

The
SHORT WAVE
Magazine

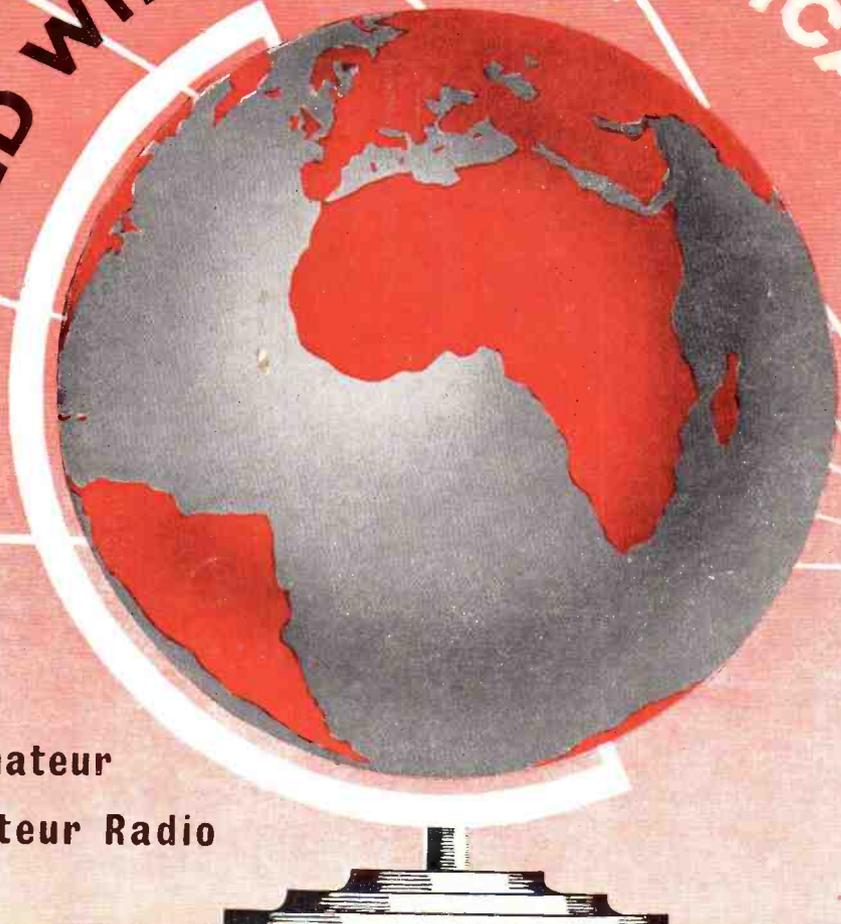
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VOL. XVII

MAY, 1959

NUMBER 3

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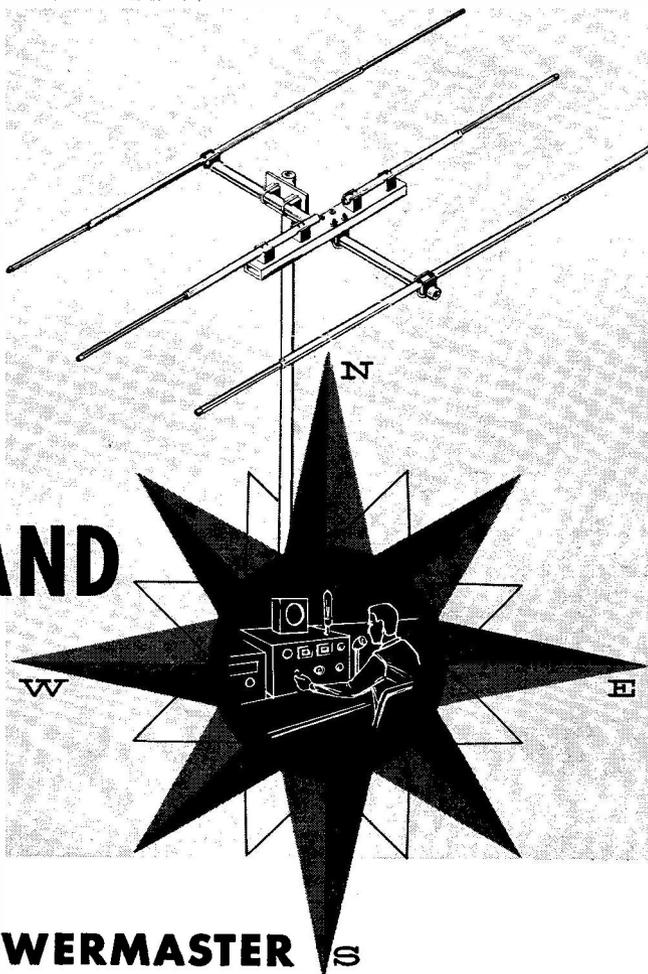
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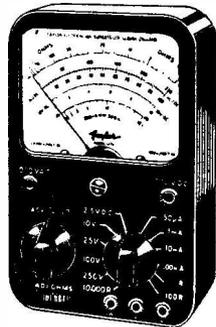
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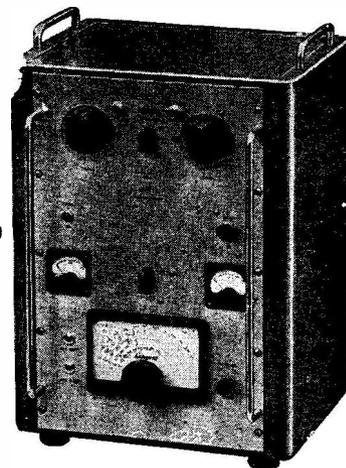
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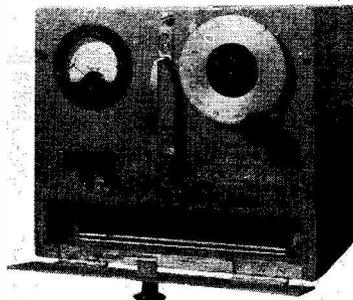
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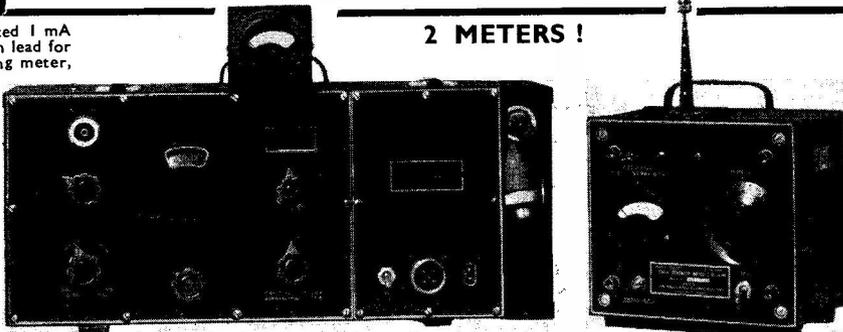
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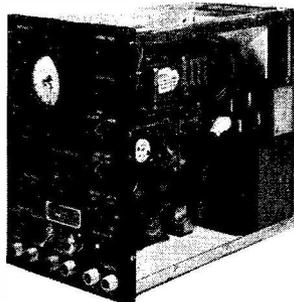


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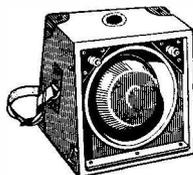
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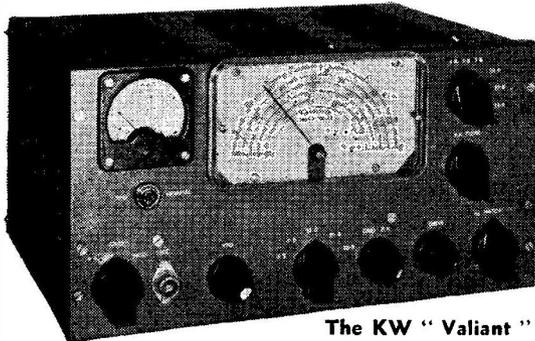
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The SHORT-WAVE Magazine

E D I T O R I A L

Guidance *Five years ago, the problem discussed in this space was that of trying to meet, in some way within the pages of SHORT WAVE MAGAZINE, the needs and interests of the beginner and the SWL.*

Our new feature "SWL," started in January and now appearing every two months, has been generally welcomed and, within the orbit of Amateur Radio, we shall be able through it to discuss a good many of the basic facts. But from the point of view of the keen SWL we are not, obviously, able to cover the ground quickly enough — there is so much to talk about, and the selection of material is not made any easier when one remembers that what is Greek to some is normal experience to others.

From quite another viewpoint, there is the suggestion that much can be done for SWL's (many of whom are really "advanced beginners") by local Club groups. Some clubs are very well organised in this respect and take pride in the number of SWL's they are able to pass through the R.A.E., the instruction having been undertaken by members; an achievement of this sort is intensely satisfying for its own sake. But too many clubs have no SWL organisation, while with some the attitude even is that while SWL's are allowed in, it is only to listen to the wise talk of their elders, the licensed members.

Enthusiasm for Amateur Radio is to be encouraged, from whatever quarter it may come. We hope that our own offering through "SWL" will go some way to meeting the needs of beginners — but we also know that there is a great deal more that could be done for SWL's.

*Austin Fobell
G6FO.*

Taking Facsimile Transmissions

POWER DRIVE OSCILLATOR
—FREQUENCY CALIBRATION
—OUTPUT AMPLIFIER

PART II

J. B. TUKE (G3BST)

For the discussion on the construction of the tuning fork, and the basic principles involved, see pp. 69-71 of the April issue.—Editor.

TO obviate any possibility of direct coupling between the oscillator and following circuits it was decided to use a twin-triode (6SN7GT) for the fork-maintaining valve and to take off the 50 c/s from the point between the two sections (see Fig. 4). This has two advantages: (a) The following circuits are completed isolated from the fork coils, and (b) The additional amplification ensures fork oscillation without any difficulty. It might be mentioned in passing that an experimental circuit with only a single triode required very critical adjustment of the grid coil position, due no doubt to the fork not being true "spring steel" and therefore having appreciable mechanical losses. The two-valve circuit, however, went off straight away. It should be noted when testing this type of oscillator that it takes about 30-45 seconds to reach its full amplitude—it does not give full output at once, like the conventional oscillator.

Oscillator Stability

It has already been pointed out that the oscillator circuit should be completely stable. This requires care at one or two points. High frequency oscillation is very inclined to start, the stray capacities and the leads to the coils acting as the tuned circuit. Also, LF oscillation may occur where the relay coils act like inductances as for a TPTG oscillator. To prevent these troubles, co-axial cable was used to connect the valve to the relay coils, and the anode load of the first triode section is shunted by a $.01 \mu\text{F}$ condenser, which reduces the amplification at higher frequencies while having little effect at 50 c/s. Grid and anode stoppers are also used and the bodies of the relays are earthed.

Mounting the whole oscillator on a metal chassis would assist from the stability point of view but was not found to be practical. A small aluminium chassis did not have the

desired rigidity (in an experimental model the fork remained stationary while it was the relays that vibrated, twisting the chassis!); a steel chassis cannot be used as it would complete the magnetic circuit between grid and anode coils, giving rise to continuous oscillation independent of the fork.

Providing the oscillator is constructed with care, no trouble should be experienced in obtaining steady oscillation entirely dependent on the fork for its frequency control. The "acid test" is to hold the fork still with the fingers and ensure there is then no output.

Frequency Calibration

When construction of the fork is completed the next problem is to obtain the correct frequency. Once again, this turned out to be simpler than had at first been anticipated, and visions of grinding off "thous" from the fork tines faded into the distance as the problem resolved itself in a much simpler manner.

With the dimensions given the fork should oscillate at a frequency somewhat higher than 50 c/s. To prove that this is the case, the oscillator should be started and the fork viewed under the light of a neon lamp (or fluorescent strip-light) when the strobing effect between the 50 c/s mains supply and the "50 c/s plus"

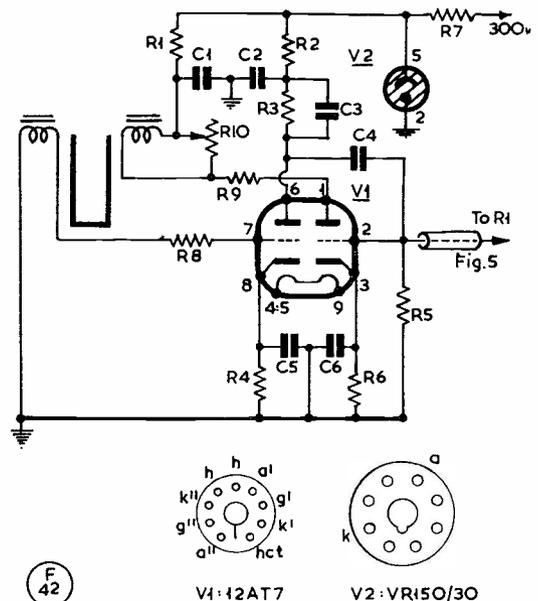
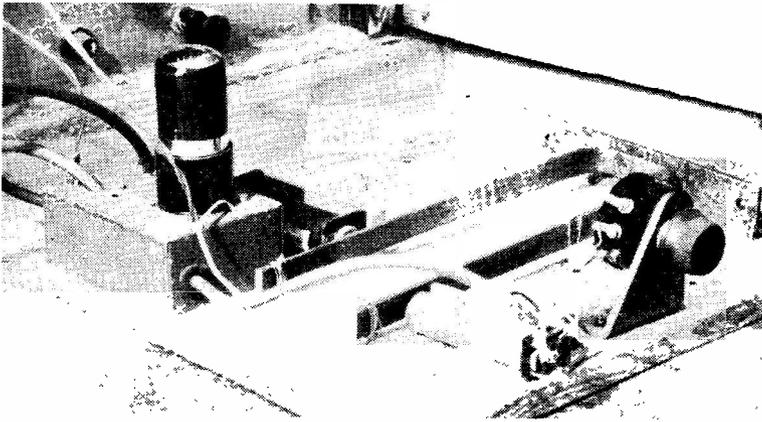


Fig. 4. The fork oscillator circuit, the feed-back inductances being ordinary relay coils with their armatures removed. The values are: C1, C2, $32 \mu\text{F}$; C3, $.01 \mu\text{F}$; C4, $0.1 \mu\text{F}$; C5, C6, $50 \mu\text{F}$; R1, R7, 4,700 ohms; R2, 10,000 ohms; R3, 56,000 ohms; R4, R6, 1,200 ohms; R5, 1 megohm; R8, 5,000 ohms; R9, 470 ohms; R10, 25,000 ohms. The oscillator valve can be a 12AT7 and the stabiliser a VR150/30.



Construction of the 50-cycle synchronization oscillator, maintained by a tuning fork to ensure good frequency stability on the power source used to drive the synchronous motor for rotating the drum. The setting-up of this oscillator is described in detail in the text. The wire and clip loadings on the tines of the fork are to bring it right on frequency — see text.

of the fork movement should be shown as an apparent slow movement, to and fro, of the fork tines. This test also shows if the fork is oscillating correctly, as the tines should appear to come together and separate in a smooth movement. If they appear to move in the *same* direction simultaneously, then the fork is oscillating as a whole around its centre pivot; this indicates insufficient rigidity in the mounting.

The strobe frequency should be around one or two cycles per second and the next step is to add weight to the fork until it is slowed down to exactly 50 c/s. To do this, wind three or four turns of copper wire (say, 28g.)

round the fork tines, about half an inch from the ends, and check the strobe frequency again. The result of this should now be a slower apparent movement of the fork, indicating that the frequency is now nearer 50 c/s. If the addition of weight has resulted in an increase of strobe frequency then the natural frequency of the fork is already below 50 c/s, and it is necessary to grind a little metal off the fork ends to raise the frequency above 50 c/s. If this is so, only grind off about $\frac{1}{8}$ -inch before checking again.

Assuming, however, that the strobe frequency is lower after the weight has been added, a little extra wire should be put on (or some solder can be run on to that already present) until the strobe movement is about a quarter to half a cycle. The final small adjustment is made by fitting two paper clips over the fork about halfway along, and by trial and error adjusting them along the fork — towards the ends to reduce the frequency or towards the centre to increase it—until the fork appears to be stationary on the strobe. Its frequency is then exactly equal to that of the mains. It will probably be observed that this “perfect adjustment” cannot be held for any length of time—this is due to the mains

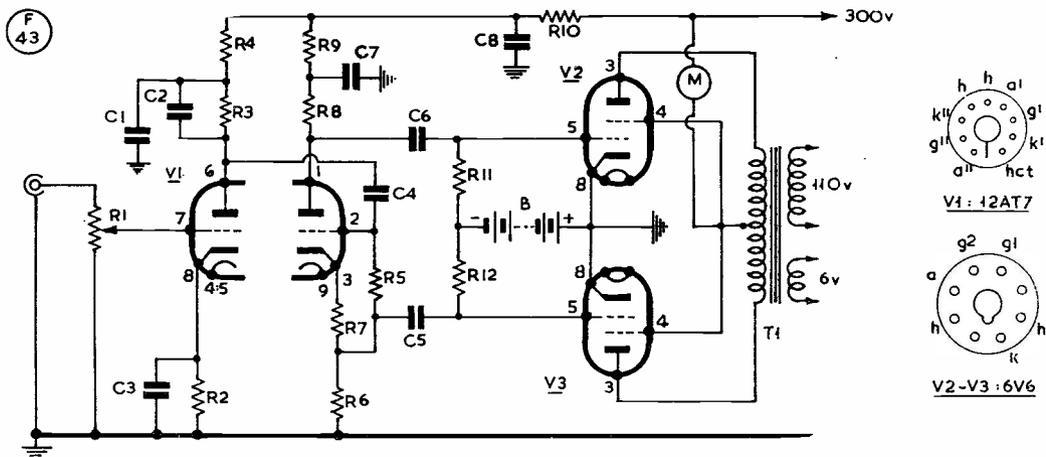
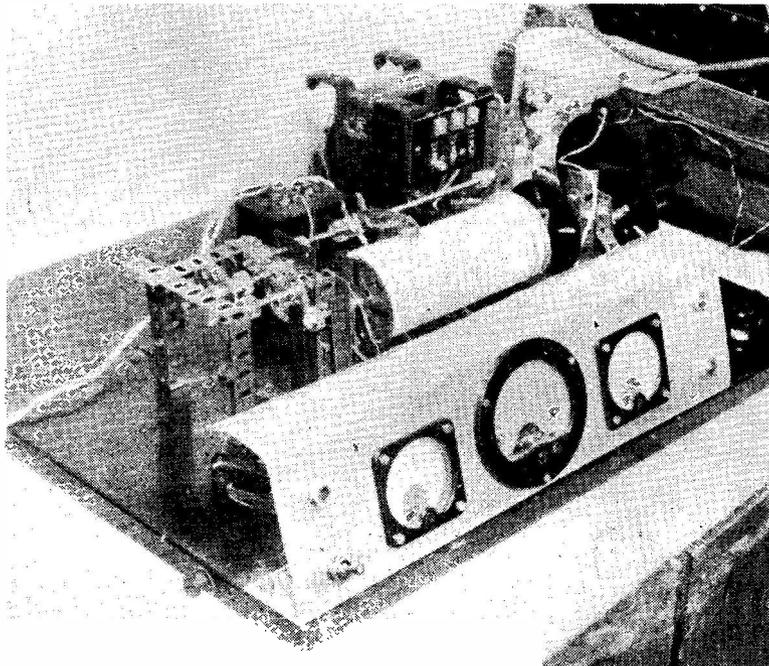


Fig. 5. Circuit of the 50-cycle amplifier, which provides the actual power to drive the drum-rotating motor — in the writer's case, this is a 110-volt 50c. synchronous machine of the fractional horse-power type, available for a few shillings on the surplus market. Values for this circuit are: C1, C7, C8, 16 μ F; C2, .01 μ F; C3, 50 μ F; C4, C5, C6, 0.1 μ F; R1, R5, 1 megohm; R2, R7, 1,200 ohms; R3, 56,000 ohms; R4, R9, R10, 4,700 ohms; R6, R8, 47,000 ohms; and R11, R12, 470,000 ohms. The valves are a 12AT7 for V1 and 6V6's for V2, V3; B can be a 45-volt deaf-aid battery, and T1 is discussed in the text.

frequency varying, not to variations in the fork frequency! The final working adjustment cannot be made until the entire receiver is complete, when the frequency must be checked on an actual facsimile signal. Perfect adjustment to the mains frequency does not mean final setting is completed, as there is no telling exactly what the mains frequency is at the time the first adjustment was made. (It is understood that mains frequency is always brought to 50 c/s exactly at 8.00 a.m. every morning, so that electric clocks can be synchronised.—Ed.)

No mention so far has been made of the variable resistor across the anode coil. This provides very slight changes of frequency by altering the amplitude of fork vibration. It is analogous to the minute effect which resistance has on the resonant frequency of a conventional tuned circuit. The final adjustment of the paper clips should be made with the resistance control in the midway position. Movement of the control will then give a frequency variation of the order of plus or minus one part in 10,000. This is sufficient to account for frequency variations due to change of temperature, which naturally affect the size of the fork. At G3BST, it has not been found necessary to put the fork in an "oven" as day-to-day temperatures do not vary extremely and care is taken to keep the fork oscillator unit away from locally generated heat.

The complete circuit of the oscillator is given in Fig. 4. Note that very efficient decoupling is used—it must be realised that if any "mains" 50 c/s finds its way into the oscillator it may well "lock" the fork frequency, or if not sufficient for this, it will cause the output of the oscillator to vary slowly in amplitude, according to whether the mains frequency is at any instant in or out of phase with the locally generated 50 c/s. To ensure complete independence of the HT supply, the plate voltage to the twin triode oscillator is obtained from a VR150 stabiliser. It pays to



General view of the mechanism of the facsimile receiver designed and described by G3BST. On it, he can take down weather charts from a large number of Met. stations. It will be noted that Meccano gearing plays an important part in the mechanical construction.

take some care over the construction of the fork oscillator unit, because a facsimile receiver without a stable frequency drive is worse than useless.

Output Amplifier

The output from the oscillator is fed by co-axial cable to an amplifier, shown in Fig. 5. This amplifier is mounted on a chassis common to the signal amplifier and overall power supply. It is conventional in design, consisting of $\frac{1}{2}$ -12AT7 voltage amplifier, $\frac{1}{2}$ -12AT7 phase splitter and a pair of 6V6's in Class-B push-pull output. However, one or two unusual points will require explanation.

It will be observed that the anode loads are again shunted by $\cdot 01 \mu\text{F}$ capacities to reduce HF response—this is partly in the interests of stability and partly to reduce amplification of harmonics of the 50 c/s frequency, which may overload the output stage before it is working to full capacity on the fundamental; this is due to the fact that a certain amount of attenuation takes place in the RC coupling at the basic frequency of 50 c/s. Battery bias is employed for the output valves, as this enables true Class-B operation to be employed and markedly increases the anode efficiency. The

anode current with no 50 c/s drive is about 15 mA, rising to 50-60 mA under full-drive conditions. A potentiometer R1 in the grid circuit of the 12AT7 voltage amplifier enables the correct level of 50 c/s drive to be applied to produce the required voltage at the motor, and at the same time acts as a motor "on-off" switch.

The choice of output transformer (T1, Fig. 5) required a bit of thought. The correct plate-to-plate load for the output valves is around 10,000 ohms. The motor used by the writer is a "surplus" item costing 7s. 6d.; it consumes 10 watts, requires 100 volts, and is of the simple split-phase type. The speed is 3,000 r.p.m., and the direction of rotation can be varied simply by connecting the third lead, which has a 2 μ F condenser in series, to either one of the supply leads. Its impedance may be taken as about 1,000 ohms. A transformer with a total turns ratio of about 3.2 : 1 is therefore required to match the valves to the motor. At first a modulation transformer was considered, but very few of the "surplus" types have a high enough inductance to operate efficiently at 50 c/s, and the big ones are expensive. So finally a mains transformer was chosen having windings of 110v. and 200-0-200v. (plus a 6v. heater winding which came in useful later). This gave an overall ratio of just under 4 : 1 with the 200v. side connected as the primary, so presenting a load of about 13,000 ohms to the 6V6's. In spite of the mis-

match the circuit functions extremely well, ample power being available to drive the motor with 300 volts on the 6V6's and a total anode current of 50-60 mA.

The output from the amplifier is led to the motor, along with 6v. from the "heater" winding which runs an indicator lamp and helps to work the frequency comparison meter (both of which are described later). The indicator lamp used is a 6v. .04A type to prevent it presenting any appreciable load to the amplifier.

(To be continued.)

(Editorial Note: A correspondent, writing from the great steel centre of Darlington, and commenting upon G3BST's description of how he made his tuning fork—see page 71, April issue—points out that mild steel does not respond to heat treatment in this way. What is required is annealed *spring* steel. Having obtained this from any blacksmith or local engineering works, the spring steel should first be annealed, achieved by bringing it to red heat and allowing it to cool off slowly; it can then be shaped as required. After this, it should be hardened, by reheating to redness followed by sudden quenching in cold water; it is then cleaned off bright with emery cloth. Tempering consists of again re-heating, but only until the metal shows colour, from straw to blue, when it is quenched as soon as the colour deepens to blue. The procedure is thus: Use spring steel; anneal, if not already annealed; bend to shape; harden, and then temper.)

PYE RADIOTELEPHONES FOR IRANIAN OIL FIELD

Pye Telecommunications Limited of Cambridge have been awarded a contract by the Iranian Oil Operating Companies for providing a radio communications system between Kharg Island in the Persian Gulf, the oilfield at Gachsaran and the Agha Jari oilfield. A 12 channel VHF system will be installed using frequency modulated multiplex radiotelephone equipment. The chain of terminal and repeater stations will cross a total of 160 miles of sea, coastal plains and mountain ranges. To facilitate servicing, the same type of multiplex receivers and 15-watt transmitters will be used throughout, although in some of the more difficult transmission areas the 15-watt transmitters will be boosted by 50-watt RF amplifiers. Each repeater station contains two 6 ft. racks enclosing all the radio apparatus together with engineers' supervisory equipment. The terminal stations have one 6 ft. rack housing all the radio and another in which the telephone channelling equipment is installed. To ensure a high standard of

reliability a reserve 5 kW air-cooled diesel alternator will be automatically brought into operation within a few seconds of a power failure in the mains supply—telephone traffic would be interrupted for rather less than five seconds while any change-over took place.

CHINESE SCIENTIFIC LITERATURE

The Lending Library Unit of D.S.I.R. has started to collect Chinese scientific literature. About 150 Chinese periodicals are now on regular order and the first batch has arrived. We cannot ignore the scientific output of China, which may be growing rapidly. Already the Lending Library Unit of the Department of Scientific and Industrial Research is noted for its large collection of Russian scientific literature, which is available to research, industrial and other organisations through a loans service. The Library also organises a scheme for the translation of Russian scientific literature, in collaboration with the National Science Foundation in the United States. This may possibly be extended in the future to include scientific literature from China.

Short Wave Magazine is an independent monthly publication

Converter for Fifteen

CRYSTAL CONTROLLED,
WITH HIGH GAIN RF STAGE

THERE are some "surplus" receivers that do not give coverage much above 20 mc, and others—though tuning up to 30 mc or more—that show a marked deterioration in performance at the upper end of their frequency range.

As is well known, these drawbacks can be overcome by the use of a converter which—if it is a good one and crystal controlled, preferably—will give an enormous improvement in results on the HF bands, in this case 21 mc.

The circuit shown here is a proved design and if built up as a separate unit, can be used with any receiver tuning around 2 mc. The crystal-controlled oscillator ensures stability and a clean beat at signal frequency while, by using a low IF, good bandsread is obtained on the main receiver, most of which have plenty of dial movement between 2.0 and 2.5 mc.

Some Circuit Points

With a CC converter, the choice of crystal frequency is of great importance if "birdies" (or spurious beats) are to be avoided over the IF tuning range. By using V3 as a 3rd-harmonic oscillator, with a crystal happening to be available marked 6.333 mc, the injection frequency becomes 19 mc, near enough. Crystals in this range are now cheap and easy to find—for instance, it should be possible to get a 6339.9 kc FT-type for 5s.; this would give an injection frequency of 19.019 mc, again near enough for the purpose, in that the 21000-21450 kc band would be tuned on the main receiver from 1980 to 2430 kc.

Oscillator injection, shown in the circuit from the plate of V3 to the grid of V2 (mixer), is by "indirect coupling"—in the model, this consisted of a couple of turns of insulated wire round the V2 grid pin.

The RF stage V1, using an ECC91, may look unusual but is in no way tricky; it is the cathode-coupled arrangement, and works very well, giving plenty of gain with low noise. The signal frequency circuits L1 and L2 are slugged to ensure broad-banding, with C1 to peak up signals on the input side, if required. The IF coil L3, which should resonate at mid-IF range—in this case about 2.200 kc—can either

be wound up for the purpose on a slugged former or (the easier approach) contrived by stripping turns off any unwanted BC-receiver type medium-wave coil. Obviously, a calibrated grid dipper would be very useful in getting L3 on to the correct frequency—this should, of course, be done with the coil in position after it has been brought to about 1950 kc on the bench.

Construction

The converter can be built up on a small chassis, the actual dimensions of which will depend somewhat on the size of dial/condenser assembly used for C1; this should have L1 mounted directly across it, placed so that the axis of the winding is at right angles to L2. As all other components can be miniature, the maximum chassis size need not be more than 6 ins. by 4 ins. with a 2 in. drop.

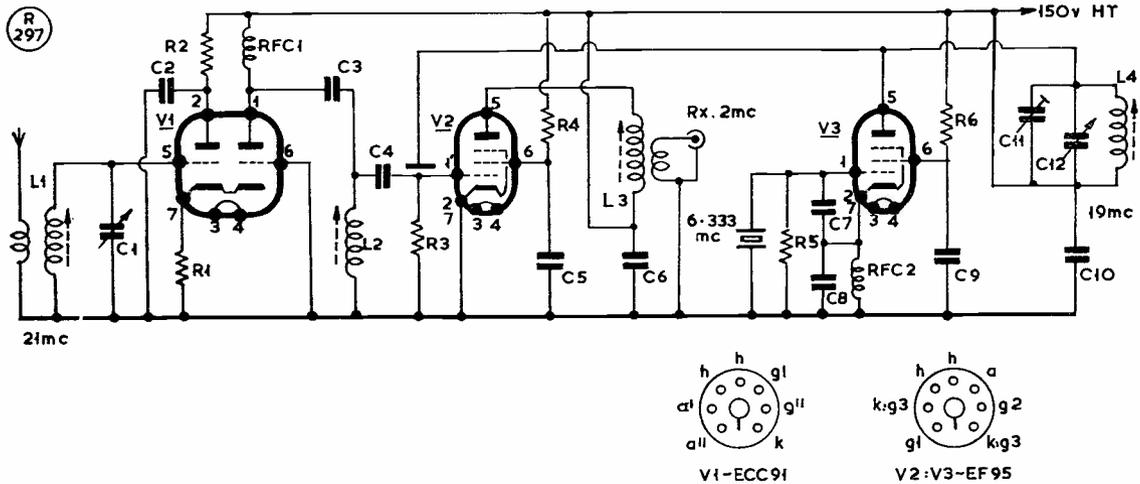
It is advisable to screen off the oscillator section and also to put a sub-chassis screen between V1 and V2. Though the circuitry is in no way related, the general construction could well be on the lines of the very neat layout adopted by G2JF for his 70 mc converter, illustrated on p. 97 of the April issue of *Short Wave Magazine*, where each stage is in a separate sub-chassis compartment.

A coax outlet should be provided for the IF link into the main receiver. The input (aerial) connection will depend on the type of aerial used; if an end-on wire, as indicated in the circuit, one end of the coupling link on L1 should be earthed down, and some juggling done with the number of aerial-coupling turns on L1.

Setting Up

The first thing is to get the oscillator stage working correctly. The crystal beat at the fundamental frequency should be heard on the main receiver; if the latter will tune also to the 3rd-harmonic frequency, it is simply a matter of adjusting C12 until a good, healthy T9x beat is heard at or near 19 mc. If the receiver does not cover that frequency area, put a 0-10 mA milliammeter in the HT line to V3 (only) and find a setting on C11, C12 at which the meter dips; for a further check, use either an absorption wavemeter on L4 (when the plate current should flicker as resonance tune is passed), or take a GDO reading from L4 with HT off V3.

With the values given, and normal methods of construction, the C11,C12,L4 combination will tune to the 3rd harmonic "first time"; unless everything is wildly out, the meter dip



Circuit of the crystal-controlled converter discussed in the text, designed for an IF of 2 mc. V1, ECC91, is a cathode-coupled low-noise RF amplifier, with EF95's as mixer and third-harmonic oscillator. With a crystal in the 6.3 mc range (see text) the IF/AF amplifier can be any receiver tuning 2.0-2.5 mc. Though a tuned IF as low as this has certain drawbacks, the great advantage is that most receivers have plenty of dial coverage in the 2 mc region, so that SSB phones are much easier to resolve and hold on tune.

point can be taken as the 3rd-harmonic tune setting on C12.

Next, adjust L3 slug for maximum "sharsh," or background hiss, with the main receiver tuning set at mid-frequency of the IF tuning range—say, 2225 kc. (This adjustment can also be arrived at with a suitably-calibrated GDO.)

As regards setting up the RF and mixer tuned circuits, L1 and L2, the neat way of doing it is to use a signal generator, because what one really needs for this operation is a steady signal at the middle of the 21 mc band. However, any locally-generated signal—such as a GDO (if sufficiently stable), a crystal harmonic or a VFO beat will do as well. First peak up on the slug in L2 and then, with C1 at mid-capacity, peak L1 slug. After this, tune across the band on the main receiver (IF tuning) and check that it is 15-metre signals that are now coming through. With an S7-S8 signal on tune (or some similar level of locally-generated beat) adjust the injection coupling between V3 plate and V2 grid—there is a "best" setting, but it is not so easy to find unless the incoming signal is a steady one. Too much injection produces noise and kills weak signals, while too little makes strong signals sound weaker than they are.

By peaking L1,L2 at mid-band and L3 at mid-IF, it should be possible to get a reasonably level response through the whole band. The frequency area being swept at IF is only about 2% of the signal frequency. If there is

Table of Values

Circuit of the CC Converter for 21 mc

C1 - 30 μ F, midget var.	R1 = 300 ohms
C2 = .005 μ F	R2 = 1,000 ohms
C3, C4 = 25 μ F	R3 = 1 megohm
C5, C9 = 500 μ F	R4 = 25,000 ohms
C6, C10 = .002 μ F	R5 = 100,000 ohms
C7 = 10 μ F	R6 = 20,000 ohms
C8 = 150 μ F	RFC1 = 1.5 mH
C11 = 15 μ F, pre-set	RFC2 = 2.5 mH
C12 = 3-30 μ F, Philips trimmer	V1 = ECC91 (6J6)
	V2, V3 = EF95 (6AK5)
	Xtal = See text

(Note: All resistors rated half-watt)

COIL DATA

- L1 = 12 turns 22g. on 1/2-in. diameter slug-tuned former.
- L2 = 15 turns 22g. on 1/2-in. diameter slug-tuned former.
- L3 = To resonate near 2 mc: stripped BC-type MW coil, slugged, with 5-7 turn link — see text.
- L4 = 13 turns 22g. on 1/2-in. diameter slug-tuned former.

Note: Coil values will be sensitive to layout and stray capacities. Adjust L1,L2,L4 by GDO check, spacing turns as necessary to resonate L1,L2 at 21.2 mc. and L4 at 19 mc. For adjustment L3 see text.

a marked drop in sensitivity across the IF tuning range, it will not be because the signal frequency circuits are too sharply tuned, but because L3 is not sufficiently flat. This is one reason why tight coupling should be used at L3—it helps to flatten its response.

Alternatively, the IF can be peaked for maximum response over that area of the 21 mc band, CW or phone, which is of most operating interest. This would bring the frequency change on the main receiver down to about plus or minus 5% relative to the IF mid-frequency, which should ensure a good broad-

band characteristic.

From the foregoing, it follows that, once correctly set up, the signal-frequency circuits L1,L2 should not require to be touched—and the discussion also suggests how useful a signal generator would be in lining up the circuits! Then, with a testmeter connected as an AC voltmeter across the receiver speaker terminals and used as an output meter, and modulation on the signal generator, all adjustments could be made accurately and at leisure, and finalised.

On the other hand, it is true to say that a converter of the type described here can also be lined up quite well, by the experienced operator, on background noise and incoming signals alone.

Break-Through at IF

Because there are strong signals, such as Top Band locals and ship stations, in the range 1980-2000-2430 kc (if a 6339.9 kc crystal is used in the oscillator) it is essential to keep the lead between the converter and the main receiver short, and to use coax. If with no connection at all on the main receiver aerial terminal(s), nothing can be heard over this frequency range, then there should be very little break-through trouble *provided* the converter-receiver inter-connection is a short coax lead: the sheathing should be taken to the receiver

earth terminal and the live side to the aerial terminal normally bridged to earth (not forgetting to remove this Ae-E link if it is used).

In a locality where there are no strong signals in the 1980-2430 kc range, or there is not much Top Band activity between 1980 and 2000 kc, or the 3rd-harmonic frequency comes out at 18.99 mc, better results will probably be obtained by using balanced input to the main receiver, with the output link from L3 connected across Ae-Ae on the receiver aerial panel; then try reversing these connections, with one Ae terminal either earthed or un-earthed.

In General

Most main receiver power packs, as built into them, will usually have enough in hand to run this converter which, when working properly, will give a far superior performance on the 15-metre band than almost any general-coverage receiver. It will not only make tuning very much easier in the sense of bandspread, but the SSB phones on 21 mc will be a great deal easier to get adjusted up on, whatever the main receiver in use (provided it has a BFO).

In fact, once you have built a CC converter, you will want one for each band—indeed, this is the logical approach to really efficient amateur-band reception.

OFF THE BANDS IN THE EARLY DAYS

LOGGING PIONEERS OF LONG-DISTANCE FLYING AND EXPLORATION

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

ABOUT the late 1920's and early 1930's radio amateurs were making great strides in the art of short-wave communication. Ten metres had been found to have considerable DX possibilities, but very little was then known about the eleven-year cycle phenomenon, or the MUF, and nothing about the possibilities of DX on the frequencies around 50 mc.

At about this time, too, others were exploring communication possibilities by means of long-distance flights using aircraft, often under extremely hazardous conditions. Usually, on these first attempts, no short-wave radio was carried, but it soon began to be realised that a means of communication by radio in an emergency could be very useful. Also, some of these intrepid pioneers began to be aware of a potential source of willing co-operation—radio amateurs. Quite often amateurs were asked to listen for such signals, although this was usually frowned upon in "official" circles—an attitude that was to be

drastically changed by the coming of World War II!

In those early days, the writer (who for the past thirty-six years has been "chair-bound") spent many interesting hours listening to much of this activity. Looking back through some old log-books, the following entries have been selected as being of interest, and may evoke memories for some of the old timers who also took part in these events.

R.A.F. Attempt England to The Cape, 1929

On December 17 1929 an attempt was made by two R.A.F. pilots to fly non-stop from England to Cape Town. The second pilot and radio operator was a Flt./Lt. Jenkins. The call-sign of the aircraft was GEZAA, and it was to report progress every four hours. The wavelength used was around 36 metres—no frequencies in those days. The writer's log shows that at 1200 GMT on 17/12/29 GEZAA was QSA4 RAC, with position given as "Above clouds twelve miles south-east Nevers, 12.04." At 1600 GMT GEZAA was QSA3 RAC, and reported "Fifty miles 313 degrees from Algero Sardinia." Again at 2000 GMT a watch was kept, but unknown at that time, the aircraft had crashed near Tunis, North Africa, both pilots being killed.

Across the Atlantic, 1930

July 24 1930 was the date of a successful flight across the Atlantic by that great Australian pioneer of long-distance flying, the late Sir Charles Kingsford-

Smith, in his aircraft named *Southern Cross*. Some publicity was given to this proposed flight and amateurs were asked to listen for signals. Many did so, and were rewarded by hearing it for most of the flight. The callsign was VMZAB, operating on about 33 metres. The log shows that VMZAB was first heard at 0945 GMT at QSA5, R8; at 1017 the report stated "All OK but cold." At 1100 GMT came the report "We are out of 600 metre range now. Position 53.15 N. 16.57 W."—and so on until 2010, when signals were down to QSA2, R3. Nothing more was heard until the following morning, when weak signals were received just before the landing in Newfoundland.

By present day standards, the radio gear carried must have been very crude, but it did its job, particularly the wind-driven generator, which was left running when no messages were being sent. As long as the carrier was there, we knew the *Southern Cross* was still airborne!

Submarine Polar Expedition, 1931

In 1931, an American submarine named *Nautilus*—not to be confused with the Jules Verne version, nor the most recent under-the-North-Pole ship of the same name—made a trip into the Arctic regions. This was the Wilkins-Ellsworth expedition and from the amateur point of view the main interest was that the submarine carried short-wave radio and the first radio operator was himself an American amateur.

From the log it is seen that on July 30 1931 WSEA was heard testing with LGN, Bergen, Norway, on 36 metres. Signals from WSEA were QSA5, R8, and the position was given as "40 miles out from Plymouth." From then on signals were logged daily, including solid copy of Press reports, which could be read in the national Press the next day! On September 6 WSEA reported "Leaving Ice Pack" at QSA5, R8. On her return trip the submarine put in at Tilbury, and the radio operator, Ray Meyers, was given a great reception at an Amateur Radio convention which happened to be taking place in London at that time.

Also in 1931, the famous German airship *Graf*

Zeppelin did a round-the-world flight. The callsign of the airship was DENNE and signals were heard on about 36 metres. On August 30 1931, DENNE was QSA5, R7, but no details were given of her position. Again, in the following year, on March 6 1932, DENNE was logged at QSA5, R9.

Seaplane Flight, 1934

On July 23 1934, a Mr. John Grierson started on an Atlantic flight *via* the northern route in a seaplane named *The Robert Bruce*. Amateurs had been asked to listen for his signals from the plane and by good fortune the writer was able to hear GACRK on the first hop from Londonderry to Reykjavik, Iceland. At 1100 GMT that day GACRK was QSA5, R7, and reported "Derry to Vik wind NW 2,000ft." At 1200 came "435 miles Derry Vik cld 4,000ft." At about 1500 GMT he was "Landing off coast of Iceland." GACRK was not heard again on this trip, but *The Robert Bruce* did complete the flight in the course of the next few days, arriving in Canada about a week later. On his return to this country the writer received a nice letter of thanks for the QSP of messages, together with a series of photographs taken during the flight.

What happy memories those old log-books arouse, thrills of earlier days gained with nothing more than a simple 2-valve O-V-1 SW receiver, *plus* the ability to read Morse, not to mention some patience *and* the keeping of an accurate log. And to this day one gets just the same old thrill listening to the satellite signals and other sounds from outer space!

(Editorial Note: The ordinary receiving licence in issue at the present time does not cover the reception of transmissions outside the recognised amateur and broadcast frequency bands. The Wireless Telegraphy Act of 1949 is framed in such a way that general listening to ships, aircraft or commercial stations is illegal. At the time talked of by G5LO in his article there were no such restrictions—all the receiving licence did was to prohibit unauthorised disclosure.)

NEW ISLE OF WIGHT SHIP-SHORE SERVICE

A new ship-shore service, operating from the Isle of Wight, came into use during January, 1959. It is now the third in the chain of ship-shore VHF stations operated by the Post Office and provides similar facilities to those already given in the Firth of Clyde and at North Foreland. VHF radio-telephone communication between telephone subscribers in the United Kingdom and suitably equipped ships of all nationalities is regularly available in the approaches to Southampton and the English Channel within about 50 miles of St. Catherine's Point (where Marconi conducted his first long-range tests in 1901).

Shore equipment is sited on St. Boniface Down, near Ventnor, and the calls are handled by the existing Post Office coast radio station at Niton, GNI. The equipment complies with internationally

recommended engineering standards, and uses frequency modulation. The frequencies employed give a single-frequency calling channel on 156.8 mc, and a two-frequency traffic channel using 161.85 mc for transmission and 157.25 mc for reception.

PIRATE OPERATOR FINED

The London papers of April 6 carried reports on a particularly fatuous case of piracy. One Graham King, East Molesey, had for some time been putting out local "record request programmes," on a frequency outside any amateur band. Aged 22, he pleaded that he was an electronics student "carrying out closed-link-circuit tests with pre-recorded tapes." This garbled nonsense made no impression on the Court, and King was put down for a fine of £20 with five guineas costs.

SOME NOTES ON FSK

THE radio teleprinter is one of the many automatic telegraph systems in use at the present moment. Its advantages over hand Morse keying are increased speed, the elimination of the skilled telegraphist and the receipt of messages directly in page form. Carbon copies of messages can be prepared simultaneously and, in addition, the signal can be re-originated for onward transmission.

The HF radio teleprinter is now widely used for aeronautical purposes such as the conveying of aircraft movement messages, meteorological forecasts, and so on, but it can also provide a valuable communication service to many other organisations where rapid, *accurate* working over long distances is essential.

Some time ago, the International Civil Aviation Organisation (I.C.A.O.) recommended that the system of operation for HF radio teleprinter working should be that of "Frequency Shift Keying," or, in short, FSK. This method has now been adopted by many other authorities.

The Radio Tele-Typewriter

The teleprinter is operated by combinations of DC impulses of equal magnitude and of either positive or negative polarity. These are generated by the sending machine and so control the receiving machine that it will print the correct letter as directed by the code group received. By convention the impulses are called "Mark" or "Space" according to their polarity, and each letter, figure or symbol has a combination of "marks" and "spaces" corresponding to it.

For accurate operation it is essential that the shape and time of occurrence of these impulses shall be preserved in transmission, since distortion in excess of a certain amount will cause misprinting. In long-range radio telegraphy the effects of propagation conditions must always cause some distortion and the object of the techniques employed is to reduce this as much as possible.

The main causes of distortion introduced by the radio link are, broadly speaking, noise and fluctuating signal strength. This latter effect can itself cause trouble, but under conditions of very deep fading (which are not uncommon) the noise level can become comparable with the signal strength and is then a major factor in degrading the system.

Distortion due to these effects can be reduced or obviated in several ways and the best systems employ as many of the following techniques as possible:

- (1) The use of a receiver having the highest possible sensitivity with automatic gain control to mitigate signal fading,
- (2) The use of two or more receivers with widely spaced aerial systems and combined outputs, *i.e.*, diversity reception,
- (3) Directional aerials at both ends of the link,
- (4) Increased transmitter power, or more efficient use of existing power.

FSK is the only system which enables the fullest

and most economical advantage to be taken of all these techniques. A brief survey of several current communication systems will illustrate this more clearly. The main systems are:

- (1) CW On/Off.—In this case, the transmitter radiates a keyed unmodulated signal. Carrier-on corresponds to "Mark" and carrier-off to "Space,"
- (2) Single Tone.—The transmitter is modulated with a keyed audio tone. Tone-on for "Mark" and tone-off for "Space,"
- (3) Two Tone.—The transmitter is modulated with one or other of two different audio tones, of which one corresponds to "Mark" and the other to "Space,"
- (4) FSK.—The transmitter radiates an unmodulated carrier whose frequency is shifted between two steady states separated by a few hundred cycles. One frequency corresponds to "Mark" and the other to "Space." To resolve these signals the IF of the receiver can be heterodyned with a stable oscillator to give an audio tone whose frequency will have one of two values, depending on whether the transmitter is sending the "Mark" or "Space" frequency. These tones can then be translated into the "Mark" and "Space" polarity DC signals by suitable filters and rectifiers.

Summary of Advantages of FSK

(1) There are no AGC problems as there is no interruption of the carrier as in CW On/Off.

(2) Dual diversity operation gives results as good as triple diversity with the other systems.

(3) Best use is made of the transmitter input power, as only a carrier is radiated and it conveys all the intelligence. In the tone systems half the transmitter power is wasted in producing a carrier whilst all the intelligence is carried in the sidebands. The table shown here, compiled by an independent authority, illustrates this advantage of FSK in the clearest manner. It can be seen that FSK will give the *same* service with *less* transmitter power or *better* service with the *same* transmitter power.

(4) FSK employs the double-current system of operation which gives positive transmission of both "Mark" and "Space." In the CW and Single-Tone systems, "Space" is conveyed by the *absence* of signal which leads to the "Space" signals being impaired by noise.

(5) Since FSK is an FM system, limiters can be used in the signal channels, and these further mitigate the effects of fading.

TRANSMITTER POWER NEEDED FOR EQUAL SERVICE OVER THE SAME RADIO PATH

CW On/Off	...	...	10 kW
Single Tone	...	...	20 kW
Two Tone	...	...	5 kW
FSK	...	...	2.5 kW

(With acknowledgments to The Plessey Company and International Aeradio, Ltd.)

Modifying The TCS Transmitter

SPEECH AMPLIFIER—
TVI FACTOR—OPERATION
AND RESULTS

PART II

J. N. ROE, M.I.R.E., F.R.S.A. (G2VV)

The first part of this article —covering main modification details and showing interior views of the transmitter — appeared in our April issue, which should be referred to for continuity.—Editor.

DETAILS of power requirements were given in his October article by G3LOX and need not be discussed further apart from one point: The rating of the 225 volt DC supply should be increased to 60 mA, at least, to accommodate current requirements for the new modulator driver stage, V102.

Speech Pre-Amplifier

Any suitable speech pre-amplifier can be used to drive V102 in the 52245A. However, it is felt that the one used by the writer and developed for this purpose at the time of making the modifications may be of interest. It is self-powered, and forms a small and compact pre-amplifier suitable for many purposes.

Little need be said relating to its construction, as Fig. 4, together with the photograph and table of values, makes the whole thing almost self-explanatory. Naturally, all leads are kept to a minimum length; screened leads are all carefully bonded to chassis. The ECC81 twin-triode gives ample output to drive V102 comfortably. Full modulation of the transmitter is attained with the speech pre-amplifier gain control set to the midway position. When in use the metal cover is in place. The microphone lead is well screened and a co-axial cable connects the amplifier output to V102 input on the transmitter. Earthing throughout is common and the 52245A is connected to a true earth.

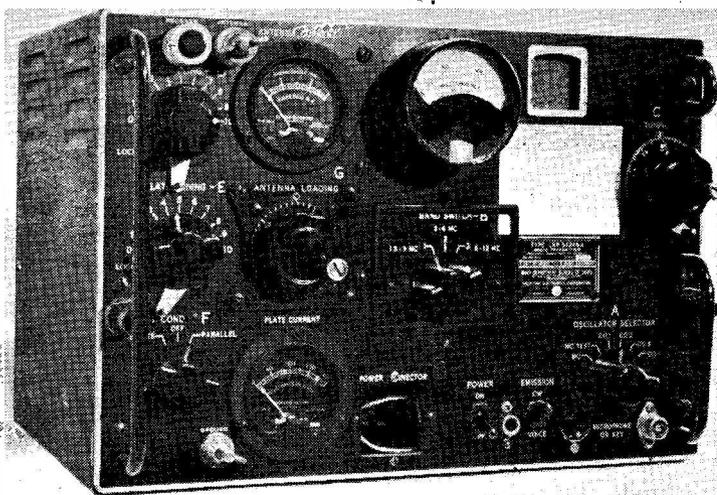
The Modified Transmitter in Operation

The actual model discussed here has been in use at G2VV since February, 1958, working CW and phone on all three bands, 160-80-40 metres. Over 500 contacts have been made during this period with very satisfactory reports at all times. Of particular interest, based upon reports received, is the freedom from hum on phone and the T9 characteristic of the CW signal. The transmitter has not been pushed to its limits by any means, conservative treatment being preferable for trouble-free working. On 1.8 mc 10 watts input is normally used (power reduction being made in the HT supply side of the power pack). On 3.5 and 7 mc 40-50 watts input is possible for CW, with a maximum of 25 watts for phone working.

Exciter output at 1.8 mc is ample; at 3.5 mc it is more than is really required but, as is to be expected in a multi-frequency design of this type, there is some falling off in excitation at 7 mc. The exciter output is enough to give satisfactory operation at this frequency, but there is room to improve upon it for the best possible results. The stability of the VFO, even at 7 mc, is remarkable and no trouble has been experienced by keying the VFO/Buffer/Doubler stages.

Aerial Notes

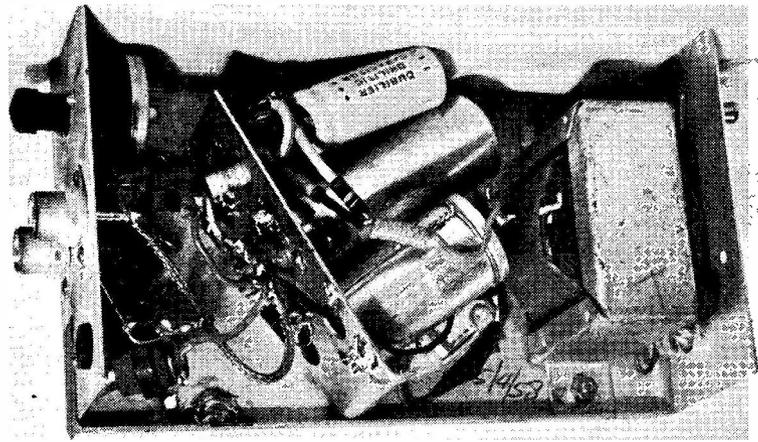
In the original, the transmitter was designed to operate with a 20 ft. vertical aerial in the 3-6 mc and 6-12 mc ranges with an additional



The TCS6-52245A Transmitter, with rubber mountings removed. The measurements are 13½ ins. wide by 9½ ins. high by 10 ins. deep, and the total weight about 50 lbs. This panel view is as modified by G2VV, with the 4-pin power connector, key shorting switch, key socket, coax input socket for speech pre-amplifier and the Phone/CW change-over switch, as additional items at bottom right.

(external) loading coil for the 1.5-3.0 mc range. Tests carried out using a 20 ft. wire produced excellent matching on the two HF bands. The wire was slung between two chairs on the ground floor and contacts on 40 metres with Lands End and the north of England brought 569 reports. On changing to an indoor 68 ft. end-fed aerial, situated in the roof space, reports of signal strength in each case remained the same. Certainly anyone located suitably for installing a vertical 20 ft. aerial direct from the transmitter aerial terminal should do very well, on 7 mc at least!

The combination of aerial coupling and loading incorporated in the 52245A permits almost any aerial to work with a reasonable degree of efficiency. The writer uses an end-fed 68 ft. aerial (partly bent!) installed in a loft 18 ft. above ground. (The QTH being but 300 yards from the banks of the River Thames it will be realised that the geographical situation is not exactly ideal from the radiating point of view!) With this indoor aerial, loading on 7 mc is satisfactory when the aerial condenser C121 is set to the "series" position. On



The self-powered speech pre-amplifier used by G2VV with his modified TCS transmitter; the output from this unit feeds into a coax socket on the transmitter front panel, the original CO stage being rewired to work as the modulator driver - see circuit page 68, April. This speech amplifier is an external item, on a chassis 6 1/2 ins. by 4 ins. by 2 ins., and enables a crystal microphone to be used instead of the carbon type provided in the original.

3.5 mc C121 is at the "parallel" position and an additional variable condenser of 300 $\mu\mu\text{F}$ is used in series with the aerial itself. On 1.8 mc C121 is set to the "parallel" position, when the transmitter can be almost fully loaded without any additional tuning unit.

The foregoing remarks are in no way intended as "final words" on using a 68 ft. aerial with the 52245A. They are quoted for guidance only and represent actual fact in one particular case.

Results

Using the aerial and input powers mentioned, general coverage of the country has been achieved on Top Band, phone and CW. On 1.8 mc CW DL1, OK, OH, YU have been worked on several occasions, with average reports of 559. For 3.5 mc working, transmission has been mainly on CW with good European coverage. Phone on 7 mc has been confined to inter-G working with good reports (QRM

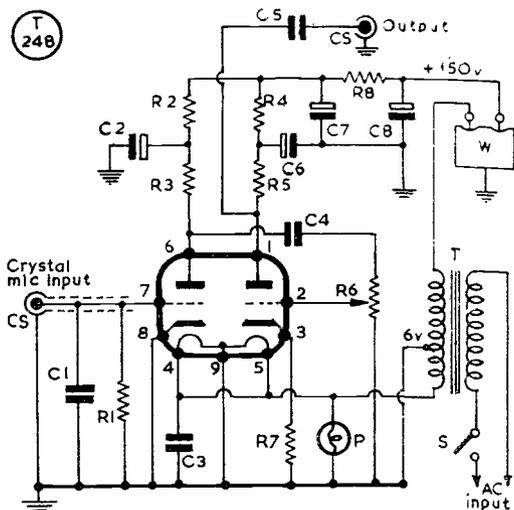


Fig. 4. Circuit of the self-powered speech amplifier which, operated as an external unit, makes it possible to use a crystal microphone see text.

Table of Values

Fig. 4. Self-Powered Speech Pre-Amplifier

C1 = 100 $\mu\mu\text{F}$ ceramic	T = Miniature Mains Transformer.
C2, C6 = 8 μF electrolytic	Sec: 150v./6v.
C3 = .001 μF ceramic	V = ECC81, Mullard
C4 = .0015 μF ceramic	S = Mains on/off toggle
C5 = .003 μF ceramic	P = 6-volt pilot lamp and holder
C7, C8 = 16 μF electrolytic	CS = Co-axial sockets
R1 = 2.2 megohm	W = Westalite Contact Cooled Rectifier Type 18 RA 1-1-8-1
R2 = 47,000 ohms	
R3, R5 = 100,000 ohms	
R4 = 10,000 ohms	
R6 = 1 megohm pre-set pot'meter	
R7, R8 = 1,000 ohms	

permitting!). Excellent CW coverage of Europe has been obtained on this band, plus contacts with UA9, W1, W2 and PY; reports from W and PY are never less than 559 — some received gave 579.

TVI

Using the modified 52245A with the inputs and aerial all as discussed here, no TVI has been experienced on the writer's own television set which stands just 2 feet away under the transmitter. Furthermore, the transmitter power pack stands above the TV receiver, separated by two inches! Phone or CW operation on the three bands 160-80-40 metres is possible with either a Band I or Band III television signal on the screen. No complaints of external

TVI or BCI have been received in more than a year's working. It seems difficult to believe that such a happy state of affairs will prevail with every 52245A in use! But there it is, so far as G2VV is concerned. Two contributory factors in this particular case: Complete screening throughout, and—plain good luck!

Conclusion

There can be little doubt that the TCS6-52245A Transmitter is extremely suitable for amateur-band working. Its appearance is pleasing, it is robustly constructed and, for the results it gives, it is very small in size. Apart from the AC requirement, it is suitable for mobile work and, in fact, was originally designed and built for that purpose.

MORE QSL CARDS WAITING

On p.647 of the February issue we drew attention, as requested, to the large number of VS/ZC cards lying unclaimed in their QSL Bureau. Now we see, from the latest issue of the R.S.E.A. *Journal*, that there are unclaimed cards in their Bureau also—for no less than 57 different VQ3-VQ4-VQ5 stations! In seven of these cases more than 25 cards await collection. This sort of thing goes far to explain the disappointment of many operators, especially those more recently licensed, at their failure to get cards back; their first impulse is to blame the QSL bureau—but if the addressee will not bother to collect the cards arriving for him, or does not want them (which is just as likely an explanation) there is nothing the bureau manager can do about it. Apart from the time and trouble it would involve, postage to return the cards to their senders as “undeliverable” would be an unjustified charge on the bureau. Though we are not suggesting that it is the practice at either the Malayan or East African QSL bureaux (which are run by voluntary effort, incidentally) it seems to us that bureau managers would be entirely justified in burning all cards unclaimed up to three months after the addressees had been asked to collect them by s.a.e. The problem is not peculiar to VS and VQ—bureau managers all over the world struggle with the same difficulty. The moral is: QSL direct whenever you can; if you QSL *via* bureaux make sure the other chap really wants your card; and if you yourself use a QSL bureau, keep it stocked with s.a.e.'s with your *callsign* on them.

BOOK REVIEW

“*The New Sideband Handbook*”

This book, the latest in the *CQ* technical series, will have an instant appeal to all who are interested in the carrierless system of amateur communication. Essentially practical in scope, within its 215 pages is a wealth of information on Sideband practice, techniques and circuits that will interest newcomer and old-timer alike. The author, W6NTS, has purposely avoided advanced theoretical and mathe-

matical concepts and has concentrated on the fundamentals necessary to ensure a complete understanding of the subject. These technical introductions, combined with the practical design and circuit information, make *The New Sideband Handbook* a well-written and useful work.

Considerable care has been given to the selection and sequence of the material and much of the information and text is original. The balance of subject matter has been well kept, with sections on general principles, modulators and mixers, SSB generators, phasing and filter exciters, linear-amplifiers, receiving techniques and station accessories. Many interesting commercial circuits are reviewed, including the new British Redifon GR-450 transistorised transmitter-receiver which uses the so-called third-method of Sideband generation. Block diagrams and graphical presentation are extensively employed to illustrate the technical discussions and practical design information.

For the champions of the double-sideband and suppressed carrier system (DSB)—which at its best is a compromise disliked by both SSB and AM operators! — the author has felt obliged to expend a full chapter on this ugly duckling of the Sideband world. But this criticism does not detract from the general overall excellence of the book, which is thoroughly recommended as a worthy addition for the amateur bookshelf.

The New Sideband Handbook, pp.215, by Donald Stoner, W6TNS, published by Cowan, New York, and obtainable from the Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. price 25s. 6d., post free. R.L.G.

HOLME MOSS HEARD IN HONG KONG

It is reported in the H.A.R.T.S. *Newsletter* for January that the BBC have been able to confirm the reception by VS6CJ of TV sound from Holme Moss on 48.25 mc. VS6CJ, who is a very keen 50 mc man, has also had confirmation from All-India Radio of his reception of their TV test transmissions on 53.75 mc (FM sound).

DX COMMENTARY

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

CONDITIONS have let us down somewhat over the last few weeks, and the going has not been too easy. This bad patch has been due to unstable conditions, rather than a rapid falling-off of sunspot activity, and there is every likelihood that we shall be out of it even before you read this.

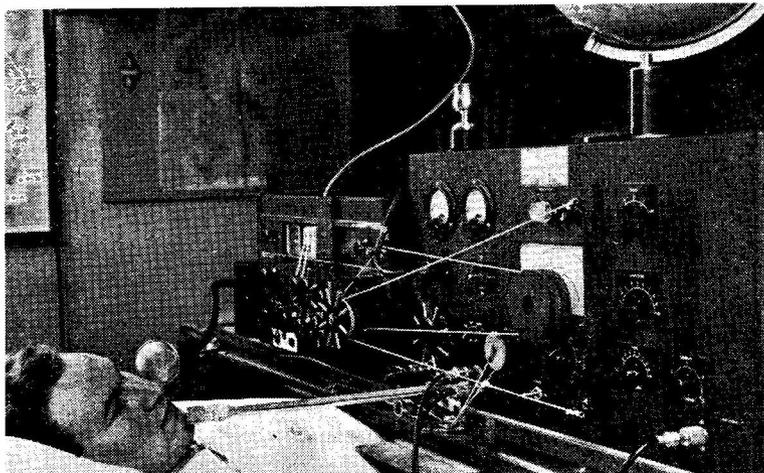
However, we are now approaching the stage where a large number of relative newcomers, who have known nothing but excellent DX conditions, will be faced for the first time with flat bands, and some wholesale QSY'ing to the lower frequencies will probably be the result.

Forty is a DX band! That has been said often enough, but there are still so many who don't believe it. The going is hard, the band is narrow, QRM is excruciating at times, but DX signals, when they are there, are usually excellent. Clean up those alarm clocks and get ready to enjoy the peculiar thrills of Forty in the early mornings. Almost the only thing to equal them is the pleasure of staying in bed . . .

But all this is looking well into the future. We still have all the HF bands in a potentially active state, and a few days or weeks of sub-standard conditions need not depress us unduly. Have a good look at Ten and Fifteen every day, and you are likely to pick up some choice and unexpected pieces. (We picked up TI9CW this very morning, right out of the blue!)

DX Gossip

The KS4BB Expedition, delayed by navigational hazards and therefore too late for full comment last month, eventually got going in fine style and ran continuously from Serrana Bank for several days.



G3MAC

CALLS HEARD, WORKED and QSL'd

Many stations report working them on three bands, and quite a few on four. Signals were excellent, operating just what was called for (the multiple-QSO system was *not* used after all), and apart from the usual manifestations by the Klots, everything was FB. QSL's will be radiating madly in all directions very shortly!

ET2US was due to be on from FL8 for a week, starting April 20 or thereabouts . . . WØAIW hopes to accompany VQ4ERR on his Seychelles (VQ9) expedition this August . . . EA3GF plans to work from Ifni in July . . . Another one due around the time of writing this was the TI9 affair, signing TI9SB on SSB, and TI9CW on CW. (They arrived in a big way on April 19!)

KH6AHQ hopes to operate from KP6 for a few days in the near future . . . FM7WT will be in FL8 some time during August . . . JT1AB now active, mostly 14065 kc CW; name of Bohous . . . AL5RR is a queer one, said to be in French Sahara.

UAØOM and UAØKQB, both

frequently mentioned in connection with a Zone 23 expedition, say *they* don't know anything about it . . . VQ8AD is now on 21 mc phone, and runs a sked with FR7ZC on 7 mc CW.

Apparently the Socorra (XE4) trip has been scrapped yet again owing to licence difficulties. Present news is that no dates are fixed and nothing projected . . . A DX-pedition to Nepal is planned for August and September according to W2BIB, who will be supplying the equipment; operators will be I1ZFF, I1AOF and possibly I1OJ. A "9N4" call is on the hook—complete call not yet known. It is hoped to run this one for two weeks. (Already licensed in Nepal are 9N1AA, 1AB, 1AC and 1AD.)

Also planned for the summer: HV1CN/M1, for ten days, operated by HV1CN and I1ZFF—CW and SSB . . . For mid-August, EA4GA and EA4FU may be signing from Ifni; again, equipment and necessities by W2BIB, who explains that though these DX-peditions are established

through his efforts, they are actually in conjunction with the activities of the New Jersey DX Association. Another note from W2BIB is that he will now handle all cards for HV1CN.

WØUQV may be on from San Marino in mid-July, CW and SSB . . . SVØWB, ØWE and ØWAE are all in Rhodes at present . . . ZD9AB active again on 14185 kc, Mondays 1800-2100 . . . VS5BY is now up on Tuesdays, 0830-1230, 14310/320 kc SSB, and may also be able to make it on Thursdays and Fridays when time permits. VS5JA will be active only every third week, AM and CW.

It's common knowledge now that the ban on Amateur Radio in Ceylon has been lifted. 4S7FJ is, of course, Frank Johnstone of VS1FJ and G3IDC, flat out for his third DXCC and much enjoying it.

Ray Baty, ex-VR3A and now VK6DL, is expected to show up as a VK9 from Cocos-Keeling—possibly VK9DL.

ZL3DA hopes to be operating as ZM6AC for four days, VR5AC for six days and ZL3DA/ZK2 for one day . . . MP4BBW has been issued the calls MP4TAD and MP4QAN . . . VK3IB showed up from the Gilberts for a short while as VK3IB/VR1, but now holds the call VR1B and is there on 14080 kc CW.

HL9KJ is a new station in Seoul, in charge of W8NYG and W9ACC, mostly phone on 14170 and 21255 kc, but occasionally CW on 14040 and 21060. W8NYG is ex-SVØWD, SVØWX and KR6MN; W9ACC has been on from KL7 and VE8; both would like to work G stations that they worked from their other locations, HL9KS and 9KT are also active; HL2 calls are used by Korean nationals.

VS1HU (Kranji) sends his last bulletin before leaving for home; he has been having plenty of varied DX, with conditions equally variable, and the score stands at 194 worked. The *Flying Enterprise II* (Kurt Carlsen, W2ZXM/MM) recently called at Singapore, and several VS1's paid a visit. On board was W4ERT (complete with a KWM-1). When the ship sailed VS1HU had an RTTY/phone

QSO—W2ZXM/MM on RTTY!

VS1JT (G13DQE) is on the air with a Vanguard . . . VS1JW runs 25 watts and has worked 57 countries with a ground-plane made of beer cans soldered together (for broad-band effect, of course!) . . . VS1JV and 1HT are on SSB . . . VS1HS is shortly returning to G3CCN . . . VS1JO (G3DNE) has a Cubical Quad on 14 and 21 mc and is doing very well with 35 watts of phone. VS1HU himself holds a large bag of certificates and awaits his WAZ and WAP: total QSO's to date—5927.

VU2RG (169 Broadway, Madras 1) is ex-AP2N—in those days he was the very first AP to take the air. When his new call came through he hastily slung a 30-watter together, but is now working hard on an 813 rig which will give him the full legal power. His name is Norman Henry and he asks us "to alert the Leeds lads."

SU1KH is cleared by G3JZL, who has a card from him with a Cairo address — SU1KH is an Egyptian national, name of Mohamed Rashed.

Miscellany

Pirates and practical jokers seem to have been especially active this month, and April the 1st brought out a whole crop of Strange Things. The best is reported by GW3AHN (Cardiff), who had only just finished repairing the top cap of a 6K8GT in his receiver when he heard a UC2 calling "6K8GT" —and nearly fell off his chair! Others were heard working this joker, who was eventually dug out from the pile-up. He gave his QTH as "Nun Island" and said QSL via Lighthouse Larry, GEC, Schenectady. Stations working him apparently took it all seriously and forgot the date (April 1, naturally).

On the same day G3MJL

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	ZB1CR	360	1	6	101	118	134	168
G3FXB	799	73	131	222	211	162	260	UR2BU	354	14	30	121	103	86	150
G2DC	784	86	115	231	196	156	264	G6TC	314	18	67	128	63	38	145
G5BZ	769	64	118	262	198	127	272	G8D1	291	30	59	80	69	53	122
G3DO	679	24	47	244	187	177	272	G2BLA	288	32	53	67	71	65	114
GW3AHN	642	16	55	197	230	144	254	G3DNR	277	10	23	89	74	81	126
G3BHW	585	15	35	196	189	150	234	UR2BU (Phone)	252	2	11	81	82	76	127
G3ABG	570	51	88	184	127	120	211	VO2NA	251	19	31	106	63	32	115
W6AM	524	30	58	294	86	57	294	G3WP	249	17	34	80	24	94	134
G2YS	514	73	92	164	111	74	180	G3MCN	241	4	6	55	114	62	144
G2HPF	469	42	80	167	90	90	189	G2DHV	236	21	27	126	46	16	137
G6VC	431	37	55	153	110	76	179	W3HQO	183	3	8	52	91	29	119
G8KU	431	26	57	162	86	90	?	G3MJL	165	5	38	33	38	61	88
GM2DBX (Phone)	427	34	31	160	102	100	176	G3LHJ	163	5	23	93	31	11	101
G3LET	406	23	73	171	101	38	186	G3NBE	162	16	20	41	23	62	86
G3HZL	402	41	74	117	96	74	144	G3MMP	150	5	24	30	32	59	80
G3IGW	401	44	70	107	89	91	145	G3DNF	147	7	31	44	39	26	66
G3JZK	378	17	60	85	126	90	175	G3IDG	119	11	15	29	27	37	53
W6AM (Phone)	377	13	52	272	39	21	272	G3NAC	82	2	10	32	24	14	50
G3FPK	364	36	76	122	79	51	147								

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

(London, W.7) heard "JA6PA" calling CQ on Forty at 1210 GMT—probably the same type that we heard with a VS6 call about a month ago. G3MJL himself is being pirated on Top Band, and a "GM3MJL" appeared also on 28 mc.

G3NHL (Clanfield) has had his call pirated before he has even had a chance to use it himself! As he says, it's hard enough to get a TVI-proofed, well-operated Tx

on the air, but to have acquired a bad name before you start is just about the limit.

G3JHH (Hounslow) has been getting reports on his 14 and 21 mc phone, which seems a bit wrong considering that he only operates on 7. 3.5 and Top Band. QSL's are arriving, and with 5 & 9 reports, too.

GM2DBX (Methilhill), whose Five-Band score was inadvertently dropped out of the table a month

or so back, was asked both over the air and in SWL reports why this was! It just shows that people read everything nowadays . . . At all events, he is back in the table this month.

GW3BNQ (Cardiff) tells us that his score is 165C worked (157 confirmed) in 40 Zones; his power has never exceeded 60 watts, and his aerials have always been sloping wires of 60 to 84 feet, with the low end only 16 feet high. It would be interesting to hear of other DX scores from stations that have never used a beam of any kind; we come in that category at G6QB, but since two 275-ft. long wires are available, there is no grouse about poor aerials. Round and about, though, there are some surprising achievements with the saddest "bits of wet string" and we should like to hear more about them.

G2FKS, now at Virginia Water, Surrey, used to be ZD4BB in Accra. He wants to know of any active stations reasonably near his present QTH. Incidentally, he has just received a QSL for a ZD4BB/CR6AC contact in March, 1952! Seven years does seem rather a long time . . . !

Last month we suggested that 3A2BA was a "bad one." G2HDR tells us he worked him on January 17 and has a card (name Armand), so maybe there were two of them.

G3BHJ worked VE8AL (Snag, Yukon), which has a population of 18, including two amateurs, giving it the world's highest concentration! It also holds the record for low temperatures, having clocked *minus* 78°F. in 1927, and *minus* 66° this winter. Apparently the VE8 QSL service has been revised and now functions normally.

In reply to G3JHH's query, last month, concerning SM1 stations, G3BID (Abbotsbury) tells us that he worked SM1AS, 1BVQ and 1BJA/Mobile, all on the same day on Ten-metre phone. SM1AMY was in the shack of SM1BVQ at the time, and SM1BSA is yet another active one.

The Overseas Mail

VE7KX, well-known exponent of RTTY, and one of the strongest signals on 21 mc most

SHORT WAVE MAGAZINE DX CERTIFICATES

WNACA (Worked North American Call Areas)

Twenty-two cards to be submitted, for contacts with stations in ten U.S. Districts (W1-0); nine Canadian (VE1-8 with one 8 in Yukon, one in North West Territories); Alaska (KL7), Newfoundland (VO) and Labrador (VO). Contacts may have been on any bands, phone or CW. Operators in W, VE, VO or KL7 are *not* eligible for this Award. (200 WNACA Certificates issued to April, 1959).

FBA (Four Band Award)

Cards to be submitted with confirmation of contacts with 20 different countries, *each* country to have been worked on four different bands. Any four bands will qualify *e.g.* 160-80-40-20, or 80-40-20-10, or 160-40-20-15 — and so on. Entrant's own country may count as one of the 20 countries. (146 FBA Certificates issued to April, 1959).

WFE (Worked Far East)

Eighteen cards to be submitted for 18 different countries selected from among the following: C (China), C3 (Formosa), C9 (Manchuria), CR9 (Macao), CR10 (Timor), DU (Philippines), FI (French Indo-China), HL (Korea), HS (Siam), JA/KA (Japan), KR6 (Ryukyu Is.), PK1-2-3 (Java), PK4 (Sumatra), PK5 (Dutch Borneo), PK6 (Moluccas), UA0 (USSR in Zone 19), VSI (Singapore), VS2 (Malaya), VS4 (British North Borneo), VS5 (Brunei), VS5 (Sarawak), VS6 (Hong Kong) and XZ (Burma). All or any bands count. (39 WFE Certificates issued to April, 1959).

WABC (Worked All British Counties)

Sixty cards required, from sixty counties of the British Isles, all to have been worked on the 160-metre band since January 1, 1952. Counties to be as shown in any standard atlas, *not* "administrative counties" such as the three Ridings of Yorkshire, East and West Sussex, County of Bristol, and so on. Isle of Wight counts as Hampshire — not separately. Isle of Man does score separately, as do all the Channel Islands. Scilly Isles also count separately. For London, the L.C.C. area scores as one County. (179 WABC Certificates issued to April, 1959).

WBC (Worked British Counties)

Open only to claimants *outside* the United Kingdom and Eire. Cards required from 50 different counties of the British Isles, worked on any band 3.5 to 28 mc inclusive, phone or CW. The definition of U.K. counties is the same as for the WABC Certificate above. (126 WBC Certificates issued to April, 1959).

PRA (Polar Regions Award)

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

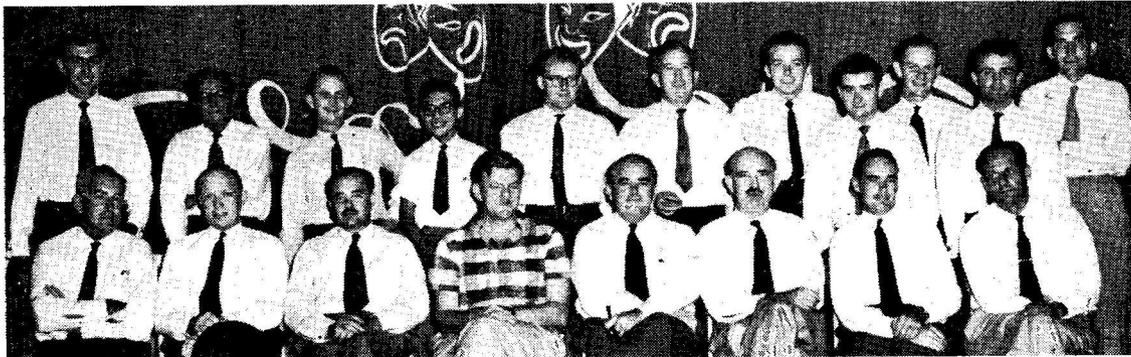
MDXA (Magazine DX Award)

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

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

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

(Overseas Amateur Radio periodicals please copy)



When the Malay Amateur Radio Transmitters' Society held their hamfest in Singapore some weeks ago, the following mustered before the camera — back row, left to right: VS1HX (GW3KWY), Mr. Tan (Telecomms. Dept.) VS1JW, VS1AZ, VS1JO (G3DNE), VS1JT (G3DQE), VS1HY (G3NLJ), VS1JR, VS1HW (GW3KQR), VS1JF (GW3LQP), VS1GC (G3LMO). Front row, left to right: W4EWS (visiting), VS1FZ (G2ATM), VS1DO, VS1AY, VS1AD, 9M2DB (G3MLR), VS1HU (G3JFF) and VS1HS (G3CCN). It will be remembered that while the Colony of Singapore retains the VS1 prefix, that of the Federation of Malaya has been changed to 9M2, as the administrations of these two territories are entirely separate.

afternoons. plans a trip round the U.K. this summer and is already licensed as G3NJD/M for the purpose. with an English car ready for collection when he arrives. He hopes to bring his little Model 31 teleprinter with him, and to get on the air from a few G stations with RTTY. This will be a "first ever" event, and Jim is tremendously keen on it.

W2QHH (Hamilton, N.Y.) has now worked 80 British Counties. One imagines that he is the first operator outside the U.K. ever to achieve this. On the world-wide basis, he has now worked 286 countries all-time (282 post-war), but lists about another thirteen that he is short of—so the 300 is a possibility!

W6AM (Long Beach) is up to 272 on phone, thanks to a card from UN1AB. OK1JX (Prague) reports that JT1AB (Box 369, Ulan Bator) is in full swing with JT1AA's old rig, and intends to operate quite often (we have several reports of QSO's with him, too). OK1JX is *not* acting as QSL manager for him (Jan reckons he now has a right to a little operating on his own!), and Milada, ex-JT1YL, is now filling out her own cards. When all cards for QSO's have been settled, SWL's will be dealt with, too, although OK1JX says "experience says that most of them have been absolutely worthless." A few exceptions, particularly one listener who logged JT1AA's and JT1YL's contacts over a long

period, and even helped to clear up some errors in logging, have already had their confirmations.

ZC4PN (Nicosia) raised a few new ones such as LA2JE/P, VS9OM and SM5WN/LA/P (14 mc); FB8CI (21 mc) and EA8AX (28 mc). He has now worked 119 (95 confirmed), but still can't get to the Caribbean area. Pete says that the parked jammers and commercials make 21 mc almost impossible out there in ZC4. He finds some good stuff on 14 mc phone, late at night, but it takes more than 40 watts and a low dipole to cope with it.

ZB1CR (RAF Luqa) writes his last letter from Malta, and expects to be on the air as a GI very shortly. ZB1DC and 1VJ are also QRT. Recent DX from ZB1CR included TG9 and PZ1 on 28 phone, and LA2JE/P on 14 CW. Cards from HS1B and CEØZG arrived.

UR2BU (Tartu) boasts his Five-Band positions with some recent DX, which included ZS5RP/7 and JT1AB (14 mc CW) and CR4AV, VP8DW, PX1YR, ZS8O and VP3MC (all 28 mc phone).

Around the Bands

We still receive, each month, sufficient reports to make it possible to write up a band-by-band survey—with one exception. That exception is 3.5 mc, and when one listens across the band it is hardly surprising that it is neglected by DX'ers. The natural human reluctance to climb out of

bed in the early hours is responsible for the lack of real DX activity up here; certainly the state of the band can't be blamed.

Here is an interesting quote from G3JZK (Cambridge): "The apparent inferiority of the LF bands during the sunspot maximum is due entirely to lack of activity. Only when we are forced on to them by deterioration of the HF's do we appreciate their value, but they are, in fact, even *better* during the sunspot maximum." In support of this, note some later remarks concerning Forty and Eighty.

Ten Metres

Although there have been many poor days on *Ten*, even these have been due to lack of activity more than anything else. When the W phone band is dead, we know that the North Atlantic path has folded up—but that is just the time to look for some interesting DX in other directions, instead of saying "Ten is dead" and switching off.

GW3AHN raised KS4BB, YN1AA and IAFM, and 4S7FJ on CW; FS7RT, KS4BB and VP9L on phone. GM3BQA (Cockenzie) worked phone with XW8AL and 8AK. CEØZD, XE2BM, FB8ZZ, PJ3AG, HS1B, BV1USC, VQ8AV and JA4HM.

G2DC (Ringwood) confirms what we have just written when he says "Nothing wrong with conditions on this band, but still lack of activity on the part of CW DX stations. When there is any-

thing doing, such as the ARRL Contest, or KS4BB, it becomes chock-full of interesting DX." He worked KS4BB and VP2GDW (Danny in Grenada), as well as FP, FF, PY, YV, VK, ZL and all W and VE district.

G3JZK, on phone, raised HI8BE, FM7WU, VP2LS, CR4AV and XW8AL for new ones, plus VK9DB, KZ5, KR6, VP5, FF8 and HC. HI8BE seems fairly regular around 1900 GMT; VP2LS was operated by VP2ZU (Z calls are allocated to visitors, who use them whichever island they are on). CR4AV was worked in Portuguese, recorded, played back, the play-back recorded and so on until the phone had covered the path four times and was still readability five.

**TOP BAND COUNTIES
LADDER
(Starting Jan. 1, 1952)**

Station	Confirmed	Worked
G2NJ	98	98
G3JEQ	96	97
G6VC	96	96
G3JHH	93	93
G2FTK	91	94
G3FNV	91	92
G2AYG	88	88
G3KEP	85	85
G3KOR	82	86
G2CZU	81	81
G3DO	76	76
GM3COV	71	73
G2CZU (Phone)	66	67
G3APA	63	66
G3ADZ	61	71
G3LBQ	61	67
G3KQN	60	72
G3KEP (Phone)	60	62
G3LHJ	60	66
G3JSN	57	64
G3LEV	55	61
G3MCY	47	54
G3MCP	46	54
G6QN	46	54
G3LNR	46	52
G3NFV	37	47
G2AAM	28	33
G3LNO	23	41

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

G3LHJ (Newton Abbot), on the band for the first time, worked FB8ZZ on CW, 9K2AP and ZS6 on phone. When the weather improves he hopes to erect a Quad. G3MMP (Pinner) worked VQ5FS, XW8AL, ZS5RO/ZS7, CT3AN, and FQ8AP on CW, plus many of the more usual things.

G3MJL collected VP6EB, PJ2CH, ZD6DT, VQ2VZ, VQ3HH, PZ1AH, HS1B, XW8AL, HH5LA, 2Z and 2AZ, HZ1AB, TI2CMF, VP5AR and quite a few more. He missed VP2AB in a super pile-up (1800 GMT).

G3ABG (Cannock) swapped phone with KR6HI (a YL), XW8AL and ZS's; CW with CR7LU (also a YL) and VQ3CF. G5BZ (Croydon) worked KS4BB and "plenty of W's."

G3BHW (Margate) worked CW with KS4BB and phone with CEØZD, FB8CG, HP3DA, HS1B, VP1EE, VP2LS, VP7NM, XE1KQ and 1PY, YS11M and ZS8I. G3DNR (Broadstairs) actually found Ten the *best* band, and raised LA2JE/P, HC1ET, VP9WB, VE3EGD/SU and OR4RW (Queen Maud Land), all new ones—which shows what can be done by paying attention.

G6TC (Wolverhampton) worked CX2BT and VP8CW (Hope Bay). G3DNF (Wembley) collected a new country with FQ8AP and FQ8HA. G3IGW (Halifax) has "worked all main African prefixes" and added JA5AF, UAØSK, ZB2A on CW, and PJ3AG on phone.

G3NAC (Yatesbury) reports for the first time. He uses 50 to 60 watts, mostly phone, and has just collected his 50th country. Best on Ten were FF8GP/SG, CR6CA, ZS5, 5A2CV and VE1ADE (P.E.I.).

G3BHJ (Norwich) worked phone with CR7EO and 7LU (both YL's), HZ1AB, KW6CB, MP4BBW, SVØWB, UA9CM, VP6JC, VS1GZ, VU2PS, YV5EF, ZL2PI, 9G1BA and 9M2DQ.

G3FXB (Southwick) had a good month with CR4AP, HC1RY, HS1B, KS4BB, UF6FB, VQ8AV, VS9AL and 9M2GA on phone; TI9CW was a new one on CW.

Fifteen Metres

GW3AHN sends his usual nice

list, which includes KH6PM, KL7's, KP4, KS4BB, UAØ, UL7, VP2GDW, VP8EG and 8EP, VQ8AD, VS1EB, 1HU and 1JF, XZ2TH and 4S7FJ, all CW; and FM7WS, KB6BH, KL7, KS4BB, KW6CL, UO5, VP2DJ, VP2GDW, VQ8AD and VR2BC, all phone. Any complaints?

GM3BQA worked phone with XZ2SY, YJ10M, FG7XE, VP8EP, 3A2AF, HL9KS, VP7NB, HR2TM, VP3MC, K G 4 A U, FK8AU, HKØAI and VS9MB. (Note the wide differences between these two lists, one from GW and one from GM.)

G2DC raised four new ones in KS4BB, VQ8AD, VP2GDW and VP8EG (the latter being South Orkneys). Others were 9M2JF, FF8GP, KA, KL7, VP2SW, VU2AL, VE2TH and all the usual. G3JZK mentions only YJ10M—but well worth having!

G3LHJ's list shows VP8EP, ZE8JZ and FG7XC; G3MMP's SVØWT, 4X4LH and Europeans; G3ABG, on CW, raised VEØNI and VQ3CF; G3DNR worked VP3MC.

G5BZ mentions KS4BB, MP4BCN, VQ2, VP2GDW, VS9MB, VP8EP, HS1C, KH6DDD/MM (off Philippines), and GC3HFE, the latter a harder nut to crack than all the exotic stuff, and his first ever with Guernsey! !

G3BHW's phone brought him FU8AE and HR2MT; CW gave CEØZA, FB8CD, FG7XC, KS4BB, PY7SC, VP2GDW, VP8CV, 8EG, and 8EP, VQ8AD, VR2AZ and 2DE, VS9MB and 4S7FJ. G6TC raised VQ3CF, VQ4CC and 4GQ, and YV5GY. G3DNF, with his 15 watts, worked VQ3CF and VO2NA.

G6VC (Northfleet) mentions 5A5TF and SVØWAE on CW, with CO8JK, 9K2AZ, ZD2GUP and HK7LX on phone. G3DO (Sutton Coldfield) had to work in French to get FB8XX (Kerguelen) and FB8CD (Comoros), the latter an all-time new one.

G3IGW, with a new sloping dipole, worked 24 new ones in three weeks! Among them were CX, KL7, UO5, UQ2 and VS9MB on CW; CE, CT2, EA9, FC, FF, HI8CJY, HP1LB, OX, SVØWQ, TF, TI2CME, VP2AB, VP4, 5, 6

and 9, ZD1EO, ZP5CF and 9M2DW on phone.

G3NAC raised 9M2GA, ZD1EO, OQØPD and a ZL, all phone. HS1E got away! G3BHI accounted for CP1CJ, CX2BT, FG7XE, FM7WS, OX3KW, SVØWP, KZ5, TF, VE8, VK, VP2AB, VP9BN and YV5AEW, all phone; also KS4BB and VP2GDW on CW.

G3FXB collected FM7WS, HH2CL, HV1CN, KB6BH, VP2GV and 2SL, VP3MC, VP5EM, VP8DW, XE1JP, YA1IW, YS3TM and ZD1EO on phone; KS4BB, UL7GL and U18AG on CW.

All nice stuff, this; one could not say that 15 metres has been too bad.

Twenty Metres

Still the most versatile band, if not the best, *Twenty* now seems to be attracting the parked jammers—there has been an especially loathsome racket around 14075 kc on many days. However, the devotees still cling, and even manage to work good DX still. It is surprising, though, what a large proportion of letters do not mention this band at all.

Among those that do, G5BZ raised FG7XC, KS4BB, 3V8AC, VP2GDW, VS1, KH6, OQ5, JA, ZE and practically all the routine DX. G5BZ thinks the band is falling off, though, and says it hasn't that lively sound in the mornings any longer.

G2DC also remarks that the interesting Pacific signals have disappeared during the 0700-0800 period; maybe the hour gained by going on BST will bring some of them back? He worked KS4BB, VP2GDW, KH6, UA9 and Ø, XE1MB, CE, YV and all the usual things.

G3LHJ collected TI2JV, TG9AL and XE2MS—all phone; G2HDR (Bristol) raised two new ones in ZK1AK and CX4CZ; GW3AHN, on CW, worked VP2GDW and KV4AA; G3MMP filled up lots of gaps with Europeans but didn't raise any DX.

G3BHW's list includes CEØZA, EAØAF, FY7YF, OR4RW, VP2GDW, VP2KR, VS9MB and ZB2A/VS9; G6TC reports KL7OOT, UAØKAR, VE5 and VE6; G3DNF added a few new



The amateur station put on for the Prague Fair signed OK1PVV and was operated by OK1HI, who is active on all bands and holds, among other DX awards, the first of our WBC certificates issued to an OK operator. Note the modern appearance of the equipment.

ones on short-skip.

G3NAC, to whom most DX is still new (lucky fellow!) added CT2BO, 5A2CV, OD5BX, FF8BO and 8CN, LZ and ZC4; G3BHI worked phone with HZ1AB and 1TA, MP4BBW and ZS5; G3LET, on CW, added in KM6BL, 15AAW, JZØHA, K6QPG/KW6, PY7SC, VS9MB, OR4RW, FM7WP, KS4BB, VKØRH, DU1DR, FB8BF, EAØAF, VU's, UAØ's and VP9's.

G3FXB found three brand-new ones—HV1CN on phone, HKØAI and KS4BB on CW. Over the three HF bands he collected seven new countries this month, so he, for one, isn't grumbling about conditions.

Forty Metres

This is the queerest band of them all. Everyone agrees that the DX is there, but few are prepared to do anything about it! G3JZK tells us that G2PU and G3NBP were until recently working all U.S. districts on phone, between 0800 and 1000 GMT, much to the disgust of the "local-natter" exponents, who regard the band as their property. G3JZK himself recently worked all East Coast W and VE, plus W7JC and YV5HL.

G3LPS (Blackburn) reports once more on this band only, where he

worked OX3RH (0140), VP8EP (0100) and TA3AA. Latterly, he says, the band has turned poor for W's, but one morning around 0100 he heard CR4, PJ2M, EA8 and KP4, all good signals, and all going back to inaudible W's. Others worked by G3LPS were PY's, ZB2, OY, UQ and UA9.

G3JHH, with 30 watts, raised a W and IT1AGA; the latter, according to G3MJL, is chasing "WALT" and looking for London contacts on CW from 2200 onwards. G3MJL himself has been hearing lots of DX and says the night of April 8/9 was superb, with CX, CR6, PY, ZC4, ZD's, ZS's and all. His aerial is not much good for the band, until he gets some poles, and he only raised ZB2A.

G2DC says "the W's roar in all night, and the W6 and 7 signals are still there as late as 0830; in fact, W6KIP has been heard at good strength as late as 1000 GMT." Two new ones for him were KS4BB and YV6BO, others including all W districts, VE1-5 and 7, PY, LU, and CX.

G6TC worked PY4 and several W districts; G3LNR (Nottingham) raised W's, VE and EA, and heard CM, TI, ZC4, UA9 and Ø, VK7, OY and others; G3BHI worked UA9KCC.

Eighty Metres

At last the 3·5 mc band merits a short paragraph on its own, in view of the reports to hand. G3JHH worked 4X4BA; G3LET crossed the pond for the first time and raised VE1ZZ and W1JYH; and G2DC had a nice surprise when ZL3QX called him (0430 during ARRL Contest!) and was followed by ZL4IE. Others he worked were OD5CI, 4X4, CT2, CT3 and several W and VE districts.

Top Band News

The most interesting DX news on One-Sixty comes from SWL D. W. E. Powell (Gibraltar), who has been covering the band recently with an S.640 and a 75-foot wire in a rather screened location. He logged W1BB with some regularity during the Tests, then ZC4IP, YU1FC, DL's, OK's and HB9's. By the time March arrived, the G signals were good—in fact, he says some of them were as loud as he had ever heard them in England! G5JU scooped the pool with an S9, and best among the others were G3KDV, G3FPQ, G3CNM, GW5VX, GM3IAA and GM3KHH. Altogether he logged some 80 stations in 25 countries, others "worthy of mention" being G3KDG, G3IBT, G3ZY, G3HSV, G3JDT and G3ADJ. No GC's or GI's have yet been heard, but GD3LXT was logged weakly on April 7/8. What a pity we can't have a really active ZB2 station on the band!

The lesser forms of DX will be taking over from now, and county-chasing continues to attract many newcomers. Those who are anxious for phone contacts with Northumberland will be glad to know that there is a nightly sked, around 1980 kc, between G3NCL, 3NCE, 3EQK, 3BEJ, 3LRV and 3LIV—all are in Newcastle, except the last, and he is in Gateshead, Co. Durham. They are all looking for GDY contacts from 2300 onwards, phone or CW—100 per cent. QSL—skeds made to order (but please send s.a.e.!).

G3JHH worked OK1AEH and 1KPP, also GD3LXT; G3LNR raised nothing new, but heard YU1FC and lots of OK's; G6VC got a QSL for a contact with YU1JK (Feb. 1958!); G3NFV (Ashted) reports for the first time, and has worked UA3BS already, as well as Carmarthen, Hereford and Merioneth.

G2AAM (Swanwick, Derby) has worked 33 counties with only 3·8 watts input to a CO-PA; he has a 132-ft. aerial and is 500 feet a.s.l., which must help! G2BP (Chatham) reports that he has started up again; also that he hopes to have a rig on the air from Aberporth (Cardiganshire) during May or June.

G2CZU (Bath) thinks that GM4's and GM5's (for WAGM) are rarer than the rarest county, but GM2UU gave him his first GM2. He has just acquired Montgomery and Carmarthen complete with the necessary

QSL's, thanks to G31QO.

The Grafton Top-Band Contest seems to have gone off very well, with G3KQZ winner (also winner of CW section); G3RX second; G3JZX third; and G3KGC fourth and winner of the Phone section. They say that their own members let them down a bit on CW, "which seems to be a dying art these days."

SWL Logs

The SWL mail this month confirms that conditions must have fallen off slightly, because few of them rise above the level of "routine DX." We do not want to discourage anyone, but honestly it is of little interest to followers of this feature to know that listeners have been hearing the very same DX stations that they have been working themselves, and, in some cases, just passed over as uninteresting.

Therefore we quote only from those SWL's who have produced something unusual, such as Peter Day (Sheffield) with his six-metre bulletin. He says the band is now in good shape for North-South and Trans-Equatorial propagation; several ZE's are on regularly, and ZE2JV has worked HB9BZ, who hears them often. The aurora at the end of March had a great effect in this region, and P.D. heard European TV between 48 and 54 mc at S9 plus. VQ5FS is active on Six; he and the ZE's all want SWL reports from England; ZC4WR and LA7Y are also regularly on the band.

Regarding Forty, P.D. finds conditions fine, and has heard CR4AX, ZB2A, YV6LO, KP4AMT, KP4GB (SSB) and ZA1AB. An interesting one on Fifteen was YA1IW (1615)—American op., and QSL to W6DXI.

J. Baxter (Hull) queries XQ8AG (Twenty phone); he is OK, and in Chile. J.B. also logged OC5MT on Fifteen phone, but this one remains a mystery. E. J. Baker (Whitley Bay) heard AG5MD (Ten phone)—can anyone help with him? E. Rose (St. Helier, Jersey) confirms that YA1IW is very active on Fifteen, will be for some time, and will also be on Ten and Twenty soon.

C. N. Rafarel (Birmingham) logged 9M2GA on Ten, 9M2FX



The centre figure in this group is Capt. Kurt Carlsen, W2ZXM/MM, master of the American freighter "Flying Enterprise II," successor to that earlier "Flying Enterprise" in connection with which the name and callsign of W2ZXM will long be remembered in the annals of the sea. When his ship was in at Singapore recently, W2ZXM was welcomed by, second from left to right: G3KDK, VS1HU (G3JFF), VS1JR, VS1JT (G13DQE) and VS1JW. On the extreme left is W4ERT, who was a passenger with W2ZXM/MM on this trip.

and 2BQ on Fifteen—all phone. We mention this because Malaya has been pretty difficult from the U.K. for the last few years, and quite a few may want them, especially on phone. Worth-while ones on Twenty phone were FB8CD (Comoros), FB8XX (Kerguelen) and VK2FR (Lord Howe Is.).

J. W. Bluff (Kenton) tells us that OK7ZH, the mammoth five-year DX-pedition mobile station, was heard on SSB testing equipment, and saying that they would definitely be departing on April 22—first stop Albania. CR8AC, he says, is back on Twenty CW, around 1400 . . . MP4DAA (Danger Is.) was on Twenty phone, S9 around 2030 . . . a rather doubtful PX1PA was heard on Forty.

J. E. Paterson (Hatch End) comments on the terrific crop of PY phones on Fifteen, the same stations being logged again and again with great consistency.

Linguists All!

G3JZK says he can manage adequate phone contacts in the languages of F, DL and YU, and he doesn't mind "having a go" in EA, CT, I, PA and UA when necessary. As he so rightly says, "Only a microscopic vocabulary is required to conduct a rubber-stamp QSO, and any mistakes made only contribute to the friendliness of the proceedings. Laughter is international and in this case educational, and I feel that looking silly is a small price to pay for an enjoyable QSO with a new country . . . it also makes the QSO noteworthy from the DX station's point of view, and direct

airmail QSL's often arrive, unsolicited." How right he is, and how inhibited most of us are on the subject of sounding foolish!

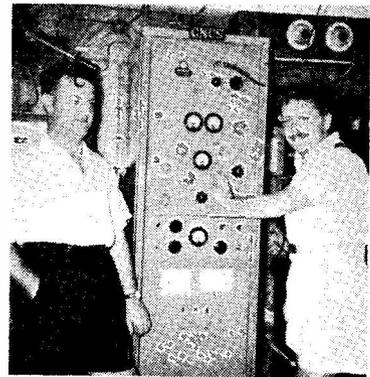
Triumph for QRP

If we hadn't been present at the time, we wouldn't have believed it possible—but we were, and it was. A brand-new commercial appeared on about 14020 kc, sending high-speed CW (not jingle-bells), and when we first heard it there were five or six carriers swishing across it, two or three stations sending strings of dots and a steady carrier or two, all much weaker with us than the commercial. Something impelled us to VFO on the frequency and send a few dashes on the el-bug—it looked like an Irishman's fight, the more the merrier.

Two minutes later there was no commercial, and the frequency was a mass of "FB's," with some "bravos" and even the odd "6ra4o." Most of the stations concerned exchanged callsigns—they were all Europeans, mostly HB9, DL and PA. The main thing is that the plan worked, the commercial disappeared, and has never been heard since. 6ra4o!

What Say, Old Man?

Another personal observation that gave us almost as much pleasure as the foregoing: on Ten Metres a G station, clearly readable with us, was calling VP8EP, who had been calling "CQ G." Immediately the G station signed, up came an enormous 4X4 on the VP8's frequency, calling the G at some length, and ending with the usual "What Say Old Man?" In this case the Old Man concerned



When 9M2DQ (left) was on leave in Hong Kong, he visited the m.v. "Glengarry," and was shown over by her chief radio officer, who is also G3KEC. The ship's callsign is GNCS and her main Tx is a Marconi Ocean-span, covering 375 kc to 22 mc, CC on the HF bands, with 3/807's in the PA, running 100 watts on CW.

had quite a lot to say, and *said it*. His little piece was well prepared, well delivered and thoroughly good value. Bravo again!

If more of us were to take a ruthless line over these bad-mannered break-ins and interruptions, we should find this uncivilised custom falling off in time. There's nothing rude in informing station C that you were calling station B, still want to contact him, and will station C kindly wait!

Lastly, we have to remind you that the deadline for the June issue is **first post on Friday, May 15**—only a week after publication date, so please don't miss it. Everything should be addressed to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Meanwhile. Good Hunting. 73 and—BCNU.

THE "NEW QTH" PAGE

This has been a regular feature of SHORT WAVE MAGAZINE for the last twelve years. It is confined to U.K. stations whose callsign/addresses have not previously been published, *i.e.* newly-licensed operators and changes of address. Notification of a QTH to us guarantees its appearance in the U.K. section of the *Radio Amateur Call Book*, the world-wide directory of radio amateur stations, issued quarterly. If you are in the *Call Book*, you are known all over the world. Most countries have a "local call book," covering just their own prefix, but the American *Radio Amateur Call Book*, now in its 37th year of publication and for which we are sole U.K. and European agents, is the only publication which includes all

known amateurs of every country, and thus has a world-wide circulation. And well it might, for it runs to about 700 pages, is more than an inch thick, and weighs nearly 2 lbs. The current edition is always available from us—see p.114 this issue.

TRANSISTORS FOR HF/VHF

The development of transistors for the higher frequencies is proceeding fast, and the firm of Semiconductors, Ltd. can offer them for RF applications in HF/VHF range 15-200 mc. In the Mullard list is the OC170, with a minimum cut-off frequency of 40 mc, and designed for -20v. operation. There will be a lot to see at the I.E.E.'s Transistor Convention at Earl's Court, on May 21-27.

INCIDENTAL INFORMATION

On the first day at the recent R.E.C.M.F. Exhibition, about every third person one met, either on the stands or round the floor, seemed to have a call sign.

* * * *

The new Eddystone slow-motion dial is having a great success in the States following its appearance at the I.R.E. Exhibition in New York. Substantial orders have been placed and many manufacturers' enquiries received. It is also understood that *QST* will be featuring this dial assembly in forthcoming constructional designs.

* * * *

This year's R.E.C.M.F. Exhibition was the last to be held at the Grosvenor House/Park Lane House accommodation, which the Exhibition has far outgrown. There will now be a pause until 1961, when it is hoped to take the show to Olympia.

* * * *

Rex Heatley, G5OH, is Woden's senior sales representative. He is also a keen racing motorist, and won this year's Hoare Challenge Trophy of the 750 Club. Rex drives a rebuilt Cooper with a very hotted-up Ford 100E engine, and made the third fastest time for the open event at the Blandford Hill Climb.

* * * *

The Plessey Company now offer a full range of miniaturised audio components for transistor circuitry. They also do a number of VHF/FM and BBC/ITA tuner units ("front ends") with up to 18 channels selectable in the TV types. Their VHF condenser assemblies range from singles and twin-gangs up to seven-gang, with or without switches.

* * * *

Woden's are manufacturing an essential item for the internals of the "Black Knight" super rocket, which is being so successfully test-fired out in Australia.

* * * *

At Mullard's "At Home" display, held in conjunction with the R.E.C.M.F. Exhibition, a transistor transmitter was shown, capable of CW or AM phone, running 4w. input and good for 50 hours' operation from a 12v. 4 AH accumulator. In this design, using five transistors in all, the PA takes OC24's and the model was set up for 500 kc (600 metres), the international calling and distress frequency. As the OC24 can be used up to at least 2000 kc, the circuit could easily be adapted as a Top Band CW/Phone transmitter, with crystal control. The commercial applica-

tions for a design of the sort shown by Mullard Ltd. include marine and expedition work, and local emergency communication.

* * * *

One of our own best-sellers at the moment is the *DX Zone Map*. This was fully described on p.514 of the December 1958 issue of *SHORT WAVE MAGAZINE*, from which you will see that the *Map* comes out at 9s. 3d. only. (The linen-paper version at 11s. 9d. is sold out, and can only be repeated if we can get the same sort of paper at the right sort of price.)

* * * *

For the up-to-the-minute telephony operator, the international (NATO) phonetic alphabet is: A, *Alpha*; B, *Bravo*; C, *Charlie*; D, *Delta*; E, *Echo*; F, *Foxtrot*; G, *Golf*; H, *Hotel*; I, *India*; J, *Juliet*; K, *Kilo*; L, *Lima*; M, *Mike*; N, *November*; O, *Oscar*; P, *Papa*; Q, *Quebec*; R, *Romeo*; S, *Sierra*; T, *Tango*; U, *Uniform*; V, *Victor*; W, *Whisky*; X, *X-Ray*; Y, *Yankee*; Z, *Zulu*. If you are on Top Band phone, try this lot on your friends! The only two that have survived the vicissitudes of the years are X, X-Ray and C, Charlie. (As some would say, *good old Charlie*.)

* * * *

One of the most active and progressive of the London club groups is the Grafton Radio Society. In the *Star* for March 20, Grafton and their station G3AFT were featured in a "Londoners' activity" series running in that paper.

* * * *

The Radio Research Board is now making high-altitude measurements of the refractive index (of such importance in connection with VHF propagation) by means of a microwave refractometer. This works by measuring the change in resonant frequency of a microwave cavity resonator excited at about 3 centimetres. The whole of the equipment, with the recording apparatus, is carried in a Hastings aircraft and observations are being made at heights up to 10,000 feet.

* * * *

It is reported that the solar batteries in the American "Vanguard I" space vehicle are still functioning. It has been circling the Earth, in an equatorial orbit, for more than a year and signals are loud-and-clear even now.

The secretary of a local committee that has been successful in preventing the despoliation of the beauty of the Helford River district of Cornwall is R. V. Allbright, a solicitor of Penzance. He is also G2JL, and will be remembered as being very active from Newport, Mon. in pre-war days.

Some Phone Circuitry

USEFUL PRACTICAL ARRANGEMENTS

THE circuits shown here are basic types intended for those who want a quick reference to standard designs which can be relied upon to work without the necessity to juggle with circuit values.

Though single-stage voltage (microphone) amplifiers have been described before—one of the best such, "High Gain Audio Stage," appeared on p.535 of the December, 1955, issue of *Short Wave Magazine*—the circuit of Fig. 1 is very useful where it is desired, say, to substitute a crystal for a carbon microphone. This would naturally call for much increased speech-voltage amplification before the existing first audio stage; by taking the grid of this valve (dotted, whatever it might be) to the slider of R6, as indicated in Fig. 1, with the secondary of the microphone transformer disconnected, enough gain would be obtained for most types of crystal microphone—such, in particular, as the sensitive "deaf-aid" variety..

Since the important thing with any high-gain audio stage which is to be used alongside a transmitter is to keep RF off the grid of the first voltage amplifier, it is essential to incorporate the RF filter Cx,Rx as shown in Fig. 1, and to run the connection from the microphone socket in screened cable right up to the grid of the valve. (The crystal microphone will, or should, have its own length of screened cable and plug.) The valve used is a GEC Z63, of which the equivalents are 6J7 and KTZ63.

All the other values are given in the table and, if built up as an additional screened unit on the chassis with the audio chain with which it is to work, this amplifier will give excellent results within the terms of reference—the substitution of a carbon microphone by a crystal type, whether "deaf-aid" or any of the standard commercial makes.

Table of Values

Fig. 1. Single Stage Speech Amplifier

Cx = 50 μ F	R2 = 3,000 ohms, 1-w.
C1 = 25 μ F, 25v.	R3 = 1 megohm, $\frac{1}{2}$ -w.
C2 = 0.25 μ F	R4 = 50,000 ohms, $\frac{1}{2}$ -w.
C3 = 8 μ F	R5 = 25,000 ohms, $\frac{1}{2}$ -w.
C4 = 0.5-0.005 μ F	R6 = 500,000-ohm
Rx = 50,000 ohms, $\frac{1}{2}$ -w.	potentiometer
R1 = 1-4 megohms	V = Z63 (6J7)

(Note: Cx, Rx comprise RF filter; value C4 affects audio response; R1 depends upon crystal microphone used).

Modulator Unit

The circuit of Fig. 2 is for a general-purpose speech amplifier modulator using familiar valve types. The principle is the well-known one of voltage drive all the way through from the microphone into the grids of the modulators V3,V4 which deliver the audio power—in this case, about 35-40 watts. These valves are therefore in Class-AB1, which means that the driver stage V2 (in this case a 6SL7) is connected simply as an inverter or phase-splitter to drive the grids of V3,V4 (807's) in the correct phase relationship for push-pull operation.

Though the circuit does not by any means make full use of the potentialities of a pair of 807's (which will deliver a good 100 watts of audio in Class-B zero bias), it does avoid the necessity for producing audio power in the driver stage, with transformer coupling between V2 and V3,V4. In other words, it is the logical approach when the audio requirement is 40 watts or so and the valves to hand are 807's—and who hasn't got a few 807's (or 1625's) rolling round in the back of the valve drawer!

The circuit of Fig. 2 does not show it, but the input end of V1 should be treated in the same way as in Fig. 1 to keep RF off the grid of the 6BR7—that is, with an RF filter network of 50 μ F and 50,000 ohms.

There are no tricks about the circuit of Fig. 2—if it works the way you build it, it will give 40 watts of audio across T1 secondary provided the HT feed to V3,V4 is 550-600 volts at 120 mA. If it does not work, or hums and howls back at you, suspect your wiring round V1 or some component that was not checked before it was connected in. If the 807's appear to be behaving in an odd way, suspect parasitic

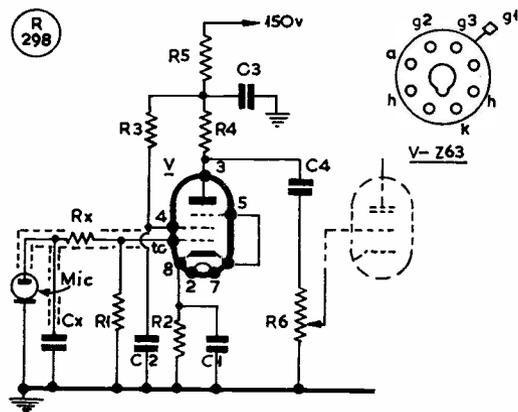


Fig. 1. Speech amplifier circuit suitable for interposing between a carbon-microphone amplifier stage and a crystal microphone of any usual type. Cx, Rx comprise an RF filter.

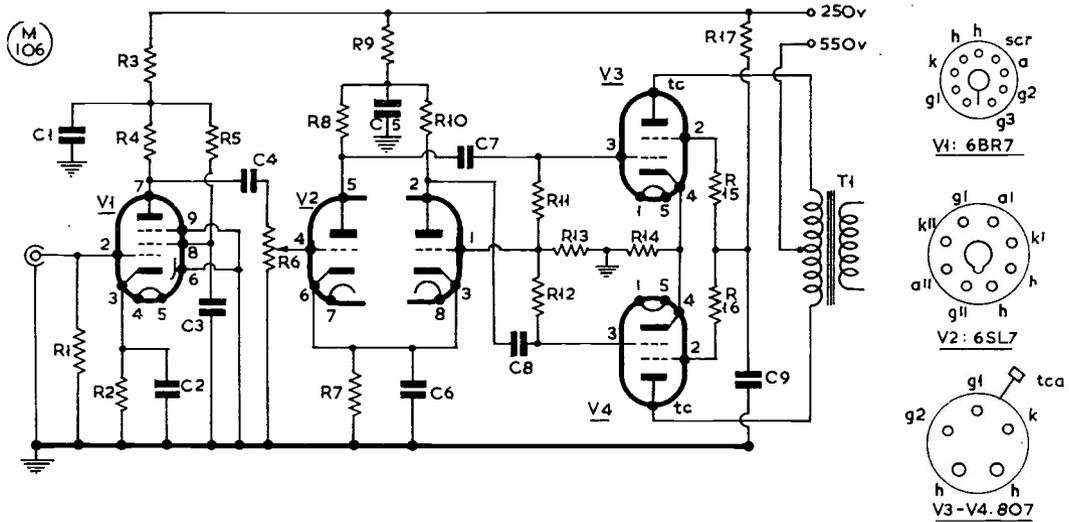


Fig. 2. A modulator using 807's in Class-AB1, capable of about 35-40 watts of audio. The phase-splitter V2 produces the drive voltage, correctly phased, on the grids of V3, V4. For good linearity and correct operation C7, C8 and R11, R12 should be matched in value. The output transformer can be a multi-ratio type, such as a Woden UM2, or a fixed-ratio transformer could be used equally well if the input and output sides can be properly matched.

oscillation, and put APC's on the plate leads, right at the valve caps—these can be made up by winding 10-15 turns of 18g. on a 5-watt resistor body, using 100-500 ohm resistors and their wire ends as anchoring points for the winding. If matters then get worse, strip off the coils and try the resistors alone; if the trouble still persists, go back to the grid of V1, and make sure the grid input lead is well shielded, with the sheathing earthed at several points. If you find the trouble here, leave the resistors in on the 807 anode leads.

Table of Values

Fig. 2. 40-Watt Class-AB1 Modulator Unit

C1, C5 = 8 μ F, elect.	R6 = 1 megohm gain control, $\frac{1}{2}$ -w.
C2 = 25 μ F, elect.	R7 = 3,600 ohms, 1-w.
C3, C4 = .05 μ F	R9 = 1,000 ohms, 1-w.
C6 = 50 μ F, elect.	R11, R12 = 470,000 ohms, $\frac{1}{2}$ -w.
C7, C8 = .05 μ F	R14 = 250 ohms, 5-w.
C9 = .005 μ F	R15, R16 = 100 ohms, 2-w.
R1 = 1 megohm, $\frac{1}{2}$ -w.	R17 = 50 ohms, 2-w.
R2 = 1,500 ohms, 1-w.	T1 = Woden UM2
R3 = 47,000 ohms, 1-w.	V1 = 6BR7 (8D5)
R4, R8, R10, R13 = 220,000 ohms, 1-w.	V2 = 6SL7 (ECC35)
R5 = 1.5 megohm, $\frac{1}{2}$ -w.	V3, V4 = 807

(Note: Insert RF filter Cx,Rx in V1, as in Fig. 1. C7,C8 and R11, R12 should be well matched in value).

BIG R.A.F. COMMUNICATIONS SYSTEM ON MALDIVE ISLANDS

The Ministry of Supply, acting on behalf of the Air Ministry, has placed a contract with Marconi's Wireless Telegraph Company Ltd. for the planning, supply and installation of a big high-power radio station at the R.A.F. staging post in the Maldivé Islands, at present the scene of some political turmoil. In all, fourteen communications transmitters and nine receivers are to be provided, together with all the necessary ancillary equipments.

The transmitting station is being built on Hitaddu, one of the 7,000-odd islands in the Maldives group. Four of the transmitters ordered are Marconi Type HS-51's; these are high power (30 kW) HF independent sideband equipments (similar to those in service at the G.P.O.'s Rugby Radio extension). In addition, two Marconi 10 kW HF ISB transmitters Type HS-71 and eight Marconi 3.5 kW HF ISB transmitters Type HS-31 will be installed. The receiving

and control station, sited on the island of Gan, approximately six miles from Hitaddu, will incorporate six ISB triple-diversity receivers Type HR-23, three double-diversity CW receivers Type HR-11, two Frequency-Shift Diplex receiving units and two 6-channel, 2-tone VF telegraph equipments Type HL-13/14, all of Marconi manufacture.

Communication between the two islands will be effected by a duplicate Marconi Type HM-300 SHF multi-channel system. All traffic from the message centre at Gan to the transmitters at Hitaddu will be carried by the same means.

Marconi's have been responsible for much of the detailed planning of the station in close collaboration with the Air Ministry and R.A.F. Signals Command, and the installation of the communications equipment will be carried out under the supervision of Marconi engineers.

FRED GOES SIDEBAND

EVOLVING NEW TECHNIQUE

By G3COI

IT took Fred quite a long time to tumble to this SSB stuff, and it happened like this: One night he was idly tuning over Eighty in search of a soul-mate when his dial alighted upon a sideband signal. For a while he stopped, fascinated by the sound like a hungry hen scratching inside a wooden box. He tuned around the signal and tried to make it readable, but the thing remained obstinately unreadable. An idea occurred to him—"It's Syd!" he thought, "old Syd from the other side of town with his Top Band splatter!" So Fred twisted the wavechange knob on his receiver and went in search of the offender on Top Band. His course took him from a weak mobile on 2 megs down to the Loran, through a hot CW QSO and Scheveningen Radio, Wick and Humber Radio, six steady unmodulated carriers and a ticking noise, but there was no sign of Syd. (It should be mentioned here that Syd was known locally as Syd the Terrible—his mod. splatter on Top Band had been complained about from "as far away as Stateside," as our W and K friends would say. When Syd came on the band, all other activity had to cease, and it was perhaps fortunate for us all that his appearances were confined to Bank Holidays—why this, nobody has bothered to find out.)

Fred, very puzzled, went back to Eighty, but by this time the hen-scratching in the wooden box had stopped, so our owner/operator was left with a furrowed brow. Wait a minute, he thought, might not it be this single carrier suppressed sideband stuff a few theorists had been taking up valuable space in the *Magazine* with? He pulled out his entire library of borrowed periodicals and looked for information on how to make the stuff readable. He waded through long articles on the theory, effectiveness and use and, as always happened when he read technical matter, he fell into deep slumber and dreamed about being presented with the first prize for Home-Built Equipment for his entry of a Portable Loop-Lamp RF Tester.

The next day, he even took some of the best articles to work with him, so taken was he with the idea that to use Sideband was to give himself 12 dB gain, etc., etc.

Of course, when he arrived at the stage when he thought of actually building a rig the big ideas began slithering to a halt. Gradually, he saw that the amount of work involved was the equivalent, in Fredpower units, of building two transmitters, a modulator and a receiver, and so he came to the big decision—he was **not going to build himself a Single Sideband rig**. Having decided this, Fred cheered up tremendously. He felt as if an enormous load had been lifted from his shoulders, and who can dispute the truth of this! But he also felt that he *must*,

somehow, get going in the new "mod. mode," so he began to study the latest Small Ads, in the hope of finding some chap who had grown tired of his SSB rig and wanted to be rid of it and get back to 150 watts of AM and Hi-Fi. Well, as you probably know, SSB rigs are pretty hard to come by in the small ad. pages—BC348's that need attention, yes; but it would seem that when you've built yourself a Single Sideband rig you become attached to it—as well you might after all that work. So Fred was driven to thinking again.

At last, he came up with an idea which may yet appear in print—so simple, it's really amazing why nobody has cottoned on to it before. The first thing required is a normal AM rig. Then you merely connect a high-Q parallel-tuned C/L circuit (tuned to the output frequency of the transmitter) *between the transmitter and the aerial*. This suppresses the carrier and leaves the sidebands free to go up the spout, as it were (*Fred speaking*). So far, tests with locals have tended to show that the resultant output is very similar to a weak AM signal, but Fred is still working on it and very shortly will be publishing figures to prove something or other. Fred would wish to emphasise to any reader who might like to try his system that it is absolutely vital that the components in the tuned circuit be of first-class material—none of your cardboard coil formers and muckite condensers, as he told me laughingly. So there you are. Me? I'm going back to my commercial AM rig.

U.S.A.F. UHF LINKS

The United States Government has placed an order for the supply of a mobile microwave telephone and telegraph communication system linking many of the United States Air Force bases in the United Kingdom. The system is planned as a number of mobile stations, each of which will be self-contained with all the necessary equipment, including its own power supply. The units can thus be deployed individually or collectively. The complete system has been planned by Marconi's Wireless Telegraph Co. Ltd., and the Automatic Telephone and Electric Co. Ltd.

The radio equipment to be employed is the new Marconi Type HM510 series, which operates in the 4000 mc band. The system is capable of carrying 240 telephone channels, and employs an English Electric Valve Company travelling-wave tube as the final stage in the transmitter, giving a power output of 2 watts. The receiver consists of low-noise crystal mixer feeding a low-noise IF amplifier which in turn drives a demodulator. The IF amplifier and following stages are on printed circuits, thus reducing maintenance problems.

The system is designed to be as flexible as possible; channels can be inserted or extracted at the repeater stations without difficulty, and the radio and channeling equipment will be accommodated in semi-trailer air-conditioned vehicles. Mobile units containing the repeater equipment will be used where the distance to be covered is considerably in excess of line-of-sight.

SWL • • • • •

THE LISTENER FORUM — DISCUSSING THE QSL PROBLEM—IDEAS AND SUGGESTIONS—STATION DESCRIPTION

THE March instalment of this feature has produced a very lively assortment of letters from readers, which must of necessity be greatly condensed in order to fit the space available. Thanks to the many correspondents who made kind remarks about that "Aerial Matching" information, in March, which certainly seems to have produced good results in many quarters.

This time the accent, by general request, is on the subject of QSL's. Converters, the next most popular subject, will have their turn in the July issue.

Meanwhile, readers themselves shall have their say in this "SWL Forum."

S. W. C. Harbour (Peterborough) wants articles on DX Listening and a Crystal Frequency Meter—both of which are duly noted. *M. Russoff (London, N.W.7)* uses an R.107 and RF-24, but would sooner work with home-built equipment, so he hopes to see in the future an article describing an all-band receiver.

P. A. Chapman (Jersey) says he lives almost entirely on the amateur bands (except for the "Archers" and "Mrs. Dale"!) and runs a CR.100 and a Pye portable—also an 1132A for listening to the local airport traffic. He wants an article on man-made interference—car ignition, vacuum cleaners, hair-driers and even electric-light bulbs!

E. Macpherson (Harlow) is a teenager and uses a home-built super with four IF stages plus a modified RF-24; he also has an RF-26 for the 50 mc band, and covers all frequencies between that and 1.8 mc, with the accent on 21 mc DX—not bad for an SWL who has yet to see his 15th birthday!

At the other end of the age scale, *S. H. Stephenson (Morden)* started as an SWL just after the first World War, and now uses an HRO, mainly on 14, 21 and 28 mc; he has heard about 185 countries and has 128 confirmed. *R. J. Reeves (Swindon)* runs the popular combination of R.107, RF-24 and RF-26, but he also has two R.1155's and a BC-624 which is awaiting mods. for 2-metre reception. He covers all bands, with the accent on 1.8 mc, and would like an article on "aerials in cramped quarters."

C. J. Smith (London, N.20) has an R.1155 and R.110; for 28 mc he uses a Cubical Quad, and for the other bands a 14 mc dipole and a 66-ft. wire; his ambition is to own an 888A and a motor-driven rotary beam. His request, with that of many others, for an article on QSL's is answered herewith!

A. W. Kelf (Croydon) is a newcomer who still uses a broadcast receiver for his listening, and naturally is interested in converters—coming shortly! *E. Gaskell (Chorley)* is starting up again, having been very keen in 1952; he has an R.208 and "75 feet of bent wire," but looks forward to something better.

E.G. would like lists of short-wave stations; but these take up a great deal of space, and with so much

published information available—such as the *Call Book* and *World Radio Handbook*—are hardly justified.

E. J. C. Baldwin (Bristol) wants to read about Hotting-up Receivers, compiling useful log-sheets, simple home-built equipment and "personal" features, with photographs and details of some of our SWL's.

Aerial Matters

All the following refer back to the Aerial Matching article in this feature in the March issue of SHORT WAVE MAGAZINE—pp.32-34. We have not space to quote from those who just wrote to mention their appreciation, but we thank them all the same. Those who have comments to make include *G. J. Knock (Tonbridge)*, who runs an R.208 and a commercial receiver, with a 225-ft. wire. This he is changing for a 67-footer plus the ATU described. He keeps a detailed log-book and card index and finds the *Magazine DX Zone Map* very useful.

R. Winson (London, W.7) harks back to the remark about "not catering for the curtain-rail fraternity"—and hopes that in future we will! He lives in a furnished room, and drilling holes in the window-frame is out of the question. There must be many like him.

G. Eddowes (Gosport) says that the ATU "works wonders"—he is using it on 28 to 7 mc with a 67-ft. wire, with a TCS-10, RF-24 and RF-26, and pulling in quite a bit of DX. *A. Whitaker (New Malden)* is faced with aerial restrictions which mean (1) nothing above gutter level; (2) no cutting of trees, or "mods" to the garden; (3) no poles except at the very edges of the garden, when they must be independent of all other structures. In such circumstances we think that an outside wire running from a first- or second-floor window and terminating on the garden fence at the far end would be preferable to anything indoors, but A.W. is now thinking in terms of a loop aerial in the loft—which could be very interesting and rewarding, especially as remote rotation would be possible.

M. A. W. Marmont (Birmingham) recommends the good old centre-fed doublet with tuned feeders. His own has a 67-foot top and 34-foot feeders, which works from 10 to 80 metres and even gives some sort of result on Top Band. *H. Timm (Hayes, Middx.)* is yet another owner of the R.107/RF-24 combination, aerials being a 14 mc dipole and also a whip on the mast, which is 20 feet high. Somewhere in the future is a rotary beam!

Tip for Morse Learners

F. Huggins (Colne) is taking his RAE this month, and passes on his tip for learning Morse—record it on a tape-recorder at 7½ w.p.m., and play back at 3¼ until you improve your speed! He owns an R.1155, and now a 358X, and his interests are mainly 40, 80 and 160 metres.

Several other readers ask for details of slow Morse transmissions; many lament the fact that there don't seem to be such exercises. We can only tell them that there *are*, and they are to be found on

Top Band every evening of the week at various times between 1730 and 2200 GMT. They come from amateurs in all parts of the country and there is at least one nearly every half-hour. Just listen around carefully.

Another Old Timer

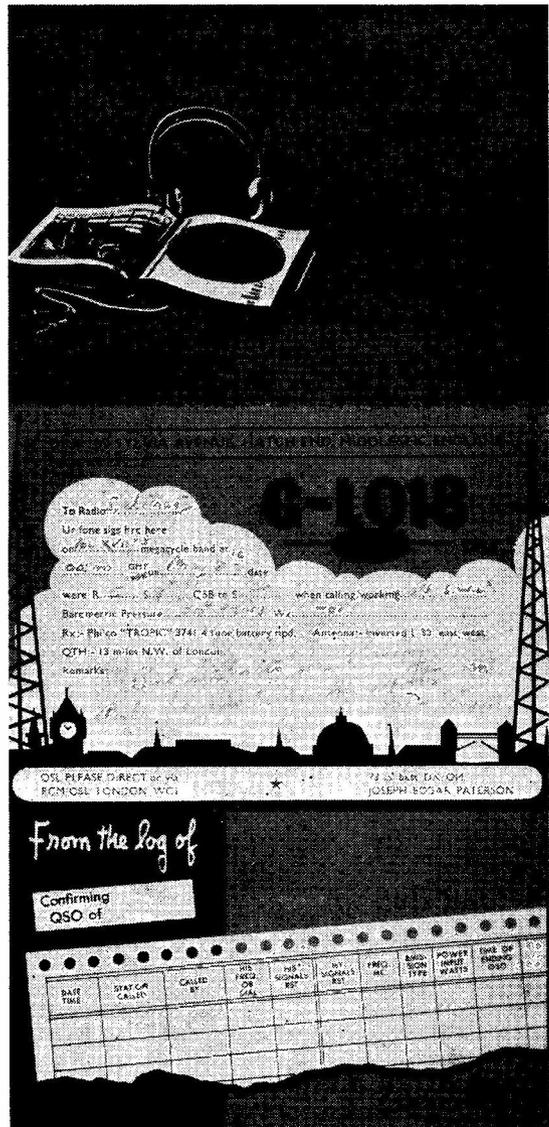
G. Stokes (*Week St. Mary*) adds himself to our bag of old-timer SWL's, having started in 1914 with "the usual contraptions of the period." In the same year he joined the R.N.A.S. (Cdr. Locker-Lampson's expedition to Russia) and operated a Marconi 1/2-kW Field Set (2 1/2 h.p. Douglas engine driving generator and spark gap!). He remembers the first valves coming into use, and the thrill of first hearing telephony from aircraft. Nowadays he has a BC-342 and an R.1392, and says that at the age of 68 he has never recovered from the first bite of the wireless bug.

F. W. Hattemore (*Penarth*) started up in 1932 with a home-built 0-V-1 and other receivers. After the war (and radio work in the R.A.F.) he started again with an Eddystone "All-World Two." Today he runs a home-built triple-conversion job for the VHF bands, with interchangeable RF heads for other bands. On 50 mc he has heard much DX (including Mexico). Other equipment includes a CR.100, HRO and a 358X, with a formidable array of servicing gear, which is really used to keep the receivers in first-class condition. Another interest is DX TV reception, and his receiver (home-built) is available for use on Continental systems. He has twice received *American TV* for brief periods!

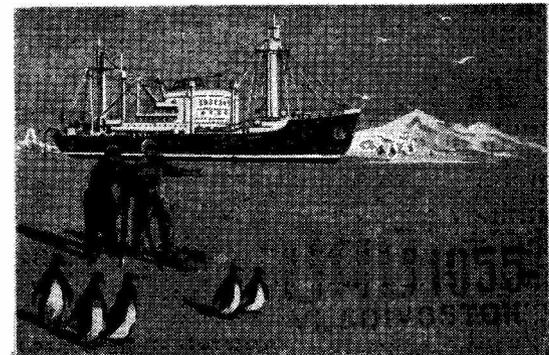
A. J. Melia (*Liverpool*) is sorry to see so little evidence of completely home-built receivers, which, he says, can be so much more versatile than the omni-present CR.100's, BC-342's and the like. So many of the rigs described up-to-date have not used low-frequency, high-selectivity second IF's. He goes on to suggest a useful rôle for the SWL in helping local amateurs to track down pirates; a group of SWL's with D-F equipment could work wonders, and convince the GPO that we are trying to keep our own bands clean.

B. L. Rous (*Canterbury*) wants to see something about the VHF bands—but that is in our colleague A. J. Devon's province! B.L.R. uses a BC-348, modified, and a 67-foot aerial matched in by a simple ATU. And yes—there's an RF-24 around as well!

J. M. Smith (*Grimsby*) covers all bands from Six to One-Sixty, and has logged 120 countries on phone, with a 358X, R.208 and RF-26; his aerial is 66 feet long, centre-fed with 33-ft. feeders. M. H. Parker (*Torquay*) has a Pye P.224 with an RF-24 modified in the usual way, a 132-foot wire and a two-element beam. The receiver has been modified to cover all bands from Ten to Eighty, and in seven months' listening has fetched in 203 countries in 40 Zones.



Selection of current SWL report cards — from OK, G, a W and a UA. G-L018 is SWL Paterson of Hatch End, Middlesex. The card below his is one of the standardised log-form types issued free by an American valve manufacturer for "goodwill and prestige" purposes. In the case of the QSL from the Vladivostock listener (lower) the report details are given on the back of the card.



Fifteen is the best band (150C) and Ten the best for listening to the States.

J. M. Nisbet (Croydon) thinks young SWL's have a certain advantage, especially in the matter of QSL'ing. He mentions on his cards that he is 16 years of age, and the replies usually comment on it, he finds. He is torn between acquiring a CR.100, SX-16, SX-25, BC-348 or Eddystone 640—but that's one of the problems that beset all listeners. The best set for you is the one that you like best—and that's all one can say.

E. M. E. Decottignies (Leigh-on-Sea) is an old timer who has not lost his keenness, and he gives us some interesting details of his rig, most of which we shall have to hold over for the Converters article in the next instalment. He uses a most unconventional arrangement of an autodyne converter working into a commercial receiver at 150 kc, the second IF conversion being to 465 kc. One of its distinctions is that he can cover all frequencies from 1.5 mc to 60 mc with a receiver arrangement which (apart from the commercial superhet) has cost him less than £3.

THE QSL BUSINESS

In the earliest days of radio the letters "QSL" meant "Please acknowledge." They carried no sinister hint of floods of post-cards travelling all round the world in large packets, but simply meant what they said—"please acknowledge receipt of this transmission"—and the reply was probably "R."

In the early 1920's it became the custom for amateur transmitters to acknowledge mutual contacts by dropping each other a post-card with a confirmation of the signal report and a few further details, and these first cards were naturally known as "QSL cards." Gradually they became more and more ornate, developing from plain post-cards with a large call-sign overprinted on them into minor works of art, all designed with a view to making the walls of the shack a little more cheerful.

It wasn't long before a healthy rivalry set in, and for quite a period the "best" amateurs were those who could produce a photograph showing the greatest number of cards on the wall—at the more active stations, it was not unusual to find three walls of the shack papered with cards from floor to ceiling! But the age of contests, competitions and DX awards had not arrived . . . and when it did, the QSL began to assume major importance.

How was one to check a claim that so-and-so had really worked 100 different countries? Well, if he could produce QSL's from 100 countries, one might assume that he had really worked them. Thus the QSL became legitimate proof of a contact; and so it arose that no contact with a new country was of much use without the QSL to prove it. No DX award could be made or a Certificate issued without the cards to back the claim.

Saving Postage

The QSL card having thus assumed a major rôle in Amateur Radio, its disadvantages soon became apparent. If you operated a station in a fairly rare part of the world, *everyone* you worked would want

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your QSL. The postage bill began to reach a figure which made one think. And so the idea of exchanging QSL's in bulk was evolved, and the QSL Bureaux were born.

To send your cards outwards you just forwarded them in bulk, as a parcel, to your Bureau, who sorted them and sent them on, with other users' cards, as even larger parcels to the Bureaux of other countries. To collect incoming cards, you simply kept your own Bureau supplied with a few stamped addressed envelopes. A simple idea, and a good one from all points of view.

But as the importance of the QSL was advancing, so were both the number of stations on the air, and what we might call "the state of the art." More and more contacts were being made, with more and more countries. QSL's from an active station would be going out at the rate of thirty or forty a week, rather than one a day. And this all-round increase has never shown signs of abating, so that today the QSL traffic has reached dimensions that we never even dreamed of before the war. To quote a figure: Assuming that half the known amateur operators in the world originate only 100 cards each in a year, that would mean a total of *fifteen million* QSL cards a year circulating through the world's Bureaux!

The SWL's Part

In the old days, when a large proportion of amateurs were struggling to get their signals through to DX countries, there were many occasions when they were very relieved and grateful to receive an SWL report. A low-powered "G" might have been calling the USA every night for a week, with no apparent result, and then would come a listener's card from Tennessee, telling him that he had a good signal there. That particular SWL would get an immediate reply, possibly by airmail!

As powers went up, aerial systems improved, receivers got better and better, and SWL's became much more numerous, so the listener's place in the reporting scheme became more and more specialised, until we reached the point where many SWL reports were, to be candid, nothing more than a nuisance. After all, a U.K. station working New Zealand, Australia, Japan and California in quick succession is hardly going to be thrilled when informed that he was heard in Hungary or Czecho-Slovakia. (There was one period when every active station was simply flooded out with Russian SWL reports, most of which were quite useless and merely brought disrepute upon the SWL fraternity.)

From this chaos emerged the better type of SWL, with the brains to see that he could still perform a useful function. His argument ran like this: If I listen, not to the strongest station who is having contact after contact, but to some of the weaker ones who seem to call CQ many times without getting a reply—perhaps some of these chaps would

actually value a report. And so it turned out. The SWL's who became known for their keenness and usefulness were those who listened for unusual stations, on unusual wave-bands, at unusual times, and left the strictly bread-and-butter stuff alone.

Many a British operator has been surprised to receive an SWL report from Australia on his *forty-metre* signals when he has been working Europe or even another G station; many a station who has spent an afternoon working a whole string of W2's and 3's has been delighted to get an SWL card (even from his own country) telling him that at one stage he was called by VP7AA, or VP4ZZ.

Unwanted

Today—we must face it—most of the SWL reports received by transmitting amateurs are of no use to them and are unwanted. If you are an SWL who sends out routine reports to stations who are obviously working world-wide DX with no trouble, and if you get a QSL card back, then you know that the chap you reported is an extremely good-natured type! For the average transmitter to QSL *any* SWL report is almost a favour, and if some of the more successful DX workers tried to reply to every QSL received, then they would never be on the air. The point one wants to emphasise here is the quantity involved—that means *time* and *postage*, apart from the cost of the cards themselves, even if a minor matter. Some DX operators are so active that they are unable to keep up with the QSL's for the stations they work, let alone their SWL mail!

Moral: Your reports must convey something worth-while, and preferably something unusual. Listen for the weaker stations; those that call and call and don't get replies; those that call, get replies, but don't hear them; those that are using extremely low power (you can find this out by listening to a QSO or two before writing your report). By these means you should be successful in raising a fair return of QSL's—if you enclose return postage or IRC's.

Hints from Experts

Peter Day, of Sheffield, whose station was described in March, p.36, makes the following points:

- (1) Return postage is a "must."
- (2) Compare the station's signals with others on the band from the same area, at the same time,
- (3) Mention the level and type of QRM on the frequency at the time,
- (4) DX logging on the "difficult" bands (1.8, 3.5, 7 and 50 mc) produces much better returns than the three main DX bands,
- (5) Listen to a station for at least thirty minutes if possible, to get an overall picture of what is happening on the frequency.

SWL Day also tells us that he often sends along such snippets of "DX gossip" as he can—this is wonderful for improving the QSL return; that it is

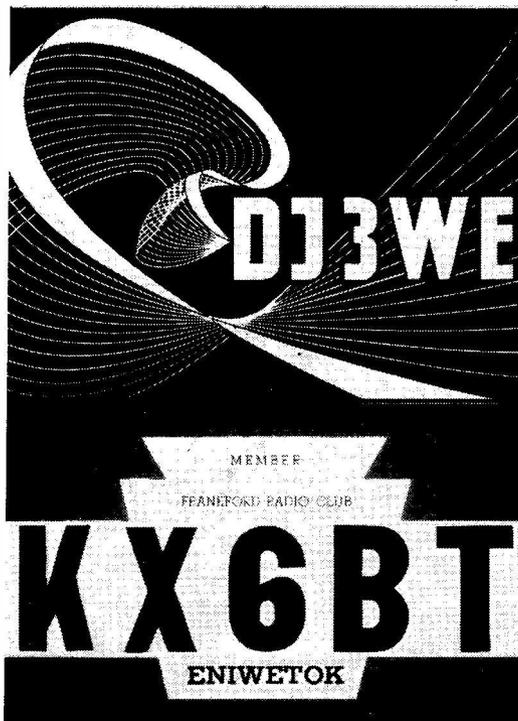
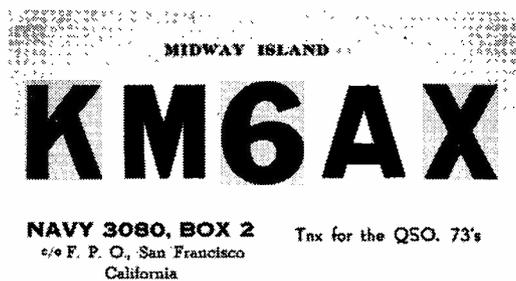
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important to mention weather conditions when reporting on VHF; and that it is valuable to tell the other station *why* you want his QSL (for a certificate, or in a local club competition), so that he doesn't think you just collect them like match-box labels or cigarette cards.

Finally, his returns shot up from 30 per cent. to 75 per cent. when he started enclosing IRC's.

J. E. Paterson (*Hatch End, Middx.*), one of whose attractive cards is reproduced herewith, finds that it pays handsomely to QSL direct—there is no question



These are transmitter cards you may have in your own collection. The upper and lower ones are chosen for their comparative rarity and that from DJ3WE for its striking design — yellow on a black ground, printed by DLICU, who has originated many of the current German QSL card styles.

about *that!* He adds that reports should be "Truthful, helpful, rational, informative, friendly and tactful"—and the initial letters of those adjectives form the word "thrift." When possible, he completes the remarks on his card in the language of the country to which it is going.

Another good point made by SWL Paterson is that one should not think along the lines of "extracting" a QSL, but should at least give the impression that one is anxious to do the fellow at the other end a useful service, and would be honoured if he will, out of the goodness of his heart, acknowledge its value. (If that value is actually *nil*, then no return QSL will be forthcoming or can be expected.)

DX-peditions

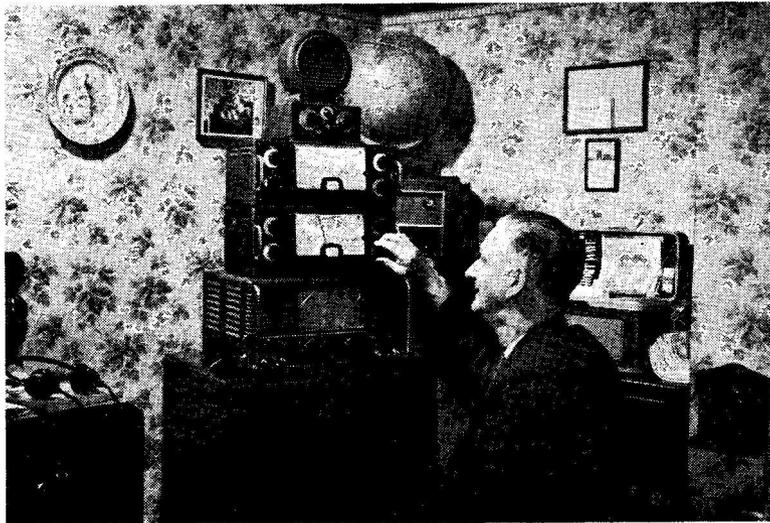
It is a sad fact for the SWL fraternity that some of the rarest stations in the world have been those operated for short periods by a small band of operators who have "colonised" an island for a few days in order to put it on the air for the first time.

Recent examples have been KS4BB (Serrana Bank), CEØZA and the others (Juan Fernandez)—see April issue SHORT WAVE MAGAZINE—FO8AT (Clipper-ton) and similar undertakings. The operators of such DX-peditions have only to set up the gear and to press the key, or pick up the mike, in order to start a pile-up of replies from all over the world.

All the time they are operating, they are probably thinking of the small chore of writing out about 3000 QSL's after their return. If every SWL that logged them joined in the chorus, this job would be even greater; and what would the average SWL report tell them that they didn't already know? No, the routine "I-heard-you-please-QSL" report is just so much bad medicine to these fellows. On the other hand, a sensible SWL report telling them, for instance, that at a certain time they were being called by rare stations in Asia, but kept on going back to W's, would probably be of great interest.

To sum up, then: SWL's have got to *work* for their returns these days. Give the fellow at the other end something worth having, and he will acknowledge it. If you can't do that . . . save your card and your money.

This month's honoured guest is C. N. Rafarel, of 89 Bonsall Road, Erdington, Birmingham, a regular reporter to "DX Commentary" and a listener of long standing. In 1922, at a very tender age, he built his first crystal set—and he still has it as a museum-piece. In 1923 came a single valve and the start of



The station operated by SWL C. N. Rafarel (Birmingham) is described in the text and demonstrates that efficiency goes with a neat and compact layout. Above the receiver assembly is the aerial selector and switching unit; below it is the 50-200 mc converter; next is the Geloso "front end"; and at the bottom the Eddystone S.680. Other equipment includes a BC VHF/FM receiver, a tape recorder and a signal generator. C.N.R. is an active SWL of long experience — he also has the distinction of not being a collector of QSL cards!

STATION OF THE MONTH

(Every two months we hope to present a short description of the station of one of our SWL readers. Photographs and descriptions of the gear used will be welcomed.)

many years of DX, for in that year he heard a weak signal underneath the old Cardiff (SWA) station and found it to be San Sebastian, Spain.

C.N.R.'s "second home" was France—and if he could hear Spain he could surely find some French stations. So the flapping-coil two-valver went to work and there was Radio Toulouse, forging a link that has never been broken, for he has listened to France or the French Union at some time *every single day* since then. Even now he has a preference for ferreting out DX like FK8, FU8, FO8 and the like.

In 1927 better receivers brought in more than 100 American and Canadian stations on medium waves, and shortly after that came the first sallies on the short waves, starting with a two-valve battery receiver. The GEC stations at Schenectady, VK2ME and VK3LO, ANE (Java) and the other famous broadcasters of those days were all logged.

As the sets improved (still home-built, but now mains-operated) so the DX improved also, and VR6AY (Pitcairn) was heard in 1932. A slight diversion was caused by the Baird 30-line TV in 1933—scanning-discs and things!—and that receiver was hauled up to Yorkshire to receive TV over more than 200 miles.

Various converters followed, in front of different broadcast receivers, and then came the war, when

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short-wave broadcast listening really could reveal interesting and exciting events -- PLE (Bandoeng) being evacuated but left running with an interval signal until the Japs arrived; Doenitz announcing Hitler's suicide; Radio Prague calling for Allied help; and Brazzaville as a link with France all that time.

After the war the gear consisted of RF-26's in front of broadcast receivers, until in 1956 the present Eddystone S.680 was acquired; since then a Gelson front-end has been added, and also a cascode RF and frequency-changer for 50-200 mc.

Thus the set-up now consists of the S.680 and two converters, and the aerial farm comprises dipoles for 28, 21 and 14 mc, all 53 feet high, and their far ends movable through 45 degrees for directional purposes. There is also a long wire, 132-ft. long and the same height as the dipoles, and arrays for Two metres and Six metres.

Sputniks I and III were duly received and recorded on tape, but C.N.R. was away in France when No. II was launched. Incidentally, he speaks French as a "second language" and also has a

working knowledge of Spanish and Italian, not to mention a smattering of German and Russian. Thus DX listening is a challenge, not only because of conditions, QRM and QRN, but also by reason of the language complication! But C.N.R. says "SW and BC listening has been more than a hobby for me; it is a way of life, an ear on the world; a way of learning about languages and people and, above all, of understanding them."

It is interesting to note that this particular SWL, with all his wide diversity of interests, does *not* collect QSL cards, but prefers to leave them to those who can make two-way QSO's. And he makes it a point of honour never to claim hearing a station until he is 100 per cent. certain about it. He hopes eventually to acquire a transmitting licence, but an imminent move to Poole, Dorset, will hold things up a little. We look forward with interest to hearing of his doings from the new location.

Correspondence from short wave listeners is welcomed for this feature, the next appearance of which is in the July issue. The closing date is May 28 and all mail should be addressed: "SWL," c/o The Editor, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

AN ULTRA-SOUND IMAGE CAMERA

A new instrument which may become of considerable use to engineering, and possibly even to medicine, has been demonstrated and described by Dr. C. N. Smyth, M.A., B.Sc.(Eng.), B.M., B.Ch., M.I.E.E., and Mr. J. F. Sayers at a meeting of the Electronics and Communications Section, I.E.E.

Sound waves are in many ways similar to light waves; they can be focused with lenses, and images of objects exposed to noise can be formed and reproduced at a distance. The wavelengths of audible sounds are too great to make these techniques useful, but for ultra-sound of frequency 1-20 mc sound lenses 10 cm. across are very efficient.

The ultra-sound camera differs only from an ordinary TV camera in that the light-sensitive (photo-electric) image-receiving-surface is replaced by a sound-sensitive (piezo-electric) * image-receiving-surface. This is simply a bare slice of crystalline quartz which, under the impact of sound, develops on each point of its surface a voltage proportional to the ultra-sound intensity. The value of this voltage is detected, point by point, by a scanning electron beam and, after amplification, controls the brightness of a TV-type screen to produce a visible image of the invisible internal structure under examination. For the demonstration, the frequency used was 4 mc, and good resolution was obtained of a number of objects such as pieces of gauze, as well as air cavities in aluminium blocks, welding defects, and some medical and biological specimens like the structure of the human hand and the internals of a goldfish. The sound intensities employed are rated at mW per sq. cm, and, at the frequency involved, are too small

to have any adverse biological effects. Dr. Smyth is at the Medical School of University College Hospital and has worked on his instrument for three years as a spare-time hobby.

ILLEGAL WELSH BROADCASTER

Some time ago (January, March 1957) we reported the activities of a pirate broadcaster, on a BBC frequency, operated in the interests of the group calling itself "Scottish Nationalist." There is also a vociferous minority of Welsh Nationalists, who have recently been breaking out in the same way—running a pirate station on Channel 5—in South Wales. The political objectives of those who think it worth doing this sort of thing do not concern us. What is so objectionable is that Press reports should imply that it is "radio amateurs" who are responsible for "Radio Wales," so-called. There is no evidence whatever that any licensed GW is involved—if there are any, they should be ashamed of themselves. On this topic, many readers no doubt saw a letter from G3FGP in the *Daily Telegraph* of April 9, in which he made the position quite clear from the Amateur Radio point of view. According to that same issue of the *Telegraph*, the local G.P.O. said they could not organise any special location operation, because "our region is about 10,000 square miles. Without a clue we can do nothing more than is normally done to trace illicit transmissions. Normal detection work will continue."

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RIGHT at the beginning of the period, during March 26-29, there were good Aurora openings affecting two metres, and on the 27th not only were the GM's workable, but DL and OZ stations were coming through as well. However, perhaps because it was a Friday and not many were watching the band (or the TV!) relatively few U.K. stations were on to take advantage of an opening which lasted most of the afternoon and evening.

This auroral occurrence was one of the most obvious that has yet happened this year; apart from its effects on TV and VHF/FM. on the Saturday evening, 28th, the radiance was visible from the Midlands and some southerly parts of England. However, a visible Aurora does not by any means guarantee that the curtain is capable of reflecting signals as high as 144 mc, for on this Saturday evening an hour's listen-

VHF BANDS

A. J. DEVON

Review of Conditions—

Reports and Results—

Ideas, Comments and the Tables—

**TWO METRES
COUNTIES WORKED SINCE
SEPTEMBER 1, 1958
Starting Figure, 14
From Home QTH Only**

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

This Annual Counties Worked Table opened on September 1st, 1958, and will run till August 31st, 1959. 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.

ing between about 9.30 and 10.45 p.m. failed to produce a single rusty beat. Yet on the previous evening, Friday 27th, the GM's were there with no auroral glow actually visible. This sort of thing has happened before; the presence or absence of visible radiance is nothing to go by, and even if TV is being affected, it does not necessarily mean that the reflecting curtain will throw back two-metre signals. What it comes to is that when Aurora is expected, or suspected, one must listen and call on a northerly beam heading. There is a group of reliable GM's who, between them, seem never to miss an Auroral opening, as the reports this time show.

As to conditions generally, they have been flat and uninteresting as far as GDX goes, and most people say they have little to report. The barometer trace has been very variable, from a high during April 1-2, to a low most of the following week, then a climb from April 15 to the week-end, with a levelling off (when we had that period of sunny weather) from Sunday, 19th, to Wednesday, 22nd; for the latter part of that week the glass

fell sharply away again.

For EDX in the tropospheric mode—as during the wonderful European openings of July, September and, in particular, October 23-29 last year—we have to wait for a period of prolonged warm-weather conditions, with a high and steady barometer, hazy mornings and clear, cool nights (oh, yes, it *does* happen!) Then, we may expect to find EU signals workable over long periods, depending directly on how long that weather lasts. It takes time for a stable "high" to develop over the Northern European area; the greater the coverage, the longer the condition lasts. The trend can be seen from the daily weather maps, and, indeed, good tropo. conditions are the easiest to forecast and to watch developing.

Summary of Reports

G2CIW, until recently active from Cambridge, has moved to

**BRITISH ISLES
TWO-METRE ZONE PLAN**

Revision, March 1959.

Zone A: 144.0 to 144.1 mc.	Cornwall, Devon, Somerset.
Zone B: 144.1 to 144.25 mc.	Berks., Dorset, Hants., Wiltshire, Channel Islands.
Zone C: 144.25 to 144.5 mc.	Brecknock, Cardigan, Carmarthen, Glam., Gloucester, Hereford, Monmouth, Pembroke, Radnor, Worcester.
Zone D: 144.5 to 144.7 mc.	Kent, Surrey, Sussex.
Zone E: 144.7 to 145.1 mc.	Bedford, Buckingham, Essex, Herts., London, Middlesex.
Zone F: 145.1 to 145.3 mc.	Cambridge, Hunts., Leicester, Norfolk, Northampton, Oxford, Rutland, Suffolk, Warwick.
Zone G: 145.3 to 145.5 mc.	Anglesey, Caernarvon, Cheshire, Denbigh, Flint, Merioneth, Montgomery, Shropshire, Stafford.
Zone H: 145.5 to 145.8 mc.	Derby, Lancs., Lincoln, Nottingham, Yorkshire.
Zone J: 145.8 to 146.0 mc.	All Scotland, Northern Ireland, Isle of Man, Cumberland, Durham, Northumberland, Westmorland.

Special Note: Within certain Zones, there are vulnerable frequencies which should be avoided, as follows:

144.00, 144.09, 144.18, 144.27, 144.36, 144.45, 144.63, 144.72, 144.81, 144.90 mc.

These are spot frequencies reserved for aircraft safety purposes, and are for emergency working only.

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, 9S4)
- 16 G3GHO, G3HBW, G5MA, G6NB
- 15 G3CCH, G3FZL, G4MW, G6XM
- 14 G2FJR, G2HDZ, G2XV, G3IOO, G3JWQ, G3KEQ, G3WS, G5BD, G6LI, G8OU
- 13 G3BLP, G3DMU, G3DVK, G3GPT, G5DS, G6XX, GM3EGW, PA0FB
- 12 F8MX, G2HF, G3FAN, G3GFD, G3GHI, G3HAZ, G3WW, G6RH
- 11 EI2W, 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, G3FIJ, G3FUR, G3IUD, G5ML, GC3EBK, GM3DIQ
- 8 G2CIW, G2DDD, G2XC, G3AEP, G3AGS, G3BDQ, G3BOC, G3GBO, G3HCU, G3HWJ, G3KHA, G3MPS, G3VM, G5BM, G5BY, G8SB, G8VZ, GC2FZC

Northfield, Birmingham, and will probably be on again by the time this appears. G3GSO (Derby) says that activity has been low in the North Midlands; however, he makes some moves in the Tables.

Every now and again, a letter drops in from someone of whom we have not heard for years; this time it is G3FEX (Storrington, Sx.), who says he is now active mainly on VHF, having rebuilt to a 90w. table-topper for Two, running a QQVO6-40 in the PA, with a QQVO3-20 tripler for 70 cm. input 18w.; the aerial for 144 mc is a 4-ele flat-top, to be improved to a slot-fed 4/4 in due course, while for 430 mc. G3FEX has the choice of a 16-ele stack, a slot-fed 6/6 or a corner reflector, latter being best. Results so far are very satisfactory, several stations having been heard or worked on 70 cm. on which band his frequency is 435.7 mc; reception reports, schedules and cross-band contacts are requested, as change over 2m./70 cm can be made quickly; G3FEX will also be /M shortly. on two metres.

G3ICO (Yeovil) can only show "locals and semi-locals" worked or heard, though he has raised G8DA for the first time, he being at 50 miles but on the other side of the Mendips. G3DLU (Sheffield) is moving, only about 100 yards, he says, but it will give him room to spread the gear out again. G3LHA (Coventry) finds that, for the first quarter of 1959, he has worked nearly 40 new stations on two metres; as he has always been active on the band, this, as he says, shows how much interest there is in VHF on the part of newcomers. For G3LHA, the catch of the month was GW4LU/P for Montgomeryshire; he now only wants Northumberland for all G counties worked on two metres. G8DR (London, N.W.2) remarks that to get 105 cards back, he had to work and QSL 225 stations; with 100 stations worked in three months, it took a year to get the cards out of them! This sort of thing makes it very hard going for those who do QSL properly, and even more so for those working for their VHFCC. Incidentally, ex-GW8SC is now ZC4SC and G8DR keeps a 10-metre schedule with him; ZC4SC hopes to get on two metres out there.

During the March auroral opening, G3KEQ (Sanderstead, Sy.) scored with GM3LAV, for a new county. A regular schedule is being kept with PA0LQ which, says G3KEQ, is 100% reliable over the 200-mile path, though signals during January and February were rather weak; his take-off to the east is not good, either. G3HBW (Bushey, Herts.) has had many excellent contacts with G3MED, "whose SSB is of excellent quality and comes through extremely well." Arnold wishes to identify himself with the comments made by G3FZL last month, and remarks that he has lost many interesting QSO's because the station called did not search carefully enough, and was content to go back to some strong signal local to himself.

At G3FZL (London, S.E.23), the aerial is an 8/8/8/8 J-Beam slot-fed, with 3-wave spacing vertically between the sections, the top being

46 ft. up and 320 ft. a.s.l.—a nice "gainy array," one would think! With this goes a 4X150A RF amplifier taking the full 150w., which can be pushed up to 220w. in the authorised QRO section of the band. Geoff's Rx layout consists of a CC converter (actually built by GM3DIQ) having a 6AM4 RF stage into a 6BQ7A, the IF tuning being 9-11 mc on a BC-342.

The letter from G3WS (Chelmsford) is by way of saying farewell—he is off to VK, and hopes to start up again on all bands, including VHF, from the new QTH near Adelaide; he wishes us to pass his 73 to all his U.K. VHF friends; we are sure they will wish him luck and good fortune in his venture.

Comments out of Context

"I dug out my old 2IQ con-

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
32	G2XV
27	G3HBW, G3KEQ, G5YV
26	G3JWQ, G6NF, GW2ADZ
23	G3BKQ, G6NB
20	G3HAZ
19	G2CIW
13	G3IOO
16	G3MED
15	G3LHA, G4RO
14	G2DDD, G2HDZ
13	G3MPS
12	G5BD
10	G2OI, G3IRW
9	G3KPT, G5DS
7	G2HDY, G3JHM, G3LTF
6	G3FAN, 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

TWO METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 14
From Fixed QTH Only

Worked	Station
78	G5YV (787)
73	G3CCH, G6NB
70	EI2W (316), G5MA, G6XM
68	G3BW, G3GHO
66	G3HBW, G3IUD(302), G3KEQ, G5BD
64	G3BLP
63	G2FJR (542)
61	GM3EGW (232)
60	G2OI (402), G3DMU
59	G3EHY, G4SA
58	G3FAN (637), G3IOO, G8OU
57	G8SB
56	G3WW (770), G5DS (654)
55	G2HDZ (495), G2HIF, G5BM, G5W5MQ
54	G3HAZ (450), G8VZ
53	G2AJ (519), G3LHA(387), G4CI
52	G2NH, G3FZL, G3JWQ (429), G6RH, G6XX, GW2ADZ
50	G3ABA, G3GSE (518)
48	G3FIH, G5ML, G6TA (487)
47	G2CIW (282)*, G3DKF, G5WP
46	G4HT (476), G5BY, G6YU
45	G2AHP (647), G2DVD (362), G2XC, G3BJQ, G3GFD, G5JU
44	G3BK, G3DVK (282), G8DA
43	G2DDD, G2FCL (322), G3BA, G3COJ, G3DLU*, G3HWJ, G3KHA (262), G3KUH, G3WS, G4RO, G5DF
42	G2HOP, G3BNC, G3IER, G6CI (220)
41	G2CZS (282), G2FQP, G3DO
40	G3CGQ, G5MR (366), G8KL
39	G2IQ, G3GBO (434), G3LTF, G3VM, G8IL (325)
38	G3APY, G3CKQ, G3HTY, G3KPT*, G3KQF, G8VN (190)
37	G3FNW, G2FZU (180), G3DLU, GC3EBK (260)
36	G2DCI (155), G3CXD, G3DLU*, G3IIT, G6CB (312), G8IP
35	G3FYY (235), G3GSO (266), G3HCU (224)
34	G3AEP, G3CKQ (162), G8IC, GM3DIQ

verter and compared it with the A1714-EC91 Cascade; there was not a lot of difference, which goes to prove that the G2IQ design still takes a lot of beating" (G3KEQ) . . . "If the cards had been counted from the bottom, it would not have given the impression that I have been unable to work any other country except France on two metres" (G8DR) . . . "I just don't hear any T3 signals here. Aurora or not; possibly it's

Worked	Station
33	G3FUR, G3HHY (125)
32	G3HIL, G8QY, G8VR, GC2FZC
31	G3HXO, G3KPT (180), G3MAX, G5RP
30	G2AHY, G3FRY, G3GOP(208), G3GVF (129), G3IRA, G3KEF (110), G5NF, GW8UH
29	G3AGS, G3AKU, G3FIJ (194), G8DR (225)
28	G3ITF, G8DL, GM3BDA
27	G3CVO (231), G3DAH, G3ISA (160), G3LTF/A, G6GR, G1GQB, GW3GWA
26	G2BRR, G3CFR (125), G3MED, G3SM (211), G3YH, G4LX, G4MR (189)
25	G3JHM, G3JMA, G3JXN (220), G3MPS, G5SK, G6PJ
24	G3FD, G3FEX (226), G3FXG, G3FXR, G3IC0
23	G3CWW (260), G3HSD, G3IOE, G4JJ/A, G5PY
22	G2DRA, G3AGR (135), G3ASG (150), G3BPM, G5AM, G8NM
21	G2AOL (110), G3DVQ, G3IWI, G6XY, GW3MFY
20	G3EYV
19	G2HDR, G3GCX, G5LQ (176)
18	G3DBP, G3JGY, GC2CNC
17	G3EGG
16	G3FRE, G3MLS
15	G3IWA
14	G2DHV, G3CYY

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

* New QTH

my non-CW ear, though I can read Morse reasonably well!" (G3LHA) . . . "It doesn't take long to move a crystal across the two-metre band, and I do not recommend anything coarser than metal polish as the grinding medium" (G3DLU) . . . "I have not a great deal of spare time, so am hoping the improvements made to the gear will enable me to work some DX under any conditions" (G3FEX) . . . "Most of our regulars have moved into the new zone, and are hoping that late-comers will not move in on top of them" (G3GSO) . . . "My new QTH is in Warwickshire, 1½ miles from the Worcestershire border and 1¼ miles from G3HAZ" (G2CIW) . . . "I do not understand how anyone can find it at all difficult to deal with good SSB signals, as it seems very easy indeed" (G3HBW).

G5NN (Spencers, Charlwood, Nr. Horley, Sy.) has some crystals to exchange, and would be glad to hear from anyone interested—8075, 9067 kc for anything in the range 8027-8038 kc.

London VHF/UHF Convention

This is arranged for Saturday, May 30, at the Prince of Wales Hotel, De Vere Gardens, Kensington, with lectures and demonstrations during morning and afternoon, followed by the convention dinner in the evening—in fact, all arrangements much as last year, including the prize draw. The all-in cost is 22s. 6d., and tickets can be obtained from: F. G. Lambeth, G2AIW, 21 Bridge Way, Whitton, Twickenham, Middx.—and please book in right away.

We have some VHFCC claims in hand, which will be covered next month, as space is now running out—it seems that cards are coming in fairly well, after all.

In Conclusion—

Deadline for the June issue is May 20, by which time we may have had an opening. All reports to: A. J. Devon, "VHF Bands," Short Wave Magazine, 55 Victoria Street, London, S.W.1. Have a good Whitsun and with you again on June 5—all being well.

The Reception of Single-Sideband

ACQUIRING THE TECHNIQUE

L. A. EARNSHAW (ZL1AAX)

Our contributor is a well-known exponent of the art of SSB and here he discusses the problem of Sideband reception as it affects the average amateur with the usual type of communication receiver. ZL1AAX argues that with practice SSB can easily be resolved on such a receiver—neither a product detector nor an external oscillator are really necessary. Sideband transmissions can always be heard at the HF end of the 80-metre and 20-metre phone areas, and over 21.40-21.45 mc in the 15-metre band.—Editor.

EASY reception of SSB — is it possible? These surely must be the thoughts of a great number of people. Various QSO's the writer has had with those who have not yet "seen the light" indicate that the average operator — especially outside America — not only has difficulty copying SSB, but a great number are not able to copy SSB at all! This is a serious state of affairs. Surely, by now it must be obvious that Sideband is no fly-by-night new-fangled witchery and that we are going to hear much more of it as time goes on. If we are to retain our place in the spectrum, we must not only keep up with development but we must be showing how it should be done. If, however, we are not able to receive the stuff we will not even be in the crowd at the rear. Easy reception of SSB is entirely possible and it is the purpose of this article to try and show just how easy it really is. (But those who have never got around to putting in a BFO are beyond redemption!)

What is SSB? Many say it is a lot of garbled stuff that clutters up the bands. Others are even more unkind. Only when we know what SSB is will we know how to handle the receiver to take it.

Nature of the Problem

If you modulate, say, a 3.800 mc carrier with a 1000-cycle tone you will create two new carriers, one at 3.801 mc and the other at 3.799 mc. If you switch in the crystal filter in your receiver and set it to its sharpest position you will find that this is indeed so. If you now tune slowly across the signal you may be

able to find three separate carriers, *none* of which is modulated by a tone. Now, if you broaden out the filter you will allow the two side carriers to beat with fundamental and so produce a beat note, which is the 1,000-cycle tone back with us again. Perhaps you may also have noticed that when you had the filter in "sharp," listening to the fundamental, its strength or amplitude did not vary when the modulating tone was switched on and off. It is fair to point out, though, that often it is convenient to look upon modulation as an *envelope* variation. An oscilloscope shows amplitude modulation as envelope variation only because it is not able to separate sidebands from the carrier. The picture we see is a *resultant* picture, the nett effect of displaying many separate patterns simultaneously.

It will be seen now how it is that we may filter off one sideband and yet leave the carrier and the other sideband. It is also evident that we can remove the carrier itself and leave in the two sidebands. And, of course, from this it will also be easy to see how it is that when we put a local carrier in again we can obtain the original modulation.

In *double* sideband suppressed carrier we not only have to put the carrier back at the correct frequency, but we also have to get it in the correct phase so that the beats produced between it and the two sidebands add together, instead of cancelling each other out—as often happens in the reception of AM when we get phase shift of the carrier and the consequent distortion. But with only one sideband transmitted, phase shift or phase distortion is no longer a problem.

It should now be clear that if we are to get the correct result we must put the local carrier back at *exactly* the right frequency. In the previous example, with the 1,000-cycle tone, if the carrier was put back at 3.800 mc plus 10 cycles then the beat note or received signal would be either 990 cycles or 1,010 cycles depending upon which sideband was being transmitted. It is the error in setting the local carrier at the correct frequency that takes the voices all the way through the audio range, with such odd effects! Somewhere in between will be found the voice as it was originally.

Receiver Stability

To keep the local carrier right on frequency we must have good receiver stability. In this there is no half-way house and no alternative. The receiver *must be* stable, both mechanically and electrically. By thumping the table you may be able to make the receiver jump a

couple of inches yet not alter an audio beat more than a cycle or two. This is not an impossible standard — unless, perhaps, the receiver is built into nothing better than a cocoa tin! It may be that the dial movement is not lined up truly with the shaft. The mounting of the components may be poor. Contrary to what is often said, the writer has found that flexible wire, so long as it is not allowed to flap about, is superior to stiff wire, which often puts a strain upon components. If necessary, strengthen the chassis beneath the frequency-determining components, so that the assembly moves as a whole and not piece by piece.

Regarding electrical stability: The suggestion is to remove the wavechange switch and make the receiver a one-band affair, using a crystal-controlled converter to get to the other bands. This is the principle built into the Collins equipment, recognised as fully meeting the SSB requirement.

To tune SSB you *must* have a good slow-motion control. Once again there is no compromise. Aim for about 10 revolutions of a *large* knob per 100 kc, and you will find yourself with the right answer. By fitting an off-centre pin to the knob you will be able to crank the receiver around the band, which may help to make things easy if there is no fly-wheel action. Further aids are a logging scale giving at least 1 kc readings and a large dial to give the normal reading.

The next requirement for a good SSB receiver is that of selectivity. Because of crowded band conditions—especially on 20 metres—this means that a narrow filter is a prime necessity. Any way, what use the transmitter restricting his width to 3 kc or less if the receiver opens out to 10 kc (a usual figure)? There is no excuse for being without a filter. Surplus FT243 IF crystals are advertised at a few shillings and in many of the handbooks, especially the ARRL's *Single Sideband for the Radio Amateur*, is to be found complete information on how to use them. In the literature, there are various circuits for slicers, toroidal filter IF strips and a mass of information pertaining to selectivity.

Carrier Re-Insertion

With increased selectivity comes the need for accurate setting of the BFO—this being the easiest way to put in the local carrier. As the sideband will be in the centre of the passband—unlike AM, where the carrier is in the centre—the inserted carrier must be to one side. Therefore, the BFO pitch control will be

set to one side or other of centre, depending upon which sideband is being transmitted. If you can't tune the station in with the BFO on the one side, try it on the other. It is usual for SSB stations to transmit the *lower* sideband on 80 and 40 and the *upper* on the other bands. However, one may, and often does, switch to the other sideband to dodge QRM. Once you have found the correct BFO settings, *leave the BFO alone*. Stations should be tuned in only with the main tuning dial, *not* the BFO.

If the injection from the BFO is not strong enough, it is more than possible that the sideband signal being received will overmodulate the local carrier being supplied and you will develop splatter in the receiver itself. To overcome this, it is necessary either to increase the BFO output or cut down the level of the received signal with the RF gain control.

Another good reason for using the RF gain control is because of the inability of the AVC system to cope with the staccato SSB signal. With most receivers the AVC is cut when the BFO is switched on. Hence, any effort to recover the audio with the RF gain right up will more than likely result in failure.

The Product Detector

The writer has never been able to understand why it is that the average amateur considers the product detector the essential of sideband reception. Yet it is quite true to say that a product detector will not give better copy of SSB than will a diode detector. Its advantages are twofold. First, the level of BFO injection is no longer critical and, secondly, only the signals which beat against the BFO will be received. This latter means that beats between stations off-tune, if they do not beat with the BFO, will not be heard. If the receiver has not much selectivity, this last may be important. It is as well to understand that though the level of BFO injection is now not critical, usually you will still find need to keep the RF gain control down to prevent overload of the IF amplifier. Also, do not expect the signal to sound better from a product detector, because it won't; it should sound exactly the same!

Perhaps the most important factor in easy sideband reception is experience. Like CW, it must be acquired. Only practice will enable you to sort signals out of the 20-metre band in the "American evenings." Only practice will tell you which way to turn the BFO knob when the voice is, say, high pitched. From practice, you will know immediately when a station is on "the other sideband." You will also find that

it is possible deliberately to change the pitch of the voice so that it clears the QRM. After a time you will find that by adjusting the BFO carefully, you can slide QRM outside the pass band. The quality of the station you are copying may deteriorate somewhat but it will be *readable* through the QRM — and that, of course, is what you are after.

In conclusion, after you have acquired a little practice, tune to the AM portion of 20 metres and see how many of the stations you can copy. This is always a wonderful demonstration of the true worth of SSB.

THE MOBILE RALLY CALENDAR

For those keeping up with the season's Rally events, the programme is now as follows:

- May 10:** Cheltenham Mobile Rally, Montpelier Gardens, Cheltenham. Arrive before lunch to take part in mobile contest.
- May 24:** Northern Mobile Rally, Harewood House (on A61, Leeds-Harrogate), from 12.30 to 6.00 p.m. Talk-in on both LF bands. Organised by Spen Valley Amateur Radio Society. Refreshments and admission charge.
- June 14:** West of England Mobile Rally at Longleat House, near Warminster, Wilts.—see below for details.
- June 21:** Annual Topsyfest and Mobile Rally at Walsall Road School, Cannock, Staffs., 2.00 p.m. onwards. Meeting, demonstrations, tea, station visits. Approach on A34; location is $\frac{1}{4}$ -mile south of Cannock town centre. Talk-in will be given on 1900 kc.
- June 21:** Harlow & District Radio Society Mobile Rally at Magdalen Laver village hall (Essex). Talk-in on LF bands. Refreshments.
- August 16:** South Shields Mobile Rally at Bents Park Recreation Ground, South Shields, Co. Durham, in conjunction with the local Annual Flower Show.
- August 16:** Derby & District Amateur Radio Society Mobile Rally.
- August 30:** South Manchester & Stockport Radio Societies' joint Mobile Rally.
- September 6:** London Mobile Rally, Festival Gardens, Battersea Park.
- September 13:** Woburn Abbey Mobile Rally.
- September 20:** Hamfest and Mobile Rally, Lincoln.

The meeting at **Harewood House** on May 24 will be mainly a social event; the park will be open for the period of the Rally, 12.30 to 6.00 p.m. and refreshments are available at usual prices; lunch and/or tea can be booked in advance and for this or further details apply: J. J. Rose, Spen Valley Radio Society, 14 South View Terrace, Hill Head, Dewsbury, Yorkshire.

To get to **Longleat House** for the Rally there on June 14, take the A362 Warminster-Frome road; the

entrance to the park is two miles out of Westminster, the grounds will be open 10.00 a.m. to 6.00 p.m., there are adequate catering facilities and car parking arrangements, with a reserved enclosure for the Rally, and the charge for admission is 1s. a head. The talk-in stations will be G3CHW/A on 1900 kc, looking for replies anywhere on Top Band, and G3FKO/A on 145.3 mc for the two-metre mobiles. Prizes are being given for the longest distance travelled to and from the Rally on the day, and for the best DX contacts (on each band) made by approaching mobiles with their control station. G3CHW/A and G3FKO/A will be on the air ready for /M contacts from 10.00 a.m. Operators wishing to work G3CHW/A are particularly asked to avoid his frequency, so as to minimise QRM on the approach.

Organisers of Rally events should let us have full advance details in good time to ensure publicity. When thinking of going to a Rally, most /M's like to have some idea of what is being laid on and, in particular, whether it is necessary to bring a picnic. Where a big attendance is expected, and because 160 metres is still by far the most popular mobile band, it is worth considering whether to provide two or even three Top Band talk-in stations; mutual QRM can be avoided by using opposite ends of the band, while really it is not even necessary for both talk-in stations to be located at the Rally site; an operator familiar with the locality can talk-in just as well from his home station some distance away, and if given a good brief to cover Rally arrangements at the ground, he can tell visitors what to look for as they arrive. At some Rally events last year, there was considerable congestion on the single 160-metre control station, which had too many /M's to handle at the peak arrival and departure periods.

And having held their Rally, the next thing organisers should do, immediately after the event, is to send in a factual report covering attendance, weather conditions, contest results, a count (or an estimate) of the number of actual /M vehicles present, results obtained by the talk-in stations (such as best /M DX and number of mobiles worked on each band), the callsigns of any distinguished visitors, and any other points they would like to see included in the published report; in general, this will appear in the earliest possible issue. A few photographs are always welcome, and can normally be used provided they are clear and sharp, with the necessary details for writing the caption. In particular, please be careful to give callsigns correctly!

Following are the latest additions to the Mobile Register: G2OI, Eccles, Lancs. (70cm-2-20m., *Vanguard Estate Car, LVU-705*); G3ABK, Darlington, Co. Durham (40-160m., *Morris Oxford JJR-18*); G3CSE, Hull (40-160m., *Morris Minor WAT-886*); G3MVA, Wookey Hole, Som. (40-160m., *Ford Pilot WMD-327*); G4TX, Walton-on-Thames, Sy. (10m., *Vanguard Estate Waggon KHP-832*); G6AU, Blackburn, Lancs. (160m., *Vauxhall Wyvern OOY-878*). All mobiles not yet registered are asked to send in details for publication under this heading.

Writing for the Magazine

NOTES FOR THE GUIDANCE OF CONTRIBUTORS

THE Editor always wants to see for possible publication articles on any subject connected with Amateur Radio. Whether such articles are acceptable for paid publication depends mainly on their scope, style, presentation and potential interest to readers of SHORT WAVE MAGAZINE.

Preparation of Work

In preparing work for Editorial consideration, there are a few simple rules to be observed if it is to earn the highest possible rate:

(A) The subject should be logically discussed from point to point in natural sequence. For instance, in a constructional article the logical sequence is: Introduction—what the equipment is and what it is intended to do; Circuit Design and points of particular interest or importance arising from the choice of circuit; Construction—how the author built it, with suggestions on how the construction might be varied in other cases; Setting up and Operating the equipment, with tables showing voltage/current values to use or which might be found under practical conditions; Results with the equipment; and Conclusion.

(B) The written material must be prepared in such a way that it can be marked up easily for passing to the printer. This means well-spaced lines (double or treble spaced typing), with wide margins, on quarto or foolscap sheets using one side of the paper only. If hand-writing is used, it must be well spaced, clear and legible without affectations.

(C) The signs, conventions and abbreviations always to be found in any *Magazine* article should be employed throughout, e.g., μ F or $\mu\mu$ F, and *not* mF, mmfd or pF: PA, HT, CC, mA, dB, mc, kc and *not* P.A., H.T., C.C., p.a., h.t., c.c., ma's, mills, dbs, Dbs, mc/s, Mc/s, Mc, kcs or Kc/s.

The correct abbreviations to use can always be checked by reference to the technical articles in any issue of the *Magazine*.

(D) Diagrams, numbered only Fig. 1, Fig. 2, and so on, must be clearly drawn on separate sheets and *not* run in with the text matter. Actual values should never be marked in on the circuit elements in a drawing. Always use the C1, L1, R1 notation, reading in

sequence from left to right across the drawing, *i.e.*, all resistors should be numbered from R1 upwards, starting with the resistor nearest to the left-hand edge of the drawing.

Drawings must be electrically correct, using hooked (or semi-circular) lines for cross-overs. The drawing should be built up above the base (or earth connection) line. They need not be copper-plate, since they are always re-drawn and sized for block-making by our draughtsman. Scribbled or thumb-nail sketches should be avoided.

The general drawing convention can be quickly grasped by study of the technical articles in any issue of the *Magazine*.

(E) Tables of values must also be shown separately and identified with the corresponding Fig. number of each drawing. They should be set out in the style as used in the *Magazine* (see any issue) and to the same convention.

(F) A list of suggested captions, identified with each drawing or photograph, should be given on a separate sheet, headed "Caption List," with the title of the article.

General Advice

The object of the author in preparing work for publication should be to make the article as submitted look as finished as it will appear in print. It should be set out in such a way as to take up as little as possible of the Editor's time in preparing the work for the printer. The whole of the work should be checked, re-checked and checked again before being sent in. Proofs are *not* sent out to contributors except by special arrangement at the Editor's discretion.

Good photographs enhance the value of most articles, and are almost essential for constructional designs. Any local studio photographer can usually produce prints satisfactory for block-making. The prints should be half-plate size, finished glossy black-and-white, with high-lights touched out or toned down.

In preparing accepted work for setting (that is, getting it through the first stage towards eventual publication), the Editor will usually at his discretion and on his own responsibility make certain alterations in the literary sense. These are mainly in connection with titling, sub-heads, captions and the like. But in general he aims to preserve the individuality and "flavour" of any contributor's work, and such alterations as may be made do not often affect the general structure of the article.

Careful attention to all the points mentioned above will not only help the Editor and so make your work all the more acceptable, but will also help you to prepare good work.

Payment

In the Amateur Radio field, The Short Wave Magazine, Ltd., pays at generous rates for contributed

material. These rates vary from two or three guineas to as much as £20-£25 for articles of exceptional merit or outstanding interest.

Length is not necessarily the deciding factor in fixing the rate for a contribution, and short articles frequently make more than much longer ones. In order of importance, the considerations are: Practical value, technical accuracy, lucidity, topical interest, and the status or qualifications of the author in the Amateur Radio field. Payment is made by crossed cheque immediately upon the publication of the issue in which the article appears.

In the nature of things, it may be some time before unsolicited work can be considered, or there may be reasons why an immediate decision has to be deferred.

But everything in hand is regularly brought forward for a final decision, and contributors having

work with us are particularly requested not to write in at frequent intervals to remind us that they await a decision. It is the Editor's own object to clear work as rapidly as possible.

Publication

Unless special arrangements are made with an individual contributor—usually, this applies only to material which has been commissioned—no guarantee can be given as to when accepted work will actually be published. But as such material is always held ready in print, we naturally endeavour to arrange the earliest possible publication.

There are many considerations—such as balance, length, topical interest and immediate suitability—which may either hasten or delay the appearance of accepted work. These are apart from questions of space, which may be the deciding factor.

CORONATION SAFARI

MEMBERS OF R.S.E.A. AGAIN
PROVIDE COMMUNICATION
FACILITIES FOR
INTERNATIONAL MOTORING
EVENT

D. T. Bradford (VQ4EV)

THE Coronation Safari is now becoming internationally recognised as one of the toughest road tests in the world for production motor cars. This annual event, run roughly on the same lines as the Monte Carlo Rally, involves controlled motoring over 3,200 miles of about the world's worst roads. Hazards like thick mud, dust, and rough surfaces are to be expected, while chances of collision with zebra and other wild game are added dangers—in fact, drivers reported encounters with lion, leopard, giraffe and elephant at various points on the road this year.

Because of the vast distances involved and the generally poor communications (only to be expected in a relatively under-developed area), radio plays an important part in enabling the officials to trace competitors' cars and check their times of arrival and departure along the route.

Again this year, the Radio Society of East Africa provided most of the radio hook-ups, using a network of amateur stations. The Postmaster-General gives special permission for amateurs to take part in this event each year, and out of the seven years that the Safari has now taken place, the R.S.E.A. has helped with six of them.

The Seventh Coronation Safari (1959) was held over the Easter Holiday, March 27-30. During this period 25 amateur stations were busy passing hundreds of messages concerning the times of passage of the seventy-odd competing cars, together with other traffic regarding the safety of crews when cars broke down or were involved in accidents. The Amateur Radio network was able to reassure the

wives and families of injured competitors and also to ensure that the injured received the quickest possible attention. Some of the amateurs were operating from their home stations, but the majority moved their equipment out to points on the route, in some cases as far as two hundred miles from their homes!

The Safari network was operated on 40 and 80 metres, linked back to two headquarters stations in the Nairobi district, working together on 144 mc. These bands were chosen not only because of their suitability but in order to cause as little inconvenience as possible to amateurs in other countries.

It is a credit to the capabilities of East African amateurs to note that of the 26 stations planned for the networks, only one failed to report on his net at the appointed time—this was because his car broke down in the wilds of Tanganyika and he was stranded without power to rescue himself! All the others reported in and stayed on the air until the last car passed.

Needless to say, in territories like East Africa, amateur stations are generally few and far between; this necessitated the pressing into service of every available operator and his equipment in order to give full coverage. Amateurs in other countries may, perhaps, have noticed the lack of activity from the VQ3, 4 and 5 areas over this period!

Although the amateur network passed some 80% of the Safari traffic, it is fair to say that information was also fed into the network from Police, Prisons and Territorial Army systems laid on for the occasion. This represents an unusual example of successful co-operation between amateur and civil communications services, of which the East African amateurs can be duly proud. It is hoped that the results of this exercise will go a long way towards obtaining official recognition of the potentialities of Amateur Radio, for emergency use, in East Africa.

And, incidentally, this is believed to be the most extensive use ever made of any form of radio communication for any motoring event in the world, local or international.

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.

GW2HFR, A. Ellis, Rhydwenfa, Portmadoc, Caerns.

G3CXX, Students' Union Radio Society, Manchester College of Science and Technology, Sackville Street, Manchester, 1, Lancs. (*Re-issue.*)

G13JGZ, E. J. Wright, 3 Queen Street, Portadown, Co. Armagh. (*Re-issue.*)

G3JWN, F. D. Walker, 32 Highfield Road, Rastrick, Brighouse, Yorkshire.

G13MDQ, A. G. H. Heaney, 182 Kings Road, Knock, Belfast.

G3MWW/T, D. G. Blake, The Flat, 9 Mount Street, Cromer, Norfolk.

G3NAA, R. C. Polley, 25 Tower Avenue, Chelmsford, Essex.

G13NEB, J. E. Wilson, 47 Coolfin Street, Donegall Road, Belfast, N.I.

G3NFK, R. J. Keech (*ex-DL2UA*), 12 Keristal Avenue, Chester, Cheshire.

G3NGB, B. C. R. Hall, 3 James Street, Flowery Field, Hyde, Cheshire.

G3NGY, F. J. Young, 119 Stanford Road, Norbury, London, S.W.16. (*Tel.: POL 1640.*)

G3NHG, C. D. Gammon, 18 Hollies Road, Allestree, Derby.

G3NHM, R. S. W. Manns, 88 Bradford Street, Hamstead, Birmingham, 22A.

GM3NIF, R. Craig, 272 Bellrock Street, Glasgow, C.2.

GM3NIO, G. W. Douglas, 10 Burdiehouse Drive, Liberton, Edinburgh.

G3NIY, E. C. Emerson, 3 Church Walk, Winslow, Bucks.

G3NIZ, K. Lawless, 276 Vicarage Road, Longwood, Huddersfield, Yorkshire.

G3NJB, c/o Rev. A. W. Shepherd, G3NGF, 75 Park Road, Mansfield Woodhouse, Notts. (*Tel.: Mansfield 779.*)

G3NJC, W. C. Cox, 41 St. Annes Road, Belle Vue, Doncaster, Yorkshire. (*Tel.: Doncaster 49237.*)

G3NJD, J. T. Hepburn. *QSL to VE7KX (QTHR.)*

G3NJE, T. H. Hayhurst, 25 Ashburn Road, Heaton Norris, Stockport, Cheshire.

G3NJQ, J. D. Simpson, 50 Vicarage Road, Norwich, Norfolk.

GW3NJW, C. Whelan, 14 Llandinam Crescent, Gabaalfa, Cardiff, Glam.

CHANGE OF ADDRESS

G2ANB, R. Brand, 20 Cambays Road, Dagenham, Essex.

G2AUB, N. I. Neame, Niwicha, Manor Gardens, Hurstpierpoint, Sussex.

G2CIW, J. F. Moseley, 1 Kingsdown Road, Northfield, Birmingham, 31. (*Tel.: HARborne 2081.*)

G3BHK, L. R. Mitchell, Katoomba, Tyneham Close, Sandford, Wareham, Dorset.

G3BPQ, E. Smith, 42 Herries Street, Ashton - under - Lyne, Lancs.

G3EAT, W. H. Burden, 102 Westhill Road, Wyke Regis, Weymouth, Dorset.

GW3EQL, S. Haring, Uplands, Oak Lane, Chatham, Machen, nr. Newport, Mon.

G3GBS, M. L. Sandoz, 41 Elizabeth Road, Moseley, Birmingham. (*Tel.: South 2102.*)

G3HRN, D. L. Wright, Kershaw, Newport Road, Edgmond, nr. Newport, Shropshire.

G3IBB, R. Walmsley (*ex-ZBISS*), c/o Sgts.'s Mess, 1 T.R., Catterick, Yorkshire.

G3ILM, L. A. Mills, 25 Whitehall Close, Chigwell Row, Essex.

G3KIW, G. W. Jenner, 27 Lytlington Court, Lytlington Road, Hampstead Garden Suburb, London, N.2.

G3KMP, C. A. May, 7 Parkwood Road, Hastings, Sussex.

G3KWI, Dr. R. W. G. Stewart, M.B., Ch.B., Wharnccliffe, 113 Radbourne Street, Derby.

G3KZQ, G. Goddard, 12 Crook Street, Hyde, Cheshire.

G3KZX, L. J. Loveland, Flat 1, Newcastle Court, Newcastle Circus, The Park, Nottingham.

G3LJK, C. Kenny, 290 Chertsey Rise, Stevenage, Herts.

G3LOL, K. S. Livermore, 38 Alexandra Road, Cleethorpes, Lincs.

G3MCS, W. R. Hawthorne, 154 Botany Road, Margate, Kent.

G3NEA, L. J. Saunders, 32 West End, Westbury, Wilts.

G3NGD, J. T. Beaumont, 6 Grange Avenue, Stretford, Lancs.

G5XW, E. C. Taylor, 98 Farleigh Road, Warlingham, Surrey.

BACK NUMBERS AVAILABLE

For those who may need them, either for reference or to make up volumes, following are all copies that we have left: 1949, October; 1951, September, November, December; 1952, August-November; 1954, August - December; 1955, January - June; 1956, January-April, June-October, December; 1957, January, May-September; 1958, April-December; 1959, January, April. For most of these issues, only a few copies remain, price 2s. 6d. each post free. For the period from March, 1946, to September, 1949, and for 1950 and 1953, there are none at all.

WORD OF APPRECIATION

We quote as follows a recent letter from G8UA (Burnley): "I should like to send you a word of appreciation for the ARRL booklet *How to Become a Radio Amateur* at 5s., which I bought for a young friend of mine. I think that the note in your advertisement about it being not strictly applicable under U.K. conditions must put a lot of possible purchasers off (to their loss!) The constructional articles, especially of the TVI-proof CW rig and the VHF gear, are in themselves worth far more than the five shillings."

The Other Man's Station

G3LFL



THE operator of G3LFL—George Western, 118 Salisbury Avenue, Torquay, Devon—is one of our blind *confreres*, and is also a diabetic. Both afflictions have come upon him comparatively recently—having tried for the Army in 1940 he was refused because of being, at that time, in a reserved occupation, so in 1942 he applied for the Royal Navy, only to be given the news that he was a diabetic and so could not be accepted. Then, in 1951, following a serious illness, he lost the sight of both eyes.

It was while at Torbay Hospital for the eye operations that his interest in Amateur Radio was aroused by another patient—John Cunningham. G3HPE. With the assistance of the locals and especially his wife, who read to him from the books, George learnt the technicalities off by heart. It was sheer, hard slogging for them both, but once again the spirit triumphed, and in September 1956, G3LFL was licensed—even the callsign itself was an ironic touch, as while learning Morse it was always those two letters F and L that caused him most difficulty!

Now, 2½ years later, G3LFL not only runs a 100-watt all-band station, but is also honorary

secretary of the Torbay Amateur Radio Society, devoting himself in particular to the interests of the younger members. His wife Gladys is taking the R.A.E. herself this time—and as May 15 sees them celebrating 25 years of happy married life, all who read this will wish her success in the Examination, which should make Mrs. Gladys Western (seen logging for G3LFL in our photograph) the first YL operator in Devon, if not in the West Country. At all events, she would be able to tell you that their transmitter for the HF bands runs a pair of 807's in the PA, with a VFO-exciter unit using 5763's and Labgear wide-band couplers, the receiver being a BC-342, and the aerials an end-fed wire and a "ZL Special," with a separate transmitter for 160 metres.

The G3LFL's have two young sons and a married daughter and, as a devoted family, they have had to overcome much adversity. For G3LFL himself, suddenly cut off as he was from the world he knew and the occupation for which he had been trained, Amateur Radio has, as he puts it, "opened up a new and absorbing life which is full of interest." And long may that be so, for them both.

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THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for June Issue : MAY 15)

ALTHOUGH Clubs no longer seem to expire in the summer—there was once a time when reports fell right off at this time of the year—many of them seem to be at a loss for organised activities which will attract good attendances.

It is surprising that more use is not made of small-scale mobile operations. We have yet to hear of an inter-Club mobile contest, or even of such an event as a meeting between two Clubs on neutral ground, coinciding with a mobile event. Now is the visiting season—and there are interesting places to visit if one thinks, for instance, of BBC, ITA and GPO stations within reach and, in coastal districts, of ports with their own radio installations. A tactful letter to the local superintending engineer will usually start the ball rolling.

Worthing, with their annual "Bucket and Spade" party, have made quite a reputation for themselves; surely other Clubs in coastal resorts could stage something similar. Hastings are fortunate in that the annual Hobbies Exhibition is always held in July, and "G-Six Happy Hastings" has become quite a well-known call on the bands at that time of year.

Ideas from Club Secretaries—for use in their own Clubs—will always be welcome in this feature, and we will, of course, give full publicity to any "open" events that they may stage.

Barnet meet on May 26 for a talk by G2AHL on Mobile Operation. Their June meeting (on the 30th) is devoted to the problem of Interference Suppression, with a lecture on the subject from a member of the GPO Engineering Department. The venue is the Red Lion Hotel, High Barnet.

Bradford will be visiting Emley Moor ITA Station on May 26; at their normal meeting on June 9 Mr. G. F. Craven will be talking on Oscilloscope Design and Construction.

Clifton heard G3ISX on Aerials and the Amateur, with a demonstration on scaled-down models, on April 3. North-West Kent members were welcome visitors to this talk. On April 17 a contingent from Mitcham attended to hear a lecture on D-F Contest Operating. May 8 is fixed for a lecture by G4ZU on Practical Transistor Circuits, and May 29 for a Junk Sale. The first D-F Contest will be on May 17. All meetings, as usual, at 225 New Cross Road, S.E.

Cornish recently held their AGM, at which new officers were elected (*see* panel for secretary's QTH). A successful year's work was reported, the membership showing a slight increase on balance, although several members had left.

Coventry will be hearing a taped lecture on

Amateur Radio in Tibet, by AC4RF, on May 11; there will be no meeting on the 18th, but on the 25th G5PP will talk about Mobile Working.

Flintshire will meet to discuss field days on May 18, and on June 1 will be holding an Open Meeting. **Halifax** will be devoting their May 19 meeting to a Ragchew, and the June event is to be a recorded lecture on Aerials.

Liverpool were very sorry to learn of the retirement of their president, formerly G6KS—an Old Timer who has now given up Amateur Radio. Their new president is G3ELL. This year the Club will be taking part in the Liverpool Show (July 16-18), from which they will be on the air.

Lothians meet on May 14 to hear GM3DDE on VHF Working; on May 28 the meeting will deal with field day arrangements. **Mitcham** report great difficulty in finding lecturers, and can no longer mention definite fixtures in advance, but their May meetings will be devoted mainly to receiving topics—every Friday at The Cannons, Madeira Road (for the benefit of younger visitors we are asked to state that this is *not* a "pub"!). **North Kent** (from whom we acknowledge their interesting *News Letter*) will be holding their AGM on May 28 (this date has been changed to avoid holding it on the eve of the R.A.E.). **Purley** likewise have an AGM in the offing—on May 15. They also propose to organise a Club Outing to the coast by coach, some time before the end of July.

Reading (note new secretary's QTH in panel) continue to meet at the Palmer Hall, West Street, on the last Saturday of the month. On May 30 G3GKH will be discussing gear for Two Metres and down, and at a later meeting G5TP will talk about Top Band Mobiles. **Romford** will have a Mobile Evening on May 12, a lecturette by G3FKJ on the 19th, and an "Open Forum" on the 26th. June 2 is booked for a Junk Sale.

Shefford gather every Friday evening (7.45 p.m.) at Digswell House, and meetings begin after a brief Morse session. Refreshments are available, and new members and visitors always welcome. **Spenn Valley**

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.



Group taken at the Hong Kong Amateur Radio Transmitting Society annual meeting recently, in which we see, left to right, top row : SWL Harvey, CR9AI, VS6CI, SWL McNeill, VS6CL, VS6AE, VS6AH, VS6DS, CR9AH, VS6DJ, SWL's Lee, Wakeford. Front row, left to right : SWL Barry, ex-CIC, VS6EA, VS1BB, SWL Drakeford, VS6DU, VS6DK, VS6DO, CR9AK and VS6BJ. On this occasion, nine XYL's were also present. The honorary secretary and local organiser of H.A.R.T.S., which is a strong and active group, is VS6DS.

will be visiting Holme Moss BBC Transmitting Station on May 13, and on the 27th they will hear a talk on Radio Control of Model Boats, by Mr. V. W. Whitehead. A demonstration of a radio-controlled boat follows, in Batley Park on June 10.

Torbay installed and operated a station from the Newton Abbot Rotary Hobbies Exhibition during April. The Club call G3NJA was used for the first time, over 130 stations being worked on Forty and Twenty with about 80 watts—operators were G3ABU, G3LFL, G3LHJ and G3GDW. This exhibition was visited by 1,400 people, most of whom were at one time or another congregated round the Club's stand!

Wanstead, Woodford and District are very keen on attracting new members, who will always be welcome on Wednesday evenings, 8 p.m., at Wanstead House, The Green, London, E.11. **West Lancs** recently held their AGM and elected G3GST chairman, G3FZG secretary and G3IZT treasurer. They run Morse and Theory classes on alternate Thursdays, and normal Club meetings every Tuesday at 8.30 p.m. May 12 is an Open Night, May 19 a Junk Sale, May 26 a TVI Discussion and June 2 is booked for a lecture on Filters and Attenuators by G3BBI.

Bournemouth have switched their meeting night from Fridays to the first and third Tuesdays. They will once more be organising a Mobile Rally (in conjunction with Ringwood), with a provisional date of June 28. Help and suggestions will be welcome. Next meeting after publication—May 19, 7.45 p.m., at the Cricketers' Arms, Windham Road.

Bury will meet on May 12 (George Hotel, Kay Gardens) for a talk by G3KMM. On June 9 there will be a Junk Sale.

Enfield send us their *Lea Valley Reflector*, just starting on Volume XI. At their last meeting G3AAE was telling them all about DX Contests, Certificates and Awards.

Hull will be discussing outdoor activities on May 12, and G3LNH will talk on kite and balloon aerials. On May 26 the subject is Improving Govt. Surplus Receivers (G3EFR). Clubroom facilities are being developed, an aerial has been erected, and it is hoped that the Club Tx, G3AMW, will soon be on the air.

Liverpool (note change of secretary) have a talk on TVI by G3LIS on May 12; on the 19th the subject will be Relays, and on the 26th Aerials (G3EWZ). Meetings every Tuesday at Gladstone Mission Hall, Queens Drive, Childwall.

Medway meet on alternate Mondays, with increased membership and well-attended meetings. A



Station G3HSE/A was established at GPO Hq., King Edward Building, London, E.C.1 during March 10-12, on the occasion of the annual arts and hobbies exhibition held in conjunction with the Post Office Youth Association. The transmitter was a Vanguard and the receiver a Geloso G.209, both provided by K.W. Electronics, Ltd., operators being G6HC (left) and G3HSE (centre). On the wall is a framed and mounted copy of our DX Zone Map, and the panel on the right of the selection of QSL cards shows framed copies of some of our DX awards and operating certificates. The exhibition was a great success, and considerable interest was shown in the Amateur Radio display during the three days it was on.

feature of their activities is the Kent-Essex Top Band net on the first Sunday of the month, 1830 BST. More than 30 stations sometimes take part! In a recent Club contest, Mr. L. Howard won the Moffat Trophy for receiving, and G2CBA the Observer Trophy for transmitting.

Nottingham recently held their AGM and elected G3MP chairman, Mr. E. C. Weatherall secretary and G3LNR treasurer. They give slow Morse practice every Tuesday, with "advanced" classes on Thursdays; R.A.E. classes on alternate Tuesdays, under G3LXL, and on the remaining Tuesdays, discussion groups under G3MP. A constructional programme is also under way. Two Club transmitters cover all bands from Ten to One-Sixty. On May 19 G6CW will be talking on SSB and showing some of his latest equipment. Membership here is now 49.

Worthing announce their Annual Bucket and Spade Party, which has practically become a Mobile Rally these days, for June 28 on the raised promenade, Beach House Park, Worthing. Mobiles will be talked in by G3GVM/A. All welcome . . . prize draw and so on . . . amusement park for the children . . . everything laid on!

Aberdeen have a talk and demonstration on Two-metre Converter Construction on May 15; on the 22nd the theme is Transition to Transistors; and on the 29th and June 5 the main subject will be field day matters. June 12 is booked for a Junk Sale. All meetings 7.30 p.m. at 6 Blenheim Road, Aberdeen.

British Timken have a Film Show on May 19, and a visit to the Northampton power station on June 16. Other planned visits are to the local brewery and the Head Post Office. The Club Tx, G3NIB, is active on 160, 80 and 40 metres on Tuesdays and Thursdays. and Morse classes have been started.

Cambridge will meet on May 29 (The Jolly Waterman, Chesterton Road) for a talk on RAEN, followed by a discussion. **Pontypool**, a newcomer to our columns, meets every Tuesday, 7 p.m., at the Educational Settlement, with the third Tuesday as a "special night." On May 19 there will be a "Valve Testing Night"; recent meetings have included a demonstration of stereo and the showing of the Mullard film "Mirror in the Sky."

Slade will be hearing about Receivers and Electronic Test Equipment on May 22; on June 5 G3DO will be talking about Contests and DX Working. The Slade Harcourt Trophy DX Test takes place on May 31.

Southgate meet on May 14 (Arnos School, Wilmer Way, N.14) for a talk by G6LL on TVI-proofing. At their last meeting Mr. R. T. Lovelock spoke on Stabilised VFO's to a large gathering.

STC (Harlow), though reporting in here for the first time, has been running for two years and has a membership of 20. Meetings are held every Wednesday, 6 p.m., with special lectures once a month on Mondays at 8 p.m. The next is on May 25, and the subject is Relays. The Club Tx is G3NIS, now operating on Top Band.

Stoke-on-Trent elected G3COY as secretary at their AGM, and he informs us that they are very busy, meeting every Monday and Thursday at the Cottage Inn, London Road, Oakhill. Mondays are

set aside for constructional work; a course of lectures starts on May 14 and continues on Thursdays. At week-ends some major constructional work (involving large blocks of Derbyshire stone!) is being put into the country shack at Hulme, where the Club Tx will be housed.

Stockport also held an AGM—secretary unchanged. On May 20 they meet for a Ragchew and field day discussion, and on June 3 for a talk on Radio Links. They recently operated GB3SRS at a local exhibition, and G3LEE/T demonstrated closed-circuit TV with home-built gear.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

ABERDEEN: W. K. Heggie, GM3NHW, 80 Leslie Terrace, Aberdeen.
 BAILLEUL: G. Sceney, G3HDD, B.R.S., Bailleul Camp, Aborfield, Berks.
 BARNET: E. W. Brett, G3LUY, 28 Edward House, Edward Grove, New Barnet.
 BOURNEMOUTH: F. G. Hamshere, 55 Maclean Road, West Howe, Bournemouth.
 BRADFORD: D. M. Pratt, G3KEP, Glenluce, Lyndale Road, Eldwick, Bingley.
 BRIGHTON: E. M. Large, School House, Frant Road, Hove 4.
 BRITISH TIMKEN: D. G. Chatfield, G3JXU, 55 Bush Hill, Weston Favell, Northampton.
 BURY: Mrs. Jean Hodgkins, G3JZP, 24 Beryl Avenue, Tottington, Bury.
 CAMBRIDGE: A. H. G. Waton, G3GGJ, New Road, Barton, Cambridge.
 CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
 CORNISH: G. W. Hubber, 9 Cardrew Terrace, Redruth.
 COVENTRY: A. Noakes, G2FTK, 4 Baron's Field Road, Coventry.
 ENFIELD: V. Croucher, G3AFY, 15 Nelson Road, London, N.15.
 FLINTSHIRE: J. Thornton Lawrence, GW3JGA, 9 East Avenue, Bryn Newydd, Prestatyn.
 GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
 HALIFAX: A. Robinson, G3MDW, 7 Upper Brockholes, Ogdon, Halifax.
 HULL: G. G. Wray, G3MVO, 93 Wolfreton Lane, Willeby, East Yorks.
 LIVERPOOL: H. James, G3MCN, 448 East Prescott Road, Liverpool 14.
 LOTHIANS: L. Lumsden, 33 Hillview Drive, Edinburgh 12.
 MIDWAY: G. A. Gascoigne, G3LCC, 78 Valley View Road, Rochester.
 MITCHAM: D. Johnston, G3NFA, 23 Woodland Way, Mitcham.
 NORTH KENT: D. W. Wooderson, G3HXK, 39 Woolwich Road, Bexleyheath.
 NOTTINGHAM: E. C. Weatherall, 16 Avebury Close, Clifton, Nottingham.
 PONTYPOOL: J. S. Hammond, GW3JBH, P.A.R.C., Educational Settlement, Pontypool, Mon.
 PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
 READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
 REIGATE: F. D. Thom, 12 Willow Road, Redhill.
 ROMFORD: L. S. Owen, G3MDP, 53 Applegarth Drive, Newbury Park, Ilford.
 SHEFFORD: G. R. Cobb, G3IXG, 7 Hitchin Road, Shefford, Beds.
 SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
 SOUTHGATE: A. G. Edwards, G3MBL, 244 Ballards Lane, London, N.12.
 SOUTH SHIELDS: K. Sketheway, 51 Baret Road, Walkergate, Newcastle-on-Tyne 6.
 SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
 STC (HARLOW): C. Waterman, STC (Harlow) Radio Club, Rectifier Division, Edinburgh Way, Harlow.
 STOCKPORT: G. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
 STOKE ON TRENT: V. J. Reynolds, G3COY, 90 Princes Road, Hartshill, Stoke-on-Trent.
 SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
 TORBAY: G. Western, G3LFL, 118 Salsbury Avenue, Barton, Torquay.
 WANSTEAD: K. Smith, G3JIX, 82 Granville Road, London, E.17.
 WEST LANCS: A. Treanor, G3FZG, 13 St. Johns Road, Waterloo, Liverpool 22.
 WORTHING: J. R. Tootill, 113 Kings Road, Lancing.

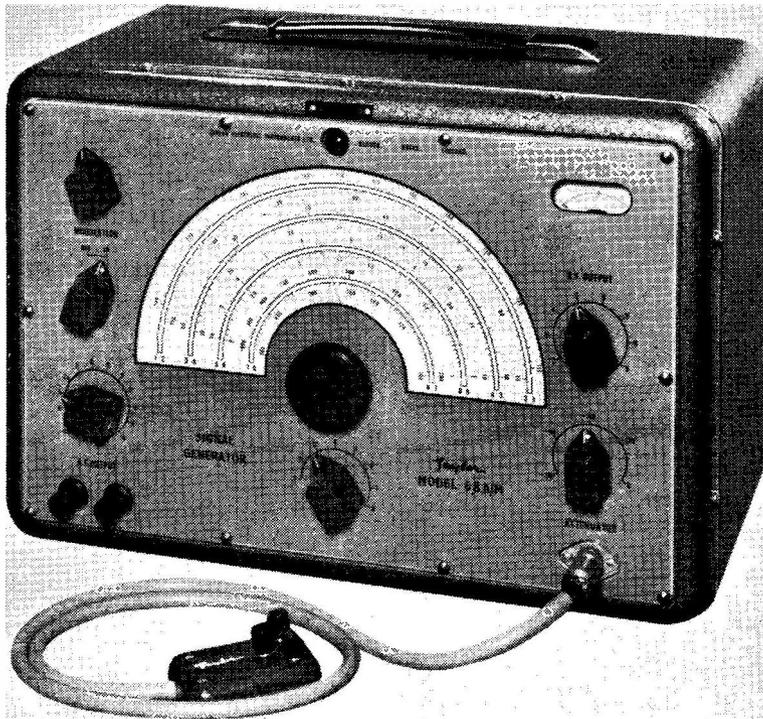
Bailleul have rebuilt their main Tx, G3IHH, and now work the DX bands with 150 watts of CW and AM. A 40-ft. lattice tower is being built, and a three-band Cubical Quad will be installed. **Brighton** will be holding a Juniors' Evening on May 13; on May 20 G3YY will talk about the Short-Wave Bands and What Can be Heard; May 27 is booked for a Film Show, and on June 3 field day arrangements will be finalised.

Grafton are preparing for their own annual Field Day, to be held on Hampstead Heath on June 13/14, with G3AFT/A on the DX bands and G2CJN/A on 7, 3.5 and 1.8 mc. Contacts and visitors will both be welcome.

Reigate is a newly-formed Club with G3JDN as chairman and Mr. F. D. Thom secretary. They will be demonstrating Amateur Radio at the Reigate Grammar School Fair on May 30, active on all bands from One-Sixty to Two as G3JDN/A, and possibly another call.

South Shields recently had a demonstration and lecture on Tape Recording, and on May 27, at Trinity House Social Centre, Laygate, there will be a demonstration of radio-controlled models. The new chairman, elected at the March meeting, is G3LKZ.

Surrey re-elected G8TB as chairman and G3FWR as secretary at their April AGM. Next meeting is on May 12—Blacksmiths Arms, South End, Croydon.



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A.C. to 3000v., 500 mA D.C., in cubicle £25 (cost). **RACK MOUNTING FOLDING TABLES**, 12" grey and chrome, standard 19" wide, 15/- (5/-). **ARMOUR RECORDING WIRE**, new spools in sealed boxes, 1/4 hour music, 10/- (2/6). **T.B.S. TRANSMITTERS** 60/80 mc/s, new, less valves and xtal, £4/10/- (30/-). **T.B.S. RECORDER ABOVE**. Containing two L.T. chokes, one 2 1/2 in. M.C. D.C. 0-50 voltmeter and 6-way terminal block built in metal case. Size 17 x 7 x 6 1/2 in., 35/-. **PORTABLE SUPPLY UNIT TYPE**. To operate from A.C. 100-250v. or 12 volt accumulator. Output 250v. 25 m/a, 125v. stabilised and 12v. heater supply. An ideal power pack for oscillators or small transmitter. Built in bakelite case with spare radiating valve, leads and circuit, 47/6. Carr. 5/-. Brand new. **A.M.L.T. SUPPLY UNIT TYPE 115**. A.C. input 200-250v. D.C. output 24v. 26a. Rating continuous. Ideal for charging 24v. batteries at a high current. Size 1ft. 8in. x 1ft. 7in. x 1ft. 5in. £15 ex warehouse. **TELEPHONE CABLE**, Single D3, 1/3rd mile drums, 19/6. Carr. 4/6. Commando telephone cable, PVC, 1,000-yard drums. Ideal field telephone cable and very useful in the home and garden. Cheaper than string, 8/11. P.P. 3/6. Five drums in maker's carton, 42/6. Carr. 7/6. **HEAVY DUTY L.T. TRANSFORMERS**. Brand new STC Pri. 200-260v. Sec. 26-41 volts in one volt steps 15 amp., tropically rated and one HT winding tapped 120-136-152-168 volts 700 m/a., £4/5/-, Carr. 7/6. Pri. 220-240 volts. Sec. tapped, 42v., 45v., 50 amps., tropically rated, £9/15/-, Carr. 10/-. R.C.A. Pri. 115-230v. Sec. 5v. 13 amps., tropically rated, insulated for 15 kv., Brand new, 37/6. Carr. 7/6. Pri. 230v. Sec. tapped 4v., 6v., 11v., 200 amps., £8/10/-, Carr. 7/6. Pri. 200-250v. Sec. 50v. 30 amps., £6/10/-, Carr. 10/-. Pri. 200-250v. Sec. 50v. 20 amps., £4/10/-, Carr. 7/6. Pri. 200-250v. Sec. tapped 28, 29, 30, 31 volts 21 amps., £4/10/-, Carr. 7/6. Pri. 100-260v. Sec. two separate windings tapped 15, 16, 17v. 4 amps., tropically rated, 35/-, Carr. 4/-. Pri. 200-250v. Sec. two separate windings 50v. 2 amps., 6v. 2 amps., 27/6. Carr. 3/6. Pri. 200-250v. Sec. 45v. 2amps., 17/6. Carr. 3/6. Pri. 200-250v. Sec. 6v. 8.5 amps., tropically rated, 17/6. P.P. 3/-. Pri. 200-250v. Sec. 6.3v. 15 amps., 25/-, P.P. 25/-. **SPECIAL OFFER OF BA SCREWS, STEEL, 4 BA 1/2 in. C.S., 15 gross, 27/6. P.P. 3/-, Or 2/6 per gross. Post free. 4 BA 1/2 in. steel C.S., 20 gross cartons, 32/6. P.P. 3/-, Or 2/6 per gross. Post free. 2 BA brass lin. C.S., 5 gross cartons, 15/-, P.P. 2/-, 4 BA steel R.H., 1 1/2 in., 5 gross cartons, 15/-, P.P. 2/-, **NUTS, BOLTS, WASHERS**. Special bargain offer, 5/- carton of 2, 4, 6 nuts, bolts and washers. **USA FILAMENT TRANSFORMERS**. Pri. 115-230v. Sec. 5 volts 13 amps., tropically rated. Insulated for 15 Kv. working voltage. Brand new, 37/6. Carr. 5/-. **VOLTAGE REGULATORS**. Liltup Minor Mk. II, load 310/3 amps., 11 volts. Supplied voltage, 19/25v. Supplied brand new, 12/6. P.P. 3/6. U.S.A. 813 **CERAMIC BASES**. Post free, 3/6. **AMERICAN THERMOSTATS**. By Fenwal. Inc. Set at 50 deg. F. Switch contacts 230v. A.C. 12.5 amps. Length 4ins. dia. 1/2 in., 17/6. P.P. 1/6. Set at 110 or 120 deg. F. switch contacts 230v. A.C. 5 amps. Length 4ins., dia. 1/2 in., 17/6. P.P. 1/6. **RF UNITS No. 25B**. Complete with valves, supplied brand new, 12/6. Carr. 3/6.**

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SMALL ADVERTISEMENTS. READERS—continued

INSTRUCTION BOOKS, originals for WS12, 18 and 68, 22, R107, remote control unit CMK2. Packard Bell K-1, tech. manual WS62.—Chipperfield, 184 Kingsway, Gatley, Cheshire.

WANTED: Eddystone Communication Receiver in good condition. Please state price.—Russell Smith, 15 Queen's Road, Reading, Berks.

FOR SALE: Brand new QQVO6-40, 50/- each. £829B, 30/-; 832, 20/-; K.W. "Vanguard" Tx, 10m.-80m., £45.—GW3ITD, Rhoslynw, Llanbyther, Carmar.

SALE: Self-contained, fully metered QRO relay-controlled Tx, Gelooso 4/102, parallel 807's PA, two internal power supplies, £18 (o.n.o.?) Also power supply, 850, 750, 650 volts DC at 500 mA, £5 (o.n.o.?) All enquiries answered.—G3MBN, 4 Yew Terrace, Claverton Down, Bath, Somerset.

ONE UNUSED SET G3ATL Mobile Whip components, with coil spring base, 50/-; 144 mc PA, p/p 24G's, with spare valves, fully metered, 60/- UM3, 80/- Gelooso VFO 4/101, re-valved 6C4, 6AU6 and 6BW6, with 3ATL 160-metre conversion components, no dial, 80/-. All carriage extra.—Thurlow, G3WW, Wimbington, Cambs.

S750 with speaker and S-meter, £40. AR88LF, £35. Two 6v. HRO vibrator packs, £1 each; 6v. Dynamotor, 10/-; 6v. 75 AH battery, 30/-; transformer D/W ratio 2-1, 3 kW, £5. S.750 mains transformer, unused, £1. Selsyn Beam Rotator Set, half-horse-power, 230v. master and slave, £6.—Earl, 26 New Street, Daventry, Northants.

STABILISED PSU 115v. input, outputs 500v. 300 mA or 300v. 240 mA stabilised; 255v. neg. stabilised, 6.3v. 15A, 6.3v. 3A, 6.3v. 1A, containing: four 2A3's, three 5R4GY's, two VR150's, VR105, 6AC7 valves, 19 in. rack mounting, Canadian make, £4 10s. 0d., or £3 5s. 0d. less valves. 1F amplifier, 30 mc, containing 7 tuned circuits, ten 6AC7's, four 6AG7's, three 6H6's, VR150, 1 mA meter, £2 10s. 0d., p x p, 7/6.—J. H. Sutton, The Patch, Salthouse, Nr. Holt, Norfolk.

SALE OR EXCHANGE HRO, AR88 (735 kc) SCR100, 358X, 3-5, 7 mc band crystals. **WANT:** BC-221 Crystal, mumetal transformer cores, 3 cm. gear, impedance bridge, Type 2, any condition; s.a.e.—Branson, 2 Park Avenue, Burnley, Lancs.

SALE 2m. Commercial Tx by Plessey, 6 switched xtal channels, 5763-5763-5763-829-829, 12AU7 clamp, blower motor, diode monitor, aerial filter; modulator, Type BC-640 PN. 10B, two 811's; power supply, Type BC-640 PN.12A. All units complete in 3ft. grey cabinet. Not tested as complete Tx. £25. Buyer collects. — G3KSW. (Tel.: Waltham Cross 3452.)

TOP BAND TABLE TOPPER, Rx/Tx combined, Rx-Net-Tx switch, 10w., uses miniature valves X78, EF92, EF91, miniature 807; ideal home rig and /A, FB, spare valves; £20.—Box No. 2124, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: One MCR1 receiver and p/pack, with all four coils, in perfect working order, £6.—Jones, Cross Keys, Selattyn, Nr. Oswestry, Shropshire.

HALLICRAFTERS Panoramic Adaptor SP-44, manual, nice condition, £25.—Surman, Lyncote, Coltsfoot Drive, Guildford, Surrey. (Tel.: Guildford 3628.)

SMALL ADVERTISEMENTS, READERS—continued

BC 453, unmodified, 45/-; Collins TA12, £3, plus carriage. Pair 815's, new, 15/-. WANTED: Eddystone S-meter, American bug key. — Box No. 2125, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

DL 2MU CR-100 for sale, FB condition electrically and physically; S-meter and limiter fitted; bargain, £15.—M.Tech. Winchcombe, R.A.F. Northhorn, B.F.P.O. 17.

TU 5B VFO, 7 and 3.5 mc output, 50/-. GPO stand-type carbon mike, 8/6; 34 feet 80-ohm coax, 1/2 in. diameter, 12/6. 1946 *Radio Handbook*, 10/-. Heavy-duty 20 Hy. 150 mA choke, 10/-. heater transformer, 6.3v. 8 amps., 9/-. WANTED: TU Unit (stripped) "Vanguard" front panel. Postage extra.—Bailey, 13 Heywood Road, Alderley Edge, Cheshire.

SURPLUS GEAR: AR88D (S-meter), £50; Pandaptor (home-built) for IF 460 kc or near, £6; ZC1 Mk. I, £5; SCR-522 for 2 metres, £4; two-metre converter, xtal control, £2 10s. 0d.; ASB 8 UHF Rx, £4; Grundig TK5, £35; Cossor Double Beam 'Scope, £12; TS69A UHF Freq. Meter (340-900 mc), £4 — and a host of other stuff. Buyer collects; s.a.e. for details.—G3DJQ, Bonehill Lodge, Tamworth, Staffs.

4 NEW GUARANTEED HV rectifiers, 2000v. 500 mA, hrs. 10v. 5a., with sockets, 45/- each. Two HT transformers, 450v. CT, 400 mA, 45/- each. Two Chokes, 400 mA, 35/- each. Various meters, etc.; s.a.e. list.—Box No. 2117, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: HRO Senior receiver, complete with all coils, 50 kc to 30 mc, power pack, S-meter, crystal phasing, manual, perfect condition, price £21, carriage paid.—Box No. 2118, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Panda PR120V, 150w. Phone/CW Table Top transmitter, unmarked and perfect in every way, £60.—G3AMH, 1 Darley Cliffe Cottages, Worsborough Dale, Barnsley, Yorks.

URGENTLY REQUIRED: Plug-in coil set for BC453, 190-550 kc, please someone.—G3JIB, 6 Erith Road, Oldham, Lancs.

FOR SALE: AR88 receiver in very good condition, very little used; about £60; buyer collects.—P. Klein, 6 Briardale Gardens, Hampstead, London, N.W.3.

ZCI MOBILE EQUIPMENT, special whip aerial, tuner unit, loading coil, capacity hat, accessories and spares. Works fine; £12.—G5JU, 333 Rednal Road, Birmingham, 31.

LG 300 Tx with modulator/power unit, complete 150-watt Tx, unpacked but unused. Owner must sell due to posting abroad. Original cost, £137. Delivery 100 miles Brighton; £100 (o.n.o.).—G3LPZ, The Old Granary, Kingston, Lewes, Sussex.

BC 221 modulator-type, new, unused, with spare set valves and handbook. No reasonable offer refused.—G2DPY, 160 Old Shoreham Road, Shoreham-by-Sea, Sussex.

TX, 150 watts., 813 PA, TZ40 Mod., bandswitched 80-10 metres, completely enclosed. Offers?—L. Evatt, 13 Lonsdale Road, Radford, Nottingham.

19 SET Mk. II, VHF i/c sections stripped, as new, plus power unit, £3 10s. 0d., plus carriage.—Gurney, 78 Bloomfield Avenue, Bath.

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 - EDDYSTONE 358X**, with "S" meter, noise limiter, nine coils, power unit for 230 A.C. ... (P/P £1) **15 0 0**
 - HALLICRAFTERS SX24**, 230 A.C. input (P/P £1) **15 0 0**
 - HALLICRAFTERS TRC1**, FM double superhets for 70-100 Mc/s. Crystal controlled but can be manually tuned, built-in speaker "S" meter. 115 A.C. input, 17 valve, 11" x 7" x 16" ... (P/P 10/-) **12 10 0**
 - SX28**, 540 Kc/s.-43 Mc/s., 230 A.C. input (P/P £1) **37 10 0**
 - Ex-U.S. ARMY RECEIVER**, eight bands, 18 Mc/s.-200 Kc/s., 230 A.C. power unit ... **8 0 0**
 - EF91**, miniature RF pentodes new and boxed ... each **5 0**
 - E205/b/7**, new boxed tubes identical to VCRI39a (P/P 1/-) **15 0**
 - AR88D**, .54-32 Mc/s., 115-240, A.C. input (P/P £1) **55 0 0**
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SMALL ADVERTISEMENTS, READERS—*continued*

SALE: ARRL *Handbook* (1949), *Radio Handbooks* (Editors & Eng.), 11th & 12th Ed.; also Sams' *Communications Receivers Manual*.—Box No. 2119, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: R107 and RF24, £10—or part-exchange for HRO.—P. Ward, 270 Park Street, Luton, Beds.

SALE: FT241A 96th harmonic xtals 70.0-99.9 mc, in 100 kc steps, 2/6 each, except those doubling to Top Band, 4/- each. FT243 fundamentals, 7500-8750 kc, 2/- each. AR88D, immaculate, matching speaker, manual, spare valves, £45: "Elizabethan" *de luxe* tape recorder, xtal mike, two reels tape, £40 (o.n.o.). WANTED: Eddystone 888A, two TZ40s, 1500-0-1500v. at 200 mA, tapped at 1000-0-1000v., 250 mA, preferably potted; exchanges or cash.—Box No. 2120, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: 3E29, 829B with base and plate clips, £25/-; 6L6, 5/-; 6AG7, 6AC7, 12SH7, 12SG7, 12SJ7, 12SL7, 12AH7, 12A6, 6J5, 6SG7, 6SH7, EF91, 2/6; 12H6, 6H6, EF50, 1/6; 931A photocell and base, 25/-. Brand-new 52 or 75 ohm co-ax cable, 6d. per yd. Brand-new AR88D spares: complete set of IF transformers, BFO, 20/-; wavechange switch with shields, 7/6. 500 μ F transmitting variables, 2/6; postage extra.—E. K. Laskari, 79a Woodstock Avenue, London, N.W.11. (Tel.: SPE: 7536, after 7 p.m.).

PANDA TOWER with latest drive shaft assembly, indicators, motor and trans.; buyer collects; £25. RME 5-10 converter, with booklet, req. attention, £4; Roller coil dial, 7/6; HRO-60 manual, 15/-; NC300, 10/-, air tested; 813's, 35/- each. Send list valves.—G3HZ, 21 Bruntwood Avenue, Heald Green, Cheshire.

R1224A Superhet (160, 80, 40) with new acc. and PSU, £4 5s. 0d., plus carr.; FB condition. WANTED: Class-D Wavemeter (modified 230v. AC preferred); must be in mint condition.—G7487, 49 Larch Hill, Bradford, Yorkshire.

WANTED: American Bug Key, good condition.—Details: Wadsworth, 2 Edith Road, Prittlewell, Southend-on-Sea, Essex.

R107 and manual, excellent condition, little used, £8 10s. 0d.—Talboys, 23 Sandbourne Road, Alum Rock, Birmingham, 8.

SENSATION: Complete Station, £20. Transmitter, p/pack, BC-342, BC-221.—Loader, Buckley Barn Farm, Castleton, Rochdale, Lancs.

HRO-5T Senior, complete with all 9 coils for 50 kc to 30 mc, handbook, circuit, fitted National's stabilised osc., S-meter, as new internally and externally, £30. HRO-MX Senior, as above, with National 697 110/230v. AC Power Unit, £25. Sobell TE-123 Channel 1 Pattern Generator, 405 line waveform, with correct frame pulses; suit Amateur TV or service dept., £7 or offer? Hallicrafter S-27, complete but in "junk" condition, £5. R-1475 (Receiver, Type 88), first-class condition, £10. Cossor 'scope unit, Type 11, brand-new, complete with conversion data, half usual price (unwanted gift), £7 10s. 0d. HRO illuminated 1 mA S-meters, as new, 28/-; used but OK, 16/6. Set of HRO IFT's, with crystal filter, 45/-. WANTED: "Junk" AR-88 chassis for spares, etc.; good prices offered.—E. F. C. Owen, 33 Burleigh Road, Sutton, Surrey.

QUARTZ CRYSTALS, 1,000-4,000-6,000-10,000 kc, for freq. standards, 18s. 8037.5 kc, for two metres, 7018, 7060, 7082, 7139-8, 7168-5 kc, 15s.—Box No. 2126, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Genuine AR88 S-meter, brand-new, boxed, £3. S.27 Rx, FM/AM 27-143 mc, mint condition, £28. Manuals: BC-640 A/B, TA12G/H, Wavemeter Class-D, RA. 10DA/DB, WS. No. 12, 17/6 each. Eddystone 750, TA6A/B, 7/6 each. Crystal Multiplier M1-19468, Crystal Oscillator M1-19467A, 10/- each. Postage extra.—A. J. Reynolds, 149 Waller Road, New Cross, London, S.E.13. (Phone New Cross 1443 after 7 p.m.)

EDDYSTONE S-meter, 65/-; mounting blocks, 8/-.—R. Grain, 15 Waverley Gardens, Grays, Essex.

AR77E Communications Receiver, 0.54 mc to 31 mc, recent overhaul, £27 10s. 0d. (o.n.o.?)—Roberts, 244 City Way, Rochester, Kent. (Phone Chatham 43953.)

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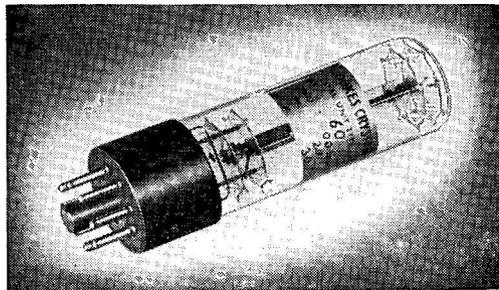
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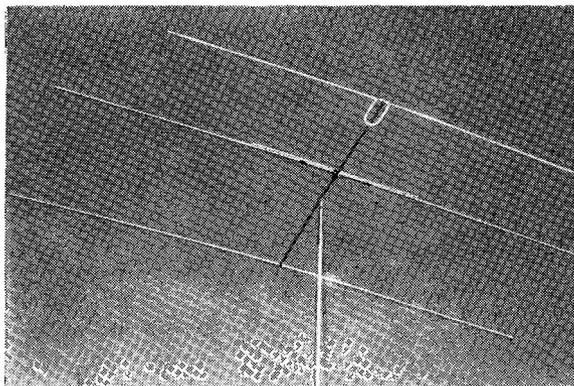
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