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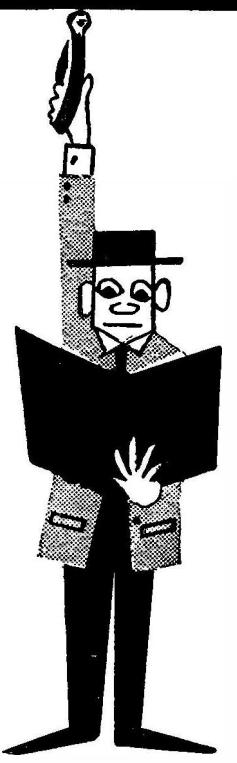

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Overhearing

As everyone with a receiver knows, there are a great many interesting transmissions to be heard outside the amateur and the short-wave broadcast bands — for instance, we constantly have enquiries about when, how and on what frequencies ships and aircraft can be overheard, and if there are publications available giving the necessary data.

These requests are invariably made in all innocence, the enquirer not having realised — because he has never read his receiving licence — that in fact there is a total prohibition on unauthorised listening on commercial and Service channels. In other words, it is against the law to listen to, for example, ships working coast stations; or aircraft in communication with airfield control; or police cars talking to headquarters — or even to taxis arranging to pick up fares.

Now, it is not for us to have to interpret the law and still less to apply it, but obviously we must observe it to the letter and in the spirit. This is one reason why in the ordinary way we do not give coverage in SHORT WAVE MAGAZINE *to communication activities outside our bands, however interesting they may be — another is, of course, that it takes us all our time to keep up with what is happening on the amateur bands, let alone with what may be going on outside them!*

The prohibition on public overhearing on commercial and Service channels is not because of some grandmotherly attitude on the part of the Post Office, and they should not be blamed for inventing the regulation. The ruling was confirmed by international agreement at the last Geneva Convention, and hence it becomes the duty of our administrative authority to apply it. In the old days, the wording of the receiving licence was to the effect that anything " inadvertently overheard was not to be disclosed," and so it did not amount to quite the total prohibition written into the present receiving licence. And, incidentally, the pre-war domestic permit did not specifically include amateur stations in the category of the non-prohibited, as does the present one. To put it another way, all you can now listen to legally are broadcasting and amateur stations, and this is what your licence says.

Though it could be argued that anything transmitted by radio amounts to " broadcasting " and that it is for the originator to ensure that his traffic cannot be heard on an ordinary short-wave receiver, by international law the onus is thrown on the listener by demanding that he should use his receiver only for those services — in this case, broadcasting and amateur — for which he is licensed.

Austin Forbes G6FO.

AN EFFECTIVE NOISE SILENCER

USING SEPARATE NOISE RECEIVER

G. T. SASSOON (G3JZK)

This interesting article describes the practical application of noise quenching to an amateur-band receiver, and is based on the sophisticated Collins design for QRN suppression, known as the Noise Blanker. An essential factor in the success of the unit discussed here is the RCA 7360, a valve of an unusual type with special characteristics. Our contributor has been obtaining very satisfactory results with this noise suppressor for some two years, and has used it successfully on VHF as well as on the HF bands. It is an important development in contemporary amateur-band receiver design.—Editor.

IN the design of many of today's communications receivers, a much-neglected feature is the noise limiter. This is possibly due to the fact that commercial users can pick their QTH, and therefore are not likely to be troubled by ignition noise to the same extent as amateurs—a fact of which the designers of many specialised amateur-band receivers do not seem to be aware. Furthermore, the increase in road traffic makes the ignition noise problem still more acute, particularly, of course, to the mobile worker.

The deficiencies of the conventional diode clipper-limiter type noise suppression circuit are well known. At best, they are barely effective on weak phone signals, and almost totally ineffective on SSB. Various solutions have been proposed: the Lamb noise silencer (first described in *QST* for Feb. 1936) is a lot more effective, although still suffering from certain inherent disadvantages; and, more recently, the Collins Radio Co. have marketed a silencer similar in principle to that described here.* However, neither circuit seems to have achieved much popularity on this side of the Atlantic, so the present article may be of some assistance to fellow-sufferers from ignition QRM.

Principle of Operation

Consider the block diagram of Fig. 1. A noise pulse radiated by a car's ignition system is picked up by the noise and main aerials simultaneously. It is amplified and detected by the noise receiver, which operates at about 40 mc, and the rectified impulse is then used to trigger a monostable flip-flop circuit. This produces a long, negative-going pulse, which is applied to the balanced gate in the main receiver IF chain, so as to switch the receiver off for a period. In the meantime, the noise pulse has also been coming through the main receiver front-end. However, the bandwidth of the latter is comparatively narrow — a few kilocycles, as compared with over a megacycle for the noise receiving section. Therefore, the noise impulse will take some time to build up to full amplitude at point D—much longer than it takes at point C. This is illustrated in Fig. 2. Thus, it is evident that the silencing impulse will have cut off the gated stage some time before the pulse arrives *via* the main receiver at point D, and so the net noise output from the gated stage at E will be very little. What we have done, in effect, is to switch the receiver off for the duration of the noise pulse.

This system works very well, but there are a number of critical points about the design which must be taken into consideration. First, every precaution must be taken to maintain the highest possible bandwidth in the noise receiver; this has necessitated the use of two pentodes for the flip-flop, where otherwise a double triode might have sufficed. Also, the first half-cycle of a noise pulse could be either positive-going or negative-going at the detector input; for this reason, it is necessary to use a full-wave detector.

Secondly, if the bandwidth in the noise receiver is made high enough, then the silencing pulse itself will contain components at the IF. Therefore, if a single-ended gated stage were used, the silencing pulses would appear in the output, defeating the entire purpose of the unit. If a low-pass filter (cutting off signals at the IF) were placed (say) at point C in Fig. 1, the bandwidth would be too small and the silencing pulses would arrive too late. For this reason, a balanced gate is essential; it must be set up so that no component of the silencing impulse can appear in the output. In practice, the balanced gate proved to be the most difficult part of the design and, in fact, a satisfactory solution was not achieved until the RCA 7360 became available.

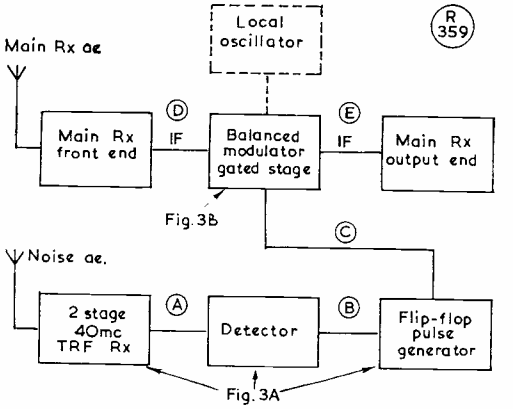
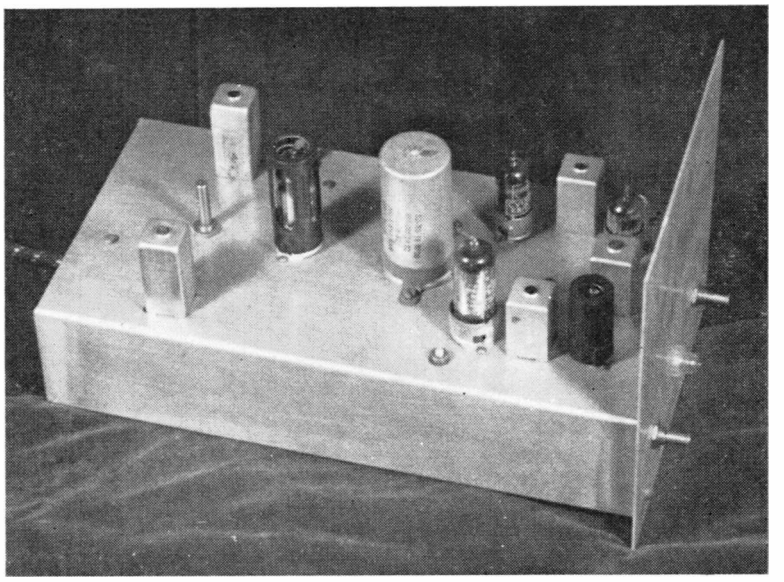


Fig. 1. Block diagram of silencer and associated receiver. The circuit arrangement is explained and discussed in the text. The local oscillator is included if the gated stage is also serving as a frequency-changer.

* For an excellent discussion of these circuits and of the noise problem generally, see the article by J. B. Dance, M.Sc., in the February, 1960, SHORT WAVE MAGAZINE.

The primary objection to this silencer, as regards fitting it to existing receivers, is that it is necessary to break into the IF chain. There is no real solution to this problem and, even if there were, it would be most difficult to prevent the stray coupling which would enable the noise pulses to bypass the gated stage. Ideally, the unit should be built in conjunction with an outboard IF strip. The balanced gate may also be used as a frequency-changer, simply by feeding in a local oscillator signal in parallel with the silencing pulses, and taking output at the desired frequency. It is hoped in due course to use the existing unit in this way to change from 450 kc to an 85 kc IF. This can be done by feeding in a crystal-controlled signal at 535 kc and installing an 85 kc transformer on the output side.



The noise silencer unit as designed and constructed by G3JZK and fully described in the article. Once adjusted, and incorporated into the main receiver, its operation is automatic. It will give almost complete noise suppression and within certain limits the higher the stray noise level, the more effective the action of the limiter. It is based on an advanced and very sophisticated design used commercially by the Collins Company.

In operation, the unit is most effective on SSB signals, and when listening on those (rare) spots on the HF bands where there are no signals. On CW, the holes are occasionally noticeable, particularly when they occur in the middle of a dash; however, only at the highest speeds could this cause a dash to sound like two dots. On strong AM signals, however, the holes are distinctly audible, particularly when it is necessary to increase the hole length to cope with the noisier vehicles. Nevertheless, the amplitude of pulses present in the output cannot exceed that of 100% modulation of the incoming carrier, so that the performance of the unit at its worst is equivalent to that of an ordinary diode clipper at its best. On weaker AM signals, the holes are much less noticeable, and under no conditions do they make copying difficult.

Circuitry

The noise receiver front-end (Fig. 3A) uses two 6AK5's, with conventional circuitry. Only two stages are necessary to give the required gain; owing to the broad-band nature of noise, the noise output is proportional to bandwidth as well as to gain. This receiver has a bandwidth of about 2 mc (about 200 times that of a normal receiver), so only about 1/200 of the gain is required. The noise aerial can be any odd length of wire, although a vertical dipole placed strategically low down and near the road gives best results. (A 40 mc dipole is about 10 feet long, to save you working it out!) It is advisable to break the aerial connection to the unit when transmitting, to avoid damaging the RF stages with excessive grid current.

The anode of V2 is inductively coupled to the full-wave detector D1, D2; gain is deliberately sacrificed here by using a step-down at L3, to improve bandwidth. A negative-going pulse is delivered to the grid of V3, which is normally conducting. As a result, the anode of V3 delivers a positive impulse to V4 grid, V4 being normally cut off. If this impulse is sufficiently large to make V4 conduct, a negative impulse appears at its screen, which is fed back *via* the detector circuit and C16 to V3 grid, and the state of affairs reverses itself: V4 conducting, and V3 being cut off. After a time, determined by VR1 and

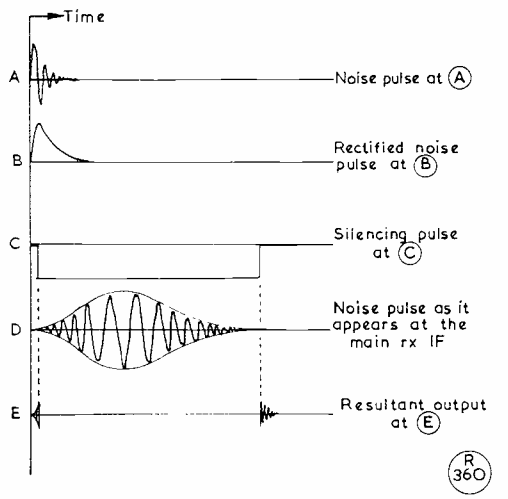


Fig. 2. Waveforms of a noise pulse as it appears at various points in the block diagram, Fig. 1.

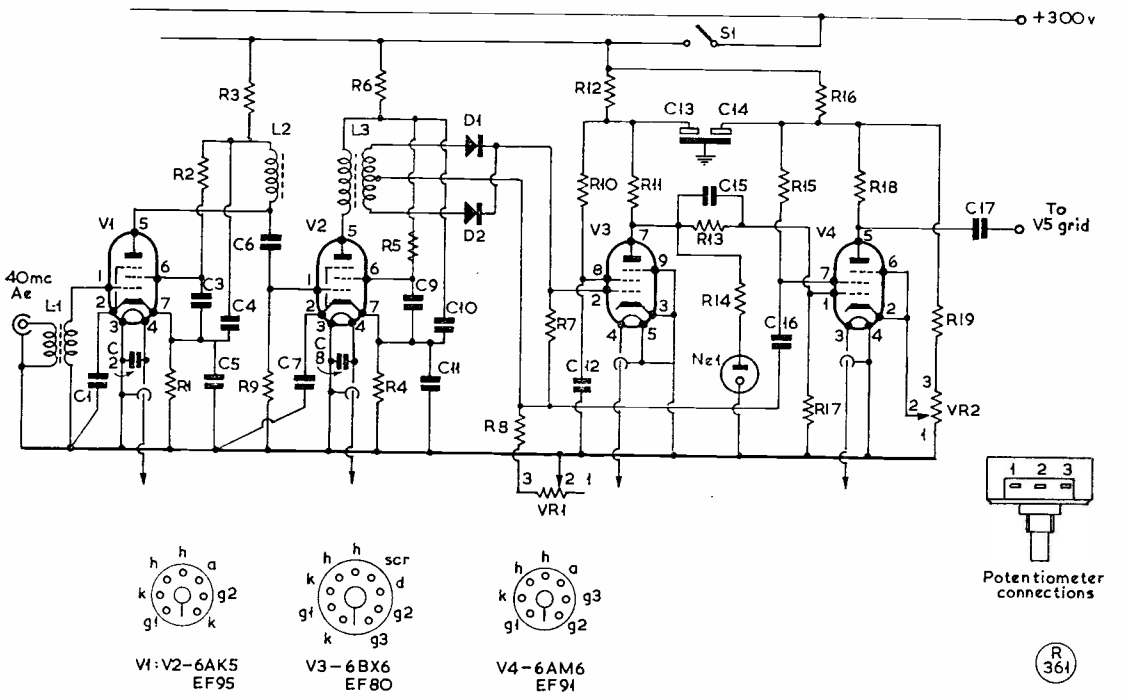


Fig. 3A. Circuit diagram of 40 mc noise receiver and pulse shaper, the output of which drives the gating unit—see Fig. 3B. In the arrangement shown here V1, V2 constitute the broad-band VHF receiver, in which D1, D2 form a full-wave detector. As explained in the text, the action of the circuit is to produce a negative-going pulse at the anode of V4, the length of which is controlled by VR1. The neon NE1 is merely an indicator, and will absorb the positive pulses. The general inter-connection into the main receiver is shown in the block diagram of the system, at Fig. 1 on p.288.

its associated 100K resistor R8 and 200 $\mu\mu$F condenser C16, the circuit reverts to normal. This produces a negative-going pulse at the anode of V4, the length of which is controlled by VR1. At the same time, a positive pulse appears at V3 anode, which is used to light a neon lamp, NE1. (This helps to fill up the panel, and gives an indication of when the unit is working.)

The negative impulse from V4 anode is fed to the control grid of the 7360 (Fig. 3B), which also has a diode (D3) fitted to protect it from positive-going surges, as recommended by the makers. The IF input is fed to the deflector electrodes of the 7360, balanced circuitry being used, since it gives a slight improvement in performance. (If, for any reason, this was inconvenient, it could probably be dispensed with.) Cross-neutralisation is employed between deflector electrodes and anodes, using Philips trimmers VC1, VC2, mounted on stiff wires over the valveholder. This is not strictly necessary to prevent instability, but is included to counter signal feed-through when the valve is cut off. Similarly, it is necessary to take every possible precaution to keep input and output isolated from each other. The input and output IF transformers IFT1 and IFT2, Fig. 3B, should be placed some distance from the valve, and the anode and deflector connections made with twisted pairs of wires. Using this expedient, it was found possible to do without full screening.

The IF transformer connections shown on the input and output sides are only suitable if the unit is to be connected by short lengths of coax. Otherwise, matching arrangements must be made, preferably including a cathode follower on the output side.

Chassis layout should be logical, with plenty of space left between stages. This is frequently as effective as sub-chassis screening for preventing instability. All power connections should be made with screened wire, and all RF stage heaters decoupled at the pins. Apart from the messy agglomeration of components round the 7360 base, the unit should present few problems constructionally.

Alignment

After assembling and checking all wiring, insert the 7360, connect up the IF leads, and switch on. If all is well, signals should be audible. Tune in a strong station, and peak up the IF transformers with VC3, Fig. 3B, at the middle of its travel. Then connect a 22½-volt deaf-aid battery between 7360 grid (negative terminal) and earth (positive terminal). This should cause an appreciable falling off in signal strength. Adjust VC1 and VC2 (the neutralising trimmers) for minimum signal. Disconnect the battery. The stage should now function again,

amplifying strongly; it should give at least 70 dB reduction in signal when the battery is connected.

Next, the noise receiver should be aligned. Plug in the 6AK5's, and connect headphones across the 27K resistor R7 at V3 grid. Noise should be heard, increasing when the aerial is connected. Peak-up the cores of L1, L2, and L3. The exact frequency chosen for this is not critical; the most important consideration is that there should be no non-noise signals in the passband. (At Cambridge, a frequency just LF of TV Channel 1 Sound is quite satisfactory.) With good HR phones, ignition noise should be uncomfortably loud when the stages are correctly aligned. If no output is obtained, check for oscillation by connecting a voltmeter in place of the phones. However, the unit should not oscillate provided that the layout is sensible, all decoupling condensers are present, and the coils are in cans or otherwise isolated.

When the noise Rx is functioning correctly, plug-in V3 and V4. The neon, fully lit hitherto, should go out. If VR2 is advanced (clockwise), the neon will light brightly to the accompaniment of a high-pitched squealing from the loudspeaker. Bring VR2 back to a point well below that where the oscillation ceases. The unit should now work after a fashion, but it is still necessary to adjust the balancing controls at the 7360. For this purpose, a test signal is necessary. This is most conveniently provided by an unsuppressed vehicle parked as close as possible to the noise pick-up aerial and ticking over. (However, caution should be exercised in using this method if the vehicle is on the road, since it is an offence to leave it unattended with the engine running. So unless the XYL can be persuaded to go and sit in it, something else must be found; possibly an electric buzzer or bell left running would suffice.)

Thus provided with a steady noise signal by one of these methods, the neon should flash regularly, and there should be a clicking from the receiver. To adjust the balance, back off the RF gain on the main

Table of Values

Fig. 3A/B. Circuit of the Noise Silencer by G3JZK

C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11 = .005 μF disc ceramic
C12 = 1 μF, paper
C13, C14 = 32/32 μF, 450v. elect.
C15 = 100 μμF, ceramic
C16 = 200 μμF, mica
C17, C20, C23 = 0.1 μF, paper
C18, C19 = .001 μF, ceramic
C21 = 15 μμF, silver mica
C22 = 32 μF, 450v. elect.
C24, C25, C26 = .005 μF disc ceramic
VC1, VC2 = 2-8 μμF, Philips trimmers
VC3 = 3-30 μμF, Philips trimmer
R1, R4 = 150 ohms, 10%
R2, R5, R28, R29, R30 = 22,000 ohms, ½w.
R3, R6 = 12,000 ohms, 1w.
R7 = 27,000 ohms, ½w.
R8, R21, R24 = 100,000 ohms, ½w.
R9 = 82,000 ohms
R10, R15, R18 = 33,000 ohms, ½w.
R11 = 33,000 ohms, 1w.
R12, R31 = 4,700 ohms, 1w.
R13 = 560,000 ohms
R14 = 100,000 ohms; value depends on neon
R16 = 10,000 ohms, 1w.
R17 = 330,000 ohms
R19, R20 = 100,000 ohms, 1w.
R22, R23 = 4,700 ohms, ½w.
R25 = 12,000 ohms, ½w.
R26 = 1 megohm
R27 = 180 ohms, 10%
R32 = 15,000 ohms
VR1 = 5 megohm log.
VR2 = 25,000 ohms, w/ wound
VR3 = 5,000 ohms, w/ wound, pre-set
S1 = SPST, toggle
NE1 = Panel-mounting neon indicator
D1, D2, D3 = Xtal diodes, any general-purpose type
V1, V2 = 6AK5, or EF95
V3 = 6BX6, or EF80
V4 = 6AM6, or EF91
V5 = RCA 7360 (*see text*)

TABLE OF COIL DATA

L1 — 20 turns 24g. enam., close-wound on $\frac{5}{16}$-in. diam. former, for *grid*. 3 turns 24g. close-wound at earthy end, for *aerial*.
L2 — 14 turns 24g. enam., spaced to ½-in. winding length, on $\frac{5}{16}$-in. diam. former.
L3 — *Anode winding:* 20 turns 24g. enam. close-wound on $\frac{5}{16}$-in. diam. former. *Diode winding:* 3+3 turns insulated wire over HT end of anode winding.
L1, L2, L3 — All fitted with adjustable iron-dust cores.
IFT1, IFT2 — As required, and fitted if necessary with internal condensers of reduced value.

Notes: Refer Table of Values: VR1, VR2 are panel controls, VR1 for "silencing-pulse length," and VR2 for "threshold." VR3 is the balancing control, *see text*. S1 is a panel control, for "silencer in-out." The neon NE1 should have its internal resistor removed; the value of R14, nominally 100K, will vary according to the characteristics of NE1.

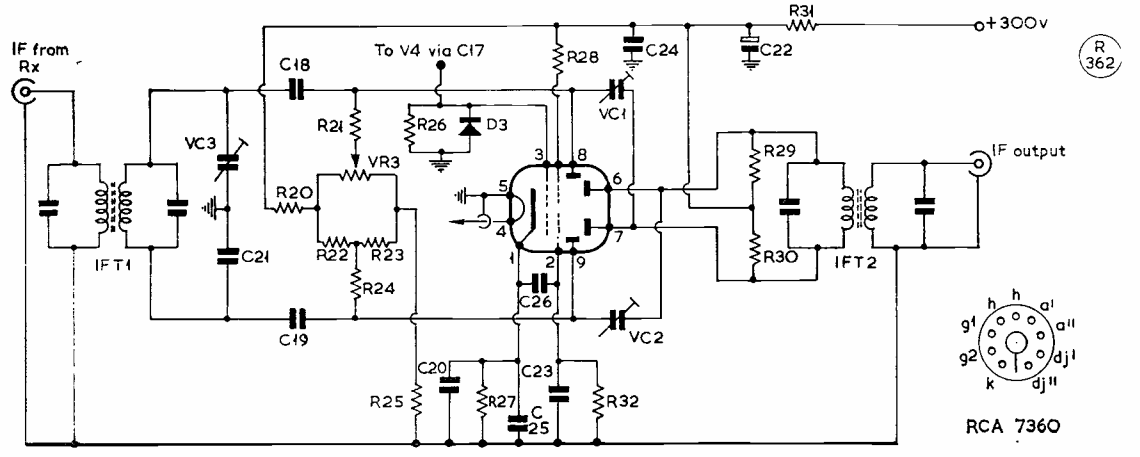


Fig. 3B. The balanced gate unit, incorporating the 7360, which is driven by V4 in Fig. 3A. VC1, VC2 are neutralising trimmers, and the adjustment and setting-up procedures are discussed in detail in the text. When the silencer is working properly, there should be an absolute blanking of peaky-noise signals, such as car ignition. G3JZK has used the circuit for the last two years with great success, in a very noisy main-road location.

receiver, and turn up the IF unit gain as much as possible. There will probably be a considerable amount of noise. Adjust VC3 and VR3 for minimum output; try touching up the neutralising trimmers if the *null* is not very sharp. Then return to normal listening conditions, peak up the IF's, and repeat the battery test to make sure. The unit should then be fully functional, producing virtually no noise when there is no input signal, and blocking any signals completely when cut off by the battery.

When finally it is working, the only indication you should ever receive of passing traffic will be a frantically flashing neon.

About the 7360

As a postscript, a few words about this valve might be in order, although the makers' agents—R.C.A. (Great Britain) Ltd., of Sunbury-on-Thames—will provide full information on characteristics and suggested applications. They are somewhat expensive, 55s. each about two years ago, but worth it in that they permit considerable circuit simplifications. They consist in principle of an electron gun, a pair of deflecting electrodes much like those in a CRT, and a pair of anodes. The gun projects a sheet beam of electrons between the deflectors, on to the anodes. When the deflectors are at the same potential, each anode receives an approximately equal share of the current. Any *difference* in deflector potential causes the relative anode currents to change, whereas if both deflectors are changed in potential by the same amount, the anode currents are virtually unaffected. At the same time, the total anode current can be modulated by the control grid. This valve lends itself to numerous applications. For example, it could be used as an audio phase splitter, with earthed control grid, audio input to one deflector, and outputs from the anodes.

However, its principal application is for balanced modulator use in SSB equipment; for this purpose it is of considerable value, since it makes it possible to build a balanced modulator with two single-ended inputs.

THE MINITOPPER

MINIATURE 160-METRE TRANSMITTER FOR BENCH OR MOBILE WORKING

W. FARRAR (G3ESP/M)

and

J. ARUNDEL (G3HCX)

THE original project was to design and construct a small transmitter for 160-metre mobile operation. To this end the equipment had to go into a small space, yet work at near the full ten watts input and have plate-and-screen modulation, in order to overcome as far as possible the limitations of a short whip aerial. Crystal control was considered, but abandoned in favour of the flexibility of a VFO.

The first attempt consisted of a 6AM6 Clapp oscillator driving a 6BW6 PA; this worked well, and still does. But there was some pulling between the PA and oscillator, due to lack of a buffer stage, resulting in a little frequency modulation on telephony, and a quite revolting chirp when working CW, with the PA keyed. The revised version, incorporating a buffer, has completely eliminated these faults, and gives an excellent signal in both modes of transmission.

The circuit is shown in Fig. 1, and the general layout can be seen in the photograph. In general there is no pretence at originality. However, some explanation of certain features may prove of interest to other constructors.

Valve Types

It was necessary to use miniature valves to get the size down. In any case, they are obtainable on the surplus market at virtually the same prices as the obsolescent octal types. Since the transmitter was intended for mobile working with a 12-volt battery, heater ratings needed to be selected and connected to suit that supply, to avoid using loading resistors which waste battery power. The PA and modulator types (6BW6) were chosen because of earlier experience with a Top Band transmitter using the equivalent 6V6 valves in those positions, with excellent results. The heaters of these stages are connected in series. The oscillator and buffer stages

Table of Values

Fig. 1. Circuit of the Miniature 160m. Transmitter

C1, C9, C13, C19, C21	= .003 μF, ceramic	R8	= 18,000 ohms
C2, C14	= .01 μF, ceramic	R9	= 10,000 ohms
C3	= 50 μμF, var.	R10	= 330 ohms
C4	= 50 μμF, trimmer	R11	= 39,000 ohms
C5	= 50 μμF, silver mica	R12, R16	= 470,000 ohms
C6	= .002 μF, mica	R13	= 8,200 ohms
C7, C12	= .001 μF, mica	R14	= 220,000 ohms
C8, C8A	= 100 μμF, ceramic	R15	= ½-megohm, var.
C10, C11	= .005 μF, ceramic	R17	= 4.7 megohms
C15	= 140 μμF, var.	V1, V2	= 6AM6, *or* Z77, EF91, 8D3, 6F12, SP6
C16	= 200 μμF, silver mica	V3, V4	= 6BW6
C17	= 25 μF, 25v. elect.	V5	= 12AT7, *or* ECC81, B309, B152
C18	= 8 μF, 350v. elect.	T1	= *See text*
C20	= 25 μF, 15v. elect.	RFC	= 2.5 mH RF chokes
R1, R5	= 47,000 ohms	J1	= Close-cct., key
R2	= 27,000 ohms	J2	= Coax, mic.
R3	= 62,000 ohms	J3	= Coax, Ae. feed.
R4	= 100,000 ohms	S1	= Net
R6	= 3,300 ohms	M1	= 0-50, *or* 0-100 mA
R7	= 220 ohms		

(*Note: All resistors rated ½-watt*)

COIL VALUES

L1, L2 — Broadcast receiver types, *see* text.
L3 — 48 turns 28g. close-wound on 1-in. diameter former.
L4 — 5 turns coupling link over HT end L3.

take 6AM6 valves with series heaters. The speech amplifier, using a 12AT7, can be connected on its own, of course. However, since this last type has a centre-tapped heater, the whole set can be wired, if desired, to run the heaters from a 6-volt supply, to suit certain continental makes of car. Both sets of connections are shown in the circuit diagram.

RF Section

This is perfectly standard, needing little comment. It was found that small broadcast-band coils suited the grid and anode circuits of the oscillator and buffer, thus keeping size to a minimum. The grid section L1 is a local oscillator coil for medium-wave, designed for 465 kc IF ; the anode winding L2 is a slug-tuned medium-wave signal frequency coil. Link coupling is used in the PA output, since it requires only one tuning condenser. In mobile service, the link is coupled *via* a short length of coaxial feeder straight to the bottom of the whip aerial. Alternatively, using a simple external tuning unit, a wire can be loaded for fixed-station or /P operation.

Modulator

Many a design has been published for a 160-metre transmitter using a push-pull modulator. What a waste of space and power, as well as money! Although in theory 5 watts of audio power is needed fully to modulate a PA at 10 watts input, this applies only to sine-wave or pure tone modulation. With peaky speech waveforms, 100% modulation can be reached when the average audio power is rather less than 5 watts—and this is within the capability of a single 6BW6 working in Class-A. The 12AT7 speech amplifier can be replaced by a 12AU7 without circuit change—either type gives more than enough gain. If a 12AX7 is available, it will give much more gain than is necessary. To offset this and to simplify construction slightly, the cathode by-pass condenser in the second section could be omitted.

Circuits have been published using a carbon microphone in the cathode circuit of the first speech amplifier. This gives no advantage. In fact, a crystal microphone insert is much lighter in weight, facilitating fixing to a boom for mobile use, and with fairly close talking gives excellent speech quality with little pick-up of external noises.

One problem to be solved was to find a small modulation transformer or choke. A small enough transformer did not seem to be available, and a choke would need to carry the combined currents of both PA and modulator valves. The problem was solved by using the output transformer from a *receiver* of the BC-453/4/5 series. The primary winding of this is approximately centre-tapped ; HT is fed to this point, and the outer ends of the primary connected to the

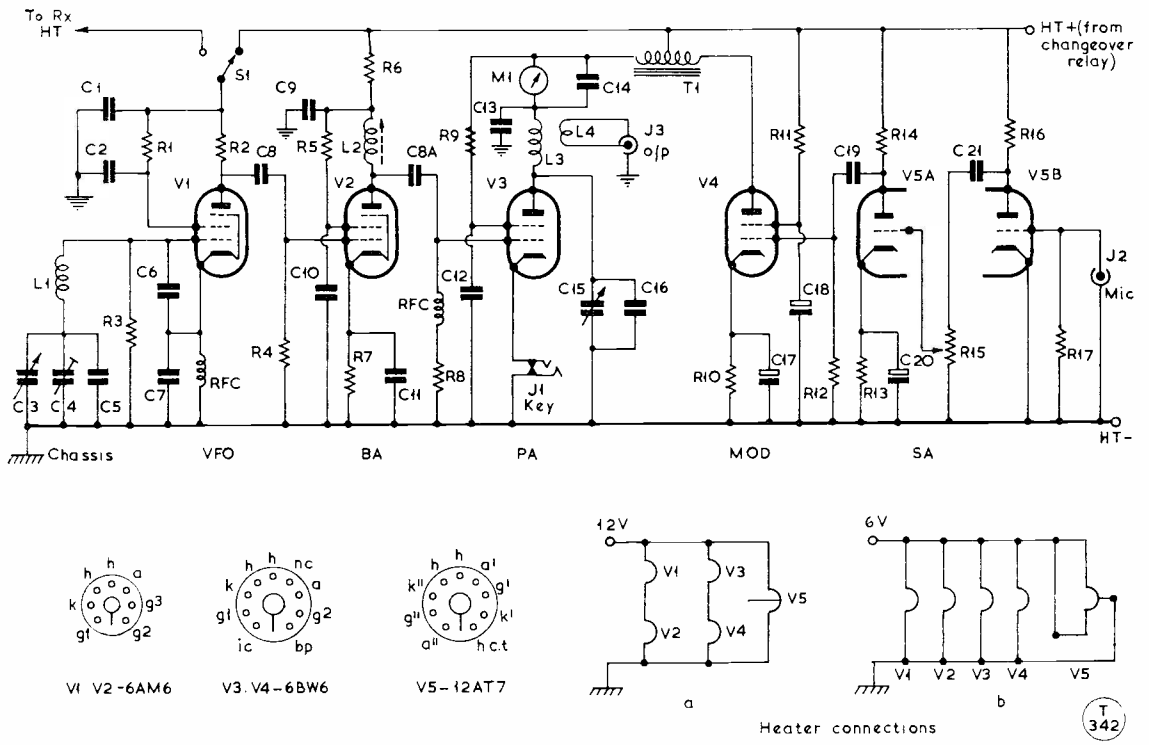
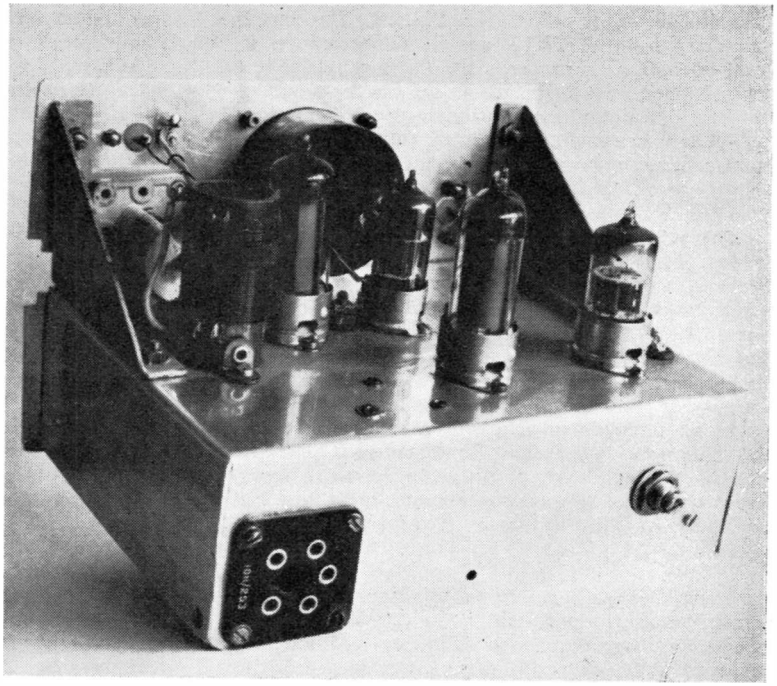


Fig. 1. Showing the circuit arrangement of the small mobile/portable or fixed-station 160m. transmitter described by G3ESP/G3HCX in their article. Miniature valve types are used, the PA being a 6BW6 (V3) modulated by another 6BW6 (V4) across the tapped choke T1 (see text). The 12AT7 in the speech amplifier gives enough gain from a crystal microphone for full modulation of a 10-watt carrier. As shown in sections (a) and (b), the heaters can be connected either for 6-volt or 12-volt operation, depending on the vehicle, the corresponding supply for bench work being 6.3v. or 12.6v. BC-type coils are used for L1, L2 in the VFO/BA, and construction can be made very small and compact.

PA and modulator *(see* Fig. 2). It made no noticeable difference if the connections were reversed. Thus, the primary of the transformer is used as a centre-tapped choke, giving a ratio of about 1:1. The DC currents to the PA and modulator flow in opposite directions through the winding, so there is no likelihood of saturating the core unduly. In this scheme, impedances might well be far removed from the theoretically perfect values, but the proof of the modulator is in the talking — it performs very well, without getting warm.

Tuning Up

Tuning can be done by setting the PA condenser for minimum dip on the anode current meter, and then loading for maximum reading. This system has been successfully used for 2½ years in the G3ESP/M autoshack. However, it *can* give false information if the degree of coupling between the PA and aerial is not optimum, so for absolute certainty a simple field-strength meter near the operating position should be used.



Rear view impression of the Minitopper described in the article by G3ESB/G3HCX. It runs the full 10 watts on 160m., can be made up in a very compact form (that shown by the authors is for suggestion only) and as designed by them is suitable for either mobile or bench work.

Miscellaneous Points

With 12 volts negative available from the car battery, the idea was considered of using this for bias supplies. However the simplification was slight, and would have precluded operation from a normal mains power unit. As it stands, the transmitter can be used in both mobile and fixed service. It fits into a "Crystal Monitor Mk. II" case, measuring 7½ by 5 by 5½ inches deep. It could be made even smaller without overcrowding. Current consumption from the 12-volt battery, using a vibrator pack (ex-PCR receiver) for HT supply, is a little over 4 amps. With an HT feed of about 280 volts, the PA can be loaded to about 35 mA at most; thus the power input is well within the legal limit.

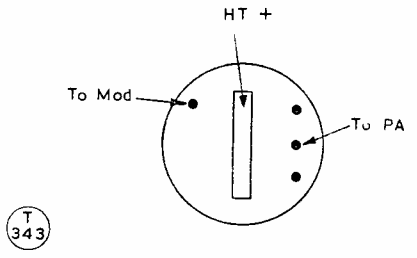


Fig. 2. The connections for the modulator choke T1, Fig. 1 — see article for explanation.

HEATHKIT PRICE INCREASE

Though the Heathkit organisation, which does business throughout the world, has been able to hold prices steady during the past few years in spite of the steep increase in their costs, they notify us that the time has now come when they must rectify the situation. The increase in their prices is only 5%, and it does not come into force until August 20—so. if you had some idea of going in for an item of Heathkit equipment (on which anyway you could not go wrong) now is the time to put in your order.

NOVEMBER R.A.E. EXAMINATION

Under the heading of "Subject No. 55—Radio Amateurs' Examination," a sitting is to be held, at centres up and down the country, on Friday. November 2. The fee is 30s. (payable locally) and the final date for applications to sit is *September 28.* The local office of your Borough or County Education authority will be able to give you full details about how to apply and where you are to take the examination if you quote "Subject No. 55, City and Guilds, November 1962."

NEW G.E.C. HEAD OFFICE

The head office of the General Electric Co., Ltd., is now at Greycoat House, Greycoat Place, Victoria, London, S.W.1. *(SULlivan 3411.)*

• • • The Mobile Scene • • •

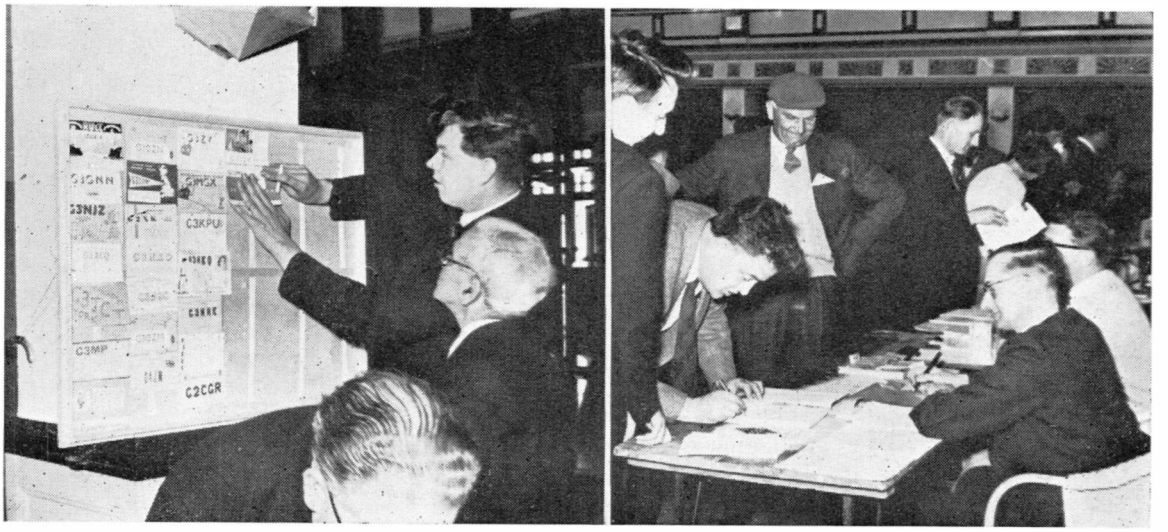
REPORTS ON RECENT RALLY EVENTS — LARGE ATTENDANCES RECORDED

MORE PAGES OF PICTURES — THE MOBILE RALLY CALENDAR

DURING the June-July period, several successful Mobile Rallies were held, and those on which reports have been received from the organisers are covered here, together with a selection of photographs.

The big day was **June 24,** when meetings of mobiles took place at Bridlington, East Yorkshire, and Barford St. John, Oxfordshire. The **Bridlington** event was a "first" and, in spite of the competition, it drew a total attendance of about 400, in 100 or so vehicles, of which no less than 40 were fitted /M ; the talk-in station, G3GBH/A, succeeded in working all of them, and all on Top Band, there being no takers for the two-metre station G3FKV/A. The weather for Bridlington was bright and sunny, though with a gusty wind. Among the several organised events was a judging for the best mobile installation, factors taken into account being appearance, band coverage, method of frequency control, ease of access, and whether home-built or commercial. The prize went to G3JQC/M (Heckmondwike, Yorks.) with 160m. gear in a Morris Mini-Minor — complete with a readily-accessible fire extinguisher, be it noted. (How many /M's have thought of this ?) The winner of the radio ramble was G3ESP/M, in his Ford Escort, this being not a very well-supported event due to the too-early start time. A lecture by G3GBH on Vehicle Noise Suppression was well received, and there were really interesting displays on the trade stands forming part of a small exhibition. Suitable events were arranged for the youngsters, who also had the excitement of seeing the Bridlington Lifeboat being hauled up on returning from a real "Mayday" call. The general impression was of "a good day out," with 135 call-signs in the visitors' book (including VQ2WR). The organisers—G3GBH, G3OHT, G5VO and SWL Iain Purves, hon. secretary of the local Club group—felt that the effort had been well worth while, and well rewarded by the fact that many visitors departed saying they hoped there would be another Bridlington next year.

The highly-Americanised event laid on by the Amateur Radio Mobile Society at the U.S.A.F. Signals Centre at **Barford St. John** in Oxfordshire, also on **June 24,** was again a great success, with a bigger attendance than on the last two occasions A.R.M.S. have been at Barford. In fine and sunny weather, the crowd was estimated at about 2,000, and by 3 p.m. there must have been something like 160 vehicles carrying mobile equipment in the parks—at any rate, the Rally control station G3NMS/A worked over 100 /M's on Top Band, and G3NMR/A logged 15 two-metre mobiles ; G8KW/A was operated in the SSB mode on the HF bands. Some 150 mobiles were signed in, and it is thought that many more did not get round to registering. The A.R.M.S. safety-standard judging gave the prize to G3BMN/M (Halesowen, Worcs.) for a very neat installation in a

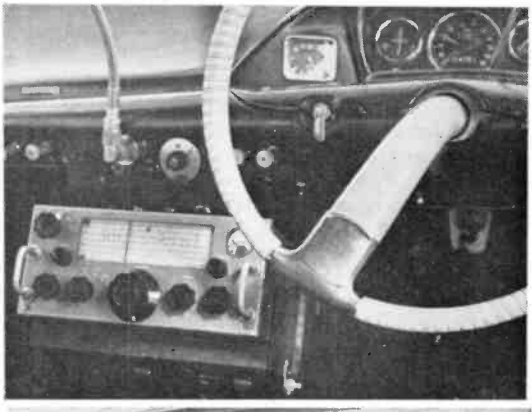


At the Bridlington Mobile Rally on June 24. On left, pinning up the visitors' QSL cards. Right, the reception desk, with G3NOG signing in. The Rally drew some 40 /M's in sunny but rather windy conditions (down on the promenade). It was the first Mobile Rally to be held at Bridlington.

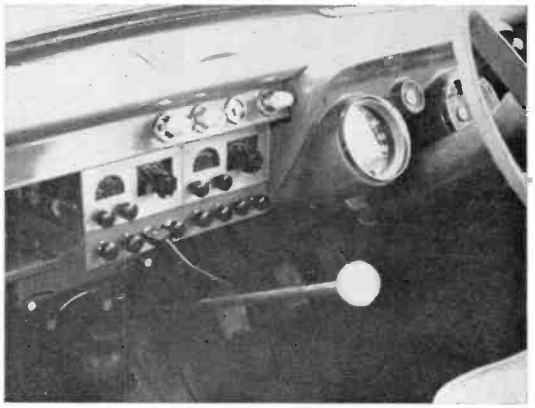
General view of the Rally park at the Barford St. John event, June 24, organised by the Amateur Radio Mobile Society. There was a very large attendance of mobiles, in fine and sunny weather (and vehicles of all sorts). *A G3GMN print*

Bill Biltcliffe, G6NB, of Brill, Bucks. was at Barford on June 24. Probably the best-known two-metre man in the U.K. and nearly always the loudest signal at DX, he has been consistently on VHF since the bands were opened.

At Bridlington on June 24, G2YS (left) meets G3GBH, organiser of the Rally — with the sea sparkling in the background.



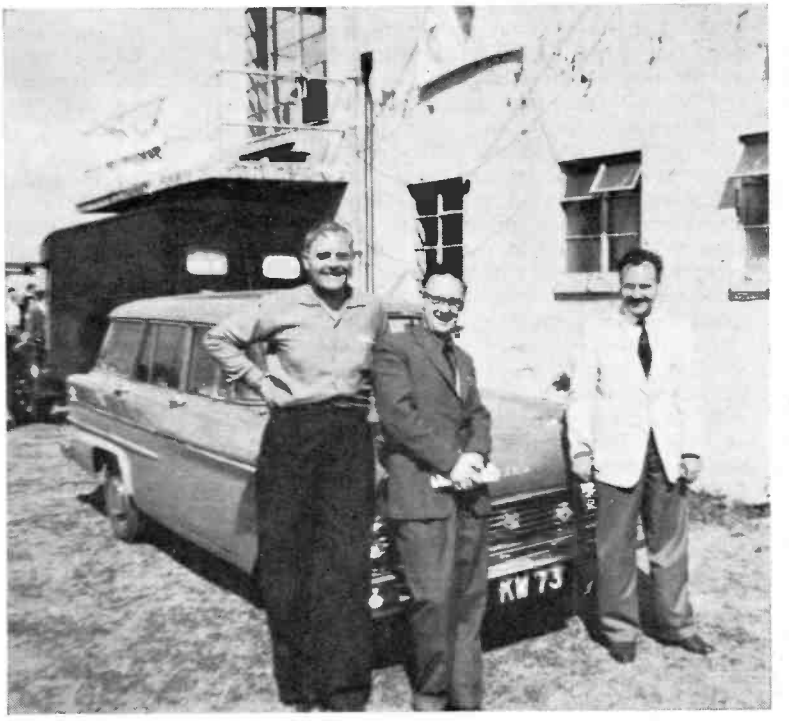
At the Barford Rally, Freddy Miles, G5ML (left), one of the real old timers of Amateur Radio, was caught with Tom Douglas, G3BA, who is well known on the VHF bands.



(Above) Seen at the A.R.M.S. Rally at Barford on June 24, the 6-band 10-valve double-conversion superhet Rx built by G3HCK (Hurst Green, Sx.) and fitted into his Citroen DS; this installation also has remote VFO tuning. (Below) The 160m. transceiver installed in the parcel tray of his Ford Popular by G3IIO (Lewes, Sx.). *G3GMN prints*

When G5PP (Coventry) wants to work /P with his mobile installation he can put up, from the car, a two-metre beam and a loaded whip for 160m. The whole assembly knocks down into handy sizes.

A G3GMN print



Officials of the Amateur Radio Mobile Society at Barford on June 24. Left to right: G3KVF/M (committee member); G3FPK/M (hon. secretary); and G8KW/M (chairman). Notice the registration number of the car, owned by G8KW of K.W. Electronics.

Rally pictures from Longleat, Barford and Bridlington

G3JXF (Mablethorpe, Lincs.) was at the Bridlington Mobile Rally; he is equipped /M for both bands, 160 and two metres.

This neat 160m. transceiver, by G3OUK/M of Bristol, fitted in an Austin A.30, won first prize for elegance at the Longleat Mobile Rally. *A G3GMN print*

Mini. The winner of the mobile frequency measurement trophy was G3LGZ (Tamworth, Staffs.), who, on the way to the Rally, got an exact check on G3NMS/A. There were other competitions, of rather a different sort, for the amusement of the young (and their mothers), the whole object of the organisers being to keep the interest going for everybody—rather on the lines of a fair. There were lucky-programme prizes (presented by the Mayor of Banbury), a tombola, go-kart racing, a swing group (!) and, for the more serious-minded, conducted visits over the transmitter halls, feeding very extensive aerial systems, as Barford is a main U.S.A.F. radio communications centre. To put on a show like this involves a great deal of planning and hard work behind the scenes, and there is no doubt that the A.R.M.S. group responsible made a very good job of their "Third International Mobile Rally"; in this, they had the enthusiastic collaboration of the U.S. 3rd Air Force authorities and the local Base commander, who provided essential services on the ground and assisted with the organisation (which included military police to look after the parking). And again, Barford was lucky with the weather; there is next to no cover, and had it been a wet, miserable afternoon on that exposed airfield site . . . Finally, it should be recorded that the visitors included many American-amateur exiles serving with the U.S. Forces over here.

Up in South Shields, Co. Durham, on **July 8,** the attendance recorded at the **North-Eastern** Mobile Rally was 300, with 29 vehicles actually fitted /M. The weather was cloudy and cool, and this may have kept some visitors away, though in fact the numbers were about the same as last year. The talk-in station G3DDI/A worked 18 mobiles, all on 160m. The competitions were varied and well thought out, and included a "worked all mobiles," won by G3JFH/M, who travelled up from Cheltenham all through the night and worked 15 /M's *en route!* Devised by G2CDN and judged by himself and G3JFH, a contest to find the best-informed mobile operator with the most complete installation was won by G3DSA/M (York), with 33 out of a possible 65 points; one question was: "Have you got your mobile licence with you?" 98% of the competitors had. The competition involving driving skill was won by G3OKG (Whitby, Yorks.), and for parking by G3OHL (Middlesbrough). The spot-frequency check, which called for setting up on a given frequency (measured on a BC-221), was won by G3LIV (Durham). The organising committee for the North-Eastern Mobile Rally report that, from their point of view, the event was a success, and hope that their visitors thought likewise.

Though the weather for the **Chiltern** (Hell-Fire) Rally, at High Wycombe on **July 15,** was far from propitious, it being dull and wet, the total attendance was about 350, in 72 cars at the peak period, of which 46 were mobiles—and 40 of them were worked by G6IP/A on 160m. These figures show a great increase on last year's event, even though there was only one 2m. /M, G3GRA (Crawley, Sx.); however, G3LVP (Wanstead, London) struck a note of originality—he was /P on 4 metres; both these mobileers received prizes, and there were also presents for various categories of visitor, such as those who had travelled the longest distance to the Rally (G3OS/M, from Gainsborough, Lincs.). The raffle was well supported by friends in commerce (for which the organisers are most grateful) and the committee—which consisted of G3INZ, G3OOZ, G3OUV, G3PVJ, G6IF and SWL Hussey, of the Chiltern Amateur Radio Society—hope that those who came along thought it all worth while. And they would also like to thank G3AGP/G3KVF of A.R.M.S. for much assistance on the ground.

Another mobile meeting on **July 15** was the **Harlow Rally,** at Magdalen Laver, also in rather depressing weather—however, 30 mobile-fitted cars came in, and G3LIT/A worked 27 of them on Top Band, and G3NNI/A three on two metres. Various competition events produced prizes for G3NKX, G3PED (lucky numbers); G3KCJ (men's darts); Mrs. G6LL (ladies' darts); G3OJV, G3MAY (frequency estimation); and G3OQT (steady-hand test—whatever could that have been!) G3PUP undertook the onerous task of organising children's sports, and a very successful junk sale was conducted by G3HJL. With the assistance of his xyl, G3ONE ran a hot-dog stall; PA music was provided by G2ARN; and old-timer G6UT was in charge of registration. Harlow club members who assisted in all this were G3IPG, G3JVI, G3NNI, G3PAI, and G3PRN—all (we suspect) cajoled and inspired by G3ERN. In spite of the Wx, it was a happy afternoon for the 250 or so who were there.

Next on the programme of Forthcoming Rally Events are the following:

August 19: The annual meeting organised by the Derby & District Amateur Radio Society (and the fifth in their series) is always a big show. Held at the Rykneld Schools, Derby, talk-in stations G3ERD/A on 160m. and G3EEO/A on two metres will be open at 10.0 a.m. The programme includes an archery contest, treasure hunt, flying display of radio-controlled model aircraft, a demonstration by Derby Borough police dogs, go-kart racing, a monster junk sale, and a raffle for about 40 unusually good prizes. Refreshments will be on sale all day, and there will be a number of surprise attractions, including events for the children. There is also to be what is described as "the most ingenious mobile radio contest ever devised, for a really big prize." An equipment display is being arranged, with free stand space available to any approved exhibitor. The Schools offer ample covered accommodation should it be wet, the ladies

of Derby Club members look after the refreshments, and there is plenty of free parking space. For any further information, write the Hon. Organiser, T. Darn, G3FGY, 44 Laurel Avenue, Ripley, Derbys.

August 26: Stockport Radio Society, Mobile Rally, at the Pavilion Gardens, Buxton, Derbyshire, starting from the Davenport Theatre Car Park (on A.6 at Stockport) at 1.45 p.m. An official sticker will be available admitting cars and occupants at an inclusive charge to a reserved car park in the Pavilion Gardens. The Rally stations will be G6UQ/A (Stockport) on 1920 kc. and G6DN/M (Buxton) on 1950 kc. For further information (and stickers) apply: E. G. Houldsworth, G6NM, 52 Worsley Crescent, Stockport, Ches. *(Tel. Stepping Hill 3959.)*

Not a picture taken at a mobile rally in the U.K., but the line-up of /M's — mainly on two metres — for the Belgian International Fox Hunt at Bokryk National Park, near Hasselt, Belgium, on Sunday, June 24. Some notes on this interesting event are given in the article overleaf by DL2XM (G6XM).

September 2: Thames Valley Amateur Radio Transmitters Society Mobile Rally, to be held at Polesden Lacy (National Trust property), 3m. N/W of Dorking and approached by the A.246 from Leatherhead to Great Bookham, then sign-posted. There is a famous house to see, there will be Rally competitions with prizes, and a raffle. Refreshments will be available on the site, which gives free access to over 900 acres of park and garden. The talk-in stations will be G3AIU/A on Top Band and G3JIP/A on two metres, opening at 11.0 a.m. The organising secretary is: K. Rogers, G3AIU, 21 Links Road, Epsom, Surrey. *(Note change of date from that given last month.)*

September 2: National Rally organised by the Northern Amateur Radio Mobile Society at Harewood House, nr. Leeds, which is intended to be a regular event, to be held on about the third Sunday in May from next year onwards. Information about N.A.R.M.S., and the Rally, can be obtained from: B. Crisp, G3LHQ, Ashmount, Moorhouse Lane, Birkenshaw, nr. Bradford, Yorkshire.

September 9: National Mobile Rally, Woburn Abbey, near Luton, Beds., at which certificates of merit will be awarded for the best: Home-constructed HF mobile equipment; home-constructed VHF/M installation; commercially-built HF mobile equipment; commercial VHF/M apparatus; and the safest HF and LF mobile installations. There will be a raffle and special arrangements for the entertainment of children. Talk-in stations on Top Band and two metres will open at 10.0 a.m. There is a per-head charge to enter the Grounds, and Woburn Abbey (the home of the Duke of Bedford) will be open to visitors for a small additional fee. As in previous years, a reserved Rally car park will be arranged.

September 16: Lincoln Short Wave Club Hamfest and Mobile Rally, North Kesteven Grammar School, North Hykeham, 3m. S/W of Lincoln, on the A.46. This is a well-established annual event, with raffles, a big auction sale and various competitions, in connection with which the small fry are not forgotten. There will be two talk-in stations—G3MUL on 80m., and G3MZB on 160m. Refreshments will be available continuously from 2.0 p.m. Further information from: J. A. Woolley.

PAØCY/M (from The Hague) was at the Hasselt Fox Hunt; he has a 3-element array for two metres, mounted on a support held to the roof of his car by rubber suction cups. The Fox Hunt involved searching for a hidden two-metre transmitter.

G3ESR, Rochmount, 10 Sturton Road, Saxilby, Lincoln.

Though we are getting towards the end of the Mobile Rally season, some big events are yet to come. Given reasonable weather, good attendances are assured. There is now a strong body of sound, practical experience on the organisation of Rallies, and every year the regular hosts for these events learn new lessons and get fresh ideas. Incidentally, and since the point has been raised, the Government proposals for the control of motor rallies does not apply to the Mobile Rally as we know it in Amateur Radio. What the Ministry is aiming to control is the road-work type of rally, whereas our rallies are really meetings of mobiles, nearly always on enclosed property. It is only if hunting round the public roads is involved that any question of control arises.

BELGIAN INTERNATIONAL FOX HUNT

The Belgian amateur society U.B.A. held its first VHF "Fox Hunt" of 1962 at Bokryk National Park, near Hasselt, on Sunday, June 24. Of over forty operators attending, about 24 were Belgian (including four SWL's), thirteen German and one English—DL2XM. Most of their families came along, too. Five of the German mobiles had been issued with ON5 calls specially for the week-end. The President of U.B.A., ON4VY, welcomed the visitors and wished them *bon voyage* and the best of luck in the hunt. It might be mentioned that he and most of other amateurs present spoke good English, so the writer did not have any language problems!

Not all the mobiles were fitted with two-metre gear—some, in fact, had modified British or American surplus equipment for the HF bands. It is estimated that approximately half took part in the fox hunt—which is a form of D/F contest, to find a hidden transmitter. DL2XM did not participate as the transistorised equipment being built was not ready. However, all installations were viewed with great interest. Some were very simple with a normal dipole aerial, but others were most elaborate and had four-element arrays; of these, the installation by DJ5KQ/M was probably the most sophisticated as his four-element system could be rotated from the driving position by an arrangement of Bowden cables! The transmitter/receiver was also a most workmanlike effort, mainly transistorised and boasting a very stable VFO.

Seen at Hasselt, Belgium, on June 24, for the International Fox Hunt. DJ5KQ/M (from Juelich) has an all-band whip of conventional design plus a 4-element Yagi for two metres, which can be rotated from the driving position!

The hunt was held in very good weather and was much enjoyed. In addition to the "big fox," two "little foxes," in the shape of two low-power transmitters, were used as red herrings near the final location; a four-element Yagi array standing on its own near the "big fox" also caused much distraction. The look of amazement and the comments of one searcher when he found the end of the long feeder terminated in air will long be remembered! The first three stations to find the fox were: DJ1UP, ON4AJ and DL1JN. All were awarded prizes for their part in the hunt.

DL2XM

GB2IC ON SCILLY

JUNE 17-29, 1962, TOP BAND AND TWO METRES

D. F. BEATTIE (G3OZF)

FIRST thoughts about organising a DX-pedition to the Isles of Scilly, under the auspices of the City and Guilds College Radio Society, came in January this year. After a few preliminary enquiries a camp site was found with AC mains available and where the owner had no objection to his land being draped with antennae. The original intention was to operate on Top Band only, but G3OSS (who used to be at the College) offered to lend two-metre gear for our use. On application to the G.P.O. the call GB2IC was issued. (This call is one used previously for functions at Imperial College, of which City and Guilds is a constituent.) Final arrangements were completed by late May and on June 15 four members of the party and 350 lbs. of equipment left London bound for St. Mary's.

The Island of St. Mary's is the largest of the Scilly group, and lies about 28 miles WSW of Land's End. On arrival, camp was set up and two 25ft. masts were erected about 300ft. apart. A slot-fed six-over-six J-beam for two metres was mounted on one of the masts, and a Top Band half-wave wire was strung between the two. The task of inter-connecting the control circuits for both the two-metre and Top Band stations was then begun. After a short while it became obvious that neither the 160m. transmitter nor the receiver had stood up to the journey any too well.

Whilst these faults were being rectified, the two-metre station was fired up and G3IUD/M on the Lizard was raised at 10.45 BST on Sunday, June 17, for the first QSO. Several stations were worked during the morning, the best contact being G5ZT in

Plymouth, from whom a " 5 & 9 " report was greatly appreciated. It thus appeared that the VHF gear was working as expected. By lunch-time on the Sunday the Top Band station was ready to go on the air—and who should be raised but G3IUD/M! All equipment then seemed to be working perfectly.

On the Sunday evening, only a few stations were worked on 160 metres but of these two were GM's, so the signal seemed to be going somewhere. On two metres, G6NB (Brill, Bucks.) was raised, on schedule, and several South Coast stations around Bournemouth were worked, as was GC2FZC.

From that time onwards most of the equipment worked perfectly and there were only two hitches—one when the mast supporting the beam had to be lowered at midnight in a gale, as it was considered unwise to risk it falling on to the tent ! The other was the appearance of FM on the Top Band phone transmission ; this was corrected by changing the VFO valve.

Operating Experiences

Each evening during the first week on 160m. a pile-up occurred on calling CQ, and stations were worked continuously until the early hours. However, during the second week heavy noise levels were experienced on this band and contacts were fewer. Nevertheless, in all, 320 QSO's in 56 counties were made on Top Band, which is thought to be not too bad considering the distances involved.

On two metres, conditions were by no means good but some GDX contacts were made. Several schedules had been pre-arranged and these were religiously kept most of the time, although some of the early-morning ones were missed ; this was because the VHF operators slept in the same tent as that housing the equipment and thus were kept awake until after the Top Band station closed, usually about 01.00 BST.

By far the most consistent two-metre contact was G6NB in Bucks. This schedule was kept twice daily and several times it was possible to change to phone. Many other stations were raised—*see* " VHF Bands." A 40-metre CW station was also put on the air occasionally under the GB2IC call and a few Europeans were worked ; although this station was rarely used, it seemed to put out a fair signal. Although the Top Band and two-metre equipments were only about a foot apart, they managed to work with very little mutual interference. The task of operating the two stations was shared between G3NNA, G3NQC, G3OKT and G3OZF, with SWL Holmwood completing the party.

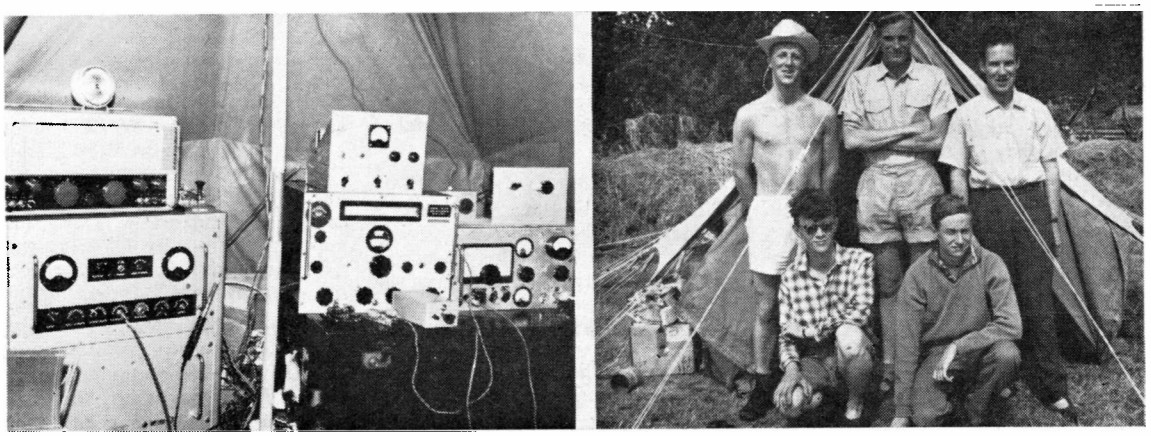
In general, operating manners were excellent, the only exceptions being the occasional types who, on not obtaining a QSO first call, proceeded to call CQ on the frequency. These stations were a pest but fortunately did not prevent others from making contact with us, and operators who lacked patience found themselves waiting until the end of the evening for a QSO !

Gear Used

The equipment for 160 metres was a home-built transmitter running 10 watts into a 250ft. end-fed wire, with a CR100 receiver. On two metres, the rig ran 50 watts to a QQV03-20A in the PA, with a Withers converter into an Eddystone 888A, the beam being a six-over-six at 160ft. a.s.l.

Welcome visitors to the camp included G3KPO, G3IUD, G3IES, G3OFN and a local SWL who hopes soon to have his ticket—the Scillies won't be rare very much longer.

In conclusion, sincere thanks must go to all who made the expedition possible, especially to those who loaned equipment. Special mention must be made of G3OSS who literally arranged all the gear for the two-metre station ; to J-Beams Ltd. for the loan of the two-metre beam ; Withers Electronics for the two-metre converter ; and to G3GBE for help with the masts. Last but not least, the thanks of the party to all those who called GB2IC—without their co-operation the expedition would have been futile.



On the left, the GB2IC set-up for Top Band and two metres. The 2m. Tx (belonging to G3OSS) is the cabinet job on the left, with an Eddystone 888A above it ; a Withers two-metre converter was used. The 160m. transmitter is beside the CR-100, and on the latter is a 40m. CW Tx. Both stations were operated by the group on the right : Standing, left to right: SWL Holmwood (who looks so cool and comfortable), G3OKT and G3NNA ; kneeling, left, is G3OZF, with G3NQC. All are members of the City & Guilds College Radio Society. They had a good time, worked hard on both bands, and did very well in giving the Scilly Is. to so many operators on Top Band and two metres.

DX COMMENTARY

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

SOMETIMES one takes a look over a very dead band and wonders where all the possible occupants have got to. Do they migrate, like birds? Do they hibernate, or go on to VHF, or blow their power-packs up, or rebuild everything? Or do they just assume that the band is dead, and keep off?

This is an important matter, since it is easy to start a moan about "poor conditions" when they are not poor at all, and the whole trouble is just inactivity.

A recent example occurred on 21 mc, when VQ9A was suddenly heard with a very strong signal, quite late in the evening. There were no other signals on the band at the time—not even weak ones. Well, obviously, if the band was so wide open to the Seychelles at that time, it might have been expected to give good paths, to, say, Aden, French Somaliland, Kenya, Mauritius and many other countries in that region. But all the amateurs in those countries *knew that the band would be dead,* so they didn't come on! It remained to our DX-peditionary, Gus Browning (W4BPD) to put VQ9A on and show everyone who was awake at the time how wrong they were.

It's not often that we plead for more CQ calls . . . but this is a case for them. When you hear an apparently dead band, that is just the occasion for a CQ or two; someone else who, like yourself, is just checking the band, and would otherwise agree with you that it was dead, might appear.

CQ's on a lively band are a waste of time, power and space . . . but let's get in the habit of using them when we *think* a band is dead.

VQ4HX

CALLS HEARD, WORKED and QSL'd

DX-ploits

Under this heading the more ephemeral pieces of DX are covered, as opposed to those which are always there (when you can find them). Rarest of the bunch has been FW8BH, activated from Wallis Is. by VK3AHO, usually around 14125 kc SSB. QSO's were still going at a fine rate when he was last heard, but he will have left by now.

Dick of WØMLY probably holds the record for sheer numbers of QSO's and has now covered TR8, TL8, TT8, TN8, TJ8 and TY2 (but *see* later paragraphs about him). Gus of W4BPD made a surprise showing as VQ9C, from Cosmoledo Island, which no one had ever heard of! (It's 75 miles east of the Aldabras.) Timor was kept on the air by CR8AB, certainly until mid-July, but he, too, has probaby gone by now.

Various VR3's and KP6's continued to show up, in addition to the KJ6 and KS6 stations reported last month; they were there all right, but conditions made their presence of little interest to us in the U.K.

VK2VC/VK2 duly did his stuff from Lord Howe Is., almost entirely on 14100-14120 kc SSB.

Nearer home, DL9PF, with W2BIB, was due to be operating from Corsica (latter part of July); ON4QX and the CW Club of Antwerp were expected to show up as LX3QX and LX3DX; and W2BIB was possibly going to make that appearance from the mysterious SMOM-1 (Sovereign Military Order of Malta). Since it is still impossible to write these paragraphs one day and have them in your hands by the same evening, most of these will have come and gone by the time you read about them.

On August 17 there is a distinct possibility that G5RV and F7GX will be signing PX1RV and PX1GX, from Andorra, all bands, CW and SSB.

A surprise visitor on 14 mc SSB was Ken Ellis, G5KW, once renowned for his signals from various parts of the Middle East. He was operating as G5KW/YI, with the possibility of operation from Jordan, Saudi Arabia and other parts. Unfortunately he seemed to be having reception difficulties, though putting out a nice signal himself.

Others due on (they may have come and gone, or may still be active), were PY4RT/Ø from Fernando do Noronha; PYØNG from Trinidade Is.; ZK1BS/P from Danger Is., Manihiki; and Dick, WØMLY, from TZ8, 5T5 and 5V4.

A goodly bag of DX-peditions and the like! But by no means the end of the story, since the more permanent DX has yet to be covered, and a selection follows.

FIVE BAND TABLE

Station	7 mc	14 mc	21 mc	1.8 mc	3.5 mc	Countries Worked
G3FXB	155	272	265	9	87	304
G2DC	143	280	267	12	101	303
G3FPQ	138	262	252	23	107	290
G3IGW	99	127	127	25	51	183
G2YS	94	176	123	20	75	198
G2BLA	73	94	96	9	39	146
GW3AHN	68	260	278	1	21	304
G3JWZ	62	107	77	9	52	132
GW3CBY	53	75	31	15	35	95
G3DO	51	270	221	10	55	295
G3LHJ	47	131	172	11	23	201
G3NFV	39	85	118	16	49	164
G3NYQ	38	32	17	11	30	53
G3PEK	32	58	17	8	22	66
G3BHJ	29	63	165	1	11	150
G3IDG	23	49	61	9	17	90
G3NOF	18	174	183	2	24	227
G3PLQ	11	18	16	10	19	74

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

DX Strays

Fixed stations among the rarer African countries are not yet too numerous. However, look for TT8AJ, 6W8DD and 8DF, 5U7AD, TT8AL, TN8AJ and the various 9U5's, nearly all on 14 mc CW, but occasionally on 21 mc as well.

Despite the query about the licensing situation, TA stations still crop up—TA2BK and 4RZ are often around. The VQ1 activity seems to have dropped off, at least as far as the Americans down there are concerned. VR5AA was on 14257 kc SSB in early July, and VR6TC is supposed to be possible around 0600 on 14165 kc, AM and CW.

Miscellaneous good ones reported on 14 mc CW include HL9KN, JZØML, ZD8RN, BV2A, JT1AG, UAØYA (Tannu Tuva), FO8AB, ZD1OM and 6O1MT. On SSB, same band, KG6IJ (Iwo Jima), KC6BK, CR9AH, VP5BL, BV1US, FG7XT, KG4AO, KW6DK, and, of course, the various KP6, KJ6, VR3 and KS6 stations, who are halfway between permanent and DX-pedition status.

Pile-Up Psychology

If any calls could cause a pile-up, these would surely qualify:— WØMLY/TR8, /TN8, /TJ8 . . . and, just as we were expecting WØMLY/TY2, up comes TY2MY —much pleasanter and more time-saving. Well, the pile-ups developed all right, but here was a man who knew how to deal with them. Sticking to 14002 kc, and frequently sending "10 high" or similar instructions, he completely ignored anyone on his own frequency (or, rather, he simply didn't hear them). For the first few sessions there were all the usual Klots calling on 14002 at great length and with much self-importance, but they just didn't ring any bells and had to find out what was wrong.

Thereafter, 14002 kc was usually clear. Trouble started when one or two stations on 14012 or thereabouts did a burst of SSB and asked for a report; Dick simply came back on 14002 SSB and gave it to them. But he soon realised that this was not a good thing, and started saying "call on '250 to '260," and anyone too dim to interpret *that* was just not in the party.

Now, although the ethics of even a rare DX station using SSB on 14002 kc are doubtful, the fact remains that WØMLY caused no more interference by doing just that than by remaining on CW—especially as most of his "overs" lasted about five seconds (he made 600 contacts in one night and posted the log to KV4AA next morning!). One might even have said that he was doing a great service to the CW boys by shifting the pile-up completely out of their section . . . a fine example of phone causing less QRM than CW, however you look at it.

You Can't Win

But . . . what happens next? Quote from ARRL Bulletin Nr. 604, from W1AW:— "ARRL announces that effective 0001 GMT on July 13 1962, DXCC credit will not be given for contacts where either station is operating by telephony, using frequencies between 14·0 and 14·1 mc." So now the balloon has gone up. Stations who worked WØMLY by this means after that date have now got to repeat the performance, which is impossible for the countries he has already visited, as he will not be returning. Undoubtedly a monumental row is going to develop over this, and the importance of the DXCC listings will diminish still further.

Opinions, at this early stage, are sharply divided about the whole thing. G3FXB writes " Dick didn't harm the CW brigade by being right on the low end. I don't like the high-minded attitude of ARRL in dictating operating practice

through the DXCC, which, though American, is an internationally recognised award. Far better suppress the activities of a certain /MM on the USS *Randolph,* running about 10 kW of phone-patch, and splattering 50 kc of the band while demanding a 'clear channel' for himself."

G3FPK, too, says that he can't see the reason for criticism, since SSB is received in the same manner as CW, and with a very selective receiver (such as one must have for competitive DX these days) such a signal would cause no more trouble than CW.

G3LPS, on the other hand, refers to Dick's "antics" on SSB and says he actually threatened to black-list certain CW stations for causing QRM; he adds "being on a DX-pedition doesn't give anyone the right to abuse the regulations." (But they aren't *regulations:* outside the U.S.A. there are no legal 'phone bands in most countries. There is the voluntary band-planning scheme, to which DX-peditioners presumably don't subscribe.)

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
	Phone and CW	
G2NJ	98	98
GM3COV	97	97
G3MBW	91	92
G2CZU	90	92
G3LWQ	90	93
G3OHX	83	87
G3NPB	82	84
G3NVO	81	88
G3OGE	81	84
G3OIT	79	90
GM3KLA	78	85
G3OLN	77	86
G3LHJ	73	80
G3PGN	69	75
GW3CBY	67	73
G3PDM	66	77
G3JFO	64	77
G3OWR	64	74
GM3PBA	59	71
G3MGI	58	66
G3PLQ	51	68
G3IDG	48	50
G3OXI	46	67
G3PEK	40	60
G3NAI	31	53
G3OHL	26	35
	Phone only	
G3FS	85	86
G3NPB	79	81
G2CZU	69	69
G3NAA	65	67
G3OIT	30	56
G3OLN	25	45
G3LHJ	20	27

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

The Upper Hand

The intelligent operating of Dick, WØMLY, and Gus, VQ9A and others, proves that the Klots *can* be brought to heel and the pile-up reduced to sensible proportions. It's when you get a bad operator at the DX end that things really get chaotic. The fact of the matter is that some of these super-DX men can operate so slickly that the QRM brigade don't even know they are there . . . ten QSO's without a call-sign may not quite ring the regulation bell, but if they only take five minutes as a result, what matter? And, of course, it's only those who are really with it who tumble to the facts of the case; one slow call-sign from the DX end would really bring the roof down. (Now don't all try to be clever and get QSO's without signing—you're not super-DX, and nobody wants *you!*)

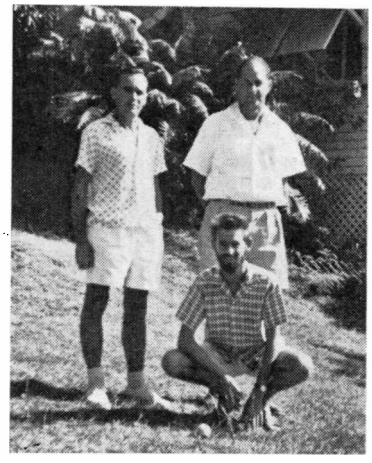
Inscrutable

The mysterious BY1PK, said to be in Peking, is continually registering on 14 mc CW. We should very much like to know the true status of this station, if anyone has the gen? He is a terrific CW operator (code-wise, if we may use the expression) and sends up to thirties on a straight key . . . but despite that, we heard him come back to a UF6 and say "RR pse repeat ur name and QTH and my report." What *does* that "RR" mean? Must be some sort of secret code. And on a parallel with that is the self-evident fact that the RST, a three-figure group, must invariably commence with 5 and end with 9 . . . well, do *you* ever hear anything varied except the middle figure? Stations that should have a report of RST 368, or 467, or even 464, never hear those beautiful figures—because everyone gives them 569! (And then asks for a repeat on something.) Let's either use the RST code intelligently, or just revert to the "S" code and send only one figure.

Top Band

One interesting flash of DX news on One-Sixty — Stew of W1BB reports that VP8GQ (South Orkneys) showed up on July 2 and worked W1BB, W2KQT, W3GQF and VE3QU. Reports averaged S7 for the North American stations and S4-8 for VP8GQ. And on some other occasion (date not given), VP8GQ worked EI9J! These results confirm W1BB's conclusion that North/South DX is possible in the summer . . . of course it's the winter season in VP8. Stew adds that the boys are all steamed up about the coming season, which promises to be really good.

G3IGW (Halifax) passes on the current pattern of 160m. operation in the U.S.A. Summarised, it boils down to this: The 1800-1825 kc



In the sunny South Pacific, when H.M.S. "Cook" was visiting Fiji. On left G3JFF/MM (VR1M/YJ1MA) with, on the right, VR2DK of Viti-Levu, Fiji. Kneeling is SWL Roy Stanney, of the ship's W/T staff, who assisted with logging for the VR1M and YJ1MA expeditions.

section is available to all the States except Nebraska, the Dakotas, Colorado, New Mexico, W6, W7 and KH6 (who have to use 1900-1925 and 1975-2000 kc); and to Georgia, Alabama, Florida, Louisiana, Missouri and most of Texas—who are not allowed to use the band at all. In addition, the States who use 1800-1825 are also allowed 1875-1900 kc. Powers vary in different parts, some having 500 watts by day and 200 by night; some having 200 by day and 50 by night. In addition to the States mentioned where operation on the 160-metre band is not permitted at all, the ban extends to KP4, KV4, KL7 and all the Pacific U.S. Territories.

G3IGW gave ZC4PS his first Top-Band QSO and has a card for it; and he says that W signals have been reported audible, most week-ends, right up to June. Finally, he says "Who *didn't* work GB2IC (Scillies)? Very fine show!" (The GB2IC story appears separately in this issue.—*See* pp.300-301.—Ed.)

GM3KLA (Shetland) raised GB2IC for what must be the longest DX possible within the U.K.! (He is at the extreme north of the Shetlands.) Since the beginning of March GM3KLA has worked 13 new counties, and thinks the activity on the band is excellent. DX-peditions accounted for were GM3AEF/A (Kirkcudbright), and GW3NWQ/P (Brecknock and Merioneth).

G3PGN (Basildon) collected the Scillies and a few more; and then, as a change from working rare GDX, he and G3OQT went off to Rutland during July 3-5; quite a number of stations were worked, including GW3NWQ/P in Merioneth and Montgomery—and QSL's have already been sent out. He, and likewise G3OLN (Cheltenham) put in a word of praise for the operators who make the rare ones available. G3OLN also remarks that there is a tremendous revival of interest in CW (at least on Top Band), and at the local club they recently had an exhibition of different types of bug key. Types who hadn't sent a "dit" for years were intrigued enough to try them!

G3LHJ (Newton Abbot) left the DX bands for a while to play

The station of VE2AGF/W6, 55W Santa Inez Avenue, San Mateo, California, actually ex-G2CIN (Tommy Lott). He seems to have about everything here, and is operating on the DX bands using the W6 suffix (which he is permitted to do under the American Canadian reciprocity agreement). As mentioned on p. 261 of the July issue of "Short Wave Magazine," VE2AGF/W6 is an important member of the Oscar Project management team, being the director of communications.

with "One Watt Willie"—an all dry-battery trans-receiver for Top Band and Eighty with a 132ft. kite-supported aerial; he will be operating portable from St. Ives, Cornwall, with this rig until August 7.

160-Metre Daylight Test

G3IDG (Basingstoke) suggests that the time is ripe for another "*Magazine Daylight Test*," similar to the one we held in June 1953. This would not only confirm the properties of the band in daylight but might be useful to the DX-chaser. All right then: we will settle for **1000-1200 GMT on Sunday, August 12.** Just come on the band (phone or CW) and call **"CQ MDT."** Report all contacts of *over* 100 miles; and SWL's please cover the same period and send in their logs covering that time. If this test is well supported we will arrange a further one. Reports by next month's deadline (*see* end of this feature).

G3OWR (Grantham) finds the 160m. band staying alive all through the summer, and has realised his dream of getting up a half-wave wire (thanks to the co-operation of about six neighbours!) First try-out raised a couple of GW's on phone, and since then, twelve new counties have been added. GM3NVU (Stirling) actually broke into a multi-way QSO, and GW3PDI (Denbigh) "tail-ended" another one.

G3PHV (Chesterfield) says his call is being pirated on the band by a character giving his QTH as Coventry, and operating on CW. He hopes to work him, and has a little speech all ready . . .

And the rest of the Top-Band comments, in brief: G3PLQ (Salisbury) has had a month's reprieve before going to sea, and has pushed up his score accordingly, still heading the G3O/G3P Ladder handsomely . . . G2CZU (Bath) returns to the fold with a new score and also with a WAGM for 160m. thanks to GM4AN, who filled the GM4 gap. He reports OH2UB on the band some time back, but he couldn't raise him.

G3OWR and G3PSB now join the latest ladder, both with scores

in excess of 50, and G3JFO (York) is a newcomer to the all-time Counties table.

Late Flashes—Top Band

G3OHH will be operating /P from Yorkshire, Northumberland, Cumberland and Westmorland between August 5 and 10, using SSB with a "Natterbox," and an RA-1B receiver . . . GM3COV hopes to go portable in Sutherland during the August Bank Holiday week-end, and he will also be on occasionally on Friday and Saturday evenings up to the end of October, conditions and weather permitting . . . And G3NGK will be in Cornwall and Devon between August 21 and 31, operating five bands and signing either /M or /P; for Top Band, he hopes to be on most evenings using a 250ft. wire on a kite.

Twenty Metres

Throughout the whole month, *Twenty* has been open for some kind of DX, but with its ups and downs. G3FPK (London, E.10) remarks that the "pre-breakfast DX" is now far less exotic, with KH6's still there but KL7's scarcer. On SSB he raised BV1US, CO8CO, FG7XH, G5KW/JY, KG4AO, MP4QBB, TF2WGX, TG9GZ, TJ, TT and TY, VQ9A, VR3S. CW accounted for 3A2DA (G3CWL working for a few days from Monaco).

G2DC (Ringwood) found three new ones (TJ, TL and TY) and also worked CE2OF, CR9AH, HL2XM, JA, OA, TG9AD, WØMLY/TT8, and 9M2UF, all on CW. He says the band is wide open for West Africans around 0700, but very sparsely populated at that time.

GW3AHN (Cardiff) was lucky enough to get FW8BH on SSB (not many did!) as well as FG7XT, FO8AN, HL9KN, KR6's, KL7, TJ, TL, TN, TT and TY, VQ9AA, VR3S, XW8AS and ZS3DP. CW fetched in VQ9AA, TL, TR and TY.

G3FXB (Southwick), on SSB, also managed FW8BH, together with KC6BK (1330), VP2KJ, FG7XH, VQ1CJ, VR3S, VK2VC/LH (2115), VQ9A, TJ, TL, TN, TR, TT and TY. His CW raised CR8AB (Timor), VQ9A and VS4RS.

GM3JDR (Sutherland) sends his usual long list, from which we select BV1US, DL8's, FG7XG, HL9KN, KC6BK, KG4AO, PJ2AA, TJ, TL, TN, TT, TY, VP2AL, VQ1RW, VQ9A/7, VQ9C and 9U5SA, all SSB. CW collected the Africans—TJ, TL, TT, TY, VQ1DR, VQ9A/7, VQ9C, VQ9A/AN and 9Q5AAA.

G3NOF (Yeovil) worked SSB with HK4EB, KZ5TD, PY4RT/7, VP2AL and 7NS, VR3S, TJ, TL and TN, 3A2AH and 5H3HH; he heard VK2VC/LH, and FW8BH, but had no luck. Don also tells us that VK9DJ (Papua) is VK4DJ, and that VS9AAA is G3NAC, well known in this feature.

G3LPS (Blackburn) made CW contacts with ZS3HX, SM5ZI/9Q5, VQ1DR, KR6BK, VQ9A, ST2AR, OX3BZ, 5H3HZ and KH6ARX. G3PEK (Stockport) also on CW, raised ST2AR, OX3BZ, KV4AA, VQ4IV, HK1AAF, YV's, KP4BEA, PY's, LU's and WØMLY/TJ8—all in the evenings except the last (0815).

EI8BC (Dublin) registered on CW with ZP5LS, 9Q5AAA, CP5EZ, CE1EK, HK1QQ, KZ5MQ, WØMLY/TJ8 and "a suspect TA4RZ." VQ9A was heard on SSB at 0300 GMT. G3PQR (Thorpe-le-Soken), running a Heathkit DX-40U on CW, worked KP4AZ, HK1AAF, HL9KN, YV1AD, UAØ's, FG7XM, VP2KJ, 9Q5AAA, 4S7NE and sundry W6's and distant U's.

G3IGW says he now finds it easier to work 14 mc DX on AM phone than for some years. He suggests that SSB has siphoned off much of the QRM. AM may even have a rarity value some day . . . G3NWT (Sandiacre) also worked some AM on the band, and collected VP4PL, HK4BQ, TF5TP and a YV. But SSB fetched in VR3S, KG4AO, HK3EY, VP7NS, OY7ML and LU.

G3DO found new ones in FW8BH and TY2MY; he also raised the other African prefixes, together with CP3BRZ, FG7XT, W4ATS/KJ6, PY4RT/7, VK2VC/LH, YS1MS and ZP5OG—all on SSB.

Fifteen Metres

The DX on *Fifteen* has certainly fallen off, but persistence is rewarded, and GW3AHN puts in a beautiful list once more. His CW brought in CR7IZ, ET2US, HK, JA's, KL7, KV4CI/FL7, WØMLY/TR8, TN8AT, TT8AL, UM8, VP8GQ, VQ2, 4 and 5, VQ9A, 9AA and 9A/7, VQ9C, VS1, VS4RS, 4S7NE, 5N, 6O, 9Q5AAA and 9U5DM (Burundi). Then he worked AM with 9U5DS, 5BB and 5JH (all Burundi), and SSB with EL4A and 4YL, WØMLY/TR8, VQ1CJ, VQ4, VQ9A, 9AA and 9C, VS4RS, VS9APH, ZS7S, 9G and 9U5KU. Makes one wonder what he might have done if conditions had been good!

G3NWT, on AM, collected 9Q5FD, 5JH and 5XX (Burundi), VK9DJ, 5N2, ZD6, VQ2, 4, 5 and an LU. SSB accounted for KV4CE. G3LPS, on CW, netted TN8AT, VQ9A, VQ9A/7, VQ9AA, VS9, UM8, VS1, ET2US, CR7AD and VU2BK.

G3LHJ worked PY's, VQ2, 4, 5, ZE2 and 6, and JA6BQC on AM; CO, JA, UM8, VQ9AA, 6O1MT and 9Q5AA on CW. G3NOF, with his AM, collected VS1GC, ZE2, ZS, 9M2AD and 2AH; on SSB, KZ5AF.

TOP BAND LADDER

(G3O-- and G3P-- stations only)

(Starting January 1, 1962)

Station	*Counties*	*Countries*
G3PLQ	78	8
G3PRM	74	9
G3OLN	72	9
GM3PBA	68	10
G3PHO	67	9
G3PDM	65	9
G3PGN	64	10
G3OWR	58	5
G3OXI	57	7
G3PPU	56	8
G3PSB	51	5
G3PEK	48	8
G3ORH	44	10
G3PJD	42	4
G3OQT	39	14
GW3PHH	32	7
G3PPF	24	5
G3OHL	21	4

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

G3FXB used all three modes; CW gave him VQ9A/7 and WØMLY/TR8, SSB VQ9A and 9C, and AM accounted for CE3OE, CR7CH, HC2AX, PJ3AO, HH2DF, TG9SC, VP5AH, VS1GC, VS4RS, XE3AF, ZD6RM, 9U5BB, 5DS and 5XX (Burundi) and 5BH (Ruanda).

G2DC, on CW as ever, worked CE3OF, CP5EZ, CO, CR7, PJ2AO, TN8AT, VS9MB, VQ2 and 5, VQ9A/7, WØMLY/TL8 and TJ8, 5R8AD, 5H3HD and 6O1MT; he found the evening periods, and the African signals, best. G3FPK raised 5B4SJ on CW, 9Q5PR on SSB.

DJ3VG (Osterode) works Fifteen only and finds it in pretty good shape except to the U.S.A. He says that in the afternoons South Americans crowd it out, mostly in phone and speaking Spanish, which he can't copy! With 80 watts he worked VQ9A and 9A/7, ZP5AW, TT8AL, 9Q5JR, 9U5DM and South Americans; on AM phone he got EL5C, VU2BK, CR6's, VQ5IS, 5N2's, VP6GN and ZL3JO.

Forty Metres

Summer conditions and QRN have kept activity pretty low on *Forty*. Nevertheless, the occasional good one is still there. G2DC spent one morning around 0700 testing a new ground-plane and raised two PY's, CT3AB and several W's.

G3LPS was lucky enough to catch VQ9A/7 on the band (2330) and also worked VP8GQ, VP9AK and some PY's. G3PIT (Exeter) found the band open from 2300 most nights, especially to South America, and some late sessions rewarded him with KV4CI, VP6GC, LU1ZAB (Larsen Island), CE3ZK, TI2LA, VP9's, VQ9A, CP5EZ, KP4ANJ and HC1DC; he was very surprised to work VS9MB at 2315 and wonders whether he was genuine? TI2LA, TI2HP and VP8GQ were all heard on SSB at the low edge of the band, and VQ9A/7 was heard twice.

Stations worked by W's recently on Forty have included ZK1BS/P, KX6AJ, FW8BH and VP8GQ. Nice to know they're there, anyway, and the latter often makes himself heard in the U.K.

The radio cabin, G3JFF/MM, on board H.M.S. "Cook," the Admiralty survey ship in the Pacific, now on the way home to pay off. G3JFF's activities, ashore and afloat, have been regularly reported in this feature, the gear shown here being a Panda Cub Tx and a Geloso converter, used with a B.40 Naval receiver.

Eighty Metres

The only reference we have to 80-metre DX comes from SWL D. Hayes (London, N.3), who says that the Pacific stations having difficulty in working into Europe on Twenty should try 3·8 mc SSB. The fact that G3FPQ and DL4FX have worked VK's during June shows that there should be a path to the Pacific, especially from July onwards. SWL Hayes adds that conditions on the band have changed a lot since last year; the Persian broadcast station on 3985 kc is always S9 plus by 2000 GMT, whereas last year this didn't happen until nightfall. Lack of activity is mainly to blame for absence of real DX on Eighty, and if only some stations from Asia, Central and South Africa and South America would fire up on the band, things would start humming.

Heading Photograph *(p.302)*

VQ4HX is run by Peter Dodd (G3LDO) at Nairobi (Box 25047), Kenya, who has a fine array of home-built gear. The main Tx is a Geloso VFO into a 5894 PA, modulated by a pair of 1625's in Class-B, zero bias. His Rx is a home-brew double-conversion job for the amateur HF bands only. He also has (similarly, home-constructed) a 14 mc SSB transceiver running 100w. p.e.p. with a pair of 5B/254M's in Class-AB1; the filter for this Tx is at 8·2 mc, using FT-254 crystals; frequency control can either be by crystal or VFO. Aerials are a rhombic, with

230ft. in each leg and of height 40ft., and the SSB transceiver is provided with a 14 mc "ZL Special." All the wall-paper is for phone contacts, with 165 countries worked to date; on sideband the score is 106C—which says a good deal for that home-built SSB transceiver. When VQ4HX leaves East Africa shortly, he will be back in the U.K. as G3LDO.

General Chat

From G3FPK: Fifteen needs some kind of activity-booster; one night a VE was heard telling someone that VQ9AA was putting in a good signal, and a look on 21030 kc confirmed it; there was Gus, S8 at 2300, on an apparently dead band . . . The horrid noise on 14100 kc seems to have blown itself up, but occasionally a nasty Loran-type thing, very potent, appears on the band . . . The promised DL operation from Corsica is probably off, owing to licence difficulties . . . MP4QBB is John, ex-5A5TA . . . TI2WR was recently in England and "the East London crowd" had the pleasure of meeting him.

From G2DC: Danny Weil is still kicking his heels in Tahiti, the licences for his next visits proving rather sticky . . . It is hoped that WØMLY may be organised to visit the Yemen as a grand finale; failing this, probably Mali and the Upper Volta . . . Gus, W4BPD, hopes to cover both Agalega and the Tromelins, and now has licences for AC3 *and* AC5 . . . WØVSB, in a QSO, said he was using a Quad, the boom 30ft. long and 60ft. high, with two directors, radiator and reflector, all supported on fibre-glassed bamboos! Finally, personal visits reported from K5JLQ, W6CTO and G5WP.

From G3FXB: Great dissatisfaction with the "MC" mode of operation, especially where VK2VC/LH was concerned. Many Europeans were getting through but not hearing him, and the MC was telling them when to transmit. They will doubtless get QSL's for these one-way QSO's, with their report (which they didn't hear) duly inscribed . . . Report in from UM8FZ on 80-metre SSB last winter . . . Still running the old AM rig to maintain skeds on 21 mc with ZS1BV and ZS6CV.

From G3LPS: Too many stations seem to avoid their QSL responsibilities by appointing a "manager." Surely only very remote DX stations should need to do this, in the absence of good postal services?

From G3IDG: On the same subject — "This practice of appointing QSL managers savours, to me, too much of having your cheques signed by somebody else" . . . And, concerning phonetic alphabets, is it too much to expect people to learn one particular one and to stick to it? After the call-sign, which has been "memorised," other people's calls, QTH's and the like come out in a fantastic mixture of Able-Baker, Alpha-Bravo. Amsterdam - Baltimore and so on (not forgetting sundry home-made ones).

From ZB1BX: The expected call of ZB1XF did not materialise, as ZB1 calls are being issued in alphabetical order. G3KXF, the holder, is now active from the shack of ZB1HC, who is tour-expired and becomes G3MIR. All bands, Ten to One-Sixty, with three beams, a ground-plane and a long wire, a Minimitter 150-watt Tx and an AR-88.

From GW3AHN: Still of the opinion that a world-wide 100-watt limit would be a good thing. And as for the suggestion that a clean QRO signal is preferable to a dirty QRP one, the quality of the signal is the responsibility of the operator, and surely power has little to do with it? And regarding strange RST and RS reports—an FO8 station was heard to give a European the report "You are R4 and S3," later amended to "Your signals are strong but there is some QRM on you." S3 (look it up!) doesn't mean that, at all.

From G3NWT: Regarding any suggestion that the "Top Band Kings" are superior beings to the mere dabblers in DX on the HF bands—to get anywhere, either in their province or in the "easy" DX field, you need the same thing, to wit: A first-class site. Furthermore, many people have to fit their operating hours with the waking and sleeping habits of employers, customers, XYL's and so on. Probably the factors of difficulty of reception, operating skill and demand for a particular station all integrate to more or less the same level on any band.

Late DX Flashes

DXCC will recognise Ruanda and Burundi as two separate countries for credit; and the old country of Ruanda-Urundi is now scratched from the list. Known to be in Burundi are 9U5BB, 5DS, 5XX, 5CB, 5DM, 5JH. 9U5BH is in Ruanda. Most of them are on 21 mc AM.

Likewise for DXCC purposes Guam Island will now count separately from the rest of the Marianas (Tinian, Saipan and so on). Guam is U.S. Territory, the rest are Trust Territories.

Gus Browning's locations have been as follows: VQ9A, Seychelles; VQ9AA (first time) and VQ9A/7, Aldabras; VQ9C, Cosmoledo Island; and VQ9A/AN, Assumption Island.

Finale

And so to the sign-off, with the usual acknowledgments to all our correspondents. The deadline for the September issue is first post on **Friday, August 17** (and for the following one, *September 14*. Don't be late, and address everything, as usual, to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Good Hunting, and 73.

COLLECT YOUR QSL CARDS

We are asked by G3WP, 43 Forest Drive, Chelmsford, Essex, to say that, as sub-manager of the G3OAA-G3PZZ section of the (RSGB) QSL bureau, he is holding a large number of unclaimed cards for operators in this call-sign sequence. Cards not claimed within one month of the publication of this notice — that is to say, by September 3 — will be disposed of by incineration. To get any QSL cards there may be for you, all you have to do is to send to G3WP, at the address given, two or three large-size s.a.e.'s, with your call-sign writ big on the envelopes. G3WP says that this is the Final Notice.

RTTY Topics

STATION NEWS — SWEEPSTAKES CONTEST RULES — TECHNICAL POINTS ON T/P OPERATION — THE DC LOOP SYSTEM

W. M. BRENNAN (G3CQE)

Appearing every other month, this feature — by an active and well-known RTTY operator on the amateur bands — discusses matters of interest, both technical and operational, to the amateur radio-teleprinter enthusiast. His previous (June issue) article included a full glossary of terms for RTTY operators; the April contribution, notes on a bias meter; and in February the main technical discussion was on printing through QRM and the use of an audio filter.—Editor.

SUMMER always brings some reduction of activity in the shack as amateurs forsake it for more attractive outdoor pursuits—mobile operation, for example. RTTY operators being no different from others in this respect, and mobile RTTY operation being rather a fearful prospect (!), there has been a noticeable falling-off in activity on the LF bands recently. On the HF bands, however, things are still very lively and on 20 metres all six continents can be weeded out with a little patience in the early mornings and late evenings.

At least one station, GM3DPS/A on the Isle of Skye, has been operating RTTY from a vehicle (a caravan ?), according to K3GIF who worked him recently. K3GIF has the happy knack of being around just at the right time to be the first one to work a new country on RTTY. His latest discovery is the club station ET2US (Asmara), making their first attempt at RTTY, although the callsign is well known on CW and SSB. ET2US runs 300 watts from a modified BC-610 with a choice of aerials, including a seven-element beam for 20m., a couple of rhombics and sundry dipoles. On the receiving side they have two Collins 75A4's fitted for diversity operation ; the T.U. is a piece of American Navy gear. The station is active every day on 15 and 20m., and should provide a welcome source of African QSO's for RTTY WAC.

Herbert Hoover Jr., W6ZH, was one of the early pioneers of RTTY and is still a keen operator and constructor of RTTY equipment. The news that he has just been elected President of the A.R.R.L.—the American amateur organisation—will be welcomed by all interested in amateur radio-teleprinter operation. Another well-known RTTY operator to receive recognition recently is Merrill Swan, W6AEE, *RTTY Magazine ;* he has been awarded the Lee de Forest Memorial Award for the greatest contribution to Amateur Radio in the past year. Since it would be no exaggeration to say that W6AEE has contributed more to RTTY progress than any other individual, the award is well deserved.

VE7KX writes in to say that he has just built the G8PD " Mixo " heterodyne exciter and that with the addition of a reactance valve it makes an excellent exciter for CW and RTTY. A recent gale brought down the 100-foot tree that was supporting the apex of his Vee-Beam, but on the credit side a new Model 28 Teletype machine has been added to the RTTY stable and is much quieter in operation than the old Model 26—a fact much appreciated by the rest of VE7KX's family !

LA1NF passes the news that the Norwegian Army Signal Corps has just presented the Norwegian Amateur Society with another 30 Lorenze T36Lo T/P's, making a total to date of some 60 machines donated by them. *Whitehall* **please** *note !*

Date For Your Diary

The RTTY Sweepstakes Contest last year proved to be a great success and it was a weekend which was enjoyed by all participants. The rules for this year have just been issued and are summarised here. The coming event should be even bigger and better than the previous one since there are now more stations in more countries active on RTTY. The competition is between all RTTY stations throughout the world, to determine their ability to exchange messages by two-way radio teleprinter operation on the amateur

SECOND ANNUAL WORLD WIDE RTTY SWEEPSTAKES

1. Test Period 0200 GMT October 20, to 0200 GMT October 22, 1962.
2. The contest will take place on the 3·5, 7, 14, 21 and 28 mc bands.
3. Stations may not be worked more than once on any one band, although additional contacts may be made with the same station on different bands. In the interest of encouraging multi-band DX operation, the same country may be claimed more than once if contacted on different bands. The same U.S.A. State worked on more than one band may be claimed once only.
4. For the purposes of this contest, KH6, KL7 and VO will be considered separate countries, in addition to the ARRL country list.
5. Stations must exchange messages consisting of Message number, RST, Time in GMT, and Country or State.
6. All two-way RTTY contacts by North and South American Countries and KH6 will score two points. All two-way contacts by other countries will earn 10 points. All stations add 200 points per country worked excluding their own.
7. Total score will be the number of exchange points earned multiplied by the number of U.S.A. States worked, and added to the number of country points earned, multiplied by the number of Continents worked, *i.e.*, Total = Exchange points *x* States worked, *plus* Country points *x* Continents worked.
8. Logs and score sheet should be sent to RTTY Inc., 372 West Warren Way, Arcadia, California, U.S.A., before December 1, 1962. A copy of the score sheet would also be appreciated by : W. M. Brennan, G3CQE, 11 Hammond Way, Norwich, Norfolk. NOR. 42R.

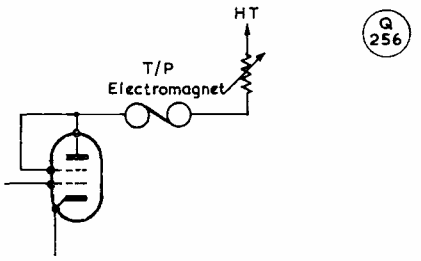


FIG. 1

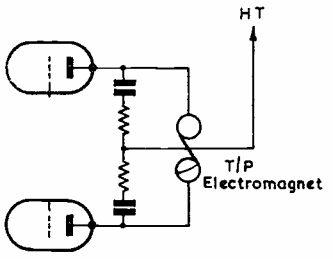


FIG. 2

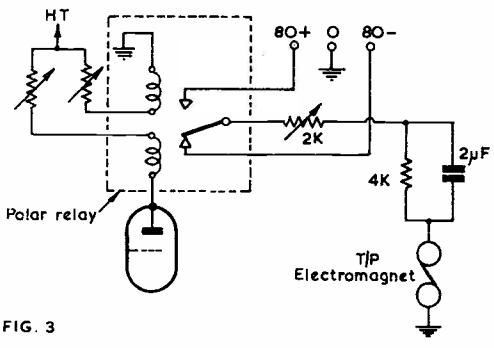


FIG. 3

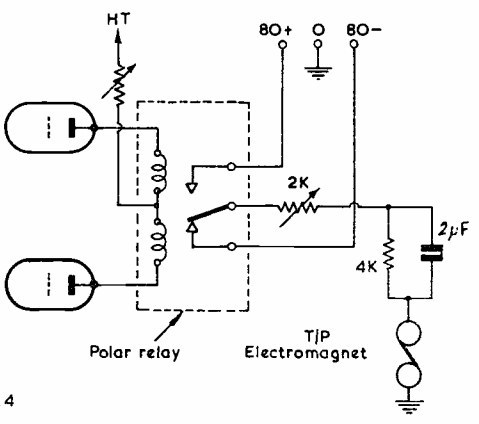


FIG. 4

Fig. 1. Single-ended circuit for direct keying of the T/P electro-magnet. Fig. 2. The same in the push-pull mode. Fig. 3. Using a polar relay—see text. Fig. 4. T.U. keyer stage driving a polar relay and keying a teleprinter on a local loop supply.

communication bands.

Reconciling Keying Systems

A query from SWL J. R. Briggs (Cromer) raises a problem which often puzzles newcomers to RTTY. He is the owner of a Lorenze T/P, and would like to operate it in conjunction with a G3BST T.U. The arrangements for keying a Lorenze machine are similar to those of most American machines, in which the T/P electromagnet requires a current of 60 mA for the " mark " signal, and zero current for " space." The electromagnet armature is provided with an adjustable spring which pulls the armature over to the " space " condition when no current is flowing in the windings. This is unlike the Creed equipment, such as the models 3 and 7 T/P's, in which the electromagnet is a form of polarised relay which requires a current of 20 mA in one direction for " mark " and a similar value in the reverse direction for " space." Quite often in this country, the problem is the other way round. A Creed T/P is required to be keyed from a single-ended or on/off keyed T.U., since many of the circuits published in the U.S.A. are single-ended to cater for their types of T/P. There are no difficulties at all when the T.U. keyer stage drives a polar relay which in turn keys the T/P *via* an external DC supply. The W2JAV design is one such T.U. and in this case the polar relay contacts are merely wired up to a suitable supply. However, several T.U.'s are designed to key the T/P direct with the electromagnet coils in the anode or cathode of the keyer stage. A single-ended keyer of this type is shown in Figure 1, and the push-pull or double-current version in Fig. 2.

Perhaps the simplest way of operating a Creed machine from a single-ended T.U. is to convert the T/P electromagnet to single-current working. In the case of the Creed Model 7 T/P, and the 7TR and 85R reperforators, the makers have made provision for this and a suitable " bias spring " can be fitted to the electromagnet armature linkage in a few seconds. For the Model 3, no such provision was made, but it is not difficult to introduce a suitable spring with a variable tensioning arrangement between the electromagnet armature and the rear of the keyboard. The current then required for the " mark " signal is 35-40 mA with the spring adjusted to give half the pull produced by this current.

Another and perhaps a better solution to the problem is to arrange that the single-ended keyer stage drives a biased polar relay, as shown in Fig. 3. The current for the bias winding is supplied from the HT line and adjusted by means of a suitable variable resistance. The T/P is then keyed from a local DC source such as the +80—0—80— volt supply used by the GPO and available quite cheaply on the surplus market. The 2000 and 4000 ohm resistors and the 2 μF condenser given in Fig. 3 are for current adjustment and keying waveform shaping purposes. Fig. 4 shows a T.U. keyer stage driving a polar relay which in turn keys the T/P on local loop supply. A polar

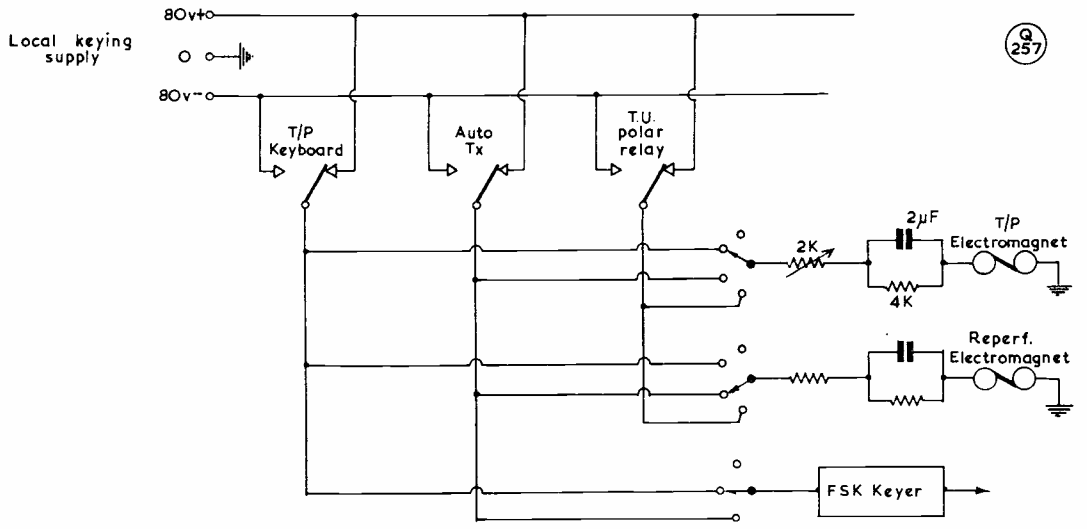


Fig. 5. Typical local loop wiring diagram for teleprinter transmission and reception ; points regarding this arrangement are discussed in the text. For the reperforator circuit, the values would probably be about the same as for those given for the feed to the teleprinter electromagnet — but will depend upon the type of reperforator being used.

keyed T/P loop is shown but for single-ended T/P's either the 80v.+ or the 80v.— is omitted.

Local DC Loop

There is a great deal in favour of using a polar relay in the T.U. and keying all the RTTY equipment *via* a DC loop. For one thing, various items of gear such as reperfs and different T.U.'s can be readily inter-connected. The T/P can be arranged to provide local copy without any valves being involved in the circuit—this is useful when tracing faults. Furthermore, large keyer valves such as the 6Y6, 6W6, 6L6 and similar are necessary to drive a polar relay and types with more modest HT current drains (such as the 6SN7, 12AU7 and EF50) can be used instead, giving little or no regulation problems in the HT supply. The disadvantages are the extra DC supply and the polar relays required. Another objection often raised against polar relays is that they introduce distortion into the keying circuit. This is, of course, true since any relay armature must have a finite transit time. However, with a correctly adjusted relay used at 50 bauds the distortion is negligible in comparison to other sources of distortion encountered in the link. That this is so is surely evident from the widespread use of polar relays in commercial telegraphy.

A typical local loop is shown in Fig. 5. As can be seen, by means of suitable switching it is possible to punch up a calling tape *via* the T/P keyboard and the reperforator, whilst the station to be called is still printing his CQ on the receiving section of the printer. There are, of course, many possible modifications to this circuit. One of these is the inclusion of a contact from the station send/receive relay which will always throw the T/P electromagnet over to the FSK keying line, so that on " transmit " the outgoing signal is always monitored on the T/P no matter which position the T/P selector switch has been left on.

Finally, the answer to one query as to good books from which to gather information about teleprinters and their operating principles. Without doubt the best answer to this is *Telegraphy*, by J. W. Freebody, published by Pitman. This book covers practically every aspect of the subject, including descriptions of most of the machines used for telegraphy (past and present) by the GPO. It is expensive to buy (£4) but it can be usually obtained through a public library on request. A less comprehensive treatment is *Elementary Telegraphy*, by E. Missen, published by George Newnes Ltd.

That's about all for this month — enjoy the holidays and see you with the October issue.

" . . . That's his 6146 going up. . . "

Aerial Hints, Tips and Ideas

Based on the experience of

THE OLD TIMER

Conclusion

This article, which deals with putting up an aerial and keeping it there, concludes a short series which, appearing in alternate months, started in our December 1961 issue. The last four instalments (December, February, April and June) have dealt in some detail with a wide variety of aerial systems of the sort that can be fitted into almost any garden—but excluding beams and the proprietary radiating devices. Because the aerial problem at almost any AT station is an individual one, no two cases are the same — but it is to be hoped that the series now concluded will have given at least a few ideas to those interested in the general subject of Aerials.
—Editor.

FIRST, a back reference to the previous instalment of this series (pp.185-187 in the June issue of SHORT WAVE MAGAZINE). G8ON (Worksop) has written to say that he devised a folded half-wave aerial of the type shown in Fig. 1 *(a)* as long ago as 1954, has been using it ever since, and is still convinced that it beats anything else which can be put up inside the same space. He is continually being told why it can't work, but his own theory as to why it *does* is as follows: The electrostatic lines of force terminate at their opposite pole instead of at earth ; in all other types of simple aerial (except the vertical dipole) they terminate at earth ; but by folding the far end of the aerial back underneath the main span, they are made to terminate at their opposite pole and therefore the potential gradient along each e/s line is greater. The "earth-lead trouble" is also dispensed with in this way.

G8ON also has a word to say in connection with three-wire feeders. The statement that a 600-ohm line with a third feeder added (up the centre) would mean feeding two of the pairs with 300 ohms was made in an unguarded moment. The characteristic impedance of an open wire line varies, not in the ratio of spacing to diameter, but in the ratio of the logarithm of spacing to diameter. This gives a figure of over 500 ohms for the two inner pairs of wires, if the impedance of the outer pair is 600 ohms ; in other words, one can forget the difference, and the tedious construction of triangular or circular spacers to give three equally-spaced wires is quite unnecessary.

And now to a few strictly practical thoughts about how to keep a good aerial when you have found one! As with the whole series, these remarks apply to aerials consisting of "pieces of wire" — not rotary beams or any kind of complicated erections on towers.

Using All the Space

First, since most of us suffer from insufficiency of space these days, you will probably want to make the thing somewhat longer than your garden allows. The various methods of bending, folding and extending have already been discussed . . . but how many people really make use of what space they have? There is no need to fix your far-end mast some fifteen or twenty feet short of the fence, just because of the guying problem ; you can put it much closer if you use the outrigger mounted high up the mast (Fig. 1). If the mast is a wooden structure of "two-by-two," simply bracket four or five feet of the same material well up the mast—at right-angles, of course. You will note, in the diagram, that the two guys leave the top of the mast at equal angles (which is where it matters most), but that the back guy anchorage is only half as far from the bottom of the mast as the other one.

If you do something on these lines you won't be wasting any space, lengthwise. And associated with this is the question of height, which is also a factor which we would all like to improve. For one thing, a well-guyed mast can be made higher than a poorly-supported affair ; and for another, so many aerials lose height (quite wastefully) because it is impossible to pull them tight! Just think of it—another five feet on the top of each mast could cost quite a lot of money, and yet you let the thing sag five feet in the middle, where the feeders dangle, and that is the very part which *should* be high.

If the masts are well erected, the halyards of good material, the guys securely anchored (and, of course,

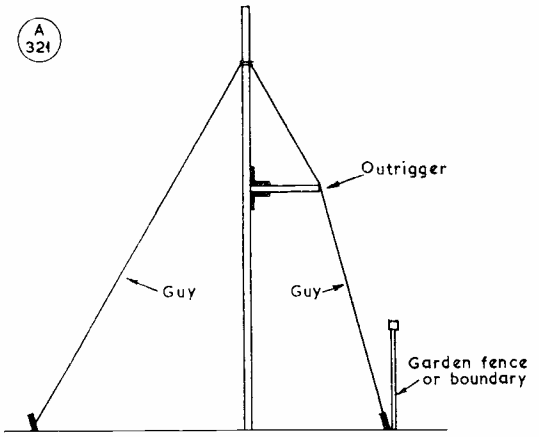


Fig. 1

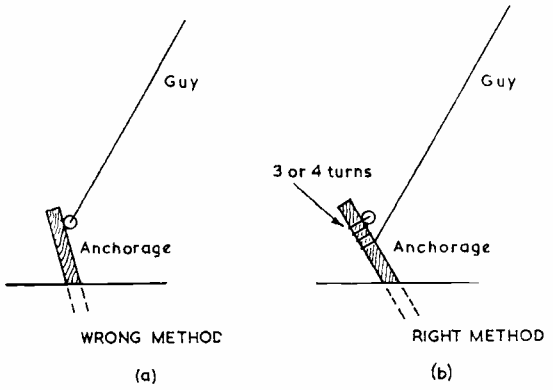


Fig. 2

Fig. 1. An outrigger, mounted at right angles to the mast and fairly well up, will reduce the distance necessary between the base of the mast itself and the anchorage for the guy; thus the mast can be placed that much nearer the boundary. Fig. 2. Guy anchorages should not be set at the near-vertical, as at (a); if they are fixed at a 45° angle, as at (b), there is no risk that they will be dislodged by a heavy pull on the guy.

the wire itself sound and free of twisted joints and the like) you can pull an aerial tight until it almost twangs! And in that condition it offers no more wind resistance than when it is drooping sadly towards the middle of the garden. Of course, an end-fed arrangement makes this easier, but there's really no need for those drooping centre feeders that one so often sees . . . they are usually occasioned by the fact that one or other of the supports would collapse if the thing were pulled any tighter.

Fixing the Guys

For a start, get those guy anchorages right. Fig. 2 *(a)* shows the wrong method, with the picket-post or whatever it is knocked in at a near-vertical angle. A really heavy strain on that guy could pull the thing right out of the ground. Fig. 2 *(b)* carries no such risk. Furthermore, it does not rely on a hook or staple to take all the load—the guy is wound round the post itself before being attached. Angle-iron is excellent for picket-posts; a four-foot length of it, sharpened at one end, may be acquired from junk-yards and will hammer easily into the toughest soil. Certainly no pull at right-angles will displace it.

In passing — it's not much good providing immovable anchorages like this if the fixing of the guys to the mast itself is not equally reliable. With a wooden two-by-two you can use very substantial screw-eyes, obtainable at most ironmongers' shops—choose the fattest and longest available. If the mast is a round one of dural or aluminium, the local garage (or blacksmith, if you have one!) will make circular clamps which can be bolted round it; the bolts can be made to take metal hooks or eyes when they are put together, or you can rely on wire (heavy galvanized) tightly wound round the mast just below the clamps, which will then stop them from sliding down.

Quite a light stranded galvanized wire will have a far higher breaking strain than you will ever need for guys; and the newer expedient of nylon or polythene multi-strand cord is excellent. One grade of the latter has a breaking strain of 200 lb. and yet is extremely flexible and light in weight. One of its chief advantages is that it makes the erection of the mast so much easier in the first place; heavy guys of galvanized wire dangling right from the top so often make the whole thing seem to weigh twice as much as it really does.

Jam-Proof Pulleys

After the guys, the halyard . . . and no one will need telling that the chief source of trouble here has always been *pulleys*—which jam! Unless you have discovered a jam-proof pulley (in which case the writer would like to hear more) don't use one at all, but dig out an old "shell" insulator, lash it to the mast, as in Fig. 3, and at least you will have no halyard troubles. There are two ways of lashing one of these queer-shaped objects to a mast — note from the diagram that the lashing wire should pass *outside* the halyard itself. In this way, even if the insulator itself collapses (which is most unlikely, because the pulls oppose) the aerial will not immediately fly to pieces!

Many of the old-established radio shops still have unwanted stocks of porcelain insulators of all shapes and sizes, which they are pleased to part with for a few pence each. But the larger type of "shell" insulator does now seem to be getting scarce. (In the '20's the average amateur transmitting aerial had about four of these in cascade at each end, adding a lot to the weight but very little to the efficiency!)

And now a tip for the joining of open-wire feeders to the aerial, be it Zepp or a centre-fed doublet. How often does one find these soldered (or just twisted) to the aerial wire and simply left to dangle? Sooner or

later the weight and movement of the feeders is sure to cause a breakage at the junction point, causing much consternation down below if only one side goes.

The remedy is simple, but it can't be as obvious as it seems, or more people would use it. It is this: Twist each wire of the feeder round the insulator, just as the main aerial wire has been twisted. Let the *insulator* support the weight of the feeders; and, of course, when you fix them to it, leave enough wire over to take across and solder on to the main span of the aerial. Fig. 4 *(a)* portrays the common (wrong) method and Fig 4 *(b)* the rarer (right) one.

Stray Tips

Innumerable other constructional points come to mind. Don't organise your down-lead, or down-coming feeders, so that they pull on the actual lead-in insulators. Anchor them firmly to something near or on the window-frame, and then have a short length of slack wire connecting to the lead-in proper. Don't trust to a single halyard, which leaves you effectively minus one mast if the aerial itself should break. Always use a continuous loop, to some point of which the aerial is attached. If you are a supreme pessimist you can instal *two* continuous loops (one simply as a reserve)—especially if you use a shell insulator (which gives plenty of room) and not a pulley. Then, if number one breaks, you use number two to haul up two more! But if you use the polythene or nylon rope already alluded to, you are quite safe from such a contingency.

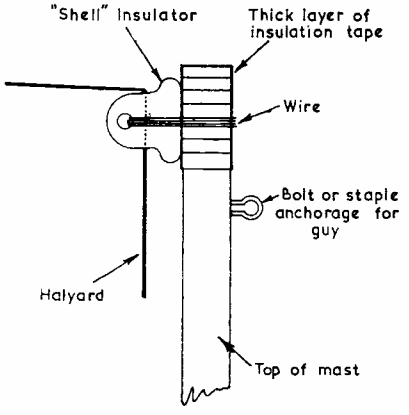
Wire guys should be broken up into odd lengths with small insulators; avoid half-waves at any of the HF bands, such as 16 feet, 11 feet or 8 feet. Likewise, wire guys, if made fast to the mast itself, should either have a generous "wodge" of insulating tape wrapped in between, or should have an insulator mounted within a few inches of the junction. A loose metal-to-metal joint of this kind can cause murder in the way of scraping noises, or even TVI.

House-end masts are best erected by the method generally employed for TV aerials—that is to say, not lashed bodily to the chimney-stack, but held to right-angled brackets by U-bolts, the brackets themselves being lashed to the stack and protected at the corners by suitable plates. If more than about twelve or fourteen feet high, they should be guyed. The mast at the bottom of the garden should have one set of guys per twenty feet of height, at the very least. A forty-footer is safe enough with three guys half-way up and three more at the top, even if it is a slender metal mast. Of course, a substantial wooden pole may not require anything more than one single back guy until a height of thirty-five feet or so is reached.

Finally, don't plant wooden poles in the ground unless you are prepared to take them down and paint the butt with creosote every so often — and *never* sink them directly into concrete. They will inevitably rot at the point where they emerge. Well worth while is a tabernacle consisting of two good oak posts sunk in concrete, with the mast bolted between them. Leave its butt an inch or so clear of the ground, and you will be able to remove the lower bolt and let the whole thing down for painting and maintenance, which should not need doing more than, roughly, twice per sunspot cycle.

Insulating Metal Masts

If you are putting up a metal mast, why not, while you are about it, insulate the foot? It could then itself be used as a ground-plane aerial, fed by coax, or as a loaded vertical, with link coupling (again by coax) into the loading coil, which can be housed in a box at the foot of the mast. While you may not have any such intention when planning the thing as a support for a horizontal aerial, you never know when you may want to try a vertical system!



A 322

Fig. 3

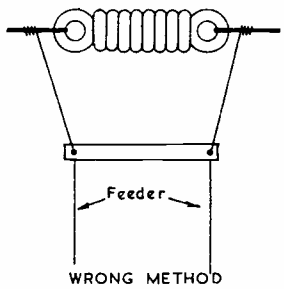


Fig. 4(a)

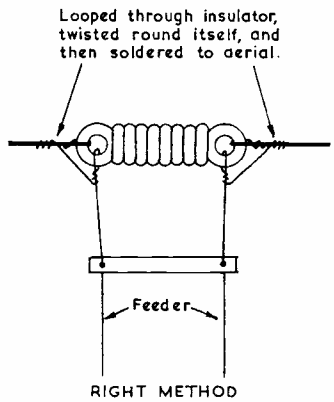


Fig. 4(b)

Fig. 3. A shell-type porcelain insulator makes an excellent unjammable pulley, but should be lashed to the mast with galvanized wire; a bolt or staple driven in just below the lashing will prevent any slipping. Fig. 4. If a twin-feeder is allowed to dangle from an aerial, as at (a), in due course a breakage near the joint is almost inevitable. If the feeders themselves are twisted round the insulator, as at (b), the weakened part of the joint is relieved of the direct downward pull.

Dural or hard-aluminium masts—when the sections are properly bonded electrically—make ideal vertical aerials. The insulation of the base is simplicity itself: Get two small Pyrex oven dishes and plant the foot of the mast in one dish, which rests on the other, placed upside down—in other words, the dishes have their bottoms in contact, the lip of the lower one taking the weight and resting across a couple of bricks, a slab of stone, or whatever, and the upper one containing the foot of the mast itself. Even if the upturned dish does fill with water, it will not matter because the fact that it is resting on the other (which is upside down) will result in a long, high-resistance leakage path, entirely adequate for any current-feed system; actually, Pyrex dishes used in this way will show infinite resistance under almost any conditions. These dishes are extremely strong, and there is no fear of them collapsing under direct pressure, even if your mast is 50 ft. high.

And if you already have a dural mast in position, and have ideas about insulating it at the foot, it is still quite easily done (provided you are using either insulated guys or nylon cord for the mast supports): Simply slack off the guy lines till you can lift the mast, vertically, far enough to slip the insulating dishes underneath the foot. With some intelligent assistance, the whole job can be done in a few minutes. But, obviously, it is no use carrying out these operations at the foot of the mast unless insulating guys are being used.

THE R.109A SURPLUS RECEIVER

GENERAL DESCRIPTION — MODIFICATIONS FOR MAINS OPERATION AND TOP BAND WORKING

J. D. SIMPSON (G3NJQ)

THE R.109A receiver was designed as a general-purpose "Army Reception Set" for use with a vehicle-station or at a fixed location, and is fairly generally available on the surplus market, at varying prices.

It is designed to tune over two wave-bands: (1) 2·0-4·9 mc, and (2) 4·9-12·0 mc. Both these bands are directly calibrated on a very good slow-motion dial. An internal speaker is fitted and can be switched out when headphones are being used. In addition, the Rx has a BFO for CW reception and also a crash-noise limiter of the simpler type. A panel socket for a plug-in lamp is provided, for use when working in the dark. The power supplies are incorporated in the receiver, which is designed to run from a 6-volt accumulator; it therefore has a vibrator-HT pack, giving a well-smoothed and filtered 150v. HT. With a 6-volt battery supply, the load is 2 amps.

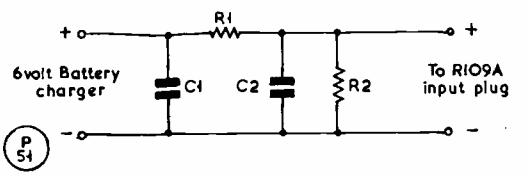
The valve sequence is as follows: RF, ARP38 (KTZ73); mixer, ARP12 (VP23); oscillator, ARP12; 1st and 2nd IF amp., ARP12; det. and audio, AR8 (HL23DD); output amp., AR8; BFO, AR8. Thus, the receiver uses three different valve types, of which only the KTZ73 is obsolescent, no longer listed. Except for the ARP38, all valves are directly heated. (When the writer obtained his R.109A. it was complete with a spare set of valves *and* a spare vibrator.)

An obvious source of trouble with an otherwise undamaged R.109A is the vibrator, which after long storage (as many of these receivers must have had) becomes inactive. If when first switching on the pilot light shows up but no buzz is heard from the vibrator, then try the spare, if available; should this also not buzz, then clump it on the palm of the hand until it does! Of some twenty R.109A's that have passed through the writer's hands for testing and adjustment, 16 vibrators went off all right, and the remaining four were started by the "clump-it" technique. The only other fault encountered in this quite large number of R.109A's has been a few valves with broken filaments, and this occurred most frequently in the mixer stage.

Vibrator hash is very low, due to the well-filtered power unit, although noise can be caused if the vibrator contacts are excessively worn (as could be the case with an old, well-used receiver). The only remedy is to try another vibrator.

Top Band Conversion

In its original condition the R.109A is good only for the 40 and 80-metre amateur bands; therefore, it was decided to get it going on 160m. This conversion is quite simple and takes only a few minutes. The first step is to remove the Rx from its case and place it on the bench, right way up. Set the tuning dial to read 2 mc, with the band-switch in the 2·0-4·9 mc position. Inject a 1·8 mc signal, from any convenient source (such as a crystal oscillator if no sort of signal-generator is available), to the aerial socket, and switch on the Rx BFO; now adjust the oscillator coil for this band, which is the second coil unit from the front panel, on the right-hand side of the chassis. Adjust by turning the core further down into the coil; this should be done gently until the 1·8 mc beat is heard to come in on the speaker; zero this signal to read exactly 2 mc on the Rx dial. Switch off the 1·8 mc



As it stands, the R.109A cannot be operated direct from a mains supply; however, the internal power pack, as fitted, is intended to work from a 6v. DC source, such as a car battery. Hence, this battery can be replaced by a mains-connected 6v. supply, obtained from an ordinary 6/12v. battery trickle charger. But such a unit would require adequate smoothing as shown above, before being fed to the R.109A power input socket. Values are given in the text.

input and turn up the Rx gain control so that hiss can be heard in the speaker.

The next move is to adjust the RF and mixer coils to bring them into correct IF alignment. First set the mixer coil, which is found between the ARP38 RF stage and the ARP12 mixer on the right of the chassis; turn the slug down into the coil until hiss in the speaker is at a maximum. The same adjustment is carried out on the RF stage coil, which is mounted at the far back of the chassis underneath the ARP38. The Rx is then ready for testing on Top Band signals.

It will be evident, of course, that the dial reads 200 kc out all the way along the 2·0-4·9 mc frequency range; it will also be found that the tracking of the oscillator remains linear over the band. To make this clear: The 2 mc mark *on the dial* is actually 1·8 mc in the Rx, while 2 mc, the HF end of Top Band, reads 2·2 mc on the dial. At the other end of the wave-range, 80m. starts at 3·7 mc on the dial. The 4·9-12·0 mc range is not affected by these re-adjustments.

On 160 metres, the performance of the R.109A is very good and, in fact is found to be better than the writer's CR-100. And the R.109A also has the advantage of being an extremely useful Rx for /P work, because it can be run from a 6-volt car battery.

Operation Off Mains Supply

Due to the fact that all but one of the valves in the R.109A are directly-heated types it is not possible to connect a normal AC power supply to the set. What is required to get the Rx working from the mains is a power pack giving 6 volts at 2 amps. of very well-smoothed DC — in other words, a battery eliminator of this rating.

The best way to meet this requirement is obtain a battery charging unit as sold in the emporia of Messrs. Woolworths! These are standard items giving either 6v. or 12v. at about 4 amps. The tapping to use is that for 12v., because the DC output from the charging rectifier must be passed through a smoothing filter, which will cause a voltage drop to around 6 volts. The necessary smoothing circuit (*see* p.315) can be very easily built into the battery charger container. It is a conventional arrangement with large-capacity smoothing condensers, readily available in these low voltage ratings. The choke or smoothing resistor R1 is, in the writer's case, no more than a DC bell coil with a resistance of about 5 ohms; whatever sort of choke is used, it must be capable of passing 2 amps. and should be wound with heavy gauge wire, of 16g. or so, as the rating is of the order of 20 watts. The resistor R2 is necessary to ensure that the voltage output remains constant under the varying vibrator load; it should be rated at 15w. Condensers C1, C2 are of 1000-1500 μF, 15v. working.

Conclusion

Those who go in for an R.109A will find that it is a very useful and robust receiver, capable of giving excellent results on the three LF amateur bands (when modified for 160m. as described here) and suitable for either portable or mobile work with a 6-volt battery, or off the mains with a battery-eliminator type of DC supply, as explained.

PAST QUESTION PAPERS — R.A.E.

Those taking the next Radio Amateurs' Examinations, in November or May, are reminded that sets of question papers for the three years 1960-1962 can be obtained from: Sales Section, City & Guilds of London Institute, 76 Portland Place, London, W.1, price 2s. post free — and be sure to quote "Subject No. 55" when ordering.

SOME CITY & GUILDS STATISTICS

In a recent report on its activities, the C. & G. shows that, for the examination year 1961-62, more than 185,000 students were examined in about 200 different subjects, ranging over the whole field of technology. The diplomas and certificates issued by the City & Guilds are accepted as professional qualifications throughout the Commonwealth, and in many other countries as well. The latest entry figures for the various examinations not only show a large increase on the previous session, but also prove that a great deal of hard work is being done part-time in local technical colleges and evening institutes up and down the country. In addition to Subject No. 55 (R.A.E.), the other radio courses include Electronics Servicing (No. 47); Radio & Television Servicing (No. 48); and the Telecommunication Technicians' Course (No. 49).

DIFFICULTY IN SUPPLY

Anent the note "No Difficulty in Supply," on p.256 of the July issue, several people have written in to say that, in fact, it is not as easy as all that—they have trouble in getting SHORT WAVE MAGAZINE on time through their local newsagent. So far as we are concerned, there is no excuse for this, as bulk supplies to order are despatched in ample time for appearance on the due date in the U.K. (Foreign delivery is another matter.) If your newsagent has an order in with his wholesaler (or with us) by about a fortnight before the date of publication (the first Friday in the month), there should be no difficulty. If there is, get him to refer to his source of supply. In every case investigated in the last ten years, it has been shown either that no order has been put through, or that it has been late. or has not been repeated.

SIR JOHN HUNT AT THE ARMY APPRENTICES SCHOOL

When recently Sir John Hunt (of Everest) visited the Army Apprentices School, Harrogate — which trains boy-entrants as radio, telegraph, line and radio-relay technicians, as well as operators—he saw the apprentices' Club station G3HKR in action. As it happened, they were in a three-way QSO with G3OIX, also of Harrogate, and G3MUM (Redcar), the hook-up impressing Sir John very much. G3MUM's suggestion that his expedition might have left a two-metre rig "on the top of that hill" went down very well! *G3FGN*

For Mobile Rally Programme — see pp. 298-299

VHF BANDS

A. J. DEVON

Conditions Still Patchy—

The GB2IC Results—

Notes on the Contest—

Success on 23 Centimetres—

VHFCC Elections & The Tables—

THOUGH there has not as yet been anything like a big opening into Europe, GDX conditions have been quite good at times, the July contest went off well, and there is quite a lot of interest to report and discuss.

Looking first at the barograph trace for the period, the variations were mainly below the 30·0-in. (1016 mb) level, while generally the weather and the sky signs were only occasionally such as to suggest that good tropospheric conditions might be developing. However, the GM's were workable from the Midlands and the North during July 8, and EI4BC/M made a most welcome appearance for the rare counties of Wexford and Wicklow — and, incidentally, for the information of several who have asked, the counties of Eire *do* come within our U.K.-county scoring system; thus, to work an EI for the first time gives you both a county and a country. There are now several EI's on two metres who are really sticking to the band, and they can be sure that they are very much wanted by most VHF operators. For years now, Harry Wilson, EI2W (who holds no less than nine "firsts" for Eire, and has worked 12 countries altogether) has been the mainstay for EI on the VHF bands—so it is high time he had some consistent support, for he has shown what can be done, as far west as he is.

Taking matters in chronological order, let us look first at the GB2IC results, in many ways one of the most successful DX-peditions of recent years: Their log boils down to 97 contacts made with 51 different stations in 20 counties, under generally poor conditions; five stations were worked on schedule and, of another four skeds made, G3AOS, G3CCH and G3CO were probably heard, but were QSB in noise and not workable. In terms of GDX, the best contacts made by GB2IC were those with G2DQ, G3BA, G3KFD, G3KMT and G4LU. Several GW's were raised, also GC2FZC for the third country. Altogether, a very creditable effort, of great interest to all concerned—and if you want to know more about it, with a photograph of the chaps who did the work, *see* p.301.

Next, the VHF contest over July 7-8. Conditions were somewhat above average, but certainly not nearly as good as they can be at mid-summer; there was heavy cloud cover during most of the night, followed by a fine, warm day over much of the country, with the glass below the 30·0-in. level, and the beacon stations somewhat down in strength. As usual, there were many well-located /P's coming in strongly and being kept reasonably busy. By mid-morning, several portables had worked more than 100 stations, one of the fastest scorers being G3PIA/P, near Wantage, who booked in 124S by 1030 and 166S by 1735 GMT; as he had 74 stations worked by 2350 the previous evening, the rate of scoring can be deduced from these figures. G2CPM/P, who ended up with about 120S in the log, must have been on a particularly good site, given as "7 miles S/W of Newbury, Berks.," as he was a consistently strong signal from well outside local range. From near Holyhead, GW2HIY was operating /M and had worked 20S in this mode by the middle of the afternoon. G3FD/P, from their old hide-out up on Dunstable Downs,

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1961

Starting Figure, 14

From Home QTH Only

Worked	Station
67	G3BA
64	G2CIW, G5MA
56	G4LU
54	EI2A
52	G3BNL
50	G3JYP, G3NNG
48	G3PBV
47	G3BOC
45	G3CO, G3KPT
43	G3LTF, G3NUE
41	G5DW
40	G2AXI, G8VZ
38	G3OJY
37	G3JLA
34	G3PLS, G5DS
33	G2BHN
32	G3GWL
31	G3FUR, G3OJY*, GI3ONF, GW3MFY
28	G3OAA, G5UM
27	G3BYY, G3OSA
26	GW3ATM
24	G3GSO, G5QA
23	G2DHV/P
22	G3NPF
21	G3FIJ
20	G3HWR
19	G3JWQ
18	G8VN
17	G2BLA, G3ICO, G3OBD

This Annual Counties Worked Table will close on August 31st, 1962. Only amended scores from those already standing in the Table will now be accepted. As usual, final placings for the year will appear in the October issue. The new Annual Table for 1962-1963 opens w.e.f. September 1st, 1962.

raised just the 100 stations—and made some of their QSO's on CW. Indeed, several /P's had brought a key with them, and there was a certain amount of CW to be heard. In the Midlands area, the MARS boys did well with G3MAR/P, working 149 stations for the contest.

Further north, the North-West VHF Group made a special effort and went out in force to a site 4m. from Leek, Staffs. The party, signing G3OHF/P, consisted of G3AGS, G3AOS, G3EGK, G3KCB, G3MAX, G3NSW and G8SB. And they have turned in a remarkable result: 180S worked for more than 24,000 points, because their contacts included five PA's, three ON's, and various EI-GI-GM QSO's.

VHFCC Elections

The claims have crept up on us a bit, and following are the issues to date:

VHFCC Certificate No. 323 is awarded to OK1KPR, the Prague club station, their list showing contacts mainly with OK, though five countries have been worked, including OE and SP.

Certificate No. 324 goes to S. F. Brown, G4LU, of Oswestry, who was off VHF altogether for about eight years from 1951; he resumed in the 1959/60 winter season, so all his cards are of quite recent origin; the DX includes GI, GM, PA and DJ/DL.

To obtain VHFCC Certificate No. 325, W. Sleat, GI3FJA, of Carryduff, Co. Down, worked 160 stations to get 105 cards—from EI, GC, GD, GI, GM, GW, as well as a large number of G's. An interesting claim from Edward Musiol, SP3GZ, of Wolsztyn, earns him Certificate No. 326. Werner Diefenbach, DL3VD, of Kempten/Allgau, for Certificate No. 327, shows cards from five countries, including HB and OE.

Running only 15w. to an 832, with a 5-ele Yagi and a G2IQ converter into a CR-100, W. A. Martin, G3FVG, of London, S.E.22, gains VHFCC Certificate No. 328. Another QRP operator, who gets Certificate No. 329, is D C. Cave, G2FMJ, of Potters Bar, Middlesex; he runs but 10w., also to an 832, the beam being 4-ele Yagi and at no great height—10 feet! His Rx is described as "the only B9G job in captivity"—it consists of a cascode EC52/CV66 with a 6J6 mixer into a CR-100.

E. W. Elliott, G3BYY, of Wraysbury near Staines (whose station is actually in Bucks.) gained his first VHFCC Certificate, No. 100, 'way back in March, 1952, from a London QTH; his present issue is No. 330—and he hopes the next one will be for 70 centimetres only. The two-metre Tx now in use runs a 3E29 (829B) in the PA, at 70-110 watts, the aerial is a 6/6 J-Beam at 38 ft., and the Rx is a double-conversion job, with an A.2599/A.2521 cascode front end; for 70 cm the Tx has DET-24's as driver and PA, both being modulated (by 2/807's in Class-B zero bias) and the same modulator is used for the two-metre PA. The aerial for 430 mc is again a 6/6 J-Beam, at 40 ft., mounted above the two-metre array; the Rx uses the same double-IF strip as for two metres, and the 70 cm. converter is a G2DD-type *(see* SHORT WAVE MAGAZINE, March 1953) with an A.2599/A.2521 RF section—and all this gear is off the home bench at G3BYY.

VHFCC Certificate No. 331 is awarded to OK1NG, Prague, whose cards are all for contacts in the Central European area. No. 332 goes to our old friend, Bill James, DL2XM (G6XM), now with the EME Directorate, Hq. BAOR, at München-Gladbach; among his cards for QSO's in seven EU countries are several G's. Under his U.K. call, DL2XM has been on VHF for many years, and will be remembered as having operated, as G6XM, from Farnborough and Nottingham.

Interesting 23-Centimetre Result

G2DDD (Littlehampton) and G3FEX (Storrington) have established contact, QTH-to-QTH, on 23 cm. (1296 mc) over a path distance of about 8 miles; in itself a very interesting result, of even greater significance is the fact that the ground between Littlehampton and Storrington rises to 700 ft.—in other words, the path is far from being line-of-sight.

Signals at G3FEX were S2-3, the G2DDD transmitter being a CV90 tripler into a 16-in. dish at 35 ft. G3FEX has a similar sort of dish, with a crystal-controlled converter giving an IF of 31 mc. The tests were witnessed by G3FP, and took place on the evening of July 23. We congratulate G2DDD and G3FEX on their very encour-

FOUR METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 8

From Home QTH Only

Worked	Station
26	G3EHY
22	G5FK
17	G3JHM/A
13	G3BNL
12	G3OKJ, G5DS
11	G3OHH
8	G3PJK

This new Table will record Counties Worked on Four Metres, on an all-time basis. Claims can be made as for the other Tables, e.g. a list of counties with the stations worked for them, added to from time to time as more counties accrue. QSL cards or other confirmations are not required.

70 CENTIMETRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1961

Starting Figure 4

From Home QTH Only

Worked	Station
18	G3KEQ, G3KPT, G3NOX/T
17	G3LQR
16	G2CIW, G2FNW
14	G3KPT
12	G3HAZ, G3NNG
11	G3BYY, G3JHM/A
10	G3HWR
9	G3LHA
8	GW3ATM, G5UM
7	G5QA
5	G3FIJ

This Annual Counties Worked Table will close on August 31st, 1962. Final placings for the year will appear in the October issue, and the new 70 Cm. Annual Table opens w.e.f. September 1st, 1962.

aging results, the reward of much development work and testing, and look forward to hearing in due course that a two-way contact has been achieved.

Four Metres

This month we start a 4-Metre All-Time Table—which may not be quite complete nor up-to-date as regards possible claims—with the take-off fixed at 8 counties. This figure is based not so much on difficulty, as to take into consideration the present general level of activity on our four-metre band. It is proposed that for the new VHF season, opening w.e.f. September 1, there should also be a 4-metre Annual, like the others for two metres and 70 centimetres. We hope that all those active on the 4-metre band will claim accordingly.

The official four-metre allocation in EI is now 70·2-70·4 mc, as for the U.K., and EI2W will be found on 70·296 mc.

Some of the Gleanings

We gather that the Birmingham Univ. expedition to Scotland, mentioned last month, will sign GM3IUB/P and that their dates are September 9-22. An expedition that has been and gone was the visit to GC (Guernsey and possibly Sark) by G3HBR, G3MLS and G3PBR—but we got no advance information about this one, nor have we any present news of their results.

During July 29 - August 3, G3BA/G4LU were to be signing GW/M from the mysterious fastnesses of central and west Wales, a safari undertaken strictly in the interests of science (working GDX from rare counties)—we hope they have returned safely, and no doubt will have many strange stories to tell. We also hope the trip was a success, radio-wise!

And, over September 15-20, the rare county of Argyll will be represented by GM5UM/A, on 145·8 mc, mainly on CW, evenings 7.30-10.0 p.m. clock time.

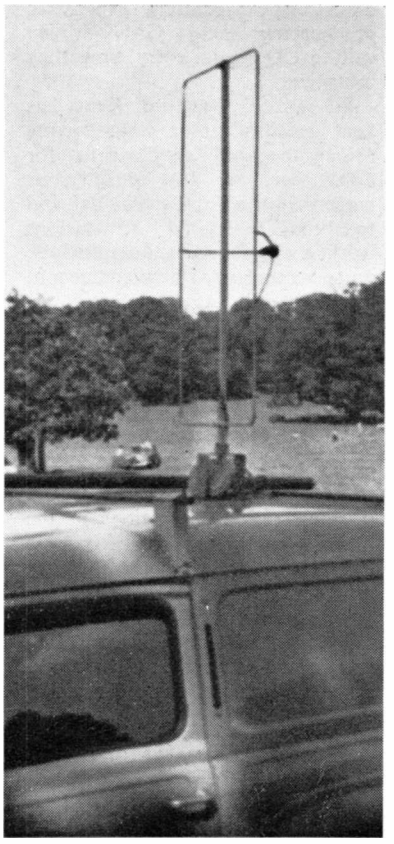
G3PBV (Wolverton, Bucks.) continues to make good progress, and hopes to get to 50C worked in his first year on two metres — recent QSO's have given him Suffolk and Cornwall, and EI2A gave Co. Meath. Though GB2IC was coming through every evening, at about S3, he could not be raised; other GDX heard at G3PBV but not worked included GM3HLH and GM3KYI/P on July 8, and GI3OFT on the 15th.

G5YV (Leeds) raised EI4BC/M for Wexford and gets to 83C in the All-Time—and he now shares the hot seat with EI2W who, on a careful re-check through all his logs covering no less than 10 years' working on two metres, found he'd got one more county than he thought he had, plus Wexford for a recent new one; Harry has covered all counties of England (41) and of Wales (12); 16 counties in Scotland; five in GI; six in EI; and Jersey, Guernsey and the Isle of Man — nice going!

G3OBB/G3OBD went /P on Okeford Hill, Dorset, for the contest and, with SWL help, made 116 contacts for 14,385 points. their best QSO's being with EI4BC/M, F9JY and ON4AB/P; they ran 22w. to a QQV03-20A, with a 12-ele stack at 33 ft., the converter working into a BC-455.

G3BNL (Keyworth, Notts.) reports "rather an inactive period due to holidays," but goes up three in the Annual. G2DHV was operating G3RCV/A for the Cray Valley group and made the Club's first two-metre QSO with G3MCS. G3BOC (Willaston) moves up in both tables. G3LDY (Wolverhampton) writes to say that, having been moderately active for 12 months, with 108S worked, he feels he can claim his place on the All-Time ladder at 27C; he runs 20w. to a modified SCR-522, the aerial is a 4/4 J-Beam at 30 ft., and the Rx a 6CW4-6AK5 converter into an Eddystone S.640 at 18 mc.

EI2A (Navan) joined up with EI2AG and EI2AK to run a portable station, signing EI2AG/P, during the July contest; located at Mt. Oriel, in Co. Louth, they had what he calls "moderate success, great fun and learned a lot"; their best DX was G3CCH. The EI2A/G3EHY schedule continues to give solid contacts with S9 signals. Incidentally, EI6X (Limerick) and EI6W (Galway) should be on regularly before long; EI6X is rebuilding, and EI6W is getting ready.



G3OBD came up to the Longleat Rally on June 17 from Poole, Dorset. He has a single-slot aerial for two metres, rotatable from within the vehicle, together with a short telescopic mast — seen stowed along the roof-line of the van — on which the slot can be mounted for /P work. G3OBD is not well located for VHF at the home QTH and so does much operating under /M and /P conditions.

G3HBW (Bushey, Herts.) is now at 73C in the All-Time, his new ones being EI2A, GI3ONF and GB2IC. During the contest Arnold was out with G3EFX/P, on Muswell Hill near Oxford, and from there they worked GM3HLH (Crail) for best DX, other interesting QSO's being EI2AG/P, EI4BC/M, ON4AB/P and GI3GXP. Three Scottish /P's heard were GM3KYI, GM4HR and GM6XW—though they were "called incessantly for hours on end, using all possible methods and reasonable frequencies" (as Arnold puts it) they just could not be raised; the G3EFX/P boys

had that exasperating experience of hearing these GM/P's just calling CQ again every time they went over.

G3CO (Nr. Dartford, Kent) has kept steadily at it and, having found the odd good spells for GDX, has been able to add four more counties for the Annual and to bring his total of stations worked up to 542—these include quite a number of new contacts in the Midlands, also some of the nearer F's, G3XC/P for Cornwall and G5ZT/M for Devon; and having been heard by GB2IC, on their schedule, G3CO reports that he also heard them; this was on June 23, when G3OJY was also heard, but neither could be raised. And G3CO remarks that G3OJY *is* often called by stations in the Home Counties, and there is some gnashing of teeth at the inability to attract his attention! The feeling is that if GB3CTC can be heard in the London area, then the Cornish boys should be workable—and it's not for the want of trying.

Annual Manœuvres

The situation at the top of Annual Counties is interesting, to say the least! Bob, G5MA (Great Bookham, Sy.) got EI4BC/M in Co. Wexford for his additional one and, though he was hearing the GM's over July 7/8, no QSO resulted. This is where G3BA (Sutton Coldfield) got the bulge on him, as Tom was able to work some new GM's and EI2AG/P and, with other new ones, to put his placing in the Annual up by no less than eight counties — it might have been nine, but one thought to have been for Co. Antrim has turned out to be not legit.! Most unusual on VHF.

G2CIW (Birmingham), now level-pegging with G5MA at 64C in the Annual, raised EI2AG/P, EI4BC/M and GM3KYI/P for his new ones. Bob seems to have missed out on EI2AG/P altogether, as he does not mention even hearing them. Jack, G2CIW, reports no EU's heard there during the contest, though some of the /P's were working them. A piece of GDX received at G2CIW was GC2FZC.

Anent GC2FZC and the comments in this space last time, G4LU (Oswestry) says that "all is now forgiven"—they had a nice phone QSO on July 8. It has been a good month for G4LU, as he also got GB2IC and several other GDX contacts, with G3EDD/G3PYE in Cambridge worked again during some further lunch-time sessions.

Louis, G3EHY (Banwell, Som.), firmly at the top of the 4-Metre All-Time, reports new stations regularly appearing on the 70 mc band; G3PLX (Liverpool) has been worked, and G3PJK from near Manchester is a consistent S9 signal with G3EHY—who has now had contacts with most of the 4-metre stations in the Lancs. area. As regards two metres, Louis has been getting very good signals from G3ILX (Durham) and on some occasions EI's and GI's were coming in like locals; though this sounds exaggerated, in fact G3EHY is very well sited and has a clear take-off in the northerly directions—so he can usually hear most of what is going on in those parts.

G3PJK (Middleton Junction, Nr. M'cr.) has started a 4-metre schedule with GI3HXV, and reports that, around Lancs., there is 70 mc activity almost every evening, with Sunday mornings also a favourite period for most stations; he confirms what G3EHY has reported about their solid schedule on 4 metres. As so many stations up North are taking the 70 mc band seriously, they would like to hear more from the South.

G3NUE (Worcester) could hear the GM's during July 7-8 and, though no such GDX was raised, he did have a very good contact with ON4AB/P—he has now worked six countries on two metres. G3PUR (Worthing) reports, triumphantly, that having duly passed his Morse test, he is now fully operational on two/four metres and has decided to remain on VHF; he is sharing, as G3PUR/A, that Washington site with G3JHM/A and, so far, has worked 42S in 13C on two metres —so will soon be into the Tables. G3PUR is also organised to work /P/M on four metres, and has already had a number of contacts; and he will be signing GW/P on *four* metres during August 5-10.

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, PAØFB
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, G3BYY, G3FIJ, G3FUR, G3JHN/A, G3JLA, G3LTN, G4LX, G5UM, G8GP, GC3EBK, GM3DIQ
8	EI2A, G2DDD, G2XC, G3AEP, G3AGS, G3BOC, G3EKX, G3GBO, G3HCU, G3HWJ, G3KHA, G3MPS, G3OHD, G3VM, G5BM, G5BY, G8SB, GW3MFY

G3JYP (Appleby, Westmorland) has been well in with the EI-GI-GM DX; he says GM2UU is putting out a very good signal, for Wigtownshire, and that GM6TF on 145·87 mc is giving Clackmannan—nice contacts, for those who can get them! G3JLA (Stevenage) goes up in the Tables, as does G5DW (Bridgwater, Som.), with seven new ones worked.

Deadline ——

There is space now only to remind you that the due date for our next is **Wednesday, August 22,** by which time we *may* have had an EU opening. Send it all to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Go carefully over the holiday — *73 de A.J.D.*

GOONHILLY, TELSTAR, ANDOVER (Maine), LANNION, GPO, BBC, BAIRD, EG2KZ and TV ACROSS THE ATLANTIC

A GATHERING OF SOME FACTS

THE spheroid *Telstar* has had so much publicity that he is now an established entity in our firmament — one of about 100 pieces of assorted ironmongery orbiting the earth in various stages of action, inaction, usefulness or approaching dissolution. In fact, space in our environment is beginning to get crowded—and there are a lot more of these devices yet to be launched.

That Telstar has been (and is being) an enormous success is also an undoubted fact. He has cost the A.T. & T. (American Telephone and Telegraph Co., the largest private commercial concern in the world) about £17 million, but they regard every penny of it as money well spent — for on the results so far obtained with Telstar, it is evident that A.T. & T. are on the way to acquiring a monopoly in world communication. From this, it will be deduced that Telstar is unique for another reason: He is the first privately-owned artificial earth satellite, having been entirely designed, constructed and launched by the A.T. & T. from its own resources; they even paid the U.S. Government the full cost of the launching facilities.

Telstar tracks on 4080 mc, receives on 1725 and 6390 mc, and re-transmits on 4170 mc, and is within line-of-sight range of the U.K. and the U.S.A. simultaneously for a maximum of about 30 minutes only on the most favourable orbit. This means that for 24-hour world-wide service, many more Telstars would have to be put up, on a carefully-controlled programme of spacing and replenishment.

The basic operating principle is simple enough: Telstar is called on one frequency (6390 mc) and re-transmits on another (4170 mc). The re-transmitted signal is of very low level, as transistorised equipment is used, powered by solar cells which are expected to give a working life of about two years. This has called for the development of very refined receiving techniques, in which the maser principle plays a large part.

On the American side, the control centre is at Andover, Maine; and for Europe there are two stations—one in France at Lannion, Brittany, and the other at Goonhilly Downs, near The Lizard. The distance between these two stations is only 120 miles, but they are quite unlike one another. The Lannion installation is entirely A.T. & T. equipped and the key operating personnel are American. Their station at Lannion gives A.T. & T. a base for a communications system to cover the Continent.

The U.K. Installation

The Goonhilly Radio Station near The Lizard in Cornwall is quite a different conception technically. It is primarily experimental and (with the exception of a 10 kW klystron of American manufacture used for the 1725 mc PA) Goonhilly is entirely Post Office designed, engineered and installed; it cost less than £1 million; and it was completed and on the air in a year.

Its main feature is the 85 ft. steerable dish (floodlit at night, incidentally) designed for frequencies up to 6000 mc, and involving dimensional tolerances during fabrication to within 3/16ths of an inch for correct functioning; the 3 dB beamwidth at 6000 mc is 0·15°. The weight of the movable structure is some 870 tons, and the dish is driven, in azimuth and elevation, by two 100-h.p. motors. These can give a speed of one degree per second in elevation and two degrees per second in azimuth, with a maximum acceleration of 1·33° per sec./per sec. (And, by the way, that "bicycle chain" about which we have heard so much actually has links 10 ins. long by 6 ins. wide, and is a high-grade power drive of the finest manufacture.)

Immediately behind the reflector there are two apparatus cabins: One of these accommodates the 4170 mc travelling-wave maser amplifier, the necessary low temperatures for this device being obtained from helium and nitrogen in liquid form. Since the maser is used to amplify incoming signals on both 4080 mc and 4170 mc, separation filters are provided. This amplifier has a gain at these frequencies of better than 25 dB and a bandwidth of more than 25 mc.

The other apparatus cabin contains the 1725 and 6390 mc transmitters, the latter running 5 kW in the PA and using a travelling-wave tube of British design and manufacture. All connections between moving elements are by flexible cable to avoid the use of slip-rings, which would introduce all sorts of design problems; this means that the connecting cables have to loop in a particular way as the dish moves in either plane.

Since two main frequencies (1725 and 6390 mc) are involved, two separate excitation feeds to the dish must be provided; both are designed for circular polarisation, and are by waveguide. They have been given a limited degree of individual movement

independently of the dish. That is to say, with the dish at rest, these exciting dipoles can be driven by small electric motors to give a scan within the main heading of the dish itself; this facility is used for search (it is displayed by the lower left-hand CRO trace on the operating console you saw in the BBC/TV pictures from Goonhilly).

Correct functioning of the system as a whole depends, of course, upon accurate tracking of the satellite, so that it is held "in the eye of the beam" while within line-of-sight range. Nor is there much time to search for the signal—the dish must be brought spot-on as rapidly as possible and then, from the 4080 mc Telstar beacon transmission, held on to the satellite. To achieve all this, a computer processes the orbital data and feeds the result to the aerial steering equipment, so that the dish can be headed correctly in azimuth and elevation; once the satellite signal is captured, the computer produces control data at one-second intervals. This information includes azimuth bearing; rate of change of azimuth; elevation angle; rate of change of elevation; and the slant range to the satellite. In addition to this automatic hold on the dish, over-riding manual control of its movement is also provided for if required.

The foregoing notes have only sketched in outline the main features of a very fine piece of radio engineering; the research and development organisations of the Post Office Engineering Department can take the fullest credit for their new (in every sense of the term) Goonhilly Radio Station.

Note on Results

Well, as we all know, the very first test on Telstar from Goonhilly on the evening of July 10/11 revealed some unfortunate finger-trouble down there (almost inevitable in new and untried equipment of such complexity), and the picture produced was a dismal failure compared with the quite magnificent capture achieved by the American station at Lannion, only 120 miles across the water from Goonhilly. When the BBC displayed the Lannion picture at 1.30 p.m. on July 11, the contrast was too startling to bear comparison, and the G.P.O. came in for some very severe criticism.

That this was unfair and unjustified was proved by the results subsequently shown by Goonhilly. Having overcome their snag (what exactly it was has not been revealed), the pictures and the recorded two-way speech transmissions over the Goonhilly link were shown to be as perfect as those obtained at Lannion—and the fact that the Franco-American station had scored a "first" became of secondary importance.

Telstar is now being used for a long series of communication tests, which include multi-channel working for speech and teleprinter circuits and facsimile-picture transmission, as well as the two-way TV. From the results already obtained (at the moment of writing) it is clear that solidlock communication has been achieved across the Atlantic *via* Telstar. However, the communication tests will have to go on for many months, perhaps several years, before a public service can be started—and it may, in the end, be cheaper and more reliable to do it by multi-channel undersea cable. It is to investigate problems of this sort that the Telstar project was conceived.

Amateur Trans-Atlantic TV in 1928

Though the name of Baird—who devised the first radio television system nearly 40 years ago—may appear irrelevant in the title of this article, it is not just for sentimental reasons that we should remember him now. For Baird did, in fact, transmit TV across to America by his mechanical-scanning system as long ago as 1928! (And the G.P.O. will take it in good part if we say that Baird's result in 1928 was quite as good as the initial results at Goonhilly in 1962.)

What is even more interesting (to us) about the Baird effort is that his Trans-Atlantic TV transmission was made *via* an amateur station! Those readers who may have watched Dimbleby holding the channel on BBC/TV on July 10, while waiting for that first G.P.O. result from Goonhilly, may recollect seeing a "still" of the Baird set-up for his test 34 years ago. That was unmistakably an amateur station, in the familiar pattern of those days (with transmitting valves the size of pineapples), and not Baird's own experimental transmitter 2TV in St. Martin's Lane, London—there were even QSL cards pinned up on the wall!

Some research has revealed that this "still" was of the Baird TV transmission being made from the amateur station EG2KZ (as the prefix would then have been), at that time owned and operated by B. Clapp, of Coulsdon, Surrey. A shaky picture went out on 45 metres, but nevertheless was recognisable as a face, in New York on February 9, 1928.

While the G2KZ call-sign is now held elsewhere, having long since been relinquished by its original owner, Mr. B. Clapp himself (*ex*-2KZ) is happily still with us—to see TV across the Atlantic by Telstar after the first experiment from his own station EG2KZ by Baird all those years ago.

A.J.F.

READER ENQUIRIES

While we do not undertake to provide a free technical enquiry service, readers who are in difficulty are always helped so far as may be possible. But where replies in this category are expected, we do look for an s.a.e., of at least postcard size. Most enquiries can be quickly and easily dealt with if the problem is clearly stated—and, be it noted, most are answered by reference to previous issues of the *Magazine*. What we can *not* do is to provide circuit diagrams of obsolete surplus equipment, or design studies for some specialised individual requirement. In any event, if you expect a reply, do include an s.a.e., or return postage.

NUVISTOR PRE-AMPLIFIER

FOR TEN AND FIFTEEN

WITH the availability of the 6CW4 (nuvistor) high-gain triode, various receiving circuits are being developed which are of great interest in the Amateur Radio sphere of activity.

That shown here is based on a design for American TV-band tuners, and comes from an R.C.A. publication on new circuit ideas. It is a cascode type of RF amplifier — similar to those discussed in recent issues of the ARRL *Handbook*—in which the valves are in series across the HT supply. If well constructed, high signal gain can be achieved, in the order of 30 dB at 21 mc to 26 dB at 30 mc—or, put in another way, an improvement in sensitivity of up to 8 times could be expected if the preamp. is used ahead of an old receiver, with the signal-to-noise ratio remaining about the same. To quote an example: If at 29 mc the Rx alone gave a 10 dB signal-noise ratio for a 20 μV input, then with this cascode amplifier ahead of the receiver, the same order of signal-noise ratio could be expected with only 2·5 μV input. The effect of this would be to bring in signals which could not previously be heard, with no great increase in noise; in addition, signals that were previously in the noise would be something like 4 S-points above it with this pre-amplifier in use.

On the other hand, it should be noted that little advantage is gained with receivers which, at the higher frequencies, already have a sensitivity of better than 3 μV and a good signal-to-noise ratio. The use of a high-gain RF amplifier of this type is, in general, only called for at the upper end of the normal HF tuning range, with receivers which are poor performers at these frequencies, say, 21 and 28 mc on the amateur bands. This is because at lower frequencies the sensitivity and front-end gain of most receivers is already adequate. But in almost any Rx covering a wide range of frequencies —medium-wave up to 33 mc, as many do—sensitivity begins to fall off above about 15 mc, and more front-end gain is needed without degrading the signal-noise ratio. This is where the 6CW4 type of RF pre-amplifier becomes so effective.

Broadbanding

With so much stage gain available in this twin-triode circuit arrangement—which is what the cascode amounts to—it also becomes possible to simplify matters still further by adjusting L1 and L2 for broadbanding, thus eliminating front-end tuning. (But, of course, some additional gain could be realised by tuning either or both these circuits.)

The recommended procedure for broadband adjustment of this amplifier is, on 15 metres, to tune L1 and L2 to 21·25 mc; for 10 metres, L1 should be peaked at 31 mc, and L2 at 29·5 mc. Under these conditions (which should be set up carefully with a calibrated GDO) gain will hold sensibly constant over both bands without any further adjustment being necessary. For the 15-metre operation, a steady signal at 21·25 mc into the aerial (which could be from a sig. generator, or simply a CO) would enable L1, L2 to be adjusted by watching the receiver S-meter. As shown in the circuit, both aerial input and receiver output are at low impedance, within the range 50-100 ohms.

Construction

Coil data and circuit values are given in the table, and putting the amplifier together will present no parti-

Table of Values

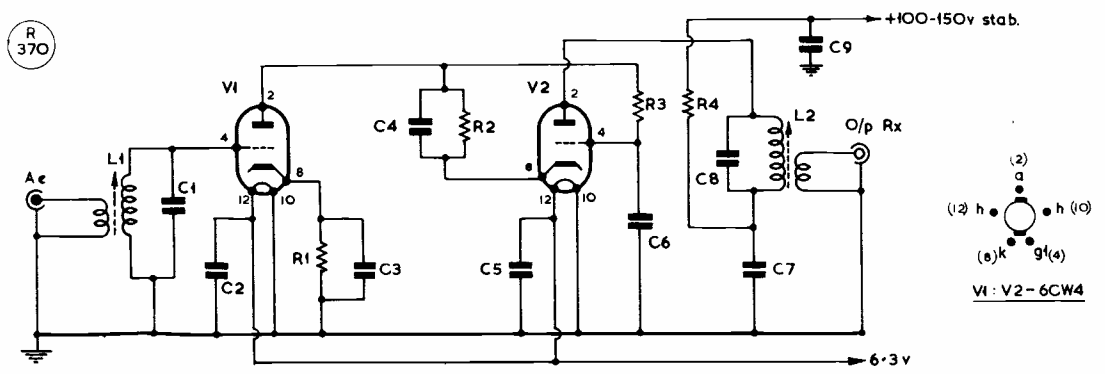
Circuit of the Nuvistor RF Pre-Amplifier

C1, C8	= *see data below*	R1, R2	= 100 ohms, ½w.
C2, C3,		R3	= 470,000 ohms, ½w.
C4, C5,		R4	= 1,000 ohms, ½w.
C6, C7,		V1, V2	= R.C.A. 6CW4,
C9	= .001 μF, ceramic		Mullard 7895.

TUNED CIRCUIT DATA

L1, L2:— (*both bands*) 18 turns 32g. enamelled on ¼-in. diameter slug-tuned former, link winding 1½ turns.

For 15 metres: C1, C8 should be 15 $\mu\mu$F.
For 10 metres: C1, C8 both 5 $\mu\mu$F.



Circuit of the Cascode Pre-Amplifier, using 6CW4's (nuvistors) in both stages; in this configuration, V1 and V2 are, in effect, in series across the HT supply, which therefore needs to be increased to about twice the 70v. or so at which the 6CW4 normally operates. While this circuit is equally applicable using less sophisticated triode types (such as two 6C4's) much of its advantage would be lost, in that nuvistor 6CW4's give high gain — something like 27 dB at 10 metres across V1, V2 — with very low noise, a figure of 4.5 dB having been measured in a well-constructed model of this amplifier. Such figures mean that, with an old receiver having poor HF sensitivity, signals would be found that could not previously be heard at all, while weak signals that were in the noise without the pre-amp. could be as much as 4 S-pts. above noise.

cular problem to the experienced constructor. There should be shielding between input and output sections —that is to say, no part of the tuned circuitry of V1 should be " visible to " L2 on the V2 side.

A convenient form of construction is an aluminium box about 4 x 2 x 1½ inches deep, with a central screen; the 6CW4's are mounted on the top, or lid, of the box, so that their base connections are made on either side of the screen. With the box totally enclosed (bottom on) this will automatically give the necessary circuit separation and screening between input and output. The aerial and receiver coax sockets can be mounted at the opposite ends of the box, and the power supply connection brought in through a grommeted hole in the side, in the V2 compartment.

Finally, it should be mentioned that while the American R.C.A. 6CW4 nuvistor is available over here, Mullard Ltd. are producing a valve with similar characteristics; designated the 7895, it would be suitable for all 6CW4 applications.

Miscellany

INCIDENTAL INFORMATION, AND ITEMS OF TOPICAL INTEREST

(Almost anything can appear under this title)

" When is something going to be done about this Fish-Fone business? Is the frequency of their rigs under their own control, because there seems to be no defined band at all — I have heard them between 1·6 and 2·5 mc. There is one who wags his carrier about while he is calling."

(Letter from G2PC, SHORT WAVE MAGAZINE, *April, 1939)*

— • • • —

" I have had quite good results from an underground aerial, consisting of a piece of insulated wire about a quarter-mile long and lying three inches or so below the surface of the ground. The ground itself is dry volcanic ash . . . "

(Letter from ZD8JP in " The DX-er " NCDXC)

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Glass-coated micro-conductors are now being made in Great Britain by a technique that permits production of copper wire as small as 3 microns in diameter. One of the features is extreme flexibility; another advantage is the very thin insulation, even against voltages of 5 kV. When coils are wound with this wire, the glass insulation may be fused into a solid mass, making them capable of standing extreme stress, more rigid mechanically than anything hitherto produced, and, of course, completely proof against humidity. *(New Scientist)*

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" If a few more of these chaps would only see the point of using a really big linear, we would get some cleaner signals on the band . . . "

(G station obliterating some 25 kc around 3·7 mc)

— • • • —

The Radio Society of Ceylon has recently published a call-book for the 4S7's which also incorporates a directory with brief details of the holders of the calls. Full QTH is, of course, given, followed by the name by which the operator is known on the air, with details of his profession or trade and also of his hobbies and enthusiasms. For instance, we read that 4S7NX is J. C. White (Jim), a radio engineer, who is " interested in electronics, astronomy, physics, poetry and P. G. Wodehouse "; and that 4S7BR is B. D. Rampala (Ramp), General Manager of the Ceylon Government Railway, and interested in SSB and Hi-Fi. An excellent idea here for local clubs to emulate, publishing the details in their monthly newsletters or in duplicated form.

— • • • —

" There is no quarrel with the basic ability to Phone-Patch. The objection is to the 99 per cent. abuse of the scheme, as demonstrated so often on the DX bands. What can be more futile, pointless and a pain in the neck to other amateurs than to find the band cluttered with drivel like ' Greetings to Joe on Armed Forces Day ' — passed over 14 mc for hours at a stretch with heavily overmodulated BC-610's running flat out into rhombics? "'

(Editorial, QTC—*East Africa)*

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" Nowadays everybody's got a splatter-bug with no weights on it, and the guy that's wagging it don't no more know what it's going to make than you do."

(W7IS, " Autocall ")

— • • • —

A combined 455 kc BFO and Q-Multiplier using the latest Nuvistor, the 6DS4, is a useful but simple piece of equipment described in *CQ* (June issue). When in operation as a Q-Multiplier, the usual condenser enables one to tune through the receiver pass-band, and selectivity is controlled by varying the gain of the 6DS4. When is use as a BFO, the unit is disconnected from the receiver mixer, and the variable condenser is used to control BFO pitch, for CW or SSB reception.

— • • • —

" What has become of the Ham spirit and good manners these days? A noticeable deterioration of comradeship and understanding, that is supposed to have been the backbone of Amateur Radio. The SSB fraternity appears to be more lacking in every-

day common courtesy than those with other modes of operation . . . old-timers on SSB are much more to blame than the 'just got on' type . . . most of the evils of SSB are due entirely to the individual operator and the qualities that distinguish one person from another. SSB is here to stay, so why not make it as pleasant as it used to be on A3, and it doesn't cost a cent to be a gentleman at any time. Try it; it could be contagious."

(W3HQO, in the Ex-G Radio Club "Bulletin")

— • • • —

Interesting items in the July issue of *CQ* include an article on Harmonic Crystal Oscillator Design, with a note on the performance of four popular valves used for the purpose; a very detailed analysis of the FL-8 audio filter, and what can be done with it (either as it stands or after taking it apart and using the components); and a description of a "Forty-Metre Vertical Beam" consisting of three 7 mc ground-planes which, through the appropriate switching, can be made to give a 5 dB gain in six different directions. There is also a description of "The Mighty Mouse," a 50-watt filter-type SSB exciter.

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Belgium, a country with a population of nine millions, has only about 550 licensed amateurs. Only those actively engaged in electronics are capable of passing the very stiff examination, and then they are limited to a power of 75 watts. Furthermore, their conversation is restricted to signal reports and technical topics.

(ON4HG, reported in "The Collector and Emitter," Oklahoma)

— • • • —

"I might be investing in the complete Collins S-line soon; but before that I've got to sell the house, the XYL, three kids, the dog, two budgies and a few other things . . ." *(G3--- on 3·7 mc SSB)*

— • • • —

A recent spot check on intruders (taken on June 29, 1600 GMT) revealed the following: Teleprinter stations were active on 14025, 14042, 14062, 14072, 14197 and 14316 kc; also on 21016, 21040, 21046, 21060 and 21095 kc—some of them *may* have been amateur. The areas 13900-14000 kc, and 20900-21000 kc were quite sparsely populated by comparison. Perhaps we should start a movement towards having our bands changed?

— • • • —

A record of some kind is claimed by two operators in Paulding, Ohio. K8YVN and K8RIQ were said to have been in constant contact for 100 hours and 33 minutes, beating the previous claimed record of 78 hours by nearly one day. *(No comment!)*

— • • • —

VS1's and 9M2's are very happy about the TV plans for Malaya. The first two channels to be used in Singapore will be 175·25 and 196·25 mc for vision, with sound 5·5 mc higher. Recommended IF's for TV receivers are 33·4 mc for sound, 38·9 mc for vision. It is stated that anyone importing receivers using IF's other than these must accept the responsibility for any complaints of IF break-through.

(MARTS News)

— • • • —

"VQ4DV says his Tx is powered by a gas-engine generator run off methane worked up from farm waste . . . imagine bleakly examining the contents of the dustbin to see whether there's enough for a couple of rubber-stamp QSO's!"

(Letter from G3NWT)

ARRANGEMENTS FOR R.A.E. COURSES

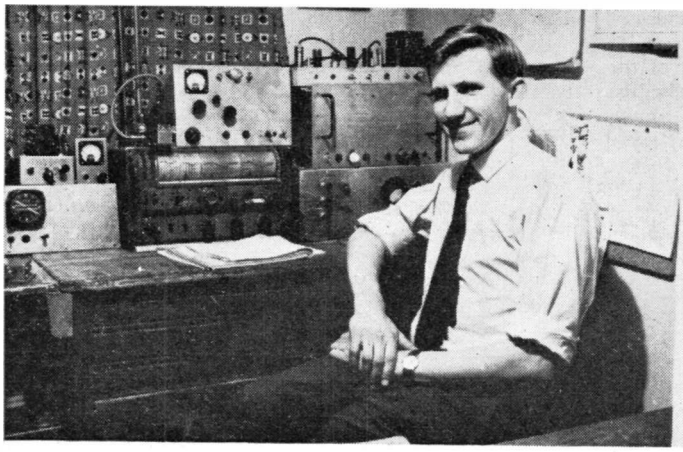
As in previous years, we shall start listing in the September issue of SHORT WAVE MAGAZINE, the local centres at which instruction is offered for those wishing to take the Radio Amateurs' Examination and the G.P.O. Morse Test for an amateur transmitting licence. So that the list can be as complete as possible, all organisers responsible are asked to let us have the necessary details (*see* p.382, September 1961 issue) by *August 15* latest. (Information already received is being held for the next issue.)

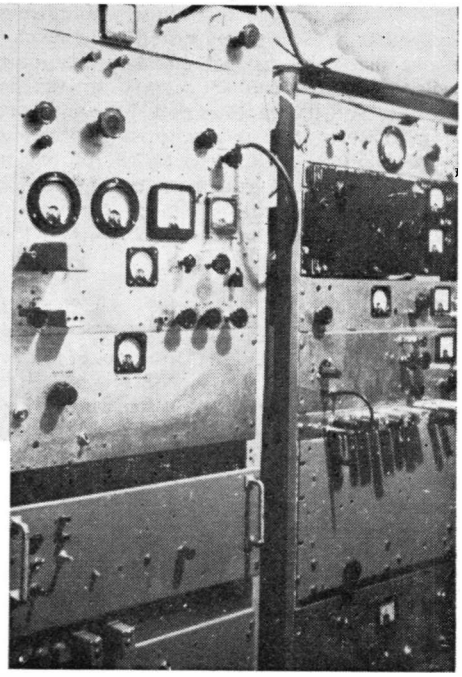
IF's ON THE ARB RECEIVER

With reference to the article in our June issue on the ARB receiver, it should be explained that this Rx is almost unique in that it has switched IF's. For ranges A and B, covering 195-1600 kc, the IF is 135 kc; and for ranges C and D, 1·6 - 9·05 mc, the IF is 915 kc. The BFO switches in sympathy. The RF coils and transformers are aligned on the upper and lower frequencies shown on the dial, except that on the A-band (195-560 kc), the aerial coil should be peaked at 250 kc.

SCOUT RADIO JAMBOREE

Those interested in the Scout movement will be glad to know that the Fifth International Jamboree-On-The-Air is organised for October 20-21, midnight to midnight, GMT. During this period, the objective will be for Scout stations all over the world to work one another and the Hq. station VE3WSB, Ottawa, Canada, operating on all bands 10-80 metres; frequencies to be used for contact with Scout stations *outside* Canada and the U.S.A. will be 14195, 14210 and 21195-21210 kc. As last year (when about 1,000 stations in 47 countries took part in the event) GB3BPH will be on the air from Baden-Powell House, Kensington, London, to give latest information and propagation forecasts for working VE3WSB. The U.K. Organiser for the event is: L. R. Mitchell, G3BHK, Katoomba, Tyneham Close, Sandford, Wareham, Dorset—he would not only be glad to give any further details required to Scout groups interested, but also to hear from U.K. Scout formations which have already arranged to be on the air, with callsign and location; this is to enable advance information to be circulated.





THE OTHER MAN'S STATION G3LTF

THIS is another VHF station of particular interest —that of G3LTF, owned and operated by P. K. Blair, 26 Chaplin Close, Galleywood, Essex. Licensed in June, 1957, since then he has worked solely on the VHF bands 4 metres-2 metres-70 centimetres, with considerable success. The present location, though not chosen specifically for its VHF properties, has turned out to be a good one, particularly in the Continental direction.

Racked up on the right we see, in the left-hand assembly, the two-metre gear, consisting of, from top to bottom: SWR monitor and aerial filter panel; 150w. PA taking a 4X150A in a trough-line configuration; the metering panel; a 2m. driver unit starting at 8 or 6 mc and delivering about 3w. for PA drive, with a crystal oven in the left-hand section of this panel; below this is the modulator, a conventional arrangement with 2/807's in Class-B zero bias. Next comes the auto-keyer, an interesting arrangement involving a photo-transistor working against a rotating transparent strip of paper on which the required calling data can be written; this keyer can be varied in speed up to 25 w.p.m. and is used to take the labour out of sending CQ, and for meteor-scatter schedule work. The lower panels in this assembly accommodate the control circuits and power supplies.

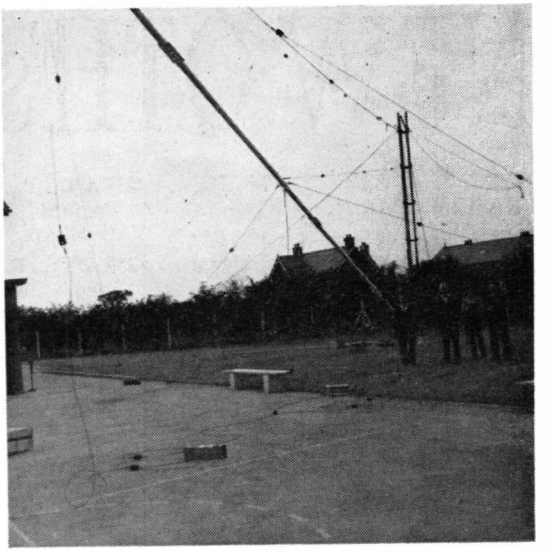
In the right-hand rack is the 70 cm. gear with, from top to bottom: SWR monitoring panel; 150w. PA using a 4X250B in a coaxial anode circuit with a strip line on the grid side; beneath, its driver stages, with a QQV03-20A tripling into a QQV06-40A as a 70 cm. buffer amplifier (this was the 430 mc PA before the 4X250B was installed); below this again is the low-level exciter, producing output on 144 mc, with a multiplier strip to give an exact 8 mc starting frequency from a 1 mc input signal, derived from a remote, transistorised 1 mc crystal oscillator in a thermally stable box; this elaboration on the drive side is to ensure an absolutely steady signal on 70 cm. for meteor-scatter work.

The photograph of the control position (and operator) shows, from left to right on the bench, the beam rotator and indicator and an audio filter unit which selects bandwidths of 20-100 c/s, with an S-meter. The main receiver is an R.1475 with "one or two modifications," and on it is the chassis with the two-metre and 70-centimetre converters. The 2m. unit consists of a 417A in cascode, with 4-6 mc tuned on the IF; for the other band the sequence is A.2521 RF stage into a crystal mixer and low-noise IF amplifier, with 12-16 mc tuned on the R.1475. The oscillator chains for each converter have their crystals in a common oven. Next to the R.1475 is a panoramic receiver, for watching what is happening on the 2m./70 cm. bands. A crystal calibrator, supplied from the 1 mc sub-standard oscillator already mentioned, gives 10 kc markers through two metres, and at every 100 kc on 70 cm. On a work-bench to the left is a parametric amplifier for 430 mc and a 1296 mc tripler using a DET-24.

As to antennae, G3LTF naturally has fairly extensive arrangements: For two metres, a pair of 10-element Yagis at a spacing of 9ft.; for 70 cm. a 72-element stack, arranged 3 x 24; and on 1296 mc he will use a 4ft. diameter dish, though this is not up yet. Just at the present time, he is not functional on the 4-metre band.

With the single exception of the R.1475 Rx, all this gear has been designed and built by G3LTF himself—and, as will be appreciated, a great deal of experience and know-how has gone into it. His results on VHF are, of course, outstanding, and may be summarised by the fact that 18 countries have been worked on two metres, including meteor-scatter QSO's (that most difficult of propagation modes) with OK and SM; his best DX on 145 mc is SM3AKW at 1,001 miles. On 70 centimetres, the station record stands at six countries worked, with SM6ANR the best DX at about 640 miles.

Naturally, the main interests at G3LTF are working DX on the VHF bands, using all modes, with a preference for CW—and building the gear with which to do it. A regular schedule is kept with G3ILX at about 250m., and other two-metre schedules would be welcomed with stations in the North or North-East at distances over 350 miles. G3LTF also has what he calls "a counterbalance interest"—he is a keen gardener, and he says the two mix quite well. And he pays a tribute to his wife for the immense help and encouragement she gives him in pursuing his radio activities—this, says G3LTF, must be because she was born during a Perseids meteor shower!

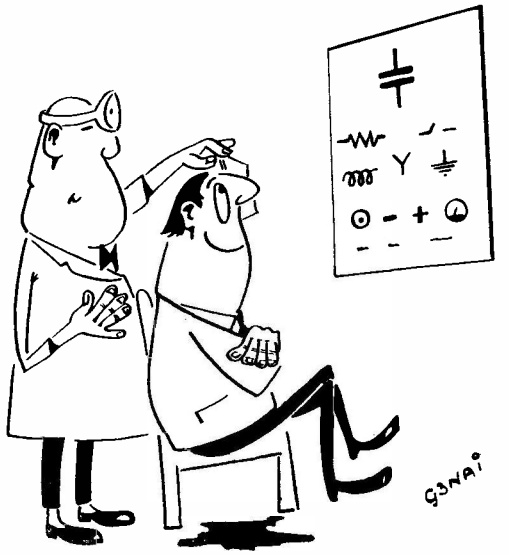


The Rawstorne School 86-ft. mast going up, with the staff responsible for the erection. Raising was by a 25ft. boom, and hauling by block-and-tackle, and took about five hours of agonisingly slow movement; the guys had to be adjusted by car headlamps, as the light had gone by the time the mast was in the vertical. Since its erection, the mast (which has become a local landmark in the Croston district of Lancashire) has withstood severe gales without a tremor. (See p.259, July and p.329 this issue).

FOR THOSE WHO CAN AFFORD IT

Out in the Dutch West Indies, PJ5CE (ex-KP4AEQ) has built what is described as "an ultra-modern, rambler-type luxury hotel" on one of the highest parts of the Island of Curaçao, with such additional attractions and conveniences as a magnificent panoramic view. a large swimming-pool, deep-sea fishing craft—and so forth. But what will be thought by many to be the most attractive feature of this delectable holiday haunt is a super-station for operation on all amateur bands, using the latest American equipment and rotary beam antennæ; three operating positions (in effect, three separate stations) are provided, and arranged so that they can be on the air simultaneously. And more than that: Under the easy-going local radio regulations, the Govt. of the Netherlands Antilles will issue a temporary 14-day PJ5 permit to any visiting amateur holding a valid transmitting licence. (This is believed to include all nationalities, but needs confirming as regards visitors from outside the U.S.). Furthermore, PJ5CE has a fishing vessel from which you can use your own call/MM when clear of territorial waters. As this hotel offers luxury living in the West Indies paradise, it is not cheap, even by American standards. The QTH is: Chester Brandon, PJ5CE, Coral Cliff Hotel, Curaçao, Netherlands Antilles. (And we could name three people who will probably be booking up right away!)

For Readers' Small Advertisements—see pp. 332-336



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.

DL2DJ, J. A. Birley, 517 MCTG, RASC, B.F.P.O. 34.

DL2ER, J. C. Clinch (*ex-VS2ER/G3MJK*), R. Signals, 1st Signal Regiment, B.F.P.O. 32.

GM3PLY/T, G. J. McNeil, 1 Craigmount Grove, Edinburgh, 12. (*Tel.: COR 1336.*)

G3POY, H. E. Smith, 7 Ascot Close, Borough Green, Sevenoaks, Kent.

G3POY/A, H. E. Smith, Wrotham Secondary School, Wrotham, Sevenoaks, Kent.

G3PQG, N. F. Cutter, 67 Martins Croft, Colerne, Chippenham, Wilts.

G3PRC, Plymouth Radio Club, c/o H. Jones, Burnbank, Goosewell Hill, Eggbuckland, Plymouth, Devon.

GW3PWA, R. R. Hughes, 127 Bute Street, Treorchy, Rhondda, Glam.

G3PXV, R. E. Wiseman (*ex-VS9AD Club*), c/o Sgts.' Mess, R.A.F. Station, Watton, Thetford, Norfolk.

GW3PXY, E. Thomas, National Provincial Bank House, Llanwrtyd Wells, Breconshire.

G3PYK, Amateur Radio Club, R.A.F. Station, Linton-on-Ouse, York.

G3PYN, J. A. Birley, 9 Bridge Road, Shaldon, Teignmouth, S. Devon.

G3PYR, R. Blackburn, 23 Widney Lane, Solihull, Warks. (*Tel.: SOLihull 4466.*)

G3PYW, Rev. A. Speight, 81 Royal Avenue, Lowestoft, Suffolk. (*Tel.: Lowestoft 4969.*)

G3PZK, S. G. Collyer, 200 Bridgewater Road, Alperton, Wembley, Middlesex.

G3PZN, C. H. Wood, 19 Buckland Avenue, Basingstoke, Hants.

GM3PZR, J. Gray, 5 Rosselm Cottages, Rossie, Auchtermuchty, Fife.

G3RAD, R. T. Trull, 1 Approach Road, Broadstairs, Kent.

G3RAJ, E. W. B. Keevill, 59 Elton Road, Bishopston, Bristol, 7.

G3RAN, P. E. Lavender, 136 Twyford Road, West Harrow, Middlesex. (*Tel.: BYRon 8644.*)

G3RAP/T, R. A. Perkins, 95 Hare Lane, Claygate, Esher, Surrey.

G3RAQ, H. J. Powell, Capella, Denstone Avenue, Ellesmere Park, Eccles, Manchester.

G3RAR, E. D. Hodgson, 12 Cornmoor Road, Whickham, Newcastle-on-Tyne.

G3RAU, D. S. Moffatt, 81 Bromley Heath Road, Downend, Fishponds, Bristol. (*Tel.: Bristol 651672.*)

G3RAV, W. R. Walters, 23 Shackleton Road, Tilgate, Crawley, Sussex.

G3RAX/T, L. D. Woolf, 25a Parkside Gardens, Wimbledon, London, S.W.19.

G3RAZ, P. B. Gaunt, 2 St. James Walk, Horsforth, Leeds, Yorkshire.

G3RBG, A. Gray, 13 Balmoral Avenue, Whitefield, Lancs.

G3RBU, Amateur Radio Society, Students' Union, Bradford Institute of Technology, Bradford, 7.

CHANGE OF ADDRESS

GC2CNC, E. Banks, 23 Marett Court, Marett Road, St. Helier, Jersey.

G3ABV, S. W. Taylor, 4 Tyning Cottages, Holcombe, Bath, Somerset.

G3DVV, J. O. Brown, Tudor Cottage, Hurst Drive, Walton-on-the-Hill, Surrey. (*Tel.: Tadworth 2164.*)

G3FTG, D. Calcott, 4 Highfield Road, Stratford-on-Avon, Warks.

G3GDJ, R. B. Wilson, 43 Dorset Street, Derby.

G3GJH, V. J. Tomlin, 53 Ivy Close, South Harrow, Harrow, Middlesex.

G3HHT, J. A. Bassford, 82 Cheshire Crescent, R.A.F. Station, Tangmere, Chichester, Sussex.

G3HSR, J. B. Smith (*ex-DL2TH/VS1BQ*), 11 The Crescent, Milton, Weston-super-Mare, Somerset. (*Tel.: Weston-super-Mare 5302.*)

G3IZJ, M. J. Faulkner (*ex-VP8AZ*), 21 Upper Gordon Road, Camberley, Surrey.

G3JBA, G. H. Maddox, 1 Montpelier Road, Sutton, Surrey.

G3JUY, A. Mallinder, 11 Columbia Avenue, Big Barn Lane, Mansfield, Notts.

G3KLG, A. H. Gay, 1 Newchurch Lane, Ulverston, Lancs.

G3KPM, V. E. Oliva, 23 Lakeside Road, Palmers Green, London, N.13.

G3KUN, J. B. M. Hain, 5 Colburn Avenue, Hatch End, Middlesex.

G3LDG, B. E. Gee, 68 Falcon Avenue, Bedford, Beds.

G3LYK/A, W. McLardy, c/o Officers' Mess, R.A.F. Station, Scampton, Lincoln.

G3LYW, J. F. R. Weston, Chenery Lodge, Old Newbridge Hill, Bath, Somerset.

G3NGI, G. W. Davey, 42 Valiant Square, Upwood, Hunts.

G3NMC, C. J. Randle, 2 Highlands Road, Bridgnorth, Shropshire.

G3NOW, R. W. Tomkys, 132 Victoria Road, Bradmore, Wolverhampton, Staffs.

G3OGH, A. Brooker-Carey, 88 Gibson Road, Paignton, Devon.

G3OKD, Z. J. Nilski, 2 Newstead Grove, Nottingham.

G3OLX, J. C. G. Parker (*ex-GW3OLX*), Bienvenu, Chesworth Lane, Horsham, Sussex.

G3OLX/A, J. C. G. Parker, 56 Tilehurst Road, Cheam, Surrey.

GM3PFU, W. Laughlin, 328 Liddesdale Road, Milton, Glasgow, N.2.

G3PMT, J. S. Russell, 141 Sqdn., R.A.F. Station, Scampton, Lincoln.

G3SN, R. P. Ellis, 12 Hillside Road, Saltash, Cornwall.

G5HK, H. S. Beckett, 136 Ringinglow Road, Ecclesall, Sheffield.

THE MONTH WITH THE CLUBS

By "*Club Secretary*"

(Deadline for September Issue : August 17)

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

LAST month we referred to the work of certain Clubs in the matter of showing the flag to the public at fêtes, galas and exhibitions. This time we are glad to make reference to another kind of enterprise, as so admirably shown by the Radio Society of the Bishop Rawstorne C.E. Secondary School at Croston, near Preston. In the July issue (p.259) we showed a photograph of their 86-ft. mast and the gathering of " local labour " by which it was erected. G3HDL/A now has at least the possibility of an aerial system which will be the envy of clubs all over the country.

Their immediate aim is for members to build a complete LF-bands station from scratch. The receiver project, for instance, starts with exercises in bending aluminium. The principle is that everything must be first-class and home-built ; surplus components are not despised, but the modification of surplus equipment is not thought good enough. Everything in the station will be discussed and designed from first principles—an ideal target for any school radio society.

Associate members of the club can only become corporate members after passing a test (Morse at 6 w.p.m., basic radio theory, and procedure). At present there are five corporates, 21 associates. In the future, holders of transmitting licences will be eligible for election in the highest grade of Fellow.

The school is an active participant in the Duke of Edinburgh's Award Scheme, for which Amateur Radio is a recognised pursuit. And the club obviously owes much to its Chairman, who is Sydney Kelly, G3HDL, Head of the Maths. Department. We congratulate them all and wish them every success.

ACTIVITY REPORTS

A good many clubs are closed for the month of August. However, in all cases where we have the details, we will give the date for re-opening and the resumption of normal activities.

Bradford, for instance, have Informal Meetings on August 21 and September 4, with the first meeting of the new session on September 18. **Dorking,** pursuing their policy of meeting in the outlying districts during the summer, will assemble on August 14 at The Barley Mow, East Horsley, and on the 28th at The King's Head, Holmbury St. Mary—8.30 p.m. on both nights, with XYL's and YL's welcome.

Morecambe have slowed things down for the holiday season by running only a Ragchew for the August meeting (already gone—August 1) and a Junk Sale on September 5. Lectures will be resumed from October 3 onwards. **Southgate** do not meet at all in August, but start up again on September 13 with a talk on SSB by G2BVN.

Cheltenham will be re-assembling for their AGM on September 12, at 8 p.m. in the clubroom at St. Marks Community Centre. It is hoped that members wishing to bring up points under " other business " will notify the secretary beforehand !

Hounslow are closing for decoration between July 30 and September 3 ; at their last meeting, a Film Show, they saw two Mullard films and also a home-made movie by G4KD on " How to Organise a Radio Show."

Peterborough heard about G3FUR's 40-valve communications receiver at their July meeting ; this has three entirely separate IF chains, and separate crystal converters for each band. Next event is a D/F contest on September 2.

York, likewise, have no club functions arranged for August, but the clubrooms will be open on Tuesday evenings for RAE and Morse instruction, and on Thursday evenings for informal ragchews.

Loughborough is a newly-formed club, with premises at the rear of the Corporation Hotel, Wharncliffe Road ; they hold the call-sign G3RAL. A recent event was a Field Day held in conjunction with the local Flower Show, and they had G3FIG/A, G3PXP/A and G3RAL/A on the air simultaneously, while G3IPL/M gave the public a demonstration of mobile working. Three dipoles, for 160, 80 and 20 metres, were all hoisted 50 feet up, and many good contacts were made.

Reigate gather on August 18 to hear their chairman, G3FM, talking on A Lattice Filter for the

CLUB PUBLICATIONS RECEIVED

We acknowledge, with thanks, the receipt of the following Club Publications: **Surrey** (*SRCC Monthly News*, June and July); **Reigate** (*Feedback*, June); **RAIBC** (*Radial*, July); **South Birmingham** (*QSP*, June); **Southgate** (*Newsletter*, July); **South Hants** (*QUA*, July); **Purley** (*Splatter*, July); **Crystal Palace** (*Newsletter*, No. 80); **Newbury** (*NADARS Newsletter*, June); **Wirral** (*G3NWR Newsletter*, Vol. 15, No. 6); **MARS** (*Newsletter*, July); and **ARMS** (*Mobile News*, June/July).

CR-100. Latest member to acquire a licence is L. D. Woolf, now G3RAX/T.

Surrey (Croydon) will meet at the Blacksmith's Arms. South End, Croydon, on August 14 to hear Nell Corry, G2YL, talking about her recent trip to CT1, CT3, VP4, VP6 and a thousand miles up the Amazon. G2YL will also be showing pictures from her previous travels, to Australia and New Zealand. For this meeting, XYL's and friends are invited.

Clifton met recently for a talk by G3BCM on Interference and the Radio Amateur, and they also held a "nocturnal D/F contest" in which five teams took part (G3OYU was the winner). Further D/F events are booked for August 19 and September 2.

Derby will get together every Wednesday in August, with a Stereo demonstration on the 22nd. On Sunday the 19th they are, of course, involved in their big Mobile Rally at Rykneld School — *see* "The Mobile Scene," elsewhere in this issue.

Halifax will be hearing about Amateur TV (from G3EKE) on August 7; the 21st is to be filled by a Ragchew; and on September 4, G2VO will talk on Amateur Radio through the Years. **Midland** will gather on August 21 at 7.30 to hear from G3LNN about the G2DAF Receiver for SSB.

Northern Heights are once more running a demonstration station, this time on August 4 at the Warley Club and Institute Charity Gala (Warley, near Halifax). On the 15th they meet at their Hq. for a ragchew, and on the 29th they will be discussing their RAE course to be held for the 1962/63 season. Those taking the course are advised to attend.

Purley meet on August 3 to hear G3OLV talk about his exploits as a VS9K . . . (Kamaran Is. expedition). On the 17th they will see G3DPW's field day film, and also some slides of Majorca by G3FTQ.

South Birmingham have a talk on August 16, by G3GVA, on the field day tracking unit, of which full technical details will be given. On September 20, Dr. C. S. Bull, of Birmingham University (also a well-known lecturer for the British Association) will discourse on "How Far can Radio Waves Travel?"

Acton, Brentford & Chiswick will be hearing from G3OJX about the new GPO Subscriber Trunk Dialling system on August 21 — this talk has been held over from the July meeting. AEU Club, 66 High Road, Chiswick, 7.30 p.m.

Caithness had a talk on SSB, by GM3DXJ, at their July meeting, and it is hoped to see increased activity in this mode up in their area. The talk was followed by the showing, by GM3NQB, of his own colour film of the club's recent Field Day. **Harrow** are holding a Junk Sale on August 3, and on the 17th Brian Hummerstone will describe his recent experiences in Guernsey; on August 31, there will be a free evening. The alternate Fridays will be Practical Evenings, with the club Tx on the air (contacts with other clubs welcomed).

Greenford have a Night on the Air on August 3, a talk on Receiver Alignment by G3MMQ on the 17th, and the AGM on the 31st. Talks are booked for the autumn on Construction Technique (G3NHR) and Civil Defence Equipment (G3OZY). **Malvern College** held a first Amateur Radio Exhibition during the Commemoration week-end in June, and showed their exhibits to 150 people. Among the candidates for the November RAE are several /T enthusiasts. and it is hoped that by June next year a QRO amateur TV station will have been completed. The clubroom, fortunately, is 620 ft. a.s.l. and, with a proposed relay link, the signals will take off at 1200 ft. a.s.l. The secretary would welcome correspondence with other /T enthusiasts on this subject. Also "on the list" are various CW/AM/SSB transmitters. (The present Malvern Radio Society membership might be interested to know that, in the late 1920's, the College held the amateur call 2MV, and was regularly on the air on 180 metres!)

Names and Addresses of Club Secretaries reporting in this issue:

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, W.3.
BRADFORD: M. Powell, G3NNO, 28 Gledhow Avenue, Roundhay, Leeds 8.
CAITHNESS: G. F. Riddell, 7 Brownhill Road, Thurso.
CANNOCK CHASE: N. H. Hyde, G3PJM, 91 Pelsall Lane, Rushall, Walsall.
CHELTENHAM: J. H. Moxey, G3MOE, 11 Westbury Road, Leckhampton, Cheltenham.
CHESTERFIELD: K. S. Hudson, 20 Tennyson Avenue, Chesterfield.
CLIFTON: E. Godsmark, G3IWL, 211 Manwood Road, London, S.E.4.
CORNISH: W. C. Pitman, G3PEP, Pendower Farm, Perranwell Station, nr. Truro.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DORKING: J. Greenwell, G3AEZ, Wigmore Lodge, Beare Green, Dorking.
EXETER: S. Line, 46 Roseland Crescent, Heavitree, Exeter.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
GREENFORD: E. Gray, G3CPS, 111 Ravenor Park Road, Greenford.
GUILDFORD: D. E. Hobden, 121 Great Goodwin Drive, Bushy Hill, Merrow, Guildford.
HALIFAX: G. Sunter, 24 Booth Fold, Luddenden Foot, Halifax.
HARROW: A. C. Butcher, 95 Norval Road, North Wembley, Middx.
HOUNSLOW: J. Grogan, G3PJG/T, 12 Downs View, Isleworth.
LOUGHBOROUGH: M. Y. Hawkins, G3FIG, 22 Sileby Road, Barrow-on-Soar, Loughborough.
MALVERN COLLEGE: J. S. J. Craig, c/o No. 1, The College, Malvern.
MIDLAND: C. J. Haycock, G3JDJ, 29a Wellington Road, Birmingham 20.
MORECAMBE: K. J. Singleton, G3NLM, 8 Westmoor Grove, Heysham.
NEWBURY: G. T. Allen, 83 Huntsmoor Road, Tadley, Basingstoke.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
RAIBC: W. E. Harris, G3DPH, 4 Glanville Place, Kesgrave, Ipswich.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
SOUTH BIRMINGHAM: T. W. Legg, Flat 3, 80 Alcester Road, Birmingham 13.
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.
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral.
YORK: N. Spivey, G3GWI, 80 Melton Avenue, Clifton, York.

Cannock Chase have delayed their next gathering until August 9, to enable them to meet an honorary member, W2HWA, and the programme will include a talk by this guest-of-honour. Normal meetings are on the first Thursday at the White Lion, Bridgtown. **Crawley** recently held a mobile evening near Guildford, in conjunction with other clubs. Their next meeting is on August 22, at the West Green Community Centre, and will be a lecture-demonstration by G8RW on VHF Operation.

Grafton organised another very successful field day on July 8, with the club station operating from Hampstead Heath on three bands, assisted by two mobiles on Top Band and one on two metres. They are now closed for the summer recess, re-opening on September 7.

Chesterfield will be meeting in future on the fourth Wednesday as well as the second, the new meeting being informal and including RAE assistance. The meeting earlier in the month will be devoted to lectures, but September 12 is the date for the AGM. (Chesterfield report, incidentally, that a number of new members presented themselves as a result of last month's mention in these columns—their first.)

Crystal Palace will be hearing from G3IWA and G3IIR, on August 18, about Power Station Design and Communications; at their July meeting several different communication receivers were "pulled apart" by G6HD, G3OJE and G3FZL.

Newbury announce a talk on SSB entitled "Ancient and Modern," by G3JMT, on August 31, at The Canteen, Elliotts of Newbury, West Street. Visitors and prospective members welcome. **Wirral** close for August, but have a talk on SSB, by G2FOS, on September 6. On the 19th they will be holding a Junk Sale . . . meanwhile decorations and repairs are going on.

Down at **Cornish** they have a new hon. secretary (*see* panel); at a recent meeting, at Falmouth, 32 members were present, with G3LTF as a visitor, to hear a very interesting talk on the Goonhilly Radio Station, by their hon. treasurer. The next get-together will be in September.

Exeter gather on the first Tuesday of each month at the Y.M.C.A., St. David's Hill, starting at 7.30 p.m.; on August 7, the programme will include a junk sale and a talk on Transistors by G3PZD. Forthcoming meetings of the **Guildford** group are on August 24, and September 13, at the City Café, Onslow Street. The club is mourning the sad death of G3HSY, one of its keenest members.

GERMAN THE EASY WAY!

G3ESP (Doncaster) spotted the following small advertisement in a recent issue of *Das DL-QTC*, the journal of the D.A.R.C., the German national amateur organisation:

"Verkaufe: home made SSB/AM/CW Sender filter type (6146) mit grounded-grid linear Endst (2 × 811A). Richtpreis DM.1200 . . . "

This makes it self-explanatory in almost any language!

SPECIAL-ACTIVITY STATIONS

The latest listing under this heading is as follows —any further appearances for September should be notified to us not later than *August 17:*

GB3ENT, Erith, Bank Holiday August 6: The North-West Kent Radio Society will have their station at the Annual Show & Sports, Erith, Kent, operating AM phone on all bands 10-160m. A special QSL card will be exchanged for all contacts, and visitors to the GB3ENT stand at the Recreation Ground will be very welcome. QSL address: B. Reynolds, G3ONR, 49 Station Road, Crayford, Kent.

GB3KEC, Folkestone, till August 9: In association with the Kent Education Committee summer school for secondary teachers, on the subject of "Introducing Electronics." A VFO-controlled Heathkit DX-40U will be operated on all bands, and QSO's with teachers and other school organisations are especially sought. The station is being run by G3FCT and G3LCK, who is also the Course Tutor. Address: D. J. Bradford, G3LCK, 43 Mount Road, Canterbury, Kent.

GB3SRC, Chingford, Essex, August 3-6: The Silverthorn Radio Club station, under canvas between Chingford and High Beech (Essex), manned by five operators, using mainly Top Band and two metres. QSL by special card—address: B. A. Lea, G3ICY, 9 Balgonie Road, Chingford, London, E.4.

GB3SFS, South Shields, August 10-12: In connection with the South Shields Corporation Annual Flower Show, the local Club group will as usual provide and man a station, operating on all bands, using AM phone. A newly-designed card is being issued, and will be sent to all stations worked. Visitors to the Club stand will be very welcome. QSL address: D. Forster, G3KZZ, hon. secretary, S.S. & D.A.R.C., 41 Marlborough Street, South Shields, Co. Durham.

GB3SRA, Wood Green, N.22, Sept. 7-8: The Southgate & District Group will operate an exhibition station at the Wood Green Horticultural Society Annual Show, Town Hall Park, N.22. All bands 10-160m. will be worked, and a special QSL card is being issued.

GB3LY, Lymington, Sept. 14-16: The Lymington & District Amateur Radio Society will be at the Hordle Church Fête, Everton Road, Hordle, Lymington, Hants., with their station, running AM/CW/SSB on 7-14-21 mc, using a Heathkit DX-100U and SB10 transmitter, into a Mosley TA33-Jr. beam. Contacts will be confirmed by an appropriate card, and the QSL address is: A. H. Trigell, G3JAF, 130 Everton Road, Hordle, Lymington, Hants.

THE "MISCELLANY" FEATURE

Readers are invited to send in comment, criticism, suggestions or ideas for inclusion under this new heading. We don't mind how hot it is, provided you really mean what you say and are not afraid of being quoted.

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

SITUATIONS VACANT

RADIO.—Radio Mechanics (civilian) required at London Fire Brigade Headquarters, Lambeth. Good knowledge of theory of radio communication and ability to drive essential. Practical experience of installation, maintenance and repair of VHF radio communication installations essential. Experience in use of transistors an advantage. 295s. 9d., 5-day, 42-hour week. Electrical contracting industry conditions. Prospects: Permanency with superannuation. Canteen.—Write Chief Officer (SM/1714), London Fire Brigade, Albert Embankment, S.E.1. by 20th August, stating age and experience.

TRADE

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, G.P.O. 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.

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

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

VQ9A and four JA's were worked recently by G3NFV on 15m. with an INDOOR " JOYSTICK " Antenna 7 ft. 6 ins. long. (G3FNV operates from a bungalow!) GB3WRC exchanged 5 and 8/9 reports with GM2CPC on 40m. phone, using a " JOYSTICK " Antenna AT GROUND LEVEL! On 80m., G3CED gets as good as he gives, using an INDOOR " JOYSTICK " and a DX-40U. Detailed performance figures on request. The " JOYSTICK " is robust, weather-proofed and beautifully finished. De Luxe version, £4 10s.; Standard version, £3 10s.; carriage paid U.K.—Partridge Electronics, 17 Ethel Road, Broadstairs, Kent. *(Tel. Thanet 62839.)*

OLYMPIC COUPLERS: 75w. Z-Match Coupler, £6 10s.; 150w. model, £7 10s.; 250w. model, £8 10s.; postage 4s. 6d. extra. Olympic Xtal Mikes: First-class Xtal mikes, equal to D.104, only £2 each, post 2s. 6d. extra. Olympic Masts: Alloy masts and mast kits, 3d. stamp for list. Olympic Diplexers: Why pay fancy prices? Send 5s. 6d. for post-free sample of Britain's best TV Diplexer: Olympic Works, Winton, Bournemouth.

SMALL ADVERTISEMENTS, TRADE—*continued*

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.

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.

SALE: Box of 100 used radio and TV valves, £3. Buyer collects. — Morgan, 9 Selbourne Road, Leek, Staffs.

FOR SALE: Marconi CR-100/7 Receiver, good condition, £13 10s.—or exchange Mobile Gear, ZC1 Mk. II, etc.—McGuire, 117 Wellington Place, R.A.F. Hullavington, Nr. Chippenham, Wiltshire.

SALE: HRO-MX, 10 coils, manual, two power packs, Multi-Q, mint, £22 the lot; buyer collects. —Stephenson, 17 Park View, Morden, Surrey.

WANTED: BC-221 or similar; 144 mc Tx, 50/25 watts; R.208 or R.308; bug key; must be in mint condition. SALE: HRO G/C coils 3·5-7·3 mc and 7-14 mc; HRO DC PSU; RF units 24 and 26; transformers 0-500-1000-1500v., 1760-0-1760v., and step-down 240 to 110v.; pair of Variacs, 110 volt 1 amp.; 24 μF 1500-volt oil condenser. All letters answered.—Box No. 2661, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HAMMARLUND HQ-180, 200-250 volts AC, complete with Verdik pre-amplifier and 10-watt push-pull amplifier, as new, little used, £180 or near offer? (To be collected from London.)—Box No. 2662, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: R.1481, R.1132, original condition; also Receiver Type P.58; HRO bandspread coil sets.—Norwood, 53 Adelaide Road, High Wycombe, Bucks.

SALE: R.1155B, excellent working order, complete with speaker/power unit, D/F immobilised but appears intact, D/F valves replaced; full official literature, circuits, etc., for communications, D/F. Bargain for D/F enthusiast, as construction of loop aerial is described, £18.—Whitehead, 91 Blackpool Road, Ansdell, Lytham, Lancs.

EDDYSTONE 358X, 30 mc to 40 kc, complete with coils and PSU, £15 o.n.o.? Will deliver up to 20 miles.—F. Kent, G3PIH, 62 Longberrys, Cricklewood Lane, London, N.W.2.

WANTED (Buy or Borrow): *Short Wave Magazine* May, 1955. Handbook, circuit or any information on the Bendix RA1B.—Clear, 140a Oxford Road, Calne, Wilts.

FOR SALE: Geloso VFO 4/102 with valves and dial, £6, or reasonable offer.—Heath, 7 Poynters Road, Dunstable, Beds.

WANTED: Command Receiver, Top Band model (1·5-3 mc); state price, condition and modifications.—Ballance, 8 Oak Avenue, Walton Heights, Stafford.

ELIZABETHAN 150-WATT Tx, 80-10 metres. 2 x 807's final, plus power pack and modulator mod. 2 x 807's in AB2. All circuits fully switched and relays fitted for one-switch control AM or NBFM; complete unit in 4 ft. x 19 in. racks in G4BI case, fully enclosed; delivered within 100 miles Stafford; £55 o.n.o.?—Box No. 2664, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Transistorised key, maximum speed over 40 w.p.m., preferably with built-in monitor. Also interested in mechanical semi- or fully-automatic keys.—Reply: P. S. Stewart, Radio Officer, s.s. *British Talent*, c/o B.P. Tanker Co., Ltd., Britannic House, Finsbury Circus, London, E.C.2.

SALE: Transformers, UM3 modulator, DT2 Driver, 5v. 5A (twice), heater; four KT88's, two unused, all perfect, £6 the lot; buyer collects.—G3HVA, 19 Fountains Road, Luton, Beds.

SALE: Hammarlund HQ170. Class-D Wavemeter. RCA AR77 Receiver. Advance E2 signal generator. Geloso VFO. Labgear wide-band coupler. Heathkit 0-12-U Oscilloscope. Taylor 100A Testmeter. McMichael all-wave radio. Belling Lee TV Aerial. Woden UM4 mod. transformer. Radiovision 2-stage (AC) pre-selector. High voltage mains transformers, HT chokes, valves, quartz crystals, short wave gear, etc. All at low prices.—Ellis, G3SN, 12 Hillside Road, Saltash, Cornwall.

COLLINS TCS Receiver for sale, 1·5 mc to 12 mc; BFO for CW signals; power unit and speaker; complete, £15.—Box No. 2663, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Information concerning the acquisition of Xtals FT241, Channels 47, 49. — N. R. Taylor, Three Firs, Bridge Hill, Belper, Derbys.

SALE: PCR in brand-new condition, 250v. AC, built-in PM speaker L.M.S., £7 o.n.o.?—D. Wood, 250 Worple Road, Staines, Middx.

SALE: W.S. 19 Set, Mark III, with "B" Set and I.C. removed, leaving plenty of room for modifications. What offers? Plus carriage, or part-exchange for R.109A, 52 Set, ARB Rx.—Foster, The Cottage, Glascoed Road, St. Asaph, Flints.

RTTY Teleprinter, Creed 7B page printer, perfect order; can be seen working on DX; £30 o.n.o.? —G3BXI, Farlow, 49 Mount Pleasant Road, Chigwell, Essex *(Hai 4546)*.

WANTED: 160m. Command Receiver.—Details of price, condition and mods., if any, to: G3NPF, 2 Edith Road, Southend-on-Sea, Essex.

1960: B.N.R.S. R.A.E. course with questions, answers and exam. papers, mint condition; carriage paid, £5.—G3POZ, 60 Greenland Crescent, Southall, Middx.

WANTED: Eddystone S.640 for spare Rx. Must be in FB working order, if not in appearance.—Watts, 62 Belmore Road, Thorpe, Norwich, Norfolk.

FOR DISPOSAL: ZC1, Mk. I, converted 160m., with crystal mike, £5. BC453, £4 10s. R.103. 1·7-7·5 mc, needs attention, £1. R.107 front end with circuit, £2. "Radio City" test meter, £1.—Hardcastle, Rigton Grange, East Keswick, N, Leeds. *(Tel.: Rigton Hill 205.)*

FOR SALE: Table-top 150-watt Tx, 80-10 metres, Geloso VFO, 2/6146 PA, Modulator 2/807, Woden transformer, metered and fully screened, in crackled cabinet. TVI-proof, this QTH; pwr requirements, 600, 300 and 6·3 volts; £25. Suitable transformers available.—P. Champion, 77 Leonard Road, Streatham Vale, London, S.W.16. *(Pollards 4508.)*

WANTED: Eddystone 888A or similar receiver; new or perfect condition.—Fitzpatrick, G3OKF, 9 North Linkside Road, Liverpool, 25. *(Gateacre 1866.)*

EDDYSTONE 740, first-class, £22. R.1155N, built-in power output stage, £11. Modified Q-Fiver, offers?—Nunn, Hartslock View, Lower Basildon, Berks.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Crystal calibrator unit for CR150. Also 50-watt TVI-proofed CW/Phone transmitter; also 2-metre mobile rig.—Particulars and price to Box No. 2665, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

K.W. VANGUARD Transmitter, 10/160 metres, built-in LP filter, excellent condition, £40. Minimitter MC-8 Converter, 1·5 mc IF, £13. BC-453 Rx, 1·5 mc and original coils, S-meter, extra audio stage, £4 10s. Eddystone PSU S451B, 175v. 60 mA, 12v. 2·5A, £2, or three units £18 10s. BC-453 Rx, new, unmodified, £4 10s. BC-455 Rx, 6-9·1 mc, £2. Command Tx, 7-9·1 mc, £2. *Ditto*, 2·1-3 mc, modified for 160m., £2. Bendix TA12B Tx, unmodified, £5. TF390G Signal Generator, less meter, £3. G219 Signal Generator, requires re-wiring, 15s. Woden Transformers DT1, £1 10s.; UM1, £2 10s. Type 247 PSU, 500v. 200 mA, 6·3v. 3A, £2 10s. Amplion PSU, 130v. 20 mA, 2v. DC 1A, £1 10s. LP Filter, AP56152, £1. 1 kV. EHT Unit, 10s. 3BP1, holder, shield, 10s. Transformers, valves, meters, components: Write for wants, details. Carriage extra. WANTED: Projector for 35 mm. transparencies; would consider exchange.—Earnshaw, Gerharden, Alkington Road, Whitchurch, Shropshire.

EXCHANGE: Cintel electronic counter, perfect order, for teleprinter in good condition, or VHF receiver.—Ince, 282 Whalley Range, Blackburn. *(Transport.)*

SALE: Heathkit Mohican, works assembled and aligned, excellent condition, with manual, £35 o.n.o.?—Hawes, Montjoie, Alexandra Road, Ash, Aldershot, Hants.

SALE: New boxed R.C.A. 813, 27s. each; TZ40, 15s. pair; s.a.e., please, for list of valves and other gear.—G3JFO, 77 Spalding Avenue, Clifton, York.

FOR SALE: G3KGN Rx, 80-10m.; 80-metre Tx; 12 Set ATU; 40-watt 807's Mod. (all less PSU); and nos. of PSU and host of useful pieces, PT15's, T.1154, etc. Getting hitched and going 160m. Offers and W.H.Y.? — G3NEF, 95 York Road, Southend *(43197)*. Callers preferred.

FOR SALE: R.C.A. AR88LF, first-class condition, with manual, £30. Also all-wave signal generator, £6. — Blackwell, 40 Seymour Road, Chingford, London.

FOR SALE: Pair B44 Transceivers with accessories and instructions; one for 12v. supply, one mains; £14 o.n.o.? TR.1986, modified 12v. operation, less PSU but complete with accessories and plugs, £7 o.n.o.? Two 12v. 45 A.H. batteries, 30s. each. Oscilloscope, 30s. Two field telephones, £3 the pair. 813 valve, 15s. B2 transmitter, £2.—G3NGK, 99 Masons Hill, Bromley, Kent. *(RAVensbourne 7774.)*

TOP BAND COMMAND Tx, brand-new and unmodified, 55s.; SX-28A manual, 30s.; S440B. brand-new, £4; matching AC mains P/P, £3; T.1540 Tx, good condition, £10; Minimitter converter, 10-80m., brand-new, £9; QQV06-40A's, brand-new, 55s.; 12-volt Command Rx dynamotor, 25s. All plus carriage. WANTED: American BC-1147A and AR88LF in mint condition; also LM14, KW160. Heathkit GDO, cowl gill motor, and Top Band Command Rx.—Box No. 2666, Short Wave Magazine, Ltd., 55 Victoria Street, S.W.1.

COLLINS TCS-7 Transmitter and Receiver, control panel, including speaker, all harness, 12v. dynamotor unit, Collins mains power pack; first-class condition; delivered reasonable distance; £25 o.n.o.? —Box No. 2667, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

35 MM. Braun Paxette Reflex 1B, as new, exchange for KW Vanguard or similar.—GW3NUO, 22 Druslyn Road, West Cross, Swansea, Glam.

FOR SALE: 160-metre mobile equipment, 10-watt transmitter, VFO controlled, Xtal microphone, Top Band Command receiver, centre loaded whip ant., all relay operated, perfect working order, £12.—G3IWE, 36 Wilmslow Crescent, Thelwall, Warrington. *(Phone Grappenhall 1278.)*

FOR SALE: Heathkit "Mohican," good cond., £30; aligned by makers. Would consider good BC-221 as part-payment. — G3MME, Shawford, Waites Lane, Fairlight, Hastings, Sx. *(Tel.: Pett 3032.)*

FOUR COMMAND Rx's; MW rough; 160m.-80m.-40m., mint. Offers? — P.P., 26 Mersey Street, Leigh, Lancs.

SALE: Pye G73 signal generator/wavemeter, 100 kc-25 mc, in 6 bands turret W/C, £25 o.n.o.? Also Canadian Marconi No. 19 Set, complete station Rx/Tx, 1·9 - 5·0 mc, 12-volt; tested but needs slight attention; first £20 secures.—Whitworth, 17 Hillview Road, Hatch End, Middx.

FOR SALE: 888A, £67. Buyer collects.—Ackley, 89 Mulberry Place, Ryhill, Wakefield, Yorks.

SALE: 19 Set, Mark III; RF Amp. No. 2, Mark III (four 807's); RF Units Nos. 24, 25, 26; absorption wavemeter, 3-30 mc; headphones; microphone; CW key; £9 o.n.o.?—Cumberbatch, 126 Stafford Road, Bloxwich, Staffs. *(Tel. 76476.)*

FOR SALE: KW Valiant, 10-80m. CW, plus phone parts and two power packs, £25.—After 6 p.m.: G3OZU, 8 Brewery Road, London, S.E.18.

SALE: Panda PR120V, 120-watt, CW/Phone; excellent condition; buyer collects; £35 or offer?—G3IFB, 12 Elmsleigh Avenue, Kenton, Middx. *(Phone WOR 7544.)*

KW VANGUARD, 160-10m., factory-built; condition, appearance and performance excellent; £45.—Crossan, 9 Palace Street, S.W.1. *(VIC 0252/SPR 6645.)*

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