

The SHORT WAVE *Magazine*

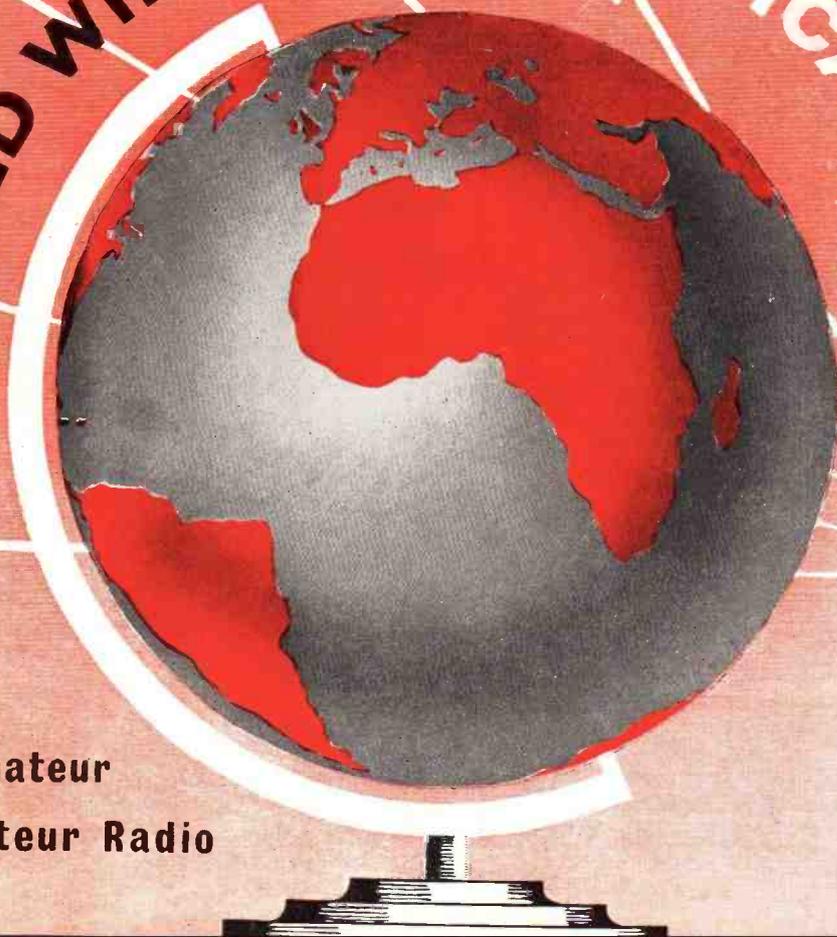
VOL XVII

SEPTEMBER, 1959

NUMBER 7

WORLD WIDE COMMUNICATION

For the
Radio Amateur
and Amateur Radio



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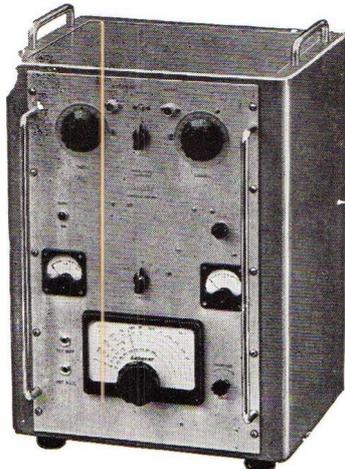
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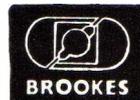
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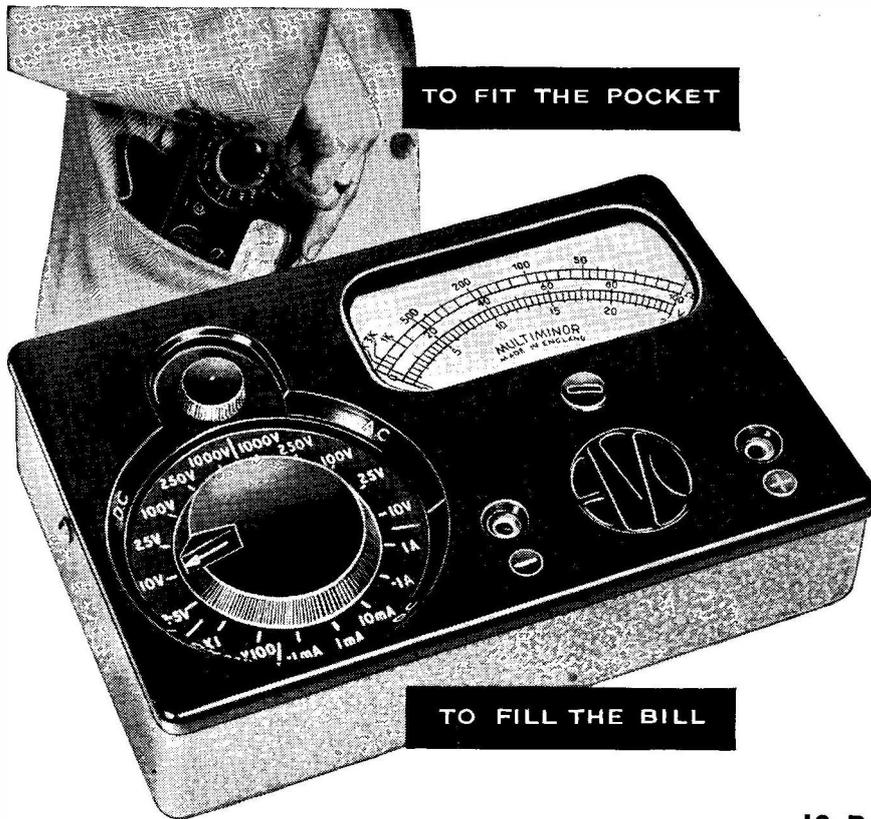


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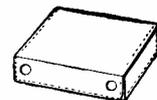
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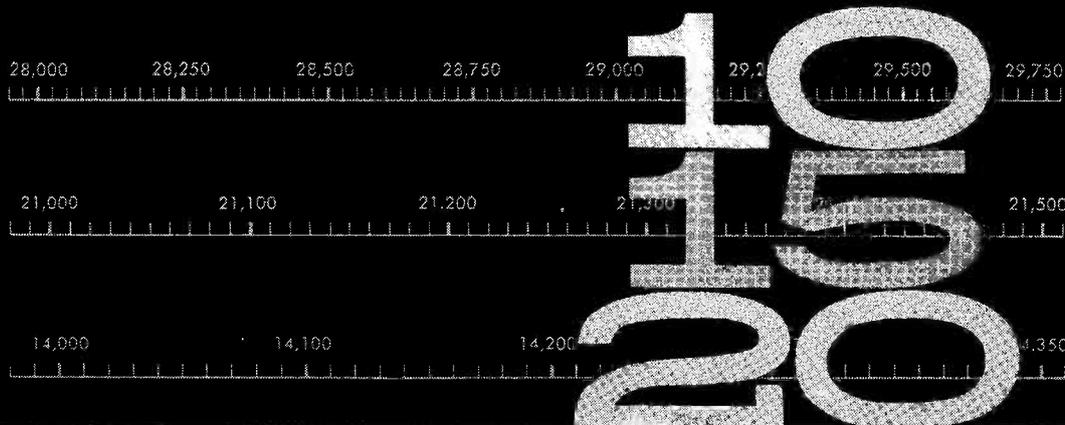
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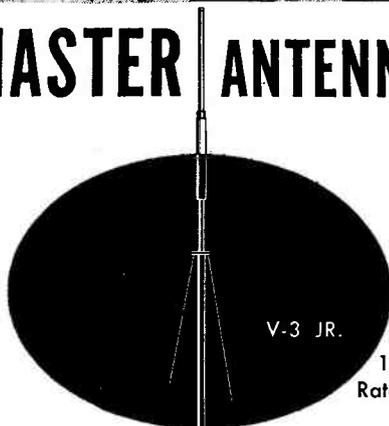


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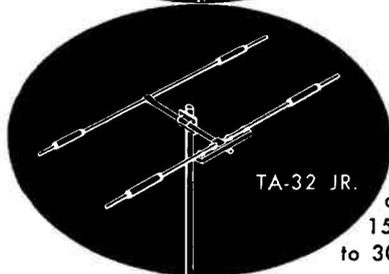


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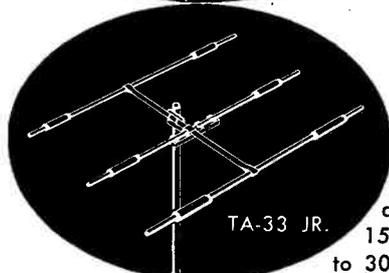
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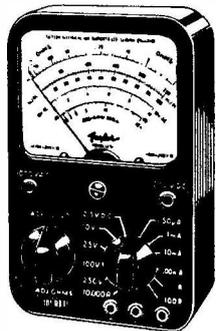
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The SHORT WAVE Magazine

E D I T O R I A L

Continuation *After an uncomfortable hiatus of two issues — in circumstances which were, of course, quite outside our control—we are able to pick up the threads again, and to appear “as if nothing had happened.”*

But something has happened. Together with so many other publishers, we have been victimised to the extent of losing, because of the recent turmoil in the printing industry, two entire issues. For any periodical publisher, this sort of thing is a serious matter. In the settlement, there is no redress for the buyers of print, who it is who maintain employment in the industry.

When the industrial history of the present era comes to be written, it will be shown that this dispute was at once an entirely unnecessary, unjustified, mismanaged and irresponsible stoppage of essential work. A great deal of balderdash has been talked and written about it, before, during and after the negotiations. The one solid fact to emerge is that the stoppage has cost the industry itself and the country as a whole tens of millions, with no discernible advantage to anybody.

* * * * *

In this issue, we have endeavoured to bring readers up-to-date with the happenings of the last three months. The news-feature articles carry all the items that would have appeared this month in the ordinary way, together with the essential facts covering the period since the June issue was published.

* * * * *

In future, SHORT WAVE MAGAZINE will appear on the first Friday of each month — and it is to be hoped that we shall now be able to get on with the job without further interference.

*Austin Fossil
G.F.O.*

G4GZ's BARGAINS

VALVES: 6H6M, 12SC7M, EF50, 2/6. 2X2, 6AG5, 6K7G, 3/6. EL32, 6AL5, 6AM6, 6C4, 6J6, 1629, EB91, EF36, EF50(S), EF91, Z77, 4/-, 3A4, 6J5GT, 6SN7GT, EAC91, EF39, 4/6. 1L4, 1T4, 6AC7M, 6AK5, 6J5M, 12SJ7M, 12SK7M, 959, 5/-, 6F6M, 5/6. 6X4, 6/-, 1R5, 1S5, 6F32, 3Q4, 6K8G, 6SG7M, 6SK7M, 6X5G, 12A6M, 12K7GT, 12Q7GT, 6/6. 5Y3GT, 6AT6, 6AU6, 6BA6, 6BE6, 6BH6, 6BJ6, 6J7G, 6Q7G, 6SA7M, 6SL7GT, 6SJ7M, 6SQ7M, 6V6G, 12C8M, 35Z4GT, 42, 801A, DC70, DL70, DF73, EBC33, EF80, EZ40, EZ80, GT1C, VYR150/30, 7/6. 6L6G, 7B7, 7C5, 7C6, 7Y4, EZ81, PY80, UF42, UY41, 8/-, 2A3, 3S4, 3V4, 6AQ5, 6ST7, 12AT6, 12AT7, 12AU7, 12AX7, 12BE6, 12SQ7M, 35Z5GT, EBC41, ECC81, ECC82, ECC83, PY81, 8Y82, PY83, UY85, 8/6. 6BW6, 12AU6, EAF42, EBF80, ECC85, ECH42, EF89, EL84, PCC85, PCF80, PCF82, UAF42, UL84, 9/-, 5R4GY, 6Q7GT, 7S7, 35L6GT, 50L6GT, EBF89, ECC84, EF41, EF85, 5E41, EM80, PCC84, PL82, PL83, UBC41, UBF89, UCC85, UCH42, UCH81, UF41, UF89, UL41, 9/6. ECH81, OA2, 10/-, 6K8M, 6L6M, 446A, 5763, UABC80, 10/6. 6BR7, ECF82, EY86, PCL82, 11/6. EY51, 3A5, 12K8M, EC80, ECF80, ECL82, GZ32, U25, VLS631, 12/6. EF86, PL81, 13/6. 830B, 866A, 15/-, 803, 20/-, 805, 30/-, 3E29, 55/-.

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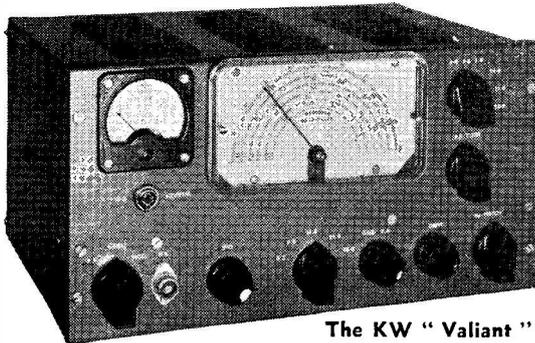
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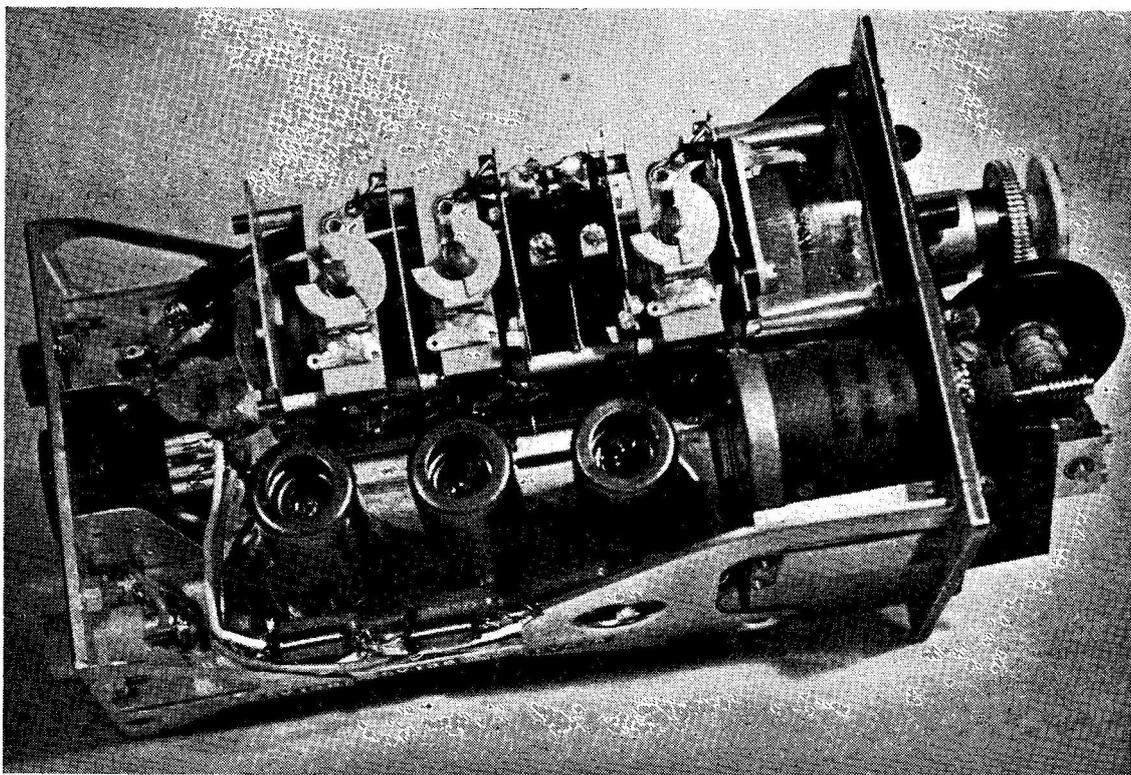
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AUTHORS' MSS

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Looking into the RF Unit No. 1, showing the heater RF chokes and decoupling condensers in the lower foreground, with the new power plug and two coax connectors at the left-hand end of the chassis. To the right are the additional (edgewise) tuning knob and band indicator. Above are the trimmers and micro-switches, with the re-routed coax cable at the rear.

RF Unit No. 1

MODIFICATION AND
OPERATION AS 21/28 MC
CONVERTER OR RF
PRE-AMPLIFIER

E. G. KENDALL (G3APA)

WHAT is actually the RF Unit No. 1 (A.M. Stores Ref. 10D/19197) is being advertised as "Band 1 RF Unit," or "RF-24, New Type." Both these descriptions are misleading, because the RF Unit No. 1 does not cover Band I as normally understood, and it is a vast improvement over those old RF Units which have in the past given such service in the Amateur Radio field. The RF Unit No. 1 is a worthy addition to the amateur's armoury, and it can be used either as a straightforward converter or as an RF amplifier, in either case bringing in the amateur 21 and 28 mc bands.

This converter tunes over 19-35 mc approximately and has an IF of 15.25 mc, at low impedance. Valves used are two EF91 and one EF93. The sensitivity is such that 1 mV will appear through the converter noise.

Though it may be possible to modify the Unit to cover the three bands 14-21-28 mc, or to change the oscillator frequency, that is not the immediate purpose of these notes, which are intended only to be of assistance in getting it on the air, in the form in which it will be received.

It is recommended that these instructions be studied with the unit before commencing operations, because it is extremely likely that having got the idea of the changes to be made, a neater and easier way will be seen to go about it.

Experience has shown that the easiest way of proceeding with the conversion is to commence by removing the covers, valves and valve cans, after which the redundant wiring and components can be attended to, in the following sequence :

Remove the small cover plate on the outside of the motor mounting bed ; this will expose

the wiring to the suppressor box below, and the ends of the red and black screened leads which emanate from the condenser micro-switches. With a pair of cutters disconnect the latter leads and screening, trace back to the micro-switches, and disconnect, removing this section of wiring. The cover plate may now be replaced, as we are not concerned with the leads to the suppressor box or its contents.

Next, disconnect the other section of red and black screened lead from the other side of the micro-switches, trace back to pins number 15 and 16 (all pins are numbered on inside of plug) and disconnect; the braid should be unsoldered from the rear panel earth point and this section of wire can now be removed.

Disconnect the thin black wire from the micro-switch, trace back to earth point, disconnect and remove.

The grey wire should now be disconnected from pin 18 and traced back to feed-through No. 11 (see Fig. 1) and except for about $\frac{3}{4}$ in. which should be connected to the nearest earth point, this wire may be removed. On the front panel will be found a 150-ohm resistor of the vitreous type; disconnect the white lead from this, trace back to pin No. 13 and remove; at the same time the resistor and its fixings may also be taken out. Disconnect the other white lead from pin No. 13, trace back to the feed-through at the rear of the chassis, disconnect and remove. Beneath the chassis, connected to the other side of this feed-through, will be seen a 22-ohm vitreous type resistor; this should be extracted, taking care not to damage the rearmost feed-through, which is still required for use later on.

Next, disconnect the one green and two grey leads from pins number 5, 6 and 12, tracing them back to the remote dial potentiometer. After removing the transparent plastic cover disconnect the leads at the potentiometer tags. It will be found that a pair of thin pointed scissors will facilitate this operation, there being very little room for the insertion of cutters. After pulling out the three leads the plastic cover should be replaced. Disconnect the three white leads from pins No. 2, 8, and 14; these leads should now be twisted together and pushed to one side as they will shortly be required and must not be disconnected from their anchorage points near to the RF chokes. Find the purple lead from pin No. 10 which has a small white collar to distinguish it from the two other remaining purple leads, cut it and identify it for future reference as the 150-volt stabilised supply. Disconnect the two red leads from pin

For some time now an item variously described as "RF-24, New Type" or "Band 1 RF Unit" has been lurking in the surplus-market advertising. It is actually a very effective converter which tunes 19-35 mc, has an IF of 15.25 mc, and can be used either to extend the range of any receiver which will go to 15.25 mc, or as an RF pre-amplifier ahead of an existing receiver already covering the 10/15 metre amateur bands. This article gives the details.

—Editor.

No. 4, twist these together, and mark them for use as HT positive 200/250 volts. Disconnect the two black leads from pin No. 1; these are the earth/negative connections and should be identified as such.

At this stage there should be left the two purple leads only connected to the 18-pin plug, one with a red and the other with a blue identification collar; these are connected to pins No. 3 and 9 respectively, and should be identified as the IF output.

Now, using Fig. 1 for reference, remove the white lead from feed-through No. 4. Pull the wire back to its associated valveholder and earth on to centre spigot. Cut the white lead from feed-through No. 8, pull the wire back to its associated valveholder and earth on to the metal screen, at the junction of the 1-megohm and 330-ohm resistors, R6-R9. [over

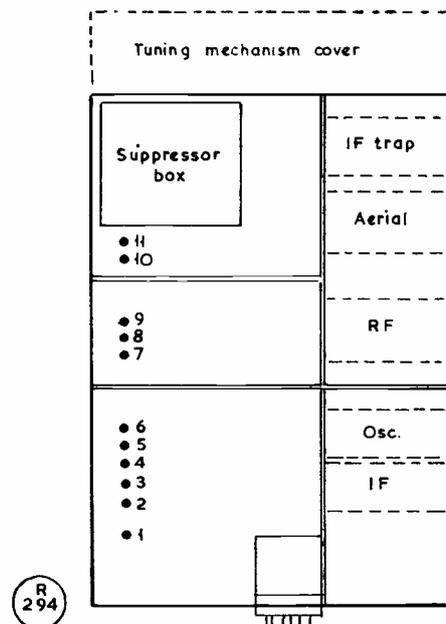


Fig. 1. Sketch showing locations of the feed-through insulators on the underside of the chassis in the Unit. Some of these have to be picked up for the conversion.

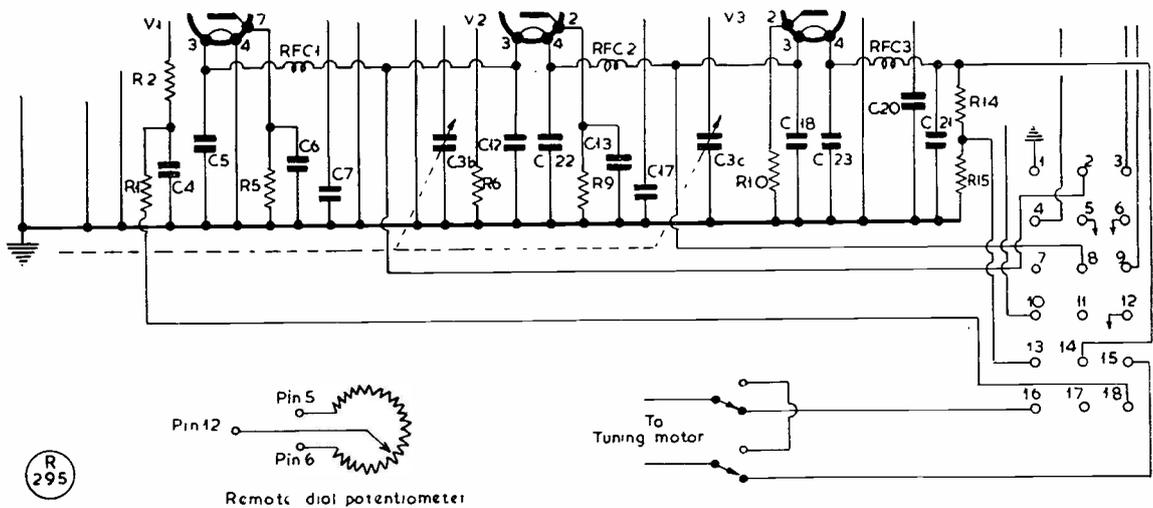


Fig. 2. That part of the circuit of the RF Unit No. 1 which is affected by the modifications discussed in the text — see Fig. 3 for full circuit and values. This diagram is to show the original power socket connections, including those to the tuning motor and remote control system, which are stripped out for the modification proposed by G3APA. Other items removed are the resistors R14 (22 ohms) and R15 (15 ohms).

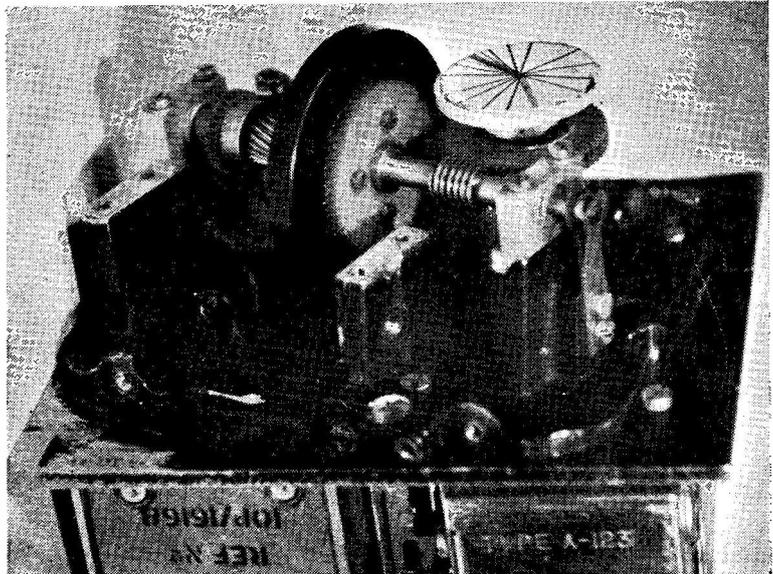
Heater Connections

At this stage the white leads previously removed from pins 2, 8, and 14 should be untwisted and each valve heater circuit tested independently *via* the appropriate lead and earth return. Having confirmed that all is in order, the three feed-throughs to which these white leads are connected should now be linked together, removing the surplus wire except that on feed-through No. 1, which now becomes LT 6.3 volts for all three valves, each valve being fed through its own RF choke—see Fig. 3.

The small modification record plate at the rear of the chassis should now be removed. If the companion half of the 18-pin plug is not available, then it is better that the existing half should be removed and the vacant space replaced by a small blanking panel, drilled to accommodate a new plug and socket; this will need to have a minimum of four contacts, or if a 150-volt stabilised supply is not available, three contacts will suffice—see Fig. 3. In the writer's case, and remembering the possible future uses to which such a plug and socket might be put,

a 6-pin plug was fitted, Bulgin type P.194.

In addition to these items, the opportunity should be taken to fit, immediately below the two outer casing securing screws (one on each side of the 18-pin plug aperture) a pair of insulated coax sockets, one of which will be for the IF output, and the other for the aerial input. (If insulated coax sockets are not available, the earthed type may be fitted, in which



Front end of the Unit, showing the method of manual tuning. The added edgewise knob is fixed to the face of the large fibre pinion by adhesive only. With the front cover back on the assembly, only the edgewise tuning knob protrudes, control being smooth and positive by thumb-control — see another photograph.

case the IF output is earthed instead of balanced.)

Assuming that the above work has been completed successfully, there remains only the removal of the aerial input lead, and re-routing this so that it runs from the coaxial socket on the tuning condenser side of the rear panel via the outside of the tuner in through the micro-switch aperture and down through the chassis to the IF trap; this will effectively shorten the coaxial lead, from which the existing plug and surplus length can be removed before re-connection.

The next step is to connect the two purple IF output leads to the other coax socket (that with the red collar should be connected to the feed-through nearest this socket) and thence via the feed-through to the centre of the socket, a very small piece of wire being required here. The lead with the blue collar should be fed through any convenient aperture and connected to the outside of the socket, except where

earthed output is desired when it may be connected to an adjacent earth point, as must be the outer of the socket itself.

All that remains to complete the wiring changes is to connect up to the plug and socket being used for the power supplies. To recap for a moment, we have: one white lead, 6.3 volts; one purple lead, 150 volts stabilised HT;

Table of Values

Fig. 3. The RF Unit No. 1 circuit complete

C1 = 470 $\mu\mu\text{F}$	R2, R6 = 1 megohm
C2 = 15 $\mu\mu\text{F}$	R3, R7 = 2,700 ohms
C3A, C3B, C3C = 25 $\mu\mu\text{F}$ triple gang	R4 = 33,000 ohms
C4, C5, C6, C7, C8, C10, C12, C13, C17, C18, C19, C20, C21 = .001 μF	R5 = 100 ohms
C9 = 10 $\mu\mu\text{F}$	R8 = 47,000 ohms
C11 = in IFT	R9 = 330 ohms
C14 = 100 $\mu\mu\text{F}$	R11 = 1,000 ohms
C15 = 47 $\mu\mu\text{F}$	R12 = 22,000 ohms
C16 = 4.7 $\mu\mu\text{F}$	R13 = 4,700 ohms
R1, R10 = 10,000 ohms	RFC1, RFC2, RFC3 = Heater chokes, as fitted
	L1, L2, L3, L4 = Coils as fitted
	V1 = EF93
	V2, V3 = EF91

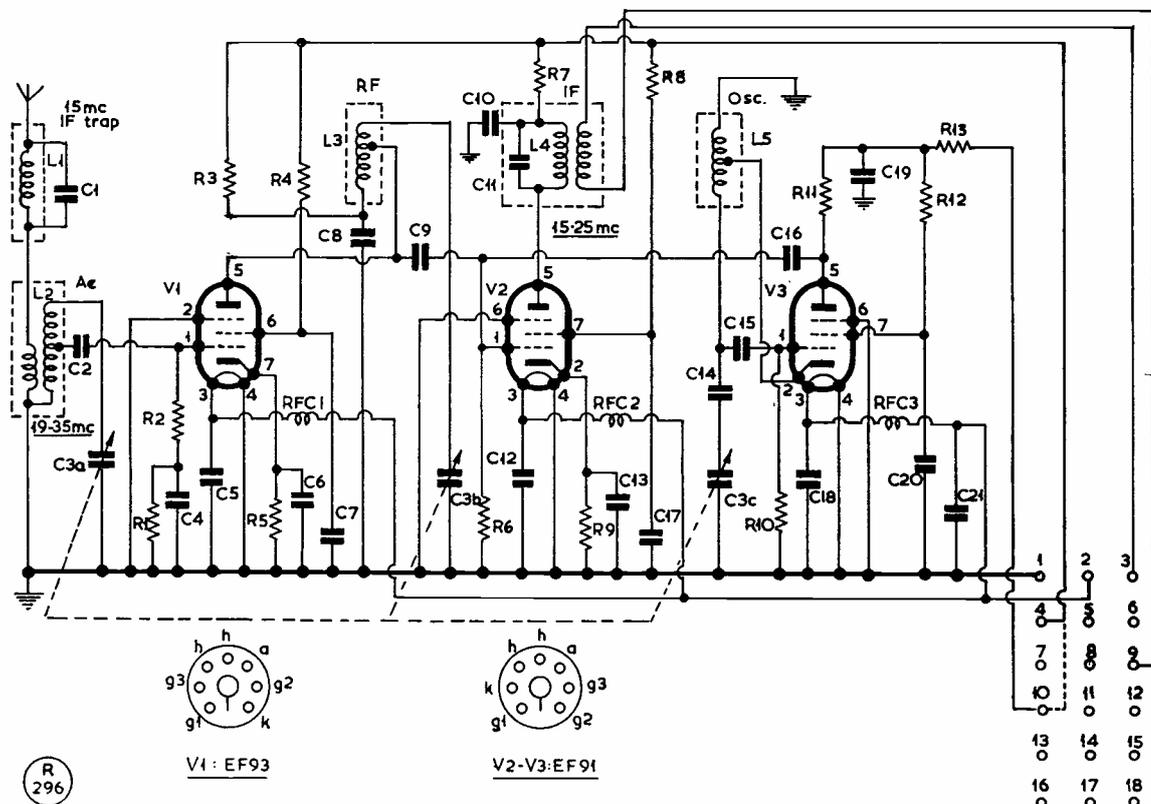
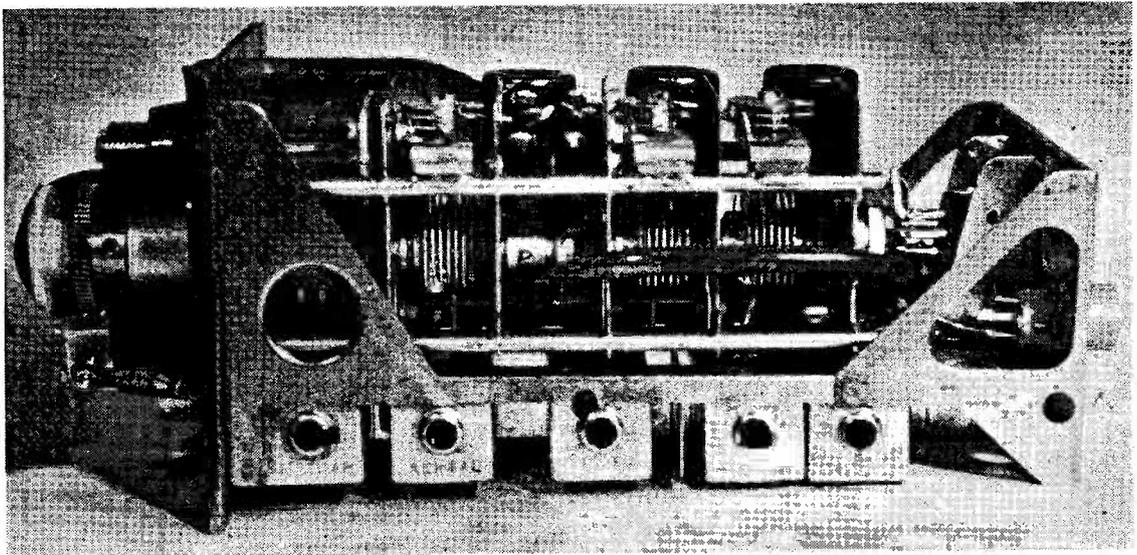


Fig. 3. Circuit of the RF Unit No. 1 as modified to work as a converter for the 21/28 mc amateur bands. By comparison with Fig. 2 it will be seen that there are only a few circuit changes involved "below the line," mainly in connection with the heaters and the power socket. It should be noted that the RF Unit No. 1 has been described, incorrectly, as "RF-24, New Type" and "Band 1 RF Unit," whereas it is far superior to the old RF-series units and does not tune Band I (41-68 mc) as now known. The RF Unit No. 1 tuning 19-35 mc, uses Mullard EF91 and EF93 valves, which are in the current range of Services preferred types. In the circuit above, pin connections are: 1, Earth and common neg.; 2, 6.3v. LT; 3, IF output; 4, HT 200-250v.; 9, IF, earthed if balanced output not required; 10, HT 150v. stabilised; if stabilised HT is not being used, pins 4, 10 should be bridged.

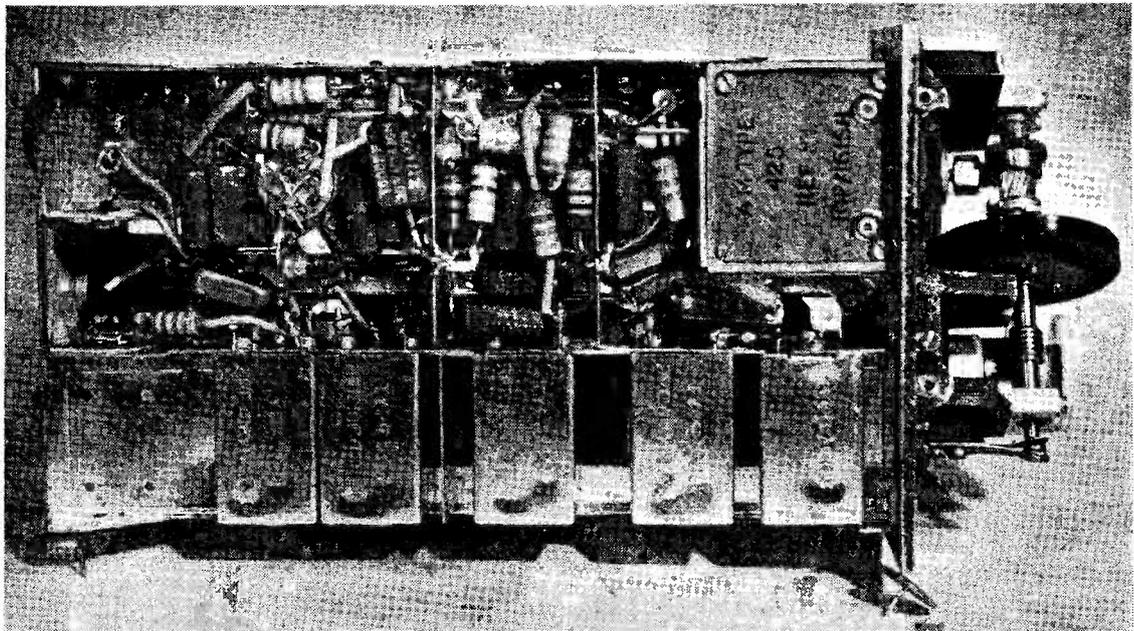


Side view of the Unit, showing the new run of coax cable from the rear panel down through the micro-switch aperture and thence to the IF trap. All these photographs show the RF Unit No. 1 (A.M. ref. : 10D/19197) to be a compact and well-constructed piece of apparatus and a considerable advance on the RF-24/27 series.

two red leads, 200/250 volts HT. The two black leads are common negative and earth, and should be connected together on one plug pin.

Assuming that all the above work has been successfully completed, the outer casing can be replaced after the addition of two holes

which will be required to give clearance to the new coax sockets; these should be mounted and secured with countersunk screws or bolts, in such a way that no interference is apparent when the outer casing is replaced. If desired a few holes of about $\frac{1}{8}$ in. diameter may be drilled in the outer casing immediately above



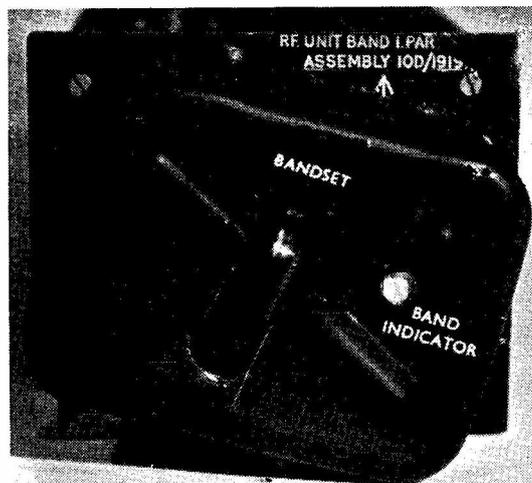
General view of the Unit below chassis, showing the termination of the aerial input coax cable at the IF trap, at lower centre of the compartment at upper right. The box in this compartment contains the suppressor components, not required for the application discussed in the article.

the valveholders, and also in the side of the case near the RF chokes and in line with the bottom of the valve cans, for the purpose of convection cooling. It is advisable to fit four small feet or mounting rubbers on the base of the outer casing, as in its normal state the unit does not stand on an even keel owing to the greater dimensions of the front panel.

Tuning Control Modification

A suitable method of operating the tuning condenser manually at a speed consistent with good station selection is desirable. It is a feasible proposition to remove both the upper and lower shafts complete, and to take off the pinion on the end of the condenser tuning spindle, substituting a reduction gear and extension spindle in its place. However, a very good slow motion drive, free from backlash, was devised as follows: Remove completely the lower shaft with its associated parts, including the slipping clutch. Take out the upper shaft, and file or cut away the lug which projects from the brass flange, to which is attached the large fibre pinion. Next, procure a disc of plastic or similar material (one of those which are found under the knobs of ex-W.D. Morse keys is ideal for the purpose), and hole the centre of this disc so that it will just fit over the outside diameter of the brass flange already mentioned; then, with a touch of adhesive, secure the disc to the face of the fibre pinion, in effect increasing its diameter. The complete assembly should now be replaced (upper shaft only), on the front panel, but it will be necessary to file a small recess in the lower reinforcing rib of the front panel (after marking off) to accommodate the larger diameter of the plastic disc. It will be found after bolting up the assembly that finger tip control of this disc enables one to tune the converter gently and accurately, with freedom from backlash.

The next move is to provide a method of indication of when one is tuning the 21 or 28 mc bands. The simplest way of doing this is to add to the front of the condenser spindle pinion a small section of dowel rod, slightly less in diameter than the pinion itself and approx. $\frac{3}{8}$ in. thick; this is fixed to the face of the pinion with adhesive and the front of the added part is either painted white or treated to a surface of some light coloured material. A slot should be added to the front panel cover to accept the plastic disc, which will be found to project just about the right amount for this type of tuning knob. Further to this, and again with careful marking off, a $\frac{1}{4}$ in. or $\frac{5}{16}$ in. hole should be made at about 5 o'clock to the centre



Panel plate of the RF Unit No. 1 as modified by G3APA. The thumb-disc tuning gives smooth and easy control through the 21-28 mc bands; this could, however, be improved upon by a dial assembly, with the conventional calibration markings. It should be noted that the legend "RF Unit Band 1" refers to a Service Band 1 of 19-35 mc, which bears no relation to the Band I (41-68 mc, TV) of the present time.

of the condenser spindle and within the area of the outside perimeter of the condenser spindle pinion. When the cover is replaced after this has been done, it will be found that the marked surface of the disc will now be visible in the little window; it remains only to find the 21/28 mc bands and to mark off with a pencil or coloured crayon that portion of white showing in the window when the bands are located.

When the condenser control has been modified to cover the whole 360° the 21 mc band will be found in two positions on the tuning dial; the correct 21 mc position is of course, that which is reached first when tuning HF to LF.

Those who prefer to use a method of tuning and band indication taken directly from the condenser spindle *via* components of their own choice, which exclude those supplied with the unit, might well present mobileer friends with the motor, shafts, cams, micro-switches and so forth, for these items could easily be built up into a remote aerial tuning unit which, housed in the boot of a car, could be operated from the driver's seat.

If it is desired to use the unit purely as an RF amplifier, the EF91 oscillator valve at the rear (*see* Fig. 1) should be pulled out. The main receiver is used to tune the 21 and 28 mc bands in the ordinary way.

It would appear at first that these instructions are perhaps too complicated, but once work has

commenced it will be appreciated that the conversion is simplicity itself, provided they are followed in detail.

Those who intend using the station receiver for supplying the unit with power, might dispense with the IF output coax socket, and connect instead to any two spare pins on the power plug which are in turn (by the addition of a pair of leads to the power cables) connected to two contacts on the inside of the receiver and thence to the aerial input circuit. Due care must be taken if the converter is to be used with

a receiver having its negative line above earth.

In conclusion, it is repeated that the object of this article is to help in getting the unit on the air, in a presentable form. However, those with an eye for a real *de luxe* modification might seriously consider crystal control, and perhaps a new case to house the unit. But whether the trimmings are to be supplied or not, the owners of R.1155's and similar receivers will find that the addition of two extra HF amateur bands, at a reasonable cost and with very little effort, is a worth-while investment.

HONOURS AND AWARDS

In Her Majesty's Birthday Honours List published on June 13, the honour of K.B.E. was conferred upon Air Vice-Marshal L. Dalton-Morris, C.B., C.B.E., A.O.C.-in-C., Signals Command, Royal Air Force, Air Vice-Marshal Dalton-Morris is a distinguished signals officer, and has held the highest appointments open to officers of the Signals Branch of the R.A.F. Many years ago, he was on the air from Iraq under a YI callsign. Latterly, when serving at the Air Ministry as an Assistant Chief of the Air Staff (Signals), he was largely responsible for obtaining for the R.A.F. Amateur Radio Society the official recognition and support that it now enjoys.

Another interesting award in the same Honours List was that of the C.B.E. to Gp/Capt. G. R. Scott-Farnie, managing director of International Aeradio, Ltd., who is well known as G5FI on the HF bands. He was GW5FI of Merthyr Tydfil in pre-war days, and entered the Royal Air Force through the original R.A.F. Volunteer Reserve in 1938. With his practical knowledge and experience as a radio amateur, G5FI made rapid progress in the Signals Branch; in 1944 he was promoted to group-captain, a rank attained by very few officers who had come into the Service through the Volunteer Reserve.

SMALL ADVERTISEMENT—BIG BUSINESS

The June issue of SHORT WAVE MAGAZINE, published on June 5, carried among the small advertising an offer by a reader of a quantity of gear to the total value of about £120. By Monday, June 8, three days after the advertisement appeared, he had sold £99-worth of this equipment to callers for immediate cash.

THE ZL AMATEUR POPULATION

Though recently the ZL's may not have been heard much on the DX bands, due to vigorous sunspot activity, there are nevertheless a good many of them. The latest ZL Call Book, incorporated in the June, 1959, issue of *Break In*, shows a total of some 2,800 ZL's in the four New Zealand districts ZL1-ZL4. N.Z. amateurs are licensed for all our bands, plus 11 metres (26.96-27.32 mc) and 6 metres (51-53 mc); their Top Band allocation is 1875-1900 kc only, but they have this virtually clear. The N.Z.A.R.T. (New Zealand Association of Radio Transmitters) has local representation at some 60

branches throughout the country. New Zealand is sparsely populated and the distances quite considerable—though the total population is barely 2½ million, it is about 1,200 miles between the furthest points of the ZL1 and ZL4 districts.

VISITING TIGER RADIO

We are asked to say that readers who may be in the Bournemouth area have an invitation to visit the works of Tiger Radio, Ltd., at 136 River Way, Christchurch, Hants., when H. S. Simmons, G8VB, will be glad to show them round.

AMATEUR RADIO EXHIBITION

This Exhibition, for some obscure reason called the "Radio Hobbies Exhibition," will be held during the period November 25-28, inclusive, at the Royal Horticultural Society (Old) Hall, Westminster, S.W.1—the same place as for the last two years, where there are ample facilities. As before, the Exhibition is being organised and managed by P. A. Thorogood, G4KD (35 Gibbs Green, Edgware, Middlesex). We shall be there as usual, on Stand 19 this time.

F.O.C.'s 21st ANNIVERSARY

It was in August, 1938, that the First-Class Operators' Club was born, of an idea conceived by the late G5BW. The pre-war president was John Hunter, G2ZQ, in his time a very well-known U.K. amateur, who lost his life in the last war. The revival of the F.O.C. post-war occurred in 1946, under the *aegis* of SHORT WAVE MAGAZINE. The Club is now independent, and has a membership limited to 350. A condensed history of the F.O.C. appeared in our issue for February, 1957. The present chairman is G8VC, and the hon. secretary L. Belger, G3JLB, 103 Whitehill Road, Gravesend, Kent. The Club annual dinner in London on November 28 will be the anniversary celebration.

R.N. ACTIVITY LIST

We are asked by GW3ITD to publish his proposal to compile a comprehensive list of all licensed amateurs who have, or have had, any connection with the Royal Navy. The intention is that the list should appear in one of the monthly Naval magazines. Those concerned are asked to forward name, callsign, rank or rating and ship or establishment, if serving, to: M. R. Davies, GW3ITD, Rhosylwyn, Llanbyther, Carmarthenshire, South Wales.

Improving the Panda "Cub"

DESIRABLE MODIFICATIONS TO A COMMERCIAL DESIGN

J. W. SWINNERTON (G2YS)

As our contributor explains, there are several ways in which this popular little transmitter can be improved, without in any way affecting its essential characteristics. Even if they do not wish to carry out all the suggested alterations, Cub owners will find this article of great interest.—Editor.

THE Panda "Cub," a versatile and moderately priced transmitter, has been deservedly popular for a number of years. But, in combining the advantages of compact size with all-band operation at a price to permit semi-mass production, the makers have had to adopt several technical compromises. For the exacting user these limitations can become irksome, and it is the purpose of this article to suggest several desirable modifications to the design which can be carried out quite easily and cheaply.

While individual models will vary somewhat in performance, the main points requiring attention are :

- (a) Chirp when keyed on the higher frequencies,
- (b) A ripple on the carrier, more noticeable on the higher frequencies and when

the "low power" output is in use.

- (c) Lack of break-in facilities, due to continuous running of the VFO which blankets the operating frequency on "Send."

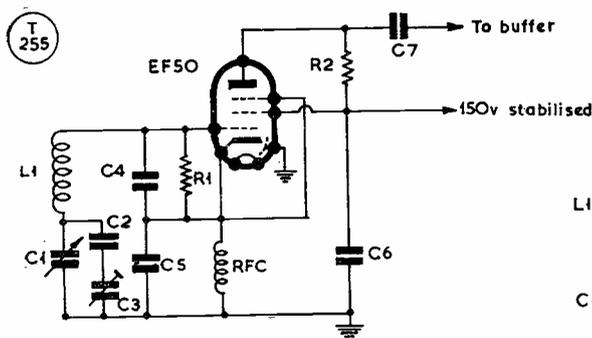
It was therefore decided to replace the VFO circuit and valve by one giving more output and better stability, and to substitute a continuously variable output control for the "high/low" power switch. Break-in and netting facilities were obtained by modifying the netting switch in the manner to be described.

The New VFO

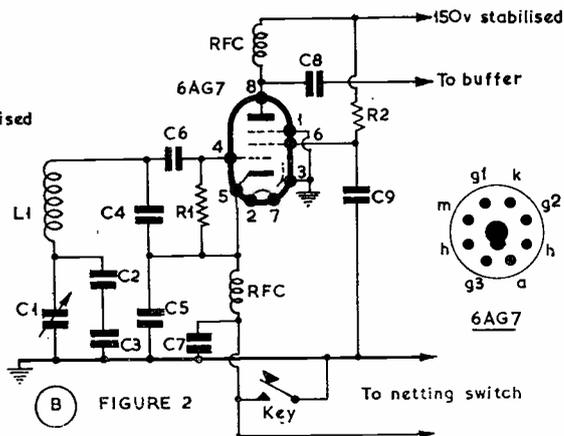
In the redesigned VFO a 6AG7 valve was used in place of the original EF50, while the tuning circuits were retained. The new circuit was taken from the ARRL *Handbook* (1958 Edition, p. 150) with two modifications ; an RF choke instead of a tuned output circuit, and a keying jack between cathode RF choke and earth. The original and modified circuits are shown in Figs. 1 and 2, below.

Many will argue that this method of keying tends to introduce the very chirp which it is desired to eliminate, but the writer has employed this system for seven years and even on ten metres has never received a single report of chirp. This is achieved by stabilization of the VFO HT supply, isolation of the VFO by a buffer stage (both of which are already built-in) and careful choice of circuit values determined by experiment. The correct VFO screen voltage is a particularly important factor in eliminating chirp.

The VFO cathode lead is brought out to the tag block mounted on the end of the diecast



A FIGURE 1



B FIGURE 2

A before-and-after drawing to show the VFO circuit modifications to the well-known Panda "Cub" transmitter. Fig. 1 is the original VFO, in which L1 is the grid coil ; C1, C2, are 10 $\mu\mu\text{F}$; C3, C7, 100 $\mu\mu\text{F}$; C4, C5, 350 $\mu\mu\text{F}$; C6, .001 μF ; R1, 100,000 ohms ; R2, 47,000 ohms. The circuit as modified is at Fig. 2. The original grid circuit is retained, the valve is changed to a 6AG7, and the resistor values are as in Fig. 1. Capacities shown in Fig. 2 are : C4, C5, C9, .001 μF ; C6, C8, 100 $\mu\mu\text{F}$; and C7, .01 μF .

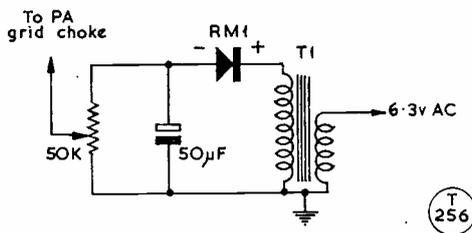


Fig. 3. The PA bias supply. The bias control can be a 50,000-ohm potentiometer, but the value is not critical. T1 is described in the text.

box, where a spare connector can be provided by redistributing the leads already connected to the block. The lead is continued through the adjacent grommet to the keying jack. (To remove the VFO box it is necessary first to unclamp the smoothing condensers beneath the chassis and move them until the VFO fixing screws are exposed.)

An Effective PA Bias Supply

Power reduction on the Panda "Cub" is normally effected by a switch at the rear of the chassis which transfers the input reservoir condenser to the other side of the smoothing choke. But while this does reduce the output voltage, the extra capacity on the output side of the power pack is insufficient to prevent a noticeable ripple from getting through to the carrier.

It was therefore decided to connect the reservoir condenser permanently in the conventional way and to arrange power reduction by means of a small variable bias supply located on a vacant space on the rear end of the chassis. The power reduction switch could then be removed and the potentiometer for bias control fitted in its place.

Since some 90 volts bias is more than enough for the 807 valve, a mains transformer with such an output may be hard to find. The problem was finally solved by the inspiration of G3JBR, who suggested using a filament

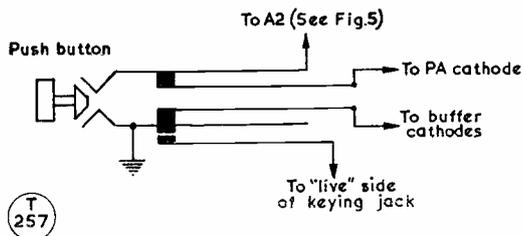


Fig. 4. The original netting switch leads are no longer required, and are removed. When the switch is rewired as shown, the buffer/PA cathodes are disconnected on "net," while the key jack is shorted to earth.

transformer in reverse. A TV tube booster transformer was found to be ideal for the purpose, since when the 13.5 volt side was connected across the transmitter filament supply about 90 volts appeared across the original primary. Used in conjunction with an RMI rectifier and a 50,000-ohm potentiometer (see Fig. 3) this provided a tidy and efficient method of varying the PA standing current between 5 and 60 mA, merely by adjustment of the potentiometer. This bias pack is also quite small and compact.

Keying

In the original circuit the doubler and PA cathodes are keyed, but now the former was connected direct to chassis, while the buffer and PA cathodes were connected to the netting switch, as in Fig. 4. A set of contacts on the main "CW—Off—Phone" switch (A2 on the maker's circuit diagram) was no longer needed for shorting the keying jack for phone opera-

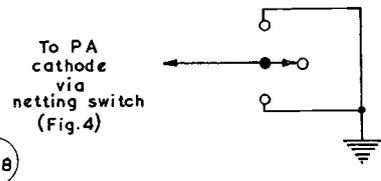


Fig. 5. Rewiring of the A2 switch, originally intended to cut out the keying jack for telephony operation.

tion, and these contacts could therefore be used for on/off switching of the PA (Fig. 5). It now became possible to leave the transmitter switched on with the key up, with the standing current drain of the intermediate stages and PA as a useful adjunct to power supply regulation; in fact, measurement of the HT voltage showed a variation of only 1% between "key up" and "key down" conditions—which is very satisfactory by any standards. Restoration of the netting facility now only remained to be tackled.

The Netting Facility

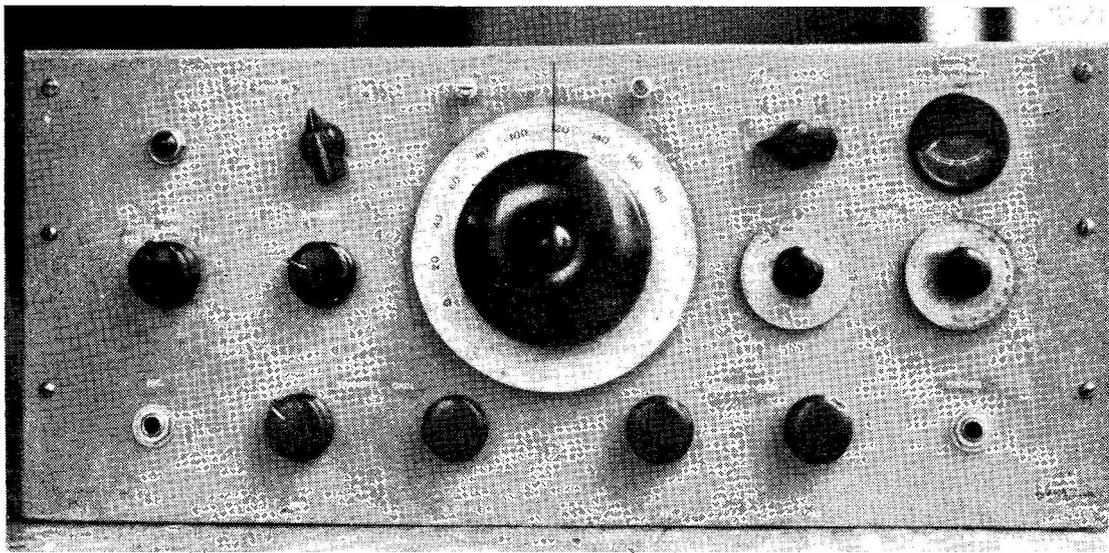
In the original circuit netting is effected by pressing a switch button which applies HT to the VFO only, but the output is weak, particularly on the higher frequencies, while the reduction of HT voltage on full power transmission tends to pull the VFO several kc from the net position. The greater output of the 6AG7 oscillator and the stabilization of its plate supply effectively cured these defects, but led instead to an over-powerful netting signal.

This was reduced by modifying the netting switch to make fuller use of the contacts provided in order to disconnect the buffer and PA cathodes on pressing the button. The feed-through from the VFO, although not enough to drive the PA, is therefore kept to the minimum for adequate audibility on all bands.

Results

The modifications described above have gone a long way towards remedying the shortcomings of this useful transmitter. The tendency to

chirp has been eliminated except for a barely discernible amount on ten metres, while the problem of ripple has been improved to a point where only additional smoothing would be likely to effect a cure, and for this there is little room on the chassis. The netting and break-in facilities are all that the CW man should require, while the variable power input enables more efficient operation with ten watts input and a correctly loaded PA than was possible using the original circuit.



Front panel layout of the G3CCN SSB Transceiver, running 60 watts on 14, 21 and 28 mc, combined with a receiver having a crystal-controlled oscillator, tunable IF and crystal lattice filter. The panel size is 18 ins. by 7 ins. and operation on either CW or phone is entirely automatic, in that change-over is by VOX control in either mode — see text.

An SSB Transceiver

INTERESTING PRACTICAL
DESIGN

From Notes by G3CCN (ex-VS1HS)

THE complete station of G3CCN (ex-VS1HS) — except for key, microphone, phones, aerial and power pack—is shown in the photographs; the chassis size is 16 ins. × 10 ins. and the front panel size is 18 ins. × 7 ins. All components used are inexpensive and mainly Government “surplus.”

The unit as shown comprises a CW or SSB transceiver covering the 14, 21 and 28 mc bands, with one pre-selected 100 kc segment

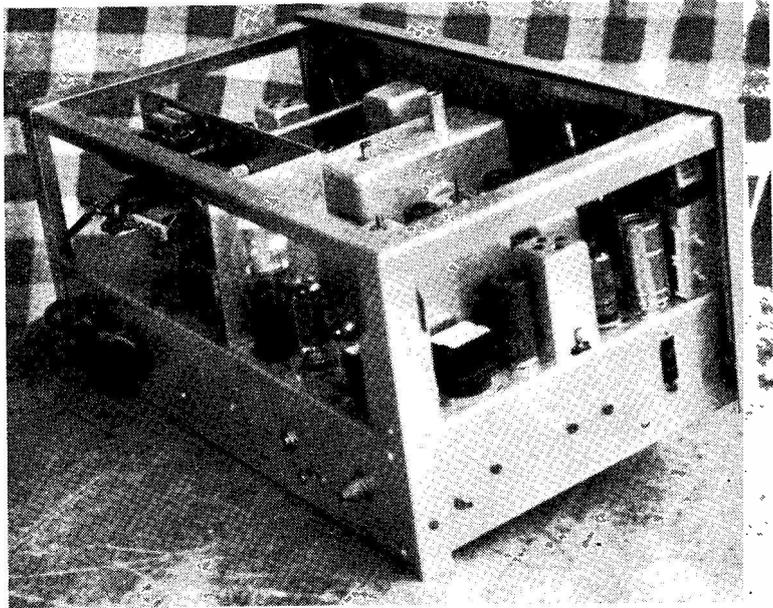
of each band selectable from the front panel. The transmitter section is normally on the same frequency as the receiver, but a front panel switch allows the transmitter section to be “unlocked” from the receiver tuning and placed on crystal control. There is no manual switching for “transmit”; either speaking or keying automatically switches the transmitter on and a short pause returns the set to the “receive” condition. The keying is monitored in the phones when using CW.

The receiver section comprises: RF stage, crystal controlled mixer, tunable IF, two IF stages with crystal lattice filter for upper side-band selection, selectable product or diode detector, audio amplifier, and output pentode stage.

The Tx section is a crystal-filter type SSB

transmitter, with a 6146 in the final amplifier running at 60 watts. VOX circuits are included and operate on both CW and speech; CW operation is accomplished by a keyed audio oscillator which feeds into the audio amplifier chain. All oscillators in the transceiver are common to both "transmit" and "receive" sections.

This equipment was used in the last three months of operation by G3CCN as VS1HS, from where 86 countries were worked on two-way SSB.



Looking into the three-band SSB Transceiver, with the PA section at upper left. The receiver unit is at near right, with the VFO section in the middle box. The coverage is 100 kc on each of the three bands tuned. This very fine Transceiver, size 16 in. by 10 in. by 7 in. deep, worked 86 countries on two-way SSB from VS1HS.

Photograph by the Author

SPECIAL-ACTIVITY AMATEUR STATIONS

During our absence, so to speak, several creditable efforts have been staged by local amateur groups.

On July 11, the *Portsmouth & District Radio Society* (hon. secretary A. C. Cake, G3CNO, 7 Wheatstone Road, Southsea, Hants.) put on G3ADZ/A and G3JZV/A at the Le Court Fete, the patients at which, as well as the visiting public, being given a convincing practical demonstration of Amateur Radio. The gear used included a modified TCS transmitter and an LG300. Numerous local amateurs and SWL's co-operated in this venture and a reasonable total of contacts was made under poor band conditions.

During July 15-18, the *Liverpool & District Amateur Radio Society* (hon. secretary H. James, G3MCN, 448 East Prescott Road, Knotty Ash, Liverpool, 14) had GB3AHD on the air for the Liverpool Show, gear used being a Tiger TR200/HF transmitter and Eddystone 888A receiver, with members' own gear for Top Band. In spite of the worst conditions, both DX and Wx, encountered for years at this Show, over 300 contacts were made in 34 countries. The GB3AHD stand included an equipment display, with descriptive posters, and special QSL cards were produced for the occasion. The public was most interested in all this and the Liverpool group has gained quite an increase in membership.

At a local sports day at Exeter on August 3, G3NFT/A was in operation on all bands, manned by South Devon amateurs and SWL's. The QSL

address is: B. C. Munro, G3FLK, 43 Prospect Park, Exeter.

The annual Friern Barnet Summer Show took place over August 21-22, with GB3SRA of the *Southgate, Finchley & District* on all bands 10-160 metres, and in continuous operation all through the Friday night. Just as this will appear the same group will again be in action with GB3SRA, this time at the Wood Green Show, London, N.22, during September 4-5, on all bands, continuous working. The hon. secretary is A. C. Edwards, G3MBL, 244 Ballards Lane, North Finchley, London, N.12.

Among future events are the expedition to Rathlin Island, 6 miles off the Antrim coast, by a party consisting of GI's 2DZG, 3HXV, 3JFX, 3KYP and 5UR who will be signing GB3RI during the period September 11-14. They will operate on all bands, including two metres, as opportunity and conditions offer. GB3RI contacts will be valid for WABC and WBC (Co. Antrim) and for WPX. The policy will be QSL—that is, only cards received will be acknowledged, by special QSL minted for GB3RI—and the QTH for cards is: R. R. Parsons, G13HXV, 45 Erinvale Avenue, Finaghy, Belfast, Northern Ireland.

For the week September 12-19, a station signing GB3SSW will be on the air for the Shipley (Yorks.) Shopping Week, with G2BXS, G3BOR, G3KSS and G3NFH responsible for the arrangements. All contacts will be QSL'd, by special card, and the QSL address for GB3SSW (how co-operative our G.P.O. is in this matter of callsigns!) is: D. W. Hudson, G3BOR, 37 Marlborough Road, Shipley, Yorkshire.

DX COMMENTARY

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

AS we were saying when we were interrupted, summer conditions this year have been rather depressing, but this is more or less normal when we are near a sunspot peak. The DX is already showing signs of returning, and we can look forward to a real boom during the months to come. Once we are off the peak, the DX will tend to smooth itself out, and there should be less difference between summer and winter conditions.

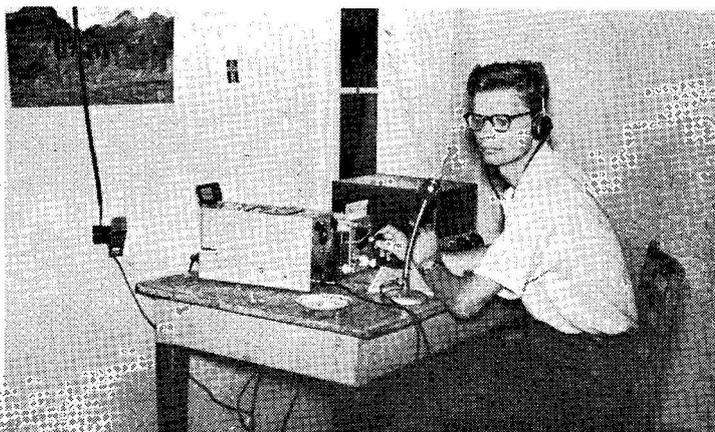
It is encouraging to see so much use still being made of the Top Band, even though we have been through the period of static and short hours of darkness. One-Sixty is an absolute hive of activity at times, and perhaps the mobile interest is in a way responsible for it.

One can hardly tune in a phone net without encountering a mobile station, and when one has "Top Band friends" scattered over the country, what better way to spend a holiday than to go on tour with a mobile? It need only be used at certain times and places, and obviously should not become one's master, but it really can provide a lot of enjoyment when treated in the right way.

DX Gossip

Much DX has come and gone since our last appearance, so this section is a highly condensed summary of all the news we have in hand concerning the rare ones, the new ones and the hard ones, past, present and future.

SSB operation from both Jan Mayen and Spitsbergen is now a possibility, according to LA6VC . . . EA2CA was on SSB from Ifni around June 16 . . . OK7HZ/



OHØNG

CALLS HEARD, WORKED and QSL'd

ZA operated SSB only, but was apparently not very active. Next calls, Greece and Turkey.

Exotic new call-sign for WPX-hunters — 8J1AA! It emanates from a Japanese Antarctic expedition . . . A mysterious VQ9XN was heard by a few 'chasers in late May and early June. Very doubtful! Another suspicious one was 9N1AC—*might* be genuinely in Nepal, but seems a little too soon.

KH6OR works YA1PB every day on 14 mc, AM, and will arrange skeds; he also acts as QSL manager . . . EAØAF has put that rare spot back on the air — on CW, too . . . 4G2H seems like the phoniest phoney yet—it doesn't even sound like a call-sign!

The customary Aaland Islands activity is promised again, and OHØ appeared on the air between July 8 and 16, controlled by OH2RD, OH3QC and OH3ND . . . CR10AA figures in these notes nearly every month; latest news is that he is still too busy to get on the air (but see next page).

CEØAC is active Wednesdays and Sundays, 0200-0300 on 14 mc CW . . . CE3AG has mailed more than 2500 QSL's for CEØZA! . . . CR7BS is now on SSB—the first in Mozambique . . . SP3PL is the first SSB in Poland, and is on all bands with 150 watts . . . If you hear the call KP4YT, hang on in case there's an interesting suffix; the same applies to his friend KP4WD, who has a yacht!

ZS2MI promises increased activity—new fuel supply has arrived on the island . . . ZD7SA promises SSB activity from St. Helena (if someone will send him a suitable rig!).

MP4DAA is frequently on 14130 kc phone — counts as Trucial Oman, by the way . . . Swan Island is represented at present by W4GQM/KS4 and W4JRD/KS4 . . . FP8 operation was promised for the latter end of August by two VE2's, 14 mc phone and CW . . . DL9PF was licensed as LX3PF for a Luxembourg DX-pedition, probably stale news by now. However, his promised Andorra trip as PX1PF was a roaring success, too. [over

During August the following were planned or promised: ZE3JO, 3JJ and 8JJ in ZD6-land, all bands, CW; VQ9ERR, Seychelles, with VQ4ERR and W0AIW handling CW and SSB; CR10AA, with VK5BV operating CW and AM.

Coming shortly, from VE3MR: outstanding QSL's from his trip to PZ1MR, FY7YF, VP3RO and PJ5AC . . . The long-publicised Socorro trip actually *did* happen in July, when XE4B finally took the air—but the pile-ups were at least 200 deep . . . Tannu Tuva cropped up again, with UA0KYA said to be there; UA0OM is the subject of yet another rumour, same place.

Certain 4X4's are located in Jerusalem and are therefore deemed to be ZC6's, for the benefit of the country-chasers . . . Nepal has actually shown up at last, with 9N1AC working a few W's on 14305 kc SSB. W1CJ is bound for those parts almost at once, and hopes to get a 9N1 call.

15GN has been very active on SSB, around 14305 kc, 1300-1400 GMT . . . FR7ZD has put Reunion Island back on the map . . . IL1AIM, operating from Lampedusa, has the same status as IP1ZGY—just another 11!

AC3PT (the Maharajah of Sikkim) has been asking for quotations for a 1 kW amateur station. . . YA1PB and YA1IW are planning a trip to AC5, VU4 and VU5—possibly for November . . . AC3SQ, who worked briefly as AC4SQ, is now in Bhutan, so look out for AC5SQ.

7G1A is genuine—in Guinea (same status as FF8AC/GN) and is a Czech amateur named Josef; QSL to OK1PD. . . The former JT1AA and JT1YL are now licensed as OK1KW and 1KX; they hope to appear soon on all the DX bands. . . OK1HI, familiar to many Top-Banders, died of a heart attack on July 1; he was a well-known amateur, and QSL manager for CAV for many years.

VP1EP is a phoney—the only genuine stations in that area are VP1EE, 1EK, 1HA, 1GLG and 1OLY . . . VR2DR is a newcomer, usually to be found around 14100 kc. . . ZA1KAC is yet another (as yet) doubtful one from

that notorious prefix area.

AC4AA is said to be on 21 mc phone. . . VS5GS, worked by G's on 21 mc CW, uses only 200-300 milliwatts to a whip aerial. . . MP4QAO is a new one on 21 mc phone . . . YJ1DL has been heard on 14036 kc C.W.

QRM Week-Ends

Stand by and start polishing up the rig for the following: **VK/ZL Contest**, October 3-4 (Phone) and October 10-11 (CW). "**CQ**" **DX Contest**, October 23-25 (Phone) and November 27-29 (CW). The "**CQ**" **DX Phone** event clashes with the **ARRL's** "CD Phone Party," so that might be a good week-end for CW-lovers! (Rules next month.)

Strays

G2DC (Ringwood) thought the ZL3DX tour was rather a flop because of conditions. He did hear him once as ZM6AC and VR5AC, working SSB and mainly to W's. G2DC was also told (by KV4AA) that the expected activity in Nepal *has* started, and that 9N1AA was worked on June 4 at 2230 GMT (14075) . . . VU5BB, said to be on 21050 kc, does not appear to be genuine . . . CN8AD/MM arrived at KV4 on June 8 and are proceeding towards Tahiti; they have an amateur crew of two.

G3HCL, G3ATU and G3LKC were due to be operating from Monaco between August 23 and 30 on 28, 21 and 14 mc, CW, AM and SSB, QSL *via* Bureau.

Already having been to Monaco just recently, 3A2CZ (at home, ON4QX) writes that he had a very busy time, making over 400 contacts with 62C in 26Z, all on 20-metre phone; the Tx ran 30-40w. to an 807, with a short single-wire aerial. The QRM was terrific, both on the air and off it. The Monaco Grand Prix was on (Stirling Moss had the room above ON4QX), and after that came the boat racing, with open exhausts in the harbour. ON4QX says that operation under a 3A2 call is difficult because, as Bob puts it: ". . . if one like to ask CQ-DX, everyone in Europe smash down the sigs . . ." The sole resident CW operator is 3A2CX, the

others working phone only, but not much due to the QRM factor. For those who had a QSO with 3A2CZ, the QSL address is: ON4QX, Everdystraat 33, Antwerp, Belgium.

News from Overseas

VP6WD (ex-G2WD and now resident in Barbados) tells us that he is at present the only VP6 using SSB and has to be quite brutal when pile-ups form. He will *not* work stations breaking in on a QSO, and if things get too bad he just closes down and tells them why. He is active between 1000 and 1100 and then again from midnight to about 0130, with a ground-plane on 21 and 14 mc.

To help the QSL expenses, Mac is getting some printed inside the standard air letter form, which will go all over the world at the equivalent of 6d.—good idea! Direct QSL'ing, he says, is almost unknown out there, and some VP6's will only send a bunch *via* the bureau once or twice a year. Many of the VP6 rigs are real lash-ups, but some are very good indeed. There's a Sunday morning net (on Forty) which goes round the West Indies and up to Puerto Rico and down to Venezuela.

UR2BU (Tartu) claims our WBC and FBA awards, and is ticking over for WNACA and PRA. He has also bumped up his Five-Band Table score once more. (Incidentally he bases it all on *confirmed* contacts only.)

ZL1ATQ (Russell) says SSB is getting a big hold over the ZL fraternity. He runs a 50-watt phasing rig and recently had an hour-long contact (both ends SSB) with ZL5AF at Cape Hallett, Antarctica, on 3820 kc. Note the frequency and the distance—2,500 miles. He adds that ZL1ACG recently worked three G's on 3.5 mc SSB and almost has his DXCC (Phone) on that band.

OH0NC (Mariehamn) is the only resident OH0 station who is even fairly active, and tells us that being as rare as he is can be a trial on the QSL department. However, he continues to QSL every contact, on receipt of the other fellow's card.

VO2NA (Goose Bay) bumps up his Five-Band position with VP9L (7 mc), HC1AGI (21 mc), EL4A (14 mc) and UQ2AS (28 mc). He adds that two new members of the GBARC are VO2GB and 2JH—both eligible for that WAG award.

G3BAA is now VK2AHO in Mona Vale, N.S.W., and hopes to be on the DX bands soon. G3JFC, who has also been known as VS1GN, VS4BD, VS5BS and ZC5GN, is now at El Adem under the guise of 5A2CW, whence he has raised 40 countries in three weeks.

MP4TAC has been on three months' leave in the U.K. but should be back by now. Usual times, 1600-1900.

VE3MR tells us that the T19 affray made 1200 QSO's on CW and 1100 on SSB. His later trip through PZ1, FY7, VP3 and PJ5 ran up another 3200, all SSB!

WØTGQ (Iowa City) confirms pretty definitely that one VP8BF, operating phone with a YL in the shack, was *not genuine*. (No YL's in Antarctica, anyway.) WØTGQ has been up to the other Pole, having operated /VE8 from the top of Ellesmere Island in 1952.

W6AM (Long Beach) puts his score up to 295 (275 on phone) with XE4B, and also climbs further up our Five-Band Table with some newly-unearthed ones. Most of his new phone round-ups are on SSB.

VS2DB got rid of his carrier recently, and despite warnings that he would not need his log book again for years, he has filled page after page of it with good DX. He runs a pair of 6146's in a single-ended AB2 linear, with ground-plane aerial.

VS4JT worked 160 stations in the recent 14 mc SSB Contest... VS1JW has a ground-plane made of beer-cans soldered together—16 feet 8 inches of them! Good idea for a broad-band aerial.

Miscellany

G2YS contributes an item in the "Stranger than Fiction" category, telling us that his friend 9M2HC has been put off the air by a woodpecker, which systematically drilled through a 40-foot bamboo pole until it col-

lapsed—aerial and all! (*Memo: Must inspect our oak tree to-day.*)

G4JA, back on the air after several years, says "I find the unwieldy phone nets on 7 and 3.5 mc discouraging and confusing to the newcomer wanting short, individual and experimental QSO's." Meanwhile he's in business trying to notch up his century with CW on the HF bands. He also says that the congestion at week-ends and holidays is closely parallel to the state of the roads; that the only part of the RST code that varies is the "S," the other two invariably being 5 and 9; that far too many kilowatt-hours are wasted on aimless and often hopeless CQ's, and that stations having no success in a pile-up must be crazy to stay on the same frequency and call CQ.

Another comment from G4JA—A bouquet to 90 per cent. of operators for their signals, procedure and etiquette, but this does

not apply to phone on the LF bands, where some of the cracks, sarcasm and general rudeness indicate that the official monitors of these bands must be very broad-minded.

VK5QL has closed down after three years and is now back home with his original call of G3KQL at Canterbury. He won't be on the air until he moves to another QTH in a month or so.

GM2DBX (Methilhill) is still not active, but reports and keeps his score in the Five-Band table. We hope to find him back on the bands at S9 one of these days.

G3KDX (Compton Bassett) is the victim of a pirate or of a misread call-sign; he's been off the air for three years, but cards still arrive. If you work a "G3KDX," he says, it *can't* be the genuine article.

G3FJW (Ilford) is another victim of these strange gents who like using someone else's call; he says that he has been off the

**FIVE BAND DX TABLE
(POST-WAR)**

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries	Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
DL7AA	921	113	171	249	203	185	267	MP4BBW (Phone)	330	1	5	126	120	78	163
G3FXB	803	75	131	222	213	162	261	G6TC	321	18	68	128	67	40	146
G2DC	775	84	113	232	192	154	260	G8DI	302	30	59	88	72	53	125
G5BZ	773	64	118	263	201	127	273	G2BLA	291	32	54	69	71	65	116
G3DO	683	24	47	246	187	179	273	G3DNR	277	10	23	89	74	81	126
GW3AHN	653	16	55	199	239	144	259	UR2BU (Phone)	274	2	11	86	90	85	129
G3BHW	585	15	35	196	189	150	234	VO2NA	260	19	34	107	64	36	117
G3ABG	571	51	88	185	127	120	212	G3WP	253	17	34	80	24	98	136
W6AM	565	40	68	295	96	67	295	G3BHJ	250	8	27	30	115	70	140
G2YS	515	72	92	164	112	75	180	G3MCN	247	4	6	55	120	62	150
G6VC	433	38	55	154	110	76	180	G2DHV	243	21	27	127	51	17	140
G3IGW	432	44	71	108	111	98	157	W3HQO	212	3	8	67	105	29	140
GM2DBX (Phone)	427	34	31	160	102	100	176	G3NBE	202	17	25	58	23	79	109
G3LET	423	24	80	173	106	40	190	G3LHJ	194	5	23	94	55	17	111
W6AM (Phone)	420	23	62	275	49	31	275	G3MJL	173	8	40	33	29	63	92
UR2BU	383	16	35	129	110	93	158	G3MMP	166	5	24	34	42	61	85
G3AKU	380	47	80	147	43	63	147	G3NAC	158	5	20	44	64	25	84
G3FPK	378	36	79	123	87	53	153	G3DNF	150	7	31	45	40	27	67
G3JZK	378	17	60	85	126	90	175	G3IDG	122	11	15	32	27	37	54
ZB1CR	360	1	6	101	118	134	168								

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

air for six years, and it's pretty galling to think that he pays his licence fee for the benefit of someone else using the call. Any station signing G3FJW is *not* genuine—please note.

The "Scroby Sands Expedition," G6ZG/A, worked 76 stations during their sortie on July 18/19. Most of their communications with "base" (Yarmouth) went *via* PAØDES! We have received the *Scroby Times*, Vol. 1, No. 1, with an intriguing account of the whole venture.

G3NBE (Oxford), who reported regularly to this feature for some months, now leaves us to resume activity under his other call, VE7ASP. On the whole he thought the G location far superior to the VE7 for working DX, and in his eight months' operation he raised 102 countries.

TOP BAND COUNTRIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G3AKU	98	98
G2NJ	98	98
G3JEQ	96	97
G6VC	96	96
G3FNV	93	95
G3JHH	93	93
G2AYG	88	88
G3KEP	85	85
G2CZU	81	82
GM3COV	71	73
G2CZU (Phone)	67	68
G3APA	65	75
G3ADZ	65	72
GM2UU (Phone)	64	67
G3LBQ	63	69
G3LHJ	62	67
G3MCY	62	63
G3KON	60	72
G3LWQ	60	67
G3KEP (Phone)	60	62
G3JSN	57	64
G6QN	57	63
G3MCP	54	67
G3LNR	49	53
G3NEV	37	47
G2AAM	35	35
G3LNO	23	41

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

Look out for VE7ASP, who will be delighted to work G's.

G3BTC (Welling) suggests a new and intriguing sheepskin, to be called the WACARRLWR . . . that means "Worked All Countries ARRL Won't Recognise"!

G3FPK (London, E.10) mentions that he and G3KVF have met OH2IK, now in digs at Canning Town while gaining experience as a chemical engineer at the Beckton Gas Works. VU2AJ and VU2SW are also over here, under the Colombo Plan, and G3FPK hopes to take all these fellows along to Mobile Rallies and other social functions.

Around the DX Bands

No one seems to think much of *Ten* these days, but *Fifteen* and *Twenty* have been carrying their fair share of DX, and the patient chasers have not been slow to lap it up.

We are already past the longest day (depressing thought), so *Ten* will be improving, and the other bands going into conditions of partial darkness instead of staying open all night. On the whole, it has been the all-nighters who have reaped the best harvest, since much of the interesting DX has come up after midnight and during the small hours.

Ten Metres

G2DC found the CW activity just about *nil*, but worked phone with PJ2, PY, YV, LU and the like. G5BZ (Croydon) only mentions ZC4VI on phone.

G3FPK thought *Ten* very erratic, and was even pleased to get a couple of solid QSO's with DL7's at 2300 GMT (on phone). The next night there was nothing there. The only other QSO was with UA9CM on CW.

G3LHJ (Newton Abbot) made the best of a few openings and raised VS9AL, FQ8AF, ZS1FH (phone) and PY1HQ and OQ5ER (CW). G3DNF (Wembley) collected a VQ3, and G3IGW (Halifax) snared HE9LAA on phone.

G3MMP (Pinner) managed to find OQ5IG on CW and a DJ2 on phone. Others mention European contacts, but there doesn't seem to have been one single opening to USA.

Fifteen Metres

GW3AHN (Cardiff) stuck pretty closely to his favourite band, and was rewarded with two new ones—FB8CD and VR5AC. Among the rest were HS1E, KR6HS, VR2AZ, VS1's, 4S7FJ and MP4BCC, all phone, and DU1FM, FK8AT, UG6AW, VQ3CF, VS1's and ZE2JC, all CW. He thought conditions poor, especially in the mornings, when the band was sometimes dead for hours on end. However, VR5AC was worked on both CW and phone at 0930 on May 21.

In a later letter, GW3AHN lists the following: *Phone*, EA9DE, KC6JA, 11ZFF/M1, VR2AZ, 2BC, ZK2AB, 9G1BM, 9M2DQ; *CW*, FP8BC, HS1C, LX3PF, VS5AD and 5GS, 4S7FJ and 7G1A. XE4B, he says, was a dead loss.

G2DC says it's sometimes quite difficult to find a hole among the commercials and parked jammers, especially as the latter drift around. But he did raise CX's, HB1TC/FL, OA4FM, VP8EG, VP6, VS1, VS9, ZP5CF, PJ2AA, 4S7FJ and a load of VK, ZL, VE and ZS's.

G5BZ's log includes VS1, ZS, ZD2VPF, ZE, W6 and 7, VQ3, VE8 and a JA. The latter, JA3BP, was calling CQ at 2245 GMT, S7, and gave G5BZ S8. An unpredictable band, as he remarks.

A later list from G5BZ includes DU1FM, HC2IU, OA3D, OR4RW, FP8BF, YA1IW, ZE3JO/ZD6, 7G1A and many lesser lights.

G3FPK swapped CW with CX2BT, IP1ZGY, KS4BB, JA7AD, VP9DL and 4S7NG; two new ones on phone were VP4LP and 9M2GA. G3LHJ's new two-band Quad has fetched him *ten* new countries, and the bag on this band was 9G1CT, VR2AZ, VS1HU, FB8BZ, 9M2DW, VU2PS, HC5MT, ZD2CKH, EL2P (all phone) as well as CR7BN, EL4A, JA7AD, XZ2TH, FQ8AN and OA4FM on CW.

G3JZK (Cambridge) found the band good around midnight, when he worked YS1O, CO8JK, HC1FS, ZP5LZ and others. The 1500-1600 period rewarded him with 9M2DW and VQ8AD (CW).

G3LET (Westcliff) worked

VS5AD (2210), FP8BC and some VP9's.

G3JBL (Lancaster) reports for the first time (he's been on the air six years!). He uses the two-band Cubical Quad described by G3JYB in the October 1957 issue of SHORT WAVE MAGAZINE and wants to give the author a pat on the back for an excellent aerial. It brought him in "5 & 9" from 9M2HC and 9M2DW, the latter for an hour and ten minutes solid. Other DX of the month was EL1C, ZS8I, 4S7YL, HZ1AB, OQØPD, VP4LP, VP8CX, VU2PK, VP7BX and numerous VE, W, ZL and ZS stations. G3JBL says he has 198 TV aeriels in a 500-yard circle from his QTH, but he works all through TV hours and comes out with a clean sheet.

Best during June on 15 metres for G3FXB (Southwick) was VR5AC on phone, together with CP1CC, FB8CD (Comoros), HC5MT, VP4LF, VR2BC and 9K2AN. All these were on phone, and CW added UD6, UAØIJ (Zone 19) and UAØKUV (Zone 18). G3FXB was delighted to receive his phone QSL from JT1AA and can at last claim his WAZ on Phone.

G3NAC (Yatesbury) got his 50 watts of phone to HH2CL, HH2Z, YV's, VP5, 6 and 9, OA4BP and 4IP, VE6QG/SU, 9K2AY, 9G1CP and many others, but a ZP got away after being sat on for two hours. CW raised OA3D, PZ1AP, CE, LU, VS9, UAØ, UI8 and the like. G3NAC tells us that there is a net on 21 mc at 0200, week-ends, and a single round-up included VP6ZX, HH2Z, PZ1AE, ZL4BO with VU, VR2, VK2 and 4, 5A, VP1, VP5 and VP9 also in the QSO! This is on AM, around 21205 kc.

G3EHT, phone only, managed to snag VR2AZ and 2CC, VK9AD, HS1E, 4S7YL, KR6QB, 9M2DW and 2FX, HR1EE, VS1's, KH6 and PZ1AP. G3MMP's CW brought QSO's with EL4A, YO3CA and UD6AK; phone accounted for SVØWY, ZC4, HB9, VS1, HS1E, CT2AC and OA4FM.

G3IGW worked phone to DU6IV, HC5MT, HS1E, PJ5AC, VP8DS and YN1AB/4; CW with VS9MB, ZD7SA, 9K2AD, OQ5, VQ3 and XR2A; he would,



G3LHJ, Newton Abbot, S. Devon was inspired by his father, G3GDW, who was licensed in 1949. G3LHJ started as ZC4LW while on National Service out there. The present station is shown here, with the gear built into a home-made wooden rack. The main transmitter is a 7-28 mc VFO/Exciter/PA running 70 watts, with a separate 10w. Tx for Top Band, both feeding into a 1.8-28 mc ATU. Aerials are a 132 ft. wire for the LF bands, a 14 mc dipole, and a two-band Quad for 21/28 mc. Receivers are a modified R.208 and an R.1155A. An interesting additional item of equipment is a portable 160-metre Tx/Rx using 1.4v. miniatures, running CW and phone. Main interest at G3LHJ is CW working, the score being 111C. On Top Band 66 counties have been covered.

naturally, like to know more about the latter, but no one else even mentions him.

EI6X (Limerick) now has a more robust Quad up (he lost his old one in a gale). On Fifteen it has produced the following new ones: KB6BH, HKØAI, 9K2AL, HZ1AB, KG4AR, XW8AL and VS9AH. Quite a stack of other DX was also raised. EI6X has now worked 154 countries, all AM, with his home-brew rig.

G4JA collected VQ4HT, VQ2NN, ZS, 9K2AD, along with JA, ZC4, PY, LU and all W districts. G3BHI (Norwich) raised CX2BT and UD6KAB on CW, CT2AI, CX6AS, EL6D, JA, KR6, TF, VP6, ZD2CKH, ZP5ET, VS1JF and 9M2FR on phone.

G3LDI (Norwich) worked TI9CW and IP1ZGY last June;

more recently he called "CQ Pacific" and back came KH6BDV/KJ6, who actually asked for his QSL, as G3LDI was his first G! Others raised were CX, EA6, EA9, 9G1, XZ, OA, OD and HS1E. All on 100 watts CW or 40 watts "clamp" phone, with a 66-ft. Zepp.

Twenty Metres

GW3AHN was one of the lucky ones (not very numerous) who raised OK7HZ/ZA. He found him fairly easy to get with 25 watts of AM, and says it was very enlightening to listen to the pile-up and note that even people with a score of 280-plus can get very hot under the collar. When you reach that rarefied status, it seems to be a *gaffe* of the greatest magnitude if you are not immediately

successful!

G3JZK raised XE1AX, YK1AT, UI8KAA and UG6DP in early-morning sessions; G3LET mentions VP5ME, FB8CE, VQ5EK, MP5BCU and HK4JC.

G2DC says that despite the short-skip nuisance Twenty is still the best all-round band. Three new ones for him were IS1ZEI, PJ2AV and HK4JC; others included LX2DC (a possible "stinker"), VE1-7, VK3-7, ZL1-4, KH6, KL7, ZS1-4, VS1, CX, OA, ZP and lots more.

G5BZ quotes VQ4HT, VK5BZ, UA9, UA0. PY's, W6 and LU; he's still spending too much time up a ladder (literally) to climb any higher up the DX variety. A more recent list from G5BZ mentions EA9IA, FP8BD, 7G1A, CE8AA, LA1VC/G, PX1PF, VS9MC, XZ2BB and VS1BB (long path), together with all the more usual customers. G2CZU was pleased to raise W7NBB (Montana) with his dipole and 20 watts.

G3FPK spent little time on this band (CW only) but raised VO2AW, VQ2GW, VQ4HT and YV5AE. G2BLA worked ZD7SA, ZS6IF, HB4FB/P and a WA2, the latter being new ones for WPX. His new aerial is a 102-ft. top with 87-ft. open-wire feeder.

G3FXB raised the OK7HZ/ZA character, who isn't too well up in the pile-up technique and doesn't seem to do much CW at all. G3NAC worked VO2RC on phone, UQ2 and ZS1 on CW. Later on he raised PY7AGY and a bunch of Europeans including LX3PF, LZ, UQ, IS1; also UI8 and UA9's. G3DNF pulled in a UA9. G3MMP worked UC2, UQ2, UA9 and SV0KX. G2YS raised VP4TR on CW.

G4JA's list includes VU2BK and 2RA, KG1AQ, KH6 and KL7, ZD2MW, EL4A and, of course, VK, ZL, PY, LU, KV4, KP4 and so forth. G3BHJ, with phone, mentions KR6DI, MP4BCC and OK7HZ/ZA.

Forty Metres

G3JUX (Stone) sends his very first report, entirely on his 7 mc doings. He has been putting a new Windom through its paces, and on three days of operation raised

UN1AH, LX3PF and two W3's; gotaways were ZB2A and UO5BW.

VQ4GQ (Nairobi) is interested in building up a good total on this band, and says that 1930-2130 GMT is the best period for G's. Practically all CW is in the bottom 20 kc, and in this small slice he worked UA1, UO5, UA0, SM2 and one U.K. station—G3NAF. He can hear virtually all-Europe but not many of them seem to get his own signals. Previously VQ4GQ had a dipole up, but now runs the 102/87-ft. type; look for him, 1800-2200 GMT most evenings.

G3LET transferred a lot of his attention to Forty and was pleasantly surprised. VQ4's have frequently been heard around 2000, with PY's in plenty later on, but not many W's. Worked between 1830 and 2000 were VQ4AQ, 4FK, 4FO, 4GQ; at other times CX6CB, YV5HL, VP6RG, ZS6BK, 5A2CV, LX3PF, SU, ZB1, ZB2 and VP9. CR4AX appears occasionally and a tremendous pile-up forms, but he is actually on 14 mc and quite oblivious of it all!!

G3NAC raised an EA, a YU, an HA and W4NPT—all new for this band. G3FPK discovered that the shocking noise around 6920 kc switches off at midnight, so he stayed on and enjoyed some DX in relative comfort. Among the month's bag were CN8JX, CT2BO, EA6AZ, GD, HB1TC/FL, OX3DL, PY's, TF3AK, UA9, UF6 and YV5HL.

G3LPS (Blackburn) worked CT2BO, CN8, PY's, UA9, UF6 and some W's. Heard, but not worked, were YV5HL, YV6BS, OA4FM, HK4AD and ZP5HK; a report was received from G3BGJ in a DC4 aircraft, on the ground at Perth, Western Australia—on a BC-348 and the fixed aircraft aerial; good going, that, for Forty. Late flash from G3LPS—he worked UL7JA and YV5HL for new ones, also LU4LRM, LX3PF, PY's and UA9's.

G3LNR (Nottingham) raised LX3PF for a new one. G3MJL (London, W.7) worked AP5B (2225 GMT), but otherwise was not at all active.

Top Band Topics

G2AAM (Swanwick) has worked HA, OK and YO with an input of 3.8 watts. His location is 500 feet a.s.l. and his aerial 50 feet high, so he's definitely not in the wet-string category.

G3APA (Coventry) was delighted to raise G3IXZ/A (Scillies), and also to get a QSO with G3JRH/A, who is using a Ttx with 270 milliwatts, over a distance of 100 miles. G3APA says the "portable boys" should be handed a bouquet for the hard work they put in on supplying contacts with rare counties. Some of them travel hundreds of miles and put up with lots of discomfort and bad weather, not forgetting the clerical work that follows. Some of the rarer phone stations would be doing the CW chaps a service if they'd switch off the mod. and plug in the key occasionally, though.

Concerning that last remark, it is our painful duty to record that there is a new generation of Top Banders growing up who don't listen to CW, don't want CW and (dare we say it?) probably couldn't copy it anyway. We are not referring to the countless "local-net" types who use the band for a different, and quite legitimate, purpose. But the DX-chasers to whom CW means nothing are quite a new phenomenon.

G2YS is enjoying himself with a mobile, his best DX in daylight being 65 miles with a "5 & 6" report.

G2CZU has not been very active, but did collect GM3IQO/P (another hard-working portable operator) from Roxburgh and Selkirk; he also raised Northumberland on phone at last, thanks to G3EQK. This gives him *all* English counties on phone, as a welcome supplement to his standing record of all Welsh counties. (And if any of the "big DX boys" who read this happen to think that working all English and Welsh counties on Top Band phone is easy, they should try it when they have five years or so to spare!)

G3MCY (Tangmere) tells us that he, with G3IDX and G3JLO, will be operating from Rutland on Saturday, September 12, either /A or /P, phone and CW. They will work as many as possible

between the Saturday evening and "last QSO on Sunday morning."

G3IXZ (Billericay) reports that his Scillies expedition went off successfully. Not a great number of QSO's were made, but they were all in the nature of DX from there. Conditions were poor except on two good nights. Maritime QRM down there is quite something, he says; "from Loran up" it's Spanish and French trawlers who *never* stop bawling, and "from Loran down" the U.K. coastal stations occupy most of the space except for about 20 or 30 kc, spread well over the band, where the amateurs may safely try to park themselves. Daylight working is hopeless.

Next year G3IXZ hopes to repeat the dose, and after learning this year's lessons he will be out for WABC in two weeks!

G3LHJ found the noise level very high, but managed to bear with it at times and was rewarded by GM3KAI, a new one for him.

GM2UU (Stranraer) claimed his Phone WABC (first for Scotland) and said it was far easier to work the stations than to get the cards afterwards. He chose a bad night for his sortie into Kirkcudbright, and worked only 20 stations, but he'll be going back again.

G3CNM (Stockport) managed to work UA3BS on the night of July 27—not without considerable difficulties which would make a long and amusing story on their own. He has now worked 12 countries on the band since last December, and is starting county-chasing during daylight hours only. He calls CQ for this purpose around 1000 on Sundays, 1984 kc.

The WPX Ladder

Our former offer to start a WPX ladder has produced just two rungs: G3ABG (Cannock) says his scores are as follows: CW, 287 (223 confirmed); Phone, 232 (162 confirmed). G2BLA scores 249 (180 confirmed). Let us have some more next month and we will get a real WPX table going.

General Chat

G3FPK has been keeping his hand in with a little Contest operation. In the PACC affair

(CW) he got together 2448 points, with 51 QSO's on 3.5 and 7 mc only. Then he took part in his very first field day event, helping out the Coulsdon and Purley group on 3.5 and 21 mc. G3FPK has recently improved his shack wallpaper with the FBA, and has sent in his claims for "Worked all LA," hoping to be the first G to get that one; several others are also pending.

G2BLA wrote on the thirteenth anniversary of his first QSO, and his most recent was only No. 1912, but now he's settled in a new QTH he hopes to get DXCC together. He queries whether the change of QTH means that he must start WABC all over again. The answer is in the negative.

G3FXB says he heard "NP1A," said to be testing from Nepal, but thought him a fishy one. The prefix should be 9N, anyway.

G3NAC tells us he had a lot of trouble getting his 21 mc Cubical Quad going, and the impedance was not what mathematics said it should be. We have gathered from recent gen. that others have found this out, and that the correct expression for the length of a side is 250/f rather than the original (smaller) figure.

Philosophy, G4JA brand: "If I get crushed into oblivion by a rat-race of kilowatts from East and West, I shrug my shoulders, move on, and very often nip into some other choice bit that has been overlooked in the mad scramble." Too true, and we know some crafty operators who deliberately search for pile-ups so as *not* to get involved in them, and find the very same thing. Others, of course, make a speciality of looking for the weakest signal on the band, assuming that 90 per cent of the bods on the band won't hear them anyway (and sometimes they are dead right).

80-metre Activity Contest

The Tops CW Club announce their contest, on 3.5 mc CW only, during the week-ends of September 12/13 and October 10/11, duration 1200-1200 GMT in each case. Single-operator stations only; exchange RST and three-figure serial number, starting at 001; one point for contact in same continent, three for other conti-

nents. QSO's in one's own country or call area *do not count*.

Final score: Points multiplied by number of countries (call areas) worked. Bonus of 10 points for each WAC completed (North and South America count as one for this purpose).

Stations may be worked once in *each session*; logs, showing Date, GMT, Station Worked, RST in and out (serial numbers), Points

Short Wave Magazine

DX CERTIFICATES

The following have been issued since the publication of our last list, in the June 1959 issue:

MDXA		
No. 8	G3FPQ	(Elstead)
PRA		
No. 2	W2SAW	(Webster, N.Y.)
WFE		
No. 40	G6LX	(Croydon)
41	VK2PV	(Mosman)
42	ZS6IX	(Johannesburg)
FBA		
No. 153	UR2BU	(Tartu)
154	DJ4DN	(Ulm)
155	DL1PA	(Bielefeld)
WNACA		
No. 214	G3MBP	(Portsmouth)
215	GW3LPR	(Llanelly)
216	VK2PV	(Mosman)
217	G5FA	(London, N.11)
218	G3FIU	(Rugby)
219	G3GNL	(Bromley)
220	G3FKH	(Shenfield)
221	CE3HL	(Santiago)
WABC		
No. 185	G3LWQ	(Southport)
186	G3LLX	(Sidcup)
187	G3MCY	(Tangmere)
188	G3LMZ	(Manchester)
189		(cancelled)
190	GM2UU	(Stranraer) (Phone No. 4)
191	GM3AVA	(Larbert) (Phone No. 5)
WBC		
No. 133	UR2BU	(Tartu)
134	VK2PV	(Mosman)
135	ZS4MG	(Kroonstad)
136	DL6FT	(Erlangen)
137	W1QVZ	(N.H.)
138	DJ2UU	(Hanau)
139	VE2AKF	(Abbotsford)
140	SM7CAB	(Jonkoping)

Details of MAGAZINE DX AWARDS and CERTIFICATES, and the claims required for them, appeared in full on p. 134 of the May, 1959 issue.

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

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

Claimed plus multiplier plus bonus points; Total; and operator's signature, to G4XC, 245 Yarborough Road, Grimsby, Lincs., before 30 November, 1959.

QRPP!

W3RZL, with a transistor rig running at 96 milliwatts, collected a 599 report from LU8FBH—surely the QRP record to end them all! He signs W3RZL/TR and would be grateful for calls from anyone hearing him.

The Top People

At the other end of the power scale, we now have W1FH and W6AM sharing the top spot of the DXCC Roll of Honour, both with 294 worked and confirmed; ZL2GX and W8HGW score 293. The U.K. is represented by G3AAM and G2PL (both 289). G4CP, whose last score shown was 282, is temporarily out of the Roll, which now ends at the score of 285. It seems that it's no longer even clever to be a 250-plus man . . . 280 is practically in Beginners' Corner, these days!

The SWL Clip

Because this feature is covering three months' activity instead of one, extreme compression is the order of the day, with some of the more recent letters taking precedence.

P. Day (Sheffield) received a nice compliment from VK9AD, who returned his report with remarks added, and said that *this* kind of report would always produce a QSL. P.D. has found 7 mc in good shape with FP8BC, CR4AX, OX3RH, YV5HL and ZB2A on CW; 14 mc phone brought him XE4B (SSB) and VP5CB (also SSB); 21 mc phone, KC6JA, VR2AZ, CP1CC, EA9DE/lfni, YA1IW and MP4QAO. The 50 mc band has been wide open to all Europe on occasions.

K. H. Walden (Cheltenham) sends a list of DX and queries IL1A1M (Lampedusa). He's just another 11, unfortunately! Also he asks whether there are any XE's on 14 mc . . . they are pretty scarce, but show up from time to time.

P. Reynolds (Thorpe-le-Soken)

is another who reports for the first time, sending a good list of 14 mc stations heard on his home-built four-valve superhet.

J. W. Bluff (Harrow) sends lots of DX news, much of which appears elsewhere in this Commentary. CT2AI was a new one on 7 mc; VS4JT/VS5 an interesting one on 14 mc and all sorts of nice DX on 21 mc.

P. F. Linsley (Cleethorpes) turns in a list of Calls Heard for every band, but we only have room to comment on EA9DE/lfni (14 SSB) and OK1AEH, OK1MF and UA3BS on Top Band CW.

J. A. Share (Penryn) says he gets quite a few cards through the Bureau and suggests that most 14-year-olds (like himself) can't afford a dozen IRC's every week!

C. N. Rafarel, despite his poor aerial, at the new QTH (Poole), has still been logging some useful DX, such as VK2FR (Lord Howe Is.), VR2BC, VP2LO, three XE's, two HH's, PY9FM (Matto Grosso) and 3A2AF—all on 14 mc. On 21 mc the best were three FE8's, FQ8HB, VP8DW, PZ1HF and ZS3BC. He also found a number of W's at good strengths on 7 mc, but thought conditions all round rather poor.

K. Whitehouse (Woodsetton) is a 14-year-old listener reporting for the first time. With his R.1155 and home-made converter, working from a frame aerial, he logged 9K2AZ, CT3, CE, EL6D, OQ5's, YV8AM, VP2AB, ZP5JP, HI8GA and HC1CW, all 21 mc phone on June 7 and 8 (he was off the air with receiver trouble for much of the month!)

J. Baxter (Hull) heard HH2Z, HK3BF, PJ2AV, TG7TD, YN1BS and XE3AF (14 mc phone); EL6D, HR2DK, OA3O, OQØPD, VP2AB, ZD1EO and 9M2DW (21 mc phone); and EL1H and ZE2JV on 28 mc phone.

Listeners are asked to note that their own feature, "SWL," as prepared for our July issue, which did not appear, is published in *this* issue. The next "SWL" will therefore come out in the November issue, and all copy and correspondence intended for it should be in our hands by **September 30** at the latest.

Late Flashes

YA1PB is said to be on 14 mc nearly every night, but YA1IW spends most of his time on 21 mc phone.

The Seychelles affair was really under way on August 13, with a 99 per cent. expectation of starting up on the 19th . . . VS9OM (Oman) is back with higher power . . . XEØJW (nice call for WPX-ers!) was W3JW playing mobile in Mexico, during a trip right down to Costa Rica.

A group of GI's will be operating from Rathlin Island for three days from September 11. This island has historical associations with Marconi, and the occasion is the 50th anniversary of the award of the Nobel prize to that great pioneer. Call sign GB3R1, all bands One-Sixty to Two.

LA3SG/P is a new one on Jan Mayen, and O.K. . . . LA2TD/P is back to Norway from Spitzbergen, and doing his QSL chores.

Just as this was going to press it was reported that the Colonial Office has withdrawn all amateur facilities from Weill, VP2VB, and he is no longer permitted to operate on any amateur band under that or any other British Colonial callsign. The reason? "Flagrant abuse of amateur privileges." At the moment of writing this had not been officially confirmed over here.

W2GT writes that the QSL's described two months ago as being issued free by an American valve manufacturer cost one dollar per batch. The "batch" used to be 300 but is now 200.

ZS6IF plans a ZS7-8-9 expedition next October and November . . . K4RSD operated from FP8-land in mid-July . . . FR7ZD has shown up on 14180 kc AM . . . VKØCC (Macquarie) is on 14300 kc SSB around 0700 GMT.

That Contest

G3MJL protests at our failure to mention that G3JZW (with extra operators G3JXC, G3KLK and himself) scored 119,000 in the CQ DX Phone Contest; but the copy of the results which we received from CQ showed G3HTA as the leading multi-operator all-band scorer in the U.K., with

36,415. G3IZW was not listed at all.

In the CW multi-operator section the same group worked under the call G3JXC and scored 188,570 (all bands), which was apparently the only U.K. entry in this category.

(We might mention, in passing, that those interested were lucky to get the results that we *did* manage

to squeeze into the June issue at the last moment; they appeared well ahead of their publication in *CQ!*)

And so to the end of yet another Commentary, with the reminder that next month's deadline will be **first post on Friday, September 11**; for the issue following it will be *October 16*. Before closing we must acknow-

ledge invaluable help from W4KVX, the WGDXC, the *Malayan Radio Amateur* and our many correspondents, some of whom do not figure in these columns by name or call-sign. Address all your mail for the next issue to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Until then, Good Hunting and 73.

"THE RECEPTION OF SINGLE SIDEBAND"

Comment by R. L. GLAISHER (G6LX-DJØBM)

The article under this heading in the May issue of *SHORT WAVE MAGAZINE*, by L. A. Earnshaw, ZL1AAX, the well-known exponent of Sideband, underlines some of the difficulties (imagined and actual) experienced by the newcomer to SSB. ZL1AAX has done much to clear the air by explaining how these difficulties come about and the steps necessary to enable the easier reception of Single Sideband by receiver modifications.

This is excellent, and the ideas he puts forward are likely to be most useful to those operators who have already decided that SSB is the answer. It does *not*, however, help the large majority of A3 (AM phone) operators who cannot tune the stuff on their present receivers and are not prepared to tear their valuable "black-boxes" to bits in the drastic fashion suggested by Mr. Earnshaw.

It is interesting to note that the majority of complaints relating to difficulties in receiving SSB originates from those operators who seldom if ever, engage in competitive CW operation (contests, field-day, and the cut-and-thrust of DX chasing). This is probably due to the similarity in reception techniques which necessitates a higher standard of operating know-how and receiver serviceability than is required for conventional AM! It is surprising how much a receiver can be out of adjustment and still give satisfaction to the user on ordinary phone reception. ZL1AAX has covered many of the standard receiver snags such as stability, backlash, and so forth. He has not, however, mentioned modulation hum and AVC faults which frequently contribute to SSB reception problems.

He has stressed the need for accurate carrier re-insertion by adjustment of the BFO control. He has explained that the BFO must be capable of tuning several kc above and below the IF, so that the locally generated carrier can be correctly mixed with the incoming signal (in the detector) for reception of both upper and lower sideband signals. This again emphasises the need for receiver serviceability and a few minutes spent in checking the frequency swing of the BFO is well worth while. The BFO bandset condenser or coil-slug should be adjusted so that the centre of the swing corresponds to zero-beat on a carrier-type phone signal correctly

tuned "on the nose." (The station VFO is an ideal carrier source.)

The slow tuning rate and IF selectivity modifications suggested by ZL1AAX are desirable but not essential. Overload characteristics and BFO injection levels vary from receiver to receiver and it is here that minor modifications really pay-off, *e.g.* replacing the "stray" capacity BFO coupling by a 3-30 μF trimmer in the AR88.

The overall system-gain obtained by using a true SSB system (receiver *and* transmitter) cannot be fully realised using broad-band receivers of the conventional type. Despite this, several dB of useful gain is obtained by taking SSB transmissions on normal receivers and it may surprise Mr. Earnshaw (and many readers) to know that a very large number of European SSB operators use standard un-modified AR88, HRO, S640, 358X, S750, SX28, G209 and similar receivers.

To summarise: It is possible to obtain satisfactory single-sideband reception on a conventional communications type receiver provided that it is in good working order and the controls are correctly adjusted so that no receiver overload takes place and the carrier is correctly re-inserted. *Double* sideband suppressed-carrier is a different animal, and it is often difficult to resolve these transmissions satisfactorily unless special receivers (or true SSB receivers capable of rejecting one sideband) are used.

ALWAYS IN THE MARKET

We are, for good photographs of Amateur Radio interest—amateur stations, groups, personalities or equipment. We prefer prints, which must be clear and sharp, size not important. All photographs that can be used are paid for on publication. Any print sent in should, of course, be accompanied by an adequate description, preferably *not* on the back of the photograph itself, but on a separate slip.

K.W. ELECTRONICS—NEW QTH

With increasing business and a good demand developing for its products, the firm of K. W. Electronics, Ltd. — of which the principal is R. G. Shears, B.E.M., A.Brit.I.R.E., G8KW — is now installed in a new factory, which the firm has had built to its requirements. The address is: Vanguard Works, Heath Street, Dartford, Kent (*Tel. Dartford 5574*). With us, readers will wish G8KW luck in this venture.

INCIDENTAL INFORMATION

SOUND WAVES LIKE RADIO WAVES

With the development of microwave techniques in the radio sense in mind — waveguides, dish reflectors and so on—an American physicist, W. E. Kock, has shown that sound waves can be handled and controlled in exactly the same way. The idea occurred to him because acoustic wavelengths (for the sounds we hear) are in the metre-centimetre region, for which radio waveguides and beam aeri-als are ordinarily used. Having tested his theory experimentally, Kock is now getting his dividend by using the acoustic technique to check the performance of microwave radio systems, such as dish aeri-als and waveguide layouts. The acoustic method is, obviously, ideal for the purpose, giving a more accurate and directly traceable result than by radio measurement. The acoustic signal is simply fed into the system by a speaker, audio equipment being used for measuring.

* * * *

FIXING THE BANDS

The I.T.U. Conference now in session at Geneva is a big affair and, one way and another, is expected to last until December. There are 101 member-nations of the International Telecommunications Union (one of the few United Nations set-ups which, being an inheritance from the old League of Nations organisation, really does work) and there are nearly 1,000 delegates at the Conference, all bent on securing the best possible bargain for whatever interest they represent. A very wide range of problems connected with frequency allocation has to be considered and agreed — including, this time, bands for space vehicles, satellites and rocket control. From the radio amateur viewpoint, it will mean a hard battle to retain what we have got, with demands of all sorts pressing heavily and the number of radio amateurs, now totalling some 300,000 throughout the world, increasing steadily. Unfortunately, one of the most powerful interests, which in practice is also one of the most useless, is that of international short-wave broadcasting, the “cultural aims” of which are expressed by jamming and propaganda wars on an enormous scale. The leader of the U.K. delegation of 45 members is Capt. C. F. Booth, C.B.E., an assistant engineer-in-chief at the Post Office.

* * * *

RTTY PROGRESS

Announced recently was the formation of the British Amateur Radio Teletype Group, with development of RTTY on the amateur bands as its main objective. One interesting and important result of the Group's activities, and much to its credit, is the fact that it has been able to secure a number of ex-G.P.O. Creed Type 3A teleprinters, for resale at what can only be described as the knockout (and probably quite unrepeatable) price of £3 10s. each—yes, just the 70s. These machines are in full working order, operate from 110v. DC at 0.7 amp., are 20 ins.

x 14 ins. x 10 ins. overall, and weigh 60 lbs. As the news of their availability has already been circulated to members of the B.A.R.T.G., it may well be that they will all have been acquired by the time this appears. Those interested in RTTY, and membership of the Group—which will have a stand at the Amateur Radio Exhibition in November—should get in touch with: A. C. Gee, G2UK, East Keel, Romany Road, Oulton Broad, Suffolk. The Group publishes an informative *News Sheet*, of which three have been issued so far. A complete RTTY terminal involves a transmit-receive teleprinter, with receiving converter, and an FSK transmitter. The Group plans to establish RTTY net working on the 80-metre amateur band.

* * * *

WIDEBAND RF AMPLIFIER

An interesting new PA technique is announced by Marconi's—the development of a wideband RF amplifier capable of being driven at several frequencies simultaneously. The advantages are that, apart from the ability to radiate at two or more frequencies at the same time, for an alteration of frequency within the PA bandwidth it would only be necessary to change the driver frequency. Full technical details have not yet been released, but the type designation of the Marconi transmitter now on the market and incorporating the wideband PA is HS113, rated at one kilowatt. Just the job for the DX bands!

* * * *

LICENCE FIGURES

Germane to the comments opposite is the fact that by the end of July this year there were 8,471 amateur licences in issue in the U.K. The /M permits totalled 761, an increase of 124 since December 31, while the amateur TV licences went down from 73 to 68. During the seven months to July 31, a total of 162 new callsign/addresses were notified to us for the regular “New QTH” feature in the *Magazine*.

* * * *

G6TP LEAVES £1,340,000

When G6TP died in January of last year, his estate was so large that it could not immediately be ascertained, as he had interests both in this country and in Kenya. It has now been proved at £1,340,000 of which some £301,000 is the Kenya valuation. Death duties total about £800,000. G6TP was Lord Egerton of Tatton, Knutsford, Cheshire, and appeared under that style in all issues of the *Call Book* between 1928 and 1939. Since the war, the callsign has been “ex-directory.” G6TP was active in the early 1930's on 40-metre phone, and actually started on the air in the 45-metre days. The callsign will probably be remembered by many old timers.

SWL • • • • •

IDEAL RECEIVERS—GEAR IN USE—MORE ABOUT QSL'ing—COMMENT AND OPINION—“CONVERTERS,” Part I

THIS month, as promised, the main emphasis is on Converters. We are not able to keep continuity with the “SWL of the Month,” feature since no one has sent in a suitable photograph or description; readers are once more asked to do so, in order that we may present some of our keener SWL's in this way.

Readers' letters, as usual, contain a wealth of interesting comments and topics for discussion. No longer are they confined to descriptions of what our SWL friends are using in the way of gear; they have some very definite ideas about what they would like to have!

This first section, therefore, might well be called “Over to You”—and it is you, the readers, who have supplied the material for it. May it lead to further discussion and to something tangible from which all SWL's may benefit at some time in the future.

That Ideal Receiver

Everyone starts with something straightforward and simple, but not many feel inclined to remain in that category. *J. W. Bluff (Birmingham 14)* sends a block diagram of his dream-child which, naturally, can not be bought but must be home-made from scratch. The potential man-hours involved are quite alarming!

It starts with a crystal-controlled converter and a 2.0-2.5 mc IF, proceeds to a second mixer-oscillator and an IF amplifier at 465 kc, incorporating a Q-multiplier and a 3 kc pass-band filter. After this come two alternatives—a product detector or an envelope detector, switched, with upper and lower sideband crystal-controlled BFO; AGC with adjustable short and long time-constant; noise limiter; and the usual output stages. *J.W.B.*, together with *W. L. Healey (Nottingham)* and several others, remarks that articles on selectivity, IF filters, Q-multipliers and similar devices would be welcome. Watch this space!

P. Day (Sheffield) has already started on his home-brewed ideal, which will look like this: Eleven valves to include one RF stage, BFO, product detector, T-notch filter, variable IF selectivity, and stabilised HT for the separate local oscillator; the tuning range will be 6.5-8.5 mc, spread right over the dial. For the HF bands an RF-24 will be used at an IF of 7.5-8.0 mc. Concerning the latter, *P.D.* passes on the information that it is worth removing the load resistors from across the RF stage trimmers, and to fit a gain control in the cathode of the RF valve.

Final query from *P. Day*: Do any other SWL's operate portable and/or mobile? He is “mobile”

with a 38 Set receiver on a motor-scooter, and was portable from a mock Antarctic Base Camp in the centre of Sheffield during the University's Rag Day. They spent a whole night in the tents, but the temperature fell ten degrees and all they heard was Radio Moscow!

What Use Are SWL's?

The recent article on QSL's has involved us in a lot of correspondence concerning amateur transmitters who openly declare that SWL's, to them, are just a plain nuisance. Such remarks are naturally resented, especially by the enlightened types who know that their reports are, or could be, of some value. *F. L. Green (Barking)* actually overheard a conversation between a G and a ZBI in which the latter said “They won't get a card from me—who do they think they are, poking their noses into other people's private conversations?” It's a quaint notion that any conversations on the amateur bands can be “private,” and the ZBI concerned probably has a large chip on the shoulder. But it made *F.L.G.* wonder “Are we wanted? From the complaints one hears, it seems that newcomers to Amateur Radio are not welcome.”

On the other, more pleasant, side of the fence stands *F. W. T. Atkin (Port of Ness)*, who says we might well dispel the idea that the SWL is just “an apprentice transmitting amateur, either pottering about or too feeble-minded to learn Morse and pass the RAE, and therefore content merely to listen to those demi-gods whose superior intellects have earned them the right to transmit as well as receive radio waves.”

He continues “there are serious SWL's of long experience—longer than that of some of the G3/3's who are liable to lay down the law at the slightest provocation—who can also read Morse and who do not aspire to a call-sign. Their technical activities make some of the transmitting amateurs' collections of wall-paper and sheepskins look very juvenile.”

Final thought from *F.W.T.A.*:— as an SWL you can't send out a CQ—you've got to go out and find stations. Don't neglect the spaces in between the amateur bands, where you may be rewarded by interesting and sometimes even thrilling experiences.

More Gen. From Readers

N. C. Dove (Luton) started “as a serious SWL” about five years ago, and has never operated anything but home-built receivers. His chief complaint about the present state of things is that not enough good components are available for the home-constructor. *N.C.D.* went through the sequence of 0-V-0, 0-V-1, 1-V-1 and then a nine-valve superhet. His present outfit is a double-conversion unit embodying the circuit given on p.120 of the May, 1958 issue of SHORT WAVE MAGAZINE (“RF Front-End Unit”). This, he says, was no trouble whatever to get going and has been giving good results for about six months.

J. W. Cave (Parkstone) has been a regular reader since the first post-war issue of the Magazine, in

March, 1946, and was also a casual follower in the 1937-39 period. His equipment, too, is entirely home-built and consists of a general-coverage "super" with two RF's, separate oscillator and mixer, and two IF's: a 1-V-1 for 4 mc to 60 mc; a 1-V-0 covering 3.5 mc only; an C-V-1 covering 28-30 mc only; general-purpose IF assembly and AF amplifier; and modified surplus gear including audio filter, test oscillator, Naval 361 Receiver, and RF Units 24, 25, 26 and 27. This formidable array of gear gives unbroken coverage from 50 kc to 100 mc, which it pulls in through various "bits of wire" and a home-built beam, all in the roof space. One of SWL Cave's chief interests has always been the 28 mc band, on which his detailed logs go right back to 1928.

R. *Winson (London, W.7)* tells us that SWL's practising Morse might well look at a transmission between 6900 and 7000 kc, which sends at speeds between 5 and 15 w.p.m. five-letter groups of mixed letters and figures. It is on between 1830 and 2200 GMT every weekday evening. Sometimes there is another station close by, sending figure groups at about 12 w.p.m.

E. *Bray (Shrewsbury)* runs an R.1155 with RF24, 25 and 26 converters, which, he says, performs quite well on SSB, although a useful accessory is a small screwdriver with which to adjust the BFO trimmer. He is interested in NBFM transmissions and wants to know where to find some (we have heard them most often on the 28 mc phone band). He, and many others, is becoming more interested in the VHF bands, and would like to know about two-metre converters and suitable aerials. Future plans include Morse proficiency and the RAE!

D. J. *Bradshaw (London, S.E.2)* wants us to introduce some certificates and awards for SWL's. Unfortunately there are many difficulties involved here. Compared with the awards available for transmitters, the SWL efforts would have to be made fantastically difficult to be worth while, since it's obviously far easier to receive all these exotic stations than to work them as well. (Don't overlook the fact that the transmitting operator who works this rare DX must also be able to hear it pretty well in order to do so!).

SWL's may find it reasonably easy to hear, say, 200 or 250 countries, but when it comes to getting the cards from all of them, then *that* is pretty difficult. The devising of a certificate which reflects one's skill as an operator, rather than one's guile at extracting QSL cards, would be very difficult indeed.

Earning That QSL

V. S. *Porter (Roker)* now sends out a duplicated "DX Information Sheet," compiled from his own listening experiences, the aim being, as he says "to give the overseas station something to read (free), something to interest him in my station, and something calculated to incline him to the course of sending a confirmation, if reasonably possible." V.S.P. works with a first-class atlas, and also reads three famous U.S.A. periodicals—in fact he absorbs anything and everything about the world to which he listens. As he says, there is *always* something of interest to be

heard—tales of one aerial loaded with thick ice while another rig is choked with sand (a VE8/5A5 QSO), familiar voices from Kuwait, Libya, Malaya, and the big noises from U.S.A. punching through the QRM.

Backgrounds also fascinate him—the radios in the shack, the crying babies or laughing bambinos, the mouth organs, the musical boxes, the squeaking door in Kuwait and the twin horns on the Citroens in Libya. And the moral of all this? Don't look on the other chap as just one more call-sign to put in the log . . . he might even become a personal friend one day.

No Reports, Pse!

As the only regularly-active amateur on the Aland Islands (between Stockholm and Helsinki, in the Gulf of Bothnia) OHØNC writes that he is inundated with QSL cards—what he actually says is: "I have been put under heavy pressure and therefore to lessen the burden (both economical and time) I have had to make the decision to cease sending cards to SWL's, except where the reports are of real value, such as for my signals heard on 6 or 2 metres . . . I know pretty well that my signals are getting out, as I regularly have contacts with all parts of the globe. . . ."

The Beginners

It is becoming obvious that we must reserve at least a small part of "SWL" for the out-and-out beginner. We are receiving letters nowadays which ask such questions as "How can I tell what wavelength I am listening on?" and "How do I connect a dipole to a receiver?" Obviously there is always new blood coming into our hobby—and a healthy thing too, or it would eventually become extinct! We must cater for the newcomers, even if the old timers lose a little of their space, and we hope they will be tolerant on this matter.

There are so many subjects to be covered that this bi-monthly feature is already "booked up" far into the future; we aim to make each instalment a self-contained and interesting collection of facts, hints, opinions, technical information and general gossip.

Up to now the SWL's have supported us valiantly; we hope they will continue to tell us (a) What they want to hear about; (b) What they are using and doing themselves; and (c) What they think of this feature.

CONVERTERS—Part I.

FROM readers' letters it is clear that SWL's interest in converters is far ahead of their desire to build complete receivers; and this is logical enough, because the combination of a good converter with a receiver which is just about "adequate" on some convenient frequency is in no way inferior to a really good receiver.

Any short-wave receiver falls logically into two parts (and we are talking all the time of superhets, because no other form of receiver will produce the selectivity essential for present-day conditions). The

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continued

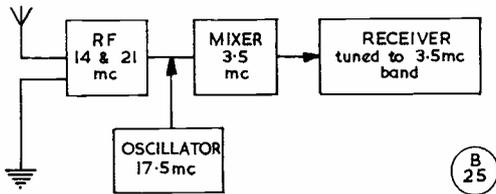


Fig. 1. Block diagram of a converter using a 17.5 mc crystal oscillator to produce a 3.5 mc IF on two bands, 14 and 21 mc, which would be tuned on the main receiver used as an IF/AF strip. The 17.5 mc oscillator frequency can be derived from a crystal of 5833 x 3 kc, or 3500 x 5 kc, or 4375 x 4 kc.

first part is the RF section; the second, the IF strip and output stages.

The requirements of the RF section vary considerably over the various bands, but if you have a good IF strip and adequate following stages, that part can remain unchanged for evermore.

When we think in terms of converters, then the existing receiver, used on one of its more satisfactory bands, becomes the IF strip—in fact, if it is a superhet it becomes a double IF strip, its RF section comprising the first IF, and its own IF the second.

First Principles

Since we have to remember the rawest recruits as well as the experts and the not-so-expert "middlemen," we must begin right at the beginning.

The purpose of the converter is to convert the frequency of the incoming signal, by heterodyne methods, to a convenient frequency at which we have some good and selective amplifying stages available.

The converter therefore consists of one or more RF stages, an oscillator supplying a signal at some pre-determined frequency, and a mixer which will handle these two separate signals (incoming and home-made) in such a way as to provide one new "synthetic" signal at a frequency which can be either the sum or the difference of the other two.

Taking a random example: a 21 mc band converter, covering 21.0—21.45 mc, could use a variable frequency oscillator tuning from 11 to 11.45 mc, so that the difference-frequency would always be 10 mc. The output of the mixer would be fed into your R.1155, or whatever you have, which would be tuned to 10 mc all the time. The 21 mc signal would in effect "come out of the end of the R.1155."

As another way of doing the same thing, the converter could use a fixed oscillator at 11 mc; this would give a beat with the 21 mc band signals which would vary between 10 mc (at 21 mc) and 10.45 mc (at 21.45 mc). Thus the tuning would be achieved by the tuning control of the main receiver, which would cover the range, on the dial, of 10 to 10.45 mc but would be receiving signals in the range 21 to 21.45 mc. The tuning control at the front end of the converter would be used merely to "peak" signals, not to search for them, so all the advantages of single-control tuning would be retained.

When a converter is built in the latter fashion, the

easiest way of making a really stable fixed-frequency oscillator is to use a quartz crystal, and the Crystal Converter is a very popular and efficient piece of gear.

The shakiest beginner will now realise (we hope) that you can choose between a variable oscillator and a fixed IF, or a fixed oscillator and a variable IF. The latter combination being the simpler of the two, we will deal with it at some length in this first instalment.

A few faint voices are probably asking "Why bother about a converter if you still do the tuning on the old receiver, anyway?" The answer to them is simple. The RF stages on the old receiver are probably not terribly good on the HF bands—if they were you wouldn't be wanting to build a converter. This being so, you build a converter which has a good front end for the HF bands. The incoming signal passes only through the converter; after the mixer it

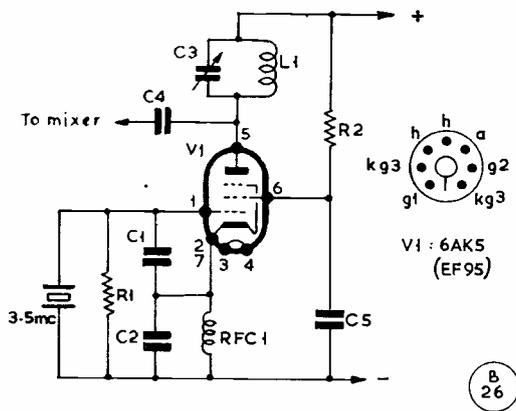


Fig. 2. Basic crystal oscillator circuit for harmonic operation. C1-C2 form a capacity divider on the grid-cathode side; L1-C3 in the anode circuit are proportioned to pick out the desired harmonic and should tune to 17.5 and 24.5 mc.

Table of Values

Fig. 2. Crystal Oscillator Circuit

C1 = 10 μμF	R1 = 50,000 ohms
C2 = 100 μμF	R2 = 25,000 ohms
C3 = 100 μμF variable	RFC1 = 2 mH
C4 = 25 μμF	L1 = see text
C5 = 1,000 μμF	V1 = 6AK5

is of no further interest. Thus the old receiver can be worked on some frequency at which it is still good—and most "old" receivers are practically as good below 10 mc as most of the new ones.

Your converter provides the initial amplification and can be designed to do so with the minimum of noise; your old receiver will provide the IF selectivity twice—first through its RF section, now the first IF, and secondly through its own IF section, now the second IF. The use of a converter means that no changes whatever need be made to your present receiver.

[over

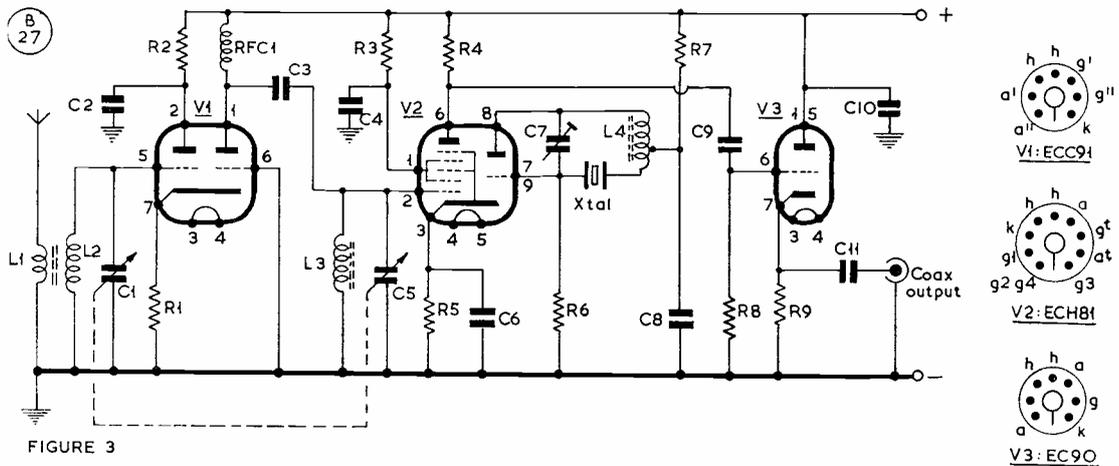


FIGURE 3

Fig. 3. A three-stage crystal-controlled converter for the HF bands, using a cathode-coupled double-triode RF stage, a triode-heptode crystal oscillator, and cathode-follower output to give a good impedance match into any usual type of main receiver, used as the tuned second IF section. There is a good deal in the design, construction, lining-up and satisfactory operation of HF-band converters, much of which is discussed in the text.

Table of Values

Fig. 3. Circuit of CC Converter

C1, C5 = 300 μF ganged	R5 = 200 ohms
C2, C4, C10, C11 = .005 μF disc ceramics	R6, R8 = 200,000 ohms
C3 C9 = .0003 μF	R7 = 20,000 ohms
C6, C8 = .002 μF	R9 = 3,000 ohms
C7 = 30 μF trimmer	RFC1 = 2.5 mH choke
R1 = 300 ohms	L1, L2, L3, L4 = see text
R2 = 1,000 ohms	V1 = ECC91 (6J6)
R3 = 30,000 ohms	V2 = ECH81 (6AJ8)
R4 = 10,000 ohms	V3 = EC90 (6J4)

Choice of Frequency

If you decide on a crystal-controlled converter, then you must settle for one of three things. You must have (a) A wide choice of IF on your receiver, to cover the various bands, if you use only one crystal; or (b) A selection of crystals, chosen to give a good conversion frequency (IF) for each band you want; or (c) A crystal circuit which will give output on its fundamental and several harmonics. (A further alternative, which we have not yet mentioned, is the use of a separate converter for every band. This approaches the ideal state of affairs, but is apt to look too difficult and expensive to the beginner.)

For the moment we will consider (a) and assume that you do not mind shifting your receiver frequency around to give the different IF channel needed for each amateur band.

Suppose we have a 10 mc crystal available (or a 5 mc crystal operated on its second harmonic). To cover the 14 mc band, you will need to tune your receiver from 4.0 to 4.35 mc; 7 mc can be covered by tuning from 3.0 to 2.8 mc; 21 mc will require a tuning range from 11.0 to 11.45 mc; and 28 mc will probably best be covered by using the 20 mc harmonic from your crystal and tuning the receiver from 8.0 to 9.7 mc.

Note that if your receiver is well and accurately calibrated, the new bands covered will also be easy

to read off directly, with the exception of 7 mc, where we are using a difference in frequency instead of a sum, and the receiver dial will work "the wrong way round."

This, however, is rather an unsatisfactory way of doing things, and means too much of a "fiddle" with various controls. A tidier method is to use more than one crystal, or to choose one, the harmonics of which can be used intelligently.

Choice of Crystal

As an example, a crystal on 17.5 mc will give a 3.5 mc IF, whether tuned to 14 mc (difference) or 21 mc (sum). The crystal itself might well be a 5.833 mc specimen, with its third harmonic accentuated—crystals in that frequency range are cheap and plentiful. (See Fig. 1 for block diagram.)

For 28 mc coverage another crystal, giving a harmonic on 24.5 mc, would be desirable, and for this a 6.125 mc crystal working at its *fourth* harmonic would be suitable.

Fig. 2 shows a well-tried crystal oscillator circuit, with provision in the anode circuit for picking out various harmonics. Fig. 3 shows another circuit very suitable for harmonic operation; the crystal oscillator is combined with the mixer by using a triode-heptode. With such a circuit as this, a 3.5 mc crystal can be made to give a reasonable output up to its *seventh* harmonic, which means that the same crystal could be used to generate the two frequencies mentioned in the previous paragraphs. The 17.5 mc output would come with fifth-harmonic operation, and the 24.5 mc from the seventh.

In general, the converter is worth building only for the higher frequency bands, and for this reason there is no disadvantage in using a 3.5 mc crystal oscillator. Such a device would be impracticable if the 3.5 and 7 mc bands were also to be covered by the converter, but assuming that we only want 14, 21 and 28 mc there is no disadvantage.

If we use the third, fifth and seventh harmonics of the crystal to give oscillator frequencies of 10.5, 17.5 and 24.5 mc, then the three bands 14, 21 and 28 mc will all correspond to an IF in the 3.5 mc range. For the 14 mc band the receiver will have to be tuned from 3.5 to 3.85 mc; for 21 mc from 3.5 to 3.95 mc; and for 28 mc from 3.5 to 5.5 mc.

Note that the amount of band-spread remains constant: on all three HF bands you will have the same ease of tuning that your receiver normally gives on the 3.5 mc band.

The 3.5 mc crystal oscillator will, of course, be audible when the IF is exactly 3.5 mc—which will occur on the extreme LF edge of each band. This can be obviated by using a 3499 kc crystal (which we have so far refrained from mentioning, to avoid complications in the arithmetic!). In actual practice a crystal on any frequency between 3499 and 3490 kc will give the desired coverage.

Referring, then, to the converter the circuit of which is shown in Fig. 3, it is possible to use the same crystal for the three HF bands, and to use, at the same time, the same tuning range on the receiver.

For the sake of simplification, however, the crystal oscillator coil has been shown as a single slug-tuned, tapped coil. In practice two coils, or possibly three, may be needed for L4. They may be brought into circuit by a simple three-way switch and may be grouped closely together as near to this switch as possible.

Using the normal $\frac{3}{8}$ -in. diameter slug-tuned formers, and spreading the windings over about $\frac{3}{8}$ -in., these coils should contain 15 turns of wire for 28 mc (tap at 5 turns); 20 turns for 21 mc (tap at 6 turns); and 32 turns for 14 mc (tap at 8 turns). The tap is in each case near to the crystal end of the coil, not the anode end. (These same dimensions, minus the tap, also hold good for the coil L1 in Fig. 2.)

The coils for the RF stage and mixer, gang-tuned by biggish condensers, may be wound on similar formers with 12 turns each and will cover all three bands. No. 24 gauge enamelled wire is suitable for all the coils.

This circuit is only intended as a guide to would-be builders of converters, and certainly not as a detailed design to copy slavishly. It has many advantages, such as a double-triode RF stage, the two sections being cathode-coupled, which gives a very low noise factor; a triode-heptode oscillator-mixer, which is very stable and quiet in operation; and a cathode-follower output stage which takes care of the matching into the receiver's aerial circuit. For further ease of matching, the cathode load of V3, shown as 3,000 ohms fixed, may be a 3,000 ohm potentiometer, but the adjustment will not usually be found to be critical.

Setting Up

There is no control of IF, other than the setting of the receiver itself—the mixer circuit is untuned, or aperiodic. Thus the first thing to do is to make sure that the crystal will oscillate on the desired harmonics. This is a matter of setting the main receiver first to 10.5 mc, then to 17.5 and finally to 24.5—roughly the

Correspondence from short wave listeners is welcomed for this feature, the next appearance of which is in the November issue. The closing date is Sept. 30 and all mail should be addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

frequencies on which the crystal will be "giving." There should be no difficulty in persuading any good 3.5 mc crystal to oblige with the circuit shown; the trimmer C7 is the critical control, and the slug in L4 should be roughly in the halfway position.

Once the crystal oscillator has been dealt with, it only remains to tune the main receiver to the 3.5 mc band and to find the position at which the receiver noise reaches a peak. Then, according to which of the L4 coils is in circuit (10.5, 17.5 or 24.5 mc), signals should be heard when the ganged condenser C1-C5 is rotated, the setting of this condenser depending upon which oscillator coil is switched in. If the converter is going properly, the RF tuning control (C1-C5) should merely give a sharp peak in signal strength at three positions, corresponding to the 14, 21 and 28 mc bands, and all tuning is carried out on the 3.5 mc band on the receiver proper.

Doubtless the more advanced readers will introduce ideas of their own; this simple and very straight design is offered merely as a good, sound basis on which to work, and it should lead on to better and more refined models as time progresses.

Readers of this section who have a file of back copies of SHORT WAVE MAGAZINE will find it interesting to refer to the following articles:—

- "Converter for Ten Metres" (April 1956, p. 84)
- "Surplus Converter for Surplus Receiver" (July 1956, p. 269)
- "Simple Ten-Metre Converter" (September 1956, p. 365)
- "Crystal Controlled Converter for DX Working" (July 1957, p. 238)
- "Converter for Fifteen" (May 1959, p. 124)

U.K./AUSTRALIA RECIPROCITY

This means that holders of a U.K. amateur transmitting permit can get a VK licence merely on production of their G.P.O. authority and payment of the standard VK licence fee of A£1. about 16s.

NEW NATIONAL (U.S.A.) RECEIVER

The latest National product is their NC-400, an 18-valve communications receiver for a frequency coverage of 540 kc to 31 mc in seven bands, with an adjustable selectivity range of 16 kc to 150 c.p.s. and sensitivity of 1 mV for a 10 dB signal-noise ratio. Instant sideband selection is provided for with exceptional frequency stability—only .002% on long-term drift from warm-up—which is so essential for good SSB reception on the HF bands. The general design incorporates selectable mechanical sideband filters, crystal-controlled HF oscillator as required for spot-frequency working, diversity reception facilities, and 110-220v. 50/60 cycle AC input. The U.S.A. price is \$895, which would make the NC-400 about £450 delivered in the U.K. It would have to be good for that money!



The grid-dip oscillator (GDO) as described in the article. For convenience, it is built into two boxes. The indicating meter is an aircraft-instrument type which has a very sensitive movement and, in fact, care must be taken not to "blow" the meter when the shunts are removed; the meter-setting is by a potentiometer. Plug-in coils are used to give a wide frequency coverage.

All-Band GDO

CHEAP AND EASY
TO BUILD

R. E. LONGSTAFF (G3MYL) and
R. W. BORRETT

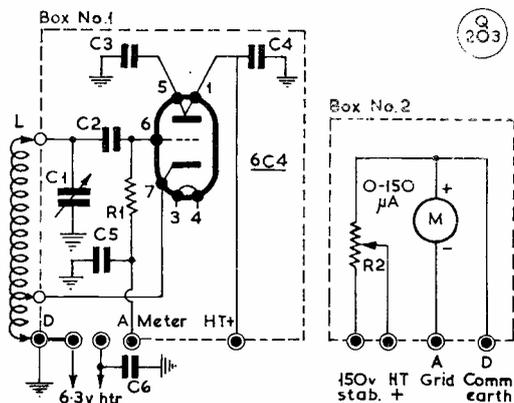
THERE is no excuse for any amateur being without this useful and versatile instrument when it can be built so cheaply—yet, despite frequent urgings in *Short Wave Magazine* that it should be in every station, one finds many still relying on cut 'n' try. In the hope more will build and use a grid dipper, the one shown here was built using parts from the junk box where possible and cutting cost to a minimum, consistent with efficiency.

There is nothing complex or new about the circuit, which features a 6C4 in the earthed

anode configuration, with the cathode tap adjusted for greatest change in grid current when tuning through resonance. Rigid mounting of components and the shortest possible leads combine to give satisfactory operation at the higher frequencies.

Two tobacco tins were obtained, each being about 5 x 4 x 2½ inches with the lid shut. These were given a single coat of brush cellulose—black in this case to match the rest of the equipment. The meter is a "surplus" Air Ministry thermometer type, reading 40-140°F., frequently advertised and costing but 12s. 6d. With the shunts removed it has a FSD of 150 microamps. The 6C4 cost 4s. 6d. and the tuning condenser 5s.; all the remaining components came from junk parts and most amateurs will have them to hand.

Providing only that attention is paid to keeping the tuning circuit leads short, there is nothing critical about the layout of components



Circuit of the grid-dip oscillator, points similarly marked being inter-connected by the cable-form shown in the accompanying photograph. Boxes can be any convenient size to suit the meter, or combined as one. Values are: C1, 50 μ F; C2, 100 μ F; C3, C4, C6, .001 μ F disc ceramic; C5, .01 μ F; R1, 22,000 ohms; R2, 100,000 ohms; meter, 0-150 μ A (see text). The resistor R2 in Box No. 2 is to set the meter at a convenient point on the scale, when changing from band to band.

COIL DATA

Range	Turns	Wire	Former	Turns/inch	Tap
1.6 to 3.5 mc	140	32g. enam.	$\frac{3}{8}$ ins.	close wnd.	32
3.4 to 7.85 mc	40	32g. enam.	$\frac{3}{8}$ ins.	close wnd.	12
7.5 to 17.35 mc	39	24g. tin.	$\frac{1}{2}$ ins.	31 tpi	14
17.2 to 40.1 mc	15	20g. tin.	$\frac{1}{2}$ ins.	16 tpi	5

and satisfactory operation should be obtained even on the 144 mc band. The 150v. stabilised HT and heater supplies were taken from an existing power pack. The 100,000-ohm potentiometer R2 is included to vary plate voltage and keep readings on scale when they differ with frequency.

The coils were wound on scrap formers and then cemented to give extra stability. After drying out, they were cemented inside inch diameter paxolin tubing and mounted on octal bases from discarded valves.

The instrument, which has proved extremely sensitive and accurate in use, was calibrated by listening to the beats on a receiver, which has itself been calibrated against a home-built frequency standard.

Finished off by transfer dials, and a perspex pointer cemented to the tuning knob, the GDO worked first time; with the coils wound as indicated, it gives adequate coverage for all the amateur bands now in use at the writer's station.

SOLDERING IRON EFFICIENCY

MAINTAINING HEAT CONDUCTIVITY IN PENCIL BITS

H. J. Long, B.E.M. (G5LO)

WHEN making a soldered joint, particularly in radio or television constructional and repair work, it is essential that the iron element should be capable of conveying the greatest possible heat to the copper bit, where it is to come in contact with the joint to be soldered.

In these days of miniaturisation, components are small and layouts much more compact. The use of the pencil-type soldering iron is almost a "must" if damage to these small components by overheating is to be avoided. Used with a good multi-cored solder, a pencil-type iron makes an excellent tool. However, they do seem to have one slight disadvantage, in that there appears to be a gradual falling-off in the heat conductivity to the copper bit, making it difficult to effect a clean, quick soldered joint.

The writer, having experienced this trouble, decided to find out the cause of this apparent loss of heat, which occurs long before the bit is worn down and in need of replacement.

After checking electrically that the element was in order and no leakage was taking place between the element and the body of the instrument, a reading taken between the copper bit and its holder showed the surprising resistance of no less than *five thousand ohms*! Although electrically it is not necessary to have a low resistance at this point, mechanically it is, as it would appear that the lower the resistance at the metal-to-metal joint, the better the heat conductivity to the copper bit.

Removal of the bit from its holder revealed a heavy coating of copper oxide, this accounting for the high electrical resistance and the poor heat conductivity between bit and holder. Careful cleaning of the shank of the copper bit, also the inside of the holder, with fine emery-cloth, restored the iron to its full heat efficiency.

It is not a bad idea when the bit is cleaned to tin it over with solder, as this will help to keep the shank from oxidising again.

CORRECTION — "Pre-Amp. For Two Metres"

With regard to this article in our June issue, G6TA writes to say that the value of R1 should have been given as 200 ohms. The effect of using a 2,000-ohm resistor for R1 would, of course, only be to degrade the performance of the amplifier rather considerably.

"SSB Topics" and the conclusion of G3BST's article on the Facsimile Receiver will appear in the October issue

IN this offering of "VHF Bands" we attempt to get the record of the last three months—and what a record!—into the space normally allotted for a single month's report. It has been thought best to do this by taking events in chronological order—and please excuse the somewhat *staccato* treatment occasioned thereby.

May 15: Though not in the amateur context, it is of great interest that for the Jodrell Bank, Ches., contact with Bedford, Mass., by moon-reflection, the frequency used was 201 mc and the input only 1 kW. The receiving dish at the American end was 84ft. in diameter.

May 30: Saw the London UHF/VHF Convention, which was very well attended and altogether a great success. The lecturers were Messrs. Kaiser (Sheffield Univ.) on "Meteor Scatter," Ross (Admiralty) on "Parametric Amplifiers," and Hartopp (J. Beam's) on "VHF/UHF Aerials." The dinner bookings were so heavy that there was a certain amount of overcrowding round the tables.

June 12: A fine EDX opening under typical tropospheric conditions produced a number of very interesting 70 cm QSO's between G/SM, the best being G3KEQ/SM6ANR. Their distance is 647 miles, making it a new world record for the 430 mc band—incidentally, this record has been held, in quick succession, by G2XV, G3HBW, and G6NB, who between them worked different SM's.

June 13: With a Scandinavian two-metre contest on, the OZ's were pouring in, LA's and SM's also being there, but not so strong and in lesser numbers; apparently, many of the Scandinavians, intent on exchanging contest numbers under good local conditions, did not realise that the band was also wide open to the U.K., and not many G's were worked. (It was a fine, hot Saturday evening, and there were not many on!) In a two-hour listening session, your A.J.D. got frequency checks on 29 LA-OZ-SM stations. Notable contacts were GW2HIY/OZ5AB.

VHF BANDS

A. J. DEVON

Getting Up-to-Date—

Sporadic-E DX on Two
Metres—

Wide Openings and New
Records—

General News Coverage—

and EI2W/OZ5AB, both new "Firsts."

June 14: The Big Day! After a hot night, with good EDX conditions into the early hours—and the QRO boys cross-modulating everything on the band—the middle-day of Sunday, 14 June, produced the first known instance in Europe of EDX working by sporadic-E, that peculiar random manifestation which can occur in mid-summer. 11KDB and 11SVS suddenly appeared on the two-metre band, with strong peak signals and rapid QSB. They proceeded to work, to hear and call, and be heard by, a number of G's. People having peaceful Sunday-morning local QSO's suddenly heard themselves hailed in a loud (and to many, an unintelligible) Italian voice, and there was great excitement for the hour or so the opening lasted. 11KDB worked G5NF and was heard calling G6OX as he faded out; 11SVS, with a slicker

operating technique, seems to have been able to work G3EJO, G3HAZ, G3MEV, G3NR, G4PS, G6OU, G6ZP and was heard by G3AJP, G3JWQ, G3KMP, G5MA, G5YV, G6OX, G13GXP and GW2HIY. Most of these path-lengths would be around the 1,000-mile mark, and it looks as if 11KDB/G5NF have it with 1,079 miles, a new Region 1 record for the two-metre band. (And how reminiscent all this is of those old 5-metre days before the war!)

Also on June 14, K6AXN/W6DQJ, both out portable, set up a new world record of 400 miles on the 1300 mc band.

And two other occurrences on that same day—the glass went as high as it has been this summer, the temperature was nearly 70° at midnight, and during the after-

TWO METRES

COUNTIES WORKED SINCE
SEPTEMBER 1, 1958

Starting Figure, 14

From Home QTH Only

Worked	Station
51	G5MA
41	G3HBW, G3JWQ
37	G3MED
35	G3KPT
32	G3LHA
28	G3GSO
27	G3KQF, G3LTF
26	G3MAX
25	G3DVK
23	G3ICO
22	G2CIW, GW3MFY
21	G3LTF/A
19	G3JGJ

This Annual Counties Worked Table opened on September 1st, 1958, and ran till August 31st, 1959. The new Table starts w.e.f. Sept. 1st, 1959, and claims can be made immediately. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. The first claim should be a list of counties with the stations worked for them. The list can be added to as additional counties accrue.

noon a remarkable mirage appeared in Bridlington Bay, which, to anyone who heard it reported on the BBC news, would be a sure sign of exceptional EDX conditions across the North Sea.

June 14/15: For most U.K. stations, however, this was the Big Night, with DJ/DL, ON and PA stations layers deep and the two-metre band sounding like a Sunday on Forty. Conditions were also very good on 70 mc for the DL/PA distances.

July 5: This was the occasion of a portable contest, under rather poor conditions, with unsettled weather in the North. The going was rather slow, but G3AYT/P, from near Leek, Staffs., had made about 90 contacts by finishing time. Some other scores noted were G3JZW/P, 36 at 1540; G3EEO/P, 54 at 1745; G3FD/P, 53 at 1840. (Contacts, not points.)

July 18: Up in the Swiss mountains, HB1FU and HB1JP found two good sites and increased the 10,000 mc world record to 136 miles; SEO-type gear was used, with parabolics.

August Perseids: For this meteor shower, expected during August 11-14, G3HBW had schedules lined up with IIACT, OE1WJ, SM3AKW and YU2HK. Though Arnold modestly remarks that he had no real success, in fact he heard all stations except YU2HK (who may not have been on), and very nearly made it two-way with OE1WJ; the latter was copying all from G3HBW, but Arnold could not read his RST from the OE. G3KEQ heard a 15-second burst from SM1JA; this was chance reception, the odds against which, as G3HBW says, cannot even be estimated.

August 25: Using a 45ft. diameter dish, and a frequency of 3000 mc (10 cm) a moon reflection contact was made between R.R.E., Malvern, and Texas University; this was not a communication test, but the first result in an investigation being carried out by the two centres using pulse-type (radar) signals to survey the path.

G6NB was not able to get in with the I's because of a local

mains fault—he only had 150v. in the pipe; most unfortunate for Bill, as it deprived him of a share of the hot seat in Countries Worked . . . G3MED, now running full power with a 4X150, is attracting much attention by the excellence of his SSB signal . . . G3NR reports a very interesting QSO with PA0OTC, running 25w. SSB and competing well with the QRO; G3NR himself has a QY3-125 as linear PA and says all his future development is towards SSB; and he got his IISVS card three days after their QSO . . . Congratulations for EI2W; after ten solid years of trying, he got his Scandinavian contact on June 14 by working OZ5AB for a very fine "First"; OZ2ES and OZ9SW were also heard at good strength; two DL's were worked during the same session—well done, Harry . . . According to GM3DIQ, the total of GM's active on VHF is now only 22 . . . Your A.J.D. has a list, dated July, 1949, showing some 250 U.K. stations then active, with their frequencies; after ten years, the current list can show no more than this—most of the call-signs are different, too . . . Indoor beam results: G3JR worked 14 EDX stations during June 12-14; G3IKV from Barrow-in-Furness, Lancs., is a strong phone signal in the London area; G3KRR gets out, too, though his location is poor . . . G3IOE and the other Newcastle stations G2BDQ, G4LX and G6JY were all able to work EDX during the period, including DL, ON4, PA0 and SM—nice work from a rotten VHF site, in the case of G3IOE . . . G3BDQ reports that during the appearance of the I's on June 14, both 10 and 20 metres suddenly became full of strong G signals; on two metres, he was able to work DJ/DL through a band full of PA0's . . . G5MA, at the top of Annual Counties yet again, lists 35 EDX contacts in six countries for the period and reports GD3UB back on the band; GW3EKX/M was also worked for Merioneth, possibly at one of Bob's own old GDX sites at Bwlch-y-Groes—the wheel turns full circle . . . G3FAN brings us up to date on his scores—he now has 760S worked in 62C for the All-Time, and an excellent total of 14C on 70 cm . . . G6OU,

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
32	G2XV
27	G3HBW, G3JWQ, G3KEQ, G3YV
26	G6NF, GW2ADZ
23	G3BKQ, G6NB
20	G3HAZ
19	G2CIW
18	G3IOO
16	G3LHA, G3MED
15	G4RO
14	G2DDD, G2HDZ, G3FAN
13	G3MPS
12	G5BD
10	G2OI, G3IRW
9	G3KPT, G5DS
7	G2HDY, G3JHM, G3LTF
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

who made the G/HB first contact some years ago, very nearly made the G/I first during the recent break; he is now TVI-proof by taking 72 mc straight out of the CO . . . When heading west, don't forget G2ADZ (Woolacombe, N. Devon), now back on two metres with a nice signal and wanting contacts . . . G3LTF is "going parametric" and shows an impressive list of EDX worked or heard from the Writtle QTH, including many Scandinavians . . . GW3MFY has a good signal to his east and moves in both Counties tables . . . G3JWQ still keeps the regular sked with G8VZ, now around the 800-QSO mark; he moves well in all tables, and works the new stations as they come on . . . G3CCH is now at 75C for the All-Time . . . G3KPT gets into Countries Worked at the 9th

rung . . . SWL Winters has passed his R.A.E. and will be with us soon . . . Stations most mentioned on the 70-cm band are F3LP, DL3YBA, PA0WAR., SM6ANR and SM7BAE. EI2W is now on most evenings, 435.78 mc, 1930-2030 clock time, regular calling and listening; F3LP is on 434.70 mc.

SHF Result

G3JHM (Worthing) has got going at 3 cm (10,000 mc) and reports a first QSO with G3GNR/P, actually cross-band and only over two miles—but it is a start, and an important result. The Tx side consisted of a reflex klystron giving 30 milliwatts RF into a 10in. ex-W.D. dish, with modulation on the klystron reflector element. The Rx was much more ambitious, involving a xtal mixer and 45 mc IF strip, with an 18in. paraboloid as receiving aerial. Actually, signals were so strong that the receiver IF section was being blocked; contact was easily held for half-an-hour or so, with no trouble due to Tx drift. Naturally, G3GNR and G3JHM (assisted by G3GDR), having field-tested the gear satisfactorily, now plan a two-way test over a much greater distance.

Correction Note

As several correspondents have pointed out, the value of R1 in G6TA's circuit on p.204 of the June issue was given incorrectly—it should be 200 ohms, and not as stated. So, if you tried the circuit and did not get much joy, try it again with the correct resistor. So sorry if you were troubled by this error.

Meteor Schedule

During the Giacobinids Shower expected on October 9, G3HBW will be on 144,892 kc exactly, continuously 0900-1200 and 1300-2100 GMT, calling and listening at one-minute intervals throughout each period, on various beam headings from south round to north-east. He will be running 800 watts, CW only, of course, to a 28-element high gain beam, with a

panoramic receiver having a NF of 3.0 dB. The object is to work extreme DX by reflection from the meteor shower, for which purpose special attention will be paid to the 144.00-144.20 mc area of the band. For the co-operating EDX stations, accurate frequency setting and high receiver stability are essential, as the signal path can only last for a few seconds.

It happens that this is the peak-year for the Giacobinids Shower, with a density or meteor rate of several hundreds per minute. So we wish Arnold good luck in this enterprising venture—and trust that he will be able to keep himself going for what will be a marathon operating effort!

How It Happens

From time to time, we get requests from readers of this piece for an explanation of the various propagation modes that are referred to in "VHF Bands." They must certainly be a bit puzzling for those who, being fairly new to VHF, have not yet got round to reading up the theory. There is no space here and no time now to discuss VHF propagation, but readers interested are referred to pp.393-396 of the 1959 *Radio Amateur's Handbook*; and the first three chapters, pp.9-53, of the *VHF Handbook*. Both these deal very well with the general subject of wave propagation in the VHF area.

VHFCC Elections

By showing cards for 100 or more stations worked on the VHF bands from 50 mc up, the following have qualified for election to the VHF Century Club: G. J. Felix, ON4FG, Bornem, Certificate No. 244, with nine prefix areas worked and cards from 30 U.K. stations; W. M. Lee, GW3MFY, Bridgend, Glam., Certificate No. 245, with all-U.K. contacts except six F stations; and R. Cordier, F3LS, Chateau-du-Loir, Certificate No. 246, showing stations worked on three bands 72-144-435 mc, including seven G's on two metres, and two FA's on the French 72 mc band.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

- 18 G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP)
- 17 ON4BZ (DL, EI, F, G, GC, GI, GM, GW, HB, LA, LX, ON, OZ, PA, SM, SP, 954)
- 17 G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, ON, PA, SM, OZ, SP)
- 16 G3GHO, G3HBW, G5MA
- 15 G3CCH, G3FZL, G4MW, G6XM
- 14 G2FJR, G2HDZ, G2XV, G3FAN, G3IOO, G3JWQ, G3KEQ, G3WS, G5BD, G6LI, G8OU
- 13 G3BLP, G3DMU, G3DVK, G3GPT, G5DS, G6XX, GM3EGW, PA0FB
- 12 EI2W, F8MX, G2HIF, G3GFD, G3GHI, G3HAZ, G3WW, G6RH
- 11 G2AJ, G2CZS, G3ABA, G3JZN, G3KUH, G3LHA, G4RO, G4SA, G5UD
- 10 G2AHP, G2FQP, G2HOP, G3BK, G3BNC, G3DLU, G3EHY, G3GSE, G3GSO, G3KQF, G3MED, G5MR, G8IC, GW5MQ
- 9 G2DVD, G2FCL, G3DKF, G3FLJ, G3FUR, G3IUD, G3KPT, G5ML, GC3EBK, GM3DIQ
- 8 G2CIW, G2DDD, G2XC, G3AEP, G3AGS, G3BDQ, G3BOC, G3EKX, G3GBO, G3HCU, G3HWJ, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB, G8VZ, GC2FZC

Special Acknowledgements

To Arnold, G3HBW, and Bill, G6NB, for their ready assistance and generous co-operation in providing much of the background information that has been written into this piece—for various reasons, your A.J.D. was out of touch for a good while during the period.

Conclusion

Next month, we hope to come in with a showing of all the Tables again—so get your claims in, so that they can be right up-to-date. Address all your VHF news and views to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1, to get there by **Wednesday 16th** latest. So, till October 2, 73 and GL with the EDX.

MOBILE ACTIVITY REPORT

NORTHERN MOBILE RALLY,
MAY 24--

WEST OF ENGLAND MOBILE
RALLY, JUNE 14--

A.R.M.S. RALLY, MALDON,
JULY 5--DERBY

MOBILE RALLY, AUGUST 16--
SOUTH SHIELDS

MOBILE RALLY, AUGUST 16--
NOTES AND NEWS

SINCE our last appearance in June, seven Mobile Rallies proper have been held and we have reports on five of them. There are three more scheduled following appearance of this issue — the London Mobile Rally at Battersea Park on September 6; the National Mobile Rally at Woburn Abbey on September 13; and the Lincoln Hamfest and Rally on September 20.

At the Northern Mobile Rally, Harewood House, on May 24, the total attendance, in fine warm weather, was about 800, with 150 mobile-equipped cars. The prizes for the best installations went to G3HAP/M (Urmston, M'cr), G3KEP/M (Bingley, Yorks.) and G3MNT/M (Stockport, Ches.), while G2QL/M (Chingford, Essex) gained the prize for the greatest distance travelled. The talk-in was the responsibility of G3IJC/A on 160m., G3NAO/A for 80m., and G3GJV/A on 2 metres. As usual, the great majority of the mobiles were on Top Band. The attractions included raffles, lucky-number prizes, and a stall selling "surplus," which did brisk business all the afternoon. The event is reported as being very pleasant and successful, and the 160-metre band was busy until a late hour with home-going mobiles. The organisers were the Spen Valley Amateur Radio Society.

On June 14 at Longleat, the magnificent and very beautiful parkland home of the Marquis of Bath, there was an estimated attendance of 600, arriving in 143 vehicles of all shapes, sizes and vintages, 65 of them fitted /M. The areas represented by visitors were Cambs., Devon, Dorset, Derbys., Hants., Lancs., Wilts and Warwickshire. Talk-in was by G3CHW/A on 1900 kc and G3FKO/A on 145 mc.

More than £100-worth of prizes were distributed in the various competitions, and certificates of merit were presented by the Most Honourable the Marquis himself to the Rally award winners, who were: G3JFH/M (Welwyn Garden City) for longest distance travelled; G3HRH/M, for best distance mobile-to-control worked on two metres, 45 miles; G3JFH/M, best distance mobile-to-control worked on 160 metres, 33 miles; G3ENG/M, giving highest field strength from a fixed point with 10w. input on Top Band; and to G6NW/M, for his equipment installation.

One unfortunate incident marred proceedings towards the end of the day, when a large branch

fell 40 ft. from a huge elm tree, severely damaging the car owned by G3BJJ, Bristol, and causing some injury to his XYL, who was in the car. Otherwise, the Rally was a great success and everyone—including G2NM, who was among the well-known people present—had a good day.

One of the callsigns to be heard on Top Band on July 5 was G3NMS—"G3 National Mobile Society"—talking in the visitors for the Rally organised by the Amateur Radio Mobile Society at Maldon, Essex, for which nearly 100 mobiles turned up, in good weather. Though there was a contest on, the two-metre /M activity was disappointingly low, and once again the great bulk of the mobile traffic was on Top Band. This Rally, the first laid on by the new A.R.M.S. organisation, was regarded as a successful social occasion, and has given those responsible for the arrangements valuable experience for the future. The Hon. Secretary of the Amateur Radio Mobile Society is: G. E. Storey, G3HTC, 10 Avon Road, Sunbury-on-Thames, Middlesex.

Again, they had the right sort of weather for the Derby Mobile Rally on August 16, and an attendance in keeping. When the register was closed at 4 p.m., 117 mobiles had been recorded, with 248 callsigns in the visitors' book; more than 400 cars were counted in the parking areas.

The contest for the mobiles was quite unique—an unannounced inspection of their log books by two G.P.O. representatives (off duty)! The winner of this exacting competition was G3LAY/M, with G3HAN/M a close second, and the prize was—a tape recorder! Other successful events were the junk sale and prize draw, but we are told that "the catering was underestimated," which is not surprising, as the total attendance was in the region of one thousand; fortunately, adequate arrangements had been made to keep the junior visitors amused. It was not in the end possible to do the formation flying of the radio-controlled models, because of gusty winds, though a certain amount of model aviation was carried out.

To handle this big Rally, organised by the Derby & District Amateur Radio Society (hon. secretary: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby) in collaboration with the Derby Short Wave Experimental Society, many helpers were needed; these included No. 2195 Squadron of the A.T.C., members of which assisted with sideshows and the reception of visitors. The local Clubs responsible feel that this Rally was an improvement on last year, but nevertheless would welcome criticisms or suggestions to make next year's even better—address as above. And G2CVV would also like to hear from the owner of an unclaimed /M log book, with no indication of ownership (!), and says that the winner of the cash prize for the balloon race will be notified in due course.

The same Sunday of August 16 also saw the first mobile meeting in the North-East, organised by G2BCY for the South Shields & District Amateur

Radio Club, at which the attendance, in bright warm weather, was about 100, in 30 cars, of which 14 were fitted mobile; the total of callsigns registered was 27. The 160-metre band talk-in station was G3NCL/A, with G3ELP/A for 80 metres—though the latter was closed down for lack of traffic, the /M activity being on Top Band. In the contests, G3DMK/M got the prize for the best installation, and G3HRE/M for the greatest distance mobile-to-control, 25 miles. A lucky programme draw for all visitors produced some useful prizes.

Though this was a comparatively small Rally, it was very successful nonetheless, and the local Club members feel that a good start has been made for an annual event.

* * * *

An interesting Top Band /M contact is reported by G3EKX (Derby). On June 7 he called CQ from sea-level at Llwyngwrl, on the coast south of Barmouth, and was hailed by GD3HQR, Onchan, a distance of 105 miles, the path lying over the *massif* of Snowdonia. The contact lasted about half-an-hour, with S7 reports both ways. G3EKX/M was using a modified ZC1 Mk.II with 8w. to a 6V6 PA and a centre-loaded 11 ft. whip. What G3EKX would like to know is "What is the record, mobile-to-fixed, on Top Band?" Such contacts much over 50 miles are unusual on 160 metres, so it would be interesting to know what other claims there are?

* * * *

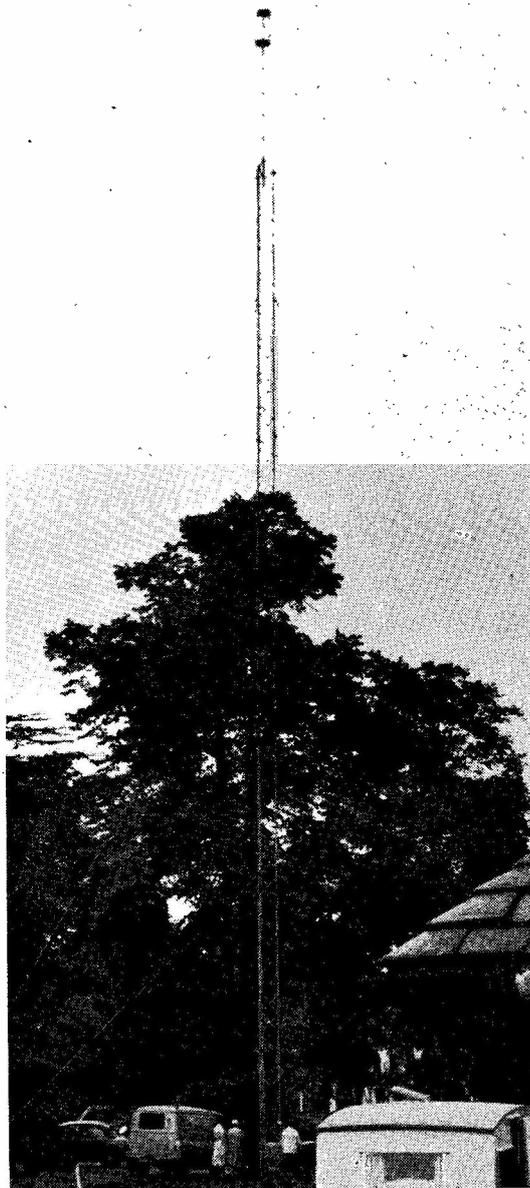
As many mobileers will know already, another organisation—"The Whips Radiomobile Group"—is proposed by G2CDN/M, who is undertaking *solus* all the preliminary work of establishing the new association. It is not intended that W.R.M.G. should be competitive with, or in opposition to, A.R.M.S., but complementary to it. The formation of W.R.M.G. arises from the discussions and decisions at the original mobile meeting which was called by G2CDN himself on February 22 last—see report p.15 March SHORT WAVE MAGAZINE.

A constitution has been drafted, membership certificate prepared, various /M awards instituted, and arrangements made to transmit a regular Group bulletin on Top Band and Eighty. Full details of the Whips Radiomobile Group can be obtained on application, with s.a.e., to: R. J. Toby, G2CDN, 13 Wood Lane, Isleworth, Middlesex.

FORTHCOMING RALLY ARRANGEMENTS

London Mobile Rally, Sept. 6: Organised by the London Short Wave Club, and to be held at the Festival Gardens, Battersea Park, routes to which are well sign-posted. If approaching from any northerly direction, make for Chelsea or Battersea Bridge; if coming from south of the River, for Wandsworth. Any good map of the Greater London area will make the routing clear. The talk-in stations will be G3IGT/A on Top Band, G2CAJ/M for 80 metres, and G3DF/A on two metres. A station signing GB2CLR will be on the air from the Rally enclosure. Special car parking facilities are being provided.

Woburn Abbey Mobile Rally, September 13: The committee of A.R.M.S. has undertaken the responsibility for organising this event, which is to be known as the National Mobile Rally. No final details are available for this issue, but many /M operators



The aerial for G3GPW/P, the 160-metre control station for the Cheltenham Rally on May 10, was provided by G8ML of Francis & Lewis, Ltd. It consisted of a 70 ft. mast standing on a base insulator, with a top loading section known as a "parrot cage," making a very effective vertical transmitting aerial for Top Band.

will already have been to Woburn and know what to expect—a magnificent site and a most interesting place to visit for its own sake. In previous years this has always been a very well-attended Rally. Woburn is on the A.50, off the A.5, just north of Dunstable. If approaching from the east or south-west, get on the A.418. There will be plenty of Top Band activity in the Beds.-Bucks.-Herts. area on the Sunday morning of the Rally.

* * * *

In our June "Rally Report," it was mentioned that the closed-circuit TV for the North Midland Rally at Trentham was provided by the BATC; in fact, it was the sole responsibility of the MARS/TV Group, the BATC being in no way involved.

* * * *

For the Mobile Register: G2FWA, Cheltenham, Glos. (160m., *Morris Eight, JPF-34*); G2HJV, Leamington Spa, Warks. (160-80-40-15-10m., *Ford Zephyr HJV-2*); G3KAY, R.A.F. Coltishall, Norwich (160-80-40m., *Humber Hawk SKC-856*); G3KEP, Bingley, Yorks. (160m., *Frisky 3-Wheeler 9623-NW*); and G3LVC, Fleet, Dorset (all bands 80-10m., *Austin Eight EMW-580*).

* * * *

According to our latest Post Office return, there were 761 amateur mobile licences in issue in the U.K. as at July 31, 1959. This represents an increase of 124 /M's during the first seven months of this year.

COURSES FOR THE R.A.E.

ONCE again, the time has come round to remind readers who wish to obtain their amateur transmitting licence that they have to pass the Radio Amateur's Examination. This will, as usual, be held in May next year, and courses for it are now being organised at various centres throughout the country.

Though this is a relatively simple technical examination which can be taken, and passed, merely by reading for it—a list of suitable books can be obtained on application to the City & Guilds of London Institute, Gresham College, Basinghall Street, London, E.C.2, for the price of an s.a.e., quoting "Subject No. 55, R.A.E."—it is better if the prospective candidate can join, locally, an evening course intended to get him through the examination. Many Clubs run good R.A.E. courses, together with Morse instruction, and at the larger Technical Colleges and Evening Institutes (which exist in practically every town of any size) courses are often available, or can be arranged, on application to the Principal. (The address will be found in the local telephone directory; always quote "City & Guilds Subject No. 55, Radio Amateur's Examination," when making these approaches.)

We shall be glad to give publicity to all organised courses, which should be notified as soon as possible. Following are details so far received:

Bradford: At the Technical College, Central Hall, Bradford 5, Thursday evenings 7-9 p.m. Registra-

tion evening September 16-18: apply in person or ring Bradford 21748 for details.

Brentford (London): At Brentford Evening Institute, Clifden Road, Brentford, Middlesex, Wednesdays 7-9 p.m., commencing September 21. Morse classes on Tuesdays, 7-9 p.m. Enrolment any evening September 14-17, at the Institute.

Holloway (London): At Montem School, Hornsey Road, Holloway, N.7, on Mondays, repeated Tuesdays and Wednesdays, 7-9 p.m., with Morse instruction, commencing September 28. These courses are run under arrangements made by the Grafton Radio Society which, over the years, has been outstandingly successful in passing out R.A.E. candidates—they had 26 successes in the last R.A.E. (May 1959), making a total of 111 passes for the six years that Grafton has been organising these courses, a record of which the Club may well be very proud. Enrolment for the course is any evening September 21-25, 7.30-9.30 p.m. at the school, but apply in the first instance to: A. W. H. Wennell, G2CJN, hon. secretary, Grafton Radio Society, 145 Uxendon Hill, Wembley, Middlesex. Though anyone interested can join the course (which is *not* restricted to members and costs but 22s. 6d. for the full R.A.E. session, including Morse), the numbers that can be accommodated are limited.

Ilford: At the Ilford Literary Institute, Cranbrook Road, Ilford, Essex, on Wednesdays 7.15-9.15 p.m. for the R.A.E., and Mondays 7.30-9.30 p.m. for Morse and Codes of Practice, commencing September 21. These classes have been running for the last 12 years and more than 200 students have passed the Radio Amateur's Examination. There is easy access to Ilford (Gants Hill) on the Central London Tube, and buses pass the door. Enrolment September 7-10, 7-8.30 p.m. at the Institute, but apply in the first instance to: C. H. L. Edwards, AMIEE, AMBritIRE, G8TL, 28 Morgan Crescent, Theydon Bois, Epping, Essex (*Theydon Bois 2316*).

St. Albans: At the College of Further Education, Hatfield Road, St. Albans, Herts., on Mondays and Tuesdays, 7.30-9.30 p.m., commencing on September 28, enrolment September 14-17, 6.30-9 p.m. at the College. Fees for both courses (Radio Theory and Morse) are 40s. inclusive over 19, and 20s. for juniors.

Wembley (London): This is another old-established and successful R.A.E. course, held as in previous years at the Evening Institute, Copland School, High Road, Wembley, Middlesex, Mondays 7-8 p.m. (Morse) and 8-10 p.m. (R.A.E. Theory). Enrolment September 14-17, 7.15-9.15 p.m. at the Institute.

The syllabus for the R.A.E. and specimen question papers for the last three examinations set can be obtained (price 6d. each, post free with large s.a.e.) from the City & Guilds, address as already given.

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NEW QTH's

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

G3NFE, G. C. White, 12 Overleigh Road, Chester, Cheshire.

G3NJM, J. E. P. Philp (*ex-DL2GA*), 59 Waverley Road, Southsea, Hants. (Tel.: Portsmouth 33912.)

G3NJV, Blackpool & Fylde Amateur Radio Society (hon. secretary: J. Nuttall), Squires Gate Holiday Camp, Clifton Drive, Squires Gate, Blackpool, Lancs.

GW3NJV, M. M. Bibby, 3 York Court, York Road, Deganwy, Caerns.

G3NKA, A. J. Lingwood, 22 Cavan Drive, St. Albans, Herts.

G3NKD, J. Wall, 6 Northampton Road, Intake Estate, Doncaster, Yorkshire.

GM3NKG, A. Campbell, 5 Clyde Drive, Shotts, Lanarkshire.

G3NKO, R. Ford (*ex-VS2FN*), Emdon, Church Street, Irvinestown, Co. Fermanagh.

GW3NKZ, L. Williams, 22 Tyla Teg, Pantmawr Garden Village, Whitchurch, Cardiff.

G3NLH, J. Dockerty, 26 Swarcliffe Road, Harrogate, Yorkshire.

G3NLM, K. J. Singleton, 8 Westmoor Grove, Heysham, Morecambe, Lancs.

GM3NLO, R. C. Harvie, 14 Mansie Road, Motherwell, Lanarkshire.

G3NLV, R. J. Campbell, Rosemount, 30 Rotten Row, Lichfield, Staffs.

G3NLY, R. Smethers, 20 Bridge Cross Road, Chase Terrace, nr. Walsall, Staffs.

G3NMW, T. L. Whateley, 34 Inverness Road, Northfield, Birmingham, 31.

G3NMZ, G. N. Bath, 182 Bishops-cote Road, Luton, Beds.

G3NNJ, F. Huggins, 8 Albert Road, Colne, Lancs.

G3NNL, N. F. K. Fletcher, 33 Aldborough Road, Seven Kings, Ilford, Essex.

G3NNO, M. T. George-Powell, 28 Gledhow Avenue, Roundhay, Leeds 6.

G3NNP, M. L. Luff, Flat 3, 8 The Downs, Wimbledon, London, S.W.20.

G3NNS, H. Johnson, 3 Wheat-sheaf Gardens, Sheerness, Kent. (Tel. Sheerness 2067.)

G3NOB, Mrs. Rita Shepherd, 72 Warwick Street, South Bank, Middlesbrough, Yorkshire.

G3NOF, D. L. McLean, 9 Cedar Grove, Yeovil, Somerset.

CHANGE OF ADDRESS

G2BCO, H. Worsley, 9 Norwood Road, Gatley, Cheshire.

G2BYM, C. H. Williams, 18 Dudley Close, Armour Hill, Tilehurst, Reading, Berks.

G2FLY, G. Edwards, 71 Deakin Road, Erdington, Birmingham, 24.

G2JB, J. H. Payton, Sandon House, Barnoldby Road, Waltham, Grimsby, Lincs. (Tel.: Waltham 2271.)

G3BLO, F. G. Sargent, 20 Priory Drive, Plympton, nr. Plymouth, Devon.

G3CSE, C. W. Smith, 41 Stanley Avenue, Hornsea, E. Yorkshire.

G3DJQ, B. H. T. Oliver, The Spinney, Moor Hall Park, Sutton Coldfield, Warks.

G3DKR, K. E. Roberts, 30 Bourne Hill, Palmers Green, London, N.13.

G3DNF, Dr. G. J. Bennett, c/o 36 Freckleton Road, Eccleston Hill Top, St. Helens, Lancs.

G3ESF, A. R. Harrower, 13 Nottingham Road, S. Croydon, Surrey. (Tel.: CRO 0250.)

G3ESP, W. Farrar, 2a Highbury Avenue, Bessacarr, Doncaster, Yorkshire.

G3GQK, J. Wall, 7 Leopold Close, Norwich, Norfolk. (Tel.: Eaton 2131.)

G3GSZ, J. S. Tempest, 18 Greenhills Estate, Wellfield Road, Wingate, Co. Durham.

GM3HXF, S. D. Morrison, 46 Devonshire Road, Aberdeen.

G3ICH, P. N. Pitt, c/o 103 Bells-hill Crescent, Rochdale, Lancs.

G3IDW, R. Reynolds, 14 Crick-lade Road, Swindon, Wilts.

G3IFD, T. Carlisle, Beuna Vista, Station Road, Greenisland, Co. Antrim.

G3IFN, K. F. Norvall, 6 Bower Lane, Basildon, Essex.

G3III/A, G. P. Lovelock, 91 A.M.Q., R.A.F. Station, Colerne, nr. Chippenham, Wilts.

G3LUW, B. C. Whittaker, 70 Crofton Park Road, Brockley, London, S.E.4.

G3LWJ, C. F. Way, 3 Farm Close, Larkham Lane, Plympton, nr. Plymouth, Devon.

G3LWM, J. Harris, 2 Lambton Avenue, Waltham Cross, Herts.

G3LZN, G. J. R. Ellison, The Bell House, Rowington, nr. Warwick, Warks.

G3MBS, 4244135 J/T Gibbs, S. H., Box 11, R.E.U., R.A.F. Station, Henlow, Beds.

G3MRS, D. R. A. Pontet, 28 Officers' Married Quarters, R.A.F. Station Wittering, Peterborough, Northants.

G3MWO, D. A. Beales, 14 Crown Road, Clacton-on-Sea, Essex.

GM3MZX, M. Pedreschi (*ex-G3MZX*), 8 St. John Street, Creetown, Kirkcudbrightshire.

G5WW, P. M. Carment, M.B.E., The Dovecote, Hunts Hill, Naphill, Nr. High Wycombe, Bucks.

G6YC, J. Roberts, 29 Merrybent, Darlington, Co. Durham.

G8UB, G. V. Marchbank, Kingsmead, Pant, nr. Oswestry, Shropshire.

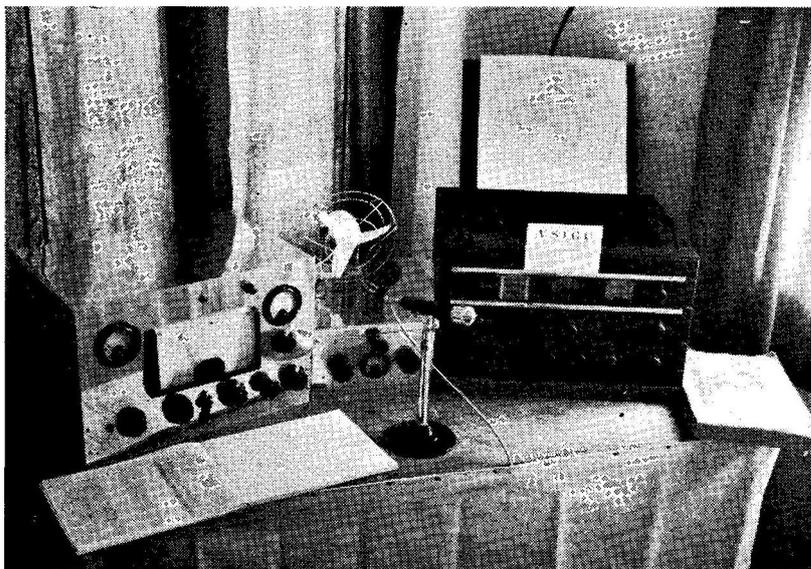
CORRECTION

G3GKD, H. A. Kearsy, Ph.D., Dormer Cottage, West Hagbourne, Didcot, Berks. (*Incorrectly recorded as G3GKO in June issue.*)

G3MSM, W. F. Thomson, 1 The Gardens, Brookmans Park, Hatfield, Herts.

THE OTHER MAN'S STATION

V S I G C



OUR picture this month is of VSIGC, owned and operated by Sgt. N. G. Cooper, R.A.F., and located at 85 Jalan Seaview, Seaview Park, Singapore, 15, who says he "expects to be out there for some time yet, and is always looking for G contacts around 21,190 kc during 1400-1700 GMT most days."

His transmitter, on the left, is a home-brew 150-watt job based on a Gelson 410/2 VFO, into a KT66 driving an 813 in the PA, with a 6L6 clamper; input is the full 150 watts, and modulation is by a pair of 807's in Class-B zero-bias, with 1200v. and 700v. power supplies, under the table. At the centre of the table is the ATU, coupled into the PA by a swinging link. Of particular interest is the fact that,

after trying a series of different aerials, VSIGC has settled for a 15-metre "ZL Special" which, though it is *indoors*, can put an RS-59 signal over the short path into the U.K. when conditions are right.

The whole station is completely relay-controlled from the Rx send-receive switch, the receiver being an AR88; this, and the Japanese microphone, are the only parts of the station that were not home-built. As regards results and DX coverage, VSIGC in his six months on the air out there has worked 85 countries on 15-metre phone, the favourite band; being an aircrew signaller he can (and does) also work CW as well. His U.K. callsign is G3LMO, with which he started on 40 metres before being posted to VS1.

EARLY CATHODE RAY TUBES

The obituary notices on the late Professor Macgregor-Morris, the distinguished physicist who for many years was connected with London University, recall that he was also a pioneer in CRT technology. The first tube to his design, incorporating internal magnetic coating, was made by A. C. Cossor, Ltd., as long ago as 1902. (From the *Journal of the Television Society*.)

CUSTOMS DUTY ON AMERICAN GEAR

With the considerable relaxations in the field of dollar imports, it is now possible to buy American radio equipment (except only valves) "as advertised." But when pricing American gear—the conversion rate can be taken as \$2.80 to the £ sterling—it must be remembered that on top of this there are Customs duties and freight charges to be paid. The average rate of duty is 20% of the sterling value. Freight charges are heavy and, of course, vary considerably, depending on bulk and distance. To take an example, a piece of American gear priced at \$280 would actually cost £100 *plus* 20% duty *plus* charges

for export packing, freight, dock dues, insurance and delivery to the U.K. buyer. The firm of Dale Electronics, Ltd., 109 Jermyn Street, London, S.W.1 (of which the principal is D. W. Wedderspoon, G2WZ) is specialising in this type of American import business, covering the whole field of radionics.

EAST AFRICAN QSL BUREAUX

We are asked to announce that "via bureau" QSL cards for East African amateurs should be sent as follows: For *Tanganyika*, VQ3, to P.O. Box 2387, Dar-es-Salaam, Tanganyika; for *Kenya Colony*, VQ4 to P.O. Box 30,077, Nairobi, Kenya; for *Uganda*, VQ5, to P.O. Box 1803, Kampala, Uganda. These are the official Radio Society of East Africa arrangements. It is understood, however, that there has recently been a split in the R.S.E.A., and that certain VQ5's have now formed a separate organisation, with their own QSL bureau. At the moment, we have no further information about this new Uganda society. The number involved can only be small, as there are barely twenty VQ5's shown in the latest *Call Book*.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for October Issue : September 11)

OUR recent preamble has brought a most interesting reply from the Yeovil Club, and the three major problems we quoted are dealt with in this way (very much condensed, owing to the space available).

(i) *How to attract members*: Advertise the Club's activities in the radio magazines, which costs nothing; also write to local newspapers, advise the local Area Youth Officer, and, if possible, get listed in the local directory.

(ii) *How to keep them*: Yeovil is a small Club, with a membership of about fifteen, and of the eight original founder-members, six are still with them. They suggest that too many people come to a Club and expect to find everything laid on for them, with an extensive programme of lectures and so on. This is impossible with a small Club and much therefore depends on the hard work of the membership themselves. Tape lectures, members' own problems, regular reports on individual activities and descriptions of gear—these are the staple diet of a small but thriving Club.

(iii) *How to find a Clubroom*: This depends, of course, on whether one wants a permanent Clubroom or a meeting-place for lectures and discussions. The local town authorities can sometimes help in arranging for a Club to use some part of business premises, and the Area Youth Officer can often assist if there are a lot of young members (schoolrooms can be made available for such purposes as Club meetings, where the intention is obviously serious and not "for amusement only").

Aberdeen held a discussion on RAEN on July 10; July 17 and 24 were local holidays, and the Clubroom was open. On the 31st Mr. G. Berry gave a Lecture-Demonstration on Stereophonic Sound.

Barnet met on July 28 for a talk on VHF Equipment, by G3LCK, and their August meeting (on the 25th) was a Junk Sale. **Bradford**, at their AGM, elected G3KLZ president, G3MGI vice-president and G3KEP secretary. They have had two interesting lectures, on Stereophonic Sound and on Oscilloscope Construction. On July 7 G3IBN gave a talk on Aerials. Informal meetings during the holiday

period will be followed by the opening meeting of the next session, on September 8.

Chester (their new title is "Chester and District Radio Society") hold their monthly net on the first Tuesday, when matters of local interest are discussed over the air. On July 14 GW3HEU led a discussion on Modern Communication Receivers.

Gravesend recently heard an interesting talk by

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE

ABERDEEN: W. K. Heggie, GM3NHW, 80 Leslie Terrace, Aberdeen.
ALDERSHOT: J. E. Fuller, G3IQE, 9 Laws Terrace, Aldershot.
BARNET: E. W. Brett, G3LUY, 28 Edward House, Edward Grove, New Barnet.
BLACKBURN: F. W. Bird, G3GZE, 14 Old Bank Lane, Whitney Heights, Blackburn.
BRADFORD: D. M. Pratt, G3KEP, Glenluce, Lyndale Road, Eldwick, Bingley.
CAMBRIDGE: D. B. Smart, G3MGB, 16 Waldegrave Gardens, Upminster, Essex.
CHESTER: H. Morris, G3ATZ, 24 Kingsley Road, Boughton Heath, Cheshire.
CHILTERN: R. Barton, 25 Hillside Road, Marlow, Bucks.
CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
CORNISH: G. Hubber, 9 Cardrew Terrace, Redruth, Cornwall.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
GRAVESEND: D. Andrews, G3MXJ, 42 The Fairway, Gravesend.
HALIFAX: A. Robinson, G3MDW, 7 Upper Brockholes, Ogden, Halifax.
HULL: G. G. Wray, G3MVO, 93 Wolfreton Lane, Willerby, Hull.
LEICESTER: P. G. Goadby, G3MCP, 535 Welford Road, Leicester.
LINCOLN: F. B. Travis, G3BCA, 202 Monks Road, Lincoln.
LOTHIANS: L. Lumsden, 33 Hillview Drive, Edinburgh 12.
MITCHAM: D. Johnston, G3NFA, 23 Woodland Way, Mitcham.
NEWBURY: J. A. Gale, G3LLK, Wild Hedges, Cookham Common, Nr. Newbury, Berks.
NORTH KENT: D. W. Wooderson, G3HKK, 39 Woolwich Road, Bexleyheath.
PORTSMOUTH: A. C. Cake, G3CNO, 7 Wheatstone Road, Southsea.
PRESTON: G. Lancefield, G3DWQ, 35 Brixton Road, Frenchwood, Preston.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
R.A.I.B.C.: W. Harris, 25 Playford Lane, Rushmere, Ipswich.
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill, Surrey.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTHGATE, FINCHLEY and District: A. G. Edwards, G3MBL, 244 Ballards Lane, London, N.12.
SOUTH SHIELDS: K. Sketheway, 15 Baret Road, Waikergate, Newcastle-on-Tyne 6.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
TEES SIDE: A. L. Taylor, G3JMO, 12 Endsleigh Drive, Middlesbrough.
TORBAY: G. Western, G3LFL, 118 Salisbury Avenue, Barton, Torquay.
WANSTEAD AND WOODFORD: N. B. Hough, 24 Raymond Avenue, South Woodford, London, E.18.
WOLVERTON: R. E. Berkshire, 58 Western Road, Wolverton.
YEOVIL: D. L. McLean, 9 Cedar Grove, Yeovil.

All Club Secretaries are invited to make use of this space, which is free, for the publication of their notices and reports covering Club activities. It is essential that all correspondence for this feature—addressed "Club Secretary," Short Wave Magazine, 55 Victoria Street, London, S.W.1—should reach us by the date given every month at the head of the article. Photographs, for which payment is made if used, are always wanted, and should be fully and accurately described on a separate slip.

G3HLF on Communication Receiver Alignment; six members took the RAE in May and now await the results. In the near future the Club will visit the Cooling Radio Station; meanwhile they meet informally every Thursday, 8 p.m., at The Old Sun, Crete Hall Road, Northfleet.

Meetings at **Halifax**, during the holiday period, consisted of alternate "ragchews" and CW classes, on July 7 and 21, August 4 and 18. The AGM was to take place on September 1.

Portsmouth put several experienced operators into their field day team, with some SWL's in support, and had other visitors inspecting the station; cooks and tea-makers are also reported to have been very efficient. Meetings are every Tuesday, 7.30 p.m., at 183a Albert Road, Southsea, with the Club Tx on the air, and Morse instruction.

Once again we acknowledge *Radial*, the journal of the **Radio Amateur Invalid and Bedfast Club**, which continues its praiseworthy efforts among the handicapped. Many more fortunate amateurs are quietly doing some excellent work in connection with this Club, but there is *always* a demand for books, periodicals and unwanted gear.

Reading had a well-attended meeting on May 30, when G3GKH gave a talk on Two Metres and Down. Their June meeting was devoted to a Junk Sale and the Slade Radio film; on July 25 G3ADJ talked on Efficiency on the 160-metre Band, on which he has had considerable success. On August 29 G3DXJ gave a lecture on SSB from the listener's point of view. Reading's meetings are at Palmer Hall, West Street, Reading, at 7 p.m. on the last Saturday of each month.

Tees-Side assembled on July 3 and 17 at The Settlement, Newport Road, Middlesbrough, but closed during August. They visited the recent Mobile Rally at Harewood House, also the West Hartlepool field day team.

Wolverton, a Club formed last February, reports for the first time. They have about twenty members, including six licensed operators, and are meeting at 7.30 every Friday at the local Science and Arts Institute. Most weeks one of the members gives a talk on his favourite topic, which leads to a general debate. They hope to hold an exhibition later in the year, and they also run Morse classes at 7.15 on each meeting night.

Reigate took part in a local fair recently, with G3JDN/A and G3NKS/A on the air, and though their demonstration attracted much public interest, they were in difficulties owing to severe interference from two model-railway layouts in the same building; many contacts were lost because of this. In-

THE FOURTEENTH MCC

Club Secretaries and other interested persons are asked to note that this year's "MCC" (The Magazine Club Contest on Top Band) will take place on November 14, 15, 21 and 22, the hours being 1700-2000 GMT on each day. Further details, and rules in full, next month.

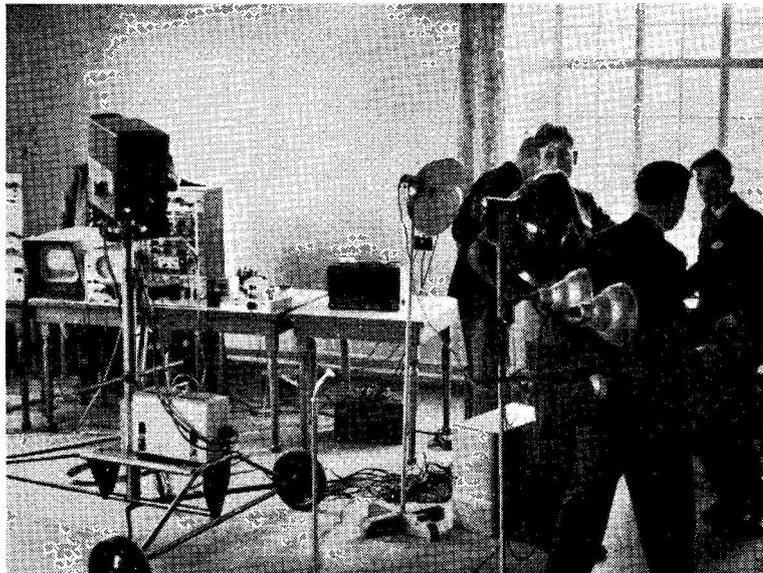
formation about future activities can be obtained from the hon. secretary—see panel—who will also be glad to hear from prospective new members.

Aldershot (note change of secretary) met on July 8 for a lecture on Two Metres. At their last meeting G3FPQ gave a very interesting talk on Aerials. Meeting-place is the Cannon Hotel, Aldershot.

Clifton recently heard a lecture on Electronic Organs, by Mr. G. Sweet, a member; and on the following day (June 27) they visited the BBC at Tatsfield. July 12 was the date of their first Club Transmitting Field Day, and meetings are held every Friday, 8 p.m., at 225 New Cross Road, London, S.E.14. **Derby** paid a visit to the Oaklands Amateur Observatory, and saw some of the work carried out with a 25-foot radio telescope. Next big event was their Mobile Rally, on August 16. See p.265.

Hull gathered for a talk on PA's and Doublers on July 14, and on RAEN on July 28. August 11 and 25 were set aside for Ragchews.

Leicester will meet on Mondays at their Hq, Old Hall Farm, Braunstone Lane, but a new scheme will be tried out, members dividing into three groups. The three categories will be Operating Technique, Workshop Practice and Constructional Work, and Lecture-Discussions. On August 4-5 the Club was active



The closed-circuit TV for the North Midlands Mobile Rally was provided by the TV Group of the Midland Amateur Radio Society. Here we see some of the gear involved, all home-built; it produced very good pictures, and the MARS/TV Group made an important contribution to the success of the Rally.

at the City of Leicester Show, Abbey Park, whence they were on the air with G3LRS/A and were also displaying members' equipment.

Preston have acquired a new Clubroom, where they will be meeting every Wednesday at 7.30 p.m. The address is 145 Hammond Street, Preston. G3KUE, the Club Tx, will shortly be back on the air, starting on Top Band. A new venture will be a Club Library, which was not possible in the old premises. **Southgate** recently had a talk by G6LL on TVI, supplemented by demonstrations of harmonic generation and detection. This was attended by 66 members and visitors. Next main event is the Wood Green Show, Town Hall Park, N.22, on September 4/5. GB3SRA will be in action.

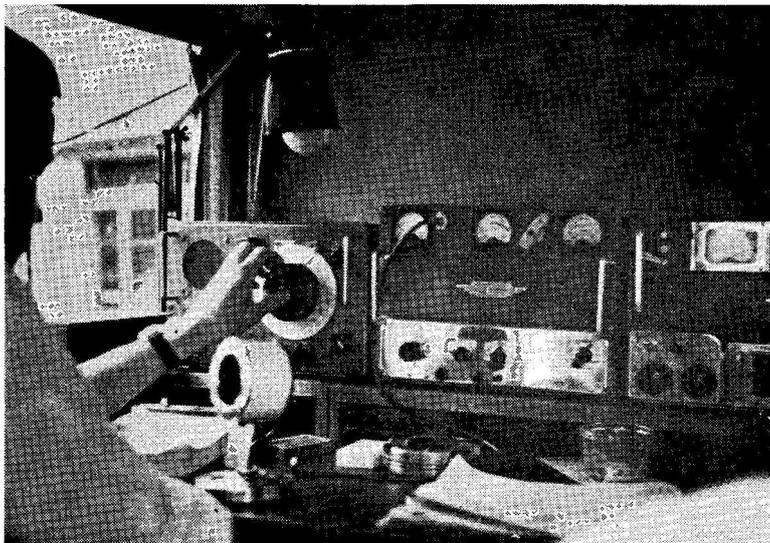
Wanstead and Woodford have got under way again, but only with some twelve members. An SWL scheme has been started for working out DX propagation, and lectures have been given on Clapp VFO's and Radio Astronomy. New members are always welcome at the meetings. Wednesdays, 8 p.m., at Wanstead House.

Yeovil, despite their long silence, have not been inactive, and meetings are held every Wednesday in the Club Room, British Legion, Preston Road, with a recorded tape lecture each month. The local Duke of Edinburgh's Award Committee have asked the Club to help with radio instruction for the Pursuits section of this award. K2CJN, who has been in close correspondence with the Club for twelve years, recently turned up in person and gave a most interesting talk comparing conditions here with those in the USA. Some 25 members and families visited the West of England Mobile Rally on June 14, and a similar visit was paid to the New Forest Rally on July 19.

Blackburn, a newly-formed Club, is anxious to enrol new members. They meet each Friday (8 p.m.) at 14 Old Bank Lane, Whinney Heights, the QTH of G3GZE, until they have grown large enough to seek their own premises.

Crystal Palace held two meetings in August: their next is on September 12 for a talk by G3IIR on TVI and BCI: on September 29 there will be the usual Morse class and other activity.

Lincoln announce their Hamfest and Rally, to be held on September 20 at the Technical College, Cathedral Street. Talk-in stations will be active on 80 and 160 metres. There will be a lecture and demonstrations for the amateurs, and also one on beauty culture for the ladies! A Junk Sale and high tea will conclude the proceedings. Tickets, 8s., from R. W. Sadler, 14 Hainton Road, Lincoln (s.a.e. also, please).



For the Cheltenham Mobile Rally, the gear in the G3GPW/A caravan was provided by G3GMN, whose constructional work is of a high standard. Signals from G3GPW/A on 160 metres were received over a wide area, using a vertical radiating system lent by G8ML—see p. 266.

Lothians, at their recent AGM, elected GM3BDA president, and Mr. L. Lumsden continues as secretary. Their opening meeting will be on September 10 at the YMCA, St. Andrews Street, Edinburgh, 7.30 p.m., and will be devoted to the presidents' address and a tape recording. Future meetings, on the second and fourth Thursdays, will include a talk by GM3LAV on Two Metres (September 24) and one on Marine Radio Communications (October 8).

Mitcham are still very active, judging by their *News Letter*, and are arranging visits to A.A. Hq. and a GPO telephone exchange. Meetings are every

NEW CLUB AT CRAWLEY

An attempt is being made to form a radio society in the Crawley area. All who would be interested are asked to get in touch, as soon as possible, with either R. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley (3359); or R. Fautley, G3ASG, 123 Ashdown Drive, Tilgate, Crawley. A meeting will be called to inaugurate a Club if the potential support warrants it.

Friday, 8 p.m., at The Cannons, Madeira Road, Mitcham. **North Kent** also circulate a really meaty *News Letter*, and from this we gather that their new session begins on September 10, 8 p.m. at the Congregational Hall, Chapel Road, Bexleyheath. **Purley** is yet another Club whose *News Letter* reaches us regularly; their recent activities have included a show at the Summer Fair, with G3JSQ/A and a publicity stand. On August 21 they had a talk by G3GKF on Receiver Alignment.

Slade will meet on September 19 for a Members'

Apparatus Exhibition, at which the judging will take place for the Enterprise Trophy. On the 25th Mr. L. T. Perriam of ICI will be talking on Non-Destructive Testing Techniques.

Torbay assembled some 30 members to hear G3LHJ give details of the SWL Contest which he is organising, and a discussion on Beam Antennas also proved popular. Next month G3BBF, home on leave, will talk about 5A2CV, the RAF Club station at El Adem. Visitors to Torquay will be welcome on Tuesday and Friday evenings at the Headquarters, 94 Belgrave Road.

The **Cambridge** University Wireless Society is fortunate in having facilities at the Cavendish Laboratory — one of the most famous scientific establishments of its kind in the world—for its meetings: the first of these for the new term will be on October 13, at 8.15 p.m. It is hoped that anyone interested who is coming up to Cambridge this year will join the C.U.W.S., which operates its own station G6UW.

Members of **Cornish** have decided to run a field day of their own on September 6, on the 80-40-20

metre bands, which is intended to give members operating experience. A Worked-Cornish-Stations certificate has been devised, details of which can be obtained from the hon. secretary—see panel. On August 9, members of the Club were able to visit GLD, Land's End, the famous GPO coast station, which for many years has handled the traffic of ships in and out of the English Channel.

The next meetings (after publication) for **Newbury** are on October 2, when G3CU will talk on SSB, and on October 30, when the Racal Receiver will be demonstrated. The annual Hamfest is on Sunday, October 11, when visitors will be welcomed—tickets and other information from the hon. secretary. The Club has now started its own marathon contest among members, and a table of results will appear in the monthly *NADARS News Letter*.

On September 5, the **Chiltern** Amateur Radio Club will run GB3HWS as one of the attractions at the High Wycombe Show. The gear will include Racal and Eddystone receivers and a K.W. Vanguard transmitter. The QSL address is as given in the panel.

AN ELECTRONIC INVERTER

What, you might ask, is an electronic inverter? In one particular sense, it is a power source providing AC from DC mains. The unit manufactured by Radio Mailing Ltd., will give 20-100 watts AC from 210-250v. DC mains, and is thus suitable for many applications within this rating.

TOP BAND ON THE GELOSO CONVERTER

The Geloso Receiver Front End is an amateur-band converter covering all bands 3.5 to 28 mc with full band-spread. It was described in detail in *SHORT WAVE MAGAZINE* for February, 1958. G31DW (Swindon) has found that this unit can be brought on to Top Band by paralleling each variable section of the three-gang tuning condenser with a fixed capacity of 180 μF . re-trimming the 80-metre cores and padding condensers so that 160 metres is covered by almost the whole dial. If it is desired to retain 80-metre coverage, the three fixed 180 μF condensers can be switched out, with the switching on the earthy side.

G5FG/P AND "THE ARCHERS"

The eight million or so listeners to the BBC serial programme "The Archers" had it brought home to them that Ambridge, too, could be involved in Amateur Radio. The local club group set up a /P station for the recent Field Day, and there was some (fairly authentic) dialogue written into the script for Philip Archer, during his visit to Lakey Hill to "make sure the chaps had all they wanted." This was accompanied by a background of well-keyed CW: the Borchester A.R.C. were signing G5FG/P. But this will give no clue to the whereabouts of Ambridge! All who may have heard this part of the "Archer" serial will agree that the Amateur Radio theme was brought out very well.

TRANSISTORS FOR PORTABLE RECORD PLAYERS

The new Philips Model AG9147 4-speed record player is interesting because it gives speaker output using four transistors only, powered from 1.5v. dry cells, which also run the motor. Four of the standard types of 1.5v. battery will give 40 hours' operation, and the all-up weight of the Player is only 9 lbs. It costs 19 gns. tax paid and can play all standard sizes of records at any of the usual four speeds.

BAND II FM RECEPTION

The BBC Engineering Division has recently published an interesting technical Monograph entitled *A Quality Checking Receiver for VHF/FM Sound Broadcasting* covering the design of such a receiver, which has a high standard of performance, the frequency stability and audio response being particularly good. The limiter-discriminator is a new version of the Foster-Seeley arrangement. The price of this Monograph, No. 25 in the Engineering series, is 5s. post free from BBC Publications, 35 Marylebone High Street, London, W.1.

RECOGNITION BY RUSSIA — Dr. Louis Essen

The Russian "A. S. Popov Gold Medal" of the Academy of Sciences of the USSR has been awarded for this year to Dr. Louis Essen, a senior principal scientific officer at the National Physical Laboratory, for his work at the N.P.L. on the "atomic frequency standard" — making use of the caesium spectral line, described on p.438 of the October 1958 *SHORT WAVE MAGAZINE*, with an illustration of the caesium-resonator apparatus on p.322 of our August 1958 issue. Dr. Essen has also devoted much time to radio measurement at micro-wave frequencies and has a well-established international reputation in this field.

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TECHNICAL ASSISTANT required in the Technical Service Dept. of Siemens Edison Swan Ltd. Duties include liaison between the Department and Factories, together with the handling of technical correspondence, preparation of literature, etc. It is essential that applicants have a good working knowledge of radio and allied subjects, and possess a wide standard of English: technical education to O.N.C. equivalent.—Apply to: Ref. J. A. R., Siemens Edison Swan Ltd., 155 Charing Cross Road, London, W.C.2.

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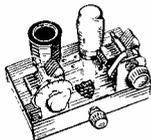
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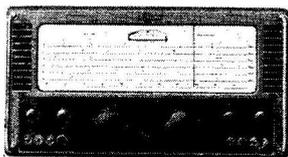
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SMALL ADVERTISEMENTS, READERS—continued

LABGEAR LG300, matching zero-bias Modulator, with three relay interlocking power supplies, £70. LM7 frequency meter with all charts, £12 10s. Webster "Band Spanner" Whip Mobile Antenna, 10-80 metres, complete with Master Mobile base mount, £12 10s. Moseley V.3JR Vertical Antenna, £5. All articles buyer collects from: G3KHE, 19 Monmouth Drive, Sutton Coldfield.

S640, £15; 3in. 'scope (see article, *Short Wave Magazine*, April '57), £7 10s. Taylor 65B sig. gen., £4. 65C ditto, £10. 45B valve tester, £15. 85A multimeter, 20,000 opv., £8. Underwood noiseless typewriter, 18in. carriage, £10. Many *QST* and *Practical Motorist*; s.a.e. list. Please add carriage.—G3MQT, 8 Coventry Road, St. Leonards-on-Sea, Sussex.

EQUIPMENT of the late G6ZH for sale, including 60ft. steel mast, 40ft. rotating mast, 2m. stacked array, power units, receivers, valves, etc. Stamp for list.—Winchcombe, 4, Estcourt Street, Devizes, Wilts.

HRO bandspread coils wanted. BC348 with internal mains pack, £14; buyer collect.—G3COI, 43 Mount Road, Penn, Wolverhampton.

SALE KW Vanguard Tx, plus KW LP Filter, mint, as supplied ready wired by KW Electronics, £47. Minimitter MR37 Receiver, perfect, £40, o.n.o.? Valradio Converter, input 12v. DC output 230v. AC 150w., unused, £10. Pye Car Radio, modern short/medium-wave version, 5 bands, speaker, perfect, £12. Valves, components, *Bulletins*, *Short Wave Magazine*, *Popular Electronics* (U.S.A.). Wanted: Reputable tape recorder equipment, exchanges considered. W.H.Y.?—Box No. 2156, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

PANDA CUB Transmitter, new condition. HRO Receiver, older model, needs attention. Complete Station, £45, o.n.o.?—Walters, 144 Yardley Fields Road, Birmingham (STE, 5431).

EDDYSTONE 750, perfect, £35 plus carriage.—B. Watkins, 1 Barton Hill, Shaftesbury, Dorset.

GOING to VQ6-land, disposing of: HRO modified to 717A input, coils 0.9-30 mc, B/S 80, 40, 20, 15, 10, with P/U and handbook. Hallicrafter S36, 28-140 mc, AM/FM, 110v. Minimitter Tx, LP filter, Coax relay, 3-band Globemaster beam with auto-tune unit, prop-pitch motor, 20 ft. x 2 in. ali. pole, LM-14 Wavemeter, with charts, handbook, homemade P/U, Heathkit Q-Multiplier, Heathkit reflected power meter. FT-241A xtals 96th harmonic type, for S/B filter, Channels 311, 312, 2 x 313, 313, 314. Transformer, pri. 230v., sec. 7v.-0-7v. at 12 amps, twice. All but 20ft. pole delivered 50 miles Tunbridge Wells, prefer buyer view and collect.—Offers to G3BYM. Box No. 2159, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

SUPER-SKYRIDER SX16 short wave and all-purpose receiver, in excellent condition, with spare valves, £23.—Mrs. E. Kemp, 19 Claremont Road, Tunbridge Wells, Kent.

WANTED: Genuine Handbook for SX28 and Hammarlund SP200 also May '59 *CQ Magazine*.—Details and price to Durrant, Roseacre, Thorpe Road, Gt. Clacton, Essex.

TAPE RECORDER with Collaro Mk. IV deck, £30 0s. 0d.; ZCI Mk. I, fully modified for AC and xtal mike, £10 0s. 0d.; Bound *Short Wave Magazine*, 1946-52, 10/- each. *Radio Designer's Handbook*, 35/-; Enlarger with F 3.5 lens and other darkroom gear, s.a.e. G3AAJ, 94 Herongate Road, London, E.12.

SMALL ADVERTISEMENTS, READERS—continued

FOR SALE: Eddystone 840A, as new, £35. o.n.o. could deliver in South.—Box No. 2149, Short Wave Magazine Ltd., 55 Victoria Street, London, S.W.1.

PANDA PR120V 150 watt Tx. nice cond., £65; latest G4ZU Minibeam 10/15 metres, co-ax feed, £12. Delivered Lancs. area.—R. Poulter, 80 Endors Street, Moss Side, Manchester, 16.

WANTED: Manual for CR-100 Receiver.—Box No. 2150, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 888 with S-meter, just checked by makers, perfect condition, £70. Also AR88D with S-meter and manual, excellent condition, £50.—G3FKM, 10 Knightlow Road, Birmingham 17.

£20 PANDA CUB, separate Williamson modulator with UM3. Dulci AM/FM Tuner type H11, £15; Collaro 4-speed transcription unit, B.J. arm, Acos stereo cartridge, £12.—Hamer, 52 Seagrave Road, Coventry.

USED VALVES: 12AU7, 12AX7, 25 of each, best offer within 5 days.—Box No. 2158, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO Senior, stable SSB reception, £10 10s. 0d.; ten bandspread and G.C. coils, £1 each; power supply voltage regulated for SSB, £2 10s. 0d.; SSB/Mobile/Fixed station transmitter, 12v. filaments, pair of 6146's in final: BC-453 mobile receiver with crystal controlled converter 10, 15, 20, 40 and 80 per the 1959 CQ SSB Handbook, £7 10s. 0d.; BC-454 Rx, no valves, "as is," £1; motor generators 12v. DC in, 1,200v. 250 mA, £4 10s. 0d.; 12v. in, 220/400v. 200 mA, £3; BC-459 converted to 15m Tx, working, £3. Add packing/carriage to above, s.a.e. for reply, other bargains.—G2MF, 51 Townhead Road, Dore, Sheffield.

UNIVERSAL AVO-METER, Model 7, condition as new, complete with test-leads and prods. and AVO leather carrying-case and strap. Also Ferranti Pocket-size Multi-Meter, perfect condition, in case with leads and test-prods.—Offers to: Watts: 62 Belmore Road, Thorpe, Norwich, Norfolk.

CR-100 with modernised front end, S-meter. N/L, spare chassis nearly complete thrown in; no reasonable offer refused; prefer buyer collects.—G3CUIY, 177 Hangleton Road, Hove, Sussex. (Phone 47225.)

6J6, 6AK5, 6AC7, 2/-; 6SN7, 6SL7, 6N7, 2/6; 12AU7, 6L6M, 3/6 (some less spigots); 807, 5U4, 4/-—all new or ex-new equipment used valves, tested, 6AM6, EF80, 6K7, 6J7, TT11, 6V6, 2/- (post extra); hundreds others, no rubbish, s.a.e. with enquiries. Wanted: FW4/500's.—Box No. 2152, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

V.R.L. 19-valve receiver, good condition, fitted S-meter, completely overhauled and 'scope realigned, auto transformer, handbook, 15 spare valves, £20.—Miles, 76 Vicarage Road, Morrision, Swansea, Glam.

AR 88D, working order, complete with manual. tuning tools, etc., case slightly damaged, £30.—Maxwell, 2 Wilson Street, Carlisle. (Phone 25864.)

BC 348 WANTED, with power pack and S-meter, must be in first-class condition. Also wanted: converter for 10-15-20 metres, preferably, xtal controlled, with power pack or w.h.y.?—Box No. 2153, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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SMALL ADVERTISEMENTS, READERS—*continued*

BARGAINS: selling up CR-100, xtal converters, test equipment (VTM 'scope, sig. gen., etc.), valves, components, etc., s.a.e. for list, callers welcome 7 p.m.-10 p.m. — Baker, 10 Upper Station Road, Radlett, Herts.

G2NS removal bargains still available for callers with cash only: Panda Cub £28; Chapman 4-stage feeder unit, long-medium-short, £3; GEC 60-watt modulator, with UM3 output transformer, £8; 1250-volt HT transformer, 17/6; 2000-volt ditto, 25/-. — Spooner, 7 Foxholes Road, Southbourne, Bournemouth, Hants.

GRUNDIG TK5 Tape Recorder, with mike and six tapes, excellent condition, £36 o.n.o. c/paid. —GW3CDP, Bank House, Resolven, Neath, Glam.

COMPLETEx Tx cheap to clear, 120w. PA, 80-10 metres, 70w. modulator, power supplies, 500 mA 650v., 250mA 300v. and 250mA 500v., Variac, mains voltmeter, Class-D Wavemeter. *Short Wave Magazine* '57-'59. First reasonable offer secures. — Bates, 36 Bryanston Road, Solihull, Warwicks. (Phone 2017.)

FOR SALE: American valves, ex-brand new equipment: 3E29, 25/-; 6L6G, 5U4G, 6SL7GT, VR105, 5/-; 6SN7GT, 6AC7M, 6J6, 6AK5, 2/6. Send for list of other new valves. Brand new R107 power pack, complete with vibrator and 6X5GT, £2. —G. E. Johnson, Tomhay, Elmhurst, Nr. Lichfield, Staffs.

SEMI-AUTOMATIC KEY required, if possible heavy non-slip base and Vibroplex type, replies delayed due to advertiser being overseas. — Daniel Carney, Fatima, Clonard Terrace, Rosbrien, Limerick, Eire.

GELOSO Rx R209, AM/CW/SSB, band edge marker, etc., £65, unscratched. Vanguard Tx, 10-80 metres, £45. Cash preferred but H.P. deal considered, against approved reference; buyer must collect, can try rig on the air. —G3BDH, 29 Mighell Avenue, Ilford, Essex. (Wanstead 4139.)

VALVES. — 2/QQVO7-40 at £2 ea.; 2/KT88 and 4/RG1-240A at £1 ea.; 2/EL821 and 2/6V6G at 5/- ea.; 1/EF50 and 2/6AC7 at 3/- ea.; 1/5Z4G at 6/-; 1/EL38 at 7/6; 2/6AQ5 at 8/- ea.; please add postage. — Box No. 2154, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED URGENTLY R208 Receiver in good condition with transit case, particulars and price to Oakley, 2 Ryemead Lane, Wyke Regis, Weymouth, Dorset.

CLEARANCE T.1154 80-40-20 metres working, £2. R.1155 with slow-motion drive, £8. Ground power units for above: Rx PU 220v. HT 6:3v. 13A LT, Tx PU 1200v. HT; all cables and plugs, £10 the two. Marconi Handbook 1154/55, 15/-, 1143A TxRx and amplifier, plus handbook, less valves, £1. Command Tx's and Rx's, racks, etc. Various valves, transformers, etc., prices according to condition. — Milner, 21 Brooklyn Way, West Drayton, Middsx. (West Drayton 4192).

HRO-MX, 50 kc-30 mc, bandspread 80-40-20-10 metres, power pack, spares, coil rack, manual, £25. — Box No. 2155, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SHORT WAVE MAGAZINE, Volumes 10, 11, 12, 13, 1952/56, bound and unmarked, 17/6 each, p.p. — Stevens, 51 Pettits Lane, Romford, Essex.

AR 88D Receiver, 540 kc-32 mc, excellent condition, guaranteed snip bargain, nearest £45 Buyer collects, Brighton, Sussex. — Box No. 2157, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

AR88D Genuinely perfect, c/w R.C.A. S-meter. A manual and tools, £55 (cash). R.C.A. 165B Oscilloscope, 230v., good condition, £14. — (Tel. LAR (London) 1544 after 5 p.m.)

GOING QRT Labgear LG.300, mint condition, hardly used, 1000v. and 350v. combined power pack, 90w. P/P 807 AB2 modulator. HRO-MX, xtal mike, valves, etc. — GM3CFS, 'phone Merrylee 5962. Address Call Book.

EDDYSTONE 888, few months' use, indistinguishable from new and in original packing, £75; G4ZU 3-band Minibeam, late type insulators, complete with 400-ohm feeder, £8 10s. 0d.; AVO mains signal generator, £4 10s. 0d. New valves: QQVO7/40, £3; 815 (2), £1 ea. Large selection Woden power pack components, complete power packs, meters, etc., s.a.e. list. WANTED: Collins' 75A1, first-class commercial 150w. transmitter, Vibroplex or Lionel bug. — G6XL, 233 Warwick Road, Kenilworth. (Tel. 679.)

FOR SALE: Eddystone 740 Receiver, good condition, offers? 19 Set Tx/Rx. working, outer case soiled, offers? Detailed manual. — Box No. 2151, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE Minimitter amateur-band converter, 1.5 mc IF output, 230v. AC/12v. DC input, very good condition, £11/10/0, or nearest offer. — Eley, 31 Franklin Road, Birmingham, 30.

FOR SALE: R208 with manual, excellent condition, £5; Triplet Multimeter, model 1200SC, recently recalibrated, £7; ATU, 19in. panel, two RF ammeters, complete except for plug-in coils, £1 10s. 0d.; TS-184A/AP, ideal for 70 cm, brand new, £2 10s. 0d.; Receiver Amplifier A3058, new, made by Pye, no valves, £3. Buyer collects. — Cheadle, Fir Tree End, Wise Lane, Mill Hill, N.W.7. (MIL 5553 after 7 p.m.)

COMPACT 150 watt CW, 120 watt and 75 watt phone station for sale. Mounted on castors with desk attached. With or without National NC200 Receiver. — Details and photograph from EI7V, 10 Strawberry Hill, Sunday's Well, Cork, Ireland.

AR 88D, S-meter, new cabinet, £40; BC221, internal modulation, power pack, £12; pair 813's with bases, £1 each; 807's, 3/6. Power pack parts cheap. — Shepherd, The Haven, Crowhurst Road, Lingfield, Surrey. (Tel. Lingfield 2719.)

SCR.522. TRANSMITTERS (BC625), including all valves, 22/6. P.P. 5/-.

SCR.522. RECEIVERS (BC624), including all valves, 25/- P.P. 5/-.

No. 62. TRANSMITTER-RECEIVER. 1.6-12 mcs in two ranges. Ideal for mobile use. Total, 11 valves. Rx — A super with separate mixer and local oscillator. Tx uses QVO4-7 as power amplifier VFO or switched selected crystals. CW, phone (grid modulation) metered for operation and valve testing. Pi output to much rod aerials or long wire. "Press to send" operation from mike. Size 8½" x 17½" x 13½" weighs only 29lbs. Completely self-contained with internal power unit for 12v. operation. Power consumption 4.4 amps on send, 3.4 amps on receive. As new condition, tested, complete with operation instructions. Price £17.10.0. Delivery included.

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Size only $4\frac{1}{2}$ " x $2\frac{1}{2}$ " overall. Output 360v. 30 mA cont. rating, or 310v. 70 mA intermittent. ONLY 12/6 each or 22/- for 2, P. & P. 2/-.

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CERAMIC CENTRE PIECE for dipoles, Type AT, 1/6 each.

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500 ohm, 300w. $\frac{1}{4}$ " coax Low loss. Ideal for Mosley and other beams, 1/6 per yd.

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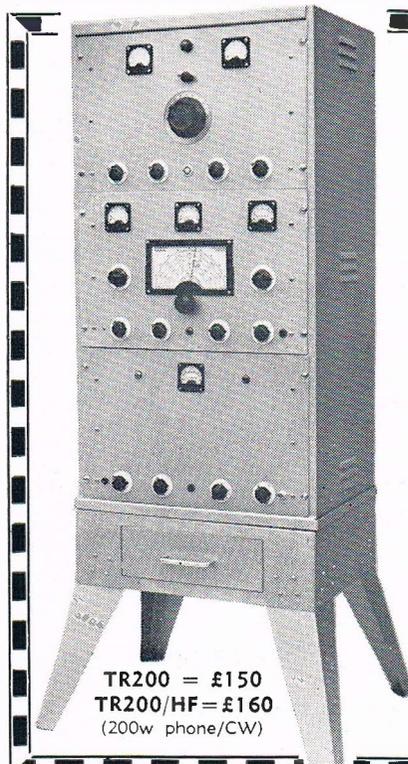
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For No. 19 Set
10 Kc/s. ; 100 Kc/s. ; 1 Mc/s. ; spot frequencies ; Crystal controlled oscillators ; includes 5—12SC7 valves, neon modulator handbook, etc.

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Frequency range 172 to 190 Mc/s. Comprising : VCR139A Cath. ray tube ; 7—EF50 ; EF55 ; 4—EA50 ; 2—EB91 ; 5U4 ; VU120 and EC52. Standard mains input 200-250 volts 50 c/s. Ideal Scope Basis. **£5/10/-** Carriage 5/-.

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Complete with 5 valves. In new condition. These Sets are sold without Guarantee, but are serviceable. **22/6** P.P. 2/6.

Headphones 7/6 pair, Junction Box, 2/6. Throat Mike, 4/6. Canvas Bag, 4/-, Aerial Rod, 2/6

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Complete with Valves, High Resistance Headphones, Handmike and Instruction Book and circuit. Frequency Range 44.0 to 61 Mc/s. Range approximately 3 to 8 miles. Power requirements : Standard 120v. H.T. and 2v. L.T. Ideal for Civil Defence and communications.

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3-channel U.H.F. Receiver ; uses plug-in crystals (not supplied) ; operating on 332.6 ; 333.8 ; cd 335 Mc/s. Unit contains 7—6A15 ; 2B7 ; 2—12SN7 ; 12SR7 ; Relays etc. BRAND NEW and boxed ; a bargain at **59/6** P.P. 5/-.

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★ 9.72 MC/S IF ★ 4-CHANNEL CRYSTAL CONTROLLED
★ 40 KC/S BANDWIDTH ★ 100 to 120 MC/S COVERAGE

Unit complete with 21 valves ; crystal ; 24 volt rotary power unit, etc., in metal case. In new condition with full circuit diagram.

£8/19/6. Carriage 10/6.

Circuits separately, 1/9 post free.

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★ 9.72 MC/S IF ★ 10-CHANNEL CRYSTAL CONTROLLED
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Sub-units	Type	With valves	Less valves	P.P.
TRANSMITTER	...	81	75/-	2/6
RECEIVER	...	114	27/6	7/6
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With VCR139A tube ; 2—EF36 ; VR66. Size 8 $\frac{1}{2}$ x 6 $\frac{1}{2}$ x 1 $\frac{1}{2}$ in. Used condition : Guaranteed Tube.

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