted are as in the original

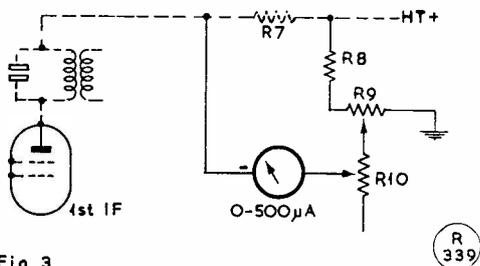


Fig. 3

Fig. 3. S-meter for the 358X, as described in the text, which also explains setting up and a suitable method of calibration. Values of R8, R9, R10 will depend on the range and internal resistance of the meter used. Starting values can be: R8, 25K; R9, 10K; and R10, 50K.

replace them with a 180-ohm resistor and $.01 \mu\text{F}$ condenser for the 6SG7. Care must be taken to return the earthy sides of these items to the RF gain control, and not straight to chassis.

If this suggested RF stage modification is carried out, it is advisable to peak up the RF and mixer grid tuned circuits to accommodate the valve change. It should then be found that there is a considerable all-round improvement in sensitivity, particularly at the HF end of the tuning range.

Any of the modifications discussed here will be found to be well worth while in improving what is basically a very sound receiver.

CLEANING UP FORTY

With effect from May 1st, 7000-7100 kc is to become an exclusive amateur allocation, for AT stations only (which, indeed, it is supposed to be at this moment). This means that the pirate broadcasters now operating in our band will have to clear out—if they will. The most pernicious of the 16 stations having the effrontery to advertise themselves as having normal transmitting frequencies in the 7000-7100 kc band are: Karachi, Pakistan, 7010 kc; Cairo, United Arab Republic, 7050 kc; and Peking, China, on 7060, 7065, 7080 and 7095 kc. All these stations are listed as running power in excess of 100 kW—the other broadcasters in the band are mainly unimportant low-power local transmitters, with no regular schedule.

Not so those named. They operate regular services, aimed at overseas listeners, for the sole purpose of disseminating their own particular brands of culture. As such, they are peculiarly sensitive to public opinion, as expressed by individuals rather than by government agencies. Hence, individual written complaints will carry much more weight than any other sort of protest.

The authorities to whom to write, pointing out the error of their ways, are as follows: Mr. R. Ahmed, Director-General, Radio Pakistan, 71 Garden Road, Karachi 3, Pakistan (and/or to Mr. H. Nasim, director of external services, same address); Mr. Mei I, director, Government Broadcasting Administration, People's Republic of China, Fu Hsin Men, Peking, China; and Mr. M. M. Taifour, Controller of International Relations, U.A.R. Broadcasting Cor-

S-METER FOR THE R.107

SIMPLE CIRCUIT MODIFICATION

D. W. Blackford (G3NPB)

There are a large number of R.107's being used both by AT station operators and SWL's. One disadvantage of this receiver is its lack of an S-meter. However, after some experiment, a simple, sensitive and efficient S-meter circuit has been devised by the writer.

On the front of the R.107 is a test panel for the checking of certain internal circuits. It is only necessary to unsolder from the back of this panel the leads marked "+" and "1A" and to connect between them an 0-500 microamp. moving coil meter (or an 0-1 mA type, with reduced sensitivity) which has across it a variable shunt resistor; this latter is important, and it should be set near zero on switching on for the first adjustment. The "+" lead is connected internally to the positive HT line, and "1A" goes to the anode of the first RF valve.

A shunt resistor of about 100 ohms variable is required—though this will depend on the internal resistance of the meter used—and it is adjusted to give full-scale deflection of the meter in the no-signal condition, with the RF gain at maximum.

Tuning in a very strong signal—such as Radio Luxembourg—will bring the needle back to about one-third of full-scale; therefore, as an arbitrary value, S9 has been estimated at 2/3rd's full scale, the meter of course reading lowest for the strongest signals.

This S-meter circuit has been found extremely satisfactory as a comparative indicating device both by the writer and by G3OHX, who is also using it. It is not only simple, but easy to fit and reliable in operation.

RATIONALISING PRODUCTION

One of the large American radio manufacturing companies makes a great feature, in its latest literature, of the fact that all its new receivers are *hand-wired* to save servicing and improve performance, stability and reliability! One wonders when some prominent U.K. manufacturer of domestic TV receivers will get round to this modern method of wiring the things up, by hand! It's rather like providing assistants at the self-service store to help customers find, select, wrap and pack their purchases, a little additional service being, of course, that the assistant also slips round to the cash desk to pay the bill and bring the customer back her change.

poration of Cairo, 4 Sherifein Street, Cairo, Egypt.

And, in the meantime, when they are occupied by these pirate broadcasters, frequencies 7010, 7050, 7060, 7065, 7080 and 7095 kc should always be used for transmitter testing and the conduct of local QSO's. It is quite certain that unless we are prepared to help ourselves in this matter, nobody else will. (*Overseas Amateur Radio periodicals please copy.*)

Ideas About Aerials

A HANGING DIPOLE — AN EASILY-ERECTED MAST — PLACING THE CURRENT ANTINODE

A CHANGE of QTH for G3FTP, with the desire to get back on the air as soon as possible, produced the solution shown by the drawings in Fig. 1. A 15-metre dipole to this design—with 11 ft. 1 in. whip ends—has done so well that it is thought worth passing on. Its particular merit is that it is a very useful type of DX aerial arrangement for the space-restricted station.

The sketches are about self-explanatory, the main points to note being (a) That the aerial hangs vertically, so desirable for DX working, (b) The assembly simply hooks on to a gutter, or other roof protuberance, (c) Construction is light and simple, and (d) Feed is at low impedance, into the centre point of the whip sections, as the aerial is, of course, no more than a centre-fed dipole.

For the whip sections, dural rod or tube could be used, and they would not require more than two support insulators each if the

wood batten to carry them is made about 10 ft. long. This batten, of "2 x 1," is itself screwed to a board, centred along its length, the arrangement being such that the mid- or feed-point of the aerial is at the centre point of the whole assembly. Hooks, and a bottom bracket to prevent the aerial falling forwards out of plumb when it is hooked on, complete the construction.

The feed line can be TV-type air-spaced coax and, for G3FTP—with but 15 watts input and the 80-ohm coax feeder taken straight into the pi-section PA tank—all American call areas were worked within a fortnight last summer, as well as much miscellaneous 21 mc DX, using the vertical dipole exactly as described and illustrated here.

DESIGN FOR A MAST

Here again the sketches at Fig. 2 are almost self-explanatory. The tabernacle, or cradle, to carry the swing-up section is made of two pieces of 2 in. by 2 in. timber, 12 ft. long, separated by their own thickness using distance pieces, with the butt end 2 ft. into the ground. The footing is actually an old paint or oil drum filled with quick-setting cement.

The hole for the drum is dug out first—

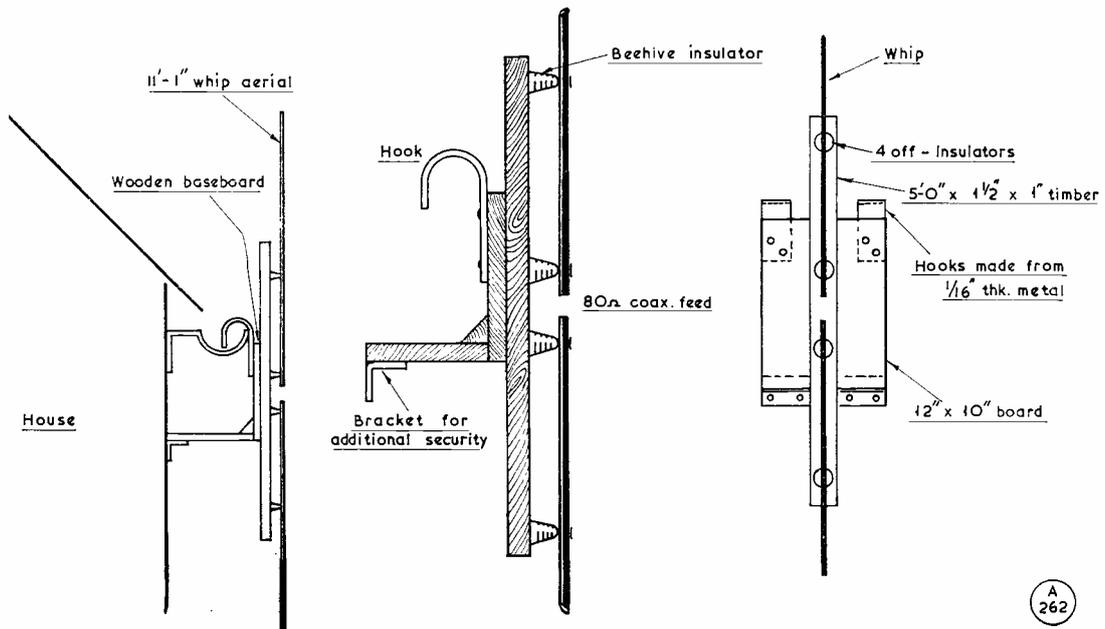


Fig. 1. These sketches illustrate the general construction of a dipole assembly to be hung from a gutter or any other protuberance on the side of the house. Though this design is for 15 metres, involving a total element length of a little over 22 feet, the same idea could be applied to 10 metres—but it would become unwieldy for 20 metres. The assembly will be clear from the drawings, and some additional notes are given in the text. During a spell of reasonable conditions on the 21 mc band, this simple aerial arrangement worked a lot of DX for its originator, G3FTP.

to the maximum possible for the lowest frequency-band to be used — normally, Top Band and 276* feet.

But by no means everybody is in a position to run out 276* feet of wire, or even the half of it, and it is the purpose of this note to show that for effective radiation it is not even necessary. Let us re-think a little: In any resonant aerial system actual radiation off the aerial takes place from the point(s) of maximum current, *i.e.* the current antinode(s). The physical dimensions of the aerial determine the position of the current antinode (there may be more than one, as in a full-wave system, which has two).

Now, the physical dimension of the aerial can be contrived in various ways to give an equivalent electrical effect—in other words, we do not necessarily require a straight piece of wire 276* feet long to produce resonance on 160 metres with the current antinode in the middle. On Top Band, with such an aerial (which is a half-wave long and has only one current antinode), this point of maximum radiation comes half-way along the wire, at about the 138-ft. mark. The objective should be, therefore, to get *this* particular point as high and as well in the clear as possible, for no radiation is taking place from any other

part of the aerial—the remaining 138 ft., or the two 138 ft. sections each side of the centre point, exist only to create the current antinode.

It now begins to emerge that for our purpose the current antinode can be created by making the two arms of the 160-metre dipole (for that is what a half-wave aerial is) not necessarily an exact 138 ft. long but simply equivalent electrically to a quarter-wave; this can be done by taking, on one side, some of the wire into the aerial tuning inductance and, on the other side, either running the 138 ft. length in zig-zag fashion, or rolling it into a large coil; actually, it hardly matters what you do to it, within reason, so long as the inductive value is about equivalent to a quarter-wave; but the more bundling up or zig-zagging you do, the less wire you will want if you are to keep the current antinode at the correct physical position in the system. It is not at all easy to determine this, and the only sure way of getting things right is have an RF ammeter (in series with the aerial) at where you want to make the current antinode and adjust your end-piece lengths till you get a maximum reading—the meter can be viewed through binoculars or, by carrying out the procedure after dark, a 10w. car bulb will give quite a good visual indication. But,

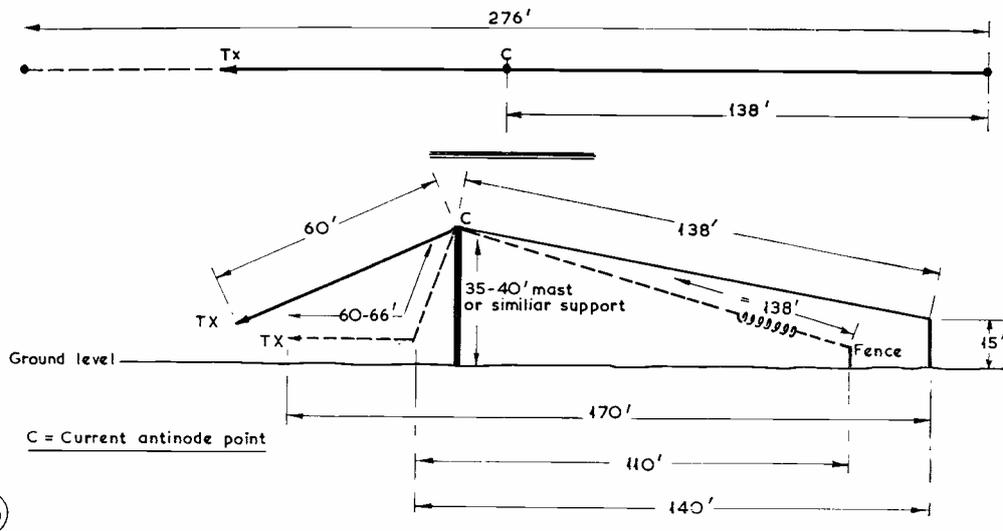


Fig. 3. An actual layout, intended primarily for LF band working, which illustrates the arguments in the text. The main point to note is that the current antinode, from the area of which actual radiation takes place, is made the highest point of the system, and that as explained in the text, by making the total length between far end and ATU about 204 feet, the system can be made to resonate fairly well, as an end-fed aerial, on all bands 160-10 metres — however, on the HF bands, more truly resonant systems (such as dipoles) would work better. As far as Top Band is concerned, the only way to improve the system as shown here (and which is tailored to a particular site condition) would be to push point C up higher; ten feet gained here would be worth more than 30 ft. at the far end. If it is not possible to run out a straight wire, the length beyond point C can be bundled or zig-zagged and tied to any convenient support, as suggested in the drawing. The actual length of wire required would be less than 138 ft. if an "inductive effect" is built into the system and the far end support is very near ground level, as shown dotted here.

obviously, this is much more difficult than being able to run out a straight 138 ft. wire.

Now take a look at Fig. 3, which is a practical case illustrating all the foregoing—and by “practical case” is meant that a system has been tried out and is working on the principles discussed here. Point C is where the current antinode comes, in a system designed (having regard to the local site considerations) for maximum effective radiation on Top Band. From the top of the mast, alongside the house, one 138 ft. arm is run down to a 15 ft. pole at the bottom of the garden. The other “138 ft. arm” is deliberately made 66 ft. long only (for reasons that will be clear in a moment), the balance length being taken up in the aerial tuning unit—there is no magic about this; it is simply a matter of getting an impedance match by tapping down a tuned inductance link-coupled into the PA.

The sketch at Fig. 3 shows how an equivalent length of 276* ft. — half-wave for 160 metres — can be accommodated in available ground lengths of from 110 to 170 feet, always with point C, the current antinode and point of maximum radiation for Top Band, at the highest position in the system. In other words, there is no alternative method of making better use of this particular site condition; the only way to improve it would be to push point C up higher.

What is Achieved

With the 66 ft. length in series with 138 ft., the layout of Fig. 3 gives us a $\frac{3}{4}$ -wave resonant system for Top Band, with the current antinode at C, where it is wanted; on 80 metres, the same system is $\frac{3}{4}$ -wave, with two current antinodes on it, one at the Tx end (for low impedance feed, straight off the PA tank, as it is used), and the other half-way along the distant 138 ft. arm; on 7 mc, the system is roughly equivalent to three 40-metre dipoles in series; similarly, for what it is worth at these higher frequencies (where it would be better to use dipoles or other systems more accurately in resonance) this 204 ft. of wire will load up on all bands to 10 metres, using an ATU with a variable tapping point for the end-on wire.

And now somebody may be thinking “Why not carry the thing to its logical conclusion on Top Band and use inductance only to produce the equivalent length of 138 ft.” — well, the answer is that we do just that with Top Band mobile whips, which systems also demonstrate the impracticability of applying the idea to the normal fixed-station installation, by reason of the fact that the whole set-up becomes so

sharply tuning and frequency conscious, that aerial taps may have to be altered to change frequency even a few kilocycles. No mobile whip is working correctly unless it *does* exhibit this characteristic of extremely sharp tuning—all this was explained in an article in the June, 1956, issue of *Short Wave Magazine*.

The other conclusion that may by now be borne in on the reader is why some of the “curly Top Band contraptions” one hears of apparently work so well—it is because, either by accident (or design?), the current antinode happens to come at or near the highest point in the system. That is all one needs to plan for in aerial designs for the LF bands—in fact, the theme is “Get your current antinode high up and in the clear.” It does not matter a great deal where the dipole arms go to—actually, it can be shown that for some long-wire systems earthing the far end of the aerial would not prevent it radiating effectively provided the current antinode is where it should be.

* For a centre frequency of 1.9 mc, a more realistic figure for a dipole for Top Band would be 246 feet — however, this does not in any way invalidate the argument; the length of 276 ft. was the accepted figure for a harmonic aerial as used on the old 1.7 mc band.—*Editor*.

INTERESTING RESULT

A reader who had a small advertisement in the March issue of *SHORT WAVE MAGAZINE* writes as follows: *My recent offer to sell transmitter, power supply and modulator at £100 cash brought a purchaser, by phone, on the day of publication—many thanks.* We quote these entirely unsolicited reader comments about the pulling power of our Small Advertisement columns—and therefore the whole range of *SHORT WAVE MAGAZINE* advertising—as a matter of interest, and to help those who might be thinking of advertising something worth having at a reasonable price; it is no use just offering junk; under a box number! The cost of readers' small advertising in the *Magazine* is 3d. a word, with a minimum charge of 5s., and again this month we have a magnificent offering of attractive items; within a few days, many £100's worth of equipment will have changed hands.

HINT OR TIP

It is worth noting that, contrary to the usual belief, it is *not* a good thing to run valves for long periods at stand-by, without HT. It has now been found that valves kept on heater only for hours at a stretch develop a disease called “cathode poisoning,” whereby the composition of the coating material changes, leading to erratic performance and premature failure. Actually, valves work better and last longest when they are used as they are intended to be—with LT and HT.



A fully-transistorised communications receiver for less than £40 in kit form. The Heathkit GC-1U "Mohican" has a remarkable specification at the price and for the facilities it gives — these include frequency coverage of 550-32 mc in five switched bands, with full spreading of five amateur bands; 450 mW audio output, ample for a speaker at normal levels; BFO, AVC and ANL, all separately switch controlled; audio and RF gain controls; aerial trimmer on front panel; tuning meter; fitted whip aerial, with connections for an external aerial and a muting terminal where a transmitter is in use; and zener diode stabilisation for RF, mixer and oscillator stages. Very good selectivity is achieved by the use of crystal ceramic transfilters in the IF stages, and BFO tuning is by variable-capacity diode, potentiometer controlled. Ten transistors and four diodes in all are used, with OC170's in RF, mixer and oscillator circuits. For ease of construction, the RF front-end is sent out pre-fabricated — wired, aligned and tested. The power supply is an internal 12v. dry battery which should give about 400 hours use on normal intermittent service.

MOBILE RALLY PROGRAMME

First important announcement this month is that the **Harwell** event, booked for **May 14**, is not now to take place; for various reasons, members of the local club find themselves unable to organise a meeting on the same lines as last year; they wish to express regret to those who may be disappointed, and say they have hopes of being able to lay on a rally again next year.

One of the well-known mobiles is G3GMN/M, of Gloucester, who runs the all-band installation shown on the next page; very neatly fitted, the 50w. PA is a 5B/254M (miniature 807) modulated by a pair of 5881's in Class-B; this modulator, designed by G2CDN, will give a good 30w. of audio, from a crystal microphone through a two-stage speech amplifier and triode driver. The receiver, fitted in an anti-vibration mounting, is a double-conversion superhet having full bandspread on six bands, with BFO and ANL, and is miniaturised into a cabinet

only 6 ins. x 5 ins. by 12 ins. deep overall.

Advance information on the North Midlands Mobile Rally at Trentham Gardens on **Sunday, April 30**, has already been published—see p.44 March issue. We now have some further details from the Midlands Amateur Radio Society, joint organisers with the Stoke-on-Trent Radio Society. The entrance to Trentham Gardens (incidentally, one of the show places of the Midlands) is on the A.34 between Stone and Newcastle-under-Lyme, Staffs. Entrance charges are 2s. for adults, and 1s. per harmonic. Full restaurant service is available without booking, in the event of bad weather there is plenty of covered accommodation, and this year the car-parking area is being extended. Talk-in will be by G3GBU/A (main control), G2AMN and G3OGD on Top Band, and by G3MAR/A on two metres. Various events are being organised and, as those who have been to Trentham before will know, there is plenty to interest

and amuse everybody.

After Trentham, the programme now definitely fixed is as follows:

May 7: Cheltenham Mobile Rally, Montpellier Gardens, Cheltenham, with G5BK operating as Top Band talk-in station; there will also be a local channel (G3IER) for two-metre mobiles. A prize-ticket draw is being arranged and the mobile contest will take the form of an "initiative test," involving map-reading on a drive round the Cotswolds. An established feature of this Rally is the dinner held the night before, to which any mobileer who is going to be in Cheltenham on the Saturday is invited. Application for dinner tickets and further details of the Rally itself should be made to: T. A. Russell, G3JFH, 10 Dale Walk, Bishops Cleeve, Cheltenham, Glos.

May 7: Thanet Radio Society Mobile Rally at Hugin Site, Pegwell Bay, Ramsgate, Kent. The control station on Top Band will be G3DOE/P, and further details can be obtained from: J. Barnes, G3BKT, 18 Grange Road, Ramsgate.

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, nr. Leeds, organised by the Spen Valley Amateur Radio Society, with J. Charlesworth, G3IJC, 23 Craven Lane, Gomersal, nr. Leeds, as hon. secretary.

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 Lyndhurst-

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 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.

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

July 8/9: South Birmingham Mobile Rally. (*Details later.*)

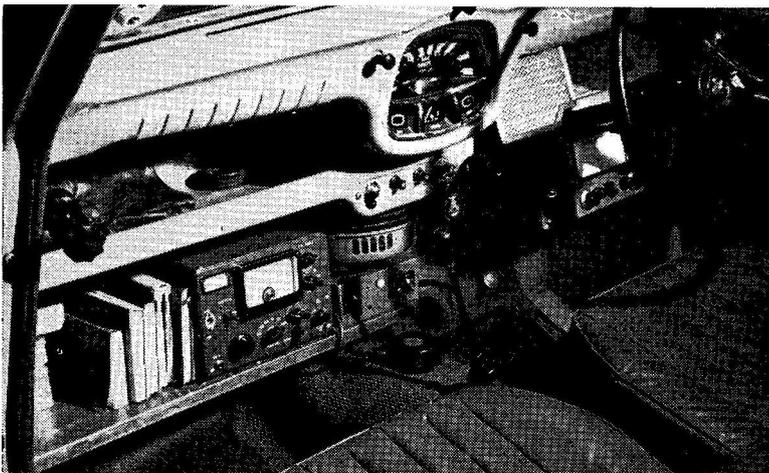
July 9: Mobile Rally organised by the South Shields & District Amateur Radio Club. Details from: D. Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham.

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.*)

Organisers are again reminded that we shall be glad to have their reports as soon as possible after the event, for coverage in this space. Total attendance can be estimated reasonably accurately by counting vehicles and multiplying by three; the number of actual /M-fitted vehicles is a useful figure to have, as well as the number of holders of call-signs present — these latter statistics should be available from the visitors' book, which every driver should be persuaded to sign, and which should have columns for "registration number" and "whether fitted mobile."

From this list of events, it is clear that we shall be having another very busy and successful Mobile Rally season, with the meetings well spread in distance, if not always in time.



Transmitter, control unit and receiver in the G3GMN/M layout, which is designed for operation on the six bands 10-160 metres, with a 50w. PA stage, the receiver being a double superhet giving full spreading of the six bands covered. This gear is beautifully finished and is remarkably compact — the Tx case only measures 8 ins. wide by 6½ ins. by 12 ins. deep, while the Rx is 6 ins. by 5 ins. high by 12 ins. A 5-in. speaker with a small baffle is fitted on the steering column. The equipment as illustrated here has now done over 30,000 miles and has given G3GMN many hundreds of /M contacts on the six bands.

DX COMMENTARY

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

DURING the past month your Conductor has experienced what must surely be the most exasperating, exhausting and exciting thing that can happen to the likes of any of us—a complete change of QTH. It is practically a venture into the unknown! There probably *are* such things as thoroughly bad locations (not from the point of view of man-made inconveniences, but just thoroughly bad spots for reception and transmission) . . . will it turn out to be one of those?

Fortunately, in this case it doesn't appear to have done so, but many other queries come up. The busy road close to the house—what will the ignition QRM really amount to? The sinister row of high-voltage pylons about a quarter of a mile away—does one have to wait for a really wet day to get the true picture? And then—the neighbours! How old are their TV sets, and are they likely to be devoted to BBC or The Other? And add to all this the fact that the former QTH was on level ground, but low; and the new one is on steeply sloping ground, but high . . . there is going to be a lot to find out.

Most heartening combination of circumstances so far is that it is possible to get a 589 from a W6 on 14 mc CW, without affecting a TV set in the same room, tuned to BBC (Channel 1) at 65 miles on an *indoor aerial!*

Regular readers of this Commentary may expect to hear quite a lot about sloping aerials, tilted dipoles, inebriated ground-planes and the like within the next few months. Suffice it to say, so far, that a temporary wire with the home end 40 feet above the shack floor, and the far end 20 feet



0A4EY

CALLS HEARD, WORKED and QSL'd

below it, appears to work pretty well in the direction towards which it slopes—although it may well do better with a mast at the far end instead of a fence post four feet high!*

Conditions have been extremely good again, particularly on the LF bands. Top Band, as a Trans-Atlantic carrier of signals, has come back almost to the standard of its peak years; Eighty, for those who spend the right sort of hours on it, can produce absolutely anything; and Forty gets better all the time, but, of course, more and more difficult and exasperating.

Top Band DX is becoming quite an international affair, but naturally only the minority of lucky ones (aerial-wise) can hope to

manage the really long hauls. However, the number of stations who have got through to ZC4, UB5 and similar distances is very encouraging. Probably it is beginning to fold up by now, but there is every hope of a terrific season to come, starting next December or thereabouts.

The HF bands pursue their uneven course, with Ten almost out of the picture and Fifteen becoming a little scratchy; Twenty, of course, never really leaves us, and it will carry the bulk of DX right through the trough of this cycle—so get yourself really geared up for that band.

And so to our survey of the bands, starting, this time, at the LF end . . .

Top Band DX

We were all hoping that this might be the year for One-Sixty to stage a real come-back as a DX band, and this it certainly has

* (In case of any possible misunderstanding, the resemblance between these passages and the article "Ideas About Aerials" in this issue—and in particular Fig. 3 on p.75—is no more than a coincidence.—Editor).

done. Things started happening just too late for last month's Commentary, but this time there is so much DX to report that it will have to be condensed as much as possible. Pardon some of the understatements which follow!

The week-end of February 25-26 was the occasion of the *CQ* Top-Band Contest, and conditions turned out to be very good.

TOP BAND COUNTIES

LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
GM3OM	97	98
G6VC	96	96
G3APA	85	90
G2CZU	83	85
GM2UU (Phone)	80	81
GM3AVA	78	78
G3NFV	78	78
G2DF	77	77
GM3OM (Phone)	75	79
G3ISG (Phone)	72	74
GM2HIK	72	74
G3NNO	71	82
G3OCA	71	74
G3FS (Phone)	69	72
G2CZU (Phone)	69	69
G3NVO	67	79
G3NBT (Phone)	61	65
G3OGY	59	67
G3NJQ	56	59
G3NNF	55	60
G3OHX	55	59
G3NMZ (Phone)	55	58
G3NXQ	53	60
G3NPB (Phone)	52	58
G3LZF	51	64
G3NNF (Phone)	47	49
G3NAA (Phone)	46	59
G3IDG	41	46
G3NNO (Phone)	38	57
G3OGI	38	50
G3NOW (Phone)	35	41
G3OIK (Phone)	27	41
G4JA	25	32
GW3CBY	23	41

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

G3FPQ, '5JU, '6BQ got across; the only one of the three to report is G5JU, who raised VE1ZZ, W1BB, W1PPN, K1KSH, K2DGT and W2EQS, hearing many more.

GM3OM was putting Scotland on the map, and found W1BB peaking at S7-8, with W4KFC and VE1ZZ nearly as good—but he didn't raise them. Strangely enough, there do not seem to have been as many G's active that week-end as on other occasions.

W1BB's report on the tests says they were an unqualified success; W2FYT worked OK3EE and some G's round about 0130 GMT. KH6IJ worked a load of W's and VE's, and W4KFC and K1KSH both made over 200 QSO's!

Later on, conditions improved still more, and the week preceding March 6 seems to have been the best for many years. W1BB says that on March 4/5 the G stations were in for two hours with strengths up to S7/8; DL1FF was also working many W's.

G5JU reports that G3CHN, '3PU and '6HB were getting across in fine style, but he himself had no luck. G3OCA worked VE1ZZ and W1BB, and reports that G3OFZ also worked VE1ZZ. Other DX for G3OCA was ZC4AK, HB9X and HB9QA.

G3CHN remarks on what a good season it has been, although he has not made many contacts except on January 15, when he worked eight W's and VE1ZZ. But he says many QSO's were ruined by G's, some of whom are still quite uneducated and persist in calling the W's on their own frequency. On one morning he logged nine G stations below 1825 kc, and would very much like to publicise their calls! HP1IE was heard at RST 349; W2FYT was heard working EL4A; and G3CHN (on March 5) worked W2GGL at 0710, when the sun was shining down in Devon.

Regarding these two good openings (January 15 and March 5) G3CHN remarks that in each case, on the preceding day, the barometer was rising and TV DX was evident. If this happens again, it would seem that there might be a tie-up.

G3OQK (Eccles) also had a tie-up of sorts; he found the W's on

3-8 mc SSB so good the previous night that he was induced to get up early on March 5. Between 0600 and 0700 he logged lots of W's and a VE on 160m., but didn't call them.

GM3OM (Larbert), also commenting on March 5, says he was rewarded for much patience and much work on aeriels by a fine 15-minute QSO with VE1ZZ—his own first contact across the pond, and VE1ZZ's first with GM. The W's were fantastically strong in GM-land that morning, with W1BB S7/8, W2GGL and '1PPN S7. GM3OM, too, castigates some of the "G-Klots" and says that two of them were actually having a phone QSO right on top of the W's and debating why they couldn't hear them!

G3FPQ (Elstead) has worked a VE and 11 W's, including W3MSK and W4KFC. He, too, says that a number of G's who should know better have been persistently calling below 1825 kc. On the other hand, G3NVO (Middlesbrough) says that in some cases it was *only* the G's who called the W's on their own frequency that got through, and the W's must be blamed for this. We will take it up with W1BB before next season—and also with the G's who cause the QRM.

G3NFV (Ashtead) worked VE1ZZ on February 26, and four W's on March 5, including W3MSK. Some strange character signing "VS1LIR" was around, but as no VS1's work One-Sixty or even Eighty, one knows what to



think. Other DX for '3NFV included UB5WF and UO5AA, the latter peaking 589 at 0430.

SWL Peter Day (Sheffield) sends his usual fine report, which shows that *twenty-two* W/VE stations were heard on February 26, and 17 on March 5. He also logged EL4A at 0615 on the latter date, and VP2VA for his twenty-second country on March 12, when the W's were very much down in strength and numbers.

G3NVO worked VE1ZZ and thinks he, with W2FYT and W3VAN, was the most consistent station. W8GDQ raised ZC4AK on March 3 and thus becomes the second W to claim WAC on the band (first, naturally, being W1BB).

Medium and GDx

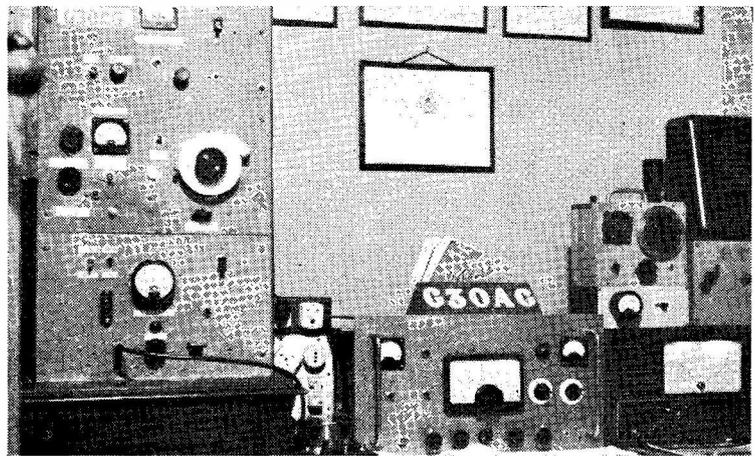
With all this Trans-Atlantic activity, it is not surprising that some of the lower levels of DX have been pretty good, too. GW3NAM, operating from digs. in Oxford with a 20-foot piece of wire tucked round the skirting of his bedroom, and listening on an old Sky Champion, heard ZC4AK at 449 (2130 GMT) but could not quite copy his phone.

There seems to be a Scottish invasion of the Counties Ladder, which has this month been joined by GM's 3AVA, 3OM and 2UU, all with high scores; in fact, GM2UU and '3OM become first and second in the phone section. Where are the GI's, GC's, GW's and GD's?

GM3OM, with a "lazy half-wave," which wanders round the garden, then shoots vertically for 40 feet, and then slopes gradually back to ground for 150 feet, had worked four OK's, a DL, 2 ZC4's, two HB9's and an HA during the fortnight before writing.

The OK's Central Radio Club are organising an interesting event for Top-Banders, which they call the "CW Monday Party." The idea is to give their members training in contest operating technique; and although from the contest point of view the event is a national one, they will be pleased if any foreign operators care to join in and send logs. The procedure is:

On second and fourth Monday



G3OAG, Prestwich, M'cr. runs 10w. to an 807 on Top Band, with an Eddystone S.640 receiver, having a home-built xtal calibrator and S-meter; the aerial is a 100 ft. wire, only 17 ft. high. The all-band rig consists of Geloso VFO into an 807 PA at about 60w., modulated by a pair of 807's. G3OAG has scored well in Top Band Counties worked.

of the month, all through the year; 1900-2100 GMT; Contest call "CQ TP," 1800-1900 kc; three points per contact, with code numbers confirmed both ways; *Multiplier*: Sum total of points multiplied by the number of stations worked during the first half-hour (1900-1930). Usual six-digit numbers, starting 579-001 and so on.

Two letters from 5A2CV (El-Adem) can be summarised as follows: With 15 watts he has worked G2BB, '3BMY, '3KUG, '6BQ, DJ-DL's, OK's, ZC4AK and OD5LX. He was off the air for a while after a 70-knot wind blew down the HF-bands Quad and the Top Band long wire, but all is now well again.

G3NJQ heard LX3AH calling CQ, which brought forth "pull the other leg" from an unidentified station. The reply was "Hi" but no more. . . . G2DF (Warrington) scores 77/77 in the Counties ladder, and says "it's hard going—with an indoor aerial!" Despite that handicap, he holds our WABC and WNACA Certificates.

G3OHL (Middlesbrough) is a comparative newcomer who has stuck to One-Sixty ever since he was licensed, and is hot after WABC. He has now got up a half-wave aerial and hopes to speed up progress; and he will be in Berks. signing /A shortly.

The Wirral Amateur Radio

Society will be operating from Carmarthenshire during the weekend following publication . . . April 7 and 8. Their Club call will become GW3NWR/A for the occasion, and the convoy of six vehicles will also be working /M *en route*, from 0900 on the 7th and again from noon on the 9th.

G3OGY (Salford) is on the verge of WABC and mentions some interesting daylight QSO's with GW, northern G, and GM stations. G3NVO becomes one of the select band to reach 70 counties, with Hereford, Staffs. and Anglesey.

EI3AE (Longford) says that he QSL's all contacts *via* the Bureau and wishes everyone else would do the same; he runs 10 watts to a 300-ft. wire and works DL's and OK's with ease, but complains that the W and VE stations are wiped out by *key-clicks from G's!*

ZC4AK (R.A.F. Akrotiri) writes that a much lower static level has made it possible for him to work many more G's, and he has now reached the target of 100 different U.K. stations. Six of them (G3KVG, '3KOX, '3MXJ, '3NAA, '5AQ and GW3NAM) have been worked on *two-way AM Phone*—very fine business. ZC4AK's log for Top Band now shows 165 stations worked in 14 countries, 8 Zones and 4 continents. As far as his WAS is concerned, the score is five!

[over

CW DX WORKED

7 mc Band
G2DC: EP1RR, MP4BBE, 4BBL, VP2LA, 5N2GUP, 2LKZ, 2ATU, VQ2, 3, 4, ZL1-4, VK2-7, all W and VE districts.
G3FPQ: MP4BBE, VP3MC, VP9BO, VQ2CZ, 2HR, 4KPB, 5IB, VS9AAC, VU2XG, 5N2GUP, 9G1BQ, VK's, ZL's.
G3NNO: W1JTD, 2PGU, WA2DXTX, K3GAE.
G3LPS: VK2QL, PY2CGC, PY7LJ, VO1DX, 1FB, VK3ADB, VE's.
G2BLA: VE, VO, VQ2HR, ZB1FA, ZC4's, 5N2GUP, 2LKZ, UG6AW, CX2TF.

14 mc Band
G13NPP: ZD1CM, VQ5IG, UA3FE/0, F9QV/FC, FB8CT, K4AIU/PJ, ZD6RM, VP3YG, 9U5VL.
G3LPS: ZE3JJ, 5JL, VQ5IB, 5IG, 5GJ, SV0WT, VS9MB, FB8XX, 8ZZ, 6O2RS, VP4TK, EL4A, YV4BE, VP3MC, VP9BO, 5N2LKZ, 2IND, TI2PZ, VU2XG, KV4AA.
G3WP: EP2AF, F9UC/FC, 5N2LKZ, 7G1A, KL7's, VK, ZL.
G2DC: AP2RP, BV1US, HM1AD, FQ8AW, VS1KQ, VS6EC, VU2XG, 2MD, JA1-7, VK1-7, ZL1-4, all W and VE districts.
G3OAG: PY7LJ, HCILE, YV4AY, 5AGD, FB8ZZ, HH2JV, F9UC/FC.
G3OFS: FB8CE, EA8CG, VP9QO, OH0RJ, U18, UH8, VE8, MP4BCV, VU2MD, 2JA.

21 mc Band
GW3AHN: CE1AD, 3RY, 4EC, CR5AR, FF7AG, 8CW, HC1JU, LU2ZO, PY7LJ, PZ1BF, VP3MC, 6AF, 8EE, VS6EC, VS9AAC, VU2NR, ZP5LS, ZS7M, 6W8BL, 8BQ, 7G1A.
G3OAG: FF8CW, 5N2GUP, VE4RO, UD6AM.
G2DC: CE3RY, OA4FM, MP4BBE, 4BBL, VS1KQ, VS9AAC, VP3MC, 4TX, 8CC, 8EG, VK, JA, ZL and all W and VE districts.
G2BLA: VK5NQ, VQ2HR, 2MS, VS9AAC, VP3MC, VU2XG, 5N2ATU, 2DCP, 2GUP, 2LKZ.
G3LPS: VU2XG, MP4BBL, VP3MC, 5N2LKZ, VQ2HR, 2WR, ZB1, ZC4.
G13NPP: FB8CI, FF7AG, 6W8BQ, 9U5HT, LA2DE/P, VP5BL, CR9AI, VU2XG.

28 mc Band
G2DC: VQ1, 2, 3, 4, VS9AAC, VU2XG, JA1, 2, 7, 5N2GUP, W, VE, VO.
G2BLA: VQ2CZ, 2HR, 2WR, 3HD, 4FK, VS9AAC, ZC4IP.

SSB DX WORKED

14 mc Band
G3NOF: CT2AH, CX2CO, F9QV/FC, KH6ECD/Kure, KL7's, KR6QW, LZ1WD, UC2AA, UQ2AN, UR2AO, 4X4IX, 9G1BF.
G3FPQ: EP5X, F9QV/FC, HV1CN, KH6ECD.
G3NWT: UA3FE/0, ZS3AD, 9G1BF, EA8BA, VS1FO, 9M2DB, SL4ZH, KC4USG.
GW3AHN: AP2CR, CT2AH, EP2AG, 2AY, EP5X, FB8CM, FF8CW, K G 6 A J B, K H 6 A W S, KH6ECD/Kure, KL7, KV4, PZ1AX, TF2WFN, UA3FE/0, VP6WD, YV5, ZB2I, ZC4AK, ZD2KHK/NC, ZS3E, 9M2DB, 2GA.
 21 mc Band
GW3AHN: CE3RY, EA0AC, EA8CT, EL1C, 2AC, FF8CW, HC2ND,

5HA, HK3QV, KP4AYK, KV4BQ, KZ5JW, OA4J, PZ1AX, 1BF, VP9DL, VQ2AB, 4RF, ZP6BB, W7's, 9Q5AG, KR6RN, PZ1AX, 1BF, EA8CT, HZ1AB, K5PXM/MM, UR2AR, VP7NT, VQ4RF, LA1LG/P, OD5CN, 5EA, ZB2J.

AM PHONE DX WORKED

14 mc Band
G3NWT: CR7CI, VQ2FC, 2JN, VQ5GF, ZS3R, VP6PV, FF7AC, EP2AJ.
G3BHI: SV0WT (Laite).
G13NPP: ZB2J, LA1LG/P, OD5CN, 5EA.

21 mc Band
G3NAC: AP2CR, CO8RA, CR6CD, 7BC, CP1BJ, EL2AC, EP1AD, FB8CO, FF4AH, FG7XH, FQ8's, HC5HO, KG6AIY, KR6RN, 6VO, OA4K, TI5RV, 2RFT, VS9MB, VP8DW, VP3MC, 4TP, 6WR, VP9DL, 9L, VU2BK, 2RG, VK9PJ, XW8AL, YV5EF, 1FI, YN1AW, 9U5VS, 5VL, 5HO, 9K2AD, 2AX, 2AP, 9G1DQ, ICC, 9M2GV, 6W8CY, 5N2ATU, 2BRG.
G3GHE: AP2MR, CR9AI, EP1AD, 2AT, FF4AH, FQ8HW, KG6, MP4TAJ, VK9PJ, 9RO, VP3YG, XW8AL, 5N2BRG, 6W8CU, 8CY, 9G1CI, 9U5NC.
G3BHI: AP2MR, FA2TW, HZ1AB, K8MVJ/VE8, LA1NG/P, VP6WR, 3V8CA, 6W8CU, 9K2AP.

G3NOF: FF7AG, FQ8HI, 8HZ, HK3LX, MP4BCY, TI2RFT, UN1BC, VP9DL, VS9MB, 9G1CC.
G3NWT: VK9PJ, 9RO, VS9APH, XW8AL, 5N2BRG, VP6PV, 6WR, VP9DL, CR9AN, VQ5IB, VS6CL, ZS80, 8K, 8W, VS1GZ, ZS3D, 9K2AY, ZE0HE.
G3OAG: HK2YO, SV1AR, ZC4MO.
G3LZF: KP4AOO, KZ5BA, HI8GA.

28 mc Band
G3NOF: HI8DGC, LU3AAT, W5INL, VQ2VZ, 5A1TY, 2CX, ZS's, UA6ABT.
G3BHI: ZS81, VQ2TV, 2BK, CX6BA, ZS3R, 3FF/4, VQ8BM, VU2RG, ZEZJA, UW9CB.
G3GHE: VK6QL, XW8AL.

G3OGI (Sunderland) reports for the first time and says that he pulled his "big rig" to pieces at Christmas and has never re-assembled it. He is chasing WABC on CW and has also worked eight countries including ZC4 on an aerial "wrapped twice around the house and terminated on the front garden fence."

Eighty-Metre DX

The surprising thing about *Eighty* is that the DX is going equally well on CW, AM and SSB. Much more is being worked than we have been directly told about, some of the more cagey exponents deeming it wiser to keep quiet about their goings-on!

G2DC (Ringwood) collected two

nice new ones on CW—5N2GUP and YV3CD. Others worked included all W districts except 6 and 7, VE 1, 2 and 3, VO, ZC4, 4X4 and ZI. 1, 2 and 4.

G3FPQ worked CW with KV4CI, VP9BO, YV3CD, ZL's and 5N2GUP; and he was also very active on SSB, which netted EA8BA, HR3HH, HZ1AB, KP4AWH, OH0NC, OY7ML, PZ1AX, UC2AA, YN1TAT, YV5ANS, ZC4AK, ZL's, ZS6TE and all W districts except 6 and 7. During the four weeks before writing, '3FPQ had had over 160 contacts *outside Europe* on Eighty SSB! He has a quarter-wave vertical, which obviously helps . . .

G3JCQ (Barrow-in-Furness) heard the SSB types raising all the DX and decided to see what his 100 watts of AM would do. It did plenty, and he raised W1's, K2 and W4, as well as hearing *via* W1BU that ZL1ACG "got a sniff" of his phone while he was working the W1's; G3JCQ passes on some gen. from K2IEG which appears elsewhere, applying to both Eighty and Forty.

ZC4AK continues to be active on SSB in the evenings when conditions are good, and has raised OH0NF, OY7ML, HZ1AB, VE's, VO, W1 and 2; he has worked 27 countries this way since the beginning of the year.

SWL Day logged ZS6AJH and ZS6TE on SSB (3695 kc) at 0400 GMT; they are both on at that time every morning looking for DX. He also heard HR3HH (3800, 0635); and at the CW end he logged four ZL3's between 0700 and 0830.

DX Gossip

At the time of writing, the VU2NRM expedition to the Laccadives is still "in" the air, not "on" it . . . there might even be a Late Flash, judging from the various dates quoted.

The MP4BBW/VE7ZM trip to VR1 had to be cancelled, owing, we understand, to the fact that VE7ZM couldn't get away; the last we heard, MP4BBW was in VS6-land . . . And the Malpelo affair is also still "on," and may have happened by the time this is published.

VP2VB's movements are un-

certain, owing to doubts about the financial side of the "Yasme Foundation," but G2DC says things are looking a little brighter. If *Yasme* does not resume operations, it is stated that an offer has been made to finance Danny Weil in a DX-pedition to any rare spot he chooses.

Also from G2DC: ZD2KHK/NC is QRT for want of a power supply, the local Marconi engineer apparently taking a poor view of Amateur Radio; however, he hopes to acquire a P.E. generator of his own . . . VK9GP, Norfolk Is., is ex-VK2ANB, and is active . . . 5U7AC has been heard being called (now known to be Niger Republic) . . . VK3ADB is on 7 mc every evening, 1900 GMT, and wants G contacts; he is also on, sometimes, at 0730.

KH6ECD (Kure Is.) was on Twenty SSB at the beginning of the month; about 30 Europeans worked him, with G3AWZ acting as m.c. Incidentally, GW3AHN mentions that G3AWZ has over 300 countries *confirmed* on two-way phone, which would put him higher than the top-scorer in the DXCC Roll of Honour. (That a score like this *is* possible is proved by the fact that SWL G. P. Watts (Norwich) now has 300 countries

confirmed from 40 Zones.)

Also from GW3AHN: AP2CR was on SSB from East Pakistan from March 10-12, and '3AHN managed a QSO, but QRM and poor operating on his frequency were "fantastic"; the prize for this definitely goes to the North American continent, and "for 90 per cent of the time it was a complete shambles, with stations calling right through QSO's." This highlights the fact that rare DX operators who use transceivers such as the KWM-1 are bound to make things rather difficult for themselves as well as others; calling on the frequency is a practice we do *not* want to see on the increase again.

Marion Island might be on SSB some time, as the KWM-1 destined for ZD9-land is going that way . . . K3HVN is bound for Java, where he will be for more than a year; he is taking some gear, hopefully . . . PX1EP will be operational around early May for about seven days, AM phone only, probably just outside U.S. phone bands on Ten, Fifteen and Twenty.

W6AM now claims 307 "all-in" and 293 on phone, thanks to admission of UA2KAA, FF8AF (Senegal) and FQ8HP . . . Two genuine Albanian stations are ZA2BAK and ZA2BOR; both are on 14 mc and QSL, according to DM2ALN, who has visited them . . . W6NTR quotes FF8BQ as in Senegal, FQ8AL in Gabon Republic, and FF4AL as Abidjan, Ivory Coast. The latter is ex-EL3A.

A "DX-pedition" to *Portugal*? That is exactly what came off when CT2AH went there and put CT1 on the map for the first time on SSB! . . . 5N2JM (ex-ZD2JM) has dismantled and returned to GM-land . . . The Hillary Expedition is said to have been allotted the call 9N3PM, as mentioned (doubtfully) before.

PY7YS and PY7SA plan to visit Fernando do Noronha during April for about two weeks; after that, Trinidad for one week; QSL's have already been printed . . . FS7RT plans to operate SSB from Anguilla (VPØRT) and will also work AM callers (no mention of CW) . . . The Tannu Tuva SSB expedition (UA3FE/Ø) made 1174 QSO's in all parts of the

world; other active stations there, on CW, are UAØKYA, ØYC, ØYD and ØYE; now they know what SSB is like! The trip was sponsored by members of the Moscow City Radio Club, the home-built gear being a joint effort by several UA3's. (The Russians are beginning to get the idea!)

Franz Josef Land will be on the air again—the call to watch for is UA1KED . . . CP5EA said to be on SSB, 14 mc . . . The Bouvet Island query — G2DC worked LA9TF/MM, operating close around the island on a whaler, who says that not only is there no amateur on it, but no inhabitants either! Wash out that LAØB . . .

"5U7" is notified by various correspondents as the new prefix for the Niger Republic, formerly part of FQ8, we believe . . . ZEØHE gave the prefix-chasers a thrill—he was a Hobbies Exhibition station.

The Overseas Mail

ZC4CT (264 Signals Unit, BFPO 53) plans an expedition to JY-land, but ZC4AK will not now be able to accompany him. He says that "rumblings from the depths of the Cyprus Post Office" show that there is a move afoot concerning separate licences and prefixes for the Republic. ZC4CT will be going to MP4 for about twelve months and will naturally try to get a licence and come on the air; meanwhile, look out for his possible JY trip, which will be on 10-80 metres, CW only.

VK6AJ (Perth), who first brought the "Quads" scheme to notice, says he is delighted with the stir it caused! VK6AJ also says that some time ago he worked W8OLJ/PK and QSL'd to W8OLJ —back came a "pretty certificate" containing no detail of the QSO, not even his call-sign. What goes on ?

The Americans in Taiwan have formed a Radio Club (TARC) and they have some 25 members; they run a QSL bureau for BV stations, theory and code classes, and are considering issuing an award for the sheepskin - hunters. QSL address is: Taiwan American Radio Club, Box 24, USTDC, A.P.O. 63, San Francisco. Logs for BV1US only date back to 1959, by

L F BANDS TABLE

(Countries Worked)

Station	1.8 mc	7 mc	3.5 mc
G2YS	20	73	89
G3FPQ	19	85	134
G3IGW	19	51	95
G3NFV	15	12	27
GW3CBY	14	27	45
G2DC	12	93	126
G3NNO	10	22	24
G2BLA	9	39	70
G3DRN	9	13	42
G3IDG	9	15	20
G3NPB	9	8	21
G3HZL	8	44	80
G4JA	7	40	57
G3OQK	7	4	20
G2DHV	3	18	32
G2FQW	1	4	33

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

the way.

The KA QSL bureau, run by the FEARL, has changed its address, which is now FEARL(M), A.P.O. 925, San Francisco. KA2JM is QSL manager.

Forty and Down

We are bringing *Forty* in with the other DX bands from now on, since there are usually not many comments but just lists of DX worked, which will appear in the appropriate place. Top Band and Eighty are DX bands now, it is true, but they have an atmosphere and a technique of their own, whereas the others can be grouped together more conveniently.

P & Z TABLE

STATION	PREFIXES WORKED	ZONES WORKED
<i>CW Only</i>		
G2DC	438	40
GI3NPP	394	40
G3WP	368	36
C3HZL	366	40
G3ABG	336	40
G2BLA	322	39
GW3CBY	264	23
G3LZF	238	34
G3IDG	234	28
G2BP	212	30
VK6AJ	194	36
ZC4CT	194	28
GW3MLU	189	31
G3OQK	105	12
<i>Phone Only</i>		
G3DO	621	40
MP4BBW	439	40
G3GHE	386	39
GB2SM	370	37
G3LKJ	347	38
G3NWT	326	39
G3MCN	324	38
G3BHJ	315	37
G3NFV	292	37
G3ABG	261	32
G3HZL	138	26
GW3MLU	109	19
G2BLA	106	21
G2FQW	99	6
G3WP	80	25



Taken by G3BID (London, N.W.3) during his recent visit to the delectable oasis of Marrakesh, Morocco, this photograph shows, left to right: CN8BS, CN8AU, xyl CN8BS, jr. CN8BS and other members of that family. CN8AU/CN8BS hope to visit the U.K. in July, using two Volkswagen minibuses.

Forty continues very good; Twenty patchy but liable to produce anything if you catch it at the right time; Fifteen and Ten just about what you might expect, with surprising openings now and then. One still needs good band-switching and plenty of agility to make the best of all the DX that offers itself!

Note that Fifteen is by no means dead as a CW band—look at the list from GW3AHN! Also that a small amount of AM phone is being worked on Twenty, though the real hunting ground for this is still Fifteen.

Miscellany

Purley and District Radio Club will be visiting Radnorshire between April 22 and 24, operating GW3OGO/P on Ten to Eighty metres, and GW3JSQ/P on Top Band. Both phone and CW will be used.

SWL John Walton is a sea-going type (m.v. *Donga*, Elder Dempster line) and a keen listener on the amateur bands too, but hopes to have his own call quite shortly; he will start on One-Sixty and (naturally) use CW. While serving as an SWL/MM he has had some interesting experiences and of course many face-to-face contacts, with such widely separated personalities as VK2AYK, VK9CP, W5KNE, and a VU, as well as a

host of others. He doesn't seem to hear many G's, but when not too far away he looks out for personal friends on Top Band (he comes from Salisbury) and for IHHC and RAIBC members on Forty. Next trip for the *Donga* starts from Liverpool, thence to Lagos (and possibly the Congo) via Rouen, Antwerp, Bremen, Hamburg, Rotterdam, Dakar and Takoradi. The ship's installation comprises radar, VHF R/T, two transmitters, two receivers, D-F, auto-alarm and a few smaller items. If he can go /MM after being licensed, the only problem will be sleeping time!

G3HZL (Isleworth) is in hospital again, but only for a short stay, we are glad to hear; he hopes to be back in the DX world next month.

G3LPS (Blackburn) now has a trap vertical mounted on the roof, complete with radials, and finds it much better than his former dipole; he worked 6O2RS (who is G3LOE), and says that he is active after 2100 GMT on Twenty most days. And twice during the month G3LPS has found Forty alive with W6's, with VK's in the second layer (early mornings).

As some readers will know, G5QA (Exeter) has kept a regular schedule on 20 metres with ZL2OU for many years—they are now up to more than 7,280 QSO's.

since first starting it in 1936. And from what you can see elsewhere in this issue, G5QA has a very fine station.

Heading Photograph (p.79)

OA4EY is operated by Ernesto Berger, Lima, Peru, running a Harvey Wells 75w. transmitter and Hallicrafters SX-110 receiver. Among his wall trophies are photographs of the Queen with the Duke of Edinburgh, and of Sir Winston Churchill, with a plaque of the Royal Arms of the United Kingdom. From all of which you might infer that Ernesto is always on the look-out for QSO's with U.K. stations.

Incidentally, in our heading photograph on p.640 of the February issue, it now transpires that though the equipment is G3BMY's, the operator shown was actually G3KLT, also of Blackheath, Birmingham.

WPX Matters

G3DO (Sutton Coldfield) helps us to clear up some WPX ambiguities. The following examples will serve: VE3BQL/SU counts as SU3; VE5MK/SU as SU5; WA2KZY/4 counts as WA4—and so on. G3DO suggests that /MM's should *not* be counted, and with this we agree—no /MM's in future scores, please. He himself is a bit of an expert in these matters, being the holder of WPX Phone Certificate No. 2; and with 491 confirmed since January 1957 is second in their WPX Phone Table.

Shorts and Quotes

Heard on 21 mc by G2JB (Grimsby): An F8 calling "CQ Long East," and a W stating "I am twelve years old and running one kilowatt to a wide-spaced three-el. beam on a 100-ft. crank-up tower."

"My receiver has developed a nasty backlash, and having 14 mc on the LF end of the scale, searching that band is like getting a cart-horse round the Grand National course" . . . (G4JA). "If you can't raise a station with a 6-el. beam at 60 ft. and another G does it with an end-fed Doorod in the clothes cupboard, there is no immediate cause to tear the beam down" . . . (G3NWT, who has his own beam and tower success-

fully up, despite last month's forebodings). "This station is now QRZ on the band and by for your final" (a DL, *via* G3NWT).

GD Expedition

The Cambridge University sortie to GD-land should be in full swing by the time you read this, continuing until April 12. Their receiver will be an 888A (not the S.680X mentioned last month), and they now hope to operate also on SSB, both Tx and Rx for that mode being home-built, and, in addition to the other gear mentioned, a Mosley HF-bands Vertical aerial will be in use.

Making it Easier

K2IEG (Barry Briskman, 1037b, 24th Street, Far Rockaway 91, N.Y.) states thus-wisely, through G3JCQ: "I will be on 3820 kc 0630-0730 GMT, Saturdays and Sundays beaming to Europe. Will listen between 3765 and 3785 kc for calls, and will also monitor 7120-7145 kc and reply on 7275 or thereabouts, looking for G's Mondays to Fridays. We have several States such as Vermont, New Hampshire, Maine, Delaware, Utah, Nevada, Washington, Idaho and Arizona wanting SSB or AM QSO's with G's on Eighty."

M.C.'s or Not ?

A lot of talk is going on about whether the master-of-ceremonies procedure is really helpful, necessary or even ethical, with a pretty even division of opinions. G3NWT writes: "No rare DX station seems to come on these days without at least one Master of Ceremonies appearing, and more often two or three. Whilst helping to sort out the pile-ups—though many, and of the rarest, seem to have managed without—the MC method can easily become a major pain in the neck. You don't have to have a better signal at the DX station, but only at the MC's. If the former doesn't get your report he relays it. This seems to me the negation of DX—the card may be forthcoming but surely not the satisfaction of doing the thing off your own bat."

Russian Call-Book

The Polar Bears Radio Club, in Sweden, have issued a Russian

Call - Book, with nearly 1000 stations listed (name, QTH, oblast and region); the Zone in which every station is situated is noted, and nearly 330 UAØ's are included. Full details available from Sven Elfving (SM3-3104), Solgardsgatan 15, Ornskoldsvik, Sweden.

Late Flashes

VU2NRM (Laccadives) did start up on the promised date, and was the cause of a mighty pile-up on 14 mc on March 20 . . . And the final schedule for the Malpelo (HKØTU) affair was given as March 24/25, so we hope some of you worked them! If they didn't arrive on time, they may even be around as you read this.

SSB from the rarer Russian areas is becoming quite popular. After the UA3FE affair, we hear that UA4IF/UI8 is expected on; UM8 and UJ8 are also scheduled.

A station signing 9N3PM/AC4 showed up, and everyone with a beam found him—in the wrong direction . . . VS9AAC hopes to operate from the MP4 territories and also from FL8 shortly.

Personal Column

G3OCA (Ken Frankcom of Morden, Surrey) works all bands from Ten to One-Sixty, main interest being DX. On Top Band he has worked 13 countries with a rig consisting of 6AM6-EL91-6AQ5, and 132-ft. aerial 15 feet high (but he also has the use of G3OFZ's 256-footer). Receiver is an 888A, and the HF bands rig a Gelosos VFO driving a 6146 to 60 watts, with a Mosley vertical and a 7 mc dipole; 150 watts to a two-el. beam is the target for the near future.

And so to the sign-off once more, with the usual thanks and acknowledgments to W4KVX's "DX"; the WGDXC *Bulletins*; the *Western Radio Amateur*; W1BB's *Bulletins* of Top Band news; and, of course, all the faithful correspondents who, between them, don't miss much! Next month's deadline is **first post on Friday, April 14**. Address everything to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Meanwhile, 73 and BCNU.

RTTY Topics

AMATEUR TELEPRINTER WORKING

W. M. Brennan (G3CQE)

This article starts another regular SHORT WAVE MAGAZINE feature, to appear every other month. Our contributor is a well-known exponent of the art of RTTY, who has worked much DX on the amateur bands by radio teleprinter. He will endeavour to catch the attention of the RTTY-active reader; to attract the newcomer to the art of Amateur Radio T/P operation; and to keep the general reader informed as to what is happening with this latest of amateur communication systems.—Editor.

SOME 18 months have elapsed since the first Amateur Radio QSO by teleprinter took place in this country. Since then, RTTY has gradually become part-and-parcel of everyday amateur activity here. Although a very late starter in the field, Europe is rapidly overhauling all continents except North America in the radio T/P race. In the States, some 12 years' start by amateurs (many of whom are highly qualified engineers) cannot be ignored. In spite of this, however, the exploitation of radio teleprinter operation by amateurs is as yet in its infancy and much remains to be done.

Commercial radio T/P (or RTTY) equipment is often highly complex, involving either space, frequency, or even polarisation diversity receiving techniques in quite modest installations. More sophisticated systems make use of predicted wave techniques, error correcting codes and all the rest. One such set-up may employ a hundred or more valves—all this to reduce errors to something less than one in 10,000 and to cram more information into a given number of kilocycles. In the commercial world a single error can be a serious matter, and so a great deal of research is devoted to reducing them. Moreover, semi-attended or unattended operation is the aim in commercial systems.

The Amateur Angle

Whilst the amateur cannot afford to build or even house similar gear, he has some compensating advantages over his commercial counterpart. For instance, the AT operator is usually present when a message is being received and is therefore available to carry out quick adjustments when the printing goes wrong. It has been said that the presence of an operator able to do just this is a good substitute for a whole rack full of gear! An even greater advantage is that the amateur can usually make good sense from a message that contains 50% of errors—a message with only 10% of error often being termed "solid copy"! Once it is accepted that errors can be tolerated, some of the established commercial systems can be looked at with a view to adapting and simplifying them for amateur purposes. Future improvements in amateur RTTY techniques are likely to evolve around such ideas.

RTTY does therefore offer considerable scope for those who are technically and experimentally minded. And to those of us whose pleasure is derived chiefly from actual operating, radio T/P provides a new form of amateur communication.

An Active Station

The photograph shows the RTTY station G3GNR, Amersham. The operator, Bob Short, is obviously well pleased with the printed copy produced during his last QSO! He uses RTTY on all bands 80 to 15 metres. The Creed Model 7B page printer is on the extreme right. Next to this is the terminal unit (or RTTY converter) as described by G3BST in the March and April 1960 issues of SHORT WAVE MAGAZINE; G3GNR has incorporated a tuning indicator 'scope in this unit. The receiver is the HRO to the left of the oscilloscope. The transmitter is not shown, but it is home-built and runs a pair of 807's with an input of 100 watts. The aerials at G3GNR are a fifteen-metre dipole and a 66-foot Zepp.

Most inter-G radio teleprinter working seems to take place on 3770 kc in the mornings and early afternoons—particularly at week-ends. Any newcomers should try their luck there. Most of the regular RTTY operators are only too pleased to help out with advice and tests.

Although the list of G stations having RTTY apparatus now runs into three figures, as yet there appears to be no activity from GW; any news to the contrary would be most welcome. Failing that, perhaps some enterprising soul will set up an RTTY DX-pedition!

One of the leading organisations in the U.S.A. is the Northern California RTTY Society (NCARTS). On their behalf, W6VPC produces a weekly bulletin and broadcasts it on all bands. It is re-transmitted by stations throughout the U.S.A. at various times during the week. Naturally, most of these transmissions take place during the evenings in the U.S.A. and usually such times are not suitable for reception in Europe. In order to give European amateurs a chance to print this bulletin, a further transmission will be beamed on Europe at a more favourable time. The transmission will be made by K3GIF, who produces first-class "copy" here whenever he is on; he will transmit the bulletin on Saturdays at 1600 GMT on 21090 kc. The NCARTS bulletin is always interesting; it contains DX news and fairly long items of technical interest. Reception reports of these transmissions will be of great interest to all concerned.

ZS1FD is, without doubt, the most active RTTY station in Africa. Henry will be visiting this country, arriving on April 19; he would like to meet as many

RTTY operators and all interested in the subject are invited to write in for this feature, the next appearance of which is in the June issue. Address to "RTTY Topics," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1., to arrive by April 28.

of the U.K. RTTY enthusiasts as possible during his stay here. It's been suggested that an informal dinner held in London would be a good way of achieving this; G3GNR has agreed to handle the organisation, and anyone interested should contact him—*QTHR*. No firm date has been fixed, but it will probably be in late April or early May.

RTTY activity seems to be growing in South Africa, and a number T/P's have been shipped there from the U.K. Stations at present active on the DX bands include ZS6CR, ZS1SP, ZS6KD, ZS1NE and, of course, ZS1FD.

G3JFF first operated RTTY as VS1HU about three years ago. Now, by courtesy of the Royal Navy, he is about to tour some of the rarer DX spots. The trip will include VR1, VR2 and VR4. Unfortunately, a teleprinter is a cumbersome piece of gear to take ashore, and although the three prefixes will be used, all RTTY operation will be /MM.

The station will consist of a Panda Cub driving a pair of 6146's as a PA. On the receiving side, G3JFF will have a Geloso front end feeding a B40 receiver, and the terminal unit will be an ex-U.S. Navy AN/UR8A. Schedules are being arranged so that G3JFF can keep in touch with the U.K. on RTTY during his off-duty hours; he is due to sail from England in early April.

In spite of the characteristic flutter that usually accompanies signals from Alaska, KL7MZ and his xyl, KL7ALZ, have both been producing good printing in Europe recently. KL7 and KH6 are still counted as separate countries by the various RTTY organisations. 14105 kc between 1900 and 2000 GMT



G3GNR, Amersham, who is active on RTTY, has the G3BST FSK converter — described in our March-April, 1960, issues — and a page printer, shown to the right on the bench. There is now a small but active group of G's running radio teleprinter as a regular means of communication on the HF bands.

seems to be a good channel, and time, to exchange some typing with these KL7's.

XE1UNM is very active on 21090 kc; although his present aerial is most favourable to the U.S.A., Erosa is nevertheless keen to work Europeans and is in the process of erecting a suitable aerial; he can be heard most days between 1700 and 1900 GMT.

That's all that space permits for this issue. In due course it is hoped that most aspects of RTTY can be dealt with—from operating to various makes and types of machines. In order to have some idea of which particular aspect of RTTY interests readers the most, any suggestions, comments or criticisms will be welcome. Please address them to "RTTY Topics," c/o The Editor. Meanwhile, *Figs UE* and keep your motor running!

SWEDISH HOLIDAY CAMP

We are informed by SM4GL that he and SM3WB will be organising their Radio Amateur Holiday Camp at Dala-Storsund—on Lake Runn, 10 miles from Falun in the district of Dalecarlia—again this year, during July 2-9. The main object of the venture is to give a good holiday at reasonable cost to radio amateurs (either singly or in families) who would enjoy community living—for instance, though in total there are about 100 beds available, and a dining-room holding 250, it is not usually possible to provide single rooms, even for YL's. The total all-in cost per head is about 15s. a day, and the amenities, apart from a large amateur station, include swimming, boating, fishing and the usual pursuits at a country holiday camp. Its callsign is SM4XA, the station operating on all HF bands with full power, AM/CW/SSB, and also on two metres. G3JUB (*QTHR*) has already

been to this Camp several times—finding himself the only G there, incidentally—and says he will be glad to answer enquiries for an s.a.e. The address for applications is: Gunnar Eriksson, SM4GL, P.O. Box 12, Falun 1, Sweden. SM4GL writes good English and G3JUB speaks Swedish, so there are no language difficulties.

USEFUL OPERATING AID

The book called *The Radio Amateur Operator's Handbook* is an excellent guide and quick reference for those, especially beginners, who want to know what the Q-Code signifies and how to use it; the amateur reporting codes; where the amateur bands come in the short-wave spectrum; and a great deal of similar basic information. The price of *The Radio Amateur Operator's Handbook*, of 50 pages, is 3s. 10d. post free, direct from us (Publications Dept.).

SIDEBAND FROM THE START

Part III

REMOVING THE CARRIER— FILTER DESIGN AND BANDWIDTH

By "VOX"

The first article, in the December 1960 issue, dealt with SSB in comparison with other modes of transmission; the February 1961 issue covered balanced modulators and the general layout of an SSB transmitter; we now consider the elimination of the carrier and unwanted sideband, and the design of crystal filter circuits.

—Editor.

THE acceptance of SSB as just one of the normal methods of transmission now sharing our bands requires a certain amount of re-thinking on the technical side. Not, by any means, the acquisition of a mass of technical knowledge which one did not possess before, but merely a clearer understanding of some of the processes inseparable from radio communication.

For instance, consider the time-honoured AM mode of transmission. The average AT station operator would probably regard an AM transmitter in these broad terms: Start with a VFO; follow with buffers or doublers or treblers, switched to cover the necessary bands; having got to the right

frequency, drive a PA—or, if there isn't enough drive there, a buffer followed by a PA. Run the PA in Class-C (you're losing efficiency if you don't). Modulate it by applying audio to screen and anode, using audio power running up to about half the DC input to the PA.

For TVI precautions, watch harmonics in particular, and don't overdrive any stages early in the chain; screen the power-pack and its leads; and keep the RF output to coax, led to a matching unit or ATU, so that no "loose" RF shall feed back into early stages or the power pack.

All right, then. All very conventional and clean, and thousands of them in daily use! But, somehow, with that massive amount of audio being applied to a fat and prosperous PA stage, it is difficult to visualise the modulation process as one of *heterodyning* or *mixing* (which, we repeat yet again, mean the same thing).

Now do a complete re-think. Don't think about SSB, as yet, but merely about a completely different approach to an AM transmitter. There's nothing sacred about the process just described... it's merely one way of doing the job, and one which happens to have had considerable support from all and sundry for many years. However, scrap it and think on the lines discussed below.

Another Method

Don't start with a VFO, but with a very stable fixed-frequency oscillator. Obviously, use a crystal. Put this at some convenient low frequency—420-480 kc is convenient, because IF transformers can be used. Follow this with a mixer stage (or call it your modulator, if you like), feeding in the RF from the crystal oscillator to one electrode of a valve, and a small amount of audio (from, say, a double-triode amplifier) to another.

Pass on this transmission (AM, please note) to an amplifier and then to a mixer in which a VFO heterodynes the 450 kc signal to a range which will cover the 80-metre band. (Note that all amplification must be linear, because the modulation is with us from the second stage right on through the chain. No more Class-C, please!) Having arrived at satisfactory coverage of the 3.5 mc band, heterodyne the whole thing into any other band, at will, by beating it with a crystal of suitable frequency. Frequency-multipliers are out, because they are essentially non-linear devices. Having arrived at the other bands by crystal switchery, and, of course, a second mixer, follow up with a driver stage and a linear PA.

Here is your AM transmitter (Mark II) with very little in common with the universally-understood Mark I variety. Has it any advantages? Well, to start with, the slightly greater number of stages is largely offset by the absence of a massive modulator embodying a heavy power-pack and a high-quality modulation transformer. In sheer *weight* you have lost a lot, and reduced the demands on the power-pack into the bargain.

Next, owing to the lack of frequency-multiplication (which could alternatively be called *harmonic*

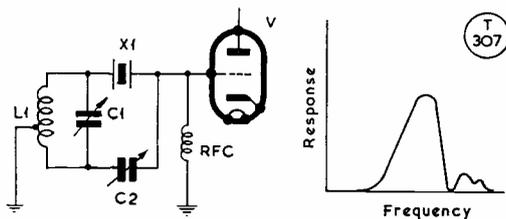


Fig. 1 (a)

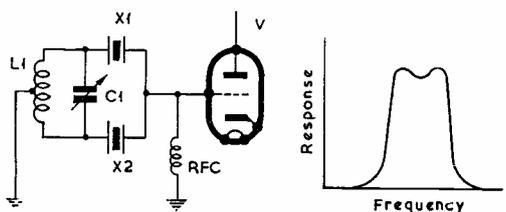


Fig. 1 (b)

Fig. 1. At (A) the original crystal-gate circuit, as used in many of the well-known communication receivers. (B) Substituting a second crystal, X2, with its frequency separated from that of X1 by 1.5-2.0 kc, improves the shape of the response curve.

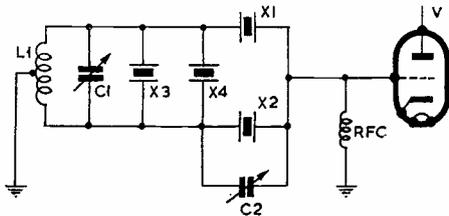


Fig. 2 (a)

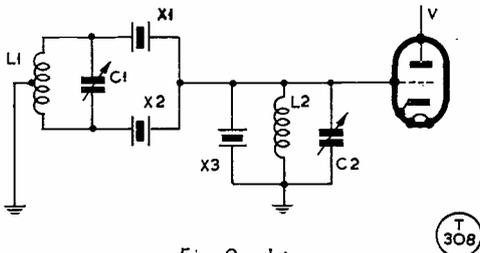


Fig. 2 (b)

Fig. 2. (A) The addition of further crystals in parallel with the tuned circuit is one way of squaring off the curve; the trimmer C2 makes it possible to move a rejection notch, which can be used for further squaring. (B) Probably the simplest form of crystal filter giving really satisfactory results—a straight-forward half-lattice type with X3, a third crystal, operating as a rejector circuit at the carrier frequency.

amplification) you have lost one of the prime sources of TVI. All switching of frequencies has been carried out by mixing; all amplification is linear; and some of the notoriously “touchy” harmonics (42 mc for those in the Channel 1 area, for instance) simply do not come into the picture at all.

Your PA efficiency has been sacrificed slightly; by running it in linear Class-B instead of driving it hard into Class-C, you may have lost 10% in efficiency. This will show up at a distance to the tune of less than 1 dB loss of signal strength; so you can stop pining over that one right away!

But the biggest advantage is a “hidden” one. This Mark II transmitter can be made into a single sideband transmitter by the addition of just one extra unit; whereas no amount of circuit wizardry would have had the same effect on the Mark I variety. The Mark II version has, in fact, been a description of a typical SSB filter-type transmitter, with the filter left out! For the first mixer, in which the low-level audio meets the low-level, low-frequency carrier, we substitute a *balanced modulator*; between the output from this stage and the amplifier which follows we insert a suitably-designed filter which removes or considerably attenuates the carrier and the unwanted sideband; and all that proceeds through the rest of the chain is the *wanted* sideband, which is suitably heterodyned into the various bands where it is wanted, and finally amplified to taste.

Looked at in this light, with an AM transmitter

regarded as being something of the Mark II variety rather than the Mark I, the conversion from conventional AM to SSB is seen merely as the early *removal* of carrier and one sideband, with no other circuit alterations whatever.

Refer back to p.650, February 1961 issue, *SHORT WAVE MAGAZINE*, and you will see that Fig. 3 shows the very transmitter that has been under discussion, and is none other than the well-known K.W. *Viceroy*.

Filter Circuits

The simplest way of achieving a filter circuit with the necessary bandwidth for accepting the wanted, and disposing of the unwanted, sideband, together with the small amount of residual carrier coming through the balanced modulator, is to use quartz crystals. The whole process *could* be done by the use of tuned circuits, but the crystal offers, in itself, the equivalent of such a superior tuned circuit that it is inevitable that it should be used. Crystal-gate superhets have been a standard design for communication receivers for the last 25 years (yes—the first HRO was available in 1936!) and there is a wealth of information and well-tried circuitry available in this field.

Fig. 1 (a) shows, in skeleton form, the crystal-gate circuit used in the very earliest communication receivers, although this same circuit is still found in many up-to-date specimens. The tuned circuit L1, C1 is resonated at the frequency of the crystal X1, and the purpose of the trimmer C2 is merely to balance out the capacity of the crystal-holder and the crystal itself. If C2 were to be *fixed*, at the correct capacity to perform its balancing function, the response curve would look rather like that shown in Fig. 1 (a). But when the capacity of C2 is varied, a “rejection notch” may be made to move across the curve; hence the “crystal phasing control” on many receivers, making it possible to reject a heterodyne of one particular frequency, even when its strength is as great as that of the wanted signal.

The obvious step is to replace the trimmer C2



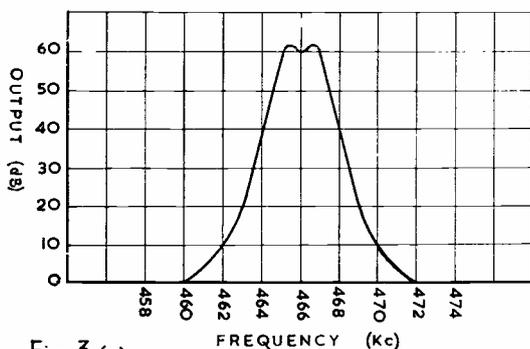


Fig. 3 (a)

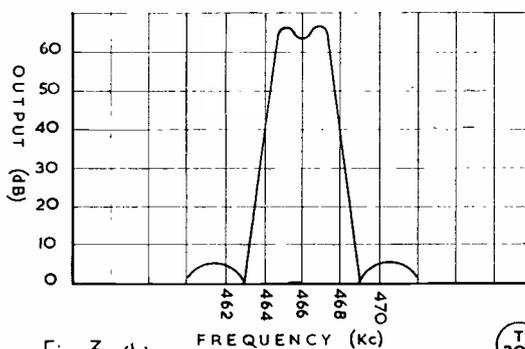


Fig. 3 (b)

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Fig. 3 (A) shows actual curve obtained from a straight half-lattice filter using two crystals, as in Fig. 1(B); the width at 60 dB down, of the order of 12 kc, would be considered excessive. At Fig. 3(B) is the curve obtained from the same half-lattice filter with the addition of a parallel trimmer across one of the crystals — see text for discussion.

with a second crystal, X2; and, by correct choice of crystal frequencies, it is possible to produce a squarish curve similar to that shown in Fig. 1 (b). If the crystal frequencies are too far apart, the "droop" at the top of the curve will be excessive; if they are too close together, the curve will be too peaky and not square enough to perform the band-pass function required.

The generally recommended figure for the crystal frequencies is that they should be about 1.8 or 2 kc apart. The bandwidth of the filter will be 1.2 to 1.4 times the separation of the two crystal frequencies. The flatness of the top of the curve will depend on the correct termination of the filter, and also on the correct tuning of the input circuit. However, as this is a brief summary, we will assume that it is possible to obtain a curve similar to that shown in Fig. 1 (b), some 4 kc wide at the flat top and with a width of, perhaps, 10 kc or better at 60 dB down.

The requirement for this filter circuit, as applied to SSB transmission, is, of course, the passing of a band of frequencies some 3 kc in width (the "wanted" sideband) and the rejection of both the residual carrier-wave and the similar band of voice-frequencies, 3 kc wide, on the other side of it. Thus the aim is, as with all good band-pass filters, the squarest possible top and the steepest possible sides. Such a curve simply cannot be obtained from a simple circuit with just two crystals, and we must consider more sophisticated arrangements.

Fig. 2 (a) is the circuit of Fig. 1 (b) with just two refinements added. First, two crystals have been added in parallel with the tuned circuit L1, C1; secondly, a variable trimmer has been restored, in parallel with X2. The effect of the two extra crystals, whose frequencies are so chosen as to be higher and lower than those of the original pair, is to introduce two rejection notches which steepen the sides of the curve quite considerably (these parallel crystals can be regarded as shorting out L1, C1 at their own resonant frequencies).

The effect of the trimmer C2 is to introduce the "variable notch" once more, in order to square the

sides off still further and to reduce what would be a bad "skirt" into a series of small humps on either side of the main curve.

Some designers even go as far as using four parallel crystals, instead of two, and produce a very fine square curve by so doing; but this method either becomes very expensive (in the event of buying properly mounted and calibrated crystals) or very touchy (in the event of etching one's own cheap ones!)

The compromise more often adopted is shown in Fig. 2 (b).

Here we have the two original crystals, X1 and X2, some 1.8 kc apart, in the half-lattice circuit; and we follow up by a further tuned circuit with a third crystal, X3, working in the series-resonance mode (i.e. offering a virtual short-circuit at its own frequency) and serving as carrier-suppressor, although much of this will already have been carried out by the balanced modulator.

Suppose your carrier generator (crystal controlled) is working at 450 kc—a convenient round figure. Then the crystals X1 and X2, for lower sideband passing, will be chosen at frequencies of approximately 449.2 kc and 447.4 kc; and the carrier-suppression crystal X3 will naturally have to resonate at 450 kc.

Here, once again, we must remind readers that this series is aimed at the beginner with a view to informing him what goes on in an SSB transmitter in as simple and straightforward a manner as possible. The subject of crystals having been broached, we could immediately get into deep water with a discussion of series-resonant and parallel-resonant frequencies, which, for most crystals, are within a few hundred cycles. In the final process of producing a

Correspondence from Sideband operators is welcomed for this feature, the next appearance of which is in the June issue. The closing date is April 26 and all mail should be addressed: "VOX," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1

satisfactory filter circuit, extensive use is made of the technique of separating out these two frequencies by means of external inductances and capacities. But a detailed article on choice of crystals, crystal-etching, and general refinements of circuitry would run to a greater length than that in which we have to cover the whole subject of "filter rigs."

The important thing is to visualise, first, the mixing of a carrier with the whole band of speech frequencies; then the reduction in amplitude of the carrier by the use of a balanced modulator; and finally the removal, or *almost* complete removal, of the vestigial carrier and the unwanted set of sidebands by means of an efficient band-pass filter, which can be built up in many ways; we just happen to have chosen the use of crystals of suitably-picked frequencies as a straightforward method to use as an illustration.

It so happens that carrier frequencies of the order of 430-450 kc have become extremely popular, for two good reasons: The convenience of using IF transformers, and the availability of large quantities of war-surplus crystals of the FT-241 type in this same frequency range. Crystals of this type marked with "Channel Numbers" from 320 to 328 inclusive have frequencies ranging from 444.4 kc to 455.6 kc in steps of 1.4 kc.

However, it also happens that crystals with frequencies between 8.0 and 9.0 mc are also cheap and plentiful on the surplus market, and hence the designing of filter circuits in this frequency range has also become popular. Transmitter design is simplified accordingly because one mixing stage is eliminated. (The 9 mc output from such a filter can be heterodyned with an oscillator in the 5 mc region to produce output in either the 20- or 80-metre bands, for instance.) High-frequency crystal filters will doubtless be available, before long, at reasonably low prices, both completely assembled and in kit form.

If readers who wish to convert themselves to Sideband technique have followed this article on the subject of filters, and the previous one (*February 1961* issue) on balanced modulators, they will find that there is little else in a complete SSB transmitter which involves unfamiliar techniques.

Start with a crystal oscillator and a low-power modulator; proceed to mix them in a balanced modulator; follow that up with a filter unit. What you now have is your lower group of sidebands, admittedly at the wrong frequency. What follows is simply the means of heterodyning them to the *right* frequency (converting the lower sideband to the upper in the process, if necessary) and then applying linear amplification.

Note that there is no reason why your filter should be designed to pass the *lower* sideband—the upper could just as easily be arranged; but the lower is convenient in view of the convention that one normally uses lower sideband on the 1.8, 3.5 and 7 mc bands; and the upper on the HF bands. This means that your first mixer is *additive*—which does not change the position of the sideband (add 3350 kc to a 435 kc lower sideband signal and you get a

3785 kc lower sideband signal). Any later mixers can then be of the "difference" variety—beat your 3785 kc lower sideband with an oscillator on 18120 kc and you will get 14335 kc *upper* sideband

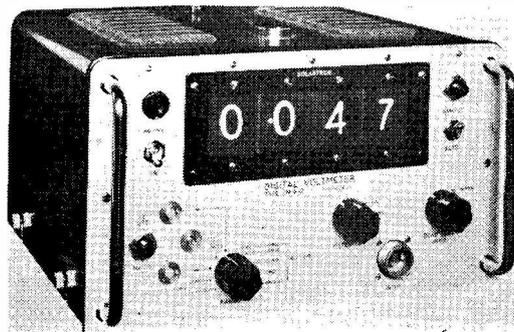
In conclusion, we would now like to say that correspondence on sideband matters would be welcomed for this feature, so that current ideas and problems affecting SSB operation and technique can be aired. We hope to be able to hold the interest of beginners but, at the same time, to offer comments of interest to those already in the swim. Correspondence for the next instalment should be in by April 26.

AMERICAN TRIP TO EUROPE

We are informed by Hugh Tinley, KØGHK, of Travel & Transport, Inc., Omaha, Nebraska, that he is bringing over a tour party of American amateurs to Europe for the period April 22 to May 12. The party will be in England from April 23 to 26th only, the scheduled radio visits including the BBC at Broadcasting House, and Rugby Radio, the G.P.O. station. So far as Amateur Radio is concerned, there is an evening meeting, by invitation, on Monday, 24th. After leaving London, the party goes through a number of European countries. This is believed to be the first such organised tour of its kind, and it is of interest just to add that the all-in cost is \$1,065 (say, £310), which includes first-class air travel and hotels.

TELEVISION FOR BANKS

At the City office of Barclay's Bank in Fenchurch Street, London, closed-circuit TV has been installed by Marconi's, the object being to permit ledgers to be read by remote control. The system saves a great deal of time and labour, as the presentation is on monitor receivers in the customer hall and executive offices.



The Solartron Type LM902 transistorised Digital Voltmeter gives a visual presentation, to four figures, of voltages of 0-1599v., in ranges of 0-0.1599, 0-1.559, and so on, the decimal point being set by the range switch. The figures displayed are 1-in. high, and the application of the instrument is to production testing, monitoring and process control.

AUDIO FESTIVAL AND FAIR

This is taking place at the Russell Hotel, Russell Square, London, W.C.1. until and including Sunday, April 9, and is the mecca of those interested in the recording and reproduction of sound of the *h'èst* possible *fi*.

IN last month's peroration, a suggestion was made that we might have a few openings "by next deadline" (meaning before March 22), and the implication was that there could be something to report this time. It was not as vague a shot in the dark as it may have seemed, because the general picture (as the March story went down to the printer) was of improving Wx conditions, with a rising glass.

Well, hardly anybody who follows this feature will need to be told that, in fact, we have had, for the time of year, a wonderful spell of EDX/GDX conditions, directly related to the weather and the high state of the glass. Those warm, spring-like days, with clear, cold evenings, cloudless skies, no wind and a touch of early-morning frost have set up just the tropospheric conditions that every experienced VHF operator has learnt to recognise. The result, broadly speaking, has been a high level of activity on the VHF bands, maintained evening after evening, with many new contacts for most people.

These typically anti-cyclonic manifestations held steady over England, Ireland, northern France, the Low Countries and the northern areas of Germany, extending at times round to the Scandinavian countries, for most of the period until at least March 22. There have also been some chances by Aurora, but by far the greater part of the DX has been worked by tropo.

European VHF Contest

It was a rare turn-up-for-the-book that, for the first time for many years (and only about the second occasion that your A.J.D. can remember) the spell of good conditions coincided with an organised Contest—in this case the European VHF affair. Normally, these contests are played off under dull, not to say depressing, conditions, with the unfavourably-placed stations working hard for contacts.

Anyhow, this time the week-end March 4-5 saw beautiful weather and consistently good conditions—which were, in fact, better still after the contest closed on the Sunday evening. The nearer EU's

VHF BANDS

A. J. DEVON

Good Tropospheric Conditions—

Much EDX/GDX Worked—

High Level of Activity—

The Barograph Trace—

were getting into Southern England all through the night of Sat./Sun., and for those in this area taking the contest seriously, it was mainly a matter of endurance to make a good score.

To take a few random examples: By 1120 on March 5, G5TZ (I.o.Wight) had worked 120 stations; by 1845, near closing time, he had got to 167S worked; throughout the contest period he was a tremendous signal right into the North Midlands whenever he had his beam that way. Other U.K. high scorers were G2DTP (147S at 1820); G3BRR/A (151S at 1735); and G2XV (128S at 1830).

The probability is that anyone getting into the first flight for this year's European VHF Contest will have to turn in a score based on at least 150 stations worked; several EU's will have achieved this. At the same time, anyone booking more than 100S did well, because to get into the three-figure category, a marathon effort was called for; in spite of the activity, it takes one operator a long time to get through that many stations.

This is what makes G5TZ's effort outstanding. Jumbo was at

it single-handed all through, and was as fresh (and as cheerful) at the finish as when he started; what made him such an excellent and very workable signal was his deep modulation and clear enunciation.

Another well-operated station, and using both CW and phone, was G3BBR/A who, from a site 5 miles east of Croydon, kept going steadily, working round the compass all the time; it was noted that he made several changes of frequency (at least three). Some good QSO's made during daylight on the Sunday included G3CCH/G8VZ and G3ARS/M working southerly stations.

TWO METRES

COUNTIES WORKED SINCE

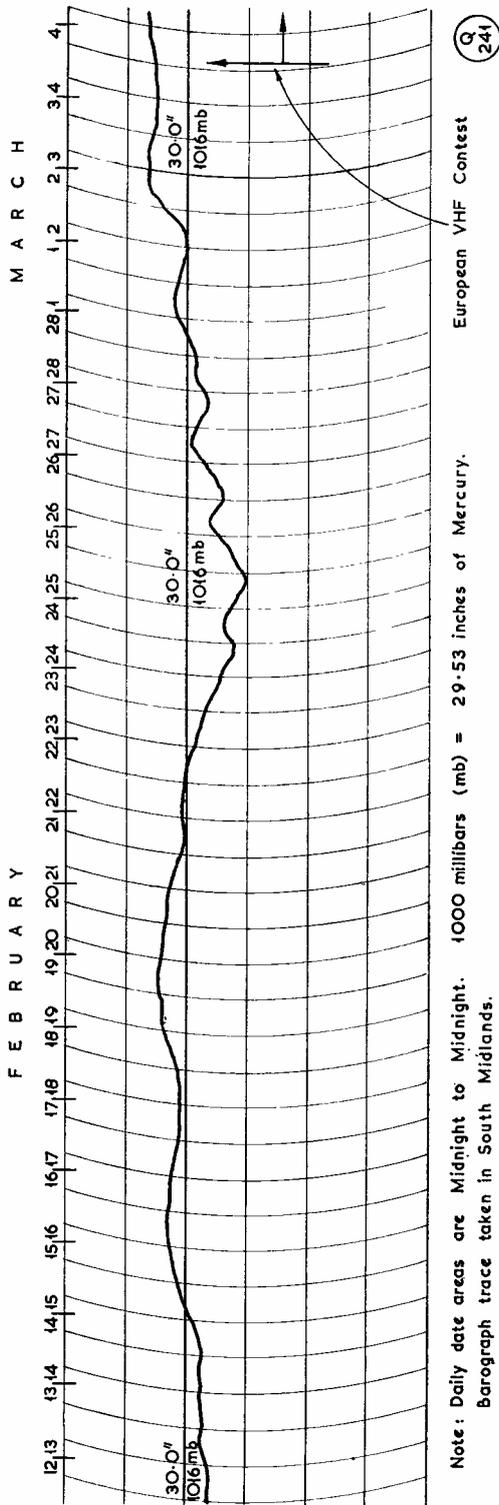
SEPTEMBER 1, 1960

Starting Figure, 14

From Home QTH Only

Worked	Station
54	G3HBW
50	G2CIW
45	G6XA
42	G3JWQ
41	G3LAR
40	G6GN, G8VZ
35	G3KPT
33	G3MTI
32	G3KQF
31	G3NAE, G3OJY, GW3ATM
30	G3HWR, G5QA, GW3MFY
28	G3MPS
26	G3MHD
25	G3HS, G3OBB, G3OBD
24	G5ZT
23	G2CVV
20	G3GSO, G5UM
19	G3OSA
18	G3KMT, G3NNK
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.



The barometric pressure variation, at a location in the South Midlands, during the period shown above the curve. The datum line has been arbitrarily chosen as 30.0 ins. (1016 millibars) because experience has shown that for good tropospheric propagation conditions to develop, one of the required factors is barometric pressure somewhat above 30 ins. The readings shown here will not, of course, apply to all parts nor will barometers even in the same area necessarily read the same — but what the curve does show accurately is the general trend in the central and southern part of the country for the period covered.

The Barograph Trace

This month, we start something new—the regular appearance of a plotting of the barometer reading over some representative part of the period under review, as shown opposite.

While the notes which accompany the curve are self-explanatory, there are some points to emphasise: This plotting, while being characteristic for the South Midlands only, is taken from a barometer which gives a good average reading for the central land mass of England; thus, the curve shown here is a pretty reliable indication of the general pressure trend for the period covered. Your own barometer will show either higher or lower readings on any given date (only by accident will they be the same), but the general shape of the curve plotted from your readings for the same period would be similar.

There are various things that can be done with this graph: In the first place, you can check from your log the suggestion made by the curve when tropo. conditions should have been good, this being especially when the curve is showing a rising characteristic. There is no particular magic about the 30.0 in. datum line; it just happens that years of looking at these curves has proved that when they are rising to above 30.0 ins., or 1016 millibars (if you prefer to work in mb) VHF conditions are improving to good—or, putting it another way, unless the pressure is up to the 30-in. mark, nothing much can be expected. On the other hand, it is also necessary to point out that a high barometric reading is only one of the factors making for good VHF conditions.

Our suggestion would be that, if you are a good distance from GB3VHF—say, 100 miles and over—during the coming period you note the signal strength regularly, and then see (from next month's plot) how the level, and therefore propagation by tropo., has varied with the curve—and, of course, let us know the result, whether it checks or not. (Your A.J.D. is well aware that there could be various inexactitudes about this, but the immediate object is to get

something started on these lines, and then sort out the details later.)

And when we get better organised, the date-area covered by the curve will be brought nearer the deadline; this month's effort is a first shot, and for various reasons was not brought as far forward as it might have been.

So much for what G9BF would call "the slide-rule stuff"—now let's see what's on the boil in other directions . . .

VHFCC Elections

Quite a number to get in this time, as follows: VHF Century Club Certificate No. 284 goes to H. W. Rees, G3HWR, of London, N.W.3, who shows G's only for his 100 QSL's—in fact, they are all from the Home Counties.

VHFCC Certificate No. 285 is gained by A. E. Williams, G3MHD, of Stanford-le-Hope, Essex, who has a few EU's in his lot; his Tx is an SCR-522 with a pair of 6L6's in AB2 to modulate, Rx is a cascode into an HRO tuning 14-16 mc and the beam a slot-fed 4/4 at 12 feet (!).

The claim from Victor Grare, F9AJ, of Soulistre, in the Sarthe Dept., is interesting because it covers three bands: 72, 145 and 435 mc; his VHFCC is numbered 286. His cards show no less than 37S worked on 4 metres, including CN8, FA8 and FA9; on two metres, he has worked 12 G's, also LX1SI and several ON's; the 70 cm lot are F's only, the two best known being F3LP and F8GH.

Pierre Richard, F3YE, of Le Mans, gets VHFCC No. 287, and his claim also covers the bands 72-435 mc; he shows very few G's and not many other EU's, the great majority of his contacts on all three bands being with F's.

A. J. Reynolds, G3NNK, of Chadwell Heath, Essex, gains VHFCC No. 288, having come on two metres on December 15, 1959; since then, his statistics show that (up to March 7) he has had 416 contacts with 168 stations in 16 counties and two countries (G/PA); 347 QSO's have been on phone, and 69 on CW. Gear used at G3NNK is interesting: Rx is an ECC84 cascode converter into

a BC-455, and then into an LF Command receiver; the beam is now a 6/6 at 33 ft.; before May 1960 it was an indoor flat-top; the PA is an 832—but what makes the Tx unusual is that it is VFO-controlled, with a pair of 6AK5's in the Franklin circuit, oscillating around 6 mc, then two EF91 buffer stages, feeding into what was the 6 mc CO stage of the transmitter.

VHFCC No. 289 is awarded to Jan Prana, OK1VAM, of Prague, whose 100 cards are strictly OK-only.

Easter Expeditions

The Cambridge Univ. GD6UW /A party should be there now, and lasting out until the 12th; they were to use Withers equipment and *may*, if various plans materialise, get up Snaefell (from the summit of which the late GD3DA/P operated ten years ago, with such conspicuous success). At the moment of writing this, all plans had not been finalised.

Also just about publication date, the Wirral boys will be signing GW3NWR/A from the depths of Carmarthenshire, on 144.72 mc, during April 7-9; they intended "definitely to be on from noon on Saturday until the Sunday evening, continuously."

Rather later in the month, over April 22-24, a group from the Purley Club will be signing GW3KVC/P from the rare county of Radnorshire—no other details available.

Station Reports—Midlands and West Country

Naturally, with the great improvement in conditions and the sustained GDX openings, reports have been numerous and claims for the Tables heavy this month—which is as it should be.

Looking west first, we hear from G3MTI, who has been putting a very good signal across the country from Great Malvern, Worcs.—he is 915 ft. a.s.l., with a slot-fed 4/4 35 ft. higher still, and connected back through 200 feet of coax into a modified TR.1986 for Tx/Rx; the '1986 transmitter is series-gate modulated and runs 25w. input; the '1986 receiver section (*see*

p.636, February 1961 SHORT WAVE MAGAZINE) feeds into an R.1155 tuning 9-11 mc—in other words, G3MTI is on all-surplus for two metres at the moment, and with this gear he has worked 196 stations in 33 counties and six countries *since Jan. 1st, 1961!* This must prove something or other, even if it's not some sort of record—anyway, congratulations to G3MTI on a very auspicious beginning on VHF.

Working round to the south-west, there is G3ICO (Yeovil, Som.) who is making steady progress, still with an indoor aerial—with which he has now worked 118 stations, incidentally. Further west and south, we come to G5QA (Exeter), with three more counties in the bag for the Annual, including a very nice QSO with G2NY (Preston, Lancs.); Herbert has now chased the beetle out of that 70 cm. converter and finds himself getting RST-589 signals from GW3ATM. with G6GN (Bristol) also worked, and G3BA (Sutton Coldfield) heard.

Right down in the south-west, at Plymouth, is G5ZT, who succeeded in knocking off no less than 42 stations during the contest of March 4-5; he kept continuous watch, and says that for him the only dead period was 0200-0530; of his 42S, six were F's; his U.K. coverage was from London to Cambridge, up to Staffs. and Derbyshire and round to Glamorgan and Cornwall—naturally, G5ZT is quite pleased about all this, and feels that his steady logging on the band is at last bringing some worth-while results.

From the Midlands area—now a centre of great VHF activity, with some 25 stations on regularly and about as many again putting in an occasional appearance (reports G8VN)—we have table claims from G3KQF (Derby); he expects to be SSB on two metres shortly, deriving the excitation from his 14 mc SSB transmitter and using a 4X150A as a cavity-tuned PA, for a nice full-power sideband set-up.

For another band, G5CP (Chesterfield) is getting going on 4 metres, with 25w. to a QVO3-20A as PA, a Labgear Bi-Square aerial, and a CC converter into

the AR88; he will be very glad to hear about schedules from anyone else interested in 70 mc (QTHR).

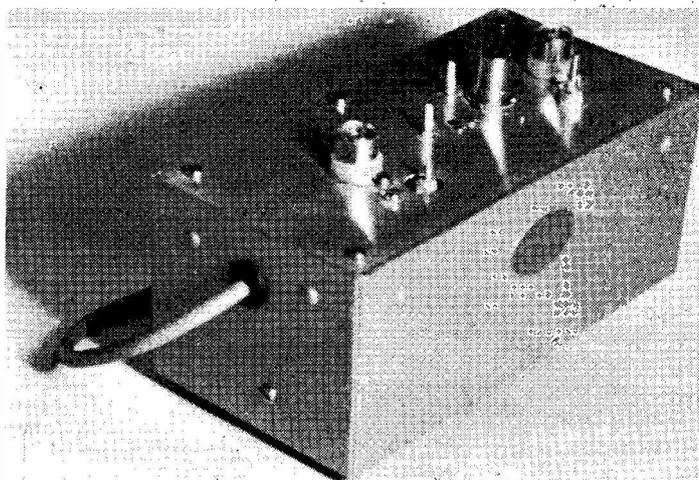
G8VN, now of Leicester, last reported from Rugby 'way back in 1957; starting up again from the new QTH in Dec. '58, and still using that indoor 4-ele flat-top, and the same 16w., he has booked in 125S in 23C; however, he now has a more elaborate beam, consisting of two 4-ele Yagis in phase (but still in the roof space); the PA is an 832, modulated by a pair of KT66's. G8VN has had a QSO with G2DUG, Winchcombe, Glos., who also uses an indoor beam—their phone was S6, both ways.

G2CIW (Birmingham) puts in his usual detailed report. Jack gives Feb. 16, Feb. 20-21, March 3, 4/5, 7 and March 9 as the good days with him, with Aurora noted for a short time in the late evening of the 4th. The best results reported by G2CIW are for 70 centimetres, on which band he worked 14S, including G3OAT/T for Hunts., with 9 more stations heard—these were: G3KQJ/T, 3LGJ/T, 3LHA, 3MXY/T, 3MYD/T, 5DT, 6NF, GW3MDY and ON4HN, the latter a nice one from the Midlands on the 430 mc band.

East and Southwards

G3MHD (Stanford-le-Hope) is now on three bands, he having recently got going on 4 metres, with G3CLW as a first contact and one or two others also worked; the 4-metre gear consists of an RF-27 unit into a BC-455, and the PA is a QQVO3-10 running 10w., with a dipole, soon to be replaced by a 3-ele beam. For 70 cm, as distinct from 70 mc, G3MHD has a G2DD converter (as originally described in *SHORT WAVE MAGAZINE*, March 1953) and the 430 mc PA is a straight-driven QQVO3-20A taking about 20w.; the beam on this band is a 6/6. Of course, he is also fully operational on two metres.

G3OSA (Wimborne, Dorset), a fairly recent newcomer and still in process of getting the gear doing better, yet had a good time during the March contest, working 34S in 19C, which gets him started



The latest item of Withers two-metre equipment — the TW pre-amplifier incorporating the new R.C.A. 6CW4 ceramic/metal sub-miniature valve, with which high gains can be realised on VHF; this pre-amplifier will do for a two-metre converter, what a good preselector does for a poor receiver on the HF bands. Withers Electronics are making this new ("Nuvisor") pre-amplifier available with or without its own power supply.

in the Tables; he is busy with an A.2521 pre-amp, for the CC converter, which feeds into a CR-100 tuning 24-26 mc; the beam is a 5-ele flat-top and the Tx an SCR-522 with 12w. input.

The Poole and Bournemouth boys — G3NAE, G3OBB and G3OBD—all report this time, with claims for the Tables and contest comments; G3OBD (Poole) worked no less than 90 stations in 30 counties during 10.00-19.00 GMT on March 5, which makes it an average of 10S an hour, or one every six minutes — pretty fast going for VHF! Actually, he was /P in Wilts., not operating from the home QTH. Some local SWL's who also went /P, listening, from Bell Hill, Dorset, 846 ft. a.s.l., logged more than 80 stations, including DJ's, many F's and ON. G3NAE (Bournemouth) says he heard more DX on the Saturday of the contest (March 4) than in the whole 10 months he's been on the band. He and G3OBD are getting ready for 70 cm, and will take it /P into the Dorset hills.

There is a good crop of reports from the London/Home Counties area. G6NF (Shirley, Sy.) found the 430 mc band open over February 16-19, during which period he worked seven stations,

including G3OAT/T for Hunts. and several others in the Midlands; with G6GN also worked, this puts Alfred up to 28C in Seventycem Counties; he runs 30w. on that band, to a QQVO6-40, and the beam is a 16-ele stack. G3HWR moves up well in the Tables, and now wants only one more to get a foot on the bottom rung of Countries Worked; he thinks the GD6UW boys will find 144-87 mc a hot spot if the band opens for them, as they will be in the Home Counties QRM.

G3LAR (Tooting, S.W.17) reports working a long list of interesting stations during the sustained spell of good conditions, including G3CZZ/M (Cornwall), G5ZT, G3BW (Cumberland), GW3MDY and G3KSB/P (Hereford), between them worth four new counties, for the All-Time; G3LAR also heard some good GDY, including G15AJ, GW2HIY and the Durham and Westmorland stations, with several GM's via Aurora. G3LAR says that activity in the London/Home Counties area is now very high—on the evening of March 15 he logged more than 100S, all south of the Midlands, and also draws attention to the fact that quite a number of London stations come

TWO-METRE FIRSTS

G/DL	G3DIV/A-DL4XS/3KE	5/6/50
G/EI	G8SB-EI8G	23/4/51
G/F	G6DH-F8OL	10/11/48
G/GC	G8IL-GC2CNC	24/5/51
G/GD	G3GMX-GD3DA/P	29/7/51
G/GI	G3DA-GI2HML	29/6/49
G/GM	G3BW-GM3OL	13/2/49
G/GW	G5MQ-GW5UO	22/10/48
G/HB	G6OU-HB1IV	12/9/53
G/I	G5NF-I1KDB	14/6/59
G/LA	G6NB-LA8RB	29/6/53
G/LX	G5MR-LX1AS	23/7/55
G/OE	G3HBW-OE1WJ	4/1/60
G/OH	G3HBW-OH1NL	14/12/60
G/OK	G5YV-OK1VR/P	27/10/58
G/ON	G6DH-ON4FG	25/9/48
G/OZ	G3WW-OZ2FR	1/6/51
G/PA	G6DH-PA0PN	14/9/48
G/SM	G5YV-SM7BE	1/6/51
G/SP	G5YV-SP6CT/P	28/10/58
GC/DL	GC3EBK-DL3VJ/P	22/3/53
GC/EI	GC2CNC-EI2W	8/10/51
GC/F	GC2CNC-F9OK	17/11/53
GC/GI	GC3EBK-GI3GXP	14/9/56
GC/GW	GC2FZC-GW8SU	16/6/54
GC/ON	GC3EBK-ON4BZ	4/3/53
GC/OZ	GC3EBK-OZ2FR	2/3/53
GC/PA	GC3EBK-PA0HA	16/7/55
GD/EI	GD3DA/P-EI2W	30/7/51
GD/GM	GD3DA/P-GM3DA/P	29/7/51
GD/GW	GD3DA/P-GW5MQ	28/7/51
GI/DL	GI3GXP-DL1SE	5/1/56
GI/EI	GI3GQB-EI2W	13/6/51
GI/GD	GI2FHN-GD3DA/P	29/7/51
GI/GM	GI2FHN-GM3OL	1/7/49
GI/GW	GI2FHN-GW3ELM	8/7/49
GI/HB	GI3GXP-HB9RG	7/10/60
GI/OK	GI3GXP-OK1VR/P	27/10/58
GI/ON	GI3GXP-ON4BZ	5/1/56
GM/DL	GM2FHH-DJ1XX	29/5/55
GM/EI	GM3BDA-EI2W	12/6/51
GM/HB	GM3HLH-HB1RG	4/8/57
GM/ON	GM3EGW-ON4BZ	21/11/53
GM/OZ	GM2FHH-OZ2IZ	18/6/57
GM/PA	GM3EGW-PE1PL	22/4/53
GM/SM	GM2FHH-SM6ANR	22/7/55
GM/SP	GM3EGW-SP3GZ	7/10/60
GW/DL	GW5MQ-DL4XS	22/9/51
GW/EI	GW2ADZ-EI8G	19/4/51
GW/F	GW2ADZ-F3LQ	14/5/50
GW/HB	GW2ADZ-HB1IV	14/9/53
GW/OK	GW2HIY-OK2VCG	6/10/60
GW/ON	GW2ADZ-ON4YV	13/5/50
GW/OZ	GW2HIY-OZ5AB	14/6/59

on during the lunch period, 1.0-2.0 p.m. daily, as many as 12 having been heard on such occasions.

G3BLP, lately of Selsdon, is now to be heard pouring out a potent signal from Woldingham, Sy. Johnnie closed at Selsdon on March 7 by working GM3EGW, having already added GM2FNF (I.o.Arran) for a new one; this makes him 67C worked for the All-Time, with the magnificent total of 908 different stations QSO'd on the two-metre band—quite a record, unlikely to be approached by any other 2-metre operator (except possibly G6NB, who probably has never counted his total.—Ed.). At the moment of writing, G3BLP had not got the new location fully assessed, but it looks as if it should be good to the east.

Another to work GM2FNF on his I.o.A. sortie back in February (which gave the county of Bute, incidentally) was G3HBW (Bushey, Herts.), who was not able to be consistently active during the period but found conditions pretty good whenever he could get on. Outstanding contacts for Arnold were G2FO, G3JYP, GI5AJ and GM3HLH/A. G3LTN (Weyhill, Hants.) has been in with the DX, both EU and G, and goes up in the All-Time; he has just built a two-metre pre-amp. consisting of two A.2521's in g.g. cascade and reports results as excellent. G3OJY (Churt, Sy.) continues to do well and shows a very fair sample of GDX worked—he mentions F3XK for his first EU, and G3OQH for his 100th station on two metres.

Also to have moved house is G3NR, lately of Bracknell and now at Woking, Sy.; he has got the Rx running off a dipole in the garage, and will have the new station organised very shortly, with the prospect of a better VHF location than the old one.

A lone cry from the north-east—G3IOE (Gosforth, Northumb.) is able to claim three new counties and remarks that the March contest "provided a lot of fun"; he caught the Ar opening after the contest closed and worked five

GW/PA	GW2ADZ-PA0HA	13/5/50
GW/SM	GW2ADZ-SM6QP	1/7/53

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED
Starting Figure, 4

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

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

GM's; his best GDX during the contest was G2HIF (Wantage, Berks.).

And Finally—

The tabular matter shown is as most lately reported—we will try and get All-Time Counties in for next month, and Two-Metre Firsts need not be shown again until there are some major changes; incidentally, in this listing note that between them G's have worked 20 countries outside England; no single G has worked the lot, though one or two are not far off it.

Deadline for May (how time flies!) must be **Wednesday, April 19**, with everything addressed: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. So till May 5, then — 73 de A.J.D.

The Other Man's Station

G5QA



The second operating position, on the west wall, is equipped with an all-band transmitter, appropriate aerial tuning units, an 888A receiver, beam indicator, and monitor oscilloscope, permanently wired in and ready to take immediate traces of either received or transmitted signals. A Class-D wavemeter ("pansied up") completes this part of the layout. The entrance to the workshop is on the immediate right—see next page.

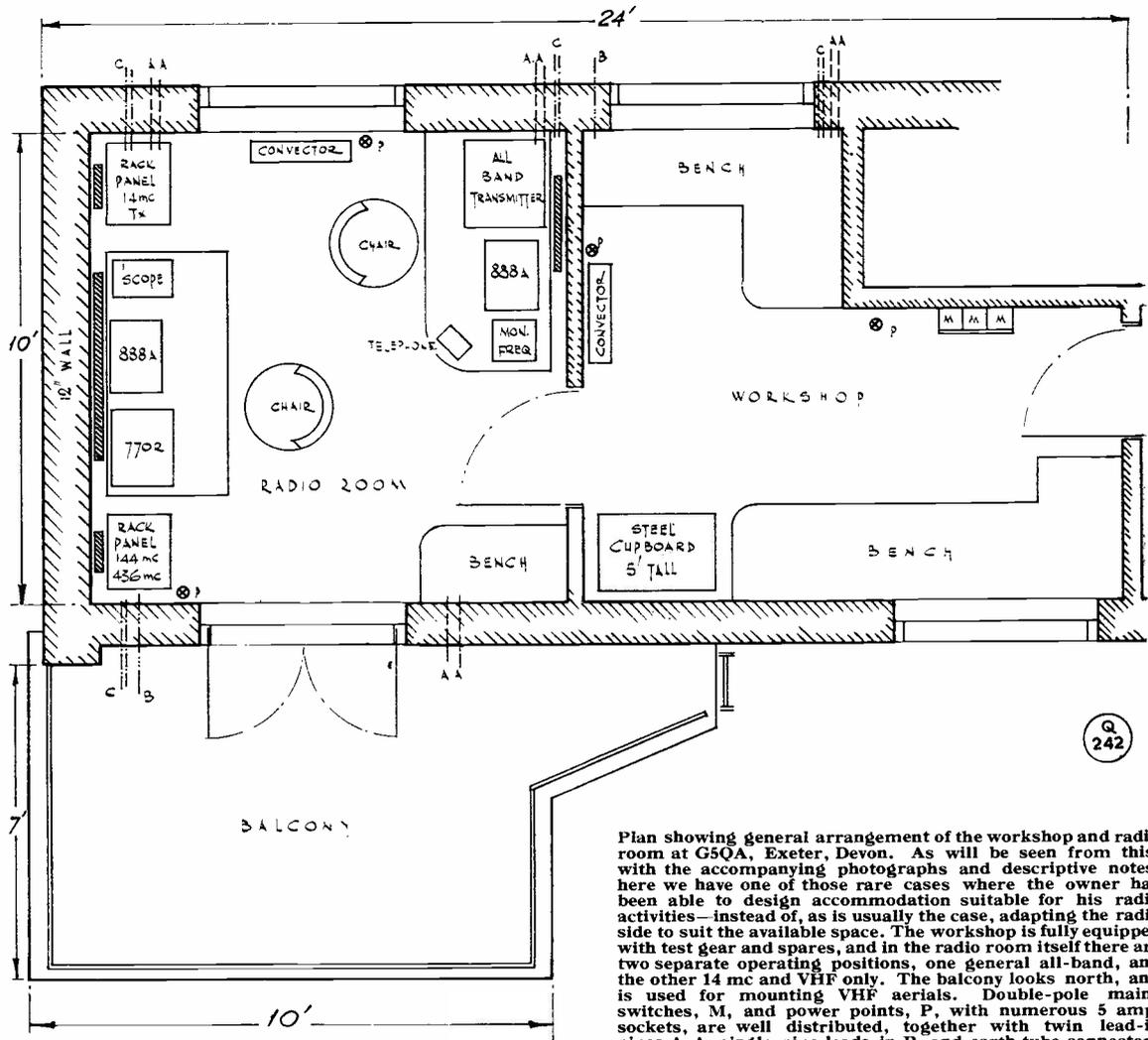
THE station we illustrate this month is of unusual interest because, in addition to being designed for its job with British-made equipment chosen for the purpose, it is installed in architect-planned accommodation—a suite consisting of operating room and adjoining workshop.

While everyone has in his mind's eye his own "ideal station," the layout illustrated here probably approximates to the aspirations of many—at any rate, it shows what can be done by an experienced radio amateur who is in a position to make the most of his opportunities, as will be seen from the plan and photographs on the following pages.

G5QA is owned and operated, and was entirely designed by Herbert Bartlett, White Ladies, Cheyney Gate, Pinhoe, near Exeter, Devon, who received his ticket in 1927, has been regularly active all through the years, and is now working CW and phone on the 14, 21, 28, 144 and 436 mc bands. The photographs and site plan give a very good idea of the layout and the equipment used.

Apart from regular schedule keeping on the HF bands—the G5QA/ZL2OU marathon, now approaching 7,300 contacts on 20 metres, daily since 1936, is well known—the main interest at G5QA is probably VHF, for which an ideal site has been chosen. The

More than 80% of licensed U.K. amateurs are regular readers of Short Wave Magazine



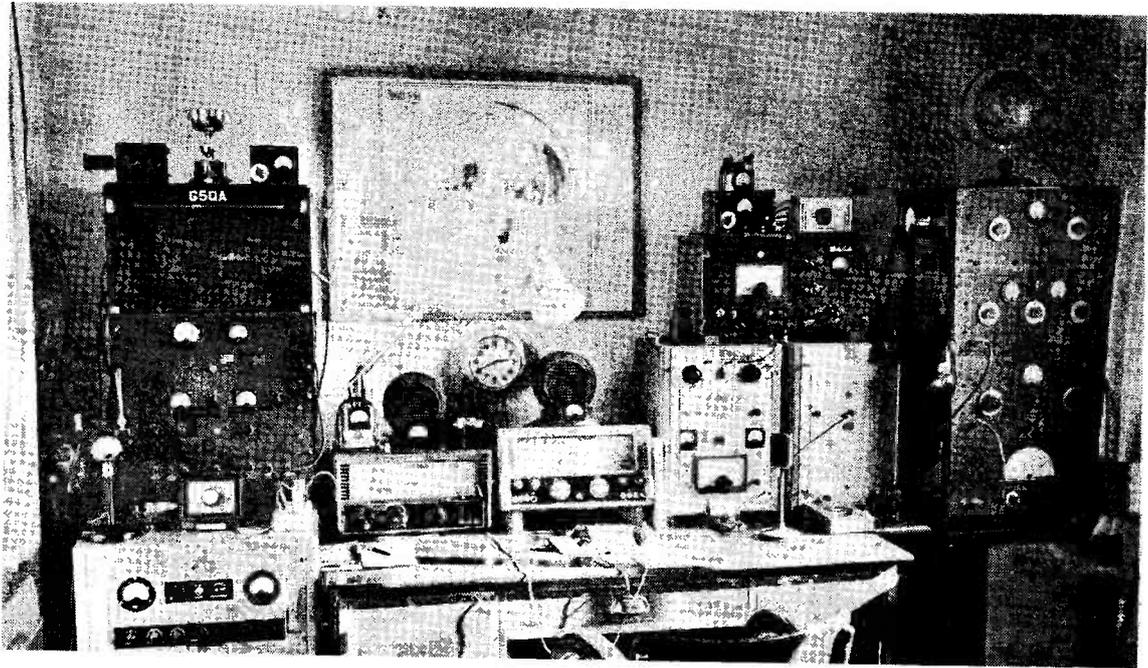
Plan showing general arrangement of the workshop and radio room at G5QA, Exeter, Devon. As will be seen from this, with the accompanying photographs and descriptive notes, here we have one of those rare cases where the owner has been able to design accommodation suitable for his radio activities—instead of, as is usually the case, adapting the radio side to suit the available space. The workshop is fully equipped with test gear and spares, and in the radio room itself there are two separate operating positions, one general all-band, and the other 14 mc and VHF only. The balcony looks north, and is used for mounting VHF aerials. Double-pole mains switches, M, and power points, P, with numerous 5 amp. sockets, are well distributed, together with twin lead-in pipes A-A, single-pipe leads-in B, and earth tube connectors C. Lighting is by fluorescent strip and heating by convector.

location is 550 ft. a.s.l. with clear take-off all round—so much so that on the south side Exmouth and the Channel are quite visible, while to the north the Wellington Monument, 28 miles away, can be easily seen on a clear day.

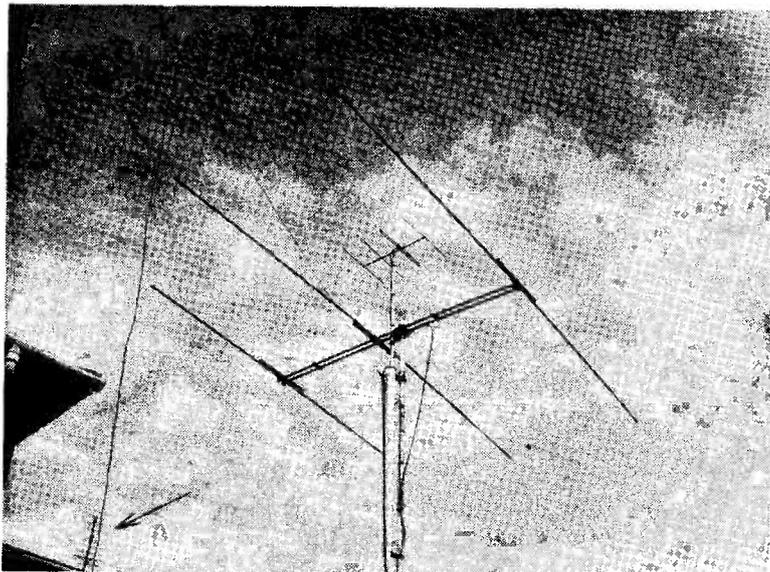
In the general planning, G5QA has paid particular attention to safety switching and the provision of power points—in the workshop there are no less than 14, each separately switched at bench level, and in the operating room there are four banks of eight sockets, all 32 being individually switched. Just inside the door, as one enters the workshop, is the one main control switch for the whole station, workshop and operating room; it is the switch every member of the household knows about, and when it is pulled off the station is completely isolated electrically, except for a safety pilot light in each room, fed from an entirely separate external circuit.

Other built-in features of this fine amateur station are continuous transmission monitoring by oscilloscope and TV receiver, a tape-recorder permanently wired in circuit for both main receivers (Eddystone 888A's), aerial selection by switching, and mains regulation. No less than twelve lead-in tubes are provided, with numerous main earth connecting points.

And let it be said that G5QA is not what is known as a "professional amateur"—that is to say, engaged in the radio-electronics industry with Amateur Radio as a relaxation or a side-line. He is in the motor business, and after many years' hard work is now managing director of one of the largest automobile and agricultural machinery agencies in the West of England. With the prospect of retirement in the not too distant future, G5QA will be able to spend his leisure under what, for a keen radio amateur, are ideal conditions.



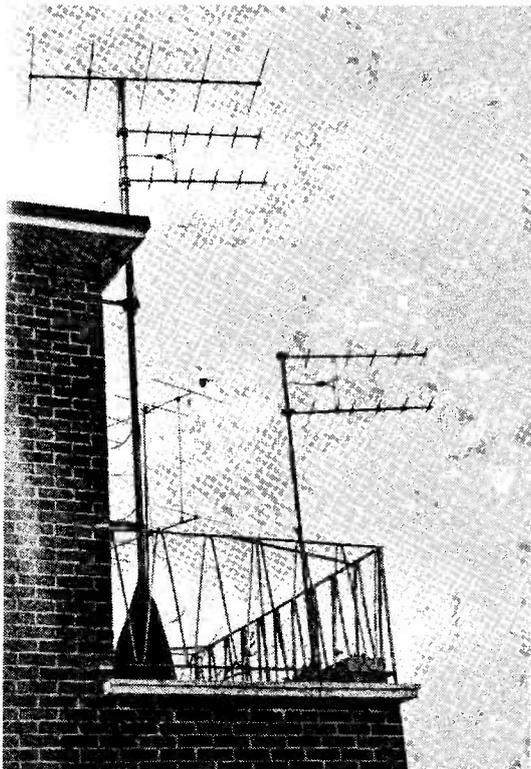
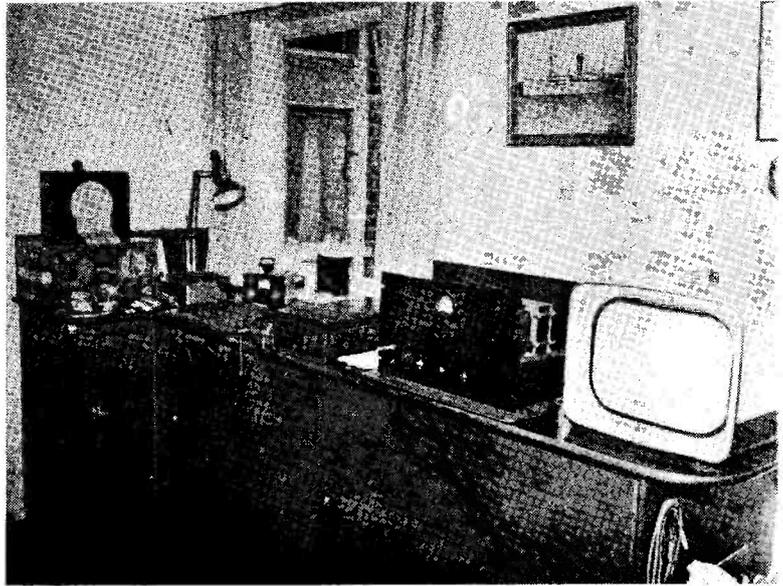
Equipment layout at the operating position on the east wall with, from left to right, 144 and 436 mc transmitters and compass indicator; Eddystone 770R receiver (19-165 mc); at centre Eddystone 888A; Labgear LG.300 transmitter and Mod/PSU; and, on the right, the old 14 mc transmitter, with which many of the 7,000-plus QSO's with ZL2OU have been worked on their daily schedule, kept since 1936. Centred on the wall in this photograph is our "DX Zone Map" — though G5QA hardly needs it for laying off the beam heading to ZL2 after all these years!



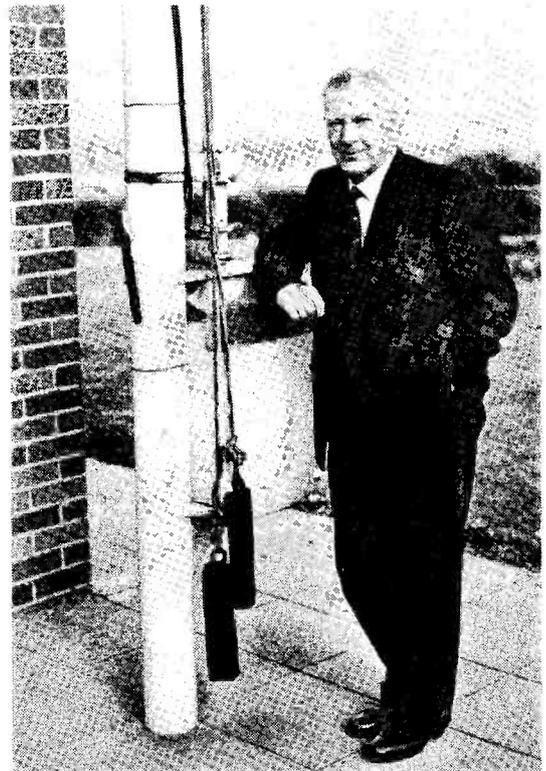
The three-element beam for the 14-28 mc bands is surmounted by a 4-element Yagi for two metres. This mast is rotated by a prop-pitch motor, remotely controlled from the operating position. Other aerials available include 68 ft. and 136 ft. wires and (arrowed in background) a two-metre 4-over-4 slot-fed array.

[over

One of the benches, along the north wall of the workshop. The old Hallicrafters S20R is used for general listening, and the portable 14-in. TV receiver is for TVI monitoring; it comes on automatically whenever G5QA is on the air, as all transmissions are continuously monitored. Beside the TV receiver is a modulator unit undergoing repair.



Part of the G5QA aerial layout for VHF. A 4/4 for two metres, slot fed, is in the background. The two small slot-fed arrays are for 436 mc, and can be put together to make two stacks in phase on the 70-centimetre band. All beams are rotatable, the main ones being remote-controlled with indication at the operating position.



In this photograph we see G5QA himself, at the base of his big beam, the mast actually being an old tram standard purchased for 50s.! G5QA, H. A. Bartlett, of White Ladyes, Cheyney Gate, Pinhoe, nr. Exeter, Devon, was licensed in 1927, and has been an active radio amateur ever since. In business life, he is managing director of one of the largest motor and agricultural implement agencies in the West Country.

NEW QTH's

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

- DL2BA**, D. R. A. Pontet (*ex-G3HAP/G3JTE/G3MRS*), c/o Officers' Mess, R.A.F. Station, Goch, B.F.P.O. 43.
- G3JXK**, P. H. Strudwick, 84 Highgate High Street, Highgate, London, N.6. (*Re-issue.*)
- G3LZV**, C. A. Berry (*ex-VS6EF/ZC5CB*), 4 Godwin Road, Canterbury, Kent.
- G3LZV/A**, C. A. Berry, Hut 71, "C" Sqdn., R.A.F. Station, Compton Bassett, Calne, Wilts.
- G3MGK**, I. A. Kemp, 1 Doric Avenue South, Frodsham, via Warrington, Lancs.
- G3OGW**, H. Wilson, 9 Dale Road, Darlington, Co. Durham.
- G3OJQ**, E. D. Wilson, 2 Wharf Road, Stamford, Lincs.
- G3OLN**, K. H. Walden, 1 Hawthorn Road, Cheltenham, Glos.
- G3OOC**, L. Wike, 38 St. Barnabas Road, Hightown, Liversedge, Yorkshire.
- G3OPQ**, G. D. Blunt (*ex-ZC4GB*), 4 South View, Flowerdown, Winchester, Hants.
- G3OPT**, D. Taylor, 31 Bates Lane, Helsby, via Warrington, Lancs.
- G3OPU**, *QSL to VP9MM, P.O. Box 275, Hamilton, Bermuda.*
- G3ORH**, C. E. Harris, 91 Kingsley Road, Maidstone, Kent.
- G3OSA**, M. G. Hall, Windrush, Park Homer Road, Colehill, Wimborne, Dorset.
- G3OSP**, S. E. Plumtree, 11 Wallows Wood, The Straits, Lower Gornal, Dudley, Worcs.
- G3OTA**, J. Will, 161 Preston New Road, Blackburn, Lancs.
- GM3OTF**, J. Mahan, 28 Bayview Road, Stranraer, Wigtownshire.
- G3OTR**, M. J. Beckley, 12 Carde Close, Hertford, Herts.
- G3OUC**, P. Painting, 18 Beverley Close, Thatcham, Newbury, Berkshire.
- G3OUD**, F. S. Downs, Newlands, Wharf Lane, Solihull, Warks. (*Tel.: SOLihull 2137.*)
- G3OUG**, F. J. Duley, 21 The Dene, Wembley, Middlesex. (*Tel.: Wembley 6808.*)
- G3OUJ**, R. L. Timms, 283 Wel-lingborough Road, Northamp- ton, Northants.
- G3OUL**, University of Liverpool Amateur Radio Society, School of Electrical Engineering, Faculty of Engineering, The University, Brownlow Hill, Liverpool. *Hon. Sec.: P. E. Gillett, Rathbone Hall, North Mossley Hill Road, Liverpool, 18.*
- G3OUQ**, H. B. Bird, 53 Coton Road, Nuneaton, Warks.
- GM3OUU**, G. W. J. Rennie, 31 Gordon Terrace, Dyce, Aber- deen.
- GW3OUW**, T. H. Williams, 152 Heathwood Road, Cardiff, Glam.
- G3OUY**, M. R. Pye, 127 Spence- field Lane, Evington, Leicester, Leics. (*Tel.: Thurnby 5167.*)
- G3OUZ**, R. G. Lloyd-Owen, Plas Newydd, Hellesvean, St. Ives, Cornwall. (*Tel.: St. Ives 320.*)
- G3OVA**, J. J. Lockyer, 153 Ivor Road, Sparkhill, Birmingham, 11.
- GW3OVD**, R. J. Baker, Penrhiwg- wair Cottage, Llanfach, Aber- carn, Mon.
- G3OVK**, J. A. Frearson, 137 Williamthorpe Road, North- wingfield, Chesterfield, Derby- shire.
- GW3OVP**, W. J. Emmett, 182 Countisbury Avenue, Llanrum- ney, Cardiff, Glam.
- G3OVV**, L. Russell, 193 Wolver- hampton Road, Pelsall, Walsall, Staffs.
- G3OVW**, D. R. Hankinson, 162 Cateswell Road, Hall Green, Birmingham, 11.
- G3OWA**, P. J. Wooden, 102 Barn- field Avenue, Kingston-upon- Thames, Surrey.
- G3OWC**, G. Boyle, 72 White- house Park, Newtownabbey, Co. Antrim.
- G3OWL**, E. Bold, 7 Bellbrook, Penkridge, Stafford, Staffs.
- G3OWO**, J. E. Taylor, 39 Broad- way, Haslingden, Rossendale, Lancs.

CHANGE OF ADDRESS

G3AHE, G. James, 10 Suffolk Parade, Cheltenham, Glos.

GW3CBA, H. S. J. Kellaway, 24 Hywel Crescent, Barry, Glam.

G3CBW, H. Walker, 16 London Road, Baldock, Herts.

G3ESP, W. Farrar, 16 Highbury Avenue, Bessacarr, Doncaster, Yorkshire. (*Tel.: Doncaster 56082.*)

G3FHG, K. S. Martin, Southview, Parklands Road, Okehampton, Devon.

G3GFH, M. E. Pulvermacher, 3 Pitshanger Court, Pitshanger Lane, London, W.5.

GM3GZA, D. J. West, Ministry of Aviation, Loran Radio Station, Mangersta. Uig, Isle of Lewis, Outer Hebrides.

G3HDA, M. E. Bazley, Monker- ton, Bell Lane, Snitterfield, Stratford-on-Avon, Warks.

G3HKP, Rev. T. G. R. Hughes, 17 The Broadway, South Shields, Co. Durham.

G3III, G. P. Lovelock, 55 Britan- nia Crescent, Lyneham, Chip- penham, Wilts.

G3JPM, B. F. W. Grainge, Wyatt Cottage, Thurlow Green, Haver- hill, Suffolk.

G3KEJ, C. B. Burke, B.Sc., 3 Albany Road, Windsor, Berks.

G3MBK, D. W. Underdown, 23 Calfredius Way, Bracknell, Berks.

G3MYF, W. H. Walton, Lindley Wood Reservoir, Otley, York- shire.

G3NEE, R. J. R. Pedder, 6 Greenall Close, Cheshunt Waltham Cross, Herts.

G3NEU, T. L. Painter, 98 Gaia Lane, Lichfield, Staffs.

GW3OCD, V. A. Davies, 12 Plasdraw Road, Aberdare, Glam.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for May issue: April 14)

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

THERE is a certain sameness about the majority of Club reports which we compress into this feature month by month. Now and then, however, comes an example of real enterprise, or something right out of the ordinary.

No one can deny that **MIDLAND** showed great originality on March 2, when the **MARS TV Group** transmitted the lecture, live, by amateur television on the 430 mc band, from the QTH of **G3MXW/T** to the audience at the Midland Institute. The Club's own ATV camera was used, and excellent pictures obtained for this first "over the air" experiment. Congratulations, Midland.

Another good example of original thinking is the "Club Project" being staged by **HASTINGS**. One of their members, **G3BDQ**, has designed an ultra-simple SSB transmitter for Top Band, and the design is being published in detail, stage by stage, in their monthly publication, *Natter-Net Notes*. Several members will be building Chinese copies of the original, for use on the Natter-Net on Sunday mornings. Crystals and other parts can be bought in bulk for such a project, and the less experienced members, technically, have the advantage of a ready-planned design to build from.

And so to this month's Activity Reports, again very numerous.

Acton, Brentford & Chiswick meet on April 18 for a discussion on Power Generation, following their visit to a generating station last month. CW practice sessions continue (first Tuesday). All meetings at the AEU Club, 66 High Road, Chiswick, W.4.

Barnet will be hearing about D-F Gear from **G3HT** on April 25; the 28th is the date for their Dinner and Dance, for which tickets, at one guinea, may be obtained from the secretary (see panel for address); this event will be held at their normal Hq—the Red Lion Hotel, Barnet.

Bradford will discuss Field Day arrangements on April 11, and at their following meeting on April 25 will hold a Junk Sale. **Bridlington** gather for their first AGM on April 10.

Bury meet at a new location—The Knowsley Hotel, Kay Gardens, Bury—for the first time on April 11, when the talk will be entitled "My First Eighteen Months" and will be given by **G3NNW**; May 9 is booked for a Junk Sale. **Cardiff** have their Junk Sale on April 10, followed by a symposium entitled "Tips on Conversions"; they meet at the TA Hq, Park Street, Cardiff, on the second Monday of the month.

Clifton recently heard a talk by **G3BCM** on International Radio Regulations, after which the lecturer demonstrated his amateur-bands receiver: April 21 is the date for the annual D-F lecture, to be given by **G3HZI**, winner of the 1960 D-F Trophy. **Cornish** met on March 1 at Falmouth and heard a recorded lecture on WIPFA's visit to **FP8**. **W. Gilbert, Junior**, was presented with the Sheila Locke shield for SWL's: their AGM will be on April 5, 7.30 p.m.

Crystal Palace will be hearing about RTTY for the Beginner, from **G3IIR**, on April 15, and on May 2 will hold their Morse class and so on at the home QTH of **G3FZL**: their normal meetings (at Windermere House Annexe) are now on the third Saturday of the month, 8 p.m. **East Kent** are participating, with other hobbyists in the area, in a Technical Hobbies Exhibition in Canterbury, May 31 to June 3. This coincides with Commonwealth Technical Training Week. Further details from **D. J. Bradford, G3LCK**, 42 Mount Road, Canterbury.

Guildford have booked their AGM for April 28: and it is hoped that on April 13 Mr. Maurice Child will talk to them on The Early Development of Radio. **Hastings** meet on April 11 for one of their "News Review" programmes which they are now making a quarterly feature: on March 14 they heard a tape lecture and on the 28th saw a Film Show.

The **I.R.T.S.** will be at the Standard Hotel, Harcourt Street, Dublin, for Film Shows on April 28 and May 26. **Leeds** meet on April 12 (Mobile Equipment, **G3GJV**): April 19 (Film Show); and April 26 (Visit to Fane Acoustics Ltd.): May 3 is the date of their Bring-and-Buy Sale. **Mitcham** had their lecture on Beam Aerials from **G4ZU** on March 24, so that April 7 is now the date for their Junk Sale: on the 21st they will discuss Field Day arrange-



ments, including those for a Dummy Run.

North Kent will meet on April 13 and 27—no programme stated as yet. **Nottingham** have their AGM on April 11, a local group meeting on the 18th, and a general discussion on RTTY on the 25th; three or four local amateurs are already active, or planning to be, and they hope to form a Nottingham RTTY group; and they are also building an SSB rig for Top Band.

Paddington have built and installed a Top Band transmitter, and will be on the air every Wednesday evening from 7.30 p.m. onwards: the call-sign will at present be that of the operator, followed by "/A," but they hope to collect G3PAD as soon as it becomes available. WALT-chasers needing London, W.2, are asked to look for them on Wednesdays.

Peterborough meet on the first Friday at the Technical College, and at their last meeting they put on a Film Show and also got down to arrangements for the Mobile Rally at Hunstanton, May 28. **Port Talbot** have changed their venue to the Rail and Transport Institute, Station Road, on the second Tuesday of the month (except for August, when there is no meeting). They are trying to arrange an R.A.E. Course for 1961-62, and anyone within range who is interested is asked to get in touch with the secretary (see panel): several talks are planned, on Field Day, SSB, and on VHF Radio in a Steel Works.

Purley are looking forward to a talk by G3BCM on TVI and BCI: the date booked is April 7: on the 21st they will be discussing Field Day arrangements. **Reading** meet on April 29, 7.30 sharp, to hear G.P.O. representatives talking about the Transmitting Licence Regulations—followed by "Any Questions?" Students from the local Technical College have been invited to attend: the meeting place is the Palmer Hall, West Street.

South Birmingham will be holding a Film Show on April 20—at the Friends Meeting House, Moseley Road, Birmingham 12. **Southgate**, at their meeting on April 13, will be hearing G2BVN on SSB for the Beginner: on May 11 G2UK will be giving a talk, with slides, on RTTY.

South Yorkshire are having a Ragchew on April 13, and a talk on Receivers, by G3HNI, on the 27th: the club hopes to be operational with its own call-sign very shortly. **Spenn Valley** meet on April 11 at the City of Bradford Fire Headquarters, Nelson Street, Bradford, at 7.30 p.m., when Mr. C. H. Gardner of Mullards will lecture on Ultrasonics: members of neighbouring societies are invited. On the 26th they visit the G.P.O., Leeds, for a lecture on Trunk



Salisbury & District Short-Wave Club signed G3FKF/A for MCC, got 530 points and came out in 11th place. The gear consisted of an HRO receiver, an 807 PA running 10w. input, and a half-wave end-fed aerial; full BK was worked, with an electronic key. In the photograph are, standing, left to right: Col. R. E. Stoney, R. Sigs., and Lt.-Col. Sir Evan Nepean, G5YN. Seated, left to right: A. Newman, G2FIX and SWL J. Walton.

Switching. Their annual outing has been arranged for Sunday, May 7, when they will visit the new Marconi Ltd. Hq at Hull.

Stoke-on-Trent have their AGM at 8 p.m. on April 6, and their next big event is the Trentham Gardens Rally on the 30th. **Sutton Coldfield** are running a Junk Sale on April 13, and a talk by G3LNN on SSB for Beginners on the 27th—both meetings begin at 7.30 p.m. in the Headquarters at 92 The Parade, Sutton Coldfield.

Torbay held their Annual Dinner on March 4, and met on the 11th for a talk by G3ABU on Relays; their April meeting is the AGM. **Wolverhampton** hope to show two colour films from the BICC film library on April 10, and on the 24th they plan a talk on Receiver Design.

Halifax held a discussion about Field Day arrangements at their last meeting. On June 6 they will be hearing about Model Aircraft, and June 20 will be an informal evening. **Liverpool** have an Open Meeting on April 11: on the 18th G31QO will talk about D-F Equipment: and on the 25th there will be a Junk Sale; May 2 is booked for a talk on TVI Precautions.

Midland have a talk on SSB Operating, by G3DO, a well-known exponent, on April 18, and on the 28th there will be a demonstration of Heathkit Stereo Equipment: all meetings at the Birmingham and Midland Institute, Paradise Street, Birmingham, 7.30 p.m.

Plymouth have a novel idea for May 10, when they will show slides and put on a tape recording

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

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Ave., W.3.
 BARNET: E. W. Brett, G3LUY, 28 Edward Hse., Edward Gve., New Barnet.
 BEDFORD: B. E. Gee, G3LDG, 12 West Grove, Bedford.
 BELFAST: W. A. R. Bell, 78 Orange'd Ave., Bloomfi'd, Belfast 5.
 BRADFORD: M. Powell, G3NNO, 28 Gledhow Ave., Roundhay, Leeds 8.
 BRIDLINGTON: H. H. Mills, G3AJB, c/o 28 East Rd., Brid.
 BRITISH TIMKEN: D. G. Chatfield, G3JXU, 55 Bush Hill, Weston Favell, Northampton.
 BURY: J. C. Winter, G3KJN, 269 Lever St., Radcliffe, Lancs.
 CAITHNESS: W. Hardie, GM3NOB, 24 Brownhill Rd., Thurso.
 CARDIFF: R. A. Stevens, GW3GQM, 65 Dan-y-graig, Whitchurch, Cardiff.
 CHELTENHAM: J. H. Moxey, G3MOE, 11 Westbury Rd., Leckhampton, Cheltenham.
 CHESTER: H. Morris, G3ATZ, 24 Kingsley Rd., Boughton Hth., Chester.
 CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Rd., London, S.E.6.
 CORNISH: W. J. Gilbert, 7 Poltair Rd., Penryn.
 CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Rd., Tilgate, Crawley.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Ave., Littleover, Derby.
 EAST KENT: D. Williams, G3MDO, Llandogo, Bge., Canterb'y.
 ENFIELD: V. Croucher, G3AFY, 15 Nelson Rd., London, N.15.
 GUILDFORD: Mrs. E. Bennett, The Inglenook, Gravetts Lane, Worplesdon.
 HALIFAX: A. Robinson, G3MDW, 7 Upper Brockholes, Ogden, Halifax.
 HARROW: S. C. J. Phillips, 131 Belmont Rd., Harrow Weald.
 HASTINGS: W. E. Thompson, G3MQT, 8 Coventry Rd., St. Leonards-on-Sea.
 I.H.H.C.: M. Allenden, G3LTZ, 16 Grovefields Ave., Frimley, Aldershot.
 I.R.T.S.: T. O'Connor, EI9U, 280 Collins Ave., Whitehall, Dublin.
 LLANELLY: H. J. Hughes, 4 Pen-y-morfa, New Dock, Llanelly.
 LEEDS: D. Dinsdale, 69 Spen Lane, Leeds 16.
 LIVERPOOL: H. James, G3MCN, 448 East Prescot Rd., Liverpool 14.
 MIDLAND: C. J. Haycock, G3JDJ, 360 Portland Rd., B'ham 17.
 MITCHAM: M. Pharaoh, G3LCH, 1 Madeira Rd., Mitcham.
 NORTH KENT: D. W. Wooderson, G3HKX, 75 Mount Rd., Bexleyheath.
 NOTTINGHAM: E. C. Weatherall, 16 Avebury Close, Clifton, Nottingham.
 PADDINGTON: N. Lambert, G3LVK, 22 Sunderland Terrace, London, W.2.
 PETERBOROUGH: D. Byrne, G3KPO, Jersey Hse., Eye, Peterborough.
 PLYMOUTH: R. Hooper, 2 Chestnut Rd., Peverell, Plymouth.
 PORT TALBOT: H. G. Hughes, GW4CG., 20 Austin Ave., Porthcawl, Glam.
 PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Rd., Purley.
 READING: R. G. Nash, G3EJA, 9 Holybrook Rd., Reading.
 REIGATE: F. D. Thom, G3NKT, 12 Willow Rd., Redhill.
 ROMFORD: N. O. Miller, G3MNV, 55 Kingston Rd., Romford.
 ROTHERHAM: S. J. Scarbrough, 25 Crawshaw Ave., Sheffield 8.
 SILVERTHORN: B. A. Lee, G3ICY, 9 Balgonie Rd., London, E.4.
 SLADE: C. N. Smart, 110 Woolmore Rd., Birmingham 23.
 SOUTH BIRMINGHAM: T. W. Legg, Flat 3, 80 Alcester Rd., Birmingham 13.
 SOUTHEND: Mrs. P. M. C. Collop, 53 Beedell Ave., Westcliff-on-Sea.
 SOUTHGATE: R. Pedder, G3NEE, 6 Greenall Close, Cheshunt, Herts.
 SOUTH SHIELDS: D. Forster, G3KZZ, 41 Marlborough St., South Shields.
 SOUTH YORKSHIRE: E. Brailsford, 15 Ayrson Walk, Cantley 4, Doncaster.
 SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
 STOCKPORT: G. Phillips, G3FYE, 7 Germans Buildings, Buxton Rd., Stockport.
 STOKE-ON-TRENT: V. J. Reynolds, G3COY, 90 Princes Rd., Hartshill, Stoke-on-Trent.
 SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Rd., Selsdon, South Croydon.
 SUTTON COLDFIELD: L. E. R. Hall, G3IGI, 24 Calthorpe Rd., Walsall.
 THAMES VALLEY: K. A. H. Rogers, G3AIU, 21 Links Rd., Epsom.
 WIRRAL: A. Seed, G3FOO, 31 Withert Ave., Bebington.

entitled "Round the Local Hams." **Silverthorn** meet every Friday at South Chingford Community Centre, with constructional meetings alternate Fridays: talks, demonstrations and the building of a Club station are all planned for the near future.

Stockport have recently heard lectures by G2IG on a Transistor SSB Receiver: Bob Auger, of Granada TV, on Record Manufacture: and G3AYT on Commercial Closed Circuit TV: attendance has been good, with many new young members. A trophy is being sponsored for the best construction of a two-metre receiver: both receiving and transmitting members can take part.

South Shields meet every Friday and also on the last Wednesday in Trinity House Social Centre, Laygate. At the March meeting they held an "Any Questions?" session when the licensed members were faced by the SWL's with technical problems.

Bedford meet on April 13 for the Transistor lecture formerly planned for March 23, when, instead, they discussed Field Day arrangements: the April meeting will be in the Town Hall Committee room at 8 p.m. **Belfast** will be running an exhibition station during Ulster TV's Holidays and Hobbies Exhibition at King's Hall, Balmoral, from April 5-15: visitors are always welcome at the Clubroom, 3rd Floor, YMCA Building, Wellington Place, club nights being Wednesdays and Saturdays from 8 p.m.

Caithness had talks on Receivers by G3COV at the two March meetings: they now have 14 members and hope for further growth. **Cheltenham** are warming up for their Mobile Rally on May 7, and although no further events are yet fixed, they hope to fill up their programme before summer activities take over.

Crawley meet on April 26 to hear about Radio Interference, by G3MQT—West Green Centre, Crawley, at 7.30 p.m. **Harrow** have a Junk Sale on April 14, and the Construction Contest for the Pykett Cup will be held on the 28th: the new Club Tx is under way on Practical Nights. **Rotherham** recently heard lectures on Regulations (G3OJG) and on Test Gear: future plans include a talk on The Decibel and its Use. **Slade** will be having a talk on Transistors on April 7: on the 21st they will see the T.W. (Withers Electronics) range of two-metre gear: and on the 23rd they hold the first D-F Test of the season.

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of the following Club Publications: **British Timken** (Newsletter No. 3); **Guildford** (Monthly Matter, Nos. 4 and 5); **I.H.H.C.** (Newsletter, Vol. 1, No. 1, and *Ham-Hop News*, Winter, 1960); **I.R.T.S.** (News, Vol. 12, No. 7); **Enfield** (*Lea Valley Reflector*, Vol. 12, No. 10); **Mitcham** (Newsletter, February); **North Kent** (Newsletter, No. 42); **Purley** (Newsletter, March); **South Birmingham** (QSP, Vol. 2, Nos. 2 and 3); **Southgate** (Newsletter, March); **Wolverhampton** (News Letter, March); **Crystal Palace** (Newsletter, No. 61); **Surrey** (SRCC Monthly News, March); **Reigate** (Feedback, Nos. 11 and 12); **Derby** (Newsletter, March); **Ex-G Radio Club** (Monthly Bulletin, No. 3); **R.A.I.B.C.** (Radial, March); **R.S.E.A.** (QTC, No. 7).

Southend had an excellent lecture on RTTY by G2UK (who knows his stuff on this subject) during March, with two machines running to give members the full picture: on the 24th members exhibited their home-made gear for judging, and a Junk Sale was also held; on April 7 a staff member of Ekco will be lecturing and giving a film show on Radar. The annual social is on May 20; normal meetings alternate Fridays, 8 p.m., in the canteen of E. K. Cole Ltd., Priory Crescent.

Thames Valley had a well-attended March meeting, and on April 5 they were due for a lecture-demonstration by G3FP on Equipment for 1215 mc. **Chester** held their AGM recently, and have their Annual Dinner on April 15; on the 18th they are judging a Constructional Contest for the younger members: G3OPT lectures on Detector Circuits on April 25. All meetings at Y.M.C.A., Old Bishop's Palace, Chester.

Derby will be taking part in the Hobbies and Handicrafts Exhibition at Heanor during April 20-22: GB3ERD will be on various bands throughout the period. From August 5-26 they will be collaborating with Derby Museum in an Exhibition called "Fifty Years of Radio," to be held in the Art Gallery. On April 12 they visit the Midland Clock Works; on the 19th G3BA lectures on Two Metres; and on the 22nd they hold their own Founder Members' Dinner. Derby being one of the oldest amateur clubs in the world, if not the oldest.

Reigate visit the BBC at Tatsfield, April 8, and

hold an informal meeting on the 16th at The Tower. On the 15th G3BCM will describe a "Top to Ten Transportable Tx/Rx." **Romford** meet every Tuesday, 8.15 p.m. at RAFA House, 18 Carlton Road: they will be operating GB3HHS on April 6-8 from the Hobbies Competition and Exhibition, Langtons School, North Street, Hornchurch.

Surrey (Croydon) hold their AGM on April 11, and their Club Constructional Contest on May 10. **Wirral** will gather on April 19 to hear a report on the expedition to Carmarthenshire, which takes place over the week-end April 7-9; the Clubroom is still at the Castle Hotel, Birkenhead, for the time being.

Llanelly meet on Thursdays for lectures and on Tuesdays for Morse instruction, and in addition bench space is available for the building of gear and the stripping of surplus items: every Sunday morning, they run a Club net on 3.7 mc, between 11 a.m. and 1 p.m. Their Hq is at Bynea Steelworks, St. David's Mill, Llanelly, and their patron is G5KJ, who was well known locally in pre-war days.

"R.107 FOR SSB RECEPTION"

G3MQJ points out that, in his article in the March issue, a drawing error appears in Fig. 1, p.17—there should be no shorting line across C111 in the plate of V1D; the same applies to Fig. 2, p.18. As it happens, this part of the R.107 is not touched during the modification process proposed in the article and was only shown for the sake of completeness; this correction is made for the same reason.

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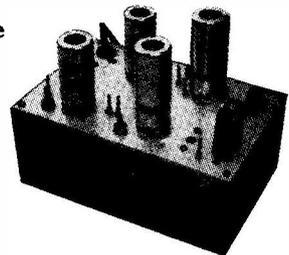
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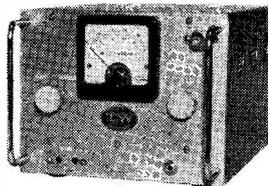
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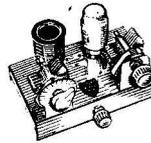
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COMMAND SERIES Receiver, tunable 118 mc-148 mc, 2RF, 4IFs; Transmitter, plate modulated, 132 mc-148 mc, size 4½ ins. x 4½ ins. x 6 ins., new, 50s. Collins Permeability VFO's, 70E-1, 70E-2, 70E-3, new Hallicrafters receivers, S-27CA, 125 mc-220 mc; S-36A, 27 mc-145 mc; R-44/ARR-5, 27 mc-145 mc; AR-88LF, £25. AN/URR-13B, 218 mc-410 mc; R-4/ARR-2, 220 mc-250 mc, 40s.; RT-122A, 420 mc, 75s.; APR, 4 Tuning Units, TN-16, TN-17, TN-18, 35 mc-1,000 mc; BC-221, TS-174/U, TS-175A/U, 125 kc-1,000 mc. Meters, 500µA, 12s. 6d.; 1 mA. 8s. 6d.; Polar relays, 12s. 6d. Carriage extra; s.a.e. —R. V. Wright, 4a Nepal Avenue, Atherton, Manchester. (Telephone 991.)

WANTED: Manual for SX-28 Rx.—J. Cooper, 5 Edgwood Road, Kimberley, Notts.

TIRE BRASSPOUNDER requires Electronic Key. Preferably W6DPU type; full details, please. Also any gen. on VRL-150 Rx, loan or buy.—Box No. 2430, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: AR88LF Receiver, excellent condition, £35. Prefer buyer collects; London area.—Box No. 2431, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Genuine AR88 S-meter, brand-new, complete with fitting instructions, 57s. 6d. (postage 1s. 6d.). Spares available for AR88D and LF; send s.a.e. for detailed list. **WANTED:** Manuals for AR88D and AR88LF.—A. J. Reynolds, 139 Waller Road, New Cross, London, S.E.14. (Telephone New Cross 1443 after 7.30 p.m.)

SALE: AR77E with LS and phones, £32. 150-watt modulator (zero-bias 807's); Hallicrafter SX-101A (new condition), Radiovision 2-stage (AC) Preselector; high-voltage mains transformers, chokes, UM3 and UM4 mod. transformers, short wave equipment, valves, condensers, crystals, etc., at low prices.—Ellis, G3SN, 47 Victoria Road, Saltash, Cornwall.

FOR SALE: TC12c Tx, with control unit, cable, harness and plugs, £5 15s. Marconi Tx, TV10, 3-30 mc, 6v. vibrator, 45s. Receiver RA1B, 150 kc-15 mc, £9. Wire Recorder, U.S.A.F. Type 13A3, with spare reel of wire and auto transformer, £4. 22 Set with PU head set, £2. German TR unit, FUG-16, 38-42 mc, Rx only with valves, £2. 38 Sets, 2 off, with phones and mic., 12s. 6d. each. Rx R.109, £2. All above items unmodified and in good condition; carriage extra.—Stagles, 127 The Ridgeway, St. Albans, Hertfordshire.

WANTED: R.208 Receiver, also good 21 and/or 28 mc receiver, and Tx.—Marris, 52 Mill Street, Kidlington, Oxford.

FOR SALE: Hallicrafters SX-110 in mint condition, complete with servicing manual. Owner purchased SX-111, £68, o.n.o.?—Kempster, Gulls Cry, Trevone, Nr. Padstow, Cornwall.

SMALL ADVERTISEMENTS, READERS—continued

MURPHY VT71 Tx. modified 2 metres. 80 watts. £25. RCA Master Oscillator, 1-21 mc. £7. Ten-metre mobile Tx and mod.. £5. Cossor 1035 'Scope. £50. Onan petrol set, 1 kW 32v.. £10. BC-640 PA unit. £4 10s. BC-640 Exciter unit. £4 10s. 9A Variac and 230v. AC meter. £7 10s. QY3-125 valves. new. boxed. £5. Misc. valves, meters; offers? BRT-400E. £75.—G3BNL. The Poplars, Delville Avenue, Keyworth, Notts. (Phone: Plumtree 2624.)

FOR SALE: Collins Receiver R-105A/ARR15 in very nice condition (includes two VFO's) with circuit and alignment data. £35. Canadian R.103 Receiver. modified for mains. 1-18 mc. with BFO. £7 10s. Bendix TA12B Transmitter, £5; power and modulator for same. £10. or £12 10s. the lot. Marconi Type 150 VF Bridge. new, with instruction book. £12 10s. Valve Voltmeter Kit. mains operated. 1-5 to 500v. AC/DC and resistance. unused, unassembled. £8 10s. complete. Canadian 29 Set. £10. APN-4 Receiver. less valves. £3. Indicator Type 6A. complete. £2 10s. Monitor Type 28. converted to Oscilloscope. £4. Receiver Transmitter APN-1. new. £3. Home-made valve voltmeter. with probe. £3 10s. American Organ. 11 stops, good order, £5; telephone cross-bar switch. makes 10 organ couplers. £10. Mullard 25 kV Projection TV power unit. £4. Portable typewriter. good order. with case. £7 10s. Model 100 Radiomobile car radio. needs alignment. £5. **WANTED:** Radio Compass control box C4/ARN7, Compass Loop LP21 or LP31. Offers considered. Free delivery.—Hillier, G3NSK. 55b Dovecote Lane, Beeston, Notts.

G.E.C. 691 RECEIVER. modern UHF. double-superhet (21 valves). as described and illustrated on p.166 of February *Wireless World*, but with all crystals and photostat circuits. Exchange first-rate amateur-band receiver. or sell.—Driver. 73 The Drive, Hove, Sussex. (Phone 32965.)

SALE: Excellent R.1155 Receiver. built-in power supply. £9. Mullard 3 x 3 amplifier. unused. £5. Latest ARRL *Handbook*. £1.—Box No. 2423. Short Wave Magazine. Ltd.. 55 Victoria Street, London, S.W.1.

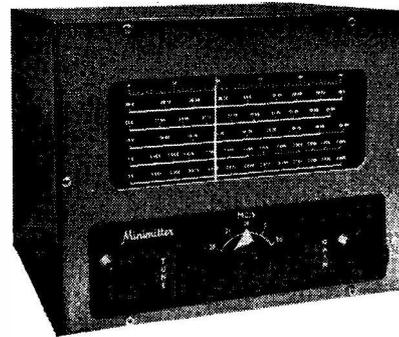
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FOR SALE: *Short Wave Magazine*, July 1958 to February 1961; ARRL *Handbook*, 1959. Valves QQVO4/60. 829B, 832 and bases; pair metal 6L6 and 6AG7; CRT's, 2API, E41043 (1½ in.). 3EG1 with P.D.A. Various miniature and octal valves. meters, xtals.—Clifford, 353 North Circular Road, Neasden, London, N.W.10.

EXCHANGE: AGFA Super Sillete. 5 filters, lens. hood, ER case, gadget bag, Weston 111 meter and Mecablitz electronic flash, all mint condx., for AR88D in good condx. — G3OKI, Aldbury, Tring, Herts (*Aldbury Common 219 after 7 p.m.*)

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OFFERS: DX-40U, VF1U, stick mic. Eddystone S.640, matching speaker, and S-meter, manuals. —G3OLZ, The Haven, Coronation Road, Loftus, Yorks.

SALE: B2 Tx with p/pack, £4; 400 mA 1100-0-1100v. trans., 230 input, 20s.; 813 (new), 15s.; 14 mc BS coil, HRO, 15s.; Mod. trans. 1:7:1 with driver 3-1 50w., 15s. Two 5-Pin Eddystone Ceramic Coils with bases 2 1/2 in. diam., 26T-12T, 10s. each. Handbooks: TCS12, AR88LF, CR-100, HRO-MX, 7s. 6d. each.—G3GZN, 26 Cardiff Road, North End, Portsmouth.

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