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VOL. XX JUNE, 1962 NUMBER 4

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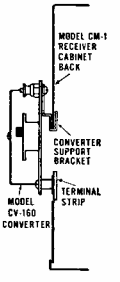

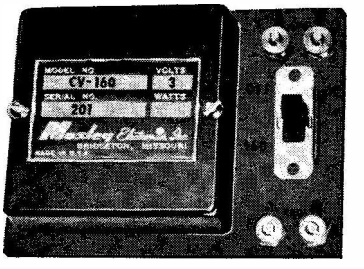

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Published on the first Friday of each month at 55 Victoria Street, London, S.W.1. *Telephone: Abbey 5341/2*

Annual Subscription: Home and Overseas 36s. ($5·25 U.S.) post paid

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

Construction

It is often said, in a loose sort of way in the Amateur Radio context, that " the art of home construction is dead." This is held to be because nowadays practically anything one needs for operating on the amateur bands can be bought over the counter, and usually on h.p. at that.

The contention that " nobody builds anything now " is, more often than not, maintained by some old timer, thinking back to the days when it was necessary not only to wind your own coils, but also to make your own tuning condensers, fixed and variable resistances and the parts for the power supply as well — the whole then being put together on a bread board either as an SEO transmitter, or as a receiver with the inevitable extension controls to contend with the instability. Whatever anyone may tell you, these productions were in general pretty rough jobs, judged even by the standards of the period, which were not very exacting. While nobody who knows anything about it would deny that home-construction at this level was interesting, exciting and sometimes surprising in the results, it was really quite easy for anyone able to use a few tools intelligently.

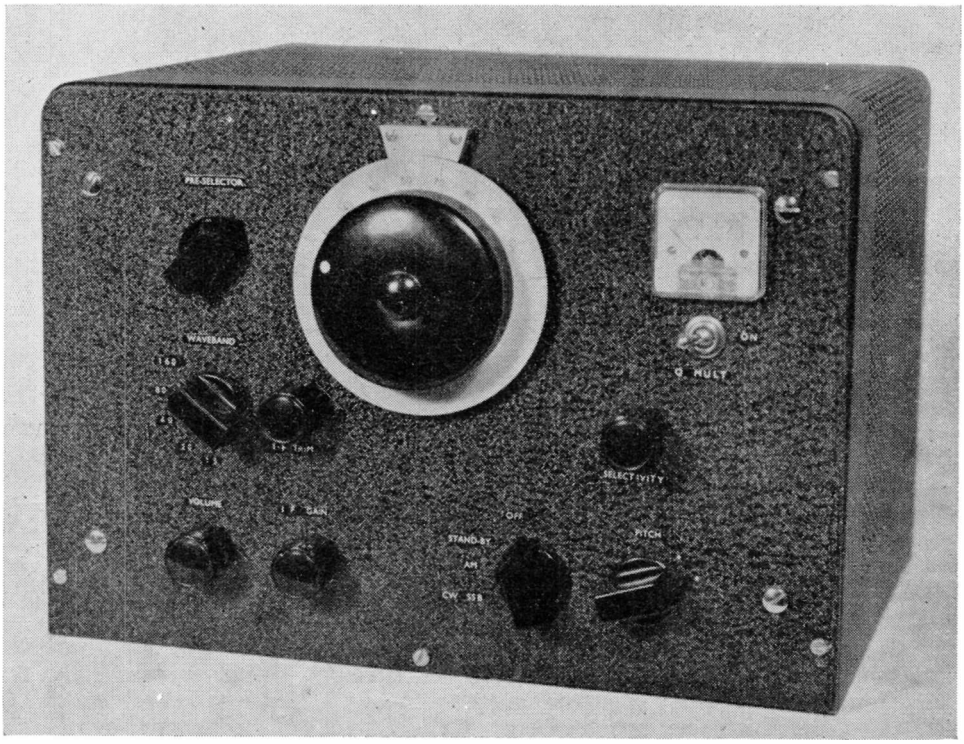
Nowadays, everything is infinitely more complicated — electrically, mechanically and in terms of the components ordinarily used. Home-construction in the sense meant by an old timer (who could tell you how he made his own tuning condensers from pieces of flattened out biscuit-tin) would today not only be an utter waste of time, but it would not even produce a usable component by present-day standards.

Is it, then, that AT station operators of today buy nothing but manufactured equipment? Not at all — nothing, in fact, could be further from the truth. While Amateur Radio is now large enough to support its own manufacturing section of the radio industry, a very great deal of excellent constructional work goes on. But it is in the context of the times — just as it was in the old days. With relatively limited resources, many of the amateurs of today are turning out fine examples of radio craftsmanship — transmitters, receivers, frequency meters, test equipment, VHF gear and complicated apparatus such as SSB exciters — which are beautifully built and work extremely well. Some are not so beautiful, but are just as effective.

In other words, the standard of Amateur Radio construction has kept pace with the times and is also far higher, mechanically and electrically, than anything attempted up to the late 1930's.

Martin Fobyl G6FO.

WORLD-WIDE COMMUNICATION



General appearance and front panel layout of the G3BDQ amateur-band receiver, which is a constructional design embodying modern circuitry and techniques. The block diagram at Fig. 1 shows the circuit sequence and by adopting unit construction a neat and space-saving layout is achieved.

Modern Receiver for the Amateur Bands

DESIGN FOR THE HOME CONSTRUCTOR, USING LATEST TECHNIQUES AND CIRCUITRY

Part I

J. D. HEYS (G3BDQ)

MANY amateurs, including the writer, have discovered that the older type of communications receiver is at best only just adequate for the reception of SSB signals. The stability and more especially the diode detectors of such receivers place their operators at a considerable disadvantage under present operating conditions. A number of AT station operators have given their receivers " face lifts " by building into them crystal lattice filters, stabilised power supplies, product detectors and new front ends. The results so obtained are often very satisfactory but usually the changes represent a compromise, and of course the re-sale value of such extensively modified receivers falls alarmingly. To obtain a really modern and effective receiver it is necessary to pay £100 and more, and few younger members of the amateur fraternity can afford such equipment.

A few years ago the writer designed and built a receiver for the HF bands which incorporated many sophisticated devices and circuits. It performed beautifully but was an enormous piece of machinery, with 18 valves and almost

Over the years, we have published a number of designs for amateur-band receivers, and modifications for existing commercial types, all of which were contemporary with the time. Here is the latest constructional design for a specialised receiver for the amateur bands, based on modern circuits and techniques, which will be within the scope of any amateur experienced in careful constructional work. Our contributor, well known for his articles on sound practical equipment, himself designs and builds all his own gear under strictly amateur-workshop conditions—that is to say, without many of the facilities often available to the "professional amateur." Hence, the receiver discussed here —which will be of great interest to many readers, whether or not they decide to build it for themselves—can be tackled with confidence in the final result being entirely satisfactory.
—Editor.

as many quartz crystals! Realising that the design and constructional techniques were probably beyond the scope of most amateur constructors no details were ever written up for publication, and attention was directed towards the development of a first-class but much simpler receiver. Ideas and suitable circuits were freely adapted from contemporary designs, such as the Drake-2B, and crystallised eventually into a 9-valve receiver, tuning five amateur bands, using easily obtainable components and not needing expensive or elaborate test gear to line it up.

Design Features

Essentially the receiver is a double superhet on the 3·5, 7, 14 and 21 mc bands, with a crystal-controlled first oscillator and a first IF tunable over 1495 kc—2005 kc. On Top Band it behaves as a normal single conversion superhet with an IF of 460 kc. A feature which may alarm some of the traditionalists in the fact that no RF amplifier stage is used. In VHF receivers the RF stage is fundamental to the satisfactory working of the equipment, but a close examination of the figures for mixer and aerial noise on the amateur HF bands up to 28 mc reveals that in terms of signal-to-noise ratios an RF stage is unnecessary through this frequency spectrum. The pundits may then say that an RF stage will give some measure of selectivity to the receiver. It will, but only in terms of tens or hundreds of kilocycles depending upon the frequency, which can be achieved by other means ahead of the mixer. Many communications receivers suffer from severe cross-modulation effects when extra strong signals are encountered, and even the

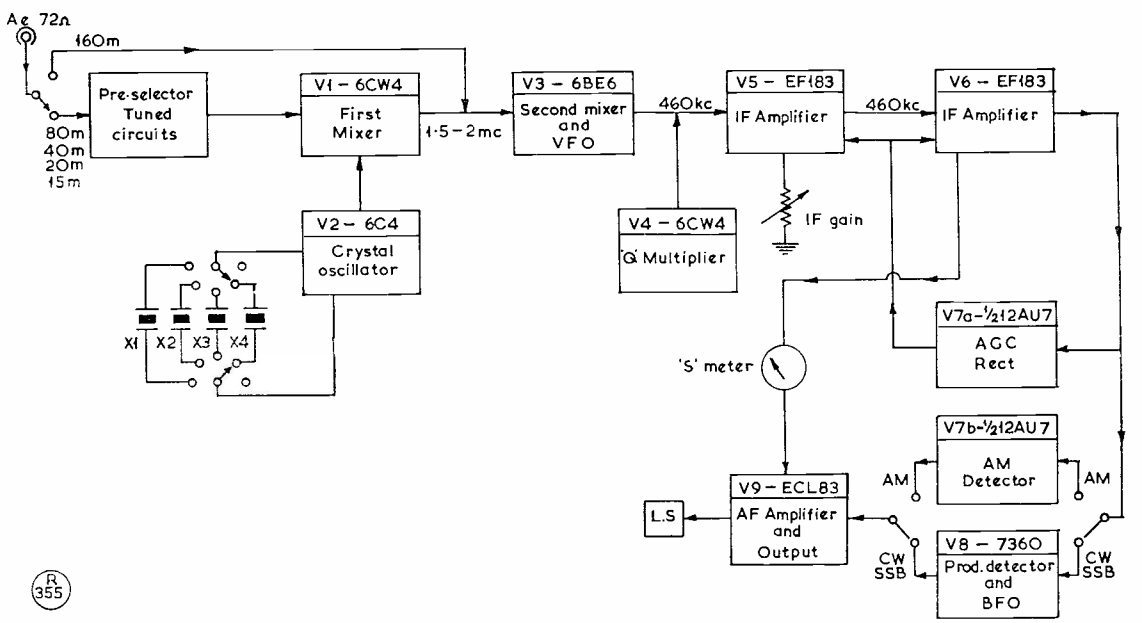


Fig. 1. Block diagram of the amateur-band receiver designed by G3BDQ and fully described in the article. In line with the modern trend, no actual RF stage is used, front-end selectivity being achieved by tunable band-pass circuits, coupled straight into the mixer —in this case a Nuvistor 6CW4, chosen for its special suitability and low-noise characteristic ; the same type is used for the Q-multiplier stage, where the requirement is similar. Full provision is made for AM, SSB and CW reception, the performance is of a very high order, and a neat and compact layout shape has been achieved on the constructional side.

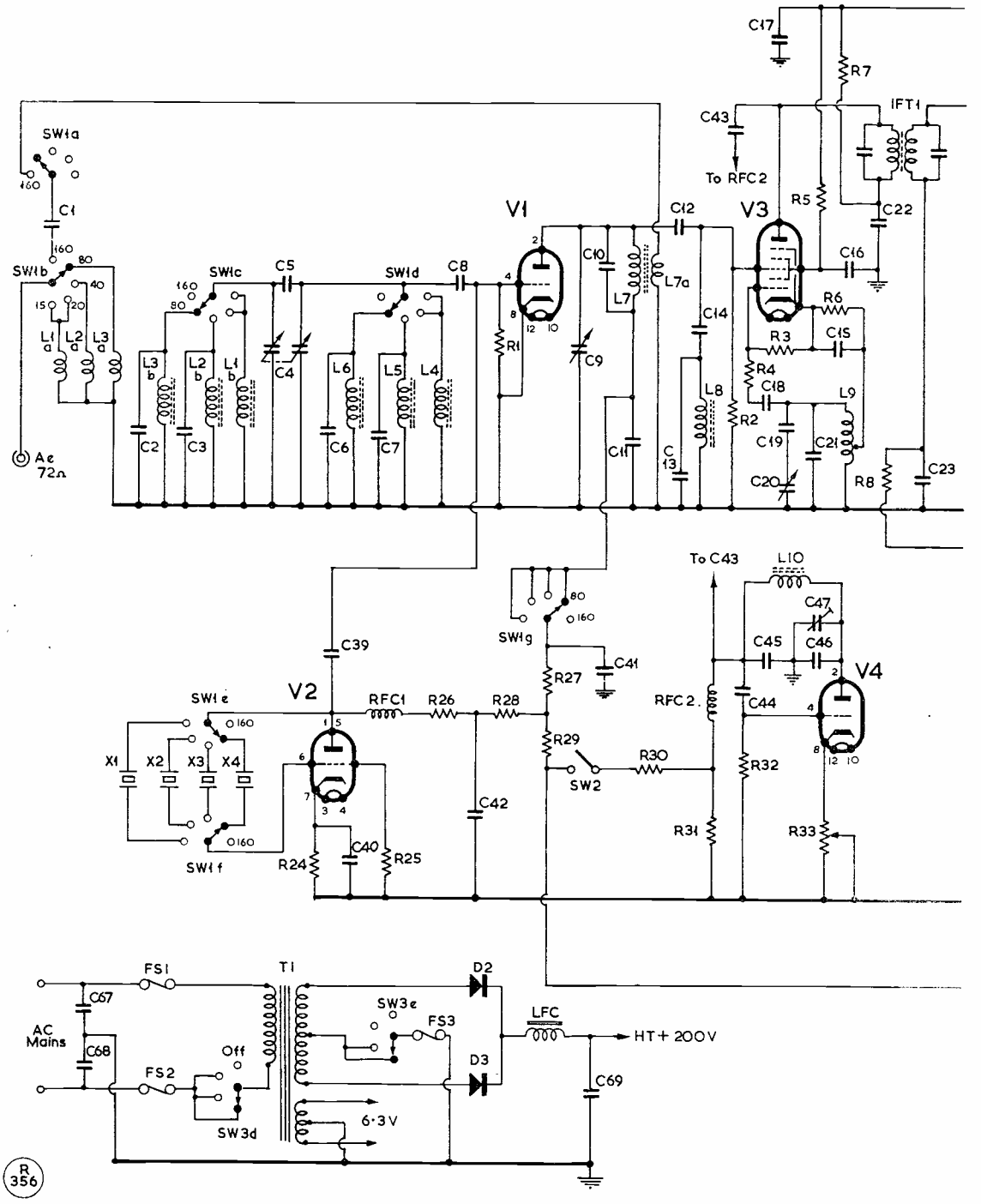
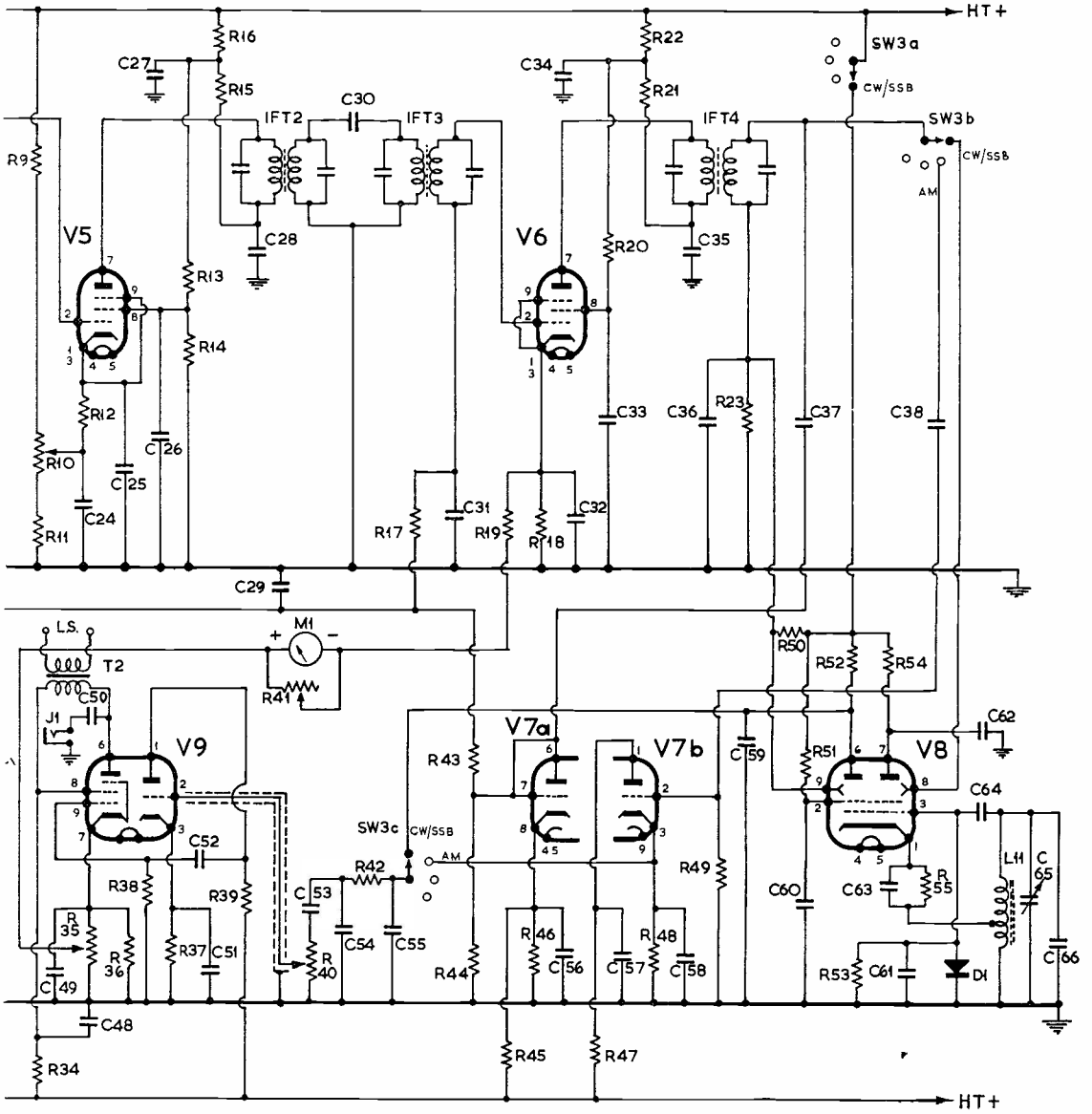


Fig. 2. Circuit complete of the 9-valve double-conversion 15-160m. amateur band receiver discussed in the article by G3BDQ. On the HF bands, the front end is crystal controlled—see block diagram Fig. 1—while on Top Band, the circuit becomes single-conversion to 460 kc, which is the 2nd IF on all other bands. The components used are standard catalogue items throughout, and full advantage is taken of recent new valves, such as the 6CW4, the 7360 and the EF183. Base connections of the types used in this receiver are shown separately; it should be noted that the special sub-miniature sockets required for the 6CW4's are obtainable from suppliers of the valve. The table of values and coil data appear on p.183.



AR88 is prone to this fault. In most cases of cross-modulation the RF stage or stages are to blame. The hotter the RF stage the more likely it is that you will hear your local BC station beneath old local G9ZZ's emanations. The well known Racal receiver does not use an RF amplifier, and most amateurs would give a good deal to lay hands upon one of these fine pieces of commercial gear.

Of course when no RF stage is used every care must be taken to reduce mixer noise, for the first stage of a receiver ultimately determines its final noise figure.

This has been done by using the 6CW4 Nuvistor triode, which was designed for low-noise RF amplifier and mixer service at VHF. Some measure of front-end selectivity is provided by a tunable bandpass filter with switched coils. On Top Band this is not needed and can be switched out of circuit.

Mixer stages have little gain, so this can be made up in the two 460 kc IF amplifier stages. Here advantage has been taken of the Mullard frame-grid pentodes type EF183. By using two IF transformers between the EF183 valves, back-to-back and very loosely top coupled, the

overall selectivity is improved and is in the region of 2·8 kc at 6 dB down. A Q-Multiplier can be switched in and with its help selectivity may be sharpened and made variable down to a bandpass of 500 c/s, which should be pretty adequate for most CW applications. The added complications entailed in providing a " notch " position were not considered worthwhile, for in the writer's experience by the time the " notch " in the passband is correctly positioned the offending QRM has changed in frequency or gone completely.

When receiving SSB or CW a product detector is brought into circuit. The RCA beam-deflection valve type 7360 is available in this country and it performs admirably as a product detector or balanced mixer, for which purpose it was originally designed. Having used conventional twin-triode product detectors it must be said that the 7360 is far superior, and in addition gives an audio gain of about seven times. This valve also performs as its own BFO in a cathode tap circuit and in this way helps to pay for its higher cost. For AM reception the writer prefers carrier detection, and one half of a 12AU7 twin-triode functions as an infinite-impedance detector which has very little damping effect upon the last IF transformer. The other half of this 12AU7 is wired as a diode to provide a negative AVC voltage for the IF amplifiers.

An ECL83 triode-pentode completes the receiver valve line-up, and provision is made for either headphone or speaker reception. The S-meter operates continuously and the circuit enables a forward reading 1 mA meter movement to be used. Another advantage of this particular circuit is that turning down the gain controls does not pin the meter needle against its stop. Meter readings decrease in sympathy with the IF gain control setting.

Power supplies are built into the receiver and a pair of silicon power diode rectifiers help to keep down the heat and occupy very little space. No voltage stabilisation was found necessary. The Drake-2B receiver has no voltage stabilised supplies and anyone who has used one of these fine receivers will confirm that there is virtually no drift after a few minutes' warm-up period. The whole question of voltage stabilisation has been overemphasised for many years, and it really dates back to the time when amateurs endeavoured to run multi-stage transmitters from a single power pack. Experiments with the oscillator used in the receiver described here have shown that a 100% variation in HT voltage only changes its frequency by 200 c/s. Such a change in line voltage need hardly be expected!

The Front End Unit

Work began on this section before the complete receiver design had been finalised. It is constructed on a small sub-chassis which mounts upon the main receiver chassis and can be thoroughly tested before it is installed. Looking at Figs. 1 and 2, V1 operates as a conventional triode mixer with grid injection from V2, the crystal oscillator, which is a 6C4. Four switched crystals are used in a Pierce arrangement which does not call for any tuned circuits. The crystal frequencies may be either higher or lower than the mixer signal frequencies. By having them 1·5 mc lower a cheaper set of crystals can be obtained, but this is at the expense of some unwanted spurious beats or " birdies " within the tuning ranges. A better system is to have the crystals 2 mc higher in frequency than the lower band edges—however, this means that on all ranges other than Top Band the HF end of the tuning scale corresponds to the LF end of the band.

The two possible sets of crystal frequencies are shown in the table herewith.

Band	*LF Crystals*	*HF Crystals*
3·5 mc	**2 mc**	**5·5 mc**
7·0 mc	**5·5 mc**	**9·0 mc**
14·0 mc	**12·5 mc**	**16·0 mc**
21·0 mc	**19·5 mc**	**23·0 mc**

If ten metres is to be considered, four additional crystals will be needed for full coverage of that band. Overtone operation of crystals was tried but found to be unsatisfactory. There was considerable pulling between the mixer and the overtone oscillators, and when on 21 mc tuning the pre-selector circuits to this frequency pulled the overtone circuit out of oscillation. Suitable HF fundamental crystals may be obtained from Brookes Crystals Ltd., or Cathodeon, and the LF ones are found on the surplus market.

The 6CW4 valve must never have more than 70 volts on its anode, and it will operate satisfactorily down to 25 volts. V2 is also run at low HT voltage (about 30 volts) for very little injection is required at the grid of V1.

C9 tunes the anode circuit of the mixer and its spindle is brought out to the front panel for peaking purposes. L8 and C13 make up a flatly tuned circuit centred on the mid-IF frequency, around 1750 kc.

Care must be taken when constructing the pre-selection tuned circuits. The two groups

of coils are kept away from each other and the *only* coupling between them must be *via* C5. When correctly adjusted by means of their dust cores each pair of coils should tune to identical frequencies at the same setting of the two-gang variable capacitor C4. The 14 mc and 21 mc bands are both covered with the same coils. The pre-selector tuning control C4 should give a sharp peak to received signals and it will require re-adjustment when tuning over the 80m. band. On 14 mc, C4 will be practically at full mesh and on 21 mc it will be set near minimum capacitance.

Any receiver tuning the range 1·5 mc to 2 mc can be used as an IF strip for test purposes; the receiver aerial terminal is coupled to the output side of C12.

The Variable Oscillator

A receiver stands or falls upon the stability of its oscillators, and the home constructor must give every care to the achievement of real stability. Good quality components should be used throughout, and special regard has to be paid to those making up the tuned circuit. V3 is a 6BE6 mixer and oscillator. It is not usual practice in communication receivers to combine both functions within one valve, but the circuit given here, which is a version of the mixer/oscillator in the Drake, performs excellently. The oscillator is arranged to tune from 1955 kc to 2065 kc; this requires a variable capacitor swing in C20 of about 120 $\mu\mu$F when using the coil and silver mica capacitor (C21) specified; a well-made double bearing 170 + 170 $\mu\mu$F variable capacitor was found to be suitable, with C19 in series with one of its sections to limit the frequency swing; the other section of C20 is unused. Suitable 1in. diameter coil formers in polystyrene are obtainable from a well-known chain

COIL VALUES FOR THE G3BDQ RECEIVER

L1b, L4 — 14 turns 24g. enam. at 30 tpi. on 7/16-in. diam. dust core former, to tune 21 and 14 mc.
L1a — 2 turns insulated wire on earthy end of L1b.
L2b, L5 — 26½ turns 24g. enam. at 30 tpi. on 7/16-in. diam. dust core, former, to tune 7 mc.
L2a — 2 turns as for L1a.
L3b, L6 — 50 turns 32g. enam. silk close wound on 7/16-in. diam. dust core former, to tune 3.7 mc.
L3a — 3 turns insulated wire on earthy end of L3b.
L7, L7a — Bifilar wound coils: Primary (L7a) 11 turns 26g. enam. between lower turns of L7, which has 75 turns 32g. enam. silk, scramble wound on 7/16-in. diam. dust core former, to tune 1.5 to 2 mc.
L8 — 30 turns 32g. enam. silk close wound on 7/16-in. diam. dust core former.
L9 — Approx. 24 μH, 41 turns 22g. enam. close wound on 1-in. diam. polystyrene former; tap 30 turns down the coil.
L10 — Pot wound high-Q coil 120-150 μH. (*Osmor* or *Electroniques*).
L11 — Standard 460 kc BFO coil, or can be made from any small LW aerial coil by removing some turns.

Table of Values

Fig. 2. Circuit of the G3BDQ Receiver—*see pp.180-181*

C1, C40, C42 = .0015 μF tubular ceramic
C2, C3, C6, C7 = 39 $\mu\mu$F silver mica
C4 = 50+50 $\mu\mu$F variable
C5 = 2.2 $\mu\mu$F ceramic
C8, C9, C18, C47 = 100 $\mu\mu$F variable
C10, C66 = 100 $\mu\mu$F silver mica
C11, C15, C16, C22, C23, C25, C31, C32, C56 = .01 μF disc ceramic
C12, C43 = 15 $\mu\mu$F silver mica
C13, C59 = 680 $\mu\mu$F silver mica
C14 = .005 μF disc ceramic
C17, C26, C27, C28, C34, C35, C38, C41, C48, C62 = 0.1 μF paper
C19 = 560 $\mu\mu$F silver mica
C20 = 170 $\mu\mu$F variable
C21 = 139 $\mu\mu$F silver mica
C24, C52, C53, C63 = .005 μF paper
C29, C57 = 0.5 μF paper
C30, C39 = 4.7 $\mu\mu$F ceramic
C33, C60 = .05 μF paper
C36 = 0.2 μF paper
C37 = 120 $\mu\mu$F silver mica
C44 = 500 $\mu\mu$F silver mica
C45 = .0027 μF silver mica
C46 = 750 $\mu\mu$F silver mica
C49 = 25 μF elect., 25v. wkng.
C50 = .001 μF disc ceramic
C51 = 10 μF elect., 12v. wkng.
C54, C55 = 270 $\mu\mu$F silver mica
C58 = 330 $\mu\mu$F silver mica
C61, C64 = 22 $\mu\mu$F silver mica
C65 = 20 $\mu\mu$F variable
C67, C68 = .0018 μF disc ceramic, 1200v. wkng.
C69 = 64 μF elect. 350v. wkng.
R1, R8, R17, R25, R53 = 47,000 ohms
R2, R9, R52, R54 = 100,000 ohms
R3 = 150,000 ohms
R4 = 10 ohms
R5 = 250,000 ohms
R6, R55 = 330 ohms
R10, R33 = 10,000 ohms w/ wound pot.
R11 = 1,500 ohms
R12, R18 = 100 ohms
R13 = 22,000 ohms
R14, R48 = 82,000 ohms
R15, R21 = 1,000 ohms
R16, R22 = 4,700 ohms, 2 watt
R19 = 47 ohms
R20 = 39,000 ohms
R23 = 18,000 ohms
R24 = 390 ohms
R26 = 10,000 ohms
R27 = 22,000 ohms, 2-watt
R28 = 100,000 ohms, 1-watt
R29 = 15,000 ohms, 2-watt
R31 = 7,500 ohms
R32 = 2 megohms
R34 = 1,600 ohms, 10-watt
R35 = 500 ohms w/wound pot.
R36 = 3,000 ohms
R37 = 620 ohms
R38 = 220,000 ohms
R39 = 33,000 ohms, 1-watt
R40 = 1 megohm carbon track pot.
R41 = 2,500 ohms w/ wound pot.
R42 = 56,000 ohms
R43, R44, R49 = 1 megohm
R45 = 390,000 ohms
R46 = 3,300 ohms
R47 = 33,000 ohms
R50 = 120,000 ohms
R51 = 68,000 ohms
RFC1, RFC2 = 2.5 mH
IFT's = Standard 460 kc IF transformers
M1 = S-meter, 1 mA movement
LFC = 20 Hy. 75 mA choke
T1 = Ex-Govt. 'C' core transformer 250-0-250v. at 60 mA, 6.3v. twice at 3A
T2 = Output transformer, 5000 ohms to 2.5 ohms load
J1 = Phone jack
SW1 = 7-pole, 5-way ceramic
SW2 = On/off toggle
SW3 = 5-pole, 4-way miniature ceramic
D1 = OA79 Mullard
D2, D3 = Silicon power diodes, 800 PIV at 450 mA, Joseph Lucas
V1, V4 = 6CW4 Nuvistor, RCA
V2 = 6C4 Brimar
V3 = 6BE6 Brimar
V5, V6 = EF183 Mullard
V7 = 12AU7 Brimar
V8 = 7360 RCA
V9 = ECL83 Mullard
X1, X2, X3, X4 = Oscillator crystals, *see text*

of chemists shops, in which they are sold as —pill containers. A calibrated receiver covering the variable oscillator frequency range should be used to check oscillator performance.

All the components in the oscillator section, with the exception of R3, are mounted above chassis, under the variable capacitor, inside an L-shaped screen, shown in one photograph.

Contrary to normal practice the V3 screen dropper R5 has the rather high value of 250,000 ohms. The oscillator thus runs at very low voltage and is far less susceptible to valve heating and voltage variation. Experimentally increasing the screen voltage of V3 was found to degrade the signal-noise figure of the receiver. When satisfied that the oscillator tunes the correct frequencies the coil should be liberally doped with polystyrene cement to set its inductance and reduce vibration effects.

The 'Q' Multiplier

All the valve Q-multiplier circuits studied by the writer incorporate the 12AX7 twin-triode—so it was decided to break new ground and use a 6CW4 Nuvistor. It may appear strange to adopt a low-noise VHF triode for a 460 kc regenerative circuit, but the chief attraction was the small physical size of the 6CW4. The whole unit can be made up on a small sub-chassis to fit conveniently beneath the S-meter. To obtain the full advantages of a Q-multiplier the coil must have the highest possible "Q", or goodness. This necessitates Litz wire windings on a ferrite pot core and such coils are best obtained from a component manufacturer (*see* Table of Values).

Resistors R30 and R31 were chosen to maintain the anode voltage of V4 at a very low value, actually between 5 and 5·5 volts. At this voltage the 6CW4 just slides into oscillation at the far end of the track of R33, the variable cathode resistor, which functions as a selectivity control. It may be noted that the IF coupling capacitor C43 has a value of only 15 $\mu\mu$F; other circuits examined seem to use at least .001 μF in this position, which would heavily damp and thereby de-tune the anode circuit of V3. High capacity is *not* needed for proper Q-multiplier action.

C47 is a pre-set frequency control which enables the Q-multiplier to be centred on the IF passband.

High Gain IF Strip

V5 and V6 are very high gain valves with a mutual conductance of 12·5 mA per volt, and if instability or positive feedback are to be avoided they must be operated at the voltages recommended by the manufacturer. Layout is important. Sensible in-line valve and transformer placing must be adopted and RF leads should be kept short. Small brass shim screens were soldered across the valveholders to isolate the grid from the anode wiring. Before this was done both stages tended to take off when the IF gain control R10 was at maximum.

AVC is applied to both valve control grids but only V5 is connected to the IF gain control circuit. The use of four tuned circuits between the IF stages enhances selectivity and brings the total number of tuned circuits at 460 kc up to eight.

Should the constructor wish to use somewhat cheaper valves for V5 and V6, types EF80 (which have the same pin connections as the EF183) may be used, but of course with a considerable reduction in IF gain.

(To be concluded)

AMENDMENTS AND CORRECTIONS

In his article on the "Stabilised Low-Voltage DC Supply" in our April issue, G3JAM draws attention to the fact that in the circuit Fig. 3 on p.71, the 5K resistor in the collector of TR1 should be in the collector line of TR2; also that C3 in Fig. 5, p.72, should be between the collector of TR3 and the positive output terminal.

The resistor values for the circuit of Fig. 1 on p.120 of the May issue ought to have been included, and are as follows: R1, 12K; R2, 2·2K; R3, 1·8K; and R4, 220 ohms.

In discussing the HRO in the "SWL" feature in the May issue, our contributor mentioned, on p.144, the valve types used in the pre-war models. GM3IAA (Inverness) writes to draw attention to the fact that the original HRO employed even earlier types than those quoted, *viz.* the 58 in the RF-IF sections; a 57 in the mixer, oscillator and BFO; a 287 in the 2nd detector, and a 2A5 in the output stage. These types preceded the 6D6, 6C6 series found in most HRO's of pre-war vintage; it was really a change from 2·5v. to 6·3v. heater when the latter valves were introduced.

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Aerial Hints, Tips and Ideas

Based on the experience of

THE OLD TIMER

Part IV

Long wires can be folded to fit small spaces; dipoles need not be horizontal; awkwardly shaped plots can accommodate effective aerials. These are our contributor's main themes this month, and finally he introduces "The Maypole." Previous articles in this special series on Antennæ appeared in our issues for December, 1961, and February/April, 1962.—Editor.

IT is said that you can't make bricks without straw, and that you can't get a quart into a pint pot . . . but if anyone tells you that you can't get a half-wave aerial into a quarter-wave garden, you don't necessarily have to believe them.

Most amateurs who yearn for a so-called "long-wire aerial" are really concerned with Top Band work, where the stations with half-wave aerials usually put out much better signals than the less lucky ones. But once you have contrived a half-wave for Top Band, you are likely to find it very useful on the other bands as well; some very big signals go out from long wires, and DX is not confined to the Quads and Yagis, by any means.

For Top Band work a half-wave can actually be a disadvantage, especially if it is properly erected in a straight line and almost entire horizontal. It will be excellent for DX, true, but local working will become quite difficult on occasions. Not so with a faked half-wave! The faking will undoubtedly have introduced one or more vertical sections into the system, and it is the absence of vertical radiation that makes the horizontal half-wave such a poor local radiator.

Let us examine Top Band aerials, then, and try to classify them: First, a *true* dipole, which will have the well-known "doughnut" pattern of radiation . . . non-existent! The wire would have to be between a quarter- and a half-wavelength high (say 200 feet) before one could justifiably expect it to behave as a true dipole should. You don't put up a 33-ft. dipole for 14 mc and expect it to work well at a height of four feet . . . yet how many 270-footers are there which are only 32 feet high, or less? (And the ratio of height to length is the same.)

A half-wave at a relatively low height, then, will *not* ensure that your signals cross the Pond every winter; but it will at least get you away from merely local ground-wave communication. Its sky-wave will be at a pretty high angle (look up the vertical radiation pattern of a horizontal aerial one-eighth of a wavelength high . . . and even *that* is 67 feet on Top Band). And this high angle is what gives the half-wave owners the edge over the others on GDX and European DX, but not necessarily for Trans-Atlantic work, for which even a loaded vertical might give a more suitable angle of radiation.

After the half-wave, the "faked half-wave," such as those shown in Fig. 1. Once upon a time it used to be considered essential to get the far end of an aerial as high as possible; where the fancy came from, no one knows. But there it was—"get your far end well up in the sky and you will get out." Nowadays the idea has at last got around that the maximum radiation takes place from that part of the aerial carrying the highest current—in other words, the centre, if it is a half-wave wire; and so, quite rightly, we strive to get the current loop (or current antinode) as high as possible. And, if we want vertical polarization, we even take steps to get the current loop into a vertical piece of wire. Fig. 1 (A) might be entitled "How to get a Half-wave Aerial into a Quarter-wave Garden." Just bend it down the

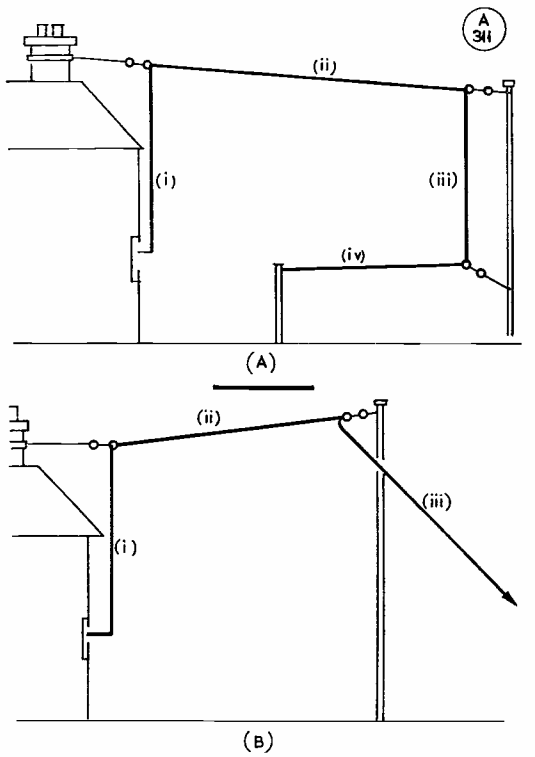


Fig. 1: One method of putting a half-wave aerial in the quarter-wave garden is shown at (A). If section (ii) is roughly 120 feet long, then the sum of sections (i), (iii) and (iv) should also be 120 feet. The method used at (B) is simply to add a sloping length of wire to the far end, assuming that some extra ground is available. But even this may be bent round at right-angles or taken right back into the home ground to make up a total length of 240 feet or so.

mast and fold it around, even back on itself, and hope for the best. You may worry about cancellation between the two horizontal lengths, but you are not aiming at any particular polar diagram; just the means of getting the *centre* of the wire up in the clear. In the case of Fig. 1 (A), the centre is somewhere along the main span, probably nearer to the mast than to the middle of the garden. If the total length is something between 200 and 270 feet, loading at the home end will take care of the rest.

For those who have a piece of waste ground at the far end of their gardens (or possibly a friendly neighbour's adjoining plot), it is worth while to try as long and as high a span as can be got between house and mast, carrying on with a sloping length of wire to make up the desired length, as in Fig. 1 (B). This can go off in almost any plane, so long as it does not form the major part of the aerial!

And so to quarter-waves, Marconis, or whatever you like to call them. If you put up a wire around 120-130 feet long for Top Band, and tune it against earth, the chances are that the radiation resistance of the system will be quite low—probably less than 36 ohms. Now, the contact resistance of a water-pipe or copper-rod earth can easily be much higher than that, especially in very dry-weather conditions, and so there's at least half your input going to waste, warming up the ground. (It has been known for a highly-fancied earth connection, when tested, to run around 250 ohms . . . in this case nearly *all* the power was being thrown away!)

To avoid this trouble—use a counterpoise. Buried radials would be ideal, but not many of us can tear up the family estate to bury four or five wires all over the place. However, it is often possible to run one wire close to the ground and underneath the aerial (along the back of the herbaceous border is a good place). A thermo-ammeter will show you, in black and white, that you get far more current into the bottom of the aerial, with a given input, when you substitute such a wire for an earth connection. If you can make the whole thing resonant, so much the better; in other words, make the total length of the aerial, and also that of the counterpoise, around 120 feet each for Top Band. (That magic figure of 270 or 275 feet: It actually resonates at about 1750 kc, and must be a legacy from the time when Top Band was 1715-2000 kc—happy days!)

In one case we know, the heavy lead to a conventional buried earth (consisting of an old galvanized bath sunk under the car-washing space) is also bonded to a wire fence, some guttering on the garage, and a long, buried main-water pipe connection which happens to run conveniently across the yard, more or less under the aerial. This station puts out a particularly effective Top Band signal, with an aerial which—while being roughly $\frac{3}{8}$th of a wavelength (about 200 ft.) long—is bent through three sharp angles in order to get the current antinode into the highest part of the system; the configuration is merely to achieve the correct placing of the current loop. It is a good example of tailoring an aerial system to make the most of the site conditions.

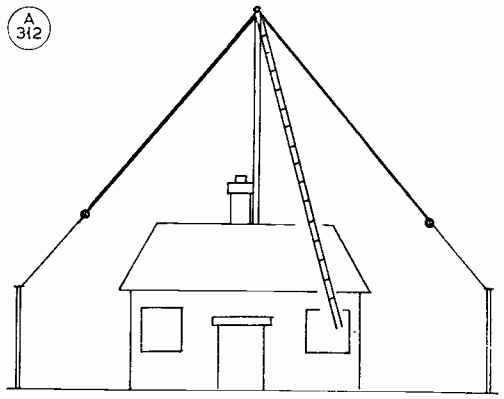


Fig. 2: A Vee-shaped aerial can be erected above the house or bungalow, using one roof mast. Lengths are discussed in the text, and two wires of 33 feet each will make a very useful three-band arrangement for 7, 14 and 21 mc.

So much, then, for Top Band, where the golden rule still remains "string out as much wire, as long and as high as you can make it"; and if you can't do it by "straight" means, then fake it.

HF Band Aerials

Now an idea or two for those who are really short of space, even for aerials on the HF bands. Ideally, of course, they would put up a tower or a substantial mast with a rotary beam on top. Those who can't, and who would be happy to get up even a decent dipole, can try out a thing or two.

Sloping doublets give quite interesting results. We are not going to talk about dipoles fed with coax, since one-band affairs are not often wanted. But consider the arrangement shown in Fig. 2. A TV-type mast on the roof is all that is needed—put the TV aerial somewhere else! If the two legs can be arranged at 33 feet each, fed at the apex with open line, then you have two dipoles in phase on 14 mc; a straightforward bent dipole on 7 mc; and three half-waves on 21 mc. Even if they can only be made around 16 or 17 feet each, you have a 14 mc dipole and also something that will work quite well on 21 mc. There seems to be little difference in performance between a bent dipole of this type and a straight one, when it comes to actual practical results. A field-strength meter at a distance would doubtless show considerable differences, but on the air a discrepancy of 2 dB or so will not be noticed. What you lose at some angles you will gain at others.

And, if you want some directional discrimination, "The Maypole" is recommended, specially developed just for that purpose. In this case, as shown in Fig. 3, *three* wires are brought down from the top of the mast, spaced as nearly as possible at 120 degrees to each other *(see* plan view). With a three-wire feeder, these three radiators can be fed in pairs to give roughly the same results as three horizontal dipoles erected in three different directions.

With many houses or bungalows it is possible, by using a 20-foot mast on the chimney, to contrive

three wires of 33 feet each without even taking in any of the garden or surrounding space. The supporting ropes or wires can be tied to corners of the building itself. Of course, if there is *some* space available, by all means pull the supports further out, making the wires slope more gently. But, in practice, it has been found that a slope of 45 degrees can be tolerated, which makes wires of 33 feet quite a possibility.

Regarding the feeder—ideally this should be a triangular affair, using circular spacers and keeping the three wires equidistant from each other all the way down. However, it can also be done by using normal 600-ohm line construction—*see* p.126, May SHORT WAVE MAGAZINE—drilling the spacers in the centres and running a third line down the middle. This means, in practice, that two of the pairs of wires will be fed with 300-ohm line, and the third pair (that served by the outer feeders) with 600-ohm line. This will necessitate re-tuning when switching to that particular pair; but the other two can be switched instantaneously without any re-tuning.

The best way of dealing with the switchery, at the bottom end of the feeders, is to use either a three-way two-pole switch, or a pair of relays, to connect the selected one of the three pairs to the ATU, and to do the T/R switching in the coax feed to the ATU. Then the receiver will be able to take full advantage of the discrimination between the three systems. This is invaluable, since it tells you which pair to transmit on, when calling a station which you want to raise.

The directions in which the aerial wires are set will, of course, depend on the local site conditions. However, if it is possible to run one of the three wires more or less due North, a useful combination of directions is obtained. Referring to the plan view in Fig. 3: If *a* points North, then the *a-b* pair work excellently towards the States, the *a-c* pair towards the Far East, and the *b-c* pair to all points South. Naturally, they also work on the reciprocals, but the combination of downward slope and tilting towards each other does reduce this to such an extent that one can almost talk about a back-to-front ratio. Gain is not high, however, and one must not expect results comparable with a real beam.

Useful lengths? Again, 33 ft. per wire is excellent for 7, 14 and 21 mc; half that length quite effective on 14 mc, but a little problematical for 21 mc, although it certainly does work. Anyone with a high chimney mast and more space might even run to three 67-ft. lengths, bringing the ends down quite close to the ground—this gives excellent possibilities, even on 3·5 mc.

To conclude — don't imagine that this arrangement is only effective when put up as shown in the sketch. If you have one pole in your garden, fairly centrally placed, it ought to be possible to drape a "Maypole" from it, anchoring the bottom ends to fences or short posts. Furthermore, to add to the "Maypole" metaphor, it might even be possible to pull the whole thing round until the three best directions are found . . . but it is *not* advisable to let three small children loose on the drooping ends!

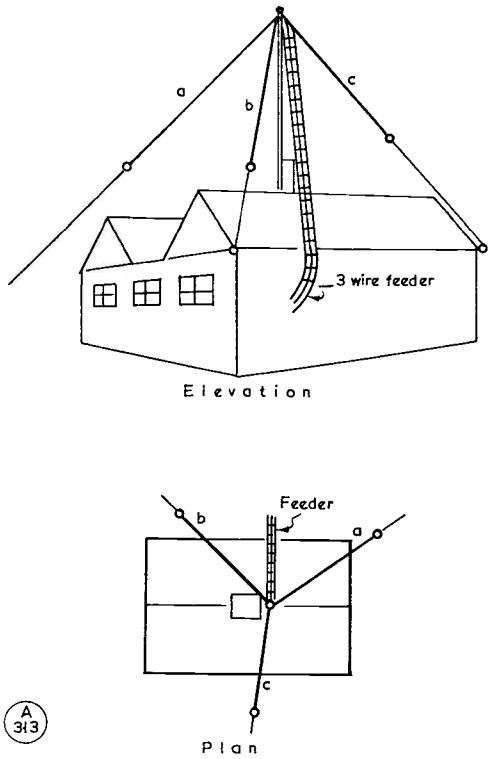


Fig. 3: The "Maypole" aerial, using three wires taken from the top of the short mast to convenient anchorages, either on the building itself or to fences or short posts. A three-wire feeder is necessary, and switching will give three worth-while patterns with noticeable discrimination, though, naturally, not high gain. Three 33-ft. lengths are excellent.

Yet another possibility is to use this as a Top Band aerial, by shorting all three feeders together so that they function as a vertical radiator, the three actual aerials forming a rather large capacity hat. This, too, has been tried and found quite effective, but is not recommended for small versions of the "Maypole."

Finally, remember that a two-wire version of the same thing brings you back to the Fig. 2 arrangement, which may be all that some space-deprived amateurs can manage. Even if the two legs are bent round at an angle to each other, this is still worth trying. The thing is to make the best you can of your own particular site conditions.

SIDELIGHT ON HISTORY

In writing to explain why he had been unable to renew his subscription to SHORT WAVE MAGAZINE, Raul Fernandes, CR8HC, of Vasco da Gama, Goa, West India, said it was because he was still in an Indian concentration camp, awaiting repatriation to Lisbon. His predicament arises, of course, by reason of Mr. Nehru's "military operation" against the ancient Portuguese colony last December.

BC Rx CONVERSION FOR TOP BAND

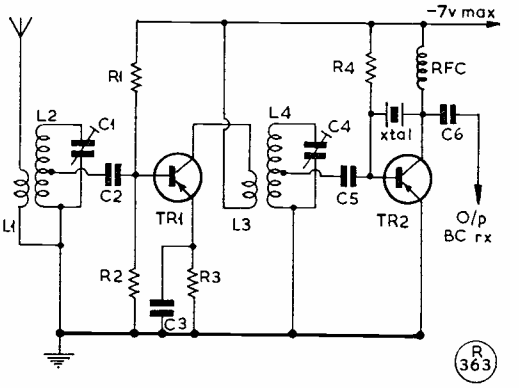
USING TWO TRANSISTORS

THE circuit shown here is intended to work with an ordinary BC Rx as a converter for the 160m. amateur band. With a 3·3 mc crystal in the oscillator-mixer TR2, 1·8-2·0 mc can be tuned from about 200 to 230 metres on the broadcast receiver—that is to say, "reverse tuning," because the oscillator is HF of the signal frequency.

At almost any location in the U.K., there will be a certain number of strong fundamental transmissions in the 200-230m. range of the BC receiver. Unless these signals disappear completely with no aerial on the Rx and the gain turned practically full up, they will constitute break-through interference when the converter is connected. However, since what we are concerned with here is a quick and easy means of tuning the 160m. amateur band on a domestic BC receiver (and in the ordinary way the 160-metre signals will be stronger than any break-through experienced) some disadvantages have to be accepted.

As regards construction, the circuit can be put together on a peg-board; on a piece of paxolin; or on a little aluminium chassis. To minimise break-through, it should go into a screening box, tied to earth.

In setting up, C1 and C4 should be offset somewhat to give a broad-banding effect. This is done by first peaking L2, C1 and L4, C4 at mid-band (1900 kc) with the condensers at half-mesh, and then turning C1 off for the best reception of a signal at about 1950 kc, and C4 on a signal at 1850 kc. This



Circuit of the transistorised LF band converter, designed for covering the 160m. amateur band by tuning 200-230 metres on almost any BC receiver. This arrangement could be used with a standard car radio Rx, for mobile working on Top Band; with the oscillator on the high side of the signal, there is the slight disadvantage that the main receiver tunes "in reverse." All necessary details are given in the text. To avoid damage to the transistors, switch off on "transmit" and short the input.

is necessary because the aerial and mixer circuits will tune fairly sharply, against main tuning on the BC receiver giving a fair degree of bandspread.

Values are as follows: C1, C4, 50 $\mu\mu$F or as available; C2, 200 $\mu\mu$F; C3, ·01 μF; C5, C6, 100 $\mu\mu$F; R1, 33K; R2, 5K variable, gain control; R3, 1K; R4, 390K; RFC, 2·5 mH standard RF choke; TR1, TR2, OC44 transistors, with not more than 7½v. from the battery; L2, L4, 60 turns 30g., tapped at the 15th turn; L1, L3, 20 turns 30g.; coil formers for L1, L2 and L3, L4 are ½in. diameter, with slugs.

The circuit arrangement shown here is due to G2CCH and G3ONR and appeared in the North Kent Radio Society's *Newsletter* for April.

ISLE OF WIGHT DAKOTA CRASH
6 May, 1962

The disaster to the Channel Airways Dakota on St. Boniface Down, Ventnor, I.o.W., at about 3.20 p.m. on Sunday, May 6, has been extensively reported in the press, together with some references to the assistance given by certain individuals—described, of course, as "hams"—who, fortunately for all concerned, were in the neighbourhood when the crash occurred.

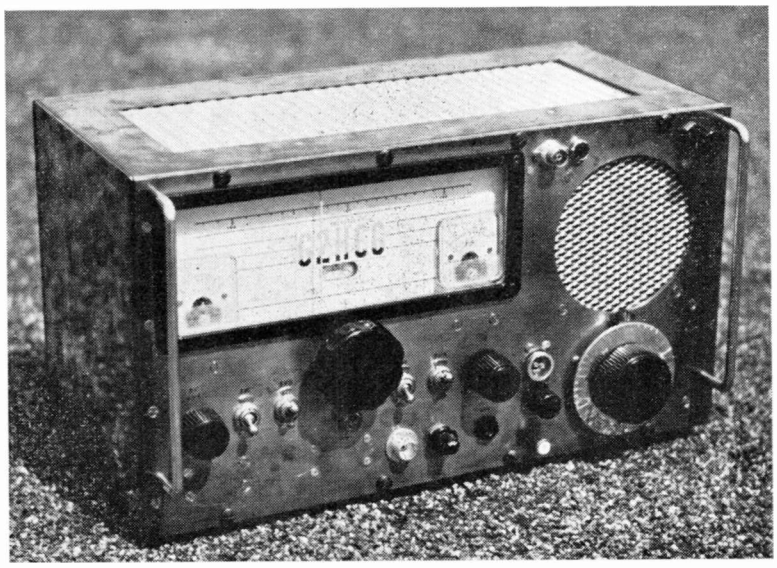
What actually happened was that a two-metre portable station—signing G3GWB/P, and manned by members of the Northampton group—had been set up in that part of the Island, combining an outing with VHF portable activity. When the farm-hand Price reached them with the news of the crash, G3GWB/P immediately went on the air with an "Emergency Mayday Raynet" call. This was not answered right away (apparently because it was thought to be "just another exercise"), but eventually G3NIM (Netley) came up and took the message; he dialled 999 and alerted the police, who quickly set the rescue services in motion.

In the meantime, by arrangement with the local police on the spot (who were at first without a radio car), G2HCG detached himself from the G3GWB/P party and drove right up to the crash, from where he operated as G2HCG/M, on two metres; he quickly raised G5NF (Farnham), who passed messages to the Aldershot police. By the time the rescue services were in full operation—which was not long—amateur assistance was no longer required.

During the period before the arrival of the ambulances and fire tenders, the G3GWB/P party did sterling work. Apart altogether from the two-metre radio link, they were directly concerned in the immediate rescue operations. Those involved were: G2ANS, G3FAN, G3FWB, G3HWE, G3ITW, G3LOK, W5PSY (a U.S.A.F. officer stationed at Chelveston, who had come along with the G3GWB/P party for the day out) and SWL Hartopp, of J-Beams, Ltd. G3FAN and G3LOK are, of course, well-known as I.o.W. amateurs, who had joined up with G3GWB/P locally. Because the high

ground at which the aircraft struck was swathed in fog, and there were dead, dying and injured to be attended to, these chaps had a very difficult and unpleasant time of it until the ambulances arrived. It is evident that between them they put up a very good show, creditable not only to Amateur Radio at a moment of real crisis, but also to themselves as individuals. Indeed, it is obvious that it was extremely fortunate for all concerned that G3GWB/P happened to be available, backed up by G2HCG/M with his efficient two-metre mobile equipment and considerable operating experience.

Though there is understood to be an active "amateur emergency network" in the South Hampshire area, from reports received it seems to have played no part whatever in the proceedings. With the sole exception of local G3NIM, of Netley, all the traffic was handled by AT station operators from outside the district.



The two-metre field day rig, belonging to G2HCG, used by the Northampton group, signing G3GWB/P, to summon help to the scene of the crash of the Channel Is. Dakota at St. Boniface Down, Ventnor, I.o.W., on May 6. It was a fortunate chance that had brought G3GWB/P to the Island that day. The transmitter in this rig runs 25w. to a QQV03-20 in the PA.

PASSING OF A PIONEER

The death is announced of F. Stanley Mockford, of the Marconi Company, who began his long and varied career in wireless in the old Royal Flying Corps in 1915, and later in the R.A.F. After the Kaiser's War, he became an Air Ministry official, and helped in the early development of the wireless services for civil aviation. He was the first examiner of candidates for the air operator's licence, devised the first international phonetic alphabet, and was responsible for introducing the "Mayday" (m'aidez) distress call in commercial telephony working. From 1930 until April last year, Stanley Mockford held a number of executive positions in the Marconi Company. He retired as commercial manager, a post in which he had served for 14 years.

RADIO AMATEUR EXAMINATION—NOVEMBER

Henceforth, there are to be two Radio Amateurs' Examination sittings each year under arrangements made by the City & Guilds of London Institute—the one in May (just held) and another in November. Details are being circulated to a large number of technical colleges and evening institutes up and down the country, and it is only at these that the November R.A.E. can be taken. The examination will be held on November 2, the fee (payable locally) is 30s., and the final date for applications to sit is *September 28*. The local office of your County Education Authority will give you further details, with the address of the nearest college at which the exam. can be taken. In all such enquiries, quote "City and Guilds Subject No. 55, Radio Amateurs' Examination, November 1962." This makes it easy for the correct information to be quickly turned up. It is most unhelpful to approach the enquiry desk with some such statement as "I'm trying for my ham licence, see, and wonder if I can get the dope?" In one such instance of which we know, the lovely young thing behind the desk happened herself to be very interested in Amateur Radio—so she handed the yob in the leather jacket and uncut hair a wad of foolscap and told him to come back after he'd written out, 100 times in a fair hand, "Could you please help me with Subject No. 55, the Radio Amateurs' Examination?" He was man enough to take it on the chin, and they are now very happy. He is glad to push the pram out on a Saturday afternoon and help with the shopping, and she takes a keen interest in the rig and looks after the QSL department. *(In Amateur Radio, you never know what you can be let in for . . . Ed.)*

ANOTHER OF THOSE DRUG APPEALS

According to the *Daily Telegraph* for April 24, "a ham *(sic)* in Whitley Bay picked up an SOS from an amateur in Poland" to the effect that a particular drug was wanted to save the life of a child. Through the local police, contact was made with the Polish Embassy in London, and all sorts of motions were gone through to get the stuff to London Airport and on to Berlin, for transhipment to Warsaw—only to find that it was not needed after all. There is nothing more phoney than these "drug appeals"; they seem always to emanate from Iron Curtain countries which, we are so often told, have the world's most advanced medical standards. If you should get involved in such a situation over the air, tell the chap to go round to his own police station and ask them to get in touch with the International Red Cross.

DX COMMENTARY

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

UR2BU

CALLS HEARD, WORKED and QSL'd

IT'S been another good month, but with its ups and downs. The conditions on the HF bands have been varied, from wonderful to pretty dim, but there has nearly always been something of interest to work. The 'chasers who stick to it through thick and thin have been rewarded; those who just switch on and whistle round the bands looking for strong DX signals standing out above the QRM have probably been disappointed.

Fifteen had an attack of the doldrums, but by May 5 and 6 was wide open for the USA once more. When it wasn't, the afternoons would show moderately good conditions to the Far East, with 9M2, VS1, VS6 and JA putting in reasonable signals.

Twenty has become really exciting in the mornings. Certain activities in the Pacific have obviously brought about a concentration of amateur operators, and on one morning W6GMQ /VR3, K3GAD/KJ6, W1MV/KP6, KM6CE, VR1M, FO8AN, VR2DK and many others, were all on Twenty CW at the same time (with HKØAB thrown in for good measure!) When the latter moved to KS4BF (Serrana) the excitement continued, and was reinforced by Gus of W4BPD, who showed up variously from VQ9A, VQ9HB and VQ9AA. Just add a few VQ1's, FB8WW, VU2US/AC5, 5R8's and a ZD8, and what more could the keen types want to make them happy?

Most of all this CW activity was duplicated on SSB, and the HF end becomes more crowded week by week. Why don't a few more move down to that nice little spot around 14125 kc? There, one can still work a bit of DX in peace. (Incidentally, VQ9AA started quite a riot by coming up on 14125 kc and listening only from 14270 upwards!)

NOC Activity

The members of the NOC (Ninth-Class Operators' Club) have been out in force, too. Just let loose a hint of fairly easy DX-chasing, and out they all come from their holes. The sad part about it is that they not only make life hard for other people, but, while doing so, they haven't the slightest hope of working the DX they are after, just because of clueless behaviour.

There's a new menace, which might be called the chain-reaction. This is a precise description of a happening on Twenty CW, on the morning of May 9: G6QB heard VR1M and called him; back, on the same frequency, came a K7 calling G6QB. VR1M was still readable through this one, so it didn't matter; but as soon as the K7 signed, up came a UB5 calling the K7! Finally, believe it or not, when the UB5 signed, an LZ with an atrocious T7 thing, clucking like a farmyard, called *him!* It makes one think that the call-sign of the station *called* means nothing whatever; anyone daring to sign his own call is immediately chased by all and sundry. The interesting thing about this little experience is that not a single QSO resulted . . . everyone ignored all the others. So where does that kind of Klottery get you?

On SSB even worse things have been heard; a G3 patiently trying to put some rarer Europeans through to a VP2, with the "breakity-break" brigade from the States swamping the whole thing; a rare DX station saying, very clearly, "I will *not* answer calls within 5 kc of this frequency" and the whole pack calling, right smack on him . . . so it goes on all

the time. Maybe some of it is due to poor receivers, but more likely it's the component clamped between the headphones that is defective.

"CQ" World-wide DX Contest

The advance results of both the CW and Phone sections of the *CQ* Contest show that participation from G stations was again on a very small scale. Only three of them got honourable mentions this time: In the CW event, G5RP was third on 28 mc, and G4CP sixth on 14 mc, while in the Phone half G3JUL was third on 7 mc. No G's showed up in the Honour Roll of the All-Band categories, although some of them did make quite high scores.

There are the results, very drastically summarised. We show, in the all-band sections, the two leading stations plus the leading U.K. stations; and in the other categories, the winner plus the leading U.K. station (if any).

While once again considering that the small U.K. entry shows a notable degree of apathy, we congratulate GW3JI, GI3CDF, GI3IVJ, G3NFV, 3NGZ, 3FXB, 3NNT, 3JUL, 2DC, 5RP, 3PEU, 4CP, 3EYN, 3JVJ and 3ATU on making their presence felt!

One note of interest: In the Phone section the single-operator technique hopelessly outclassed the best that the multi-operator organisations could do; and in the CW section, likewise, the single-operator stations did better than the multi-operator, single-transmitter group. But the multi-operator, multi-transmitter set-up did produce the two highest counts in the world, DJ3JZ and W3MSK both scoring nearly the 1½ million! The credit for the highest numerical score, regardless of class or section, from the U.K. goes to G2DC for his 267,189 in the single-operator CW category. Even this fine total did not get him into the Top Ten, all of whom scored over 450,000.

PHONE CONTEST

Single-Operator, All Bands

CX2CO	876,304
KW6DG	349,492
GW3JI	171,384
G3NFV	30,284

Multi-Operator, Single Transmitter

VQ4RF	542,244
5A3CAD	338,100
GI3CDF	133,450
G3NGZ	46,200

Multi-Operator, Multi-Transmitter

K2GL	319,144
DJ3OU	220,818

28 mc

LU1DAB	79,643

21 mc

ZB1HC	57,009
G3FXB	50,648

14 mc

ZS7P	225,597
G3NNT	108,968

7 mc

4X4DK	22,410
G3JUL	2,666

3·5 mc

I1AIM	7,560

CW CONTEST

Single-Operator, All Bands

7G1A	1,177,893
CX2CO	856,416
G2DC	267,189
GI3IVJ	127,980

Multi-Operator, Single Transmitter

VK5NQ	709,000
HV1CN	529,356
G3JUL	50,400

Multi-Operator, Multi-Transmitter

DJ3JZ	1,451,437
W3MSK	1,405,767

28 mc

K2HWL	7,130
G5RP	3,360

21 mc

PY4GA	105,616
G3PEU	22,656

14 mc

UA9DN	274,412
G4CP	131,145

7 mc

W9WNV	146,510
G3EYN	19,604

3·5 mc

OK3DG	18,300
G3JVJ	3,128

1·8 mc

OK1ADX	740
G3ATU	525

DX News from Everywhere

We have already mentioned some of the best ones; HKØAB, KS4BF and VQ9AA were models of how to handle the pack while continuing to give the maximum number of QSO's. VU2US/AC5 has also come and gone, but nothing like the same number of contacts came from him, owing to the slower operating and the giving of QTH, name, and so on, in every QSO. However, quite a few G's broke through the curtain and made it. Mike of G3JFF was a wonderful signal when signing G3JFF/MM just south of the Ellice Islands, but by no means so good when he became VR1M. WØAIW/3W8 and WØFWA/3W8 were two more who stirred things up during April; W4LCY/KM6 also showed up, and will be there for some months.

G2DC informs us that the big DX-pedition to rare African countries, by WØMLY, will already be fired up by the time this is published. Dick of WØMLY knows quite a lot about Africa (he will be remembered as VQ6MY and FL8MY, among others) and was due to fly to the Cameroons from New York on May 17. This effort is being sponsored by the Yasme Foundation—hence, QSL's go to KV4AA, and early replies necessitate IRC's or s.a.e. It is planned to visit TR8, TL8, TY2, TJ8 and 5V, over a period of several months.

Also from G2DC: VK3AHO will be operating as FW8BH, from Wallis Is., for approximately one month from June 10 . . . and the VS9 boys are planning another one, possibly to the Kuria Muria Is. (off the Oman coast), if country status is granted. It is isn't, they may go to the Kamaran Is. again, although Socotra is also being considered . . . Finally, Danny's departure date from Tahiti is near, and he should be on from Flint Is. about the time you are reading this.

From G3FPK: WØMLY *(see* above) is due on SSB from TR8 on May 26 or thereabouts—should still be there on early June. He will be in Central Africa for three months . . . FW8BH (also *see* above) will be on SSB on 3790, 7090, 14130, 14345 and 21390 kc; he will listen for Europe between 0700 and 0900 GMT, transmitting on 14130 kc.

From G3NOF: UAØKYA will be working permanently from Zone 23 shortly . . . VS1DO has been operating as ZC5DO on 14 mc SSB . . . W6GMQ, WA6WQM and K6YZZ all working SSB from VR3 . . . TA2AR asks for QSL's to PAØWWP and still says he is the only genuine AT station in Turkey—but an American recently there reports that there is *no* activity in TA-land.

Gus Browning, W4BPD, has

already spread joy from Aldabra Is. The full story, pieced together from several sources including Gus himself, seems to be this: In the Seychelles he teamed up with VQ9HB and used that call on SSB; on CW he used his own former call, VQ9A. On the way to Aldabras he signed VQ9A/MM until he reached the halfway mark, when he switched to VQ9AA/MM. Finally there, he became VQ9AA, and operated very long hours, as promised—but his signals were weaker than when he was /MM. At the time of writing he was uncertain about his VQ8 licences (for Chagos and Rodrigues) and slightly worried about the future programme. VQ8 if possible, otherwise a stab at the Comoros and then back to the Aldabras. (QSL's to W4ECI.)

A Brazilian expedition to St. Peter and St. Paul Rocks is now promised, the Brazilian Navy being concerned with the transportation. On these rocks is a disused lighthouse which might serve as shack and aerial support.

Mike of G3JFF was active again as VR1M from Tarawa in early May; but he was scheduled to fire up on a second session during the period May 28 to June 4—so look quickly on 14050 and 21050 kc CW if you want him. Thereafter, VR2EA will be on again for one or two week-ends, and then H.M.S. *Cook* starts her long voyage homeward.

So much for the present and future activations; for news of past DX-ploits read on, under the HF bands headings.

Top Band Activity

Although the scheduled tests are over, Trans-Atlantic QSO's have continued on practically every Sunday morning. They are fewer and more difficult — but still possible. W1BB's April bulletin sums up the season as very good indeed, and it seems to have peaked late, judging by the doings throughout March. In fact, March 4 was probably one of the best mornings of all, with W1BB working eleven Europeans and W1PPN thirteen! Others getting across to the U.K. were VE1JX, W8GDQ, WØAIH/VE3 and VE3DU, W2IU, W2UWD, K8NSF, K8HBR/8 and quite a few more. March 11 and 18 tailed off somewhat after this wonderful morning. By March 25 the actual participants were getting scarce. Meanwhile, there is plenty of activity from ZL, the Western States, South America and the Caribbean, all keeping things lively for the W's, but hardly for us in the U.K. Next season should, by rights, be even better; and there will doubtless be some long pieces of wire going up between now and the autumn.

GM3IAA (Inverness) was delighted to raise W1PPN and W1BB on March 4; the W1BB contact was only the second between W and GM on the band, after all these years—and almost certainly the first for Inverness.

Don't forget the **Scillies** expedition by the City and Guilds College Radio Society, June 16-29, signing **GB2IC** (details last month, p.136). Another one is promised by G3BHT (Surbiton), who will be signing GM3BHT/A from Loch Sunart, Inverness, July 8-13. Likewise, G3NQX (Preston) will be operating from the Isle of Man, June 16-30, on *phone*; he will be at Port St. Mary with a 250-ft. wire, looking for all and sundry.

The Simon Langton Grammar School (Canterbury) trip to North Wales went off well; they showed the world what "portable" really means, carrying all the equipment *on foot* and moving between ten and twenty miles a day. GW3OSL/A got on the air four evenings, the gear worked well, and best DX was Shetland, with the home stations also worked. The main snag, says G3LCK (who was with them) was aerials. If anyone can offer them a couple of 90-footers which weigh two pounds and fold into eighteen inches they will be obliged . . . As it was, their "bits of wire" were seldom higher than fifteen feet, and all Youth Hostels seem to be surrounded by mighty walls of rock. The whole thing was helped along by the loan of a T.W. transistor receiver and a Venner silver-cadmium accumulator for the Tx heaters. Next year they will head for "wildest GM."

Other Top-Band gen. in brief: A vote of thanks to the Easter expeditions from many of the 'chasers (Rutland, Carmarthen, Kinross, Sutherland, Westmorland and so on). All went off successfully . . . G3PDM and G3PLQ both report wasting time on UA9DA, who appeared on successive nights signing also UQ2KQ, UA1KAI and UA3-something. Just a pest! G3PU also worked "ZC4SS," but suspects him of being a phoney.

G3PDM says "summer" conditions are making headphone work painful, and short-distance skeds are becoming difficult . . . G3OXI comments on GI3MCZ (Fermanagh) and GM3GDU (Argyll), adding that Easter week-end was like a field day. He, too, heard the phoney Russian . . . G3PPE joins the newcomers' ladder—running 6 watts to a 6V6 and a home-built receiver . . . G3OHL likewise collected some of the portables at Easter.

G3NVO, too — and he also winkled out GC3KAV (Guernsey). A QSL turned up from UB5WF—

FIVE BAND TABLE

Station	14 mc	21 mc	7 mc	3.5 mc	1.8 mc	Countries Worked
G2DC	274	265	143	101	12	301
G3DO	261	220	51	55	10	292
G3FPQ	257	250	138	106	23	287
GW3AHN	255	277	68	21	1	303
G2YS	176	123	94	75	20	197
G3NOF	163	183	18	24	1	222
G3LHJ	136	189	47	23	11	199
G3IGW	126	127	99	51	23	183
G3JWZ	107	77	62	52	9	132
G2BLA	94	96	73	39	9	146
G3NFV	83	118	39	48	16	164
G3IDG	49	61	23	17	9	90
G3PEK	44	15	30	19	8	54
G3NYQ	32	17	38	30	11	53
G3PLQ	12	7	11	14	10	54

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

at least *he* is known to be genuine! G3NPB (Hexham) keeps Northumberland on the band, and has now moved to a house with a 250-ft. garden. (He doesn't know whether he prefers no garden and plenty of operating time, or a Top-Band half-wave and lots of gardening time!) G3OWR, on the other hand, has moved and now has a "temporary" 66-footer — but he worked an OK on it, and in daylight at that.

Notes from The Med.

ZB1XF is G3KXF, who has been in Malta since last November. A recent storm wrote off most of the ZB1 beams, but ZB1HC and 1XF have built a three-element Quad (for Fifteen) and hope to arrange a good assortment for the other bands. The two of them, plus ZB1PSE, will be motoring back to the U.K., starting June 2, for leave (ZB1HC tour-expired) and will hope to make several personal QSO's *en route*.

5A4TC (Tripoli) sends details of the Libyan Amateur Radio Award. Europeans must use at least three bands and work eight Libyan stations (the same station counts again if worked on more than one band). QSL's must be held but *not sent*. Check list required, countersigned by the secretary of the local club, or by three locally licensed amateurs. Ten IRC's with this, to The Awards Manager, 5A QSL Bureau, Box 372, Tripoli, Libya.

Twenty Metres

What with the DX-peditions and the spectacular Pacific DX, *Twenty* has scooped the pool this month. Long lists have been received of DX worked by many of our regular correspondents, and they have been pruned rather ruthlessly in view of the really good stuff available. G2DC thought the band had stolen all the honours this time, and to prove it he quotes the following, all CW: VU2US/AC5, VQ9AA, AP5CP, FO8AN, HKØAB, JT1KAA, VR1M, W6VUN/KW6, WA6WQM/VR3, YA1BW, 5R8AB.

GM3JDR sends a terrific list of

I1FO, Franco Silvano Orefice, Via Pagliano 1A, Milan, runs a 6146 in his PA, operates mainly on CW, is a member of the First-Class Operators' Club, and started on the air in 1927.

SSB contacts for the three weeks up to May 8, from which we select BV1US, CE8AA, HKØAB, HS1W and 1X, KW6CJ, KS4BF, KX6BQ and 6BU, VP2MC, VQ1CJ and 1JR, VQ9A/MM, VQ9AA/MM, W1ZLG/VR3, K1AZA/KP6, K6CQV/KS6; and, on CW, VQ9HBA, KS4BF and HKØAB. (In the SSB list there are so many JA/KA, KG6, KR6 and the like that we have to pass them over as "locals," despite the fact that this is 1962, not 1957!)

G3OJV (Hornchurch) has just fired up on 20 metres after being on Eighty for many months. He came out with HV1CN, KA2MA, SVØWT, distant Russians, XZ2SY and K1HVJ/MM (Red Sea). This with a home-built rig—a pair of 807's and a ground-plane with only three radials.

G2BP reports an unusual one in the form of JA7AD at 2305 GMT on CW. Signals 589 at first, then QSB . . . G3MWV (Cromer) says recent reports would seem to suggest that AM on Twenty is of little use. He stuck to it and worked HC3NL, VE1TV, UO5KAA, VE1AFY and many Europeans (from a poor location with a ground-plane between two buildings).

GW3AHN refused to be torn away from his favourite band (Fifteen) for too long, but some time spent on Twenty brought him HKØAB, K3GAD/KJ6, K1AZA/KP6, KS4BF, VQ1CJ, XZ2SY, 5H3HH and 3GC, 9M2DW and VQ9AA—all on SSB.

G3FPK also had a good month, and his SSB list includes HH2PW, HKØAB, HV1CN, KB6CL, KG4AN, KG6, KH6, K3GAD/KJ6, KS4BF, KX6DB, KC4USV, VK9NT, VQ9AA, VQ9HB, W1ZLG/VR3, XE, ZP5OG, 9G1EB, 9M2DW and ZS7S.

G3NOF, also on SSB, raised EA9AZ, EL4A and 4YL, FY7YI, HKØAB, KG6, KS4BF, MP4TAO, VP2MC, VQ1CJ, ZS3DP, 5H3GC and 9M2DW. He heard the HKØ and KS4 expedition at various times around 0700, 1000, 1200, 1900 and 2200 — proving, as he says, that band conditions are not always as poor as we imagine, when someone actually gets on the air from a good spot.

G3DO makes a welcome reappearance in the Five-Band table, and reports SSB contacts with FK8AZ, WA6UNJ/KB6, K3GAD/KJ6, W4LPY/KM6, K1AZA/KP6, KX6BU, VP2AB, VQ9AA, VR2DS, ZC5DO and ZK2AB. And he had to go on to AM to collect VU2US/AC5—new for him, as were the KJ6's.

G3LPS, on CW, had a nice

mixed bag with ET2US, VS6EC, 4S7EC and 7NE, HS2M, 9M2FR, 6O1MT, 5R8AB, 5T5AD, KS4BF, W6GMQ/VR3, VQ9AA, KH6's and many more, including the mysterious 9A1FQ (giving QTH as "San Martino"!)

Fifteen Metres

Full of surprises again—apparently dead for hours on end and then suddenly producing the rarest of rare DX—that's what this band is like, even now. GW3AHN, whose band-score is now no less than 277, made the best use of it—with three modes. CW netted him CE3RC, CX2BT, HKØAB, UAØ, UH8, UI8, UJ8, UM8, VQ9AA, VS4RS, 4S7NE, 5H3IP, 6O1MT and 9M2FK; SSB was good for HKØAB, KR6, KS4BF, KZ5, PY, VS1DO, 5H3GC, 9G1GN, HH and HK; and AM was used for VU2US/AC5, JA, MP4TAM and 9M2AD. Tom made the first European QSO on the band with KS4BF (May 2, 1700), and then they faded out, so he may have been the only one.

G3FPK used CW and worked JA1 and 7, UD6, UF6, UI8, UJ8, UM8, VS9MB and VS9OC. G3NOF, on AM, raised TT8AL, VQ2, 5A2CX and 3TY, 5N2JKO and 2SMW, and 9G1AB. G2BLA worked EP2AR on SSB, UF6KPA on CW.

G3NWT, on AM, collected VS1, 9M2, DU1EH, ZD6RM, VS9OC, ZE2, VQ4 and 5, 5H3, 5N2 and ZS's. G3JOC, same mode, raised CR5ST, CR7's, EP2BD, MP4BDC, 4BDN and 4TAC, PY, TN8BA, TT8AL, VP9, VS9, VU2BK, VU2US/AC5, ZE, ZS, ZS4PB/ZS9 and 5N2's.

G2DC, on CW, connected with TA2AR and VQ9AA (both new) as well as EL3AF, CE3ZK, OA4KF, HKØAB, KZ5MQ, JA1 to Ø, VK6AS, VP8BJ, VU2CM, VS4RM, VS9PC, 9MB, 6O1MT and 9K2AN. He also comments on a wonderful showing of South Americans around 2000 on May 6.

G3LPS, also on CW, worked YV1GE, 5H3GC, 9U5DS, VQ5IG, DU1OR, EL4A, ET2US, VU2GC, CE1BD and 3AD, 9K2AD, 9Q5AAA, UL7, UI8, UJ8 and others.

Ten Metres

There's very little interest in Ten these days, although the band is far from dead on the North/South path, and some spectacular short-skip from Europe is beginning to appear. G3MQD took his Heathkit "Mohican" to the top of Roundway Hill, near Devizes (600 ft. a.s.l.) and, with only the four-foot whip, he logged ZE2JA, ZD6RM, CR7GF, LU4DM, PY2CCQ, ZS1CI, 5A2CR, 3BC and 3CAA, 5N2NFS, 9G1AB and sundry Russians . . . all on AM between 1615 and 1725 on April 24. He also heard 5A3TG on SSB. Hardly a "dead band"?

SWL D. Gray (Easington) heard 5A3BC say that he had worked 42 countries in six weeks, on Ten. G3NOF used AM mostly, and raised TN8AD, ZC4's, ZS's and 5A3BC. On SSB he worked VQ2AT, and he remarks that there have been openings around 1400 to the USSR and most of Africa, but the band often seems to go dead at about 1600. However, TN8AD has been S9 plus on an otherwise dead band around 1800, with South Africa coming up later still.

Many others pass up the band with brief comments, such as "not bad for South Africa," but it seems there are very few who will risk missing the DX on other bands in order to find out what Ten can offer.

There is, as yet, no sign of this band becoming popular for local QSO's (unless there are "pockets" of activity in parts of the country that are not audible in the south). Top Band seems to have an unassailable hold on the Sunday-morning natterers!

Forty Metres

There is a definite move away from Forty—the DX has become more elusive than ever, and the QRN level is coming up. So maybe it will drop quietly out for a few months. However, G2DC reports working HKØAB and "the usual W gang," and G3NYQ raised CT2AI and CT3AC around 0130.

SSB is attracting a few more to the band, but no one reports except SWL D. Hayes (London, N.3), who listened around 0700 and logged 4X4DK, ZL2AAQ, VK5ES, 3TW and 3BM.

Eighty Metres

The SSB DX gang on this band, too, are gradually finding things too much for them (meaning QRM and QRN). G2DC says "little or no DX has even been heard, but most W districts worked." SWL Hayes, again, had an interesting bag on SSB and mentions CN8IK, VP9DL, LX1TJ, ZL4OD, UB5WF, PZ1AX, KP4AXU and sundry VE's and W's. HKØAB apparently came up on SSB and worked VE7YY, but went QRT when all the W's started to call him. On CW he worked several Europeans.

Sortie to Rockall?

GM3JZK (Isle of Mull) has been offered a trip to St. Kilda by a boat-owning friend; and, of course, St. Kilda is the nearest land to Rockall, which has become famous for having all the qualifications for a new DXCC unit (as meaning "country"). A Rockall DX-pedition would make efforts like Serrana Bank and Baja Nuevo sound easy . . . the rock is 70 feet in diameter, 70 feet high, sheer-sided, and with only one narrow ledge where it is

TOP BAND LADDER

(Starting January 1, 1962)

(G3O-- and G3P-- stations only)

Station	*Counties*	*Countries*
G3PDM	65	9
G3PLQ	64	7
G3PRM	58	9
G3OXI	57	7
G3PGN	57	10
G3OLN	50	8
GM3PBA	49	8
G3PPU	49	8
G3PEK	48	8
G3ORH	44	10
G3OQT	39	14
GW3PHH	32	7
G3PHO	30	8
G3PPE	24	5
G3OHL	21	4
G3PJD	18	3

New Claims for this Table may be made at any time. Confirmations not required.

The Club station of VS1GZ, R.A.F. Changi, Singapore, is regularly on the air with five licensed operators — VS1KP/GI3MDA, VS1KQ/G3KYZ, VS1KS/GI3LNJ, VS1KT/GI3MHE and VS1KY/G3MQY — available to paddle the key. Those present on this parade are, standing left, VS1KS; seated left, VS1KT; working the rig, VS1KQ; and leaning right, VS1KP. Activity is mainly on 15 and 20 metres, running 150w. AM phone, aerials being a 350 ft. long-wire and multi-band dipole, each 55 ft. high. Receivers are an AR88D and an R.1475. The Changi Club has been in existence since 1955, and more than 200 countries have been worked by successive groups of operators serving out there with the Royal Air Force.

possible to stand upright without hanging on by the fingernails. Landing is only possible by jumping from a small boat at the crest of a wave, and clutching at seaweed (if any exists at the right spot).

Now—GM3JZK says he is prepared to make an attempt and requires "some similar foolhardy types" to help. Qualifications: Gymnastic ability, good nerve, good sailor, ample time to waste (at least a week's sailing involved, plus endless hanging around for the weather). Conditions on board will be rough, and, once on Rockall, "bare subsistence, if that."

Anyone interested in a unique DX-pedition, under these conditions, is asked to get in touch with GM3JZK right away—quite a lot of initial co-operation will be necessary. Mobile techniques will be required — the "country" is no longer than a forty-metre dipole! QTH: G3JZK, 8 Huntingdon Road, Cambridge.

The QRM-Machine

Few people seem to have realised that the appalling noise centred around 14100 kc (which makes things very difficult for DX'ers at certain times of day) is a second harmonic of the Thing on 7050 kc. But those of us who have mentally written it off as "just another UA jammer" might be surprised at G3FPK's findings. He has taken some bearings on it, and finds marked *nulls* at 080° and 285°, with peak strength observed between 150° and 180°. So where *does* it come from—the middle of the Sahara? Norman adds that he worked VQ9AA on May 7, when he was stronger than at the same time on May 6; but the reverse was the case with the QRM—indicating that it is not at the same distance as the Aldabras. A report from a 5H3 or a 4X4 should be helpful, and G3FPK is prepared to correlate all information sent to him at his home QTH—*QTHR*. However. it must be more detailed than "Heard at S9, 1800 GMT." What *are* they trying to jam on 7050 kc? And why does it go off at 2300?

DX Shorts

From G3FPK: KH6IJ expects to be in London, September 9 to 12 . . . ZB1BW is G3PEU . . . ZC4PC has the only SSB outfit in ZC4, but ZC4CS, one of the operators, has a K.W. Viceroy on order . . . VP2SX (St. Vincent) often on Twenty SSB, around 2300, 14250-14275 . . . K6CQV/KS6 on most mornings at 0700; after his phone-patch to the States he sometimes works a few DX stations (14265 kc).

Very unusual QSO for G3FPK —with W4NMK / Submerged Maritime Mobile! This was the U.S. Submarine *Cutlass*, 58 ft. below sea level off Norfolk, Va. The 12-ft. whip was pushed up with the insulator two feet above the sea! They swapped 5 & 9 reports.

PY2ON was a special station established to commemorate the second anniversary of the foundation of Brasilia (the new capital). Special QSL's are promised—*via* Box 708, Brasilia, Brazil . . . HS1W and HS1X are both in the U.S. Embassy, Bangkok; but the first runs 400 watts PEP and the second only 45. For HS1W QSL *via* U.S. Embassy, Bangkok; for HS1X, *via* WA2WCB. (Thanks to SWL D. Gray for the foregoing.)

More QSL Information

For W1MV/KP6 and K1AZA/KP6, *QSL to W1MV*. For all QSO's with Gus, W4BPD/VQ9AA and so on, *to W4ECI*. For TA2AR, *to PAØWWP*. For W6GMQ/VR3, WA6WQM/VR3 and W1ZLG/VR3, *to W6AFI*. For HKØAB and KS4BF, *to W4DQS*. Finally, any who are still short of a card from 3A2BT . . . a shortage of QSL's accounted for this, but they will all definitely be answered, either direct or *via* the bureaux, whichever way they were received.

Our Heading Picture *(p.190)*

UR2BU, Karl Kallemaa, Vaike-Tahe 14-1, Tartu, Estonia, USSR, writes good English and is a keen DX operator—he is also a regular reader of SHORT WAVE MAGAZINE through the Moscow Library Service. His score stands at 234C, including VU2US/AC5, and he holds no less than 219 DX certificates, several of ours amongst them; he has just applied for WNACA. UR2BU has been licensed for many years and was

on the air in pre-war days, when his call was ES5D . . .

Miscellany

Reverting to the subject of the Van Allen belts, G3NWT says "presumably the explosion won't affect the outer one . . . but if it is possible to fiddle with Nature to this extent, the removal of the entire ionosphere might be only around the corner. With technology at its present stage, they might fix us up with something much more reliable in its place. The only thing I'd object to is not being asked whether I wouldn't sooner struggle along with the old one."

Still with G3NWT, but change of subject: The perfect counterpart to the DX operator who says "Pse all call me 5 kc apart" . . . a lady, writing on flower arrangement, who says "Cut each stalk shorter than the others, to display the blooms to the best advantage." But worst of all is the type who says "Move down 20 kc," and then, after you have obediently done that and called for ten minutes, is found working the unprincipled type who stayed on his own frequency !

On May 10 G3NWT found the strongest "patterning" he had ever seen on TV Channel 4. Rushing home, he expected to find Ten a mass of Europeans on short-skip, but there was only an isolated Italian (50 kc outside the band-edge!). However, Fifteen was full of Europeans at S9 plus, with the usual DX in amongst them. And (final-final) Geoff comments on the fact that there is a proposition to advance the International Quiet Sun Year by at least twelve months, since the sunspot cycle is reaching its minimum much faster than was expected.

G2DC, being philosophical, calls this "a laughable incident" . . . He was on a sked with FO8AN and a very rough UA signal was blotting out the frequency with long and unanswered CQ calls. He was therefore asked to QSY, as he was on top of FO8AN, but he obviously thought he had met with success at last, since he came back calling FO8AN and giving him an S9 report! That ended the sked, and the UA was still calling FO8AN when G2DC went to breakfast fifteen minutes later.

G3FPK suggests that since there are now many more stations on the air, and fewer kc in the bands, than at the peak of this sunspot cycle, we are not doing so badly, DX-wise. The declining conditions have made the keener DX types improve their radiating (and operating) efficiency. Norman echoes our own thoughts: "A few quid spent putting the beam up another ten feet gives results comparable to spending very much more on a linear."

GM3IAA was at a real Old Timers' party when he went to the Reunion of the Royal Engineers Wireless Signals (1914-18) Association. Several well-known personalities were there, yet Jim writes "we are a dying race . . . about seventy were there, but just *one* other radio amateur besides myself. Here was a bunch of Old Timers, nearly all expert wireless operators, and yet only two with amateur callsigns in the whole lot. Perhaps the others had had too much of it."

Referring to GM3IAA's comments last month, GW3AHN misunderstands one remark: When quoting (*apropos* the RST code) "the first figure is only 4 if the second figure is 4 or less" it was certainly not meant to imply that this is how it *should* be . . . only that that is what happens. One seldom gets a 479 or 489 report, although it would be quite accurate on many occasions. Likewise reports of 549, 539 or even 529 are entirely feasible. The intention was to back up GM3IAA's statement that, in general, operators didn't give one an honest R4 report unless signals were S4 or less.

Now that so many stations have receivers with S-meters that work (after a fashion) on SSB, one hears "Five and one" reports occasionally, and GW3AHN says he even heard a "Five and Zero" being given! Incidentally, such reports are useless for DXCC, for which the minimum requirement is Three and Three.

On the subject of QRO, GW3AHN says he has heard European stations confessing to powers of 2 kW PEP . . . this would not be legal for U.K. stations, of course, but we all know many examples of 2 *x* 813, or 4 *x* 811A. Heart-cry from Tom (who has no reason to be despondent about the length of his own DX lists): "Oh, for a worldwide limit of 100 watts input . . . that really *would* sort out the men from the boys!"

Late Flash

Pacific conditions still fantastic (May 15). Between 0700 and 0830 on 14 mc CW, three VR3's, K6SKU/KS6, KM6, KB6, VR2, VK, ZL and innumerable KH6 and KL7 signals, all breaking through the EU barrier . . . Six continents heard simultaneously (14050 kc CW): K6SKU/KS6, 5N2JKO, HK7XI, MP4BBL, KL7DMD and (of course) Europeans, the latter mostly calling CQ DX! These last few early mornings have been as good as anything we had during the peak sunspot years.

And with that pleasant thought, we must leave you until next month, for which the deadline will be **first post on Friday, June 15.** Address all your news to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Before finally signing, we must acknowledge, as always, the help we have had from the WGDXC *Bulletins*, W4KVX's *DX Magazine*, the FEARL *News*, the NCDXC's *DX'er* and all our own "private ears" who gather so many useful scraps of information. Thanks again until next time. Good Hunting — and 73.

RTTY Topics

NOTES AND NEWS—
GLOSSARY OF TERMS—
POINTS ON MACHINE
ADJUSTMENT
AND MAINTENANCE

W. M. BRENNAN (G3CQE)

This feature appears in alternate months. The April "RTTY Topics" discussed a bias meter for improved teleprinter operation, and in February the main subject was printing through interference, and the use of an audio filter. Readers interested in amateur teleprinter working are invited to write in, for comment in these columns.—Editor.

A FAIRLY accurate indication of the growing interest in RTTY is the increasing number of inquiries about how and where a T/P can be obtained. Everyone who uses RTTY in this country no doubt looks forward to the day when there will be a simple and satisfactory answer to such inquiries. At present there isn't—and the only advice that can be given to those looking for machines is that they should have a word with any local amateur known to be interested in RTTY, keep an eye on their local junk shops and scrapyards and, finally, read the Small Advertisement section of SHORT WAVE MAGAZINE as soon as it arrives. It is possible to buy secondhand T/P's from a commercial organisation in this country, but at prices ranging from £30 upwards. Also, every now and again an RTTY amateur has the pleasure of channelling a machine to someone who has been searching for one for quite a time. Still, for the average amateur with a limited amount to spend, the acquisition of a T/P is a real problem. However, commercial organisations do move with the times, and as new models of T/P's are designed, so the older ones are discarded. Perhaps the time is not too far distant when the whole situation will be much easier—and, when it is, the writer will try to persuade the Editor to print the news in colour!

DX Round-Up

Band conditions have been rather variable on both 15 and 20m. As far as trans-Atlantic contacts are concerned, with the longer days, the best times for working into the U.S.A. on RTTY have been rather late at night. However, more often than not at such times, signals are very good and, it being early evening in the States, there are more RTTY stations on the air.

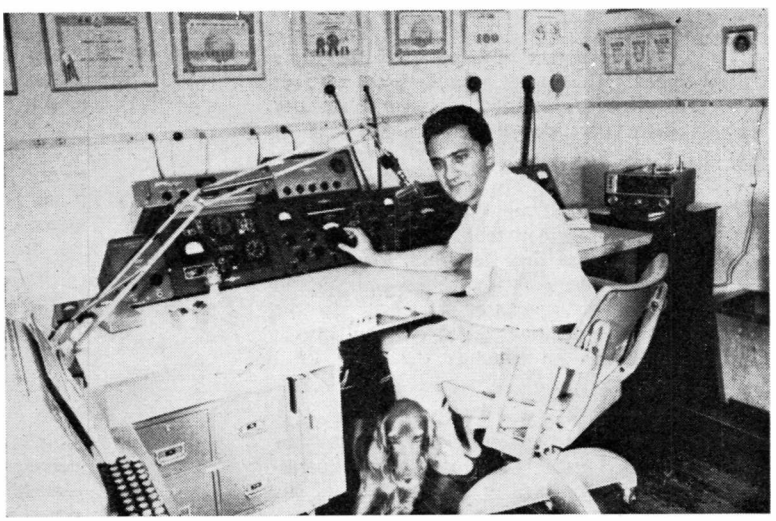
ZS6UR is the latest addition to the active RTTY community in South Africa. His first QSO was with K3GIF, followed quickly by others, with KR6MF, ON4HW, ZS1FD and VK3KF, leaving only a QSO with South America necessary to complete the RTTY WAC. ZS6UR is running a Creed Model 7B machine, HT-32 transmitter and a Mosley TA33 beam. He also says that ZS6ARL has a Creed Model 3 and hopes to be using it on the air shortly.

K3GIF reports another couple of newcomers, this time KP4GN and KP4AEB, both active on 15 and 20 metres. Two other recent new ones, OA4BN and PY2BCD, will help to provide more activity from South America.

Asia, too, looks like becoming easier to work on RTTY since KH6IJ is moving to Pakistan, where he hopes to keep his RTTY going, and WØNMH (better known on RTTY as KR6AK) is also moving to Viet-Nam, where he hopes to rattle out a few bauds if permission is forthcoming.

V.E.R.O.N. RTTY News Bulletin

This bulletin continues to be a weekly highlight for European RTTY operators. The whole PAØAA transmission schedule has been changed recently and the broadcasts take place on Friday evenings, the RTTY transmission at 2030 GMT. The change of time does not seem to have made the service any less effective, since 100% copy has been reported by many U.K. stations, including G2UK, G2FUD, G3HVB, G3NES, G3LLV, G6CW and GM8FM. G6CW also reported hearing the 2-metre transmissions of PAØAA at the same time as the 3625 kc one. The RTTY Bulletin from V.E.R.O.N. recently included an RTTY "picture," too! [over



TG9AD, Box 514, Guatemala City, Central America, is a well known DX/RTTY station, running a Model 15 T/P, with a Collins KWS-1 transmitter and 75A4 receiver. As the wall decoration suggests, he holds a number of DX certificates.

Glossary of Terms

It has been suggested that a glossary of RTTY terms would be useful to newcomers to RTTY—and to the general reader, too, for reference. Certainly, there are a number of such terms that will be unfamiliar to many amateurs, and to add to the confusion, the same item of RTTY gear may have a different name on either side of the Atlantic. Just as "plate" and "anode" mean the same thing, so does "tape transmitter" and "auto-Tx." However, the amateur quickly comes to accept either. Here, then, are some of the most often encountered RTTY terms:

Audio Frequency Shift Keying (AFSK):
The transmission of two tones, one for the mark and the other for the space signal by means of either amplitude modulation (A2), or by frequency modulation (F2). Convention is that 2.125 c/s denotes the "mark" signal and 2,975 c/s the "space."

Autostart:
A system for the unattended reception of messages at pre-arranged times. The receiving station is switched on and off by a time switch. The T/P is started by the reception of a signal on the station receiver and is switched off when no signal has been received for more than two minutes — or some similar fixed period.

Auto-Tx:
A machine which accepts perforated tape and scans the perforations, translating them into the five code elements of the RTTY signal and automatically adding the start and stop pulses to complete the signal.

Baud:
A measurement of telegraphic signalling speed. The speed in bauds is the number of pulses transmitted per second, *i.e.* fifty pulses per second denotes a speed of fifty bauds.

Bias:
A mechanical or electrical force continuously applied to a polarised relay to enable it to operate from a non-polar signal. A polarised relay may also acquire an unwanted bias due to the incorrect positioning of its contacts in relation to the armature.

Bias Distortion:
A distortion of the RTTY signal in which the duration of either the "mark" or "space" pulse is increased with a corresponding decrease in the duration of the other pulse.

Code Elements:
The five pulses of the RTTY signal which convey the information as to which character is being transmitted.

Converter:
The RTTY Converter (or Terminal Unit) is the apparatus which accepts a two-frequency RTTY signal — *see* AFSK above — from the receiver at either an IF or an audio frequency and converts it into a DC signal suitable for keying the T/P. A converter usually consists of a limiter stage followed by a discriminator, a DC amplifier and a keying stage.

DC Loop:
A local keying circuit interconnecting various items of RTTY gear with each other and/or with the station transmitter or receiver.

Double-Current Operation:
A system of signalling in which the current flow in one direction indicates a "mark" signal and in the reverse direction a "space" signal. For example, "mark" could be indicated by a positive voltage relative to earth and "space" by a negative one.

Downshift:
The action of the T/P printing mechanism when it changes over from printing figures to printing letters.

Electromagnet:
This is the name given to the keying relay of various models of T/P's, etc., made by Creed & Co., Ltd.

Frequency Shift Keying; (FSK), F1:
A form of frequency modulation. As far as amateur RTTY operation is concerned, a carrier is transmitted on a given frequency to denote the "mark" signal and is shifted 850 c/s lower to denote the "space." FSK is FM with a deviation of plus and minus 425 c/s. The actual FM centre-frequency is never transmitted, since when no information is being passed, the "mark" signal is going out, *i.e.* the centre frequency *plus* 425 c/s.

Local Copy:
A monitoring copy of the information being sent on the T/P keyboard reproduced by the receiving side of the printer being used for transmission.

Narrow Tape:
This is the $\frac{3}{8}$-in. wide tape on which the message is printed by such T/P's as the Creed Model 3. This tape is also sometimes referred to as "slip."

Page Printer :

A teleprinter which produces printing on a continuous sheet of paper, the width of which is approx. 8½ inches.

Perforated Tape :

A tape on which the T/P message is recorded as a series of perforations. Each perforation corresponds with a code element that is a " mark " signal. *(See* " RTTY Topics," p.312, Aug. 1961 SHORT WAVE MAGAZINE.) This tape is 11/16 ins. in width and it is intended for use in conjunction with an Auto-Tx.

Perforator

A machine used to produce the perforations in the above tape. It has a keyboard which is linked either mechanically or electrically to the punching head.

Polarised Relay :

This is a type of relay which responds to the direction or polarity of the current applied to its operating coils. A current in one direction will cause the armature to move from one contact to another, and a current of the reverse direction is required to restore the armature to the original position. Such relays are widely used in RTTY.

Polar Operation :

See "Double-Current Operation."

Reperforator :

A machine which can be keyed by a T/P signal, say, from a T/P keyboard or from the output of a T.U., and which will produce perforated tape corresponding to the signals fed to it. Such a machine can be used, therefore, to " record " a signal for future re-transmission.

Reversals :

A series of RY's often used for testing T/P circuits. Neglecting the " stop " and " start " pulses, the code combination for R is the reverse of that for Y, hence the term.

Selector Magnet :

The keying relay of a T/P *(see* " Electromagnet ").

Shift :

The total deviation of an FSK signal, or the frequency difference in the two tones of an AFSK signal. Normally 850 c/s in both cases.

Single-Current Operation :

A system of signalling in which the line current excursion is between positive and zero, or alternatively negative and zero, to denote the " mark " and " space " signals.

Slip :

See " Narrow Tape."

Strip Printer or *Tape Printer :*

A T/P which produces its printing on narrow tape.

Tape Transmitter :

See " Auto-Tx."

Terminal Unit :

See Converter.

Transmitter Distributor (TD) :

A machine which performs the same function as the Auto-Tx, though the manner in which it does so is somewhat different.

Typing Perforator :

This machine is similar to the reperforator but provides the additional facility of typing the character that has been punched on the tape.

Typing Reperforator :

Similar to a reperforator but also provides a printed record on the tape of the characters punched on the tape.

Unshift On Space :

An optional facility provided by some teleprinter manufacturers whereby the T/P printing mechanism will change over from printing figures to letters upon the receipt of either the normal " letters " signal or the character space signal.

The Cost of RTTY

Visitors to an RTTY station often remark that the running costs of such a station must be high. Usually they are referring to the cost of the paper used by the T/P. Since the paper for page machines may be obtained for little more than the cost of scrap paper, 7s. would easily cover a year's supply, even if both sides of the paper were not used (as it usually is). The narrow paper for tape machines has to be purchased new, and so may cost the operator something like £1 for a year's supply. The typing ribbon for a T/P is about 5s., and this should also last for about one year with a little care. However, some amateurs seem to have to replace ribbons three or four times a year, which indicates that some attention is required around the typehead area! The spacing between the typehammer and the typehead is adjustable on most machines, and this can be set a little wider when a new ribbon is in use. This prevents excessively heavy black typing and waste of the ribbon ink. As the type becomes lighter, the hammer can be moved near to the typehead. Few amateurs wish to make carbon copies of their copy, and so the wider gap is no disadvantage. Reversing the ribbon spools and so turning the ribbon upside down often gives it a further lease of life and, finally, more service can be squeezed out of it by placing the spooled ribbon in a tin lid in which there is about a ⅛-in.

depth of turps. substitute, to which has been added a few drops of oil. The ribbon is left to soak for some hours and then removed and left to dry out sufficiently to enable it to be replaced on the machine. Quite often T/P ribbons become frayed after they have been in service for only a short time. This is either due to incorrect adjustment of the ribbon jumper or to sharp edges on the jumper, and this should be looked into. Once a ribbon does become frayed, it should be replaced, since the frayed threads can wind themselves around the typehead and have actually been known to pull the ribbon jumper into the rotating typehead, with disastrous results!

As with most other machinery, it pays to give a teleprinter a critical check over from time to time to see if any T/P types of gremlins are nesting in there.

BCNU in August; meanwhile, keep it running. *73 de G3CQE.*

• • • The Mobile Scene • • •

TRENTHAM AND THANET MOBILE RALLIES REPORTED AND ILLUSTRATED — PROGRAMME OF EVENTS TO COME

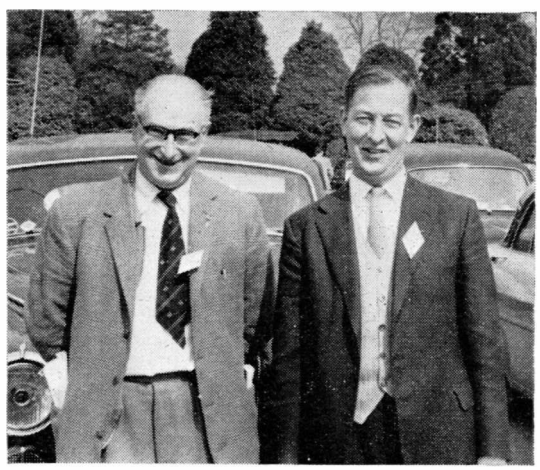
WITH the Rally season now well under way, there is a good deal to report and discuss this time—starting with the Trentham Gardens event (for which we are able to show a selection of interesting photographs), and outlining the programme for some of the Mobile Rallies yet to come.

The *Trentham Gardens* affair on *April 29* was the first of the 1962 season, at which the number of cars actually fitted mobile was about 250; of these, 90% or so were on Top Band (as ever) and the greater part of the remainder on two metres—so the pattern has not changed much! Talk-in was by G3GBU/A (Stoke-on-Trent Amateur Radio Society) on 160m., and G3MAR/A (provided by Midland Amateur Radio Society) on two metres. The attendance was drawn from a very wide area — Trentham is better situated geographically than almost any other Rally *venue*—and the enthusiasm for it was underlined by the presence of a 13-year-old youngster who had found his own way from Liverpool, just to see the mobiles. The attendance overall was significantly greater than last year at this event, under similar weather conditions, showing an increase of 25% in /M-fitted vehicles alone. This is the most reliable way of judging the attendance in the strictly mobile context because—as all who have been there will know—any such event at Trentham also gets the unexpecting support of large numbers of general-public; the reason for this is that Trentham is a show-place open through the year, with full catering facilities and all amenities for public comfort and entertainment.

Apart from the attractions of the *locale*, the radio interest included an exhibition supported by a number of firms and several neighbouring radio societies; a raffle through which about 80 prizes were distributed; and an evaluation of mobile installations for merit awards; these latter went to, among others, G3BMN (whose loading-coil design is said to have created a national shortage of plastic knitting needles in the No. 12 size — *see* SHORT WAVE MAGAZINE, August, 1961), and also to G3FUR, G3GGR, G3GTN, G3IPL, G3JFH, G3LHA, G3LZY, G3OVM and G8CK.

Obviously, the in-coming 250 /M vehicles meant that, from the point of view of the organisers, the Rally was a heartening and rewarding success. Trentham is always a co-operative effort by the Midland and Stoke Amateur Radio Societies, and this year the chairman of the management committee was G3JPN, with G3BA, G3NAQ, G5PP and SWL H. Parker as working members. They are to be congratulated on the results of their efforts, and they will have the thanks of all who again enjoyed Trentham. The committee had the considerable assistance of the local manager at the Gardens, and the R.A.C. provided Rally sign-posting on all the access roads — a useful feature to be borne in mind by other Rally organisers, as not everyone can ring up the appropriate talk-in station.

By reason of its location in the S/E corner of England—and also a day of very off-putting Wx, as well as a most unfortunate clash with another similar event in the same area—the *Thanet Radio Society* could not expect a very large attendance for their



Two well-known mobiles—left, G6MN (Worksop), "Eric the QSL," on Top Band and 80 metres; and G3APY (Sutton-in-Ashfield) who is /M on two metres. Both were at the Trentham Rally. *A G5CP print*

Seen at the Grantham Mobile Rally, at Belton House, Lincs., on May 13. Left to right: G3MZB, G3ESR, G3BCA and G3PTI. In fine but rather cold weather, about 50 cars were checked in, and prizes were given for the best /M installations. The chilly wind made it an earlier dispersal than usual. *A G5CP print*

Rally at Pegwell Bay, Ramsgate, on *May 6*. Nevertheless, they got about 100 people, and 15 cars fitted mobile, all on Top Band. Prizes went as follows: Best home-built Tx, G3NPU/M; best Rx, G3ONR/M; safest mobile rig, G3IEX/M; and longest-distance traveller, G2AVC/M, with xyl G3GOX (who were featured in the London *Evening Standard* of May 8, and you can guess in what picturesque language). The Thanet organisation was in the hands of G3BAC, G3BKT, and their chairman, SWL N. Cramp, with G3DOE/A coping with the talk-in.

Following are the events scheduled for June, and onwards:

June 17: West of England Mobile Rally, Longleat, nr. Frome, Som., approached on the A.362, Frome to Warminster. Talk-in will be by G3CHW/A on 1880 kc, and G3GYQ/A on two metres; visiting mobiles are particularly requested to avoid QRM'ing their channels at the close distances. The Rally programme includes operating contests, a *concours d'elegance*, treasure hunt, DX balloon race, prize draw, and a small equipment display. There is also the opportunity to visit Longleat House itself, one of the finest of the stately homes, set in a magnificent park, and owned by the Marquess of Bath. As Longleat is another of the regular showplaces, there are good catering facilities on the site, for those not taking a picnic. There is a small per-head entrance charge. Any further details from: J. Tanner, G3NDT/T, 20 Hughenden Road, Clifton, Bristol, 8. *(Bristol 34366.)*

June 24: For the Amateur Radio Mobile Society's annual Rally at the U.S. Air Base, Barford St. John, near Deddington, Oxon.—off the A.423, Oxford-Deddington-Banbury, turn west at Deddington on to B.4031—a good programme includes, as well as the usual rally features, proper arrangements for the distaff side and the small fry, an AFEX (American Service) roving canteen, special prize events, a raffle, and visits to the U.S.A.F. radio station on the site (which is an ex-RAF satellite airfield, and therefore there are ample parking facilities). Talk-in will be by G3NMS/A on Top Band, with other stations running SSB on the DX bands and talk-in on VHF. Every licensed American amateur known to be in Britain is being asked to the Rally as a guest of A.R.M.S., so there should be a good turn-out of exiled W/K's. Additional information from: N. A. S. Fitch, G3FPK, hon. secretary, Amateur Radio Mobile Society, 79 Murchison Road, Leyton, London, E.10. *(LEYtonstone 6700.)*

June 24: As already notified, on the same day as the A.R.M.S. affair in Oxfordshire, the Bridlington & District Amateur Radio Society have their Rally at Bridlington, on the Yorkshire coast. The meeting point is the Spa Royal Hall, which can accommodate 3,000 people if the Wx is wet—so no need to

The Trentham Gardens (Midlands) Mobile Rally on April 29 was opened by the Lord Mayor of Stoke-on-Trent, accompanied by the Lady Mayoress, and here is Alderman Wm. Hancock, J.P. (who is an electrical engineer) at the knobs of the Heathkit DX-100U. Front-row personalities are, left to right: G2ATK, G3UD, G8IX and G3EHM (background), representing the M.A.R.S. and Stoke-on-Trent groups, who between them laid on the Rally.

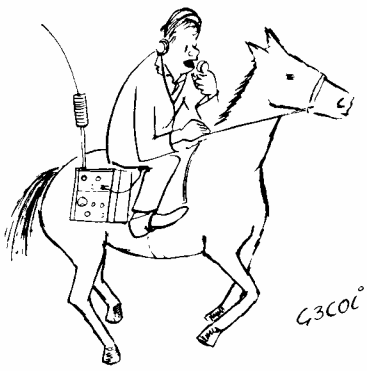
At the Trentham Mobile Rally on April 29, one of the stands was manned by cadets of 238 A.T.C. Squadron, using their own equipment; this was operated both on their 5 mc point-to-point network under their A.T.C. callsign, and for 80m. talk-in signing G3COY/A. He is Sigs./Trng. Officer of this very active Squadron, several members of which are u/t for the R.A.E. When this photograph was taken, G3MGG/M was being worked on 80m. G3COY himself is at centre, back, in uniform, when he becomes Flg./Off. V. J. Reynolds, RAFVR(T).

With one of the well-known beauties of Trentham Gardens—G6GR (left), and G8CK. Both are keen /M operators. We don't know about her. *A G5CP print*

worry about that—and if it is fine and warm (who knows, it might be!), well, Bridlington is a pleasant seaside town with all the appropriate amenities. The Spa Royal Hall is ideally placed near harbour and sands, and special parking enclosures are being provided on the promenade. Those wanting a meal (at about 4.30 p.m., 7s. 6d. per head, in the Spa Hall) *must* book in advance—*see* QTH below. The talk-in stations, G3GBH/A on 160m. and G3FKV/A on 2m., will be on the air from 11.0 a.m. After the get-together up to 1.0 p.m., scheduled events include a specially devised mobile radio ramble over a 20-mile course; a lecture on Interference Suppression (by G3GBH, an authority on the subject); judging of the mobiles for various prizes; and then, after tea, the raffle draw and prize presentations. Further details and tea bookings: I. C. Purves, 10 Meadow Road, Bridlington, East Yorkshire.

July 1: Worthing & District Amateur Radio Club annual Bucket-and-Spade Party, Beach House, by the sea—for mobiles, passive resisters, harmonics and all with any interest in Amateur Radio and a taste for a day out under real bucket-and-spade conditions. Details from: P. J. Robinson, G3KFH/T, 46 Hillview Road, Worthing, Sussex.

July 8: For their North-Eastern Mobile Rally at Bents Park Recreation Ground, South Shields, Co. Durham, the South Shields & District Amateur



Radio Club are arranging competitive events to be held at the site, starting at 2.0 p.m., and also one that is different: On the day of the Rally, from 0001 BST onwards, it is open to all Top Band mobiles to work as many other /M's as possible, bringing their logs with them to the Rally for evaluation. The talk-in station will be on 160m. only, signing G3DDI on 1980 kc, and opening at 11.0 a.m. Light refreshments will be available in the grounds throughout the Rally period. The hon. secretary, S.S. & D.A.R.S., is: D. Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham, who will be glad to give any further information.

In the case of Mobile Rallies scheduled as follows, further details will be given in the appropriate issues, as the information is received from organisers. This must reach us by the following deadlines: June 15, July 13 and August 17 for the next month's issue, addressed "Mobile Rally — Attention Editor."

July 14: Southern Counties Mobile Rally, on Southampton Common. *(Note that this is a Saturday.)*

July 15: Harlow Mobile Rally, Harlow New Town.

July 15: Mobile Rally organised by Chiltern Amateur Radio Club at West Wycombe Estate, near High Wycombe, Bucks.

August 19: Annual Rally, Derby and District Amateur Radio Society, Rykneld Schools, Derby.

August 26: Stockport Radio Society Mobile Rally at the Pavilion Gardens, Buxton, Derbyshire.

September 9: Rally organised by the Thames Valley Amateur Radio Transmitters Society.

September 16: Annual Lincoln Hamfest and Mobile Rally, organised by Lincoln Short Wave Club.

As in previous years, we hope to have reports and photographs for publication covering all Rallies listed here for the season. This has been a regular feature of SHORT WAVE MAGAZINE during the summer months ever since we first started covering Rally events, 'way back in 1955-'56. It is now nearly seven years since the first-ever Mobile Rally was held in the U.K., near Oxford on a sunny afternoon in October, 1955.

In compiling their Rally reports—which should reach us as quickly as possible after the event—organisers are asked to give special attention to the matter of getting a reliable estimate of the number of vehicles actually fitted mobile, together with the totals of mobiles worked by the talk-in stations. For us this information comes under the heading of "vital statistics."

MORE "HAMS" ON THE BBC

In their "True Story" playlet series, in the Light Programme on Tuesday evenings, the choice for May 15 was a piece with the alluring title *"Calling CQ."* After an introduction in the worst sort of stunt-reporting style, liberally larded with—yes—the word "ham," the first item dramatised the *Yasme* episode of some years ago, when Weill was shipwrecked. The second covered one of those rare-drug appeals. This was quite well done, except that the operating procedure was totally unrealistic—indeed, laughable, to the extent that when the desperate DL operator told the anguished wife that "somebody must answer soon," one felt that it was the cue for Hancock. Various call-signs were bandied about—DL3PG, GM3JC, G3HFW, G3ESS (apparently intended to be G3EES, and said to be known as the "English Ecclesiastical Station") and G8MM—while the station commander, Hendon, was promoted to "the A.O.C.," who had to be got out of bed to authorise an aeroplane to fly the precious stuff to Celle. The author of this not very convincing (and, to your reviewer, rather irritating) dramatic presentation was one Bob Kesten, who also played the part of an American amateur operator.

We don't know who Mr. Kesten is, but he and his producer have a good deal to learn about this sort of thing—and it is about time the BBC itself grasped the fact that, to U.K. radio amateurs at least, the word "ham" is an offensive appellation. It would be interesting to know how, and who by, the BBC is advised on Amateur Radio matters. The Hancock affair of some months ago had to be taken right out of its context to make it funny. It *was* funny, but in the wrong sort of way for Amateur Radio—or are we being just an old fuddy-duddy?

". . . . Am not joining in any more nets or round tables . . . ."

VHF BANDS

A. J. DEVON

Improved Conditions and Increased Activity—

Some EDX/GDX Worked—

Results on Both Bands—

Meetings, News and Station Reports—

AS forecast in last month's preamble, an uplift in VHF conditions duly occurred after Easter and, generally speaking, the period since has been distinctly better than anything that has gone before this year. However, we have not yet had a really widespread nor sustained opening—nor shall we until the general weather situation improves considerably, with stabilised anti-cyclonic conditions. And, at the moment of writing, there is not much sign of that, with the Spring already about a month late.

What might be called the Easter opening occurred over about April 24-27, peaking on the 25th, and this condition is clearly shown on the barograph trace; the evening of April 30 showed good N/S conditions for England; then, from about May 8 onwards, the glass started moving downwards again, with severe irregularities over the following 10-12 days, so that nothing much could be expected.

Sunday, May 6, saw considerable contest activity, with quite a number of portables out. under pretty miserable weather conditions for most of them. The day was generally cloudy and raining, with some bright patches. and the only real break as regards conditions was a brief auroral occurrence in the afternoon, which brought some GM's into England for a short time.

Because on these contest occasions many portables are well sited, putting out strong signals from high ground, and working numerous fixed stations over quite considerable distances (mainly by reason of the site advantage) there is a tendency to rate conditions as good when, in fact, they are no better than average; it is the activity that is good, with the whole band sounding busy and occupied. In fact, for some, too occupied, in that, on May 6, there was a good deal of cross-modulation and QRM, affecting particulary those groups of /P's who had adopted the same site area! The neighbourhood of Dunstable Downs and the Peak District sounded distinctly over-crowded, and some pairs of stations could only work in reasonable comfort in the *null* of one another's beams. Certain sites are well recognised for portable work, and are regularly used year after year, more often than not by the same stations. While it is, of course, open to anyone to go where they like, for mutual comfort and convenience it would be better to spread out a bit more; there are plenty of excellent sites available, which can be picked by careful study of the Ordnance Survey sheet and some preliminary reconnaissance.

To get back to the contest itself: ON4AB/P was as welcome as he was unexpected, and must have been on a very fine site, with good equipment, as he worked a number of U.K. /P's under the rather dull conditions prevailing; he was a readable signal in the South Midlands for most of the day. Some of the scores noted, in terms of stations worked, were: G3EFX/P, nr. Oxford, 81 at 1850; G3MTI/M, on Worcester Beacon, 77 at 1850; G3PIA/P, nr. Wantage, 94 at 1820; G3JZW/P, nr. Luton, 58 at 1735; G3FD/P, one of the group of /P's nr. Dunstable, 62 at 1755; and G3KEU/P, nr. Swindon, 39 at 1720; G3MAR/P raised 109S. A party consisting of G3GMR, G3JZN and G3KMS, signing GW3JZN/P, made what G3KMS calls "the arduous journey from Macclesfield to Drum Mountain" (nr. Conway, in Caernarvonshire) and worked a total of 105 stations. including seven GM's; they found the *Ar* opening in the afternoon, but, according to G3KMS, "nothing rarer than GI and GM was heard." The best DX noted was GC2FZC. repeatedly called. At this /P site, they were able to keep warm by *snowballing!*

As so often happens on these contest occasions, there was a distinct improvement in conditions *after* the closure—but by then the activity had died down.

Credit Where It Is Due

Last time, it was said in this space that the GB3GEC beacon on 431·5 mc is operated from the G.E.C. establishment at Wembley. Not so—it has been gently pointed

70 CENTIMETRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1961

Starting Figure 4

From Home QTH Only

Worked	Station
18	G3KEQ, G3NOX/T
17	G3LQR
16	G2FNW
14	G3KPT
12	G2CIW, G3HAZ, G3NNG
10	G3JHM/A
9	G3LHA
8	G3HWR, G5UM
6	GW3ATM
5	G3FIJ, G5QA

This Annual Counties Worked Table is reckoned from September 1st, 1961 and will close on August 31st, 1962. All operators who work four or more Counties on the 70-centimetre (430 mc) band are eligible for entry. Counties should be claimed as they accrue, and otherwise the rules are as for the Two-Metre Annual Table

out to us that the signal comes from the M-O Valve Works in Hammersmith, London, W.6, this firm being a subsidiary of the G.E.C. The array is beamed on The Hague, *i.e.*, there is not much effective radiation in any other direction; the transmitter gives 500w. output; and the PA side consists of a 4X150A driving a 4X250B. This is a lot of power on such a frequency under CW conditions, and the transmitter—which was designed throughout by the staff of the M-O Valve Co.'s Applications Laboratory — has several interesting features.

Some Recent Meetings

A report from GM3DIQ says that the GM/VHF Convention on April 28 was again very successful, with the largest local attendance (44) yet recorded, and what Clarke describes as "a magnificent raffle."

Then, on May 1, a dinner-meeting was held at Overton-on-Dee, Flints. (*see* photograph p.206), supported by a number of VHF operators from the Salop-Cheshire area. The gathering was organised by G3ASC (Oswestry) and G3EWZ (Chester) by over-the-air contact, and there were, in fact, many more wishing to attend than could be accommodated. In the end, the count was 17 Tx men and one keen SWL — and there is every intention of arranging another such occasion.

On May 19, the London VHF Convention attracted a very good attendance, some 100 places being taken for the dinner with which the day wound up. There were some informative lectures during the afternoon; a home-constructor equipment display; and one of the speeches of the evening was made by Mr. W. A. Kirkpatrick, of the Radio Branch, Radio Services Dept., G.P.O. It is interesting to see how these VHF occasions have developed from the gatherings initiated and first organised many years ago by SHORT WAVE MAGAZINE—and held not only in London, but also in Nottingham, Manchester and Cheltenham as well. These were all dinner-meetings, and attracted large "non-partisan" attendances, as the records show.

The Scilly Is. Expedition

For those who will be pursuing GB2IC on Scilly during June 16-29 (and they will be many), the transmitting frequency will be 144·03 mc. Some advance information was given in this space last time, and G3OZF assures us that they will do their best to work as many stations as possible on two metres. This expedition will depend, more than most, on conditions for its success on VHF — the distance from London to St. Mary's is a good 280 miles. Stations in EI and GC are, however, within easy range, over favourable paths. Contacts with GB2IC will score as for a county.

70-Centimetre Items

G3HWR (London, N.W.3) worked G3ODR in Herts. for another county in both tables. At the beginning of the period, G2CIW (Birmingham) raised G3KEQ, G3LTF and G3NOX/T and now has 12C in the Annual for the 70 cm. band. G5QA (Exeter) gets one more with G3EHY for Somerset.

A new station on 70 centimetres is G3PUR/T (Worthing), who has a QQV06-40 tripling in the Tx output stage, a 16-ele stack with mesh reflector, at about 90 ft. a.s.l., and a converted P.58 as receiver. G3PUR/T acknowledges the great assistance he has had from G3JHM, locally, who is also a useful contact for development work.

Around Two Metres

The clip this time is a pretty thick one, reflecting the better conditions and consequent increased activity. G2AHY (Crow-

Nice gainy two-metre mobile array carried by G3BAK/M (Stockport), consisting of two halo's, stacked. As well as gain, such an arrangement would give a marked increase in directivity—which might be thought a disadvantage under mobile conditions.

thorne, Berks.) now has a 5-ele flat-top, energised from improved shack accommodation, and moves up four in the Counties tables. G4LU (Pant, Salop) makes claims for both tables and is now at 47C in the Annual and 54C in the All-Time; he gets about quite a lot as GW4LU/M, and always attracts business.

G6XY (Kenilworth) is back on again after a break of no less than six years. A change of QTH necessitated a fresh start, and the Tx is now a 12AT7 osc./mult. into a 5763 tripler driving a QQV03-10 to 15 watts, modulated by a pair of 6L6's, soon to be replaced by a 6AQ5 modulator; the new beam is a slot-fed 4/4 at 25 ft., and a Nuvistor converter is in hand. G6XY says the band is very noticeably more active, with many new stations on in addition to the old stagers.

TWO METRES
COUNTRIES WORKED
Starting Figure, 8

20	G3HBW (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP)
19	G5YV (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OE, OK, ON, OZ, PA, SM, SP)
19	G3CCH (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, OE, OH, OK, ON, OZ, PA, SM, SP)
18	G3LTF, G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, LX, OK, ON, OZ, PA, SM, SP), ON4BZ
16	G3GHO, G3KEQ, G5MA, G6RH, G6XM, PA0FB
15	G2XV, G3AYC, G3FZL, G4MW, GM3EGW
14	G2CIW, G2FJR, G2HDZ, G3BLP, G3FAN, G3HAZ, G3IOO, G3JWQ, G3KPT, G3WS, *G5BD*, G6LI, G8OU, OK2VCG
13	G2HIF, G2HOP, G3BA, G3CO, G3DKF, G3DMU, G3DVK, *G3GPT*, G3NNG, G5DS, G6XX, G8VZ
12	EI2W, F8MX, G3EHY, G3GFD, G3GHI, G3JAM, G3OBD, G3PBV, G3WW, G5CP, G5ML, G8DR, GW2HIY
11	G2AJ, G2CZS, G3ABA, G3BDQ, G3GSO, G3IUD, G3JZN, *G3KUH*, G3LHA, G4RO, G4SA, G5UD, G6XA, OK1VR
10	G2AHP, G2AXI, G2FQP, G3BK, G3BNC, G3DLU, G3GSE, G3KQF, G3LAR, G3MED, G3OSA, G5MR, G5TN, G8IC, GC2FZC, GW3ATM, GW5MQ
9	G2DHV, G2DVD, G2FCL, G3FIJ, G3FUR, G3LTN, G4LX, G8GP, GC3EBK, GM3DIQ
8	EI2A, G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKX, G3GBO, G3HCU, G3HWJ, G3JHM/A, G3KHA, G3MPS, G3OHD, G3VM, G5BM, G5BY, G8SB, GW3MFY

From down in Cornwall, G3OJY (Penzance) asks us to make it clear that it is now all Go on two metres in those parts, the following being active: G2BHW, Falmouth, 144·46 mc; G3JFS/M, from Helston, 144·275 mc; G3CZZ/M, from Redruth, 144·065 mc; G3XC, St. Columb, 144·135 mc; and G3OJY himself on 144·130 mc. There is a possibility of more stations coming on in Cornwall "if there was shown to be an increased interest in working the county" (says G3OJY). Well, of course, for most of the U.K. Cornwall is GDX, and naturally there *is* great interest in working them. G3OJY himself has been out /M recently, and from The Lizard made a number of G/GW contacts, also F2NX, 180 miles across the water at Granville. The stations on regularly are G2BHW, G3XC and G3OJY, their times of operating being from 8.0 p.m. onwards most evenings, and after 10.30 on Sunday mornings; G3CZZ/M is out most Sundays at a site 750 a.s.l. near Redruth, during 10.30-1.0 p.m.

G3NUE (Worcester) started on two metres in November last, and has got to 24C in the tables; during a spell in hospital, he was able to get round sister, and was allowed on the two-metre air, with the equipment fitted into a cradle made to hook under his bed, the aerial being a rotatable dipole fixed to the back of the bed! Under these rather unorthodox and somewhat unpromising conditions, G3NUE managed quite a number of contacts, and was also able to hear GB3VHF. The gear at present in use consists of a 5-stage Tx with a QQV03-20A in the PA, running 35w.; the Rx is a rebuilt RF-27 Unit with a 6CW4 pre-amp.; and the aerial is a 6/6 slot-fed J-Beam, shortly to be pushed up to 45 ft.

G2CIW (Birmingham) says that the April opening did not produce much in the way of EU's in the Midlands; however, on the 27th Jack worked EI2A, and heard EI2W and three GI's; five more counties for the Annual were picked up during the contest on May 6, with G3KEF/M for Hunts. also worked.

Bob at G5MA (Great Bookham, Sy.) got into F, DJ/DL, ON and PA during the April opening, and has also had CW contacts with GI3FJA (Belfast); the contest

On May 1st, a group of keen VHF types in the north-west Midlands area arranged a private get-together at the "Cross Foxes," Overton-on-Dee, Flints., at which a total of 18 met for dinner — the numbers actually wishing to attend were much greater, but the accommodation dictated the limitation. In this photograph are, left to right: G3IOO, pointing at camera; G4LU in earnest conversation with G3ENY; G3AOS, and G3ASC, who made the arrangements. The chairman for the evening was G3EWZ. This meeting was so successful and enjoyable that already there are plans for "next time."

produced three rare counties—Cornwall, Caernarvon and Montgomery—so Bob is now at 60C in the Annual, level-pegging with G2CIW. G3GSO (Derby) also moves in the Annual, and mentions 26 /P's heard during the contest, his best DX being G3PNA/P in Surrey. G3FIJ (Colchester) is able to make claims for all tables on both bands, and now has 412S worked on two metres, with 5C on 70 cm.; he mentions that the tests are proceeding on 23 cm., with G3LQR, but with no result so far.

G3NPF (Southend - on - Sea) breaks his "100S worked" with 103 stations in four countries now booked in, all with 20w. and an indoor 4-ele Yagi. G3BOC (Willaston, Wirral) has been on two metres for over ten years—

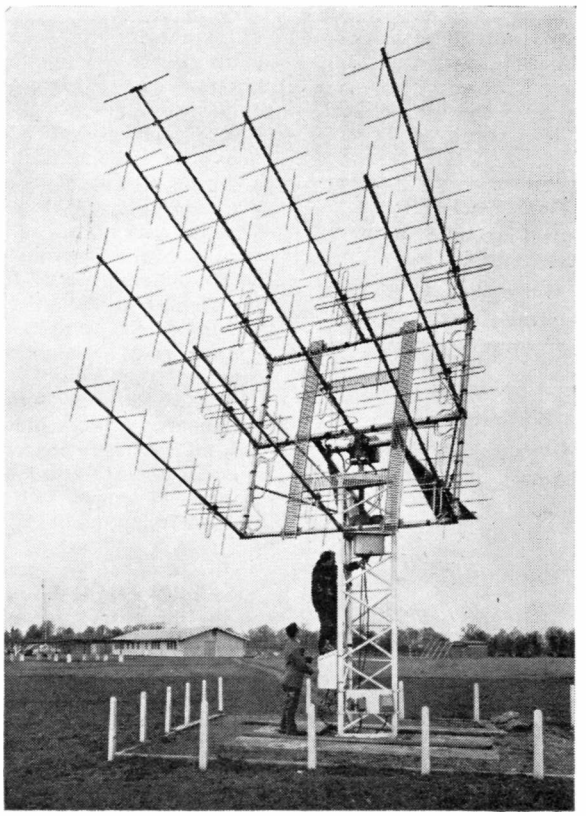
SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

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

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



The remote-controlled steerable Yagi array at the Winkfield station of the Radio Research Board, and now in use for keeping in contact with the U.K. satellite "Ariel" on 136.41 mc. Eight of the 3 x 3 sections are phased to work as the receiving aerial for the satellite ¼-watt transmitter; the ninth section, in the centre, is for transmission to "Ariel." The whole array is controlled from the Winkfield operations room.

and again this year will be at Brora in the very rare county of Sutherland, signing GM3BOC/A for a couple of weeks or so w.e.f. August 27; he will have what he describes as "rather better gear." with 30w. to a QQV06-40 *(QTHR* for skeds). During the short aurora opening on May 6, G3BOC raised GM4HR, who told G3BOC he had worked every station he'd heard *via* aurora, amounting to about half - a - dozen contacts. And G3BOC adds that G3IOE might like to know he is getting into the Wirral.

GW3MFY (Bridgend) goes up to 29C in the Annual, and G3HWR (London, N.W.3) makes claims for all tables on both bands, with a note also for 4 metres. The proposed table for this band cannot yet be started, as we have fewer than the required six claims—all interested are asked to put in a 4-metre score for next time, on *(a)* an annual w.e.f. 1/9/61, and *(b)* an all-time, basis, as for the other tables. Anyway, for G3HWR the 4-metre standing is 8C and 9C, respectively.

G3EHY (Banwell, Som.) reports that the May contest produced tremendous activity, with much QRM all through the band from the strong signals of the /P's. Louis caught the *Ar* opening round about tea-time on the 6th and is another to comment on GI3GXP's luck in working, *via* the aurora, a GM in the very rare county of Ross—we don't know at the moment who this GM is, but no doubt he was equally pleased to

raise GI3GXP! Louis reports that his sked with EI2A continues very successfully, with signals up to S9 on many occasions — very rewarding after the long struggle through the winter.

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1961

Starting Figure, 14

From Home QTH Only

Worked	Station
60	G2CIW, G5MA
59	G3BA
50	G3NNG
47	G4LU
45	G3BOC
43	G3KPT, G3LTF
42	EI2A
40	G2AXI, G3CO, G8VZ
39	G3BNL
38	G3OJY
36	G3PBV
34	G5DW
33	G2BHN
32	G3JYP
31	G3FUR, GI3ONF
29	GW3MFY
28	G3OAA
27	G3OSA
24	G3GSO, G3NUE, G5QA
21	G3FIJ
20	G2DHV/P, G5DS, GW3ATM
19	G3HWR, G3JWQ
18	G3NPF, G8VN
17	G2BLA, G3ICO, G3OBD, G5UM

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

As many who are still with us will know, G2HOP is on again, putting out a very fine signal from his eyrie at Uffington, looking out across the Lincolnshire Fens, with a good take-off in all directions; he is 146 ft. a.s.l. and, with a slot-fed 6/6 at 70 ft. on top of that, he can hear PA's most days! The Tx runs 100w., and the Rx consists of a CC converter with a 6CW4 pre-amp. G2HOP says he is delighted to find so many newcomers on the band—and we are equally glad to hear from him again, after so long.

G3CO (Dartford, Kent) having had a "brief Easter holiday jaunt into the wide open spaces and rare counties of the North," is contemplating /M to take full advantage of such opportunities; he called on G3BW (Whitehaven, Cumb.) and had what he describes as "the novel experience of listening to the incredibly remote-sounding signal from GB3VHF"; G3CO got back in time to catch the April opening, and was able to work some EU's, to his great content.

G2BLA (Old Welwyn, Herts.) claims for both two-metre tables, and now has 113S worked. He says he doesn't own a Tx, the one he uses being on loan from G5UM! The Rx at G2BLA is an R.114 (TR.1986 receiver) unit adapted and modified as described in the February 1961 issue of SHORT WAVE MAGAZINE. His beam is a slot-fed 6/6 at 43 ft., rotated by the "armstrong" or "hand-raulic" method; during the April opening, G2BLA worked what for him were four new countries, using phone and CW. G2BHN (Yeovil) writes to stake claims, and mentions G3KMT/P, from near Ludlow, as the best signal with him during the contest; G2BHN is now at 173S worked, and 33C in the Annual. G3IOE (Newcastle) has been doing better since putting the A.2521 pre-amp. right in the converter and, on the Tx side, is changing the QQV06-40A for a 4X150A—all he needs now is that planning permission (still awaited) for the beam assembly. G2DHV (Caterham) has been out /P and /M, but had no luck with the EU's during the April opening.

From Dublin, Harry of EI2W reports contact with EI6AI in distant Co. Donegal, for a new EI ground record of 142 miles; this was on April 24, as conditions began to build up for the opening already mentioned. Harry says EI6A is not well located, being surrounded by mountains — it means hard going for EI6A, and we hope that he will, in fact, get his share of contacts. EI2W also reports that the EI's have the same 4-metre band allocation as in the U.K.

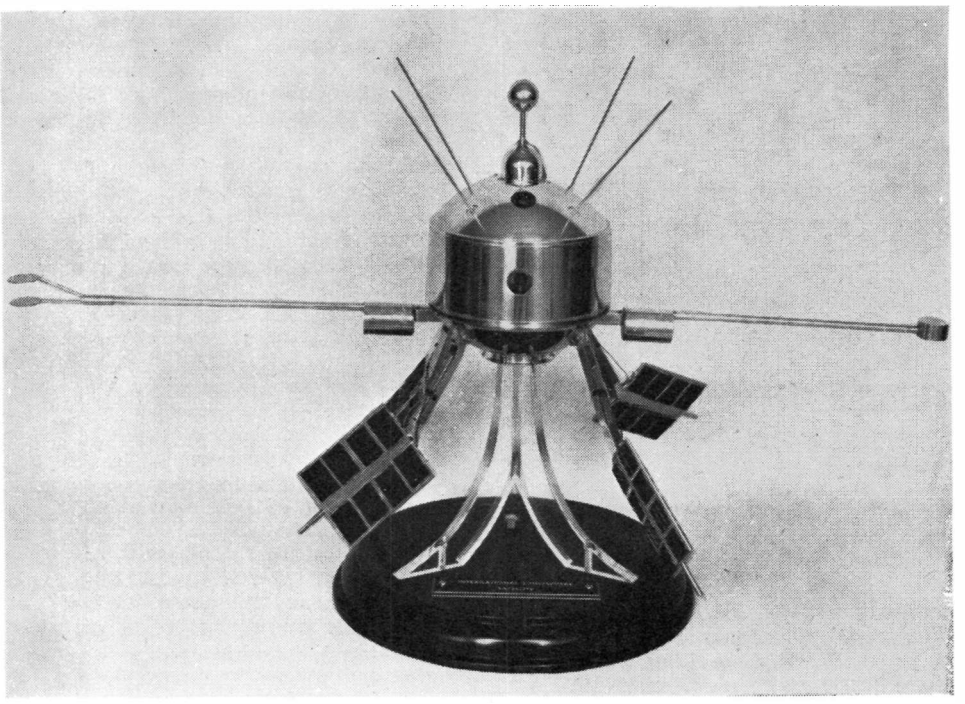
Interesting Conversion

As is well known, G3BA (Sutton Coldfield) is now putting out a very potent two-metre signal. Tom has adapted his K.W. "Viceroy" as the master drive for a VHF mixer-linear, giving SSB and CW output on two metres, with the added advantage of VFO control, as the stability of the Viceroy is so good; the system may be described as a "transvertor," and will be of great interest to all who own a Viceroy—details will appear in due course. For AM phone working, the linear is separately modulated—and shortly this linear will consist of a pair of 4/125's. All who have heard G3BA's sideband phone know how well it sounds.

Just as we closed, a note from UR2BU (Tartu): He has been running meteor-shower tests with G3HBW and G3LTF (no results yet) and has worked—by the more usual propagation modes—seven countries on two metres, these being OH, SM, SP, UA, UP, UQ and UR. UR2BU is the holder of the ground-record (about 550m.) for VHF/DX in the USSR (where they are mainly interested, with a few exceptions, in short-haul working).

And in Conclusion ——

Don't forget the Calls Heard lists, to be started next time; don't be surprised if Oscar II should pop up suddenly on about 145 mc; have a good Whitsun; and send all your VHF news, views, claims and comments to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1, to reach us by **Wednesday, June 20.** So, till July 6, *au revoir* es 73 — *de A.J.D.*



General impression of the U.K. satellite "Ariel" as it is revolving in space. The plane of the orbit is 55 the equator, and takes "Ariel" out to 650 miles (apogee) with a nearest approach (perigee) of 200 miles; the orbit time is about 100 minutes. Power for the quarter-watt transistor transmitter is from the solar cells mounted on the paddles; the aerials are projecting from the dome; and the other projections are probes feeding into the instruments "Ariel" is carrying. Six separate pure research projects are involved, which are entirely dependent on the correct and continued functioning of the telemeter circuits. All information is stored on a miniature tape recorder, which can be triggered to play back at high speed when "Ariel" is well placed for one of the ground stations involved in the tracking and recording part of the work. All transmissions from "Ariel" are in the 136-137 mc band, and the signal is easy to find on the near-passes.

MODIFYING THE ARB RECEIVER

R.C.A. TYPE CRV-46151

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

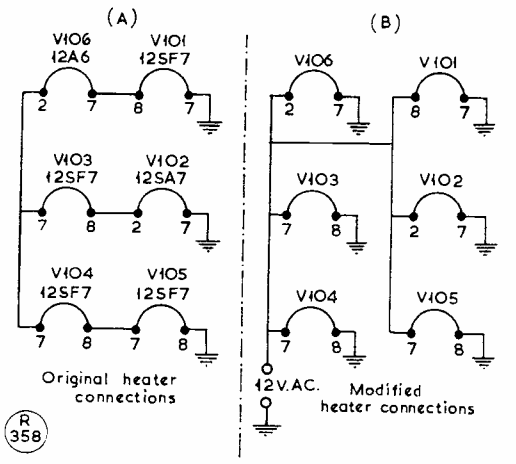
While this article gives the essential modification details, those who may want further information will find an illustration and a complete circuit diagram of the R.C.A. ARB Receiver in our publication "The Surplus Handbook."—Editor.

THIS receiver forms part of the complete ARB equipment, of R.C.A. manufacture, and designed for either aircraft or shipboard use. Extremely well made, compact, and reasonably lightweight, it gives coverage of the three LF amateur bands, over its two HF tuning ranges. Originally intended for 28v. DC working with a self-contained dynamotor, it was operated through a remote control box linked to the set *via* 16-point, 5-point and 3-point connectors. The circuitry of the receiver closely follows that of the well-known Command sets, whilst the general component layout and wiring has much in common with the familiar TCS equipments. All parts are very clearly marked with applicable circuit designations, this being of considerable assistance when carrying out alterations.

Modification Details

In order to make the receiver operational as a complete unit, it is necessary to fit an input gain control and headphone jack. These can be conveniently incorporated on the front panel by removing the 16-point and 3-point connectors, which are no longer required. Certain leads on the 16-point connector need to be marked for subsequent use in the modifications. All pins are numbered on the face of the plug panel, and the appropriate numbers concerned are quoted in brackets in the wiring information which follows.

Existing feed leads to the dynamotor should be disconnected, and the dynamotor may be completely removed, if desired, by releasing its four mounting bolts. The wiring on the On-Off "motor drive switch" (front panel) should be removed. This toggle



The heater modification to the ARB receiver, enabling it to be run from a 12v. AC supply. The ARB is a surplus-type 6-valve receiver having a good performance on the lower frequency amateur bands—1.8, 3.5 and 7 mc are covered.

switch is now used for BFO control. All unwanted leads should be taped up and tucked away under the cable forms, or completely stripped out.

A miniature 20,000-ohm variable resistor, for RF gain control, is fitted to a small aluminium panel, of suitable dimensions, to cover the hole left by the removal of the 16-point plug connector. This panel is drilled at the four corners to match-up with existing holes in the main front panel and secured in position with the four original bolts.

Similarly, the headphone jack is mounted on a small aluminium plate and fitted to the front panel in the position originally occupied by the 3-point plug connector. The 5-point plug connector (top left on front panel), being rather difficult to disconnect, can be left in position, but should be fitted with a cover, as HT voltage appears on two of the pins. (This fact was discovered in a rather unpleasant manner during bench tests !)

The main tuning control is designed with a gear-driven assembly for remote control connection, but it is quite an easy matter to fit a small knob, at right-angles to the front panel, for manual tuning.

Wiring Details

The existing heater circuit—series-parallel arrangement—is shown in (A) above. For 12-volt operation, the heaters must be parallel connected, as indicated in Fig. (B). This re-wiring is a little complicated and each step should be checked carefully with a continuity test. Remember to remove all valves before doing this job, otherwise false readings will result.

RF Gain Control: Connect one side and centre to ground, wire remaining side to junction of R110 (100 ohms) and R125 (33,000 ohms), (Pin 7 on 16-point plug).

Phone Jack: Wire body to ground and tip to output transformer T115 wire (Pin 2 on 16-point plug) for 4,000 ohms output, or (Pin 12 on 16-point plug) for 600 ohms output.

BFO Control (original motor drive switch): Connect one side to ground and the other to the end of R137, 5600 ohms (Pin 5 on 16-point plug). R137 is fitted inside the metal box, at the far end of top deck, housing T113, T114, L110, and is easily accessible by removal of the top cover.

Pilot Light Corrector: Connect a 50-ohm 10-watt resistor in parallel with R136, 88 ohms; the latter is mounted under chassis at rear end.

Connections to Power Supply Unit: In the writer's case, the PSU is external to the receiver. Connection is by a 3-core cable, wired as follows: HT+ to pin 4 on 12A6 (V106) valveholder; live 12-volt lead to any convenient live valveholder pin; common HT− and grounded side of 12-volt supply to chassis. The 3-core cable is taken out through an existing hole at the bottom of the front panel (there are two holes, one on either side of the panel), and thence to the PSU by way of a 3-point plug-and-socket connector.

Ratings of the PSU required are: 12 volts AC at 2 amps., and 150-200 volts DC, 80-100 mA.

As a point of interest, the use of miniature components for the PSU would probably allow this to be included within the receiver in the space originally occupied by the dynamotor.

Performance

Alignment checking, for those who have the required experience of such matters, presents no difficulty. All trimmers and inductances are clearly marked to coincide with the ranges numbered on the front panel. Unfortunately, however, the IF frequency is not stated, but checks against a signal generator measure this at about 200 kc.

The receiver is extremely lively on all four bands and reasonable tuning spread (thanks to the most effective geared slow-motion drive) is available in the 1·8 and 3·5 mc bands. For 7 mc it is somewhat cramped but quite workable. Output is ample to work a speaker, which should be connected to the phone jack through a suitable output transformer, *i.e.* for 600 or 4,000 ohms matching.

The following detailed information covers the functional aspects of the receiver:

Dimensions: 8¼ ins. wide, 7¼ ins. high, 16½ ins. deep, including metal case.

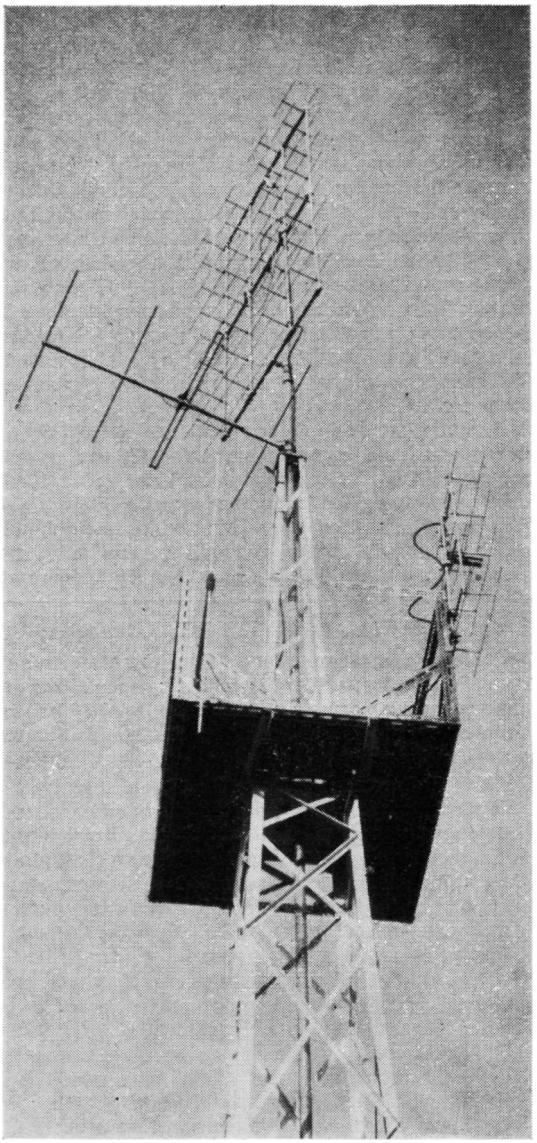
Weight: Approx. 28 lbs.

Frequency Coverage: 195 kc to 9·05 mc in 4 switched bands, as follows: Range A, 195-560 kc; Range B, 560-1,600 kc; Range C, 1·6-4·5 mc; and Range D, 4·5-9·05 mc.

Circuit and valve line-up, with designation numbers: RF Amplifier (V101) 12SF7; Mixer (V102) 12SA7; 1st IF Amplifier (V103) 12SF7; 2nd IF Amplifier (V104) 12SF7; Det.-CW Osc. (V105), 12SF7; Output (V106), 12A6.

THE OTHER MAN'S STATION

G3NOX/T



THE picture this time is of the impressive (and effective) VHF aerial array at G3NOX/T—Jeremy Royle, Keepers Cottage, Duddenhoe End, Saffron Walden, Essex, who is the son of a very well-known Old Timer, G2WJ, well known also in the world of printing. When Jeremy was younger (and before he got married!) he and his father worked together on G2WJ/T, and many readers will remember how successful they were on VHF and amateur TV.

Now, Jeremy's G3NOX/T is an entirely separate installation, the main interest being, of course, amateur TV transmission and reception on the 430 mc (70 cm.) band. A considerable amount of equipment has been built for this, and the video gear in use at the moment consists of a photicon image iconoscope camera, complete with viewfinder; a monoscope test card generator, with call-sign; and a sawtooth generator for transmitter testing. Each of these picture sources is brought up to a 3-channel vision mixer, which can either cut or fade between them—this gives scope for what is known as "camera work."

All the vision equipment is controlled by the 405-line interlaced waveform generator (this is the standard BC waveform), which is fed to the transmitter monitors. The vision equipment has been constructed on the standard 19-in. rack system, so as to be readily accessible for servicing. Stability of the various TV power supplies is essential, and considerable trouble has been taken to stabilise all HT and EHT sources; no less than 15 valves are used solely for voltage control.

The G3NOX/T transmitter—which is designed for both normal phone working on 70 cm. and for TV transmission—is lined up as follows: Osc. 12AT7-EL91-5763-QQV03-20A tripler into another QQV03-20A as straight RF amplifier, driving the 4X250B in the final to the full 150w. input. This PA is modulated by a special stabilised-screen system; in this, an electronically stabilised power supply has the audio inserted at the grid of the PU control valve; thus, the mean screen voltage is held steady at a preset value, the result being that the carrier does not increase and decrease in strength as modulation is applied, and maximum modulation depth is achieved because the PA is always running at the correct mean level.

For TV operation, the 4X250B final amplifier is grid modulated by a pair of 6AG7's, one of which is a cathode follower stage DC-coupled to the grid of the PA. The necessary bias and modulation are superimposed at this stage; under TV modulation the audio voltages are removed from the grid of the PSU stabilising valve, the power supply then reverting to the normally stabilised condition. As it is sometimes necessary for speech messages to be passed while a TV contact is being made, the picture can be faded down to black and the audio turned up on the control valve grid.

On the receiving side, a G3BKQ-type 70 cm.

converter—as originally described in the July, 1954, issue of SHORT WAVE MAGAZINE—is used with an AR88. The converter has an A.2599-A.2521 cascode RF amplifier ahead of it, and the IF tuned is 22-29 mc. Excellent results have always been obtained from this well-designed converter, a particularly good feature of which is the total absence of "birdies" through the tuning range; this is no doubt due to the layout advocated by its designer. The G3BKQ is used exclusively for 430 mc amateur-band reception. For amateur TV reception, a tunable-oscillator (SEO) converter is employed, with IF at 45 mc; this couples into a special vision receiver which has a video output at a level of 1-volt, suitable for feeding into the TV transmitter for relaying. The cascode RF amplifier can also be used with this TV receiving converter.

Looking at the photograph, the aerial system shown consists of a 64-ele stack for 430 mc, a 4-ele two-metre Yagi for cross-band working, and a 16-ele stack for relaying TV from other amateur TV stations. This array is carried on a 2-in. dural scaffold pole which is rotated by a cowl-gill motor, from the surplus market (a cowl-gill motor is an item of aircraft electrical equipment, used for opening and closing the cooling louvres on certain types of piston engine). The turning mechanism is mounted at the base of the tower; this weighs 3½ tons, and the platform shown, within reach of the beams, can accommodate four people to assist in the erection or adjustment of antennæ. And if this were not enough, the tower is on a site 450 ft. a.s.l. with a clear take-off in the direction of the Continent!

Naturally enough, G3NOX/T has done extremely well on UHF, and his results are due entirely to his own initiative, capacity and resource (and the careful training of father, G2WJ, from earlier days!) Having designed and built all this complicated equipment, the operating record for G3NOX/T on the 70-centimetre band now stands at 6 countries worked on phone, with SM7BAE as best DX; 18 U.K. counties worked for our Annual 70 cm. Table; and, on the TV side, the reception of pictures from G3NOX/T as far as Birmingham (by G3LGJ/T), a distance of 96 miles. The present ambition is to transmit amateur TV to the Continent, and G3NOX/T would very much like to hear from any EU station interested.

SPECIAL-ACTIVITY STATIONS

Referring to the note on p.142 of the May issue of SHORT WAVE MAGAZINE, the following special-activity stations, using temporary call-signs issued for the purpose by the G.P.O., will be on the air for the periods given:

GB3COV, Coventry, to June 3: Established by the amateurs of Coventry and the surrounding district in connection with the festival to commemorate the consecration of the new Coventry Cathedral; operating all amateur bands 160 to 2 metres, and on view to the public. GB3COV cards for contacts made on the first day (May 25, when the Cathedral was consecrated in the presence of Her Majesty) will be of particular interest, because they were sent direct bearing the special postmark, expected to be much sought after by philatelists. The GB3COV QSL card itself is of a very chaste, contemporary design, befitting the great edifice with which it is associated. The address for GB3COV QSL's is: J. Boyce, 73 Maidavale Crescent, Coventry.

GB3EAS, on June 11: At the Ealing Parish Fête, on 40-80m. phone, from 10.0 a.m. to 6.0 p.m., operated by the St. Benedicts Amateur Radio Society; a special QSL card will be sent to all stations worked. The QSL address is: GB3EAS, c/o D. A. Evans, G3OUF, St. Benedicts School, Ealing, London, W.5.

GB3LCH, on June 23: At the Leonard Cheshire Home, The Hill, Sandbach, Ches., from an exhibition station in the grounds, working all bands from 160 to 2 metres; GB3LCH is being provided and operated by a group of local radio amateurs, who will be very glad to see visitors; the occasion is an afternoon fête at The Home, and arrangements are in the hands of T. A. Dugdale, G3KQK—*QTHR*. An appropriate QSL card is being issued.

GB3SFG, on July 7: In connection with the Shipley (Yorks.) Fête & Gala, operated by members of the Bradford Radio Society under the leadership of G3KSS; all bands 160-10m. will be tried, and a special QSL card is being minted; it is hoped to contact once again many of the stations worked under GB3SSW, the call-sign used on the same occasion back in 1959. The QTH for confirmation is: D. W. Hudson, G3BOR, 37 Marlborough Road, Shipley, Yorkshire.

GB3SMG, July 22-29: On the occasion of the Tenth International Games for Paraplegics at Stoke Mandeville, Aylesbury, Bucks., when it is hoped that GB3SMG will help to give the chair-borne some insight into Amateur Radio which, in the widest sense, would restore their ability to communicate. The aim of GB3SMG is world-wide communication and, to this end, the practical assistance of radio clubs and individuals in setting up a local station—perhaps at the home of some disabled SWL, or in a hospital or hostel (anywhere in the world)—would be very much appreciated. Operation from GB3SMG will be mainly on AM phone, all bands 160-10m., as conditions permit. Disabled SWL's who could accommodate a /A station, and licensed operators in any way handicapped who would like to pre-arrange QSO's, are asked to write to: K. Jones, G2FQW, 3/50 Shelley Road, Worthing, Sussex, who is undertaking the arrangements for GB3SMG.

Deadlines for the receipt of further notifications and information under this heading are: June 15, July 13, and August 17, for appearance in the following month's issue.

For Readers' Small Advertisements — see pp. 218-224

NEW QTH's

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

GC3MLR, S. A. Faulkner *(ex-9M2DB)*, Sentosa, sous l'Eglise, St. Saviour's, Guernsey, Channel Islands.

GW3PDI, Dr. D. Ifor Jenkins, 59 Beechley Road, Wrexham, Denbighshire, North Wales.

GM3PIL, A. Chisholm, 116 High Street, Nairn.

G3PNR, W. Higgins, 47 Marryat Road, Norwich, Norfolk.

G3PTL, D. R. Ward, 336 Selly Oak Road, Kings Norton, Birmingham, 30.

G3PTY, B. J. Hood, 63 Cannock Road, Burntwood, Lichfield, Staffs.

G3PUO, L. D. Rooks, 19 Beche Road, Cambridge, Cambs.

G3PUR/T, R. J. Tarr, 245 South Farm Road, Worthing, Sussex. *(Tel.: Worthing 7416.)*

G3PWB, I. G. Dufour, Suban Cottage, Shotteswell, Banbury, Oxon.

GW3PWE, W. Thompson, 70 Winston Road, Colcot, Barry, Glam.

G3PWV, M. R. Jennings *(ex-VS1FT/MM)*, 48 Paganel Road, Minehead, Somerset.

G3PWY, D. M. Gresswell, Trevilder, Plaidy, Looe, Cornwall. *(Tel.: Looe 2561.)*

GM3PXK, Mid-Lanark Radio Group, Club Room, Carfin Hall, Motherwell, Lanarks.

G3PXN, M. J. Bartlett, 6 Douglas Road, Southbourne, Bournemouth, Hants.

G3PXT, Norfolk Amateur Radio Club, c/o J. D. Simpson, 50 Vicarage Road, Norwich, Norfolk.

G3PXX/T, J. J. M. Phillips, 36 North Sudley Road, Aigburth, Liverpool, 17. *(Tel.: Lark Lane 2465.)*

CHANGE OF ADDRESS

G2CKQ, R. S. Trevelyan, The Decca Navigator Training Establishment, Bridge House, Newcomen Road, Dartmouth, Devon.

G3AAV, G. N. Glover, 30 St. Chad's Avenue, Leeds, 6, Yorkshire.

G3AJX, G. Stanton *(ex-VK3QF, ZB1AJX)*, 44 Lynford Way, Winchester, Hants.

G3BZM, K. C. Barrett, St. Andrews, Church Path, Nairdwood Lane, Prestwood, Gt. Missenden, Bucks. *(Tel.: Gt. Missenden 2355.)*

GM3DVX, J. Gorrie, 32 Allan Park Road, Edinburgh, 11.

G3DXA, C. J. Godden, 87 Avondale Road, Ashford, Middlesex.

G3FCB, E. D. Melville, 30 Rufford Avenue, Bramcote, Nottingham.

GM3GRG, D. R. Rollo, 25 Beaufort Drive, Kirkintilloch, Glasgow. *(Tel.: KIR 2065.)*

G3GVL, J. S. Orme, Two Ways, Viewdales Close, Hulland Ward, Derby.

G3GXD, J. E. Burnitt, White Oaks, Atheling Road, Hythe, Hants.

G3HEY, D. F. Collings, 16 Dunkirk Road, Fishponds, Bristol.

G3HFB, F. H. Barnes, 36 Church Lane, Darley Abbey, Derby. *(Tel.: Derby 58070.)*

GM3HMB, I. E. Elliot, A.M.I.E.E. *(ex-G3HMB)*, 12 Muirwood Grove, Currie, Midlothian.

G3HOX, The Manchester and District Amateur Radio Society, c/o A. B. Langfield, King George VI Club, North Road, Moston, Manchester, 10.

G3IEW, S. J. Heard, 29 Oaklands Avenue, Sidcup, Kent.

G3KBI, T. S. Waller, 12 Skelton Road, Brotton, Saltburn-by-Sea, N.E. Yorkshire.

GI3KIX, R. Eslor, Mount Pleasant Estate, Bushmills, Co. Antrim.

GM3KMR, T. Heslop, The Lodge, 18 Colinton Road, Edinburgh, 10.

G3LOV, M. J. Francis, 8 Lipsham Close, Banstead, Surrey.

G3OCE, J. Davies, 26 Harvey Road, Mansfield, Notts.

G3ODB, A. E. Pritchard, 8 De Lapre Close, St. Mary Cray, Orpington, Kent.

G3OJH, R. Bennett, 42 Frankby Road, Anfield, Liverpool, 4.

G3OPC, N. F. Ward, 4 Riddlesdown Avenue, Purley, Surrey. *(Tel.: UPLands 1750.)*

GM3OWZ, W. Gillespie, 21 Corsebar Crescent, Paisley, Renfrewshire.

G3PDF, C. R. Helps *(ex-VS1KJ)*, 112 Valiant Road, Albrighton, Staffs.

G3PLR, D. A. Sochachewsky, White Cottage, Hartley Bottom, Longfield, Kent.

G4QU, F. C. Mason, 23 Hill Rise, Cuffley, Herts.

AMENDMENTS

G3IJU, E. Briggs, 38 Choulston Close, R.A.F. Station, Netheravon, Wilts.

G6XY, R. H. Webb, 22 Southbank Road, Kenilworth, Warks. *(Tel.: Kenilworth 52679.) (Incorrectly printed as G3XY in May issue.)*

Notify New Callsigns and Changes of Address as early as possible

DON'T BE IMPATIENT . . .

Readers who chafe at what appears to be the inordinate delay in producing the R.A.E. results should reflect that No. 55 is only one of about 220 different subjects, under 20 main headings, in which City and Guilds examine tens of thousands of candidates every year. The authorities are just as keen as anyone else to get results through in good time, and every effort is made to do this. In the circumstances, a wait of three months is not unreasonable, though it may be tedious.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for July Issue: June 15)

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

THE "League Table" idea for Club stations has not caught on. We are sorry to note that this is so, but it does seem that most Club stations, properly installed at headquarters (as distinct from members' stations used for the purpose) are available at such restricted hours that even our latitude of three days for operation is not sufficient.

Also, quite a few club secretaries confess that their members are not terribly interested in operating the Hq. station, which, usually by virtue of a poor aerial system, is inferior to their own gear at home.

So now we put it to the clubs to say what *they* would like. If there is a demand for this kind of running contest—for nominated members' stations—we will fill it. Similarly, if an idea emerges for a competition of some sort between the *bona fide* club stations, on club premises, we will also do our best to promote something suitable.

All of this, of course, has no bearing on MCC, the Magazine Club Contest, which gathers more entries every year and will, of course, be laid on again as usual this coming autumn.

Bradford are holding a Treasure Hunt on June 12, and on the 26th are visiting A. R. Sugden (Engineers) Ltd., Brighouse; at their recent AGM they elected G3NPO president, G3KEP vice-president and G3NNO secretary.

Cambridge devoted a recent meeting to members describing their own equipment. There is much interest in amateur TV, and the Junior Group is busy building Top Band receivers. May meetings included a very interesting talk by G3EDD, of Pye's, a Junk Sale, an Informal Evening and a talk by G3GVV on Unusual Army Equipment. Next meetings are on June 1, June 20 and June 29.

Clifton won their Inter-Club Quiz with Crystal Palace by a small margin. They are now in the throes of re-decorating and modernising their clubrooms; a D/F Field Day is planned for July 8, and G3GHN/P (3545 kc) would much appreciate short CW contacts on that day from 1100 onwards.

Dorking will hold two informal meetings during June: on the 12th at the King's Arms, Ockley, and on the 26th at The Cock, Headley, both at 8.30 p.m. Summer meetings of this club are always held in the outlying districts, and members are invited to bring along wives and friends. **Greenford** have a talk, on June 8, from G3CPS entitled "D/F in the RAF." On June 22 the subject will be Construction Technique. Talks booked for the future cover Receiver Alignment (G3MMQ), Home Office Equipment (G3OZY) and an evening or two preparing for the R.A.E.

Halifax are visiting Ferranti works in Manchester on June 5, and members are asked to assemble at the Beehive and Crosskeys, 6.30 p.m. promptly. June 19 is booked for a Ragchew. **Harrow** are holding a Junk Sale on June 22 and a Brains Trust on July 6. On July 20 the subject will be Audio Amplifiers. Alternate meetings, as usual, take the form of Practical Evenings, and G3EFX, the club Tx, is on the air Fridays from 7.30 p.m.

Lincoln held their AGM and elected J. R. Charlesworth as chairman, G3PMT secretary and SWL Dellar treasurer; on their committee is Major D. Hollander, USAF (WØCJ); note panel for new secretary's QTH. **Silverthorn** report that their hard-working secretary, G3EIO, has unfortunately had to give up the job and leave the district, but he has been replaced by G3LJB, elected at a special meeting of the club—*see* panel for QTH.

Slade continue to cover a wide variety of activities, with Radio Controlled Models the topic for June 1; Sound and TV Magnetic Recording, with a BBC lecturer, for June 15; and Sound Reproduction (Warner's Audio) for June 29. **Sutton Coldfield** have a further talk on Receiver Design on June 14; and on the 23rd they are going to be busy at the Sutton Coldfield Carnival. Booked for July 12 is a talk on Resistance and Capacity Bridges, after which, as usual, the club will close down for August.

Torbay held their AGM in April and elected G5SY president, G3ABU chairman, Mrs. G. Western (G3NQD) secretary and G3ZC treasurer. Normal meetings are on the second Saturday of each month—

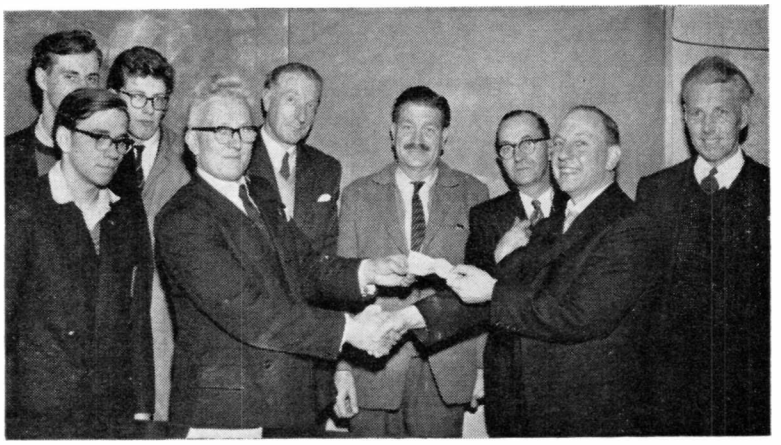
NOTICE TO ALL HONORARY SECRETARIES

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

next is June 9—7.30 p.m. at the YMCA, Castle Road, Torquay. Their most recently licensed member is G3PXM, and six of their SWL's took the recent R.A.E.

Wolverhampton have their own field day on June 17, with a talk on SSB Techniques the following day at 8 p.m., at the Headquarters. On June 30 they will be active at the Hobsons/I.C.I./Boulton - Paul combined Sports Gala. The Club Tx, G8TA, is on the air after each meeting—next dates, June 4 and 18.

Hastings recently held a special meeting (on a Saturday) to hear a visiting lecturer, G3HWG, on the subject of Oscilloscopes. This turned out to be an outstanding lecture/demonstration, from which members learnt a lot. June meetings are on the 5th and 19th, the first being booked for G3BDQ on Ultimates in Component Design.



When the former Peterborough Radio & Scientific Society was wound up some time ago, it was left with assets worth £180. This handsome sum has now been made over to the present Peterborough & District Amateur Radio Society, and here we see the ceremony of the cheque, with smiles and congratulations all round.

Acton, Brentford & Chiswick meet on June 19, when G3OJX will be demonstrating his Top Band transmitter—7.30 p.m. at the AEU Club, 66 High Road, Chiswick, W.4. **Cray Valley** held an AGM during May to ratify a new set of rules, and followed it up with a Film Show. On June 26 they will be hearing about VHF from G3FZL—Station Hotel, Sidcup.

Dudley report that they are running smoothly and now have a membership of 41 ; the club has just bought an AR88. On June 8, G8RF will be giving a talk, and June 22 is booked for a Treasure Hunt. The first newsletter will also be published this month.

Eccles meet normally at the Congregational Mission Church, King Street, on Tuesdays at 8 p.m. There is, however, a special meeting booked for July 24, when G3GRO will lecture on Communication Receiver Design. **Exeter** meet on the first Tuesday at the YMCA, St. David's Hill, at 7.30 p.m. At their last meeting the SWL Contest results were announced, Clive Vicary having won with 616 points, with Barry Marshall the runner-up at 377 points. **Hounslow,** a newly-formed club, held their second meeting on April 30 and elected G2NG chairman, G3PJG/T secretary and J. Ryan treasurer ; Radio theory and Morse instruction start immediately, and meetings are held every Monday, 7.30 at Isleworth Town School (opposite the West Middlesex Hospital).

North Kent held their AGM on May 10 ; dates for forthcoming meetings are June 14 and 28, July 12 and 26—all at the Congregational Hall, Clock Tower, Bexleyheath, 8 p.m. **Peterborough** report a wonderful windfall in the form of a cheque for £180, donated by the old Peterborough Radio and Scientific Society, which has now wound up after deciding that all funds be donated to the new club.

St. Benedict's, a school radio society, meets on Mondays and Thursdays during the lunch break, and very shortly they hope to be operating on 3·5 mc between 1215 and 1315 GMT on those days (call G3OUF/A). On Whit Monday they are operating GB3EAS from the Parish Fête—*see* panel for secretary's QTH.

Thames Valley had a successful May meeting, with 45 members and friends attending to hear G4ZU on Aerials. Next meeting is on June 6, when Mr. T. Taylor, B.Sc., will talk on The Future of Nuclear Power. All local clubs are invited to attend.

Wessex—a newly-formed group—replaces the old Bournemouth club, and continues to meet at the same place, The Cricketers Arms, Windham Road, Bournemouth, on the first Monday, 7.45 p.m. In addition, they will have a meeting on the *third* Monday at the home of their president, Maj. Inchbold-Stevens (47 New Road, Northbourne) ; this meeting will be of a social nature. Morse classes are held regularly and a Junior Section is being formed. On June 4 the subject will be Railway Signalling and Communication.

York will meet on June 21 for a talk called Hints on Mobile Operation ; this will be tape-recorded, and an open invitation is extended to amateurs and SWL's in the district. The Club Tx, G3HWW, will be on Top Band between 7 p.m. and 8.15 p.m. that evening. Clubroom—Fetter Lane, York.

Chesham report a great amount of local interest and good publicity from the local press—especially with reference to their keenness on training the

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of the following Club Publications: **South Hants** (*QUA*, May); **Southgate** (*Newsletter*, May); **RAIBC** (*Radial*, May); **North Kent** (*Newsletter*, May); **Wolverhampton** (*News Letter*, May); **Slade** (*Contact*, April); **IHHC** (*Newsletter*, March); **Enfield** (*Newsletter*, Vol. 13, No. 10); **Derby** (*Newsletter*, 1961/62); **Crystal Palace** (*Newsletter*, No. 78); **Surrey** (*SRCC Monthly News*, May); and **Royal Signals A.R.S.** (*Mercury*, Spring Quarter).

Names and Addresses of Club Secretaries reporting in this issue:

ABERDEEN: G. Roberts, GM3NOV, 111 Great Southern Road, Aberdeen.
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.
BLACKWOOD: P. M. Fulton, GW3MMU, 36 Sunny Bank, Blackwood, Mon.
BRADFORD: M. Powell, G3NNO, 28 Gledhow Avenue, Roundhay, Leeds 8.
BURSLEM: W. Luscott, 36 Rothsay Avenue, Sneyd Green, Handley, Stoke-on-Trent.
CAMBRIDGE: A. H. G. Waton, G3GGJ, Arkengarthdale, New Road, Barton, Cambridge.
CHESHAM: Capt. C. G. Stephenson, G3CLJ, 21 Lynton Road, Chesham, Bucks.
CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley, Surrey.
CLIFTON: E. Godsmark, G3IWL, 211 Manwood Road, London, S.E.4.
CORNISH: W. J. Gilbert, 7 Poltair Road, Penryn.
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DORKING: J. Greenwell, G3AEZ, Wigmore Lodge, Beare Green, Dorking.
DUDLEY: D. H. W. Pratt, G3MHS, 23 Kent Street, Upper Gornal, Dudley, Worcs.
ECCLES: A. W. Ward, G3OQW, 5 Newstead Road, Davyhulme, Manchester.
ENFIELD: V. Croucher, G3AFY, 15 Nelson Road, London, N.15.
EXETER: S. Line, 46 Roseland Crescent, Heavitree, Exeter.
GREAT YARMOUTH: B. E. Gillingwater, G3NTV, 2 Hamilton Road, Great Yarmouth.
GREENFORD: E. Gray, G3CPS, 111 Ravenor Park Road, Greenford.
GUILDFORD: D. J. Hobden, 121 Great Goodwin Drive, Merrow, Guildford.
HALIFAX: G. Sunter, 24 Booth Fold, Luddenden Foot, Halifax.
HARROW: A. C. Butcher, 95 Norval Road, North Wembley.
HASTINGS: W. E. Thompson, G3MQT, 8 Coventry Road, St. Leonards-on-Sea.
HOUNSLOW: J. Grogan, G3PJG/T, 12 Downs View, Isleworth.
IHHC: M. Allenden, G3LTZ, 16 Grovefields Avenue, Frimley, Aldershot.
LINCOLN: Cpl. Tech. Russell, J. S., G3PMT, RAF Scampton, Lincs.
MANCHESTER: S. J. Andrew, 69 Pine Tree Road, Oldham, Lancs.
NEWBURY: G. T. Allen, G3JTK, 83 Huntsbrook Road, Tadley, Basingstoke.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.
NORTH KENT: B. J. Reynolds, G3ONR, 49 Station Road, Crayford.
PADDINGTON: N. A. Lambert, G3LVK, 2 Warwick Crescent, Paddington, London, W.2.
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
PRESTON: W. K. Beazley, 9 Thorngate, Penwortham, Preston.
RAIBC: W. E. Harris, G3DPH, 4 Glanville Place, Kesgrave, Ipswich.
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
ST. BENEDICT'S: R. V. Coupe, 55 King Edwards Gardens, London, W.3.
SILVERTHORN: A. Jones, G3LJB, 26 Monkhams Lane, Woodford Green.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTHGATE: R. W. Howe, G3PLB, 162 Victoria Road, London, N.22.
SOUTH HANTS: G. J. Meikle, G3NIM, 34 Victoria Road, Netley Abbey.
SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
SUTTON COLDFIELD: L. E. R. Hall, G3IGI, 24 Calthorpe Road, Walsall.
THAMES VALLEY: K. A. H. Rogers, G3AIU, 21 Links Road, Epsom.
TORBAY: Mrs. G. Western, G3NQD, 118 Salisbury Road, Barton, Torquay.
WESSEX: G. J. Fowle, 138 Surrey Road, Branksome, Poole.
WOLVERHAMPTON: J. Rickwood, 738 Stafford Road, Fordhouses, Wolverhampton.
YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.
YORK: N. Spivey, G3GWI, 80 Melton Avenue, Clifton, York.

younger generation. Slow Morse transmissions are now being carried out by five stations, and we quote the times so that other local clubs may benefit: Thursdays, 2000 GMT, 1870 kc; Saturdays, 0930, 3550 kc; Sundays, 1200, 3550 kc. The calls are G3MDG, 3CLJ, 3NLX, 3PNB and 3PNV.

Crawley are holding a Members' Evening on June 27, when members will bring along items of equipment made during the past year. This will be followed by a rag-chewing session. Visitors and prospective members always welcome, at West Green Community Centre, Crawley.

Great Yarmouth, after re-forming, has a firm membership of 20, and meets every Friday at the Electricity Sports and Social Club, North Quay. They start at 7.30 p.m. with Morse, and follow up with theory or practical work on the club station (G6ZG/A), completing the evening with a rag-chew. The committee meets monthly and arranges future activities.

Newbury will meet on June 27 for a lecture on Crystal Techniques by G2CPM. This meeting is at 7.30 p.m. at The Canteen, Elliotts of Newbury, West Street—visitors and new members always welcome. **Northern Heights** recently visited the Leeds and Bradford airport, held their AGM, and heard a talk by G3OGV on Converters for Two and Four. On June 6 G3JKD will talk on Printed Circuits; the 20th will be an informal evening; and on July 4 there will be a display of members' gear. All meetings at the Sportsman Inn, Ogden, Halifax.

Civil Service continue to hold their meetings on the first and third Tuesdays; recently they heard a lecture on SSB by Redifon Ltd., interest being added by the fact that a complete Collins SSB station is now available to members at GB2SM. In the recent *CQ* SSB contest this station had 792 contacts and hopes to secure a good position in the results list.

Cornish had their May gathering in Falmouth and attracted 23 members. The Area Radio Supervisor gave a talk on Marine Radio and Control Stations. Visitors are always welcome to the meetings, held at the Falmouth YMCA on the first Wednesday of the month. **Preston** meet on the second and fourth Tuesdays at St. Paul's School, Pole Street. Morse practice sessions are held on each occasion. On June 26 there will be an illustrated tape lecture on Semi-conductors, and on July 4 the club will visit the TV transmitter at Winter Hill.

Reading report their gatherings well attended, with a membership now over the 40 mark. The subject for the May meeting was How to Become a Radio Amateur; that for June is Transistors—a talk by G8SC. Meetings are on the last Saturday at the Palmer Hall, West Street (7.30 p.m.).

Reigate are due on June 16 at The Tower, Redhill, but arrangements for a speaker have not yet been confirmed. There will be a Juniors' get together at 12 Willow Road, Redhill, on July 5. **Yeovil,** who meet every Wednesday at the British Legion Headquarters, hope to organise a Field Day at the beginning of June. They have an active group of SWL's, three members active on SSB, two with Top Band mobiles, and others with battery-powered transceivers. Visitors always welcome.

Aberdeen have what they call a " Work Night and Ragchew " on June 8, a talk on D/F by GM3ALZ (with practical demonstration) on the 15th, a Jumble Sale on the 22nd and a visit to Durris TV Station on the 29th. The regular meetings are at 6 Blenheim Lane, Aberdeen, 7.45 p.m.

Blackwood now get together every Friday evening at Blanche Cottage, off the High Street. The place belongs to them, with about half an acre of ground, and has been completely renovated by the members, who number about 50 (most meetings are attended by at least 30). G6BK is now president, GW3CJR chairman, GW3MMU secretary, and the Club station GW6GW is active on Top Band on club nights and most week-ends.

Surrey (Croydon) are meeting on June 12 (Blacksmiths Arms, South End, Croydon, 7.30 p.m.) to hear from Mr. T. Withers, G3HGE, about his range of VHF Equipment, which will be demonstrated. The club's Treasure Hunt and Car Rally will be held on June 27, and details for a good event are now being worked out.

On the third Wednesday of each month, the **Burslem** group gather in the local Queen's Hall ; a varied programme has been arranged, including visits to places of special interest to radio amateurs.

For their field day, **Manchester** have been offered a site, by the City Parks Dept., which is not only a beauty spot but is said to be particularly potent for radio working. The coming programme is : June 6. Practical Night ; June 13, Elementary and Advanced Radio Theory, and Morse ; June 20, Lecture ; June 27, as for June 13. Meetings are at the King George VI Club, Moston.

The **Guildford** club can be found at the City Café, Guildford, on the second Thursday and fourth Friday of each month, and the new secretary (*see* panel) is always glad to hear from prospective members.

Paddington is now a well-established club, with regular meetings each Wednesday evening at Beauchamp Lodge, Harrow Road, W.2. These are well attended and cover a variety of subjects of interest to radio amateurs. A monthly members-only newsletter called *Key-Klix* is also produced.

B.A.T.C. CONVENTION

The sixth Amateur Television Convention, organised by the British Amateur Television Club, will be held in the Conway Hall, London, W.C.1, on September 8. The B.A.T.C. which now has about 450 members, looks after the interests of those engaged in amateur television transmission and publishes its own *CQ-TV*, quarterly. The hon. secretary, B.A.T.C., is: D. S. Reid, M.A., 21 Silverdale, Sydenham, London, S.E.26.

1962 AMATEUR RADIO EXHIBITION

This year's Amateur Radio Exhibition will take place during October 31 - November 3, at a new *venue*—the Seymour Hall, Seymour Place, near Marble Arch, London, W.1.

SMALL ADVERTISEMENTS

(" SITUATIONS " AND " TRADE ")

9d. per word, minimum charge 12/-. No series discount: all charges payable with order. Insertions of radio interest only accepted. Add 25% for Bold Face (Heavy Type). No responsibility accepted for errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

TRADE

GO ONE BETTER. Have your cabinets, panels, etc., stove-enamelled and lettered to your own or original specification. — For by-return quotations, contact: The Universal Productions (Enamellers) Ltd., 22 Aston Road North, Birmingham, 6. *(Tel. Aston Cross 2987.)*

WANTED FOR CASH : Good clean communications receivers and SSB equipment. Please state price. — Short Wave (Hull) Radio, 30/32 Princes Avenue, Hull. *(Tel. 18953.)*

QSL's and Logs by Minerva. The best there are.—Samples from Minerva Press, 2 New Road, Brentwood, Essex.

QSL CARDS AND LOG BOOKS, GPO. APPROVED. CHEAPEST, BEST. PROMPT DELIVERY. SAMPLES. — ATKINSON BROS., PRINTERS, LOOE, CORNWALL.

WEBB'S LOG BOOK for recording signals heard and worked ; 112 pages 9¾ in. x 8 in., approved format, semi-stiff covers. Excellent value ; 6s. 0d. post free, or callers 5s. 4d.—Webb's Radio, 14 Soho Street, London, W.1.

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

RADIO AMATEUR COURSE.—A postal course for those wishing to take the Amateur Examination. A sound basic training in radio communication. Very reasonable terms. Send for brochure.—Premier School of Radio, 3 Kerry Crescent, Calne, Wiltshire.

SILICON RECTIFIERS, 400 PIV. ½ amp., 3s. 9d.; 70 PIV ½ amp., 3s. Transistors: Red Spot, 2s. 3d.; White Spot, 2s. 3d.; Mullard OC71 6s., OC72 7s. 6d., OC44 9s. 6d. Newmarket V30/20P, matched pairs. 27s. 6d.; V30/30P, 47s. 6d. pair. BM3 Mike and stand, 48s. R.109, brand-new, £3 (carriage £1). Cash with order, post extra (excess refunded).—Moore's Experimental Supplies, Dept. S., 8/10 Granville Street, Sheffield, 2.

TUNING METERS, AR88 only, calibrated S-units, etc., zero to right, new, shortly available ; s.a.e. details.—Carter, 224 Cavendish Avenue, London, W.13.

Olympic Announcement

SOUTHERN RADIOCRAFT LIMITED, Bournemouth, wish to announce that, due to the flood of orders over the December/January period, making all delivery promises next to impossible to confirm, they were obliged to cease ALL Advertising until such time as this large back-log had been cleared. With early clearance now in sight, we shall be free to accept fresh orders, with good delivery prospects, as from end of June. Please send 3d. stamp for List of LARGE PRICE REDUCTIONS and Discounts on all orders placed during the slack period, July/Aug./Sept., to " Olympic Works," Markham Road, Bournemouth, Hants.

BINOCULARS AND PERISCOPES wanted in exchange for Radio equipment. — Details to Busfield's, Astro-Marine Sales, 45-47 Eastborough, Scarborough, Yorkshire.

SMALL ADVERTISEMENTS, TRADE—*continued*

WANTED FOR CASH: All types of radio equipment. — Details of Busfield's, Astro-Marine Sales, 45/47 Eastborough, Scarborough, Yorkshire.

WANTED: TCS Transmitters, Receivers, Connectors, Loading Coils, etc.—R. Gilfillan, 98 Dominion Road. Worthing, Sussex. *(Tel.: Worthing 8719.)*

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

TAPE RECORDER, 3-speed Moetek deck, professionally-built Mullard amplifier, deck just been overhauled by makers, £30 (cost £40). R.1132A, 80-100 mc, and R.1392A, 100-150 mc, £5 each or £8 the pair. CR-100, working, £8 o.n.o.? Exchange any of above for commercial converter. MW or 3-6 mc Command Rx, or transistor PU. — Box No. 2629, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

£25 SECURES complete G3KNB station (requires space — gone mobile); buyer collect (will not separate): Bendix RA1B, 150 kc to 15 mc, matching PSU and speaker, RF-24 converter for 15 and 10 metres; 50-watt, 80 to 10-metre Tx in enclosed 3-tier, 4-ft. rack, Geloso driving 807, pi-output, pair 807 class-B modulators; twin 500 volts PSU; Top Band miniature Tx with 300-volt PSU, 25-watt modulator with own PSU; 5RV-type Tx, 80-20 metres, separate 500-volt PSU; 6-volt vibrator pack. Henry's Signal Tracer, 100 kc to 1 mc; xtal marker; HF pre-amp.; resistance/capacity bridge. Hundreds of valves, transformers, loudspeakers, etc.; s.a.e. details.—Ballance, 8 Oak Avenue, Walton Heights, Stafford.

SALE: HRO (not ex-W.D.), 28 to 1·7 mc coils, PSU, £15. Power pack, 1300v. 150 mA, £5. Mic amplifier and 200w. Class-B modulator, £5. Power packs, transformers, Tx valves, etc., at your price.—G5IS, 17 Rutherwyke Close, Stoneleigh, Surrey. *(Phone Ewell 6770.)*

FIVE-SECTION LPF, £1. DENCO FM Tuner, £3. Electric Spray Gun, unused, £3. Car radio, finest made, cost £50; four SW bands, medium, long, and four presets, push-pull output, easily modified mobile, £15. McElroy de-luxe bug with dot stabiliser, £7. Minimitter Mercury, new condition, £49. 4ZU co-ax beam, new telescopic mast, £18. All plus carriage; s.a.e. enquiries, please.—Box No. 2630, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TELESCOPIC MAST, brass hand winding winch, extends 30 ft. approx., minimum height 9 ft., £25. Buyer inspects and collects. — G3OFU, Glendale, Bollingway, Prestbury, Macclesfield, Cheshire. *(Prestbury 89710.)*

FOR SALE: S36A Receiver, 27·5-143 mc, first-class condition throughout, resprayed, £35; buyer collects. — 29 Hillcrest Road, Orpington, Kent. *(ORP. 26802.)*

G8KW all-band dipole, 97 ft. coax, £4 5s. Vibroplex bug, £3. WANTED: Z-Match, Monimatch.—Box No. 2631, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

HEATHKIT DX-40U, £20. BC-342N, 1·5-18 mc. S-meter. 230v. internal PSU. £14. WANTED: UM2, 2m. J-Beam. BC-454 and 373 IF strips.—G3PMD, 15 Benhall Avenue, Cheltenham.

MINIMITTER Mercury transmitter, 3·5-28 mc. 120 watts Phone/CW, 70 gns. BC-221T. £16 10s. Acos Mic-33 table microphone, £3. Medium-wave Command receiver, £5 10s. Co-ax Minibeam, £10. Near offers considered.—Box No. 2632. Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: TW Nuvistor converter, built-in PSU. TW2 and matching PSU. £38 o.n.o.? Consider exchange Eddystone S.750 or similar. WANTED: Coils HRO B/S 10, 40, 80; G/C 900 kc-2·05 mc; s.a.e.—Stagg, 2 Jackson Close, Easthampstead, Berks.

TA-12C Transmitter, £4 (4 VFO's). WANTED: Eddystone 888A Receiver; not going abroad. —Collect from: Smith, Windmill Road, Kemble, Cirencester.

FIRST REPLY received secures AR88D. table, £29 10s.; also AR88LF, rack, with tuning meter, £27. Sound working order; carriage paid; no haggling. — Findlay, 42 Hanover Street, Stranraer, Scotland.

PANADAPTOR, 455 kc, 5AP1, £25. Unused cowl gill motor, 25s.; both carriage extra. WANTED: Audio generator.—Stevens, 51 Pettits Lane, Romford, Essex.

ELECTROLYTIC Capacitor Bridge, 0·2 μF to 2200 μF, 0-600 volts, good condition, £10.—Box No. 2633, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: SX-28 speaker and/or mains transformer, or scrap SX-28 for spares.—Price and details to: GW3ACF, 22 Smallwood Road, Baglan, Port Talbot, Glam.

EDDYSTONE S.750, with S-meter, perfect condition, £40 o.n.o.? WANTED: Eddystone S.640, unmodified.—R. J. Newey, 23 Lea House Road, Causway Green, Oldbury, Birmingham.

WANTED, by Eire SWL: Manual and wiring diagram of R.107. Also headphones.—Box No. 2634, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: MR44/II; 888A with S-meter, or similar. Tiger Tx for sale. 150 watts.—Box No. 2635, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Geloso G.209 Rx, very good condition, £50.—Brough, 5 Beech Grove, Macclesfield, Cheshire.

SALE: R.107 and R.208, handbooks, cases, etc.; both complete, unmodified, working. R.107 needs attention. £11. Offers?—G3PSV, Wickham House, Church Road, Bagshot, Surrey.

SALE: HRO-M, new condensers and valves throughout, maker's power pack, 9 coils including two BS, re-aligned, latest American manual, in mint condition, £20.—G4LS, 148 Boston Manor Road, Brentford, Middlesex.

WANTED: Copy of February 1961 *Short Wave Magazine*, or details of conversion of R.114 to tune 144-6 mc. — G. D. Findon, Orchard House, Tredington, Shipston-on-Stour, Warwicks.

SMALL ADVERTISEMENTS, READERS—*continued*

SELL: Eddystone 680X, ex. cond., £70, c.r. Also Heathkit "Comanche," mint, cond.; first fair offer secures. — GM3CIG, 39 Hillfield Crescent, Inverkeithing *(Tel.: 590)*, Fife.

DST-100 Receiver, p/pack, manual, £22. TCS-12 Receiver, 1·5-12 mc, £5. R.1131A Receiver, p/pack, £3 5s. Ferrograph Tape Recorder 4AN, £75. Minifon (pocket) Wire Recorder (battery), £15. Mullard Type 5-10 amplifier, mixer 61/P's, 15 ohm speaker (Goodman's), £18.—Box No. 2636, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: BC-453, FB, £5; RF-27, £1 (heaters OK); APN1 rotary, 15s. All post paid, c.w.o.—Browning, 325 Staines Road, Twickenham, Middx.

GOING PORTABLE?—12/18v. DC 20 amp. petrol generator, self-starter, ammeter, 1 ft. cube, £12.—G3IES. *Edgware 0937.*

WANTED: Official Handbook of BC-348L, state price, also any details of circuit and operation of H & B "Kapani," Capacity Bridge.—R. Harvey, Hynton, Fulford Road, West Ewell, Surrey.

MOBILE: Two Pye Radio Telephones, model PTC-113; receiver frequency 85·625 mc; transmitter frequency 72·125 mc; both complete with mounting brackets and hand sets, suitable 12 volts DC, perfect working order; £15 each. — Farlow, G3BXI, 49 Mount Pleasant Road, Chigwell, Essex. *(HAI 4546.)*

FOR SALE: R.208 in good working order but without case. £4 o.n.o.? Buyer collects, please.—Hewitt, 65 Bedonwell Road, Bexleyheath, Kent.

KW77 mobile Rx, 160-10m., with Mosley 3-band mobile whip, £40 o.n.o.? Exchange for Labgear LG.300 RF unit. — G3LAS, 12 Beech Avenue, Buckhurst Hill, Essex.

WANTED: Heathkit "Mohican" Receiver; state price and condition. — Box No. 2637, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TWO QQV06/40A, new, boxed; what offers? WANTED: Pair 7360's; also 4X150A and blower.—G3HRO, 2 Cedar Road, Bromley, Kent.

NATIONAL HRO-5T, later model, metal octal valves and aerial trimmer, excellent stability, professionally re-aligned to standard signal generator, 480 kc-30 mc, as new, in maker's crate with service manual and power supply, £35 o.n.o.?—Pearson, 154 Derby Road, Southampton.

WANTED: *Short Wave Magazine* for May, 1956. —R. Anderson, 16 Kitto Road, New Cross, London, S.E.14.

WANTED: April 1960 *Short Wave Magazine* or information on modifications and improvements to CR-100.—J. F. Hall, 64 Falconer Road, Bushey, Herts.

SALE: Geloso G.209 Rx, modified for Top Band; excellent condition; step-up transformer and manual included; £60 (buyer collects).—Warburton, 23 Dettingen Road, Blackdown, Aldershot, Hants.

G3IES/XYL Margaret announce arrival of third harmonic (Keren Claire). AOK, *QSLR*.

SMALL ADVERTISEMENTS, READERS—*continued*

LATTICE MAST, 37 ft., telescoping to 26 ft., and prop-pitch motor for sale, £15; buyer to inspect and arrange collection. WANTED: Heathkit " Mohican " receiver in good condition.—G3HCM. 321, Tile Hill Lane, Coventry.

SALE: Sonobuoy UHF Rx, £6; R.208 Sputnik, cased, £5; 120-volt Elim., stab., £1; BC-454 (2), 7·0 mc, 45s.; 3·0 mc, 45s. RF-26 (2), 25s. each. BC-906, 30s. 'Scope, Type 221 int. EHT unit, £3. R.1132 (2), £3 each. R.1132 PSU, rack-type (2), 50s. each. Two Eddystone Rx new chassis, 358 type, with 3 coils, require attention, £3 each. R.1392, complete with Army handbook, £3 10s. R.1124, one with valves, one less, 30s. Two 19 Set vario., 10s. PCR, built-in speaker, requires attention, £2. Two cased grey PSU, 250v. 60 mA, 6·3v., 50s. each. CG46068 12-valve 12v. Rx, 60 to 80 mc, with circuit data, £5. 28v. PSU, £3. New Wavemeter UK4, £5. Test set, Type 37, £1 o.n.o.? All letters answered, carriage plus. — Port, 11 Bournewood, Hamstreet, Ashford, Kent.

WANTED: Woden UM3 modulation transformer; £3 10s., plus carriage, offered. — Pollock, Holmlea, Omagh, N. Ireland. *(Tel.: Omagh 139.)*

EXCHANGE Cintel Electronic counter (U.C.2.A), 28 valves, perfect, for Communication Receiver or W.H.Y.?—Ince, 282 Whalley Range, Blackburn. *(Transport available.)*

FOR SALE: R.107 with manual, £9; WS.19, with generator, control unit, headset, etc., £6; both plus carriage. — Davison, 67 de Parys Avenue, Bedford.

7 MC Ground Plane! Ex-Govt. telescopic rod with base; fully extended, 33 ft.; a really well-made aerial, approx. 2-in. base to ½-in. top; £4 10s. Write far particulars. Valves, new: 6B4G, 7s. 6d.; 6V6GT, 5s. 6d.; used 813, 15s.—G2DC, Morseden, Hightown Hill, Ringwood, Hants.

LG. 50, nearly new, and in mint condition, £35, or would exchange MR44. — G3NPB, Springfield, Haydon Bridge, Hexham, Northumberland.

MINIMITTER MR44/II, 6 months old, as new; offers around £40. SWL bought gen. cov. receiver. — Kendrick, 1 Longwood Road, Barr-Common, Walsall. *(Aldridge 52100.)*

WANTED: BFO coil for 7 mc Command Rx and Collaro Studio tape deck or similar, in good condition. — G3NNW, Taylor, 65 Manchester Street, Heywood, Lancs.

RECEIVERS! R.107 and R.208, unmodified, £12; buyer collects. — J. Peck, 31 Reginald Road, London, E.7.

FOR SALE: Heathkit/Daystrom 'Scope 0-12U, perfect condition, £30 o.n.o.? Buyer collects.—K. E. Griffiths, 127 Utting Ave. East, Liverpool, 11.

LABGEAR TOPBANDER, as new, £16. — Write G2SG, Applegarth, Beech, Alton, Hants.

SALE: B2 Transmitter/Receiver, complete with PSU, coils, 2 xtals, instruction manual, minus phones and key, in original cases, £10. WANTED: 25-watt modulator; PSU 320v. 200 mA.—Box No. 2638, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED, for GW6GW, Blackwood Club Station: Multiband CW/Phone Tx, commercial or good home-brew; must have T9 note.—GW3MMU, D. M. Fulton, 36 Sunnybank Road. Blackwood, Mon., S. Wales.

PROPERTY OF THE LATE WALTER KROHN. G6KJ, to be sold to first comers: Minimitter "Mercury" AM/CW/FM 10-80m. Transmitter, 120-150w. table-top, panel controls, modified for touch tuning by blind operator (could easily be restored); exciter wave-change switch needs slight attention; price £50. One HRO-MX receiver, with GC coils 0·9 - 2·05 mc, 1·7 - 4·0 mc, 3·5 - 7·3 mc, 7·0 - 14·4 mc. 14·0 - 30 mc; some marked for identification by touch; price £20. One HRO, early pre-war type, with full set GC coil packs, as above; price £17. Also HRO coil packs: One BS 21 mc, one GC 14·0 - 30 mc, 25s. each; one 900 - 2005 kc, 15s. One m/c meter, various switched mA ranges, designed for touch reading by blind operator, 25s.; one ditto. reading several ranges of volts, 25s.; both in brass mounting, safe to handle. Universal Avometer, standard instrument, fully modified by manufacturer for touch reading, with all leads and instructions in Braille, new condition, £15. One Wilcox-Gay VFO. unmodified, £1. One modulator chassis, TZ40 Class-B, with Woden DT3 driver and UM3 modulation xformers, £5, including valves. Control Unit. Type 203, numerous useful parts incl. relays, metal rectifier, etc., £2. W.B.-type HF-1012 hi-fi speaker. 3 - 15 ohm taps, new, £2. One 40-ft. dural mast, standing, in two 20-ft. 2-in. sections, with two sets guys, on turnbuckles, all good material, in excellent condition, £5 10s. only (buyer dismantles for removal). Several boxes useful oddments, 10s. each. All offered in reasonable condition and working order, cash-and-carry only; arrange call by appointment.—Krohn. 20 Church Street, Buckingham. *(Ring Buckingham 2349, 4.15 - 6.30 p.m.).*

WANTED: Inexpensive, mains-operated, 2-metre receiver; home-made gear considered. Also required: R.A.E. course in reasonable condition.—Box No. 2639, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Viceroy Mk. I and PSU (BK CW version). as new, £95. Constant Voltage Transformer. 230v. 250w., £2.—Swinnerton, 28 Nightingale Road. Rickmansworth. *(Tel. 6864.)*

MARCONI ABSORPTION WAVEMETER. TF-643, 20-300 mc. with charts. £7 10s. L.P. Morse Record for GPO Test, 25s.—A. J. N. Eardley, The Grange, Colne, Lancs.

WANTED: Viceroy, Victor or Vanguard in very good condition.—Box No. 2640, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EDDYSTONE 840A Communications Receiver for sale, £38 or nearest offer; as good as new; purchased 21/2/62 for £55. Seven valves, including RF amplifier, coverage 10 to 620m.—A. Frontera, 2 Sherriff Road West Hampstead, N.W.6

EXCHANGE: Marconi CR-150, 2-60 mc. complete with power pack, very good condition, for Panda PR-120v. Tx or 455 kc Panadaptor.—15 Goudhurst Road, Gillingham, Kent.

WANTED: Good 12v. mobile PSU to give at least 300v. at 150 mA. W.H.Y.?—G3OTD. 65 Wainfleet Road. Skegness. Lincs.

SMALL ADVERTISEMENTS, READERS—*continued*

R. 109 Rx, brand-new, unused, with spares, £4 10s., plus carriage; or part-exchainge for 52 Rx. R.1155, etc.—Renwick, 21 The Grove, Windle, St. Helens, Lancs.

FOR SALE: R.1155A with power pack, nearest £10; buyer collects; good condition. — Mrs. Kirk, 70 Richmond Mount, Leeds, 6, Yorkshire.

R. 107 Rx for sale, internal speaker, phones, plus RF-24 unit, good condition, £9 inclusive.—Derrington, 263 Kingsbury Road, Birmingham, 24.

MARCONI CR-100/7, excellent cond., with handbook, £17 10s.; 2-metre test eqpt. with signal generator, FS meter, and test meter, 70s.; 4/65A with base, 30s.; 19 Set power pack, 25s.; 6-volt Vibrapack 250v, 80 mA, 20s. *QST* (2s.) and *Short Wave Magazine* (1s.) back issues; carriage/postage extra.—G3MOE, Westbury Road, Cheltenham, Glos.

R. 208, unmodified, in metal carrying case, good condition. View and collect by appointment. £8.—*Phone: Tadworth (Surrey) 3247.*

EDDYSTONE 840C, under guarantee, 3 months old, as new, no offers, £48, plus £1 p./p.—Box No. 2641, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

YOUR PRICE PAID for HRO Instruction Manual in good condition.—G2CNN, Mount Pleasant Inn, Dawlish Warren, South Devon.

SALE: R.206 Mk. II Rx, with adaptor 50 kc to 30 mc, PSU, speaker, manual, connectors, £12; or exchange mobile gear, W.H.Y.?—G3GCO, 31 The Crescent, Donnington, Shropshire.

SALE: Hallicrafters S.38C Receiver, 1·5-30 mc, with bandspread, £12. — Box No. 2642, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO-M Receiver (rack), coils, PSU, excellent condition, £19 10s. New signal generator to 200 mc, exchange for National 1-10 Rx, R.1392, Trophy 8, or sell £4 15s.—SWL, 88 Grenfell Avenue, Saltash, Cornwall.

WANTED: HEATHKIT Valve Voltmeters, and other Test Gear by Heathkit. Also Dow Relays. —D. H. Baynham, G3DHB, School of Signals, Catterick Camp, Yorks.

SALE: Hammarlund Super-Pro receiver, with power pack and speaker; CR-100 with speaker; Class-D Wavemeter; Granton Capacitor Analyser; Weston Oscillator, Model E692; Home-built Elizabethan Tx; Valves: pair 813's, 866's, etc. Offers? Also many spares, transformers, chokes, mikes, etc., for callers.—Howe, 12 Lanchester Road, Maiden Law, Lanchester, Co. Durham.

FOR SALE: R.107 S-meter, manual, phones, spare valves; perfect condition and appearance; £10. Collect or pay carriage.—W. Bassi, Wycliffe, 13 Westbourne Crescent, Whitchurch, Cardiff.

FOR SALE: New, never been on the air, TR200X, £170 (still under guarantee); weekly fil. warm-up only, £120 o.n.o.? Council won't allow antenna or poles. — Powell, 21 Tanybryn Estate, Valley, Anglesey.

COLLINS 310B Exciter, similar in appearance to 32V1, mint condition, 10-80, 40-50 watts to 6146, outstanding VFO stability; completely self-contained with CW monitor, negative bias for Rx to provide full BK facilities, together with 25-watt modulator; a gift at £50.—G3CRH, White Cottage, Hammerwich, Lichfield, Staffs.

WANTED (setting up new station): Good quality receiver, 160-10m, SSB, AM, CW; 150w. Transmitter, DX-100U with SB10U, or similar; also aerials, amateur bands. Glasgow.—Box No. 2643, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO, 500 kc-30 mc, p/pack, LS, £20 o.n.o.? R.1155, own power supply, output stage, £8. 2000-watt 230/115v, transformer, 3 outputs, fused, silver-grey, £7 10s.—G8KC, Aorangi, Tokers Green, Reading.

R. 107, £10. Army No. 12 Set, 1·2-18 mc, band-switched Tx, complete with manuals and special-type plugs. Both in first-class condition.—G3OIB, Read Grammar School, Drax, Selby, Yorkshire.

SALE to nearest offer: HRO-MX, all coils, 80, 40, 20 bandspread, 30s. each, ATU, PSU, speaker, £22. Panda Explorer, 6146's, xtal mic., low-pass filter, aerial change relay, £70. R.1392, 30s. *(QRT).*—Elliot MacDonald, 8 Lela Avenue, Hounslow, Middx.

HEATHKIT "Seneca" VHF-1 Transmitter, complete with 4 crystals for 2 metres, for sale with manual; has gained owner VHFCC, Veron VHF cert., 9 countries; and Four Metres and Down cert. for 2 only; in perfect working order and good appearance. Pair 6146's spare. Price £85. Also Heathkit DX-40U and VFO, just completed and tested, price £45.—G3OJY, Trevarrack Cottage, Rosudgeon, Penzance, Cornwall.

Printed by The Courier Printing Co. Ltd., Tunbridge Wells, for the Proprietors and Publishers, The Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. The *Short Wave Magazine* is obtainable abroad through the following: Continental Publishers & Distributors, Ltd., William Dawson & Son, Ltd.; AUSTRALIA AND NEW ZEALAND — Gordon & Gotch, Ltd. ; AMERICA—International News Company, 131 Varick Street, NEW YORK. Registered for transmission to Canada by Magazine Post. *June, 1962.*