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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Political *Like every other human activity involving the inter-play of human personalities, Amateur Radio has its own particular brand of " local politics " — indeed, this is almost unavoidable. However, where it is a case of one group, nationally or internationally, not getting on with another, or disagreements arising which lead to schisms, the situation can usually be resolved by one fair-minded mediator in whom both factions have confidence.*

But that is not the sort of political situation now being considered here — rather, it is the fact that, gradually and inexorably, Amateur Radio is being drawn into world politics, in the sense that its future could be affected by decisions remotely taken, over which we, as amateurs, can have no sort of control. The reason for this and the cause of the trouble is the proliferation of so-called " independent states," most of them at a low level of development and as yet without any real sense of responsibility. The one thing they have in common is that they are all members of the United Nations, and each one has a vote (which counts equally with the single vote of Britain and the U.S.A.), in spite of the fact that some of these states have a population rather less than that of, say, the city of Birmingham.

And what, you may now ask, has all this to do with Amateur Radio? The answer lies in one word — Frequencies. Having become independent in the political sense as popularly understood, the next thing that the Republic of Saudi-Banana must have is a broadcasting system, so that the " image of the nation " can be projected to the outside world. It must also have radio facilities for its army and police (the main function of the latter being, of course, to keep the " free people " of Saudi-Banana under proper control).

Nobody who has read thus far needs to be told that the finding of new frequencies to meet the aspirations — just or unjust, necessary or unnecessary — of the emergent nations is virtually an impossible task. Broadly speaking, there are no spare channels, anywhere in the spectrum. And what makes it all so much more difficult is that even when a plan can finally be agreed (remember, all these sandy republics have a vote each) there is no guarantee that it will be implemented. Having no sense of responsibility, any of these emergents feeling aggrieved about its allocation can stand out, as we have seen in the case of Egypt and Pakistan following the last Geneva agreement. (The independent Chinese line is based on a different argument, as those who have written to Chinese BC stations on the subject of amateur-band interference will know: Having refused to attend the Geneva conferences, China will not be bound by its agreements).

It still remains to explain where Amateur Radio comes into all this, and how we as amateurs might be affected. This we will attempt to do next time.

Austin Forsyth G6FO.

SOME MODIFICATIONS FOR THE TCS RECEIVER

IMPROVING A GOOD SURPLUS TYPE

A. D. TAYLOR (GW8PG)

Available very cheaply on the surplus market, the TCS receiver, unmodified, is exceptionally stable, but is lacking in selectivity and adequate bandspread. Our contributor describes some simple and inexpensive modifications to overcome these deficiencies, the end-product being a receiver capable of giving an excellent performance on the three LF amateur bands.

A NUMBER of articles describing modifications to the TCS series of Ex-U.S. Government transmitters have been published, but as much attention has not been paid to the associated receiver. The writer has always been attracted to this particular receiver because of its magnificent mechanical construction and high frequency stability; the low purchase price is a further strong recommendation. About 12 months ago one of the receivers was obtained in unused condition, the object being to convert it into high-performance equipment for the three LF amateur bands. In the unmodified state, the receiver had an exceptionally good frequency stability, particularly useful when resolving SSB signals, but it lacked adequate bandspread and sufficient selectivity. A number of modifications were carried out to overcome these deficiencies and they form the subject of this article. The total cost of the receiver, an ex-WD power pack delivering 250v. at 90 mA and 12v. at 1·5A, and the components for the other modifications was under £13—a reasonable figure by any standard.

For those who are not familiar with this receiver, certain useful information is given in the table on this page.

Fitting Bandspread

The total cost of fitting mechanical bandspread was 1s. 3d., the components required consisting of a 5 : 1 epicyclic drive, a one-inch 6 BA bolt and two 6 BA nuts. The logging dial on the main tuning control shaft was removed and the epicyclic drive fitted in its place. The 6 BA bolt was then inserted in the securing bracket on the drive and adjusted until its free end fitted firmly in the depression in the top of the dial locking spindle on the receiver front panel. The grub screws on the epicyclic drive were then tightened up and the logging dial secured on the drive spindle. This simple modification provided a bandspread varying from 8 divisions of the logging scale per kc at 1·8 mc to one division per kc at 7 mc. The whole "feel" of the receiver was enormously improved and accurate tuning became very easy.

Selectivity Improvements

Two steps were taken to improve selectivity. An additional, loosely-coupled tuned circuit was inserted between the mixer valve anode and the first IF transformer, and a peaking type Q-multiplier was provided. The basic arrangement is shown in Fig. 1 and the Q-multiplier circuit, which is quite conventional, is given in Fig. 2. L1 in Fig. 1 is one winding of a normal IF transformer, and it was mounted in the space at the rear of the coil pack, being attached to one of the coil-pack cover securing screws by a small bracket. It was not found necessary to screen the winding.

The main Q-multiplier assembly was built on a paxolin board and mounted in the space above the crystal holders on top of the chassis. Care was taken to ensure that the coil was separated from any ferrous metal by at least twice its own diameter. The Q-multiplier peaking capacitor, C7 in Fig. 2, was mounted in the hole previously occupied by the power on/off switch (a control which only functions when the receiver is used with the original Collins power unit). Connections to this condenser C7 were made with 16g. wire, supported as necessary. Finding a hole in which to mount the regeneration control RV1 presented some problems, as no other redundant components exist on the front panel. The difficulty was overcome by removing the calibration chart and fitting a potentiometer with a short spindle in the lower right hand trimmer access slot. This is fairly easy to do provided that the spindle length does not exceed about $\frac{5}{8}$-inch. As will be seen later, a further control was mounted in a similar manner.

An HT positive lead for the Q-multiplier was connected as shown in Fig. 1, through the 100K resistor R2, and the live heater lead was taken to pin 7 on the receiver local oscillator valveholder. No on/off switch was provided for the Q-multiplier, as suitable adjustment of the two available controls allows satisfactory reception in all modes.

Separate RF and IF Gain Controls

The existing control marked "RF Gain" actually controls the gain of both the RF and IF amplifier stages. Considerably improved operating flexibility can be obtained by providing a separate RF gain control. The circuit for this is shown in Fig. 3, the additional components being R1 and RV1 respectively.

Procedure to locate the lead designated "X" on

Table 1

TCS RECEIVER DATA

Frequency Range: 1·5 to 12 mc.
Intermediate Frequency: 460 kc.
Power Supplies: 250v. DC at 80 mA and 12v. AC at 1·25A.
AF Output Impedance: 600 ohms.
Connections to power socket: Strap pin 2 to pin 3. HT positive to pin 2. 12v. AC to pin 5. Earth and common neg. to pin 6. AF output can be obtained from pin 9 if desired.

Table of Values

Fig. 2. Q-Multiplier for the TCS Receiver

C1 = 8 μF	R2 = 1 megohm
C2 = 750 $\mu\mu$F, s/m	RV1 = 500 ohms, w/ wound pot.
C3 = .0027 μF, s/m	L1 = IF coil to tune 460 kc (*Electroniques* Type Q46)
C4 = 100 $\mu\mu$F, s/m	V1 = ½-12AT7
C5 = 500 $\mu\mu$F, s/m	
C6 = 50 $\mu\mu$F, s/m	
C7 = 50 $\mu\mu$F, var.	
R1 = 2,200 ohms	

Fig. 3, which had to be disconnected from the existing gain control system, was as follows: The receiver was turned upside down and looked at from the front. The third tag from the left on the rear tagstrip in the IF section was found to have two leads and a 220-ohm resistor connected to it. The two leads were clipped and a continuity test was made between their free ends and the second tag from the left on the next tagstrip towards the front of the receiver (this tag also had two leads and a 220-ohm resistor on it). One lead gave continuity and the other did not. This second lead was "X." The other lead was re-soldered to the tag from which it has been disconnected, and the connections shown in Fig. 3 were made to the lead marked "X." R1 was taken to the second tag from the left on the rear tagstrip, as this is an HT positive point, and the lead to RV1, together with lead "X," were connected at the free end of R1. Then RV1, another potentiometer with a short spindle, was fitted in the bottom left hand trimmer access slot on the front panel and the connection between its slider and earth completed. Suitable clearance holes were then cut in the calibration chart and its transparent cover and these items were replaced, thus restoring the front panel to its original appearance.

Valve Changes

When testing the receiver prior to commencing the modifications it was noticed that the 12A6 output valve gave an audio output level which could be dangerously high when headphones were used. It was also felt that the 12A6 local oscillator valve was giving an excessive output to the mixer. Both

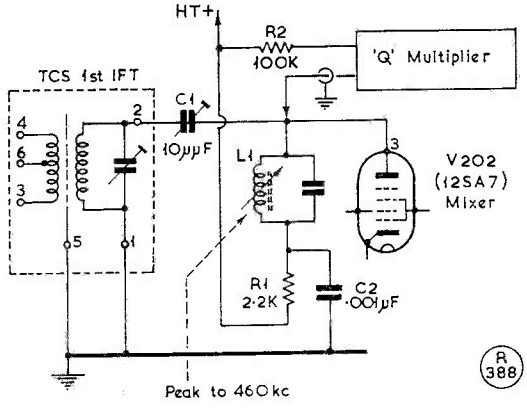


Fig. 1. The IF circuit modifications for the TCS receiver, discussed by GW8PG in the text. C1 is for bandwidth control.

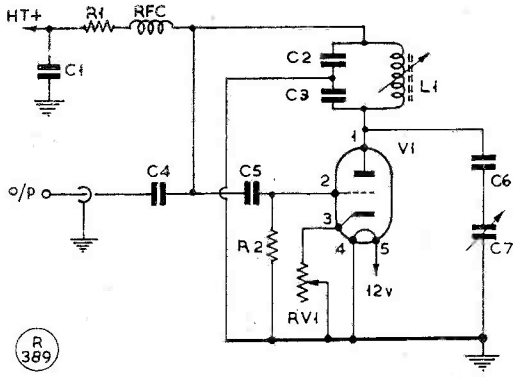


Fig. 2. Q-multiplier arrangement used by GW8PG for his TCS receiver — and see Fig. 1 for inter-connection. C7 is the peaking condenser. The selectivity of the receiver is considerably improved by incorporation of this unit.

these valves were replaced by 12J5 triodes, which can be plugged in with no wiring changes. The calibration of the main dial was found to have changed slightly and this was corrected by adjusting the slugs in the oscillator coils. The new output valve gave a very adequate audio level and two or three "birdies" which had been noticed in the 1·5-3·0 mc range were found to have disappeared. This modification also reduces the HT loading by some 20 mA.

Results After Modification

After the modifications described, the performance obtained was equivalent to that given by receivers in a much higher price bracket. The inherent stability, together with the improved selectivity, gave an excellent result on SSB phones and the Q-multiplier proved amazingly effective for peaking up weak CW signals. During the winter of 1962/63, when Top Band was busier than it has ever been, the receiver was used for dozens of DX contacts with Europe, Africa and North America. It was also used for a (confirmed) 650 mile middle-of-the-day Top Band contact between HB9T and G8PG/A in Cheshire. Performance on 3·5 and 7 mc is also very good.

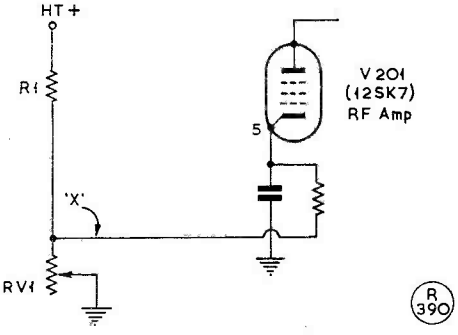


Fig. 3. Separating the RF and IF gain controls on the TCS receiver. In the original, this is common to both, as in many surplus types. The modification is explained in the text, and values here are 220K for R1, and 20K for RV1.

AUDIO-DERIVED AGC FOR THE AR88

INGENIOUS CIRCUIT FOR CW/SSB OPERATION

G. F. MORRISON (G3MOU)

BEING mainly interested in the transmission and reception of SSB, the need for an AGC system on the receiver, using the audio, was an inevitable line of approach.

The unit is made switchable, and can be installed without any major modifications to the AR88 receiver. The switching system allows for the ordinary AGC or the audio AGC to be used at will. It gives a rapid-acting and slow-release effect, which is what is required for SSB or CW reception. The system gives two speeds, as used in the AR88, and in each case manual control of RF gain is still retained. These speeds are: *Short Duration,* in which the discharge circuit is the 3·3 meghom resistor R2, brought in parallel with the circuitry of the RF gain control of the AR88. *Long Duration,* in which the discharge circuit is the 3·3 megohm resistor R2.

The writer was a member of a regular three-way QSO which took place on Top Band. One of the stations was located half-a-mile away, and the other about ten miles or so. As can be imagined, the difference in signal levels was colossal. As the QSO's were all carried out using VOX technique, the receiver, if adjusted for the stronger signal, was unable to produce the weaker one, and if set up for the weaker station, the stronger one was completely deafening. This was most disturbing, as the writer is at the moment a flat-dweller in London.

Circuit arrangement

A 12AT7 double-triode is used in the circuit shown, one half as an audio amplifier, and the other half strapped as the charging diode.

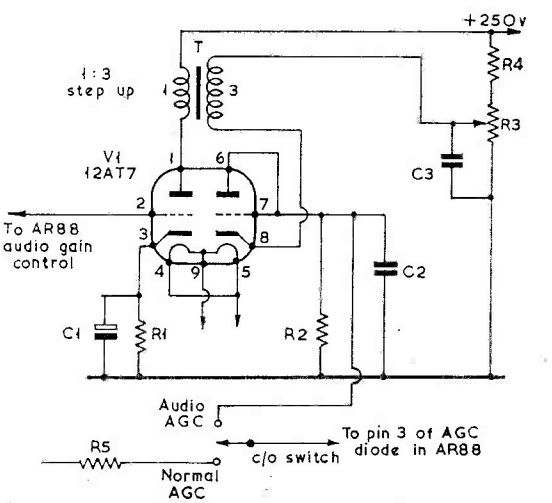
The audio is taken from the AF gain control in the receiver; it is then amplified in V1A and transformer-coupled to the charging diode V1B (anode-and-grid strapped). The diode charges the 1·0 μF condenser C2 across the resistor R2 and this is fed to the AR88 AGC line through the SPDT c/o switch.

R3 enables a delay to be obtained by putting a variable bias on the cathode of the charging diode. In practice it is set to the required level, and then can be left.

The coupling transformer T is a 1 : 3 step up, and the writer's is, in fact, an old intervalve one found in the junk box. The *Radiospares* "Standard" 3 : 1 type would do here.

The unit was built on a (throat pastille) tin bottom, which is just large enough to accommodate the components. Layout is not critical. The unit is contained in the receiver by bolting it on the base plate, at a point approximately under the output valve socket. (It can, of course, be placed in any convenient position.) The change-over switch is located in one of the holes used for re-alignment, on the rear of the chassis. The unit is fed with 6·3v. for heater and 250v. DC HT from the receiver, and the connections made to the AGC line. For those not having the AR88 circuit data the connections are as follows:—

(i) Disconnect the 2·2 megohm resistor from pin 3 of the AGC diode in receiver. AGC diode is the 6H6 nearest front of receiver. Check that there are no other DC paths to earth from the receiver AGC line, as the discharge (in the long



R 387

Table of Values

Circuit of the Audio AGC Unit

C1 = 25 μF, 25v. elect.	R3 = 10,000 ohm potentiometer
C2 = 1.0 μF	R4 = 220,000 ohms
C3 = 0.1 μF, 350v.	R5 = 2.2 megohms
R1 = 1,000 ohms	T = 3 : 1 xformer
R2 = 3.3 megohms	V = 12AT7

time-constant) should only take place through the 3·3 megohm resistor, R2.

(ii) Run a lead from the 2·2 megohm resistor (marked R5 in the circuit here) to one contact of change-over switch.

(iii) Connect output from audio AGC unit to other contact of change-over switch.

(iv) Connect pin 3 of AGC diode to arm of change-over switch.

(v) Take unit input to "hot" end of AF gain control (using screened cable); this is the one with coupling condenser connected to tag.

Operation

To obtain full benefit from the unit, the BFO injection should be increased, and the receiver used in selectivity position 3 or 4, as the steeper the skirt the more effective the unit will be.

The BFO injection in the writer's AR88 receiver has been increased by soldering a wire from pin 3 of the BFO valveholder (6J5), and feeding it through the tag of pin 3 on the last IF valveholder (6SG7), no *direct* connection being made at this point.

The change-over switch now controls the type of AGC available. Switched to the unit, it will give audio AGC, and in the other position normal operation of the receiver AGC. Switch to audio AGC; with the receiver MAN-AVC switch at MAN, a short time-constant is available; with the switch at AVC, a long time-constant is given.

In practice, the RF gain control in the writer's AR88 is used with the spigot pointing horizontally to the right, output being adjusted on the AF gain control. This setting takes care of most QSO's. If a really weak station, coupled with a strong one, is being worked in the same net, the AGC will take care of both, even if the RF gain has to be advanced fully to receive the weak one.

The short-duration setting is normally used, as its discharge time is such that a weak station can be heard immediately after a strong one has been transmitting.

It is probable that this system can be applied to most receivers, provided the necessary circuit changes can be made. The unit has proved well worth building and has proved effective in cutting close neighbours, and others, down to size!

SIMPLE TEST PRODS

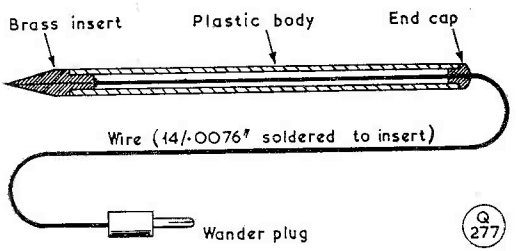
USING BALL-POINT PEN BODIES

A. R. TUNGATE

MANY moons ago, the writer procured a Test Meter—less test leads! On numerous occasions when the meter was used, wires of varying shape, size and length have served as test leads, either by insertion direct into the sockets (to be retained by matchsticks!) or sometimes, a wander plug had been fitted. Nearly always it was muttered "I must get some test leads for this meter" but somehow, it never came about. Recently, however, a simple but effective remedy was contrived by means of a couple of spent ball-point pens—the cheap-and-cheerful variety, of course, which cost a shilling and are normally discarded when the ink runs out.

These pens have a clear plastic body, a turned brass insert housing the ball, and a coloured plug at the extreme end. Plug colour indicates the ink content.

The brass insert was removed from the main body, and the flexible plastic tube containing the ink detached from the insert. In its place, a length of 14/·0036 flexible PVC wire was soldered to the brass body. (Red and blue wire was used respectively in two pens.) The wire was then passed through the clear plastic body and through a hole previously drilled in the coloured end-cap. With the brass insert then re-inserted, and the end-cap replaced, a wander plug was fitted to the remote end of the wire, and the test prod was complete.



The sketch shows a cross-section of the assembly. A test lead of this nature should fill the needs of those in a similar predicament, and would also serve those who have constructed test meters described in this *Magazine*—all of which articles never mention a test prod!

MAY R.A.E. RESULTS

We are informed by the City & Guilds of London Institute that of the 1,229 candidates who sat for the Radio Amateurs' Examination last May, 861 passed, giving a pass-rate of 70%—which can be regarded as a satisfactory figure, showing that the question paper was a fair one, for which the candidates were properly prepared. The odd fact is, however, that (on previous statistical evidence) less than half of these 861 successful candidates will go on to take the Morse Test and come on the air. The gain in U.K. amateur stations licensed may well be less than three hundred. Why this should be, nobody seems able to explain—unless it is that an R.A.E. pass certificate is being accepted as a basic qualification for entry to the radio industry.

WITH PX1OX IN ANDORRA

AT 8,000FT. FOR JUNE 23-26, 1963

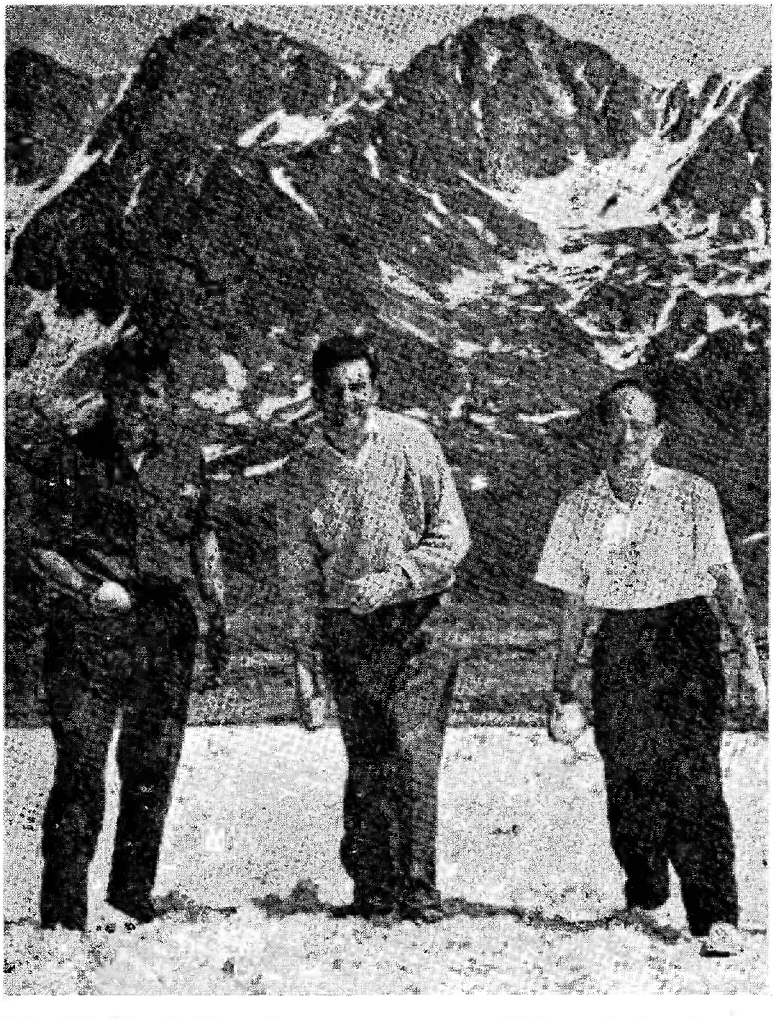
G. D. GRIFFITHS (DL2OX/G3POX)

THE venture to take a side band station into the high mountainous areas of Andorra was formulated in the December of 1962. During the following months many snags and pitfalls had to be overcome in order to make this adventure a success. The obtaining of the necessary licence to operate, though it took some five months to come through, was not a problem. By early June frustration from some quarters nearly brought the planning to a standstill—but as so often happens, in the end we were able to complete the arrangements. The party was to be three, for the period June 23-26 in Andorra, and June 21 was to be our departure date.

During the afternoon of Friday, June 21, the party (consisting of DL2OX, DL2AG and Brian, our log-keeper) packed the radio equipment, 500-watt mobile generator, camping equipment and all the paraphernalia necessary to operate an amateur station under canvas at 8,000ft. in the Pyrenees. At 5.0 p.m. we said goodbye to our respective XYL's and headed south, taking the main German autobahn to Switzerland, and by three in the morning of the 22nd we had entered France; the early dawn came with the promise of a very hot trip through France. By late evening we had got across and were climbing the foothills of the Pyrenees. The climb was arduous and slow (at times gradients of 1-in-8) and in addition we experienced extremely bad weather in the area—much of the early journey in the foothills over roads covered inches deep in new mud, the result of a recent thunderstorm, and at one point a bulldozer was at work to clear the road ahead of us.

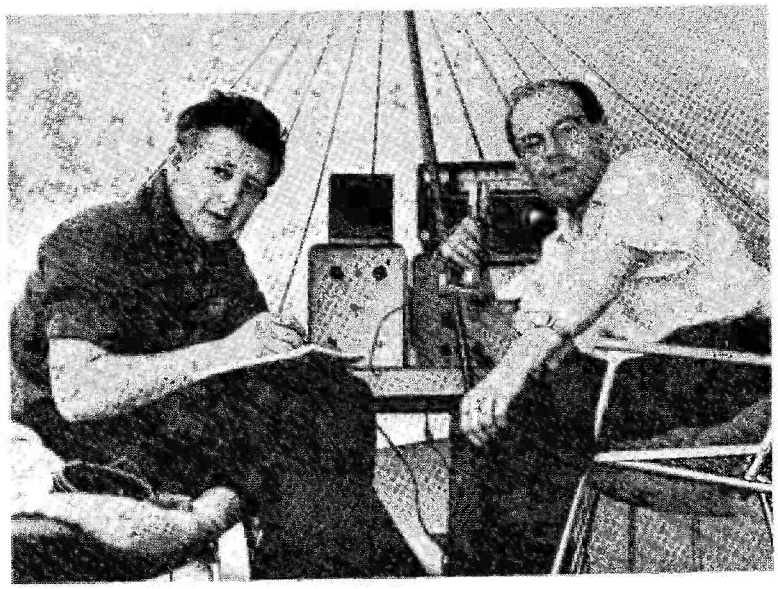
At 1.30 a.m. Sunday morning, June 23, only 30 hours after leaving Germany and covering a distance of 1,020 miles, we arrived at the desolate Andorra border control. Here we experienced the kind hospitality of the Andorra customs people and spent the remainder of the early hours of Sunday morning brewing coffee.

At the crack of dawn we set off on the last leg of the journey into Andorra, which entailed climbing another 600ft. in three kilometres. On reaching this point (the highest one accessible by road) we found a perfect site to set up the station. There were two garages and a small, primitive rest house, which we would soon find invaluable. A quick compass check was made and as luck would have it, there on these barren mountains, with hardly a blade of grass growing, let alone a tree, there were two vertical supports, one a telegraph pole and the other a steel mast some 30ft. high on one of the garage buildings; these became the anchor for our G8KW trap dipole and gave us a major radiation lobe northwest/southeast. During the early planning it



Against the inhospitable Andorran background of barren mountains, at 8000 ft. a.s.l. and with 8 inches of snow outside their tent, this was the team operating PX1OX during June 23-26 — left to right, SWL Balchin, DL2AG, and DL2OX/G3POX. Though things did not go quite as planned, they had a very good time and made more than 700 contacts in 64 countries — see story.

had been our intention to concentrate on working into Europe and the United States, as apparently previous expeditions to Andorra had failed to register in these areas, particularly the States, on the HF bands. Luck had taken a hand in regard to the aerial.



The operating position, PX1OX, Andorra, with DL2AG on the microphone and SWL Brian Balchin logging. The gear, fitted up in their living-tent, consisted of a K.W. Viceroy and a Drake 2B receiver. Except for some trouble due to power supply variation, which caused a 500-cycle drift on the Tx, it all performed faultlessly. The band mainly used was 20 metres, in the SSB mode. In a total operating time of 49 hours, 720 contacts were made in 64 countries and 171 of the QSO's were with U.K. stations.

Getting on the Air

By 0700 hrs. GMT, camp was completed and the equipment (K.W. "Viceroy" and the Drake 2B Rx) were installed. The great moment of "throwing the big switch" produced what could have been disaster—the transmitter was unserviceable! Fortunately, however, it was only a broken wire in the power supply. The equipment was tested once again and to the party's relief the RF output meter showed that PX1OX was ready for business!

The first CQ call was made at 0800 hrs. GMT on June 23, producing the stimulating result we all needed. Within seconds the 14 mc frequency became so full of QRM from the many stations calling, that it took some two to three minutes to winkle out our first contact, SV1AP with a 5-and-9 plus signal from Athens. During the following three hours we continued to work G's and Europeans on the same frequency with the occasional DX station popping through from time to time. Around mid-day the band took on the first of what was to be its many dead spells, so it was decided to catch up on some sleep, which we desperately needed after the long drive to Andorra.

Sleep! What a hope! At about 2.0 p.m. the heavens literally opened up and threw all hell into this mountainous area. It was the most vicious thunderstorm any of us had ever experienced in our lives. With the exception of DL2AG (one of those types who can sleep on a clothes line) we sat there in this tiny tent with 6in. flashes from the antenna feeder, absolutely petrified.

Local Competition

During the afternoon and in the middle of this storm, we were considerably surprised by the arrival of a competitor in the shape of a Swiss party headed by HB9IK, equipped to a high degree—Collins "S"-Line, plus spare 3 kV generator and all the lot! During the evening they set up their station in the little rest-house some hundred yards away, using the call PX1IK.

On the evening of the 24th we ventured on to 80 metres, joining a QSO with G3OEM and G3NSN; in typical 80-metre fashion a report was received of a fault in our transmission, an 0·5 kc drift! On this band with all its QRM one could easily drift on to one of the teleprinter channels. We apparently had had this fault from the start and we certainly finished with it, as QSO No. 720 confirmed. We were unable to cure the drift, as its cause was in the power generator output voltage hunting. So we accepted the drift, and continued unconcerned. (After all, it tested the capability of the receiver at the other end!)

Tuesday, June 25, proved to be the best session on 20 metres, both long and short skip giving us a day's total of some 290 contacts. It was during the evening of the 25th that we had a first-class opening to the U.S. and once we had established ourselves on 14124 kc we were working W's for nearly three hours at the rate of one every forty-five seconds. Unfortunately, the early hours on the 26th saw the closing of 20 metres once again—this time, as far as we were concerned, for good, as we only worked 25 contacts either SSB or CW during the remainder of the 26th.

Taking advantage of these poor conditions DL2AG and Brian took the car to the capital of Andorra, leaving the writer to enjoy the first day of sunshine and attempt a little sunbathing. They returned to the site with a burst radiator hose! This catastrophe was coupled with another possible though more amusing embarrassment—in their absence the garage proprietor had called threatening to cut down our aerial if we did not buy more petrol at his garage! The latter fault was hastily remedied but the hose failure was something which gave us great concern, as we did not wish to be stranded in the mountains indefinitely. We therefore made a snap decision to return to Germany, ceasing operation

on the evening of June 26. A quick survey of the cooling system showed that with luck on our side the hose could be repaired, so with the aid of glue, string and the ever-present insulating tape the hose was sealed and fingers crossed in anticipation. The return journey, commencing in the cool of the evening, continued uneventfully and the cooling system held out. However, during the following hot day's drive through France things were not so rosy and scores of stops to replenish the radiator were necessary. Nevertheless, we arrived safely at our destination in the mid-morning of Friday, 28th—exactly one week after commencing the expedition.

Conclusions and Reflections

Reflecting on the expedition we feel it should be noted how we found the general operating techniques and behaviour on the DX bands. Without question the Stateside boys certainly have the lead on the rest of the world, being so slick and quick off the mark as to allow at times for as many as three contacts to be made in one minute. At the other end of the scale were the DL's and DJ's, unable to get out of the habit of giving their station history, their name and QTH, and all the rest of the formula. During the short-skip openings many more QSO's could have been made had this time-wasting procedure not been so prevalent. Nevertheless, during the total operating period of 49 hours we made 720 contacts and worked stations in 64 different countries. Out of this total of 720 contacts, 171 were with U.K. stations, a fairly high percentage.

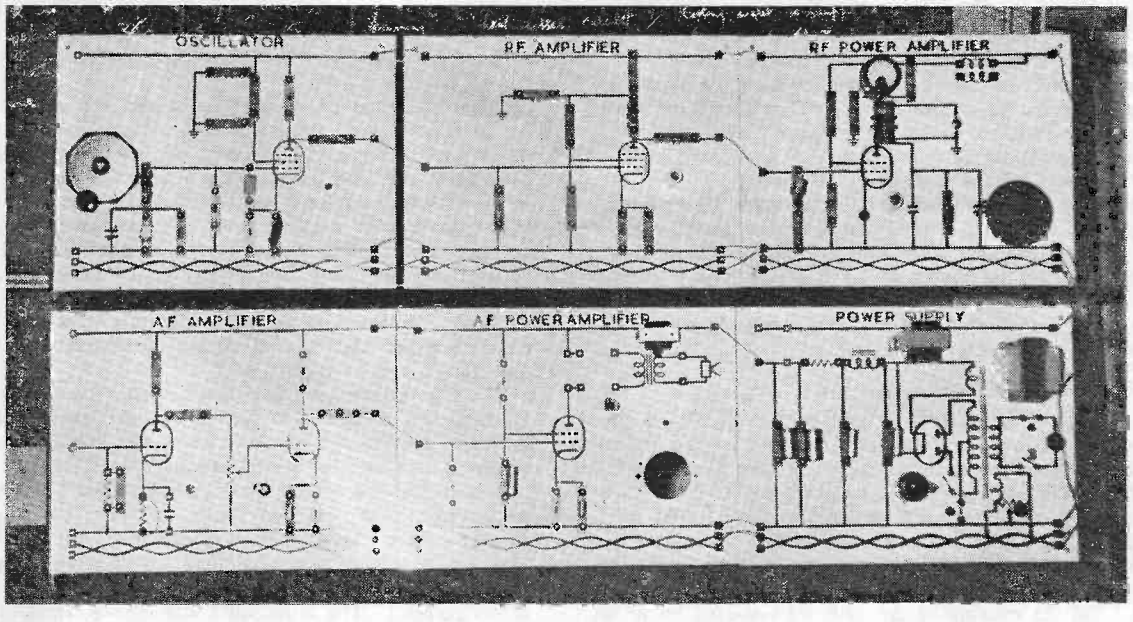
Concluding, we hope that this short expedition attempt in PX gave a few people the satisfaction of working a new country, as was particularly the case for GI3CDF, worked on 80 metres to give him his 100-up on this band.

POLICE NOTICE

Any radio amateur holding a U.K. licence who is a member of a Police Force—there are quite a number of them—and who may be interested in joining a Radio Amateur Section of the International Police Association is invited to write either to : D. McCutcheon, GI3OAU, Royal Ulster Constabulary, Dromara Station, Co. Down, Northern Ireland, *or* to C. Fish, G4OM, 7A Landemann Circus, Weston-super-Mare, Somerset.

MORSE TEST SESSION

The G.P.O. announces that Morse Tests are to be held in various centres up and down the country, for which application forms must be obtained from : Radio Services Dept., Radio Branch, G.P.O. Headquarters, London, E.C.1. The form, with 10s. in stamps, must be completed and returned by *August 20 latest.* The Test will take place during the week September 9-13, and candidates will be informed which centre they are to attend.



Demonstration bread-board layout, to illustrate the basic principles of radio circuitry and design, at the Heanor Technical College, Heanor, Derbyshire. The circuit actually used is based on the "Minitopper" as described in the August, 1962, issue of the Magazine. A modification was to change the VFO coverage to the medium-wave band (0.9-1.0 mc) with the buffer stage doubling. G3RWN says that very good reports have been obtained with the layout just as it is shown here. The circuitry can be quickly altered on this type of demonstration board, and it is an added advantage to be able to conduct a live QSO!

• • • The Mobile Scene • • •

MORE RALLY REPORTS AND PICTURES—ON5 AND PA9 LICENCES TO BE AVAILABLE SEPTEMBER 14-29—NOTES, NEWS AND THE RALLY CALENDAR

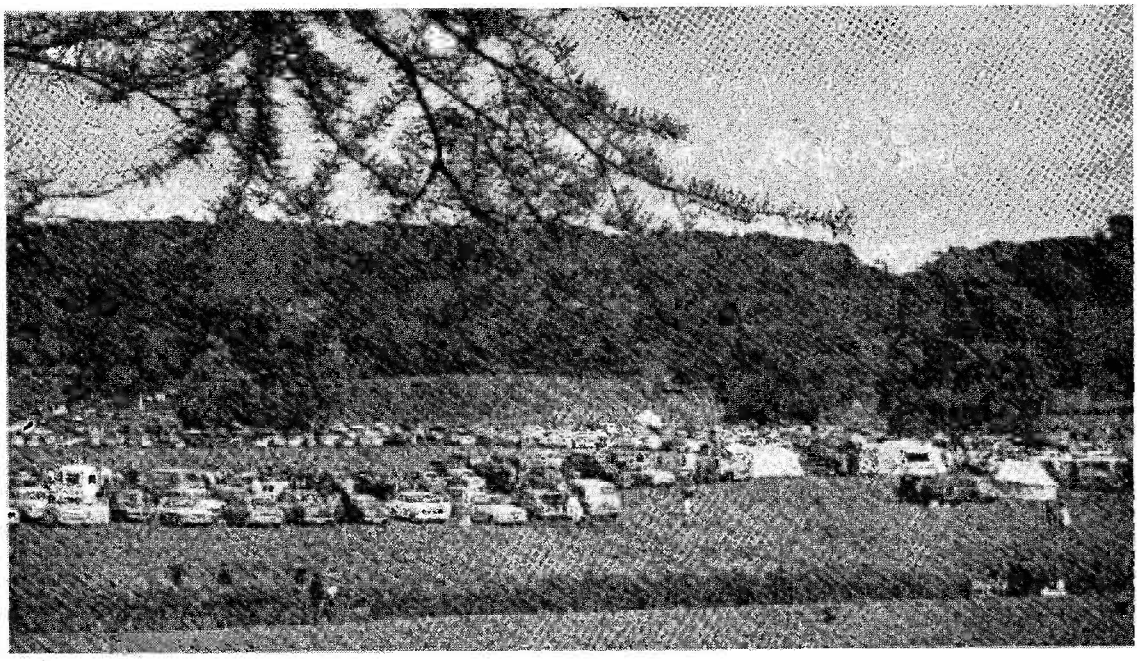
THE last-minute cancellation of the South Shields Rally fixed for July 7 was not due to any failure on the part of the local Club group—who had all their plans made and were ready with a programme on the lines of previous years—but because of the typhoid scare in North-East parts early in July. The South Shields and District Amateur Radio Club came to the conclusion that the event should be called off, not because of any danger of infection, but because the publicity the outbreak was getting in the newspapers might have deterred many people from coming. They were undoubtedly right, as the scare was enough to put off anyone who was thinking of taking the family along for the day.

However, the South Shields boys did establish some sort of a record—they had the unique distinction of running a Top Band talk-*away* station, just in case there were people who had not heard the Rally was off! As it turned out, G3DDI did not have much to do, which perhaps proved that their original decision was the right one.

Those /M's visiting Cornwall and down-about there on holiday are reminded that most local amateurs do work, and hence are not usually available on the air till about 7.30 p.m., though contacts may occasionally be possible after mid-day and during the lunch-hour. Anyway, it's not much use putting out blind calls on Top Band at 12.0 noon and 6.0 p.m.

* * *

On the lines of the Verviers event earlier in the year, we are informed by G3BID that the Dutch and Belgian authorities are prepared to grant temporary PA9 and ON5 licences, respectively, to U.K. amateurs holding current /M permits, for the period September 14-29. This takes in the Brussels VHF Fox-Hunt (2m. D/F event) on the 15th, and the Red Cross Centenary Mobile Rally, also at Brussels, on the 22nd. It is emphasised that the PA9 concession is for passing-through only, and *not* for anyone making a holiday stay in Holland. To obtain a temporary



General view of the car park at the West of England Mobile Rally, Longleat House, Warminster, Wilts., on June 30. In a clearing afternoon, they had about 400 visitors, and of the 200 or so vehicles in the park, one hundred were fitted mobile. The setting for this Rally is particularly attractive, and Longleat itself is a magnificent house.

PA9 licence, send a photostat copy of your /M permit to: N. A. S. Fitch, G3FPK, hon. secretary, A.R.M.S., 79 Murchison Road, Leyton, London, E.10. This should be done right away, as it takes time to get these bits of paper through the appropriate authority.

For your ON5 licence, send a photostat of your U.K. ticket to: Monsieur R. Vanmuysen, ON4VY, 81 Rue Joseph Baus, Wezembeek-Oppem, BT, Belgium, with an international money order to the value of 100 Belgian francs (this will cost you about 15s.) which includes entrance fee for the Brussels Rally and the compulsory vehicle insurance. ON5 licences are *not* valid for Top Band operation. Applications should reach ON4VY as soon as possible, and in any case before September 1st.

G3BID and the A.R.M.S. people have put in a lot of work to make these valuable and most interesting concessions available for U.K. amateurs, who are asked to observe the procedure carefully and conform closely to the local rules.

* * *

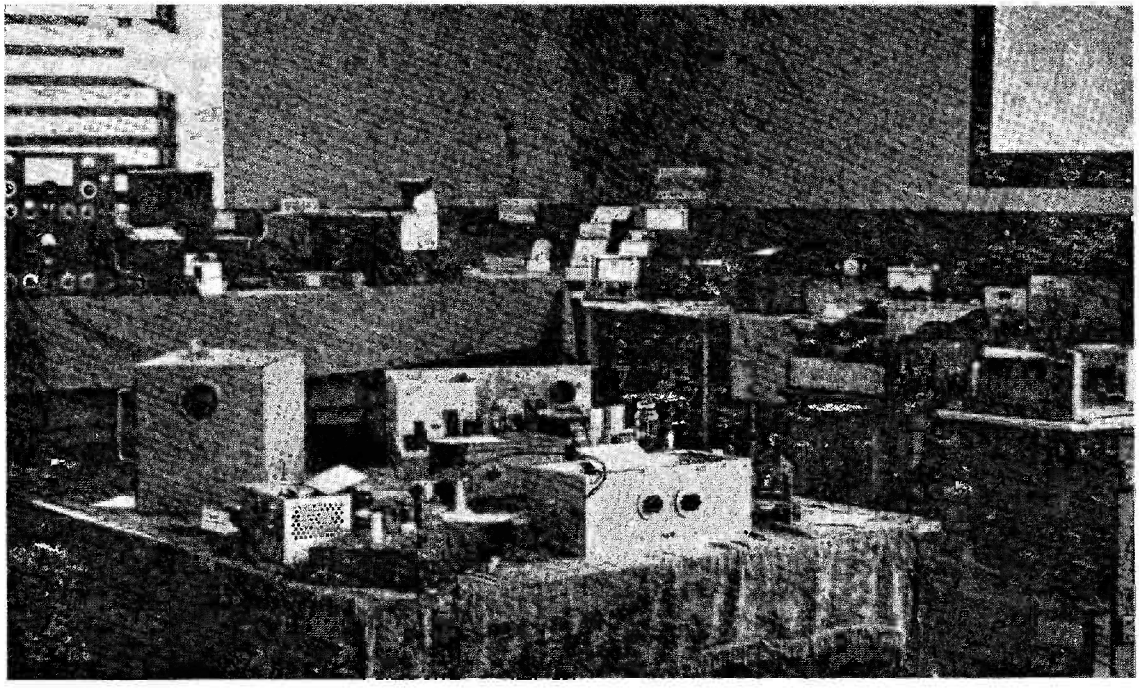
SOME RALLY REPORTS

The garden party held on June 26 at Whiteness Manor, Broadstairs, (which is a home for disabled boys, with a strong Amateur Radio interest encouraged by local amateurs, who give them a lot of help), was a great success, some 300 people turning up, with several mobiles, even though it was a Wednesday afternoon. This has inspired them to embark on a more organised Mobile Rally in September.

For the West of England Mobile Rally at **Longleat** on **June 30,** though the weather was threatening, the attendance was nevertheless about the same as last year (some 400 people), and there were 100 vehicles fitted mobile; the talk-in station, signing G3JMY/A, worked 38 of them, all on Top Band. G3JEQ/M (that man again!) of Leatherhead, Sy., was awarded the prize for the best installation, and G2CDN/M took it for the longest-distance contact with control, at 32 miles when located at Weston-s-Mare. G3OMO/M made the longest journey of the day—he came down from Hull. Overseas visitors included F2BO, LA5HE, ZS1XM and 5B4WD. The raffle went off very well and the report is that "many more tickets could have been sold." Everything for sale was disposed of, and altogether the Bristol group feel that this Rally was possibly the best yet held at Longleat. The Marquis of Bath, owner of the property, made his customary personal appearance and presented the prizes. Those responsible for the Longleat organisation this year included G3CHW, G3JMY and G4UZ, with other members of the Bristol group.

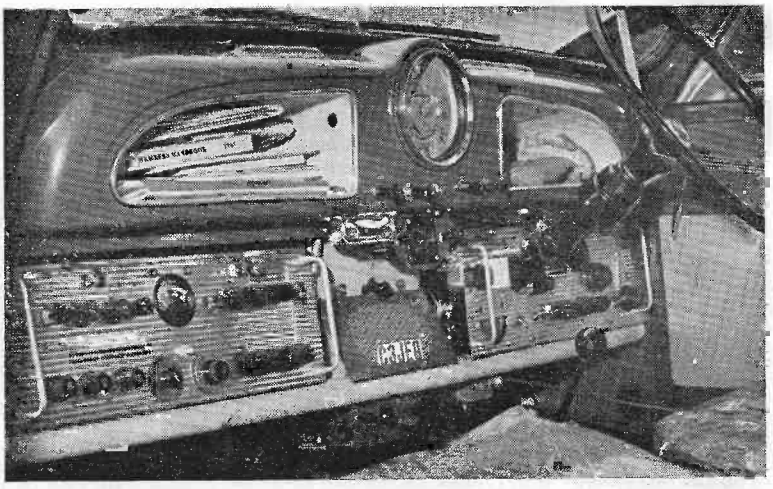
* * *

They had a lovely day at **Harlow** on **July 7,** with an attendance of 50 mobiles and about 250 people (actually, less than last year), but those responsible think that as an event the Rally was an improvement on previous years. The attractions included a monster junk stall, well patronised, and one very interesting working exhibit was the transmission of speech and



Part of the exhibition arranged by the Cornish Radio & Television Club in connection with their Mobile Rally effort at Penzance, in June. The event as a whole was organised in aid of the R.A.I.B.C. and the local Cheshire Home, the proceeds being divided between them, with a respectable cheque for each.

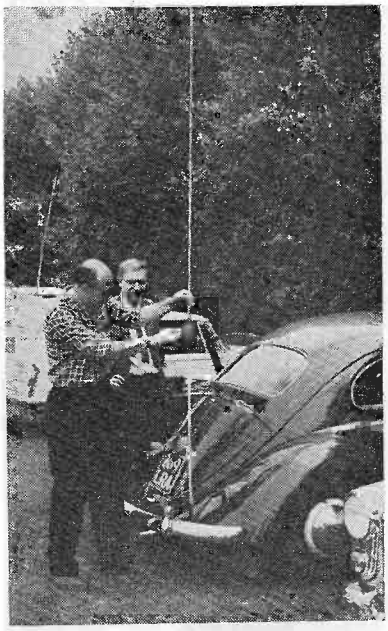
G3PQH/T fitted up the mobile gear for GB3BUS, the High Wycombe outing to Barford. The job had to be done in a hurry, and insulation of the aerial was by binding it on in towelling !



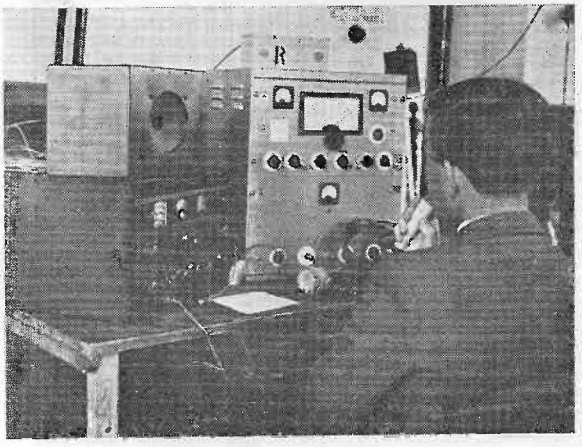
Close-up of the G3JEQ mobile installation for 160-80-40m. and two metres, as fitted in the parcel space of a Morris Traveller, with the shelf lowered slightly to accommodate the panel depth. The Tx side is on the left, and the right-hand panel carries the LF-band Rx, incorporating a transistorised converter for two metres. Control switches are at centre, and the speaker is in front of the heater element. This is a very fine example of home-constructed gear for mobile working, on several bands, and G3JEQ (Great Bookham, Surrey) has been a winner at several Rallies this year. The photograph was taken at Longleat by G3GMN.

Among those at the Wolverhampton event was old-timer G2YM.

At the Wolverhampton Rally — none other than (left to right): G8RY, G6GR and G8CK.



G5CP (Wingerworth, Derbys.) now runs a Volkswagen and has a new mobile installation for it. G8CK (shirt) and G3PWJ were looking it over at the Wolverhampton Rally on June 15.



The Top Band talk-in station for the Cornish Radio & TV Club's Rally at Penzance over June 15-16 ran a Tiger-100 Tx (throttled back for 160m., of course) and an AR88 Rx, the aerial being an 8 ft. centre-loaded whip. In this picture, G3RID is operating.

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music over a modulated beam of light to a range of about one mile—this was put on by two junior SWL members of the Harlow group, Ewan McPherson and John Powell. Needless to say, it completely mystified the non-technical. There was a raffle, and also various spot-prize events. The organisers for the Rally were G3ERN and G3NNI, and the general feeling is that they put on a very good show.

* * *

We gather that there was some slight failure of organisation for the **Chiltern** event on **July 14**—visitors were turning up before the working party had got things ready, and our correspondent's report says something about "too little arranged too late." Anyway, with 70 mobiles on the ground (rather too liberally bespattered with the "pancakes" left by the previous occupants of the field!), the talk-in stations were kept busy. G6IF/A worked 50 /M's on 160m: and G3INZ/A had five mobile contacts on two metres, including one with G5PP/M keying a transistor oscillator a few feet away. For an estimated total attendance of 300, a second tombola had to be hastily organised, as the first one was an almost immediate sell-out. This helped to make the Rally a success financially, but the organisers are men enough to admit that it could have been a better show if more time had been given to the planning and preparation.

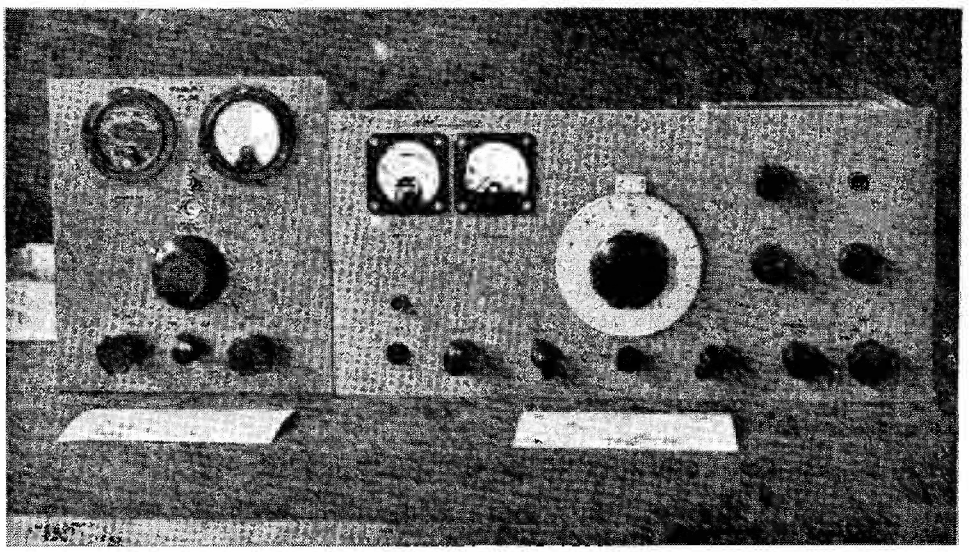
* * *

MOBILE RALLY CALENDAR

We are now approaching the end of the Mobile Rally season—the last of this year's organised events will take place next month. However, there are some important ones yet to come, and following is the list with the latest information we have :

August 11: Mobile Rally at the Royal Naval College, Dartmouth, South Devon, organised jointly by the Britannia Royal Naval Radio Club and the Torbay Amateur Radio Society. Talk-in will be by G6VJ on 1880 kc and by G5ZT/P on 144·1 mc. The prize competitions of /M interest will be for long-distance working to control *en route;* for the best home-built mobile installation; and the neatest and safest mobile rig. The R.N. College will be open to visitors, with cadets (under training as naval officers) as guides, and one of the demonstrations will be of Civil Defence signals organisation and message handling; the local C.D. Unit will make the Rally the occasion for an exercise in emergency feeding—this means free-tea-and-eats from 12 noon until 4.0 p.m. Apart from that, there will be the usual refreshments on sale in the grounds, which are beautifully situated on the banks of the River Dart, with naval craft in the anchorage. The College is only a quarter-mile from the old-world town of Dartmouth, with its centuries of sea tradition. Needless to say there is ample parking space, and covered accommodation (with alternative arrangements for the entertainment of visitors) if the weather is wet. All local routes to the Rally are being sign-posted by the motoring organisations. All in all, this also promises to be a very good show. Any further information from : T. R. Ashby, G3NBR/G6VJ, R.N. College, Dartmouth, Devon, *or* E. J. Hayman, G3ABU, Torbay A.R.S., 113 Barton Road, Torquay, Devon.

August 18: Derby and District Amateur Radio Society Mobile Rally at Rykneld School, Bedford Street, Derby, will be much on the lines of previous years—this is a well-established event,



This was one of the home-constructor items in the Cornish Radio & Television Club's exhibition at Penzance on June 15. Built by G3OCB of Truro, it is a 10-160m. SSB exciter giving 40w. p.e.p. with, at left, a two-metre PA operated on the transverter principle, through an oscillator-mixer unit.

and enjoys good support—with displays by the Police and Fire Brigade ; treasure hunt, film show, Judo demonstration, radio-controlled model aircraft flying, trade stands and exhibits, a big surplus-equipment sale, and a draw for many valuable prizes. There is no admission charge, refreshments will be available on site, and parking space is ample. The programme starts at 2.0 p.m., and the talk-in stations will be G3ERD/A on Top Band and G3EEO/A for two metres, on the air from 10.0 a.m. The R.A.C. will sign-post the Rally all round Derby. Further details from : J. Anthony, G3KQF, Rykneld School, Bedford Street, Derby.

August 25: Reading A.R.C. Mobile Picnic (bring your own food and drink) at the Childe Beale Memorial Trust, Basildon, Pangbourne, Berks.

September 1st: Bucket-and-Spade party at Newton Institute, Newton-Nottage Road, Porthcawl, South Wales. Off the A.48 from the east, turn on to the A.4106, and right at Newton cross-roads ; off the A.48 from the west, take the B.4283, turn left at cross-roads in Nottage. Top Band talk-in by GW3ACF/A and on 2m. by GW4CG. Bring a picnic, as liquid refreshments only will be available on site. Further details from : H. G. Hughes, GW4CG, 20 Austin Avenue, Porthcawl, Glam., South Wales.

September 8: Thames Valley Amateur Radio Transmitter Society's Mobile Rally at Polesden Lacey, near Leatherhead, Surrey. Details from : K. Rogers, G3AIU, 21 Links Road, Epsom, Surrey.

September 14: Hamfest and Mobile Rally arranged by Whiteness Radio Club, at Whiteness Manor, Kingsgate, Broadstairs, Kent. Opening at 2.0 p.m., with free admission, car park, teas, games and prizes. The 160m. talk-in station will be G3PNI/A. Further details from : The hon. secretary of the club.

September 15: VHF Fox-Hunt (2m. D/F) near Brussels, for which ON5 licences will be granted to U.K. visitors—*see* p.296 for application procedure.

September 15: Hamfest and Mobile Rally organised by the Lincoln Short Wave Club, at North Kesteven Grammar School, Moor Lane, North Hykeham, Lincoln, on the A.46. Cafeteria refreshments, plenty of parking space, and a programme for everybody. Assembly is for 1.30 p.m., and the talk-in stations—G4BU on 160m. and G3MZB on 2m.—will be on the air from 11.0 a.m. Further information from : Mrs. L. E. Woolley, G3LWY, Rochmount, Saxilby, Lincoln.

September 22: Red Cross Centenary Mobile Rally at Brussels, for which ON5 licences will be granted to U.K. visitors—*see* p.296 for application procedure.

These callsign rugs were worked by Mrs. J. D. Ingle, wife of G3OIZ (Littlestone, Kent). They live about opposite their friend F2KZ (Boulogne) and are in regular QSO. The rug for him has black lettering on a blue ground, in the Continental style, while that for G3OIZ is in deep pink, also with the callsign in black. Mrs. Ingle remarks that " they may be of interest to other wives as they make useful birthday presents " — and very nice, too. (And there are those who might say that it would be a good way of keeping the XYL usefully occupied while the station is on the air!).

HELP, PLEASE !

Would the holders of G3RPI and G3RTY please let us have fresh slips for the " New QTH " section —giving callsign, name and full address. In both cases, the information left off the slips already sent makes it impossible for us to get in touch with them in any other way !

RADIO AMATEURS' EXAMINATION
COURSES OF INSTRUCTION

Arising from the note on p.235 of the July issue of SHORT WAVE MAGAZINE, courses of instruction for the May, 1964, R.A.E. have been arranged at the centres listed below. In most cases, these courses assume only a "starting as beginner" standard and from that take students through the R.A.E. syllabus up to a level at which they can sit, and should be able to pass, the examination. In all cases, fees are nominal, amounting only to a pound or two for the whole course. Most start during September and carry on through the winter educational session. In many instances, the instructors themselves hold AT station licences.

Students can obtain the R.A.E. syllabus ("Subject No. 55" in the examination list) on application to the Sales Section, City & Guilds of London Institute, 76 Portland Place, London, W.1, price 1s. post free. For general reading for the R.A.E., we recommend the *Radio Amateurs' Examination Manual*, obtainable from our Publications Dept., at 5s. 6d. post free.

Those responsible for R.A.E. courses not included in this list are asked to let us have details by August 16 for publication in the September issue of SHORT WAVE MAGAZINE.

Birmingham: At the Central Evening Institute, Lea Mason Centre, Bell Barn Road, starting September on Monday and Wednesday evenings. Apply: G3HBE (*QTHR*) or at the Centre.

Bradford: At the Technical College, Great Horton Road, Bradford, 7. Wednesday evenings, 7.0-9.0 p.m., enrolment evenings September 9-10, at the College; Theory and Morse instruction. Further details from G3KEP *(QTHR)*.

Brentford, Middlesex: At the evening Institute, Clifden Road, Brentford, enrolment week starting September 16. Theory and Morse instruction. Full details from: Evening Institute Dept., Education Offices, Town Hall, Chiswick, London, W.4 *(Tel. CHI 6661)*.

Brighton : At the Technical College, one evening each week, commencing September 19. Lecturer-in-charge, F. R. Canning, G6YJ. Other C. & G. Radio/TV courses also offered. Apply: Head, Electrical Engineering Dept., Brighton Technical College, Richmond Terrace, Brighton.

Bristol : At the Technical College, starting on September 23, evenings. Enrolment at the College, Ashley Down, Bristol, 7, evenings September 12, 13, 16. Apply: R. E. Griffin, G5UH, Bristol Technical College, for details. Other Radio/TV courses available.

Carshalton, Surrey: At the College for Further Education, Nightingale Road, Carshalton, starting in September, both Morse and R.A.E. Theory. Apply to the Registrar for details.

Cheltenham: At the North Gloucester Technical College, Cheltenham. Details from the Principal, at the College *or* from G3MOE, hon. secretary Cheltenham Amateur Radio Society *(QTHR)*.

Durham: At the Technical College, Framwellgate Moor, starting in September, in Morse and Theory. Apply to the Principal.

Glasgow: At Allan Glens School, Montrose Street, Morse and Theory, enrolment evenings September 2-5. Full details from GM3AXX *(QTHR)*.

Halifax: At the Percival Whitley College of Further Education. For details apply G3MDW *(QTHR)*, hon. secretary, Northern Heights Amateur Radio Society.

Heanor, Derbyshire: At the Technical College, Ilkeston Road, on Friday evenings, starting mid-September. Further details from the Registrar.

Holloway, London: At Montem School, Hornsey Road, Holloway, N.7, Morse and Theory commencing end-September. Apply in the first instance to: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middlesex. (This is one of the most successful R.A.E. courses in the London area, having had 225 passes in the ten years to last May's examination, when 26 out of 41 students passed.)

Ilford, London: At the Ilford Literary Institute, High School, Cranbrook Road, Ilford, commencing end-September, with enrolment September 9-12. Apply in first instance to: W. G. Hall, G8JM, 48 Hawkdene, North Chingford, London, E.4. (This also is a very successful course, having secured 250 passes in the last 12 years.)

Northwood, Middlesex: At the Evening Institute, Potter Street, Northwood Hills, starting week September 23, enrolment evenings September 16-18. Details from G. P. Anderson, G2QY, 16 Warrender Way, Ruislip, Middlesex.

Plymouth: At the College of Technology, special course designed to cater for sightless students, together with the usual R.A.E. session of instruction. Apply A. F. Ward, G3HSP, Electrical Engineering Dept., Plymouth College of Technology. (The R.A.E. course for the sightless will depend upon there being sufficient demand for it.)

Reading: At the E. P. Collier Evening Institute, Swansea Road, registration evening September 25. For details apply R. G. Nash, G3EJA, 9 Holybrook Road, Reading.

Stoke-on-Trent: At North Staffs. College of Technology, on Monday evenings commencing in September. Apply: K. H. Parkes, G3EHM, 28 Grove Road, Heron Cross, Stoke-on-Trent.

Wembley, Middlesex: At the Evening Institute, Copland School, High Road, on Monday evenings, with Morse and Theory; enrolment evenings September 16-19. Further information from: A. Bayliss, G8PD, 99 Warford Road, Wembley.

Weston-s-Mare: At the Technical College, which offers a variety of Radio and Telecommunications courses in addition to the R.A.E. Apply to the Head of the Dept. of Engineering, at the College.

For The Beginner

MIXERS AND MIXING PROCESSES

The term "mixer" covers a wide variety of circuitry. In receivers and also in transmitters, mixing of two frequencies to produce a sum or difference frequency is almost universally encountered. Some of the simplest and most effective ways of doing this are discussed here.

RADIO terminology is always changing; what we now call a "mixer" has also been known (and still is, in some quarters) as a converter, a frequency-changer, a first detector and even a modulator. Luckily the term *mixer* has now become generally accepted for all the wide range of stages the purpose of which is to combine two inputs, of different frequencies, in order to provide an output at a new frequency—usually either the sum or difference of the original two.

It is a sensible term—the two inputs really *are* "mixed"—and the meaning is unambiguous. So we will proceed to examine some typical mixer stages and to discuss their purpose and their design.

The first mixer that the novice encounters is usually that found in even the simplest superhet receiver. The incoming signal and a locally-generated signal are mixed together to give a new signal at the intermediate frequency of the receiver, which is then amplified and filtered to taste. (In a typical example, an amateur signal at 1900 kc is mixed with a 2355-kc signal produced within the receiver to give an IF signal at 455 kc—the difference. The other frequency—the sum—will be at 4255 kc and will be rejected by the sharply-tuning 455-kc circuits of the IF amplifier.)

A modern treble-conversion superhet will naturally have three mixers. In some cases they are "all in a row," without IF amplification between them; and they may be heptodes (sometimes called pentagrid converters) or triode-hexodes. Examples of simplified circuitry for each type are shown in Fig. 1.

Wide Power-Range

These receiver mixers, naturally, run at very low power, and so do some which are used in the early stages of transmitters. But "high-level" mixers are also met with, and though bigger valves and higher voltages are involved, the principle remains the same. One of the input frequencies is fed to the control grid of the valve, and the other to the cathode, or possibly the screen. The development of SSB for amateur use has necessitated much experimentation and hence greatly increased knowledge about mixers, as all SSB transmitters rely extensively on the beating of an oscillator with one particular frequency to produce another. Gone are the days of chains of frequency-doublers, which were used to produce 7 mc from 3.5 mc, and 14 mc from 7 mc. Nowadays if you want to get on to 14 mc from 3.5 mc you do so by beating a 10.5 (or 17.5) mc crystal oscillator with the 3.5 mc input.

Typical transmitting mixer circuits are shown in Fig. 2. The choice of valves, and also of which electrodes to use for which purposes, depends upon the impedances involved. For instance, an SSB signal

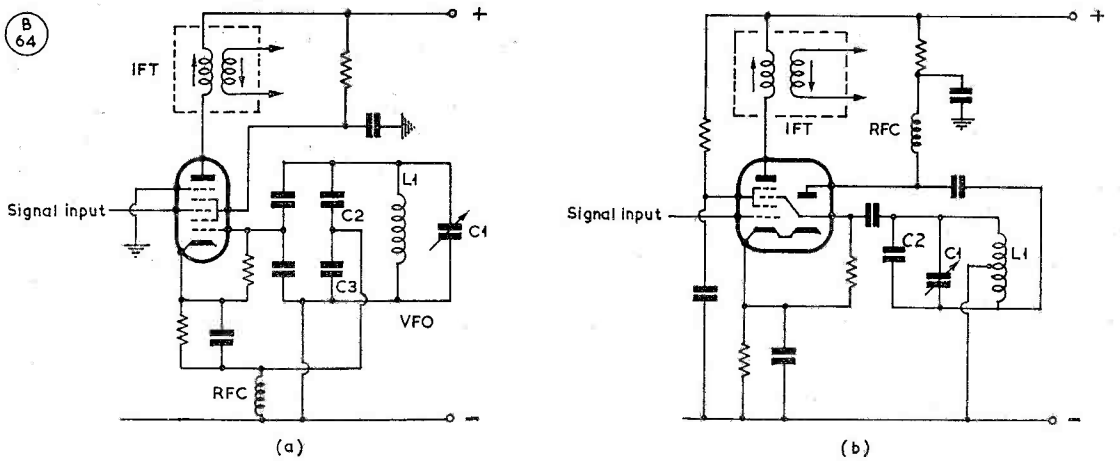


Fig. 1. Typical mixer circuits for superhet receivers. At (A) the valve is a heptode (or pentragrid) with the signal input from the previous stage fed to its third grid, while the local oscillator circuit is connected across the first grid, cathode and screen (earthed). At (B) the more popular triode-hexode is shown, with the triode section used for the local oscillator and directly connected (internally) to grid 3 of the hexode section. The signal input, connected to grid 1 of the hexode, mixes in the electron stream.

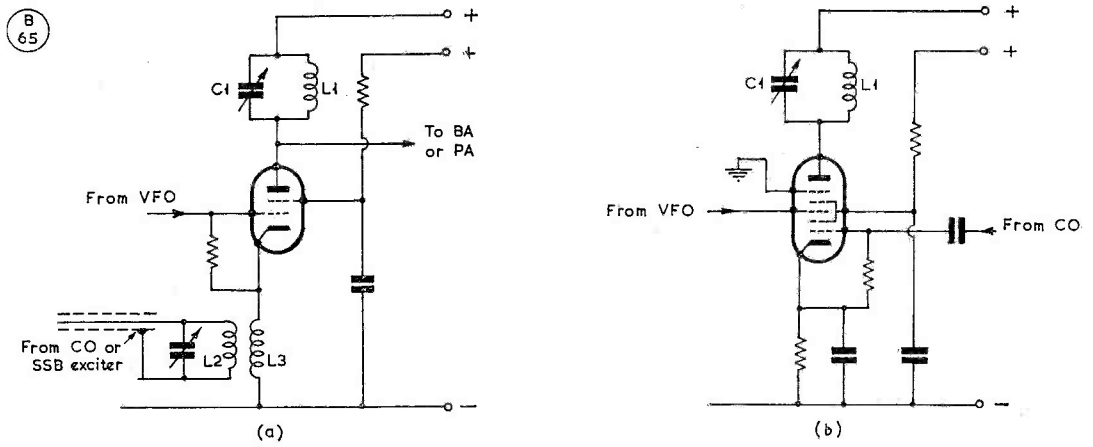


Fig. 2. Transmitter circuits for mixing two frequencies. At (A) the VFO is fed to the control grid of a tetrode, and the other source, whether a crystal oscillator or the output of an SSB exciter, fed at low impedance into the cathode circuit. At (B) a hexode is used, with the VFO feeding one grid and the CO another ; a pentode or even a tetrode could also be used, with one source feeding the screen. In both cases the tank circuit L1, C1 is of course tuned to the desired frequency, i.e. either the sum or difference of the two applied frequencies.

coming out of an SSB exciter at low impedance may have to be mixed with the output of a crystal oscillator or VFO which is at a high impedance, and for such a purpose one would use a circuit similar to that in Fig. 2a, with the low-impedance SSB signal injected into the cathode of the mixer.

Such an arrangement, by the way, demonstrates the *true* mixer stage—it carries out the mixing operation but nothing else. Many of the other types include their own local oscillator, particularly the triode-hexode types for receivers, where the receiver's previous stage supplies signals at one frequency to the control grid of the hexode section while the triode section is a self-contained oscillator with its output introduced into the electron stream within the hexode.

Generally speaking, you will find multi-electrode valves and combined mixer-oscillator circuits on the receiving side, but separate mixer stages in transmitting equipment.

The Double Triode

Those wise designers who are all in favour of simplicity—and how it pays off !—make extensive use of the popular double-triodes such as the 6J6, 12AT7 and 12AU7, which can be employed in a great variety of mixer circuits. (Fig. 3).

One obvious way of using such a valve is to take each grid circuit for one of the frequencies to be mixed, the new frequency then coming out at the anodes, which are strapped. A refinement of this scheme is to arrange one half of the double-triode as a cathode follower, which is useful in providing isolation from a local oscillator. In this case one of the anodes is earthed (with respect to RF) and the two cathodes are strapped together with a common cathode load resistor. (Fig. 3b).

Also, of course, the balanced modulator found in SSB generators is nothing but another form of mixer, and although semi-conductors are often used for this, nowadays, the double triode also has its place. One circuit often found in these circumstances is of the "push-push" variety (grids in push-pull, anodes in parallel, as in Fig 4); or it can be done the other way, with an audio source applied to the grids in push-pull and the RF to the same grids in parallel, the anode circuit then being of the normal push-pull configuration.

Simplest of All

All of the foregoing gives the beginner some idea of the vast variety of circuits by which the operation of mixing (or converting, or modulating, or heterodyning) can be carried out. The fact is that practically any non-linear circuit will function as a mixer. It is said that the fact that we can hear beat-notes between two musical tones proves that the *ear* is a non-linear device, which is certainly true. Rather fascinating effects can be obtained with two separate headphones, by feeding different frequencies into each ear !

However, this leads to the fact that mixing is frequently carried out in the simplest possible fashion —by merely bringing the two frequencies together somewhere in the external circuit, not by blending them together within the electron stream inside a valve. What is often termed " BFO injection " in a receiver is nothing more than a weak capacitive coupling of the BFO output into the grid of the second detector. Sometimes, even in complex commercial receivers, this is achieved merely by coupling a short lead from the BFO can to another lead associated with the second detector.

The popular Nuvistor converters and Nuvistor front-end units, so useful for improving the signal/noise ratio of elderly receivers, generally adopt this arrangement. After all, the Nuvistor is only a triode, and you can't do much clever stuff when you only have three electrodes to play with ! So one often finds a Nuvistor as first mixer in a receiver (the very first stage) with a crystal oscillator loosely coupled to its grid circuit. And very effective it is, even in

this critical position which determines the entire performance of the receiver.

Modulation

Finally, a few more thoughts about the transmitting side, where you will find "mixers" in the guise of balanced modulators, or simple stages for shifting one frequency to another by beating the VFO with another (usually crystal) oscillator, or even in the final stage and modulator of an AM transmitter—for what is amplitude modulation but the mixing of a radio frequency with a complex band of audio frequencies ?

High-level RF mixers are not too popular for the reason that a mixer operates at pretty low efficiency—usually of the order of 25 per cent. This means that you have to use a larger valve for the job than you would for a straightforward amplifier, or else you will be in trouble with excessive anode dissipation and consequent overheating.

So the "done thing" is to arrange the necessary mixing operations as early on in the circuit as you can, the later stages being drivers, buffers or final amplifiers, all of which can be run at a much higher efficiency.

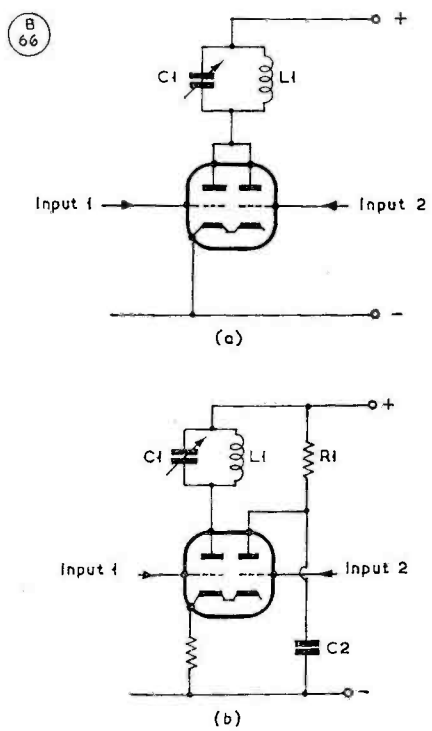


Fig. 3. Double-triode mixers are suitable both for receiver work or for the early stages of transmitters. At (A) the anodes are paralleled and the combined frequency selected by the tank circuit L1, C1; at (B) the second anode is held at earth potential (RF) by C2, so that the second half of the triode runs as a cathode follower, with a common cathode load.

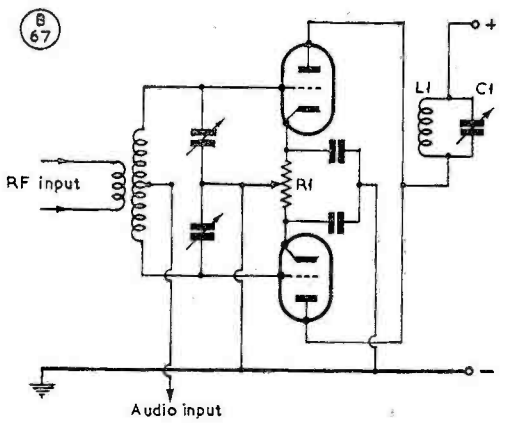


Fig. 4. One of the many balanced modulator circuits in common use. The RF input, coupled into the grids in push-pull, will not drive the valves until the audio input is applied, at the centre-tap of the grid circuit. The audio component cannot appear in the output, which is taken *via* the high-Q tank circuit, L1, C1. The output from the stage as shown would consist of two side-bands. (The circuit is considerably simplified for clarity, and in practice might utilise one double-triode or even a pair of diodes.) R1 is the balance control.

Flexibility

Mixer circuitry and technique is one of the more fascinating pursuits for the amateur designer, because the requirements can be met in so many different ways. The circuits are not critical in the way that, for instance, a VFO circuit is critical; quite a lot of flexibility is permissible, and circuits can be designed to fit any special requirement.

It must be hard to design any sophisticated piece of equipment nowadays that does *not* use a mixer in some form, and a little practical experience of all the various circuits available will stand the amateur constructor in good stead.

Final word of warning—never forget that when you mix two frequencies you will end up with *four!* These are the original two, their sum and their difference. Only one out of these four will be the one you want, and the others must be disposed of. Fortunately a high-Q tuned circuit is a most effective device for selecting the wanted frequency, but if any of the others are too close to it, special trap circuits to filter them out may be needed. For this reason, choose your frequencies carefully. Don't, for instance, try to do something ridiculous such as beating 2·0 mc with 3·8 mc in order to get 1·8 (not that anyone would!). But in such a case the original 2·0 mc component would undoubtedly be a nuisance to get rid of. If, in such a case, you should really want to derive 1·8 mc from 3·8 mc, the sensible thing to do would be to generate 5·6 mc, which would give the desired beat frequency without producing anything else too close to it.

Think first, design afterwards—with mixers, as with everything else !

THE BC-906 CAVITY WAVEMETER

AND PRACTICAL CAVITY CIRCUITS FOR UHF/VHF APPLICATION

D. G. GILMOUR (VE7YG)

Having acquired as surplus a BC-906 VHF wavemeter and investigated its circuitry, our contributor was led on to design and construct cavity resonators for practical use on the VHF bands. The importance of the cavity resonator lies in the fact that it can be made to give a very high Q-factor, and also exceptional stability in straight VHF oscillator circuits. Its disadvantage for frequencies in the two-metre band is its rather large size; however, for 70 centimetres the dimensions would be reduced by about two-thirds, and so become much handier. This article is also an interesting example of how ordinary materials can be used for refined circuit techniques—the main requirement for the construction of cavity resonators is a supply of cans (beer or fruit juice) and a good soldering-iron.—Editor.

THE writer heard of resonant cavities during the Second World War and has since given thought to them and even read a little about them. Among the surplus items of the past few years there is the BC-906D, a cavity wavemeter. A check of the circuit discloses a resonant cavity coupled to a diode detector followed by a valve voltmeter—*see* Fig. 1.

Calibration to cover 150 to 235 mc is by a series of graphs, inside the lid of the case. These graphs read "15·0 to 23·5" and tend to mislead one as the instrument coverage is in the VHF, not the HF, region. On the writer's unit, the dial from 10 to 95 degrees coincides with 150 to 235 mc. It is not unreasonable to expect the coverage to extend from 144 to 240 mc —without modification!

The BC-906 can be classified as a secondary frequency standard and as such is a good thing to have for general VHF work—particularly at its price as surplus.

No laboratory investigation has been possible for formal checks, but practical tests prove that the BC-906D sensitivity is such that a 6C4 oscillator will give good deflection on the meter depending on the closeness of the coupling. With the very low power output from a signal generator, its modulated signal can be heard in headphones with no apparent deflection of the meter needle.

As to the selectivity, independent dips have been obtained from two signals less than 250 kc apart on the writer's two-metre transmitter, running about 30 watts. With virtually nothing to warm up, the stability seems to be exceedingly good. The Massachusetts Institute of Technology apparently used panoramic receivers to plot resonant cavities during the war and specify 25°C at 60% relative humidity as "standard calibration." M.I.T. point out that humidity and temperature will affect calibration of cavities at microwave frequencies, but it is the writer's opinion that as long as "living-room conditions" apply we have no need to worry at this range of frequencies. Nevertheless, as a secondary frequency standard it should be carefully handled.

Circuit Details

A loop couples into the cavity—*see* Fig. 1—which has a 7 $\mu\mu$F band-set trimmer and an 8 $\mu\mu$F tuning condenser. Another loop is coupled to the diode section of the 1S5. The grid of the 1S5 picks up the signal and may be switched across the resistors to prevent overloading. The meter is shunted by a resistor which allows compensation to a certain extent as the battery ages.

Practical Work with Cavities

It is possible to be terrified by the mathematical do's and don'ts associated with resonant cavities and to be under the impression that the work-bench must be equipped with all manner of power tools. Do not be alarmed. All that is required is a pair of tinsnips, plenty of solder, a right-sized soldering iron, and *clean* old apple juice, tomato juice (or even beer) cans made of tinplate.

Figs. 2, 3 and 4 indicate variations in the use of a

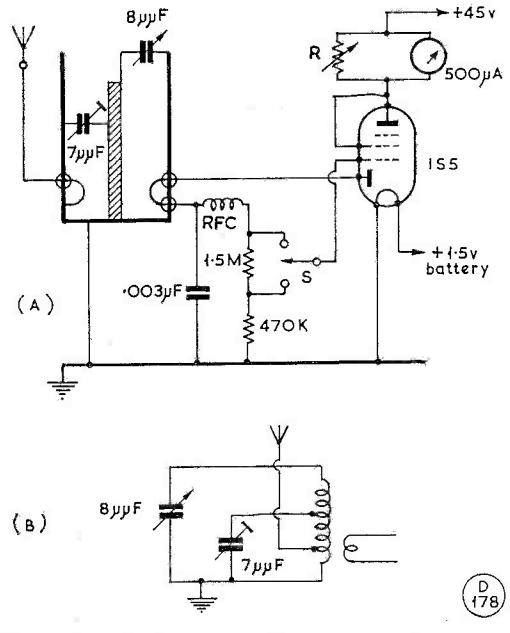


Fig. 1. At (A) is the circuit of the BC-906D, which is in the category of a secondary frequency standard for the range 144-240 mc. Sketch (B) is the equivalent circuit of the resonant cavity.

Fig. 2-4. Circuits using can-type cavity resonators, the cans being beer or fruit juice, as discussed in the text. Fig. 2 is tunable in the two-metre band and can be very sharply resonated as an output filter. Fig. 3 is a band-pass filter arrangement, of very high Q. Fig. 4 is a stable self-excited oscillator, tunable over a wide range and also sharply resonant; the grid can be tapped down the centre to improve stability.

resonant cavity. The resemblance to a length of coaxial cable is intentional, and for those mathematically inclined such things as impedances can be worked out. But the writer believes that only two things need to be appreciated: First, that the length of the can has a bearing on its natural frequency, normally the length "A," Fig. 2; this should be around a ¼-wave of the highest frequency for which you are aiming. The condenser in Fig. 2 will upon increase of capacity lower the frequency. Secondly, the experts agree that for the highest unloaded Q, a ratio of outer conductor to inner conductor should be 3·6 : 1. Where a heavily-loaded circuit is required the ratio can rise to 9 : 1.

Initial experiments took place with an apple juice can rated as 48 oz. and measuring 7in. deep by 4½in. in diameter as the outer conductor, having a centre section fabricated from similar tinplate roughly 1·2in. diameter and just under the 7in. long. The right soldering iron is essential to get the inner section properly soldered inside the centre of the can! (Other sizes of cans tried were 3¼in. by 7in., etc., and are still being worked on.) With a good iron and using a can-opener to take off the end of the can cleanly, the mounting of the centre spigot is simple enough although the consumption of solder can be alarming.

Stick with the 48 oz. size can if possible. The inner element consists of a section of tinplate about 7in. long wound round a broom-handle or similar former as a mandril, and soldered along the edge to form a tube. Initially, a copper tube was tried, but it conducted the heat away too fast from the soldering iron!

Note the lid, Fig. 4. If required or desired a lid can be fitted; it should have about ¼in. space from the centre conductor and will serve to keep the RF inside and complete the screening, but is not essential.

Resultant Circuits

Fig. 2 is literally a band-pass tuned circuit with an input loop located opposite the output loop, and was inspired by an article in *CQ*—for July, 1954. The writer's 30 watt two-metre transmitter has it in the antenna line; it tunes nicely to 147·33 mc and does not seem to have diminished the RF output power appreciably. The can has a lid, double-spaced air trimmer and input/output sockets. A somewhat similar type of high-Q cavity filter was described by G3FUL in the April, 1957, issue of SHORT WAVE MAGAZINE.

In Fig. 3 is shown a slightly different coupling, reminiscent of the BC-906 circuit, with possibilities for RF input circuitry. Fig. 4 indicates an interesting VHF oscillator. Forget pin 5, and either a 6C4 or 6J6 will fit in. Mount the valve socket as close as possible to the cavity. The *quality* of the grid condenser, not so much its size, will affect the

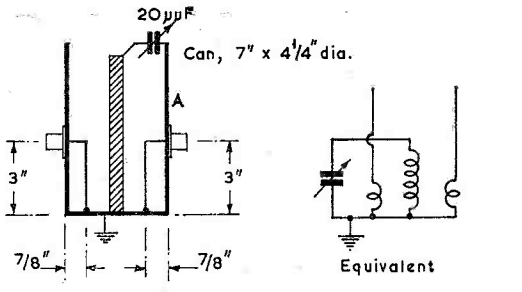


Fig. 2

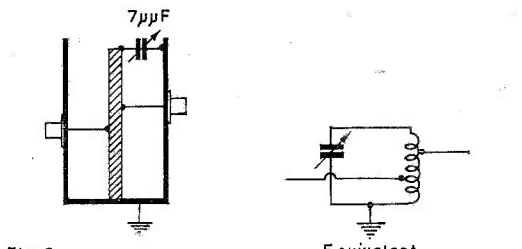


Fig. 3

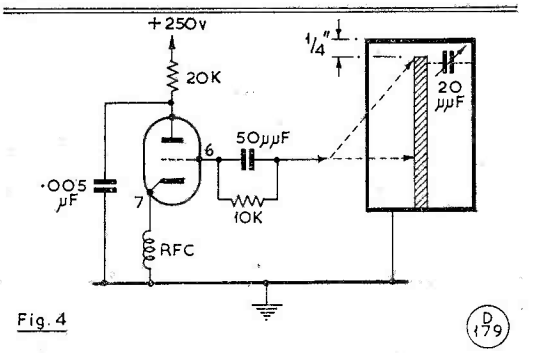


Fig. 4

stability. Tapping the grid leak down the inner conductor will also improve the stability. The cathode choke RFC can be the ground lead or else about five turns close wound to ¼in. diameter.

To date the most intelligent exercise carried out by the writer has been to produce the oscillator of Fig. 4 on 150 mc (as checked by the BC-906) then inserting band-pass filters (Figs. 2 and 3) all tuned to the same frequency. The objective is to prepare for work on the 430 mc band.

WEST AFRICAN APPOINTMENT

In expanding their African business, Redifon, Ltd., of Wandsworth, London—manufacturers of high-grade commercial radio communications equipment of all types—have opened a new sales office and customer-servicing centre at Lagos, Nigeria. In charge is C. K. Harrison, G3OPJ/5N2CKH, who also holds an air pilot's licence. His responsibilities cover an enormous marketing area, taking in nearly 20 of the new West and Central African states. We wish G3OPJ luck and good business in what should be a very interesting and stimulating job.

DX COMMENTARY

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

ONE of the great advantages of Amateur Radio as a hobby is the fact that one's interest in it need never die out. Circumstances may cause its focal point to shift from time to time, but there is never when one feels that the whole thing is so difficult, or conditions so poor, or QRM so bad that the only thing to do is to give up. There are some, of course, who do just that, but they, probably, weren't sufficiently interested in the first place. Incidentally, if all the new stations listed in the *Call Book* in each successive edition stayed on the air for good, then the situation might really become desperate. (Another 14,000 licences were issued between the appearances of the Spring and Summer, 1963, editions !)

What we are really getting at is this—if summer conditions fill 14 mc with short-skip, one doesn't just pull the big switch and go off the air until the autumn. Some 3·7 mc phone can be tried, or 28 mc on ground-wave, or Top Band can be used more often. And, of course, there's always VHF and Mobile, to say nothing of RTTY . . .

The change in emphasis works in both directions; this summer some keen 14-mc men have appeared on Top Band, but most of the Top-Band DX ops. have had a fling on 14 mc ! And those SSB types who were always in a huddle around 3800 kc, waiting for "rare" DX to show up, have disappeared from their habitual spot—but certainly they are not merely waiting for the winter. You can be quite sure that they are up to something, if it's only the design of bigger and better linears or possibly the erection of some mammoth aerial system for next season.

It would be amusing to produce a kind of Glossary of Amateur Radio Types. There's G5--, the specialist in "rare ones," who has hardly been heard since 1947 unless there is a new one in the offing; the mere appearance of his call on the band serves as a kind of alert. There's G3---, who works phone only and doesn't care whether his QSO is local or DX, but is invariably heard arguing about the rights and wrongs of this or that type of SSB generator, or filter, or linear. There's G3R--, or G3S--, working away like a beaver with his recently-assembled DX-40, very proud of his 100 countries in six months and probably a good deal happier than G8-- who, with his house-full of the latest American equipment, is as miserable as sin because he missed that DX-pedition that would have put his score up from 320 to 321.

And there's even the type whom we look on as "the happy innocent," who has been on the air for years, enjoying every minute of it, but can still pop into the local club meeting and say "I heard my first VK this morning, but of course I couldn't raise him"; or "I heard a station signing ZD6RM—anyone know where ZD6 is ?"

Yes, it takes all sorts . . . and how lucky we are that the bands are not full of identical people, all either voraciously gobbling up the DX or all nattering away about the superiority of mechanical filters. Happy is the man who can say that he doesn't respond to type-casting at all, but has a bash at everything within reach.

Predictions

For some months comment has been made on the unreliability of short-term propagation predictions. (The actual conditions still continue to be better than the predictions indicate.) Even more interesting is the fact that people are now trying to predict the progress of the long-term sunspot cycle, with widely-varying results.

Some of the more depressing types were suggesting, a while back, that the phenomenal sunspot peak of 1957-58 was the last really good one that we should see in our life-times. The long-term cycle, it was said, had a kind of sawtooth envelope, and this very high peak would be followed by an unusually low one. In fact, so their doctrine ran, the maxima for the rest of this century might not be much higher than some of the *minima* between recent peaks.

So it is intriguing to note that other ideas are now being aired. One of them even suggests that there are indications that the peak of 1969 will be even higher than the last one, and that of 1980 higher still ! It's all guesswork, but interesting, nevertheless. And now the confirmed pessimists are beginning to say "Look at the congestion on the DX bands right now. If we get another big peak the whole thing will be complete chaos." And, in the extreme case, "I've slaved all these years to work over 300 countries . . . and now conditions are going to get so good that every child will be able to do it. Devaluation, I call it." One thing is certain—if we *do* build up in the next five years to another high peak, every single kilocycle we have will be needed—those 1700 in the 10-metre band will be mighty useful. So don't let's neglect Ten.

REPORTING ACTIVITIES ON SIX BANDS

DX News from Everywhere

DX-peditions invaded Europe in a big way, and at times they all seemed to be working in the bottom 10 kc of *Twenty* . . . what with 9A1TAI and M1QJ from San Marino; the Hammarlund twin stations F9RY and F9UC, as well as the "independent" F8FC, all from Corsica; and PX1OX and 1IK rubbing shoulders in Andorra, things were often pretty lively. Hearing some of the frightful signals that came back to them at times when the skip was short, one was reminded of what happens when you stir up a muddy pond. All good fun, if not always clean.

Gus, after his mammoth operation from VS9KDV (Kamaran) was heard signing MP4QAR/4W1, and also W4BPD/4W1, but he left those parts early in July and flew to Calcutta. Latest news is that he may well be operating from AC5 by the beginning of August, before going by pack-train to the Capital City. There he will be installing a two-element beam and an SR-150 transceiver for AC5PN and the King of Bhutan. His pack-train trip "passes a corner of AC4-land"! He hopes to be on from the Neutral Zones in Arabia, around November or December.

FP8CB operated all through July, CW and SSB on all bands . . . CR8AC is back on the air from Timor, 7 and 14 mc CW only . . . The situation in Turkey remains enigmatic, as ever; the best description of it that we have heard is that "they are all pirates, but genuine pirates"! Take your pick from TA2NK, TA5BY and TA4SO.

There has been a phoney signing ZM7AD; the real one is ZL2BCH, who runs 15 watts of CW and AM on 14 mc only . . . A group of LU's plan a trip to South Sandwich, South Georgia and Falkland Is. . . . JT1CA has been activating Mongolia very generously, mostly 14 mc CW and SSB.

HL9KT, now coming on shortly as HL9KO, says he has been listening with exasperation to QSO's between BY9SX (Manchuria) and BY1PK (China). The WGDXC *Bulletin* comments "that reminds one of the two barbers trying to make a living shaving each other."

The real situation around Oceania is a bit confused. However, the Hammarlund operation (VK9BH on Nauru) went off well, but not for Europe; VK6ZS/VK9 (Christmas Is.) did show up, but unfortunately a pirate using the same call caused some confusion; VK4JQ started from Willis Is. but will not be fully operated for some time.

ZS2MI (Marion Is.) is being reported again . . . VS9MB is back on SSB after trouble with the rig . . . VR6AC will leave Balboa for Pitcairn on July 24.

VR4CU (Solomons) was very active during the first half of July; there is some chance that the same crew will show up as FU8AF (New Hebrides) . . . HK9LX was HK3LX operating from the Rio Amazonas district . . . VK9DR (Christmas Is.) is known to be building a rig, but premature appearances suggest a pirate . . . VP2CC/C was on Carriacou Is., and will count either as St. Vincent or Grenada, not as a new one.

ZD7 will be activated from about August 7 by G3PEU, signing ZD7BW; CW and SSB, mostly 14 mc . . . ZD8 operation is promised by W5HSG, if he can get a licence . . . VQ8BFA performed in real cloak-and-dagger fashion (only the initiates knew what was going on) from Agalega. But the Decree is that it doesn't count separately!

Express Service

If you are very lucky you may hear the first news of some new DX event by tuning to 14002 kc. The call of the late W6TI (Horace Greer) has been issued to the NCDXC, with W6WX as chief trustee. A "QST de NCDXC" on 14002 kc will indicate that some hot news is about to be spread. A keyboard-type perforator is used, with a home-built keying head, and news is transmitted at the rate of about 20 w.p.m.

W4KVX, the originator and publisher of *"DX,"* also uses 14002 kc extensively, and if you have some hot news and a potent enough signal, he will often reply to a blind call on that frequency (but give him time to get across the room!).

DX News from Readers

From GW3AHN: The Trinidade expedition promised by PY4AS did not happen (the authorities wouldn't allow civilians on the island) . . . W9JJF was due to appear in Portuguese Guinea (July 10) and should operate thence for several weeks; also possibly from other rare African spots . . . ZM7AD is on 14100 kc CW, QRP AM and SSB . . . W6FAY/KP6 is on from Palmyra at present, moving to Jarvis Is. in September . . . VK9BH left Naura July 18, but the resident amateur, VK9AM, hopes to be using SSB soon . . . VK4JQ (Willis Is.) on 14149 and 14305 kc SSB, but no European QSO's yet.

From 5N2AMS: Has now left England for the Middle East until August 1965. Licences for HZ1 and MP4 are already settled, with

FIVE BAND TABLE

Station	1.8 mc	3.5 mc	7 mc	14 mc	21 mc	Countries Worked
G3IGW	28	53	102	132	127	184
G2YS	22	75	99	184	130	208
GW3CBY	20	37	56	81	34	103
G3NFV	17	57	44	112	125	177
G2DC	14	102	149	291	273	312
G3KMQ	13	47	65	187	77	208
G8VG	12	38	86	159	87	179
G3PEK	12	30	56	81	36	95
G3HZL	11	52	94	159	125	187
G3IDG	11	17	27	53	64	94
G3DO	10	73	64	298	223	311
G2BLA	10	40	77	100	99	153
G3PMR	10	5	20	37	21	48
G3FXB	9	105	164	290	270	314
W6AM	8	30	59	316	87	321
G3PEU	4	26	22	134	72	154
G3NOF	2	33	23	201	185	246
G3RFS	2	9	48	98	10	105
G3BHJ	1	18	29	84	165	180
G3RFE	1	24	4	56	68	101
GW3PSM	1	26	38	56	25	77

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

hopes for YK and JY, subject to clearance by the Internal Security Services. Visas for AC4, C9 and BY, but no radio permits as yet! VS9 call from Aden expected, but 4W1 has been refused, as amateur activity thence is illegal.

From VS1GQ and '1GC: The Changi Radio Club station (VS1GZ) will soon be in full swing again. Several past operators have gone home, but VS1LQ, 1LR, 1LV and 1LX have all turned up to revitalise things. 150 watts on 7, 14 and 21 mc, CW and AM.

From 4S7IW: A 7 mc groundplane will be up soon, and 9M2GV says he is building a 7 mc Quad! But main activity from '7IW will be 14 mc SSB, and he is the only 4S7 on that mode (with a KWM-2).

From W2EQS: Laying plans for a return trip to St. Pierre et Miquelon with W1YIS/FP8BC, covering the last week of August and first week of September. All bands, Fifteen to One-Sixty (useless to figure on Ten now!).

From G2DC: The promised VK6ZS/VK9 sortie has "gone astray" and is not likely to take place. VK9DR will be on at weekends—14100 kc CW at 0600, and 14305 kc CW at 1300 Sundays . . . Also possible that VK9XI will open up with CW on 14008 and 14052 kc (QSL *via* W4WTF) . . . VS1LP sounded out the Indonesian authorities about a licence, and was told nothing doing, but the situation may change shortly . . . Danny Weil is in Texas, having arrived in Freeport after a non-stop run from Fiji. *Yasme III* will be cleaned up and disposed of in the open market . . . Peter, VP8GQ, will be in the South Orkneys for another nine months and promises even greater activity this winter . . . LA5HE, met at the Longleat Mobile Rally, said he had been visiting "our leading SSB stations" and that he had been greatly surprised, since he had always understood that our maximum power was 150 watts. No comment!

Top Band Expeditions

Whenever the slightest hint is dropped in this column that Top Band is under the weather, owing to static or long hours of daylight or whatever, in come the letters saying "Where does this idea come from? The band is in marvellous shape." And so it is this month. The devotees are certainly a faithful crowd. Despite this, there has been no real DX on the band. The most interesting feature just at present is the great number of expeditions to "rare" counties, and as many more are planned for the near future, listed herewith are those on which information has been given.

G3JEQ will be travelling with no set itinerary, mostly in Scotland, with the goal of a new county each night. Dates, August 10 to 24. Frequency, 1825-1830 kc. Times, 2130 GMT until there's no one calling! You can see a picture of his very fine /M, /P rig on p.297.

GI3PLL has no fixed station, but with his /M or /P outfit, can put out a signal from rare spots very easily. In June he was in Fermanagh, and now hopes to be there at week-ends until further notice. Times, 2000-0200 GMT, Saturdays and Sundays.

G3RPY and G3NJF will be in Scotland from August 17 to 24, and will be operating Top Band as well as VHF; no fixed route or programme, but on the air from "somewhere" most mornings and evenings.

GM3ROA/P will operate from St. Abb's Head, Berwickshire, during August 18 to 24, assisted by G3PVD and G3RKR; half-wave aerial, CW only, special QSL's (they hope).

G3REP and G3RRT will be /P from Brecknock, Radnor and Hereford, August 1st to 8th, with a 62 Set and a transistorised rig.

The Channel Islands DX-pedition have decided to use the call GB2GC from Sark (August 9-11), Alderney (August 13-15) and Jersey (August 17-21). This applies to Top Band and Two. The operators may be using their individual callsigns (GC3OUF, 3PCL, 3PCR, 3PSH, 3ROP) from Jersey on the other bands. (This supplements and corrects the information published last month.)

G3OBY/P (Wolverton Radio Club) will be operating from Rutland using SSB (1900-1930 kc) on October 5 and 6. All calls, all modes, will be answered, providing they are on frequency.

Other Top-Band News

G3OLN (Cheltenham), who has been on the band about three years, has worked over 1100 different stations; this is, incidentally, a measure of the activity on 160 metres . . . G3RRU (Greenford) now shares the second rung of the G3P--/G3R-- Ladder with G3REA, thanks to "three lucky glances" at the band. These brought him G5PP/P in Bute and Kirkcudbright, and GM3PWK/P in Argyll . . . The former G3NNF (Wantage) has now become GW3NNF (Talsarnau, Merioneth), whence he is already active on SSB with a half-wave 55 feet high at the centre; he is getting good reports from all over the U.K. and has worked GM3FSV (Orkney). Active most evenings, 2200-2300, and a good stock of QSL's in hand!

GM3IKD (Dunfermline) writes "Since the 'owners' of the DX end went off I have done pretty well with W3, 5A3, PA, HA, HB, OK and so on." He says he has been delighted to find that "the usual DX pests" were not around to keep telling one to QSY off *their* frequency. (We have had other comments on this business, too.)

GM3KLA (Shetland) is looking forward to the DX-pedition peak and hopes to work them all, including the GC's; he is at last in the home straight with over 90 counties, and would be thrilled to complete the list.

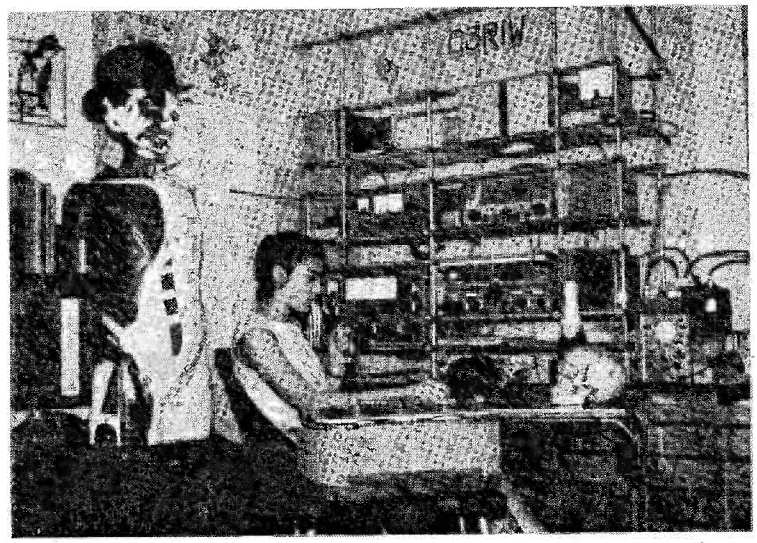
G3REA (Warrington) says "It's the best lucky dip, these days, that I remember. So many /A's and /P's, and never a clue where they are until you work them. Much more interesting than working a straight call and knowing where he is."

GW3PPF (Cardiff) would like to congratulate GW3RRU/P and says "his handling of the pile-ups was really superb and a wonderful lesson for any potential DX-pedition operators."

G3GGS (Chorley) heard K3MBF (449) at 0245 on July 14, and noted G3OUV working

VE1ZZ cross-band (80/160). G3RHM (Greenford) will be working from Hunts. on phone during the third week in August.

G3PLQ writes from Sierra Leone once more, and should be home by early August. He quotes a letter from Rolf (PY1-15652 in Rio de Janeiro) who says "Is 10 watts the power limit in G-land or is there another licence class which permits more power? If negative, hats off to all G boys who have worked such wonderful DX with their 10 watts." Rolf has a splendid QTH, in a club-house on the beach, no houses anywhere near, and space for five miles of aerials! He will be pleased to fix listening skeds with G stations (use the PY bureau, and address to PY1-15652).



Station G3RIW is owned and operated by Miss Beatrice Whitaker, 51 Chevening Road, London, N.W.6. Her equipment includes a KW-77 Rx and transmitters for all-band coverage. Note how the frame-work for carrying the gear is built up by use of adjustable tubular fittings. It should be explained, that, as well as Amateur Radio, G3RIW is actively interested in human physiology, the keeping of lizards, and breeding a particular species of beetle. She refuses to explain the significance of the skull!

Daylight DX?

G3CNM (Cheadle) has been asking himself what really constitutes "daylight" on Top Band, and has adopted this standard for himself: No QSO counts as "daylight" between the beginning of September and the end of April; during the remaining months May-August contacts are only counted between 9 a.m. and 5 p.m. (or four hours after sunrise till four hours before sunset). At other times, he argues, you cannot be sure that propagation is 99 per cent due to ground-wave.

With these strict standards set, G3CNM is working towards a WABC, with 35 counties to date, and is pleased to think that he is probably the only one doing so. Another activity he recommends is the learning of a foreign language; he can cope in Czech on CW (but not phone!), has worked over 130 OK's, and finds it much more pleasurable than the rubber-stamp QSO.

Eighty and Forty

This month these two bands are lumped together, since very little DX has been reported on either of them. The European DX-peditions have been using them, of course, which has enticed some of the 'chasers away from Twenty on occasions.

G3GGS, on Eighty CW, raised W4BPD/4W1, F9UC/FC and KV4CI (0036). Forty CW fetched in W4BPD/4W1, PX1IK, FP8CG, F9UC/FC and VQ4IV (2100); he found the latter band very lively around midnight.

G3OUV, who admits to having been a keen Top-Band fanatic, tried CW on Eighty and Forty "just to see what he could do." Result: A "CQ DX" call on Eighty at midnight brought back VP8GQ. 9G1EI, W2 and VE were also raised . . . 18 countries worked in 10 days. Best on Forty were a PY2 and two KV4's. VE1ZZ was raised on both bands, and also heard G3OUV (229) on One-Sixty.

G2DC was pleasantly surprised when he took a look at Forty at 0500 GMT, and found the band lively with DX "coming in crisp and clear like locals." He worked EP2DM, F9UC/FC, PX1IK, HC1CU, HK7AN, PY2DAG and 7AR, W 1-4 and 8.

G3PIT (Topsham) reports on both bands, which he has been working on CW. Only east coast W's and VE's on Eighty, although he heard stuff like VS9KDV, W4BPD/4W1, WØDCA, FP8CB, PY'S and VS1LP (sending unanswered CQ's at 2305). Forty was more interesting and yielded UM8KAA, FP8CG, 5N2ACB, KZ5CU, W4BPD/4W1 (all between 2245 and midnight). Later hours brought in CE1BD, XE1OK, VS9KDV, FP8CB, KZ5FC, PJ2AE and VK5KO (0605). G3PIT sends a long commentary on 7-mc conditions to most parts of the world. Very interesting and informative, and a pity we haven't the space to quote it all.

Twenty Metres

Very tricky at times, this month. QRM from commercials, short-skip at fantastic strengths (even from G's), and changeable conditions. In short, all you need to make it—well, interesting.

G3DO bagged two all-time new ones on SSB with VK9BH and VS9KDV. G2DC worked Gus in 4W1 for his new one, as well as EP2AS, ET3AA, FB8ZZ, HC1FG, KJ6BZ, VR2BK and 2DM, VR4CU, VS1LP, VS4AR, VS9MB, ZS3A and 9M2GJ—all CW.

G3FXB has put up a full-size 14 mc beam, which, though only 28 feet high, is out-performing his former multi-band set-up which was at 40 feet. He says "It's fun to have a commanding signal on Twenty at last" and proves it with the following: *SSB*, AP2MI, DUØDM, FL5A, HI8AKU, HL9KR, JT1CA, MP4QAR/4W1, OA4M, TI's, VP2CC/C, VR4CU, ZL1ABZ, FR7ZC/E. On *CW*, VQ8BFA, VK9DR (Christmas Is.),

VS9KDV and 5T5AD.

G3BHJ, on SSB, raised EP2AB, ET3MEN, FP8CB, LX1DE, OY7ML, VS9KDV, VS9AAA/ZE1JE and ZP5CF. G3RFS, running a home-built 40-70 watter with a ground-plane and a dipole, raised 6W8AC, HK7XI, ZB2A, PX1IK, F9UC/FC, M1QJ, W's and the like; he has worked 105 countries since last August, when he was licensed.

G3NOF found the band good for Africa and Central America in particular, and his SSB raised FG7XT, FM7WQ, FP8CB, HC5EJ, HI8ORC, HK3LW and 9LX, OA3M, PJ2AA, TI2MY and 6CAL, VP2CC/C, VS9KDV, W4BPD/4W1, YN3KM, YS1RRD, 5N2JKO and others.

GM3JDR worked CW with CP5EZ, HL9KP and 9TH, JA 1-8, KR6BQ, VS1LJ, VS9KDV, W4KKA/VS9M, VQ9HB, W4BPD/4W1, 6O1ND and 9M2UF. SSB was used for CR9AH, CX's EP2BR, OA1W, OD5AX, PZ1AG, TU2AE, UAØ's VS9KDV, VP2CC/C, MP4QAR/4W1, 5R8CM, 6O1WF, 9G1EO and 1EX. He makes a few cutting remarks about the "big boys" and says he is only QRP with his 150 watts.

G3RRU, keen Top-Band man, deserted that band and went for some CW DX, including 6YAXG, CE's, VE3FFW/SU, SM6BQL/9Q5, VQ2 and 4, PJ3AN, VS9KDV, W4BPD/4W1, 5X5JG, 5N2, VS9BM and 6O1ND. GW3PSM, also on CW, raised the various European DX'ers, plus VP9FK and HZ1AB.

G3NFV stuck to SSB and booked in 5X5IU, JT1CA, EP2AB, 9G1EO, VS9KDV, VP2CC/C and the European types. G3GGS didn't use this band much, but raised W4BPD/4W1, M1QJ and PX1OX.

Fifteen Metres

The falling-off of 21 mc seems to have been arrested, and on some occasions strong signals, even from the USA, have broken through the short-skip QRM. And it is still the best hunting-ground for AM phone. G2DC says "lack of activity makes this band a poor one—it will still carry the DX OK." He worked CR6AA, CR7IZ, CR9AH, FB8XX, JA1ELX, VS1LV, VS9ADV, VS9MB and VK3AMR, all CW.

G3BHJ, on SSB, raised VQ2RW, VQ4AA and 4DS . . . G3FXB, on AM, worked CR7EE, VK6QL, VS1GC, 5H3HG, 5U7AC and 9U5CM. CW accounted for FR7ZC/E.

G3NOF has been hearing the W's around 2300, even if the band has gone dead, as it sometimes does, at 2200. In the early evenings many signals have been noted from West Africa, Central and South America. He only worked W's and K1TFX/MM. An earlier remark from G3NOF reminds us that the scarcity of reports for this band probably has quite a lot to do with TVI . . . a very large proportion of the population are served by that channel on 41·5 and 45 mc, and undoubtedly 21 mc operation during TV hours is tricky in many places where 14 mc just gets by.

Ten Metres

You could hardly call this a flourishing DX band, but at least it is not so neglected as it was six months ago. Sporadic-E and other types of short-skip conditions have made it possible to work a lot of medium-distance countries, which interests some of the newcomers quite a lot.

G3NOF says that signals from here and there have been coming in as late at 2000 GMT. The only DX heard was also worked—VQ4AA. G3GGS (the only reader to report on *six* bands) says he had an interesting QSO with DL7AA, who told him that in the previous five weeks he had worked 40 countries on Ten (mostly Africa, South America and the Near East), but he also said that there were some fine East-West openings the week after the "needles" were sent up. Rudy, DL7AA, is using 200 watts to a Hy-Gain beam at 80 feet.

G3IDG heard 18 countries on the band, all European, but the interesting point is that 13 of them were on CW—a big change from, say, a year ago.

SWL Dave Gray (Easington) asks whether anyone ever heard the like of the 14 mc band this month. "Short-skip, long-skip, rapid DX openings closing equally rapidly, DX-peditions galore, klots, noises like ailing concrete mixers, but, above all—DX!" He has found things lively around 1800 GMT, quietening down from 1900-2000, but that's only the calm before the storm, and from 2000 onwards there have been needle-bending SSB signals around 14100-14125 kc from all sorts of choice DX.

He heard PJ2AA telling of the great pressure put on "rare" CW/AM stations, by the W's, to go on SSB. They don't realise the difficulties of the remote spots—no spares, no discount, no trade-in, and so on, and freight charges are often excessive.

G2DC reports fourteen regular commercial intruders in the 14 mc band, some of which may be harmonics. The "shocking affair"

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
	CW and Phone	
G2NJ	98	98
G3OIT	93	96
G3NPB	93	94
G3LWQ	93	93
GM3KLA	88	91
G3OLN	86	92
G3NFV	85	87
GM3PBA	85	86
G3PLQ	83	89
G3JFO	82	84
G3REA	80	82
G3OWR	77	80
G3OXI	76	82
GM3IKD	60	67
GM3PPJ	52	69
G2BP	52	56
G3OLU	50	54
G3IDG	50	53
G3RHM	42	56
G3HZL	25	52
	Phone only	
G3FS	86	86
G3NPB	85	85
G2NJ	49	49
G3OWR	41	54
G3OLN	36	49
G3LHJ	27	31

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

at the LF end, which spreads into the band, is Russian and signs UXY58, calls CLB23 and passes traffic from Leningrad. His second grouse is about the SSB tactics of some of the "big boys," and he mentions a gaggle of these birds on 14120 kc, waiting for the self-appointed "MC"—an SM5—to put them through to VK9BH. But as the SM told VK9BH which station was calling and then told the said station what VK9BH's report was, G2DC wonders how many *real* QSO's may be said to have taken place.

Some days later, he says, the same gaggle was there, the same "MC," but VK9BH was missing. The SM "repeated the calls every five minutes or so, with all the geese hissing away in their stall nearby." An hour later, still with no reply forthcoming, the SM said he had to go QRT, and would another station "take over"? Take over *what*, enquired G2DC on CW, but the geese hissed him off the frequency.

As a friend of ours recently remarked "All that remains, for me, after a QSO is the personal satisfaction of having achieved it . . . what is there for these types who make a very doubtful half-QSO and probably aren't even sure of that until a QSL finally turns up? And then what do they do with it—waggle it about in front of all their admiring friends, or what?"

Hard Times

G3IUG (Poole) asks "Why are we, especially down here in the South, tormented by teleprinters who plonk their atrocious signals just where we have a fairly clear space, between 1883 and 1869 kc, and on top of that, CW stations, Army installations, I believe, and in wet weather, interference from overhead grids, all day and night." Too true, we have much to complain of. But G3IUG's point is—will the shipping stations complain of teleprinter interference? Or do *we* get the blame once again?

It certainly is a bit hard, when you think of how ridiculously narrow our bands are, that we have to share them with all and sundry—even when they appear on the charts as "exclusive" amateur bands. Of course One-Sixty is very much a shared band; but "shared" is a very vague word. Does a mouse share a bed with an elephant?

G3FYR (Bromley) is ex-GW3FYR, GM3FYR and VS9AI. While in Aden he had 1800 QSO's, and still has 500 blank VS9AI cards; so if anyone who worked him still wants one, just get in touch (Top Flat, 31 Sandford Road, Bromley, Kent . . . *not* the QTH in book).

Movements

Barney Joel, ZS1AB, will be in London August 31-September 1, and, after visiting Europe, again from September 21 to October 9. Any G who would like to contact or meet him is asked to ring him at GROsvenor 6363. (Note from D. G. Rumsby, Wallington.)

G3SBP (Launceston, Cornwall) is ex-5N2RDG, and he will be returning overseas in September, destination at present unknown.

Late Flashes

Gus made a surprise appearance as AC5A on July 16. He was expecting to move off by pack-train about one week later, taking three weeks for the journey. (If you should hear him signing "W4BPD/?" he might be worth working!) . . . W6UOU and his family left VR4CU on July 16 and should have been on from FU8AF around the 18th or 19th . . . CR5AA (Portuguese Guinea) delayed in starting but should be in full swing by now (operator is W9JJF) . . . KC6AQ (Western) and KC6BK (Eastern) Carolines operate daily, 0700, 14260 kc SSB . . . SV1SV will be on from Marathon, Greece, August 1-11, mainly Sideband on 20 metres.

Sign-Off

And once more we take our leave, after an unexpectedly lively month. Things should really start humming now, and we look forward to the autumn DX season before the move towards the LF bands begins. Acknowledgments, this month, to the WGDXC *Bulletin*, W4KVX's *DX*, W1BB's Top Band bulletins and to all our readers who manage to scoop most of the red-hot news between them. Keep it up, please; deadline for the September issue is **first post on Monday, August 19.** Address to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Until next month 73 and—BCNU!

MAKING A QUICK TAP CONNECTION

When needing to make a temporary connection, or take a meter reading, it is worth remembering that a pin (ordinary domestic household variety) can be pushed through almost any insulating covering to make contact with the inside wire—this can save a lot of awkward fiddling, especially when the lead is a bit inaccessible. To do the job tidily, and make a handy tool, solder a length of flexible insulated wire to the pin-head. With a little practice, quite tight connections can be made by pushing the pin in so that the insulant (on the lead being tapped) holds the pin against the inside wire. There's just nothing to it—and *oh, so easy*, as they say on the commercials.

NOTE ON T/R SWITCHES WITH TRANSISTOR FRONT ENDS

Arising from the article on "Automatic Receiver Muting" in the July issue of SHORT WAVE MAGAZINE, it should be pointed out that T/R switches may not be safe to use with transistor receivers, or Rx gear incorporating transistor front-ends. As a general rule, the RF voltage at the input end of such a receiver must not rise above about 6 volts if transistors are not to be electrically destroyed. The change-over system with a transistor Rx must include a dead short on the tuned input circuit—it is not enough just to short the aerial terminals. Indeed, for proper protection, the receiver should be switched off and de-tuned well off frequency.

Miscellany

ITEMS OF TOPICAL INTEREST, GLEANED FROM FAR AND NEAR

WA6QMX and 6QMY are identical twins who have been crippled and confined to bed for over fourteen years, and Amateur Radio naturally means a tremendous lot to them. Their twin stations are relay-operated, and as they cannot write, they rely on each other's memory, one remembering the call-signs and names, the other more details of the previous QSO's. Relatives have now bought a station-wagon for them, and it is hoped to instal special beds and a mobile rig.

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Some technical writings of 1920:—"The carrier wave is very much stronger than the speech or music, and must be removed before these can be received. If it is not, it sets up a loud howl through which nothing else can be heard" . . . "The valve filament is caused to glow by a battery of secondary cells, and at once gives off negative electrons which ionise the vacuum or exhausted gas in the bulb" . . . "Most amateurs now want to use the three-electrode valve, and, as we have pointed out, this is one of the most perfect 'jamming' devices ever invented."

(From researches by G3NWT)

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Heard on the Air:—". . . calling CQ and tuning from the high end up."

(PAØ -- on 144 mc. reported by G3EDD)

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Strange People:—The operators of one of those Special-Activity stations, at a garden fête in the Midlands, have reported that every single call they made was deliberately jammed by a local (very strong) carrier, sometimes modulated by tape, BBC programmes and other noises. All visiting amateurs and students expressed their utter disgust at these tactics, for which no one could suggest any reason.

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"Not so long ago, Stuart Faulkner managed to produce a live Bulletin, filled up issue after issue with items of interest, properly printed and supported by advertisements. The reluctance of our members to contribute to this well-edited Bulletin was the main cause of its demise."

(Malayan Amateur Newsletter)

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More Technical Writings:—From Sweden: "Telefunken employed HF generators of moderate cycles, the cycles being raised in transformers. By deforming the transformer field with DC there were obtained overtones which were cultivated and raised in further transformers." And from Japan: "This reflection is an instantaneous flash that takes only two-thousandths of a second and is what is called the Optical Maser. Unlike electric waves, it proceeds in parallel fine beams of light that continue in straight lines over a long distance. A balloon placed in the course of the light was instantly blown up."

(Gleaned by G3NWT)

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Heard on the Air (during the recent DX-pedition to Corsica): "I get the 'F9RY' part of it all right, but why am I expected to *stroke Fox-trot Charlie?*"

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VHF types are well catered for in the July issue of *CQ*, with articles on Converting Commercial VHF Gear for Amateur Use, a "Nuvistaverter," and a 16-element two-metre Yagi. There is also an interesting description of a Solid-State Fixed-Tuned Receiver, using transfilters, into which a VHF converter may be worked. (In actual fact the "receiver" is so small that it could be mounted inside the VHF converter.)

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Violent reactions to the ARRL's proposed incentive scheme for licences (meaning the re-instatement of an "advanced grade" with extra privileges) are reported in *QST* for June. Other interesting articles cover the subjects of Aerials for Mobiles, Microwave Communication, a very cheap 21-mc Beam, a Solid-State SSB Transceiver and a tunable-IF device for use with VHF converters.

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Laser communication is with us (meaning amateurs) at last! A large group of W6's, members of the Amateur Radio Club at Optical Systems, Inc., in Pasadena, transmitted phone for 118 miles on the beam from a helium-neon gas laser. Previous attempts, not always completely successful, have covered only 25 miles. (Wavelength—6328 Angstroms; you work out the frequency!)

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Latest small gadget available in the USA is a "Nuvistor-Puller," which will do the job without scratching or squashing the Nuvistor. Though agreeing that it should be a great help in inaccessible places, when reading of "sizzling-hot Nuvistors" one begins to wonder what some people do to them!

And then there are those two WA2's ('WIR and 'VFW) who hold the Marathon QSO Record (99 hours on 50 mc!). Some of our own nets sound a bit like that, but in actual fact are about 97 hours short of the record.

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Oops, sorry! Last month a remark was included about disconnecting the lead-in and earthing it, when charged rain is falling, G3IWR points out that this is one way towards electrocution! (It was *not* suggested doing it during a thunderstorm, but we agree with his gentle suggestion that it would be more *prudent* to present the earth wire to the lead-in.) But when he adds "I'll be surprised if you have the courage to retract and print this comment" . . . well, we hope he is surprised. We repeat, with him—don't hold your aerial and present it to earth; hold the earth wire and present it to the aerial. After all, you never know when lightning may occur.

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Strange aerial systems one hears about on the air. First this month was a "horizontal Quad," which had us puzzled. But it turned out to be the result of a 90-knot gale, which makes it understandable. The one that really had everyone guessing was a W2 station who said he was using a "rotary vertical." Ideas about that would be welcome.

The ISWC is urging its SWL members not to send reports of any kind to stations in the countries which indulge in BC jamming, and says that "to get reception reports these stations have to bribe the listener with free holidays, or expensive prizes. One ISWC member has received a letter from Radio Bucharest offering him a *badge* in return for two reception reports!" Do foreign broadcasting stations really have to justify their existence by producing shoals of reception reports? If so, the sooner everyone stops reporting altogether, the better.

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In last month's "Miscellany" (p.265) mention was made of a "Home-brew *versus* Commercial" argument from the Wirral *Newsletter*. This month the home-brew supporters hit back in forcible terms; G3CSG, on their behalf, writes "Few pieces of commercial apparatus are ideal for the individual. When building your own equipment you build it to your own requirements . . . We want a new Tx for Field Day. Six bands, full break-in keying, T9x note, built-in electronic keyer, slide-rule dial, adequate drive from Top to Ten, TVI-proof. Anyone know where I can buy a robust, well-built, well-finished job for less than £20? It will save us a lot of time!" Well, he's said something there. . .

THE SUMMER "CALL BOOK"

The latest, Summer 1963, issue of the *Radio Amateur Call Book* ("Foreign Edition") has more than 100 columns devoted to U.K. amateur callsign/addresses. All new QTH's and changes of address as published in SHORT WAVE MAGAZINE up to and including our April, 1963, issue are taken into the Summer listing. The cost of this issue of the *Call Book* is 27s., post free. It gives the callsign/address of all known radio amateurs of the world *outside* the U.S.A. The American edition of the Summer issue costs 45s., post free, and lists nearly a quarter-of-a-million amateurs of the U.S. and her possessions.

FOR BEDSIDE READING

A book well worth putting on your library list for bedside reading which, while being completely non-technical, is yet of enormous radio interest, is *My Father, Marconi,* by his daughter Degna Marconi, published by Muller, London. Naturally enough, the book reveals many intimate details, never previously published, about Marconi's life and work. Though he was born with certain advantages, Guglielmo had great obstacles to overcome, both in the early days and much later in life, even when it seemed that the success of the Marconi Company was assured — in fact, his business and financial difficulties were scarcely less pressing than the technical problems he had to solve. He was at all material times his own chief engineer and director of research and nearly always his own financial adviser. The burdens he carried throughout his life were immense. Though his daughter's treatment of her illustrious father's life-story is naturally sympathetic, she is not blind to his failings and weaknesses (one of the most surprising of which was his predilection for pretty women). But the thread running through the whole story is that of a strong-minded man with a fine intellect, dedicated to the development of wireless as a method of world-wide communication. And even if his biographer does get her technical terms a bit mixed at times, that is a minor matter of no consequence in the context of the fascinating story she tells.

G5IC RETIRES FROM BBC

Until recently in charge of the big BBC External Services Transmitting Station, which is an HF-BC band complex at Woofferton, Shropshire, L. F. Ivin, G5IC, is retiring after having been with the Corporation since 1928. He started in the London Control Room, and was then at the Daventry and Brookmans Park transmitting stations. G5IC became engineer-in-charge at Woofferton in 1946. This is the station through which Britain addresses the rest of the world by short-wave broadcasting, so that its operations and programming are partly under Foreign Office control.

"CLEARING THE AIR"

FIRST REACTIONS, AND READERS' COMMENTS

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

The band-cleansing campaign which was advocated in the article in the May, 1963 issue of SHORT WAVE MAGAZINE *has met with quite a strong response from readers of all kinds. Most people agree with the whole idea but are rather pessimistic about the possibility of getting results. The reactions are very interesting—even the small minority who take exception to the whole thing are worth quoting. Further useful suggestions have emerged, as will be seen from the following summary of readers' views.—Editor.*

EVERYONE using the bands must realise, by now, that we are up against a traffic problem as acute as the one confronting the Minister of Transport. The number of amateur stations on the air is growing at a considerable rate, but nothing can be done about widening the bands which have to accommodate them. Instead, amateurs themselves must solve the problem by occupying less space, or less time (which amounts to the same thing) and by using every possible means of avoiding unnecessary interference with others.

More than 90 per cent of our correspondents face these facts squarely and agree that it is up to all of us to do something about it. The remainder either despair of the whole situation, or argue that everyone has a right to do just what he likes on the bands, within the terms of his licence.

The following brief extracts from letters show how widespread is the dissatisfaction with the present state of our bands.

Quotes from Readers' Letters

"One very effective way with persistently bad operators of the 'Klub' type is to send them QSL cards with M4 (or T4), or worse, in red ink. These cards go through the Club, and the head of same doesn't like his operators to produce bad reports" (G2BSA, Looe) . . . "Effective, very much to the point, and very sympathetic . . . I am sure that one's reputation with one's fellow amateurs is the most important thing—in other words, the efficiency of one's station, taking into account the question of expense. Better to have a nice 25-watt signal than a rough 150" (G2BJY, Walsall) . . . "Your article on Clearing the Air should be compulsory reading for every licensed amateur throughout the world" (W5PAA, Oklahoma).

"Please, if you cannot find anything more useful to fill the Mag. with, then leave these pages blank, and those of us who don't chase DX or fight for a position on a ladder can use them for taking notes during ragchew QSO's" (G3PHZ, Sheffield) . . . "Do something about the irritating and time-wasting habits of some of the phone nets whose operators still repeat their call-signs three times, plus location, almost every time they pass the transmission over . . . also beware of the long-winded gentlemen on Eighty SSB, because they *do* listen through (*and* between sentences) and I have been strongly told off by one when I commented to another member of the group that he was talking far too long" (G3WW, March).

Plea for CW

"Listening on the air to-day is enough to make a good *operator* consider giving it up . . . it appears that the present-day amateurs scrape through the Morse test with 12 w.p.m. and promptly go on phone. If only they realised, it takes skill to be a good CW operator, but any clot can babble into a microphone, and 'babble' is the right word, with all this C-for-Casablanca, Z-for-Zanzibar business" (G3EVA, Letchworth).

"This is more than a plea for cleaning up the bands. The Services and other Government departments welcome recruits from the amateur movement, and if these enthusiasts are already inculcated with good habits, the country will benefit. Moreover, if they don't become professional operators, their good manners will contribute just the same by increasing the respect of foreign amateurs and encouraging international amity" (E. O. T. Sabin, Shrewsbury).

Bright Idea

"I am now working on the practical application of 'Thought Modulation,' as I think this will beat even SSB. At least, with the many narrow-minded operators to-day, their signals will certainly decrease in bandwidth, and in many cases a complete lack of modulation will result, leaving room for the DX and the true amateurs" (G3RRZ, Bovington).

Support from the FOC

In the June Circular Letter of the First-Class Operators' Club their secretary, G3JLB, writes: "It is not suggested that we should 'police' the bands; rather to demonstrate, by example, how a station should be operated. Call these badly-operated stations, find out what makes them tick (or click). Burying our heads in the sand and tut-tutting about the menace will do no good—we must offer help, at the same time avoiding a superior attitude, and making the offer modestly and politely."

And in the July Letter G3AAE makes another point when he says that we may be "fighting a losing battle with the 'big brother' stations with lots of money and commercial gear, whose sole interest seems to be remaining on top of the heap . . . there remains a goodly number with clear consciences, good signals and good technique; the pleasure they get must be infinitely greater than that of the rat-race merchants."

Good Operators, But . . .

This latter point is emerging as an important one. There are people who are *capable* of being good

operators, but have become so DX-crazy that they will stop at nothing to prove their superiority over everyone else. Power limits go by the board; the "gentlemen's agreement" band-plan is scrapped, and if they want to use SSB in the CW bands, they think nothing of it. And *manners*—the less said the better. These types cannot be described as Lids or Klots . . . they are just plain vicious!

A very well-known DX-peditioner, who asks us to refer to him as "Dog X-Ray," fires a telling broadside about the harm done by "amateurs in all parts of the world who delight in indulging in the childish antic of 'I can blow my balloon bigger than you-s'." He derides the various DX bulletins, news-sheets, foundation bulletins and, most of all, "the cryptic, top-secret, cloak-and-dagger information disseminated nightly on 14 mc SSB between the chosen few of the hierarchy." And he adds that this matter of contributions ("one dollar per QSL") and the business of wealthy individuals sponsoring amateurs to travel to distant places for the sole purpose of satisfying the ego of a "hobbyist" makes one wonder how much of Amateur Radio is in the pleasure of communicating, and how much in Big Business, in one form or other.

"QSL Managers" are also suspect, when one notes the fierce competition to be allowed to spend money on cards, printing, postal expenses and the privilege of spending many hours writing out contact details. Are they all just supremely public-spirited people?

Final comment from "Dog X-Ray": "If your hobby is golf, you don't expect the rest of the golfing fraternity to pay your green fees, or your train fare to Gleneagles, do you?"

The Squeeze

So the picture that is gradually emerging is this: that on the one hand we have the real Lids . . . the types who, through ignorance, inexperience, or sheer stupidity, get in the way at every turn without achieving any particular results for themselves. On the other we have the "big boys," who ought to know better but are still willing to resort to anything, including assault and battery, to prove (to themselves?) that their own station is the biggest, best and noisiest in the world. And squeezed in the middle sit the vast majority of amateurs, whose interest lies in making their station as efficient and as well-operated as their capabilities and finances permit; who are interested in communication, but are equally concerned about the way in which it is achieved, with the minimum of interference to others.

This middle stratum of law-abiding, *decent* amateurs is the one that matters, and the one that really represents all that is good in the Amateur Radio movement. We have now got to find the means whereby they can curb the activities of the others—both the ignorant and the unscrupulous. The campaign must continue, and we hope for many more letters on the subject, so that further fuel can be added to the fire at frequent intervals.

Book Review

"Amateur Single Sideband"

FIVE years ago the Collins Radio Company published their *Fundamentals of Single Side Band.* This comprehensive work covered almost the whole field, including detailed studies of propagation and military equipments. It has now been supplemented by another publication entitled *Amateur Single Sideband.*

This new book from Collins will prove invaluable to the amateur designer for it contains much that cannot be found in the standard handbooks on the subject of Amateur Radio. Of particular interest is the analysis of transmitter ALC systems, a topic which seems to have escaped the attention of amateur publications. There are also circuits of a Phase Discriminator for PA tuning and a Loading Comparator — both are Collins developments which ought to find their way into amateur and commercial transmitters. A high-power linear amplifier incorporating these circuits would prove easy to set up and tune with little risk of damage to the expensive valves used in such an equipment.

The spurious responses which so often bedevil the amateur designer are examined in detail and a useful chart is given which should lessen the arithmetical burden when faced with a choice of injection and mixing frequencies. There are also Chapters dealing with Single Sideband Receivers, Tests and Measurements, and The Amateur SSB Station which also covers transmission lines, aerials and mobile working.

Amateur Single Sideband is not a handbook for the tyro who perhaps wants complete circuits to copy or modify, but is very suitable for the more experienced constructor who prefers to design his own equipments from sound basic data. Many of the circuits shown are taken from existing Collins equipments which have for long proved their worth and have a high reputation.

It is difficult to fault this new book, but perhaps an outstanding omission is in the design and application of crystal filters; the assumption is, apparently, that amateurs will all wish to use (Collins) mechanical filter units in their designs! The large complete circuit diagrams of the KWM-1, KWM-2 and 30S-1 equipments which were useful features of the earlier Collins book are missed in *Amateur Single Sideband,* and their inclusion in any following edition would be welcomed. The book is obtainable at 30s. post free through the Publications Dept., Short Wave Magazine, Ltd.

J. D. HEYS, G3BDQ.

VHF BANDS

A. J. DEVON

OBVIOUSLY, the sudden appearance over July 19-22 of a warm, sunny, windless spell of summer-like weather, with clear nights and cool mornings, produced an upsurge in VHF conditions. Equally obviously, it did not last very long, because by the 22nd a depression had formed over the Atlantic and started to move in across the U.K. and into the North Sea area. Likewise, this warm spell, being of short duration, did not allow the development of any very widespread area of good conditions—though as this went down the whole pattern was beginning to change again....

However, the opening was not at all bad while it lasted. On the Saturday and Sunday evenings, July 20/21, the nearer EU's were being heard and worked from the Midlands, and LA, OZ and SM were also available, for those who could reach out that far. Apparently, Sunday 21st was best for the Scandinavians, when some good contacts were being made by stations in the north of England.

Naturally, we have few individual reports covering this opening because (as so often happens) it broke after the deadline for this piece ! But from what your A.J.D. heard while compiling his notes for the present offering, quite a number of people were taking advantage of it, and having a very good time with the EDX. No doubt we shall know more about it by the next deadline.

EDX by MS

Going back a bit, a report from Harold, G5YV (Leeds), describes an MS contact he had, by schedule, with HG5KBP (Budapest), on June 29. The interesting thing about this is that G5YV was only running 90w. with a 5/5, the input at the HG end likewise being relatively QRP (for meteor-scatter working), at 150w., and using an 11-ele long-Yagi. This QSO is the reward for about a dozen sked attempts over the last two years, and puts Harold up to 20C in the Countries table. He explains that though he has a 750w. PA on a QRO licence, said PA was u/s when he needed it most, so the attempt had to be made on low power. The meteor shower used and due during June 27-30 was that named (believe it or not) Pons-Winneckeids, and is marked in the astronomical reference books as "not plentiful." Anyway, the density was sufficient for this G5YV/HG5KBP contact, and they are both to be congratulated on the successful outcome of a lot of hard schedule keeping.

Incidentally, the next meteor shower due is the well-known Perseids, during August 10-13, and expected to be of greater density than the P-W manifestation. It is the Perseids appearance which has been used so successfully in the past for VHF/EDX, by operators such as G3CCH, G3HBW and G3LTF. No doubt there are plans in hand for Perseids schedules, of which we shall be hearing in due course. Those who experiment with this rather esoteric technique for DX working usually say nothing about it until they have some results to report—and who is to blame them for that.

VHF Contest Notes

The field-day event on July 7 produced much the same pattern of results (and effects) as usual—a number of very loud /P's working hard for points under conditions that were no more than average, though EI2A was being called towards the end, and some EU's could be heard in the Midlands. After a shocking day on the Saturday, the 7th turned out dull, mild and damp in most parts of the country, though it was quite warm and the rain did hold off. And also as usual, conditions started to improve after the contest finished. The high scorers, in terms of stations-worked, were G3LIT/P near Harlow, who had 106S at finishing time; G3PIA/P, the Harwell group, were up to 106S about ten minutes before the close, and may have found a few more by 1900. At 1815, G6NB/P had 73S, having knocked off seven stations in the previous half-hour. G3CGQ/P, after the EU's for some time, were at 67S by 1755, and by 1815 fixed-station G3ASC (Oswestry) had worked 19S, while G3LAS (Berkhamstead) was up to the same figure by about 1830.

GW4LU/P, near Welshpool, had continuous generator trouble —it stopped about 30 times during the contest—but nevertheless he worked 94 stations for 10,574 points. His best contacts included G5ZT/P in Devon, EI2A, GI3GXP, G2YU/P for Norfolk,

70 CENTIMETRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1962

Starting Figure 4

From Home QTH Only

Worked	Station
30	G2CIW
29	G3KPT
25	G3LQR
22	G3LHA
20	G3AYC, G3EDD
19	G3BNL
15	G5QA
12	G3OXD/A
9	G3HWR, G3NOH, G5UM
6	G3BIK
4	G3EKP

This Annual Counties Worked Table is reckoned from September 1st, 1962 and will close on August 31st, 1963. Final placings for the year will appear in the October issue. The new Table for 1963-'64 will open on September 1st.

and ON4ZN/P, but the only London station heard or worked was G3OSS.

A break-down of the G3CGQ/P log shows 40 /P's worked out of a total of 70S, for 7,276 points; portables were raised in F, ON and PA. A very leaky C.E.G.B. pylon about a mile away to the NW was producing a 40 dB-over-9 noise, which meant that G3CGQ/P could not work stations in that general direction. Their portable gear consisted of a slot-fed 6/6; Tx running 17w. in the QQV03-20 PA, modulated by a pair of 6V6's; and a converter with no less than *three* RF stages, into a BC-348 tuning 7-9 mc; all heaters are wired for 12v., and power supply is from batteries charged by a P.E. set. Bill explains away the three RF stages in his converter by saying the "extra horsepower has been proved useful by experience"—and he has had 13 years of VHF portable working.

We would dare say that G3LIT/P could emerge as the winner of this contest. Located 330 ft. a.s.l. at Nazeing, near Harlow, the operators were G3JMA, G3LTF and G3LIT himself. The aerial is described as having been specially constructed by G3LTF (who knows about aerials) and amounted to four 10-ele lightweight Yagis at 1¼-w/l spacing, arranged in square; it produced contacts with F8VN (Paris) and PAØEZ, with EI2A heard. Their Tx was a 20-watt job, and the Rx a G3LTF converter tuning 4-6 mc on the IF side; power was by P.E. set charging batteries for transistorised HT units.

Some other contest gleanings: It would probably interest GM6XW/P to know that they were being heard, and vigorously called, by G3PIA/P . . . G3GWB/P worked ON4ZN/P at 1135 . . . G3FD/P got ON4LQ/A at about the same time . . . G2YU/P was an interesting possibility for Norfolk . . . G5ZG was on, for Essex, and OT G6OU was a very good signal from Basingstoke . . . The G3PIA/P boys are now ready for all VHF bands (well, they've got a dipole cut for 23 cm.) . . . The only station heard on CW (by your A.J.D.) was G3HBW.

Expedition Gen.

The proposed GM3IUB/P tour of the Lowlands was covered here last time. Before they go, G3NJF/G3RPY from Grimsby plan to be in "various GM counties," using their own calls GM/P on both two metres *and* four metres—frequencies will be 145·54, 145·63 and 145·72 mc, with 70·29 mc for 4m. Their dates are to be August 17-24 and, though no fixed programme is envisaged, G3NJF is *QTHR*.

For GB2GC in the Channel Is., the arrangements are: Sark, August 9-11; Alderney, August 13-15; and Jersey, August 17-21. Their frequency will be 144·20 mc, and operation mainly on CW, be it noted—unless conditions are good, phone may not be used at all. This will give those who still understand Morse a much better chance to work three new counties!

G3BOC (Wirral) will be signing GM3BOC/A from the very rare county of Sutherland during August 27-Septembr 13; let us hope conditions give him (and us!) a break. This is a regular holiday trip for G3BOC, and it usually means a new county for some GM's, even if conditions don't extend further.

23 Centimetres

The attempt by G3HBW on this band from Worcester Beacon (*see* this space, June) produced two contacts, with G3KFD and G3KPT/A, both at about 30 miles. Conditions were poor, and tests with G2RD/P and G3FP proved abortive.

G2CIW (Birmingham) now has a receiver for 23 cm. and is testing it with G3KFD; the 12-mile path between them has been proved workable on 1250 mc by an interchange of gear. These tests have also proved the importance of aerial height—even a few feet gained improves signals considerably. Jack's 23 cm. Rx starts at 35 mc, with two 6AK5's doubling the overtone to 424 mc, and then a tripler into trough-lines; the IF comes out at 24-26 mc tunable. The aerial at G2CIW is a corner-reflector arrangement which was adjusted using G3KFD's DET-24 tripler unit.

70 Megacycles

Though there is now a general plaint about the dearth of 4-metre stations, the regulars keep at it and find the band more and more useful and interesting. And it is astonishing what you can hear

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1962

Starting Figure, 14

From Home QTH Only

Worked	Station
77	G3BA
64	EI2A
62	G3BOC
60	G3EDD
56	EI2W
54	G3BNL
51	G3OXD/A
50	G2BJY, G3CO
48	G3JXN
47	G3HRH, G4LU
44	G3PLS
42	G3PTM
40	G3JYP, G3PBV, G3PSL
37	G2AXI
36	G3GWL, G3NUE
35	G2BHN, G3FIJ
34	G3OJY
33	G3JWQ
32	G3DVQ
30	G5QA
29	G2DHV/P, G3CKQ, G5QA
26	G3BJR, G3CCA, G3NOH, G5UM, G8VN
25	G3GSO
24	G3SAR
22	G3LQR, G3PTO
21	G3GVV
20	G3JHM/A, G3NPF, G3PKT
19	G3HWR
18	GI3ONF
17	GW3CBY
14	G2CDX, G3IOE, GW3ATM

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using only a 3-ele flat-top with an RF-27 Unit. . . .

G3OJE uses a simple 6BQ7A (twin-triode) converter into a CR-100 tuning 2·7-2·9 mc, with a 4-ele Yagi; his Tx is EL91-5763 driving a QV06-20 to 25w. Taken out /P, with a transistor PSU, 58 stations were worked during the contest reported here last month.

From up in Macclesfield, Ches., G3OHH writes that he has now worked 64 stations in 24 counties and six countries on the 4-metre band. G3OWA (Kingston, Sy.) is at 14C worked, from 54 different stations, in 10 months' casual operating from what he says is a "very poor VHF QTH."

SEVENTY CENTIMETRES

ALL-TIME COUNTIES WORKED

Starting Figure, 4

Worked	Station
40	G2XV
36	G3JMA
35	G2CIW, G3KPT, G6NF
33	G3JHM/A, G3LTF
32	GW3ATM
31	G3JWQ, G5YV
30	G3KEQ, G3LHA
29	G3LQR
28	G3HAZ, G3HBW, G3NNG
26	GW2ADZ
23	G3BKQ, G6NB
21	G3AYC, G3IOO
18	G5UM
17	G3BA, G3BNL, G3MPS, G5QA
16	G2DDD, G3BYY, G3MED
15	G2OI, G4RO
14	G2HDZ, G3FAN
13	EI2W, G2BDX, G6XA
12	G3HWR, G3NJO/T, *G5BD*
10	G3HWR, G3IRW, G5DS
7	G2HDY, G3JHM, G3OBD/P
6	G3FIJ, G3KHA, G3WW
5	G3FUL, G3IRA, G3IUD, G3LTN, G5ML
4	G3EKP, G3JGY

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

G5FK (of the G.E.C. Research Radio Club, Wembley) is on the 4-metre air every Wednesday evening. Supported by about a dozen operators—several of whom are well-known VHF types—G5FK is now up to 96 different stations worked, with cards from half that number, so they are on the way to a VHFCC "for 70 mc only." This is a certificate we shall be very glad to issue, with a small present *(neither expensive nor gaudy—Editor)* to the first claimant.

G8VN (Leicester) reports that he has acquired a Pye PTC-112, as suggested in our last, and that he has got it going on 4m. RF output is about 5w., and his first QSO was with G5JU in Birmingham—using an indoor dipole.

70 Centimetres

G3LTF (Galleywood, Essex) writes to say that with 33C now worked he is "slowly catching up." In fact, G3LTF is one of our leading VHF men (he is at 20C in the Countries table) and has a fine 70-centimetre paraboloid, 15 feet in diameter, which is arranged to sweep a large sky area by using the rotation of the Earth as one motion, and vertical swivelling the other way. We shall have notes and illustrations in an early issue.

G5QA (Exeter) keeps regular 430 mc skeds going with G3OYM of Chepstow, Mon.; G3KFD near Brierley Hill, Staffs.; and GW3ATM of Portskewett, Mon. Since last writing, Herbert has worked three more counties for his 70 cm list, in the shape of G2XV (the grand old man of Cambridge); GW3MDY for Flintshire; and GW4CG in Porthcawl for Glamorganshire. G5QA is off to the States on a business-*cum*-holiday trip so we shan't be hearing from him again for a couple of months or so.

The Tabular Matter

Your A.J.D. has been trying for months *(yes, months—Ed.)* to get an up-to-date version of All-Time Counties into this space. It was 'way back in February that the last printing appeared, and since then at least 50 movements have been notified. These claims have all been carefully entered, and your A.J.D. hopes and believes that none have been missed. It is not until about a page of space becomes available that the All-Time Counties Table can be shown again.

Because we have got on to this theme, your A.J.D. would like to ask attention to the general rule about sending in claims—please make them on a sheet separate from the report-letter, headed with your callsign and stating clearly which table the claim is for, as then they are not missed and the preparation of the tabular matter is simplified.

The Annuals close for the year at the end of this month—they immediately re-open again on September 1st, for the 1963-'64 season—and final placings will appear in October. It looks as if Tom, G3BA, is now unbeatable in the two-metre, but the 70 cm. position is still fluid; G2CIW will have to pay close attention to the 430 mc band this month!

Two Metre Reports

G3OHC (Birmingham) visited ON4FZ while on holiday over there, and found him getting ready for 70 cm. The ON4 calls having run out, licences in the ON5 sequence are now being issued to Belgian nationals—an ON5 callsign no longer means only a visiting foreign amateur.

An interesting report from G5MN (Hull), who has been on the band just about a year, and encountered his first real EDX opening during July 20/21, when DJ/DL, F, OZ, PA and SM were worked in the one session; more than a dozen EU's were involved in this marathon, and G5MN remarks that never before had he found the band so productive up there. At a QTH only 6 ft. a.s.l., he runs 10w. and the beam is a 5-ele at 38 ft. Other stations in the Hull area also pitching into the EDX were G3AGX, G3FCY, G3NEZ and G3OHT.

EI2A (Navan) continues to make good progress, with 64C for the Annual and 79C in the All-Time. Two mobiles have been active around Eire—EI4Q/M and EI9AE/M—and the EI fixed

stations on most frequently are EI2AG, EI2AH, EI2W, EI4Q, EI6D and EI7D, so there are enough of them to make a party of it. The EI2A/G3EHY sked continues to be almost 100% solid, often at S9-plus.

"The ears of Hereford are keeping a listening watch on two metres"—they belong to G3OSE, who has a 6/6 at 25 ft., and is in what is known to be a bad VHF reception area. However, he intends to persevere, get the beam up higher and improve the gear, all this activity having been inspired mainly by a visit from G3NUE.

A welcome report from GM3LDU (Clarkston Renfrew), who says that though conditions have not been good, he heard the following during the July 7 contest: G3IKV/A, G3KCB/P, G3LSF, GI5AJ, GW3ATZ/P, GW3JGA/P, GW3KMS/P, EI2A and a number of unidentifiable phone squeaks; his own solo QSO outside GM was with GW2HIY/P, and the only GM/P's heard were GM3KYI/P and GM6XW/P. Since then, some G's have been worked, and about 17 GM's either heard or worked.

GW3CBY/GW3DFF, in the Swansea district, are using transistor Tx's at both ends and have regular contacts over about 4 miles, input being 300 milliwatts; when out as GW3CBY/P, range was increased to 20m. on the TTx. They will be on Brecon Beacons for the next field-day event, over September 7-8.

Another to be working with transistory, but in rather a different way, is G3BYY (Staines) who is building for /M, using transistors for the early stages, and a transistorised PSU with a home-made toroid (wound while sitting in a deck-chair during that bit of sunshine we had a while back). Anyway, the result has turned out very successfully, the power pack giving 250v. at 200 mA and showing an efficiency of about 80%. The two-metre mobile Rx line-up is RF AFZ12, mixer AFZ12, osc. AF102, 1st IF OC171 (30·4 mc), 2nd IF EF97, 2nd mixer ECH83 with CO (32 mc), EF97-ECH83 2nd IF's at 1·6 mc, with OC71 and XC141 in the output stages, and OA81's for the NL and detector. Using a J-Beam halo and 6146 PA running 20w., also with transistors in the early stages on the Tx side, G3BYY had his first /M contact, from Wraysbury in Bucks., with G3JHM/A near Worthing, with good R5 reports both ways. The point about all this is that G3BYY says he didn't know the front end of a transistor from its base line when he started on the job at the beginning of the year. He feels the results "have been worth it"—so do we!

G2DHV (Sidcup) confines his activities on two metres to /P, /M working, and is making steady progress in the Tables; his portable beam is now a close-spaced 10-ele Yagi.

Referring to the comment here last month about sporadic-E, G8VN recalls that in June/July of 1948, just before we lost the old 5-metre band to TV, he worked OK3ID and heard several I1's and OE1CD; the spor-E opening on July 19, 1948, was probably the last experienced in 5-metre amateur working. Back to two metres, and the present, G8VN found some of the open patches and mentions G3ORL (Keynsham, Bristol) putting a good signal up Leicester way with an *indoor* 4/4.

G4LU (Oswestry) is another who has embarked on a transistorised two-metre Rx, using OC170's in all the RF stages; it is to have 24-26 mc tunable, and is already through the bench tests. He keeps mid-day skeds with G3BA and G3EJO in Birmingham, and mentions some interesting contacts with mobiles — G3AOS/M, G3KMS/M and G3LDY/M—all sustained and at distances of 50 miles or more, which says much for their gear.

G3AOS himself, writing from Hale Barns, Ches., remarks that up North they are disappointed with the present GB3VHF showing—the signal is poor and inconsistent, and the identifying characteristic is missed.

G3HWR (London, N.W.3) makes claims for the Tables, and says he is trying to improve the quality of his modulation — his full-power CW is perfectly all right, but when he tries to modulate it . . . *well!*

There are some VHFCC claims in hand, which it is hoped to clear before our next appearance — the delay in dealing with them is much regretted, but apart from this being the holiday season with its consequent office disorganisation, the general load of work has been heavier than ever (normally, we expect the summer months to be a bit slack—not so this year).

FOUR METRES

ALL-TIME COUNTIES WORKED LIST

Starting Figure, 8

From Home QTH Only

Worked	Station
34	G3EHY
27	EI2W
26	G3JHM/A, G3PJK, G5FK
24	G3OHH
20	G3NUE
19	G3BNL
18	G5JU
17	G3LZN
16	G3BJR, G3IUD
14	G3OKJ, G3OWA
12	G2OI, G3AYT, G3LQR, G5DS, GI3HXV
10	G3HWR
9	G3PMJ

This Table records 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.

In Conclusion

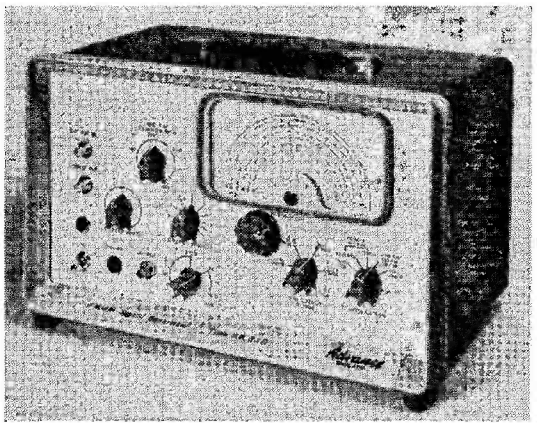
With a bit more time in hand this month, the deadline for September can be **Friday, August 23** —and it could well be that we have had a decent Continental opening by then. Anyway, look out for sporadic-E and watch the Wx charts. All VHF reporting to: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. With you again on September 6, all being well, and take care over the Bank Holiday. *73 de A.J.D.*

LOOKING BACK 25 YEARS

The August, 1938, issue of SHORT WAVE MAGAZINE featured the Maidstone Amateur Radio Society in the "Club History" series—it had an active membership of 38, with 2DBA (now W/Cdr. P. M. S. Hedgeland, O.B.E., B.Sc., G2DBA) as hon. secretary—and G8LY was in "The Other Man's Station" though she was in fact Miss Constance Hall (and is still licensed). On the technical side, G2UK described a Morse Recorder, and A. J. Devon's VHF piece discussed some exciting 5-metre EDX results. The general-interest article was on the Influence of Solar Activity on S/W Propagation, while A. A. Mawse's "Transmission for Beginners" offering described a general-purpose power pack (still in use, incidentally, though the chassis and metal components are a bit rusty after 25 years!). Webbs Radio and Avo were among the advertisers—they are in this issue, too. The Editorial took a swipe at Radiolympia, the national radio exhibition, which even at that time had begun to degenerate into "a display of rather cheap furniture, set off by mannequins" (*sic*)—some things don't seem to have changed much, even in 25 years!

GETTING "CQ" AND "QST"

Those interested in the American radio amateur periodicals *CQ*, *QST* and *73* are reminded that we can accept sterling subscription orders, or subscription renewals, at their current dollar rates, *i.e.*, without any premium, handling or postage charge, the cost for a year of 12 issues being, for *QST*, 48s.; for *CQ*, 44s.; and for *73*, 30s. Orders are forwarded by airmail to the publishers concerned immediately on receipt, and delivery is by surface mail from the American end. Send your order, or sub, renewal, with remittance, to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. We can also handle subscriptions for any American technical journal, radio or otherwise.



The new Advance Signal Generator type SG63D provides FM or AM output over a variable frequency range of 4-230 mc, in six switched bands, with a crystal check on the calibration at 5 mc intervals. The RF output range is 1 microvolt to 100 millivolts, with 100 dB attenuation in four 20 dB steps and continuously variable control over 20 dB. Six different modulation outputs are provided and leakage is less than 3 microvolts in close proximity to the instrument.

"MAGAZINE" CONSTRUCTIONAL ARTICLES

Readers are reminded that we are always interested in hearing about results and experiences with apparatus built or adapted from SHORT WAVE MAGAZINE constructional designs. A great deal of trouble is taken to get these articles absolutely "right"—and if errors do creep in, they are always corrected in a following issue—so it is helpful (not to say encouraging) to know whether readers get the results they expected.

SMALL ADVERTISEMENT COVERAGE

There is another very interesting spread of small advertising in this issue of SHORT WAVE MAGAZINE —*see* pp.328-335—with many attractive items on offer. The July Small Advertisement section was unique in that included for sale were a house (aerial situation OK), and a car (fitted mobile equipment), both these, of course, coming within our definition of "advertisements of radio interest only accepted." It is certain that if you are looking for any sort of good gear at a fair price, you will find it in Readers' Small Advertisements—though it may well be that it will be gone before you get in. There is a very buoyant market in used amateur-band equipment of quality. If you have anything to sell or exchange, or some particular "want," you cannot do better than use the Readers' Small Advertisement section of SHORT WAVE MAGAZINE—the cost (to readers, as distinct from Trade notices) is only 3d. a word, with a minimum charge of 5s. Draft your advertisement clearly and concisely and send it, with remittance, to: Advertisement Manager, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. And don't leave it too late for us to get it in.

USE OF THE /A SUFFIX

We are informed that where a *permanent alternative* address is notified to the Post Office, it is not necessary to use the /A identification, *i.e.*, the callsign may be used "straight" at both addresses. However, in such cases, the log record for the two stations must be kept in the same book.

"STOP PRESS"

Results of the 4th annual 160-metre DX contest organised by *CQ* were received on July 22, and show the following to be the leading U.K. scorers: GI6TK, with 17232 points; GW3JI, 16104; G3IGW, 13685; G5JU, 12210; and EI9J, 10395. Leading EU scorer, and the only one to beat the G-entry, was DL1FF, with 20880 points. No less than 253 U.K. stations are known to have taken some sort of part—but only 13 of them sent in a log!

"RTTY Topics": It is much regretted that because of heavy pressure on this month's space, it has been necessary to hold G3CQE's feature over until the September issue.

BALANCE-TO-UNBALANCE CONVERSION

75/300-OHM MATCHING UNIT FOR THE HF BANDS

THESE days, it more and more happens that it is required to match the unbalanced low-impedance (50-100 ohm) output of the transmitter network into a balanced feeder system, such as a 300-ohm or 600-ohm line.

At Fig. 1 is the basic HF-band circuit for this conversion, in which C1 and C2 are of equal capacity, and L1, L2 of the same inductance, the values being chosen to satisfy that condition where the inductive reactance is equal to twice the capacitive reactance, at the frequency involved. For single-band working, the appropriate values are given in the table, and in each case C1, C2 should be made variable.

Multi-Band Coverage

However, few of us are concerned with one band only (on the HF ranges, at least) and so it is as well to make the matching unit a flexible, multi-band device, and this requirement is met by the circuit of Fig. 2.

In this, C1 and C2 consist of a BC-type 500 $\mu\mu$F gang condenser (having the widest possible plate-spacing). L1, L2 are both of 24 turns of 18g. on a $1\frac{3}{4}$-in. former, with the winding spaced out by one wire diameter to a length of about $2\frac{1}{2}$ ins. Taps are taken at the 4th, 6th, 9th and 14th turns for the 28-7 mc bands, the whole coil being in circuit for 80 metres. Switches S1, S2 are ganged, and should be of good low-loss type—such as are found in the RF circuitry of many surplus units. The meters M are more or less essential for accurate working, since the adjustment is to find the C1, C2 setting for the same RF current in both arms. For transmitters running about 100w. input, thermo-couple instruments scaled 0-0·5 amps. RF are suitable. They can themselves be checked for balance ("equal reading") by connecting them in series with an RF source, any discrepancy being corrected either by adjustment or on the scale. (As all this is reminiscent of Zepp-feeder tuning in the old days, those a bit long in the tooth will remember that matched pairs of 6v. 0·5 amp. flash-lamp type bulbs could also be used with reasonably satisfactory results.)

The circuit of Fig. 2 should be built as a separate screened unit, and connected on the output side of the Tx network, to follow any LPF that may already be in use. The readings for C1, C2 can be marked for the various bands, so that band-changing is effected merely by switching the inductances and setting the condenser dial.

And it should be noted that this matching device can also be used "the other way round"—that is, between a coax-connected aerial system into the

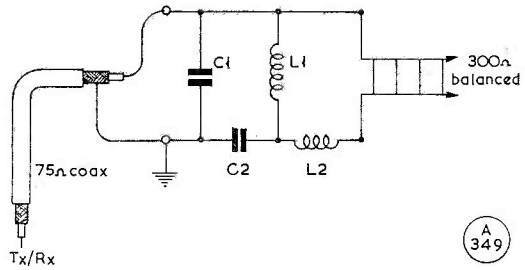


Fig. 1. Circuit for a single-band matching unit for 75 ohms into 300 ohms, transmission or reception. Values for each band are given in the table below.

VALUES FOR
Single-Band Balun Unit

Band mc	C1 = C2 $\mu\mu$F	L1 = L2 μH	Coil Data L1 = L2
3.5	300	14	29 turns $1\frac{1}{4}$-in. dia. by 2-in. long, close wound
7	150	7	22 turns 1-in. dia. by $1\frac{1}{2}$-in. long, close wound
14	75	3.5	12 turns $1\frac{1}{4}$-in. dia. spaced out to $1\frac{1}{4}$-in. long
21	50	2.2	9 turns as above
28	35	1.8	8 turns 1-in. dia. spaced 1-in., self supporting

(*Note: Use 18g. enamelled for both coils.*)

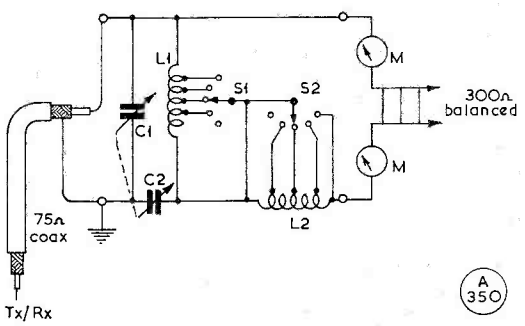


Fig. 2. A multi-band adjustable balun for the HF ranges, which can be used either way round. Values are given in the text, opposite.

"balanced Ae." terminals of the Rx, or to enable an open-wire feed line to be taken into the coax socket of the receiver. Of course, for purely SWL purposes the meters M are not required, and adjustment is merely by peaking on C1, C2 from band to band.

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.

DL2MY, W. Taylor *(G3MYU, ex-VS6EM)*, Gerdaweg 16, Detmold, Western Germany.

G3RK, H. A. Spashett, 38 St. Mary's Street, Bungay, Suffolk *(re-issue)*.

G3RMM, T. Bradley, 3 Lady Beatrice Terrace, New Herrington, Houghton-le-Spring, Co. Durham.

G3RNL, B. A. Watling, 286 Hempsted Road, Hempsted, Nr. Chatham, Kent.

G3ROU, A. V. Prosser, 25 School Lane, Meols, Wirral, Cheshire.

G3RTQ, J. A. Hordern, 111 Ridgacre Lane, Quinton, Birmingham 32.

G3RVC, P. Cochrane, 81 Martyn Avenue, Sutton-in-Ashfield, Notts.

GW3RVF, K. Brown, 25 Heol-yr-Efail, Rhiwbina, Cardiff, Glam.

G3RVX, J. Colegate, Glenhaven, School Lane, Batheaston, Bath, Somerset.

G3RWG, R. W. Gibson, 12 Park Road, Chandlers Ford, Eastleigh, Hants.

G3RWN, R. Harrod, 36 Lodge Road, Newthorpe, Notts.

G3RWN/A, R. Harrod, Heanor Technical College, Ilkeston Road, Heanor, Derbyshire.

G3RYJ, R. J. Robson, 36 Sandrock Road, Harworth, Notts.

G3RZA, E. B. Iddon, 152 Walthew Lane, Platt Bridge, Hindley, Lancs.

G3RZW, V. Wardle, 168 4th Avenue, Edwinstowe, Mansfield, Notts.

G3RZY, C. E. Abrey, 34 Rock Road, Royston, Herts.

G3SAW, J. G. Taylor, 42 Station Road, Heacham, Kings Lynn, Norfolk. *(Tel.: Heacham 235)*.

G3SAX, J. Robinson, Adrien, Queensway, Gerrards Cross, Bucks. *(Tel.: Gerrards Cross 2440)*.

G3SBF, B. V. Eames, 46 Ratby Lane, Markfield, Leics. *(Tel.: Markfield 585)*.

G3SBH, H. G. Cavill, Oak Hall, Inglestone Common, Hawkesbury, Badminton, Glos.

G3SBJ, D. J. Millard, 59 Climping Road, Ifield, Crawley, Sussex.

G3SBM, D. G. Turner, 9 Northwick Walk, Worcester.

G3SBP, R. D. Gynn *(5N2RDG)*, Hillside, St. Stephen's, Launceston, Cornwall.

G3SBQ, G. J. Smith, 54 Kynaston Road, Bromley, Kent.

GM3SBS, P. G. Bigam, 7 Hillview Terrace, Corstorphine, Edinburgh, 12.

G3SBT, R. E. Snell, 132 Battersea Park Road, London, S.W.11.

G3SBV, H. L. W. Bellfield, 195 Covington Way, Streatham Common, London, S.W.16. *(Tel.: POLlards 4381)*.

G3SBW, M. S. Chambers, 62 Whinney Lane, New Ollerton, Newark, Notts.

G3SBX, V. W. Dobbs, 11 Horsley Road, North Chingford, London, E.4.

G3SCB, R. A. Hinder, Rangemoor, Round Hill, Radstock, Somerset.

G3SCD, D. B. Dunn, 59 Church Lane, Winthorpe, Skegness, Lincs.

G3SCE, K. G. A. Gair, 62 Valence Circus, Dagenham, Essex.

G3SCP, G. J. Gilman, 31 Homestead Way, Luton, Beds.

G3SCU, J. Savage, Landour, West Garth Road, Exeter, Devon. *(Tel.: Exeter 77714)*.

G3SDB/T, D. J. Taylor, Crestwood, New Rowley Road, Dudley, Worcs. *(Tel.: Dudley 53441)*.

G3SDJ, H. A. H. Jefferies, 24 Holcombe Road, London, N.17. *(Tel.: TOTtenham 8715)*.

CHANGE OF ADDRESS

GW2CAS, J. Douglas, c/o Lloyd's Register of Shipping, Mersey House, 1 Quai de Rouen, Antwerp 1, Belgium.

G3AJB, H. H. Mills, 15 St. Peter's Road, Whitby, Yorkshire.

GM3BHO, J. R. Orr, 37 Hillside Road, Cardross, Dunbartonshire.

G3FYE, G. R. Phillips, 6 Ross Avenue, Davenport, Stockport, Cheshire.

G3GBH, J. H. Jones, 11 Belvedere Road, Bridlington, East Yorkshire.

G3IYG, B. E. Cook, 17 Prescot Road, Redhills, Exeter, Devon.

G3JGR, G. S. Rockwood, 34 Queen's Crescent, Burgess Hill, Sussex.

G3JNO, F. D. Buck, 30 High Street, Burnham - on - Crouch, Essex.

G3KQZ, P. F. Bernal, A.R.I.C.S., 38 St. Peter's Road, Ditton, Maidstone, Kent.

G3LKJ, B. E. Symons, 52 Reddenhill Road, Babbacombe, Torquay, Devon.

G3LOL, K. S. Livermore *(ex-MP4BDG)*, 30 Johnson Road, Barrow, Bury St. Edmunds, Suffolk.

G3LQP, R. Brown *(ex-VS1JF/GW3LQP)*, 32 Castleton Road, Goodmayes, Ilford, Essex.

G3LWT, P. W. Buck, 1 Greenacre, Salisbury Road, Broughton, Hants.

G3MBQ, S. J. Scarbrough, 95 Cavendish Road, Hazel Grove, Cheshire.

G3MGY, D. V. Mayers, 26 Groveland Avenue, Hitchin, Herts.

GM3MYO, A. M. Jeenes *(ex-VS2FF/VS9AAJ)*, c/o Officers' Mess, R.A.F. Station, Aird Uig, Timsgarry, Isle of Lewis, Outer Hebrides.

G3NAS, W. K. Ginder, 222 Whetstone Lane, Aldridge, Staffs.

G3NEP, P. Bradley, 121 Worrin Road, Shenfield, Brentwood, Essex.

G3OEQ, D. J. Bunn, 30 Orford Drive, Oulton Broad, Lowestoft, Suffolk.

G3OHT, E. Thackeray, 5 Eastgate, Patrington, East Yorkshire.

G3OYR, W. S. Llewellyn *(ex-GW3OYR)*, 65 Goldington Avenue, Bedford, Beds.

G3PHZ, J. C. Fogg, Cedar Oak, The Hill, Almondsbury, Bristol.

G3PYL, D. A. Justice, 314 Stannington Road, Stannington, Sheffield 6, Yorkshire.

G6JY, Dr. F. T. Farmer, 81 Grosvenor Avenue, Newcastle-upon-Tyne 2. *(Tel.: Newcastle 810400)*.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for September Issue: August 16)

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

FROM the reports that reach your Club Secretary from all over the country, it would seem that the Club movement is going through a rather difficult time at present, for no reason that is readily apparent.

During the last three months, two clubs have closed completely; two have changed from fortnightly to monthly meetings; several have abandoned weekly meetings on an organised basis.

In another case, for a pre-arranged visit to a place of considerable interest, only *four* members turned up; and another Club's field day had to be abandoned (on the day) because "only three or four" came along. And yet another one heard of was the sad story of a small club holding monthly meetings informally at a local hostelry; at their last supposed meeting the secretary found himself the only one there, so he had a drink and went home again!

On the other hand, some of the bigger and better-organised clubs are reporting record attendances at meetings, and excellent turn-outs for field events.

Looking at it from the secretarial chair, it is pretty obvious that the clubs that prosper are those with a pre-arranged programme of events, preferably printed out on a card, or a diary slip, and circulated to all members. This entails much work by the officers and committee, it is true; and in many cases they have to share the lectures and demonstrations among themselves, because no one else will do anything except just come along and sit down, waiting to be entertained. It is hardly practicable to make arrangements for visiting lecturers, if you never know whether anyone will turn up to hear them. So while failure begets failure, nothing succeeds like success—though it does mean that one or two members have to do most of the work.

Reading through the various club publications, we notice that some of the members get a pretty stiff talking-to by their secretaries and other officials . . . so it seems that constant prodding is necessary to counter the creeping apathy that can eventually paralyse a club.

At the same time, we can't help feeling that an interesting programme should be capable of fetching in enough members to make a good meeting. Another idea is only to have a meeting when there *is* something interesting on the programme.

"MCC"—MAGAZINE CLUB CONTEST

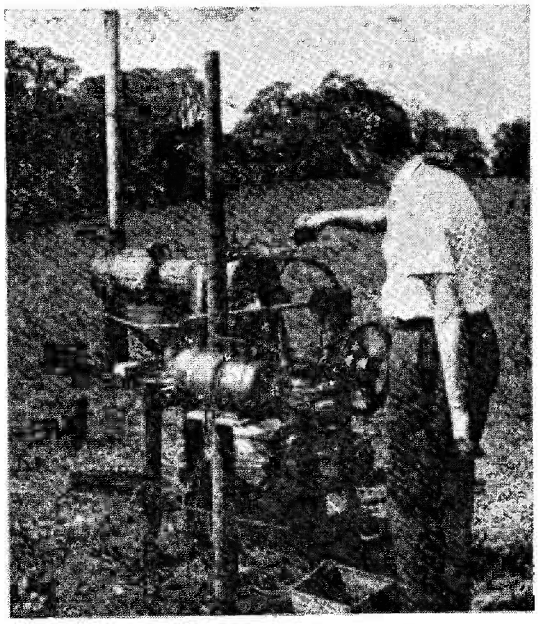
The Eighteenth Magazine Top Band Club Contest will be held over the week-end November 16/17. Rules in full will appear in the October issue. General form of the Contest will be as last year, when more than 90 Clubs took part.

Activity Reports

Variety of interest is certainly the keynote at **Blackpool,** where August 12 and 19 are "Open Nights to build Field Day Gear," the 26th is the date for a visit to the Royal Naval Radio Station at Inskip, and September 2 booked for a visit to a brewery. Something for everyone!

Bradford, virtually in a summer recess, have two informal meetings (August 20 and 27) and hold the first meeting of the new season on September 10.

At **Chesham,** where the accent is on training, some reorganisation has taken place. The club is now registered with Bucks. C.C. as a Youth Organisa-



Rather unusual (to say the least) power generating system for the Loughborough Club's recent field day—a miniature steam plant driving a 230v. AC generator. For the consumption of only 1 cwt. of small coal, the little engine ran non-stop for 24 hours and gave a steady line voltage with sufficient amps. for the whole station. The plant was provided and supervised by Mr. George Wall, a local model engineer and friend of the Loughborough Club group.

tion, and is affiliated to the Amersham Community Association—this qualifies it for certain financial assistance and other facilities. Classes are held on Mondays and Tuesdays (7.30 p.m.) at the Germain Street School, Chesham, and an Advanced Morse class on Wednesdays at the Community Centre, Amersham.

Cray Valley forward their July *Newsletter*, which illustrates their interest in Mobile Rallies and VHF. **Crystal Palace** notify an intriguing lecture on Electronic Colour Separation (by G3GWD) on August 17, and a Film Show on September 21.

Most of the energy of the members at **Derby** will be devoted to the Mobile Rally on August 18, but they also have a Junk Sale on the 7th and an informal meeting (to talk about it all ?) on the 21st. The 28th is the date for their D/F Practice Run No. 4.

Mitcham remind us in their *Newsletter* that the club was originally formed for the purpose of field day activity ; they only had one station going this year. Attendance at their meetings seems to be getting very small, visitors sometimes almost outnumbering members.

Northern Heights ran a very successful demonstration station at the Halifax Charity Gala ; useful practice for their busy month of August, when they have similar undertakings on the 3rd (Warley Charity Gala), the 10th (Halifax Agricultural Show) and 17th (Forest Cottage Community Centre). On the 28th members will show some of the slides they have made of club activities during the past year.

Peterborough invite visitors to their riverside get-together at Alwalton on Sunday afternoons—two boats are available ! Their normal meetings are at the Technical College (Eastfield Road) on the first Friday, at 7.30 p.m. On July 5, G3HXR demonstrated his new mobile whip with tunable loading coil.

Flintshire meet on August 26 for Slow Morse (7.30), Simple Hints and Kinks (8 p.m.) and an SSB talk by GW3PCZ/T (8.30). On July 7 they spent a day operating GW3JGA/P, 1,300ft. up on Denbigh Moors, and on June 13 they joined forces with the Conway Valley club to visit the Department of Electronic Engineering at the University College of North Wales (Bangor).

Acton, Brentford and Chiswick will be holding a Film Show at their August meeting (on the 20th), at the AEU Club, 66 High Street, Chiswick, 7.30 p.m. **Stockport** gather at the Blossoms Hotel, Buxton Road, on alternate Wednesdays at 8 p.m.; August 14 and 28 are the next two dates ; recent items have been visits to Granada TV and to the new Ringway Airport Control.

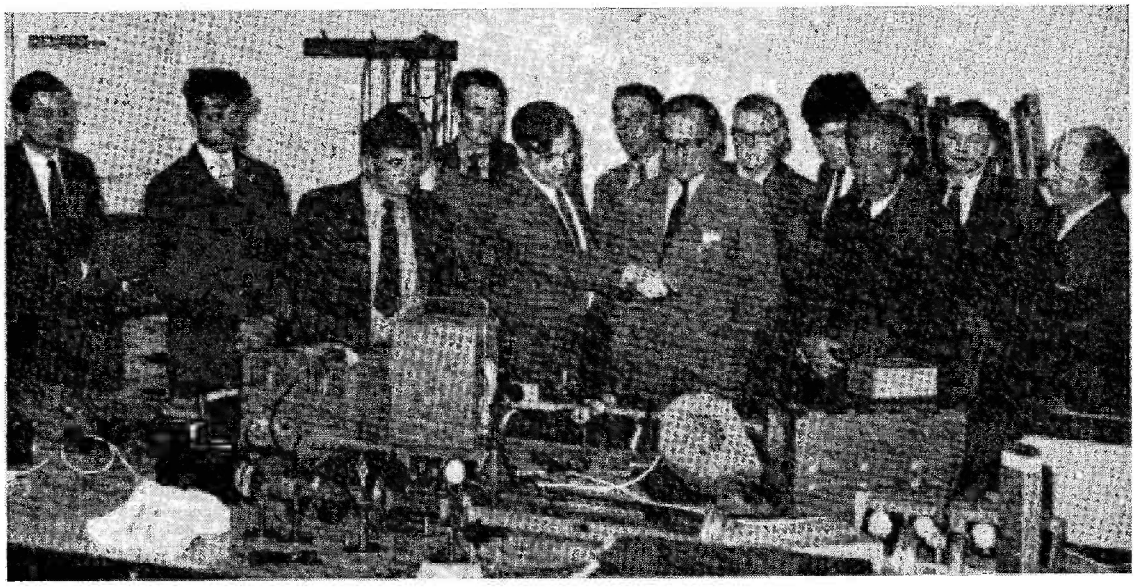
Newcomer Does Well

Recently started up, **Mansfield** report that their club is now well under way. Weekly Slow Morse classes are run by G3BDF and G2MX, and R.A.E. lectures by G8HX. Future events include a trip to the Derby Mobile Rally and the setting up of a station at a local Hobbies Exhibition.

Lothians elected GM3KPD president and GM3AKM secretary for the new session ; meetings recommence on September 12, thereafter on the second and fourth Thursdays. **Scarborough,** who have a date every Thursday (7.30 p.m.) at Chapman's Yard, Waterhouse Lane, North Street, invite local SWL's and visitors to join them. The first meeting

Names and Addresses of Club Secretaries reporting in this issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, W.3.
BARNET: F. Green, G3GMY, 48 Borough Way, Potters Bar.
BLACKPOOL: J. Boulter, G3OCX, 175 West Drive, Cleveleys, Blackpool.
BRADFORD: E. G. Barker, G3OTO, 63 Woodcot Avenue, Baildon, Shipley.
CAMBRIDGE: H. Lowe, G3PEI, 47 Hurst Park Avenue, Cambridge.
CHELTENHAM: J. H. Moxey, G3MOE, 11 Westbury Road, Leckhampton, Cheltenham.
CHESHAM: Capt. C. G. Stephenson, G3CLJ, 21 Lynton Road, Chesham.
CORNISH: W. J. Gilbert, 7 Poltair Road, Penryn.
CRAWLEY: R. G. B. Vaughan, G3FRV, 9 Hawkins Road, Tilgate, Crawley.
CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DORKING: J. Greenwell, G3AEZ, Eastfield, Henfold Hill, Beare Green, Dorking.
ENFIELD: S. Dyke G3ROZ, 30 Church Lane, Edmonton, London, N.9.
FLINTSHIRE: A. Antley, Fairfield, Fairfield Avenue, Rhyl.
GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middx.
HALIFAX: J Ingham, G3RMQ, Lambert House, Greetland, Halifax.
HASTINGS: W. E. Thompson, G3MQT, 8 Coventry Road, St. Leonards-on-Sea.
LOTHIANS: L. R. Richardson, GM3AKM, 64 Easter Drylaw Drive, Edinburgh 4.
LOUGHBOROUGH: J. S. Davis, 12 Avondale Road, Loughborough.
MANSFIELD: M. Dawson, 35 Elkesley Road, Welbeck Colliery Village, Mansfield.
MIDLAND: C. J. Haycock, G3JDJ, 29A Wellington Road, Handsworth, Birmingham, 20.
MITCHAM: B. Blandford, 1 Biggin Avenue, Mitcham.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.
NORTH KENT: B. J. Reynolds, G3ONR, 49 Station Road, Crayford.
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
READING: R. G. Nash, G3EJA, 9 Holybrook Road, Reading.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
ROYAL SIGNALS: Capt. A. C. Earl, R. Sigs, Army Apprentices School, Harrogate.
SCARBOROUGH: P. Briscombe, G8KU, Roseacre, Irton, Scarborough.
SCOTLAND: A. Barnes, GM3LTB, 7 South Park Terrace, Glasgow.
SOUTHGATE: K. Spicer, G3RPB, 22 Clifton Road, London, N.3.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Nr. Leeds, Yorkshire.
STOCKPORT: E. G. Houldsworth, G6NM, 52 Worsley Crescent, Stockport.
STOKE-ON-TRENT: K. H. Parkes, G3EHM, 28 Grove Road, Heron Cross, Stoke-on-Trent, Staffs.
STOURBRIDGE: A. G. Macintosh, 50 Field Lane, Oldswinford, Stourbridge.
UXBRIDGE: A. Duell, Treetops, Bakers Wood, Denham.
WESSEX: G. J. Fowle, 138 Surrey Road, Branksome, Poole, Dorset.
WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral.
WOLVERHAMPTON: J. Rickwood, G3JJR, 738 Stafford Road, Fordhouses, Wolverhampton.



When members of the Flintshire Radio Society and Conway Valley Amateur Radio Club visited the Dept. of Electronic Engineering at the University College of North Wales, Bangor, Dr. H. J. Roberts of the Department described and demonstrated a 3-centimetre tripler unit using semi-conductor diodes.

each month is a junk sale; at the others there is normally a talk by a member. On August 8, G3GBH will give it on VHF; on the 15th there will be a discussion on the R.A.E. paper, and on the 22nd the subject will be Servicing, by G3NRI.

Crawley are putting emphasis on outdoor events, and on August 28 will meet at the Hog's Back, Guildford, with talk-in for visitors on 144·64 mc and 1925 kc. Overseas visitors are usually in the neighbourhood and recently they have been pleased to welcome OH1NE and VE8YG.

The attendance at **Reading** reached the 40 mark when Rowley Shears, G8KW, gave his talk on June 29. Another full house is confidently expected for G6CJ's well-known Aerial Demonstration, on August 31 (Palmer Hall, 7.30 p.m.). Reading Technical College will be running a series of R.A.E. lectures during the coming session—details later.

Breaking right away from the usual subject, Amateur Radio, **Wessex** will hear a lecture on Sailing (by G3RGY) at 8 p.m. on August 12. In September (the 2nd) they revert to normal with a talk by their secretary on Communications Receivers.

West Kent have organised a Picnic at Sheffield Park (near the terminus of the celebrated Bluebell Line) for August 25, and on September 13, under the title "100 Years of Wireless" they start a series of talks-*cum*-discussions on the last hundred years of our hobby.

Hastings have re-arranged their programme for the time being and will meet (still at 33 Cambridge Road) on the first Tuesday of the month in future.

North Kent, we gather from their *Newsletter* No. 69, held a meeting at which model answers to the recent R.A.E. paper were given by various club members; and on July 25 they held a demonstration of equipment by G3PDG, followed by a talk on CW operation.

Stourbridge, at a recent meeting, had a talk on Mobile Interference, by G3BMN, and a colour film show. As Foley College is closed during August there will be no meeting there, but they are booked for the 23rd at the Bell Hotel, Market Street. A series of R.A.E. lectures will begin in September—full details when available.

From the July *Newsletter* of **Southgate** we gather that the Junk Sale at their last meeting was so successful that hardly a single member went away empty-handed.

CQ Shrewsbury

In **Shrewsbury** there is talk of forming a new club, if a sufficient number of interested people can be found. The licensed amateurs are easily contacted, but the SWL's are more difficult to round up. They are asked to get in touch with Dr. K. E. Jones, G3RRN, Greystones, Shrewsbury Road, Church Stretton, Salop.

Barnet report that the lecture by 5N2AMS on his African travels attracted an attendance of nearly 100 at a recent meeting. Next event—August 27, at the Red Lion Hotel, High Barnet—will be a Junk Sale.

Grafton had considerable success with their field day and also their annual exhibition at Islington Town

Hall, from which GB3AFT was operating. The club is now closed for the summer recess, but will be re-opened on September 6, by which time it is hoped to have three transmitters operational—Top Band to Two. The usual R.A.E. and Morse classes will of course be held again this winter.

There will be no meetings at **Cambridge** on August 2 and 9, and the three following Fridays will be informal. September 6 is to be devoted to arrangements for the VHF Field Day, the 13th will be informal and on the 20th, G3FUR will give a talk on his receiver.

Uxbridge is a newly-formed club which has already been active with a stand at a local show. They are now arranging a field day for August 31, and their winter session will include Morse and R.A.E. classes, lectures and film shows. New members very welcome—*see* panel for secretary's QTH. (The meetings are held at St. Andrew's Church Scout Hut, Uxbridge Road.)

Cheltenham are running an expedition into Anglesey on August 3 and possibly the following week, the location to be decided on the spot. September 11 is the date for their AGM—8 p.m. in the clubroom.

Wirral, who forward their *Newsletter* (Vol. 16, No. 6), meet on August 7 for a D/F Night, with local practice, and on the 21st for a talk on First Aid for Electric Shock. September 4 is booked for a Junk Sale.

Good Example

Clubs with largish sums of money in the Bank (and there *are* quite a few) might note the fine example of **Cornish,** who, after their recent Radio Exhibition and Mobile Rally, were able to send cheques for £7 10s. each to the Cheshire Homes Radio Group and the R.A.I.B.C. There may be similar such efforts—we would like to hear of them. Visitors to Cornwall are always welcome at the club meetings—first Thursday of the month at the S.W.E.B. Recreation Room, Pool, Camborne.

Loughborough have bought a new receiver, and G3IPL has given them a transmitter which covers all bands, Eighty to Ten, phone or CW. In July they ran a Junk Sale, also a two-part lecture on RTTY by G3LCG and G3KEV. An SWL member also gave a practical demonstration of reception technique, and at the last meeting of the month they had a Film Show.

Another successful exhibition station was run by **Reigate** in connection with the local Carnival Fête. G3BBR/A managed country-wide coverage on Top Band, while G3REI/A was on Fifteen and Eighty. A constant stream of visitors saw the fine array of home-built equipment, and the club had some admirable publicity in the printed Carnival Programme. Another such effort is in hand for the Bank Holiday Horticultural Show and Gymkhana. Next club night—August 17, at The Tower, Redhill.

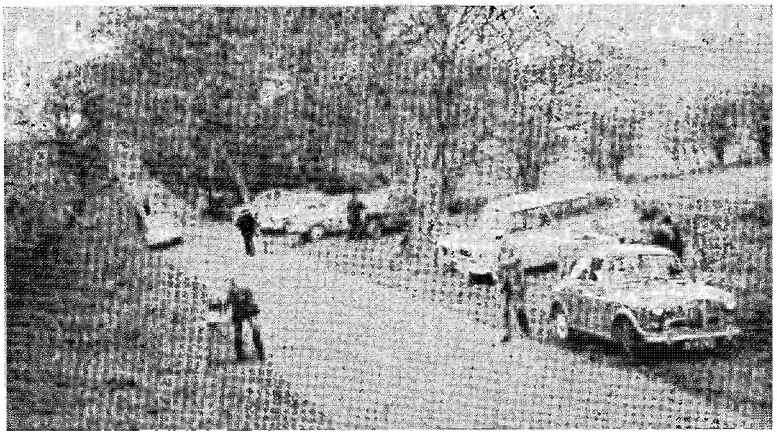
"MCC"—MAGAZINE CLUB CONTEST

The Eighteenth Magazine Top Band Club Contest will be held over the week-end November 16/17. Rules in full will appear in the October issue. General form of the Contest will be as last year, when more than 90 Clubs took part.

Radio Club of Scotland, in their magazine *GM,* report a highly successful first year of operation. What was started as a local (Glasgow) affair has blossomed out into a well-organised club with a worldwide membership, with Scots all over the world keeping in touch with GM-land. It now threatens to become so big that the formation of smaller local groups is already being proposed.

We have received *Mercury,* the journal of the **Royal Signals Amateur Radio Society,** whose headquarters station is at Catterick Camp, Yorks., and signs GB3RCS and G3CIO. An interesting item is an all-band aerial system "for simple souls short of space," and details are also given of the Junior Leaders' Regiment Amateur Club's weekend on Great Mis Tor, Dartmoor, with their own station G3PYZ/A.

Wolverhampton's July *Newsletter* is a good deal thicker than usual—it contains, in addition to an article on a GP aerial system, an amusing account by the wife of G8KL of their silver-wedding anniversary trip to Paris, during which earnest efforts were made (by G8KL) to "look up some French amateurs"; the search (which was largely unsuccessful) led them into some extraordinary situations. At Wolverhampton's recent Saturday Rally, the sale of raffle tickets realised £6 for the R.A.I.B.C. Next meetings are August 26 and October 7 (the latter



Start of the Slade Radio Society's D/F competition for their Harcourt Trophy, in which no less than eleven teams with direction-finding receivers took part. As the Slade boys and their visiting competitors have the technique of hunting a hidden transmitter by D/F pretty well buttoned up, this annual event is always an exciting one with a needle finish.

being the AGM), both at 8.0 a.m. at their Hq., Neachells Cottage, Stockwell Road, Tettenhall.

From the **Enfield** report we get it that all four of their members who took the May R.A.E. passed it, and are going on to their Morse Test. The **Halifax** group have their next meetings arranged for August 6 and September 3, at Fairbank Harding, Bramley, Leeds, when the subject will be hi-fi and recording.

Complete and extensive renovation and redecoration of the club premises is mentioned in the report from **Stoke-on-Trent**; this work is to be finished by mid-August, when they expect a reciprocal visit from the M.A.R.S. group. By the beginning of September, the club will resume normal weekly meetings—each Thursday evening at 8.0 p.m., at the Cottage Inn club-room, Stoke. Talks and demonstrations are to be given by G3DML (Aerials), G3EHM (Transistorised Electronic Organ), and G3MGG (Films). An R.A.E. course is being arranged in collaboration with the North Staffs. College of Technology—details from the hon. secretary.

Having held their AGM, **Spen Valley** are now in summer recess until September 19, when there will be the first meeting of the winter session at Heckmondwike Grammar School, under the presidency of G3MMK, supported by G2HHV, and a committee of three members, all holding callsigns. SWL N. Pride remains as hon. secretary, as he has been for many years now.

In their July *Newsletter*, No. 193, the **Midland** membership is given as "over 100," but even at that they have difficulty in getting enough material for the Newsletter. This sort of thing is not at all unusual, especially during the holiday months. Nevertheless, M.A.R.S. remains one of the strongest of the Midland club groups. They are planning participation in the Birmingham Show at Handsworth Park during September 6/7, and have their annual dinner booked for September 13.

SPECIAL-ACTIVITY STATIONS

Stations to be put on the air for some special event during the next few weeks are as follows:

GB3KEC, Until August 9: For the Summer School of the Kent Education Committee, when the station will be running gear on all bands Top to two metres, CW and phone. QSL cards direct to Kent Summer School, Folkestone, Kent, to arrive during the activity period, will be much appreciated, otherwise *via* bureaux. All contacts and reports will be QSL'd. Schedules for teachers, students and others interested in education can be arranged direct with: D. J. Bradford, G3LCK, 42 Mount Road, Canterbury, Kent.

GB3ENT, August 5: Installed by the North Kent Radio Society, for Erith Bank Holiday Sports, running all bands Top to Two. QSL address: B. Reynolds, G3ONR, 49 Station Road, Crayford, Kent.

G3NKT/A-G3REI/A, August 5: Operated by the Reigate Amateur Transmitting Society at the Memorial Sports Ground, Redhill, in connection with the Reigate Gymkhana and Horticultural Show. G3NKT/A will be on the HF bands, and G3REI/A on 160m. A special QSL card will be given for all contacts, and G3RIN, 3 Cronks Hill Road, Meadvale, Redhill, Surrey, is managing the QSL side.

GB3SRC, August 3-6: Silverthorn Radio Club field outing, located near Sewardstonebury, Chingford, Essex. QSL *via* G2HR (*QTHR*).

GB3SFS, August 9-11: In connection with the South Shields Annual Flower Show in Bents Park, S. Shields, Co. Durham, and organised by the South Shields and District Amateur Radio Club. An LG.300 Tx will be used on the HF bands, and RTTY will also be worked from the stand, for which schedules are wanted with U.K. stations running radio T/P. Write: D. Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham.

WINTER R.A.E. SITTING

We are informed by the City and Guilds of London Institute that a Radio Amateurs' Examination will be held on Friday, December 13, 6.30-9.30 p.m., at some 38 local technical colleges and institutes in about thirty counties through the U.K., and covering most main centres. The examination fee of 30s. is payable to the college authority at time of entry—note that the closing date for entry is *November 1st* — and intending candidates should apply to their own Technical College or Education Authority for information about where the examination is being held in their area. Quote "Subject No. 55" in the City & Guilds examination syllabus, and if your local people are not themselves on the list of centres, they should be able to find out for you the nearest one at which this December sitting will be held. The coverage of the named centres is such that nobody would have to travel very far.

ASSOCIATION OF BLIND AMATEURS

In connection with the proposed "White Stick Award"—for proved contacts with not less than 50 sightless amateurs throughout the world—GI6TK (*QTHR*) would like the names, callsigns and addresses of all known U.K. amateurs who are blind. GI6TK, who is himself sightless, an affliction that came upon him after a full and active life (he was a flying member of the staff of B.O.A.C.) already has a list of 200 amateurs in the "white stick" category. So far as we know, there are not less than 60 of these in the U.K. alone, and it is interesting to note that of the eleven blind students who took the May R.A.E., nine were successful. The City & Guilds makes special arrangements for their examination.

"100 WATT RF AMPLIFIER"

G2OX draws attention to the fact that, in his article in our June issue, the lower end of VR2 should not be earthed down but connected to the negative line at the junction of R12, R14 in the diagram on p.177.

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

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WORKING DIRECTOR wanted urgently. Take complete charge of Coupler Department. Suit retired amateur; s.a.e. details to—Olympic Works, Winton, Bournemouth.

TRADE

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.

CATALOGUE No. 15. Government Surplus Electrical and Radio equipment. Hundreds of items at bargain prices for the experimenter and research engineer, 2s. 6d. post free; catalogue cost refunded on purchase of 50s.—Arthur Sallis Radio Control Ltd., 93 North Road, Brighton.

MODERN Communication Receivers Wanted.—Teleradio Co., 64 High Street, Waltham Cross. *(Tel : WS.22973.)*

CASES, chassis, panels. ANYTHING in metal; send your drawings for quote. Stove enamelled, hammertone, or plain, in any colour.—Moss Watson, 40 Mount Pleasant Street, Oldham, Lancs. *(Main 9400.)*

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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

WANTED: AM/CW Tx in exchange for mint Agfa Silette 35mm. camera, 9 speed, f3.5, leather E.R. case, exposure meter, lens, hoods, filter, close-up lens, lens brush, and new Heathkit Sig. Gen., 100 kc-200 mc; worth £45.—Box No. 2849, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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TYPE D with manual, 6v. AC, excellent condition and good working order, 70s. plus post.—Phillips, Firdowne, Gomeldon Hill, Salisbury, Wilts.

FOR SALE: GEC Communications Receiver BRT-400, immaculate condition, perfect working order, 550 kc to 31 mc, S-meter, matched speaker, can be seen working by appointment, £75.—J. O'Donovan, 2 Patshull Place, London, N.W.5.

FOR SALE: Geloso 212 Tx, 60 watts input, table topper, nice appearance, good Dx'er, 80-10m., £35; or would exchange for good condition AR88 Receiver.—Box No. 2838, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

CODAR CR-66 Receiver, cabinet tuning indicator, Wharfedale speaker, phones, manual; used only 2 months, £22.—L. C. Smith, 38 Park Road, Lenton, Nottingham.

2M STATION, "modified (1986)" 12 volts, with handbook, leads, mic, and PSU. WANTED: 160m. Tx or 160, 80, 40m. Also valves, transistors, s.a.e.—G3LRO. *(Grangewood 8479.)*

WANTED: Geloso VFO 4/102, also CR-100, details and price to—R. Hardy, 522, Halifax Road, Bradford, 6.

MOHICAN or mobile Rx wanted, also all band Tx, SSB Exciter or Tx, 4-metre gear, W.H.Y.?—P. Flanagan, Gortin, Omagh, Tyrone, N.I.

SALE: Eddystone 680B receiver in mint unmodified condition, £40. ARRL design DCS-500 receiver, IF and AF sections only, with power pack and all valves and crystal for use with Eddystone 680B, gives much improved SSB reception, professionally built, £15. R.107 receiver, mint, £10. LM-14 Frequency Meter with charts, £8. Vibroplex "Champion" key, new, £5.—Box No. 2839, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: HRO-MX with BS coils 3·5-7-14-28 mc, complete with power supply, good condition, £15. Goodmans bass reflex corner cabinet with Goodmans 12 in. speaker, £10. Mullard 510 amplifier, preamp, and transcription unit, £5. Deliver 50 miles.—G3MGY, 26 Grovelands Avenue, Hitchin, Herts.

SMALL ADVERTISEMENTS, READERS—*continued*

SALE: AR88LF with case, 110/240v., £25. ZC1 Mk.II, £5. W.1191 wavemeter, £2 10s. Beam indicator, 15s.—G3KFY, Old Orchard, King's End, Powick, Worcester. *(Phone : Powick 267.)*

INFORMATION REQUIRED: Marconi transmitter Type AD87B, manuals or previous issues *Short Wave Magazine.*—Sub-Officer Hewitt, c/o Fire Station, Old Dover Road, Canterbury, Kent.

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SALE: R.107 Communications Receiver, £9, buyer collects.—Fitzpatrick, G3OKF, 9 North Linkside Road, Liverpool 25. *(Phone : Gateacre 1866.)*

CR-100, excellent condition, noise limiter, S-meter, also spares kit and handbook, £18; carriage extra. —Garside, 76 Hollyfield Road, Sutton Coldfield, Warks.

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FOR SALE: Eddystone S.750 11-valve double superhet Rx, 1450 kc to 32 mc in four bands, condition immaculate as new, complete with instruction manual, Eddystone S-meter, Eddystone speaker, Eddystone standing blocks, SGB phones; first £50 secures, no offers.—W. Bassi, 13 Westbourne Crescent, Whitchurch, Cardiff, Glam.

SALE: PCR, in excellent condition, with int. loudspeaker and new int. power supply, double diode noise limiter and AVC switch, £9 o.n.o.?—Apply Goswami, 49 Tether Down, Muswell Hill, London, N.10.

VALIANT 160/10m. Tx, mint, £27. Valiant separate PA and mod. PSU in neat metal case, £5. Bendix Rx RA10DB, 400 kc-10 mc manual tuning, 35s. Admiralty PSU, 250v. 100 mA, 40s. Valves, 50 current, mostly new, 2s. 9d. each, s.a.e. list; or £40 takes all.—Smith, 44 Ashfield, Liverpool, 15.

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WANTED URGENTLY: Gonset G66 with PSU or similar Mobile Equipment, such as Elmac. —Box No. 2841, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

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HEATHKIT MOHICAN, 6 months old, factory aligned, £35.—B. Arends, 18 Granada Road, Denton, Lancs.

GELOSO Receiver front end, all bands 3·5 to 28 mc, mint condition, with manual, £15 o.n.o.?— J. Everatt, 5 Baffam Gardens, Brayton, Selby, Yorks.

RTTY AP66862 units, £5 each. Radiovision "Commander," £20. TCS-12 Rx, B29 Rx, other gear; offers; list s.a.e.—Box No. 2842, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

NEW COMMAND RECEIVER, £3 10s. Collins 12v. DC PSU, 50s. Collins pem. VFO, £7 10s. 420 mc Antenna, 12s. 6d. Telescopic aerial, built-in winch, closed 9 ft., open 36 ft., non-rusting, fits in tripod, list over £40; £12 10s. plus carriage.—Wright, 12 Woodwards Road, Daisyhill, Westhoughton.

RF UNIT No. 2, 100-156 mc, and RF Unit No. 3 190-240 mc, identical with RF Unit No. 1 described September 1959 issue of *Short Wave Magazine*, offered in new condition, £3 10s. each, p/p 5s. SCR-522, 100-156 mc, complete with mains PU RA62C, mounted on rack with cables and instruction books, nearest £12 10s. Also brand new Collins Tx/Rx 2-9 mc, MO eight pretuned channels on any frequency, 60-watt output, input 24v. DC.—R. Jay, 69 Church Road, Moseley, Birmingham, 13. *(Local callers appointment only Tel: South 2285.)*

NEW EDDYSTONE diecast speaker, mounting blocks, 3 RCA valve books, £3. 1957 *World Radio Handbook for Listeners*, 8s. Bush VHF 90C, covers 88-100 mc FM, 6 valves plus rectifier, £11 (send P.O.).—Box No. 2843, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED Tx: Professionally built LG.50, Vanguard, or similar; also GDO, Valve-voltmeter, telescopic mast; will collect.—Hely, 25 High Street, Olney, Bucks.

FOR SALE: *Apply after August 11:* HRO-MX, 4 miniature valves, power pack, etc., £21. Test gear: Acton signal generator, £3 10s.; various panel meters, 7s. 6d. each. *Bulletin* October 1961 to present, £1 10s. *Short Wave Magazine* March 1962 to present, 25s.— Matthews, 41 Priestnall Road, Heaton Mersey, Stockport, Cheshire. *(Tel. Heaton Moor 4502.)*

GM3OOI QRT. Hallicrafters SX-28, £27. K.W. Converter, £13, Meters 0-150 mA, 7s., 0-4 amps RF with in-out switches, 8s. Belling-Lee mains filter, 25s. AC p/pack (1) 250v. 100 mA, 6·3v. 3A, 12·6v. 3A, £2. (2) 600v. 200 mA, 400v. 250 mA, 6·3v. 7A, 12v. DC, £6. 12v. 3-pole relay, 6s. 10/100/1000 kc calibrator, £2. Magazines by Volumes: *Short Wave Magazine* from April 1958. *Bulletin* from May 1957.—Box No. 2844, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: HRO bandspread coils, 14, 21 mc, brand new, 35s. each. 21, 30 mc used but perfect, 25s. each.—A. J. Martin, East Round Down, Gomshall, Guildford, Surrey. *(Shere 2351.)*

FOR SALE: 12v. Dependapac transistor converter giving 350v. 300 mA, switching to 350v. 150 mA, £15 o.n.o. or W.H.Y.?—G3OHC, 24 Wood Green Road, Winson Green, Birmingham, 18.

AR88D, completely overhauled, rewired, renovated 1962, hardly used since; as new, with matching speaker, headphones and manual, £40. Buyer collects.—Bone, 14 Little Gaynes Lane, Upminster, Essex.

ARRL HANDBOOK, 12s. *Bulletin,* Vol. 37, Nos. 1-4, 6-8, 10, 12. Vol. 38, Nos. 1, 3, 4, 7, 8, 9. *Short Wave Magazine,* Vol. XIX, Nos. 3, 5, 9, 10, 11. Vol. XX, Nos. 1-4, 6-9, all 1s. 3d. each.—G3LOL, 30 Johnson Road, Barrow, Bury St. Edmunds, Suffolk.

COMPLETE STATION Geloso G210 Tx and matching G207 Rx; Z-match ATU with SWR indicator and dummy load; low-pass filter; Class-D wavemeter and Geloso desk mike, excellent condition and appearance, £35. Fixed or mobile Top Band station: Compact Tx, Minimitter Transistor Rx, G3FIF mobile whip, lapel mike, mains and 12v. power packs, £15. Offers for separate items considered if unsold complete.—Box No. 2845, Short Wave Magazine, Ltd., 55 Victoria Street, London S.W.1.

VICEROY SSB Tx, 180w. p.e.p., separate power pack, little used, mint condition, 100 gns. Labgear band switched *pi*-network Inductance (E5033), £2. Telescopic Whip, 15 inches to 13 feet, 25s. 300 watt mod. trans., fixed ratio approx 1/1, open type, 30s. Trans., standard inputs, 1650-0-1650v. at 450 mA, with matching 15 Hy. choke, Woden, £4. Many trans. and meters, seen Cheshire.—*(Marple 2616),* or Box No. 2846, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Mohican Rx, mint condition, offers £20-£25.—Sykes, St. Thomas's House, Lambeth Palace Road, London, S.E.1.

WHY NOT MAKE IT a personal QSO? By offering hospitality to visiting Radio Amateurs, or better, you may visit them. This can be arranged by joining the International Ham-Hop Club. Membership is open to all Radio Amateurs and SWL's. Subscriptions 10s. per year, including free *Newsletter.* —Contact G.B. Division Hon. Sec., G3HZP, H. James, 7A South Avenue, Egham, Surrey, *or* Deputy Gen. Sec., J. Cooté, 56 Dinsdale Avenue, Kings Estate, Wallsend, Northumberland.

SALE: 150 watt AM & CW Tx, 10-80m, £65. K.W. Valiant with K.W. power supply, 10-160m, £40. Heathkit SB-10U SSB Adaptor, £25.—Apply D. A. C. Jack, Cherry Tree Camp, Colchester, Essex.

SALE: Keyboard Perforator, Buckley Electronic T/R switch, Teleprinter 110v. DC motor PSU. Offers?—G3IGG, 26 Hooton Way, Hooton, Wirral, Cheshire.

FOR SALE: CR100/8 fitted S-meter, SG Brown headphones, Eddystone speaker with spare valves, £15 carriage paid.—Box No. 2847, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: R.107, perfect working order, £12, carriage paid.—Bull, Sunnybrae Cottage, Perth Aerodrome, Perthshire.

SMALL ADVERTISEMENTS, READERS—*continued*

EDDYSTONE S.750, S-meter, and AR88 speaker, one owner, no mods., excellent, £39. Collect if possible.—Watson, 19 Frances Road, Basingstoke, Hants.

LABGEAR Topbander, later model, plate-and-screen modulation, immaculate condition, you collect, nearest £21.—W. C. Moodie, 53 Bournside Road, Cheltenham, Glos.

WANTED: Creed 7B Page Printer and Creed 6S automatic transmitter; state condition and price.—Bullock, 15 Salisbury Close, Princes Risborough, Bucks. *(Tel. 789.)*

GREY 680X, £60, buyer collects Essex. New CR-100 manual, 30s. Send P.O.—Box No. 2848, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

HRO-MX, nine coils, power pack, speaker, extra valves, excellent condition, £25 o.n.o.?—Peters, Four Winds, Lon-y-Bryn, Bangor, Caerns.

WANTED URGENTLY: Coils units for National HRO Senior, bandspread or GC. A full set is preferred. Write to—A. J. Reynolds, 139 Collenswood Road, Stevenage, Herts.

DRAKE 2B Receiver with Top Band, as new, £98, no offers.—R. J. Toby, 13 Wood Lane, Isleworth, Middx.

SALE: 144 mc VQ4EV Converter, 24/26 mc, complete, £5. 70 cm G2DD Converter with RF amplifier, £6. 300-1000 mc Converter TN18/APR4, £8. 70 mc mobile Tx/Rx, modified ex-Pye, £6. 28-85 mc RL85 Receiver, £8. AC, 4-6 mc Command Rx, AVC, noise-L, BFO, with Nuvistor Converter (Tiger), 12-volt, FB 2-metre rig, £12.—Box No. 2854, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: 4/102 Geloso signal shifter, dial and escutcheon, and valves, £5. CR-100, modified with Geloso front-end converter built in, £12. Woden type PTF16 transformer, 2-0-2v. 6 amp, new, 15s. Woden UM1, £1 10s. Woden UM3, £3. Woden DT3, £1 2s. 6d. G2DAF Rx in ex-Eddystone cabinet with external power pack, £45.—P. G. Spence, 130 Braunston Road, Oakham, Rutland.

SELL, £27, or P/Ex. Heathkit Mohican, factory built, year old. WANTED: Good GC mains Receiver.—Taylor, 12 Leinster Gardens, London, W.2.

SALE: CR-100, 60 kc-30 mc, plus manual and spares, good working order, £15 o.n.o.?—Box No. 2850, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EXCHANGE: Hallicrafters S40B, 0·55 mc to 44 mc, 110v. to 250v. AC, in excellent condition, overhauled and re-aligned, electrical bandspread, noise limiter, sensitivity, AM, CW, AVC, etc., complete with spare set of new valves FOR Eddystone 670A marine receiver, or with a R.103A receiver 1·7 mc to 7·5 mc, 200 to 250v. AC, in good condition, and other items for Eddystone 840A receiver. W.H.Y.?—M. Gallet, 36 Ashlone Road, Putney, London, S.W.15.

WANTED: Commercial all-band transmitter, complete; approximately 30 watts phone, 50 watts CW, for G3HWW (York Amateur Radio Society). Reply to—Hodgson, 69 Sherwood Grove, Acomb, Yorkshire.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: Two-metre mobile station, preferably using transistors throughout, professional or amateur design and construction. Good price paid for well made and efficient gear.—Full details please to Box No. 2851, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: T.S.3 A/P UHF frequency meter and power meter 2700 to 3400 mc, complete with all accessories, any offers? Canadian Marconi Rx No. 9, 1·7 to 5 mc, with AC power pack, £5 o.n.o.? Bush 9-inch TV, with converter, £4 o.n.o.? Post Office open rack 5 ft. high, £2. Teleprinter Type 3 for spares only, with 200 to 220 volt motor, type head, etc., £3. 25 rolls ⅜-inch tape for Type 3 Teleprinter, 30s. Five type 723 A/B Klystrons, £4 o.n.o.? One type K301 Klystron (new), £2, 2500 to 3500 mc. One pair CV52, £3. One pair 703A, £1. One Army AC power pack (rack mounting), £1. Two Type 38 W/Talkie with junction boxes and spare valves (new), £3. 30 GL-446A, £4 lot. Four GL-446B, £1. Ten 807, £1. One Canadian Marconi ATU for No. 9 Rx, £1 (new). Buyer collects or encloses postage.—B. Davies, 16 Mulkern Road, Upper Holloway, London, N.19.

SALE: R.208. Rebuilt 19 Set Rx, 80 and 40 metres, 11-valves, mains PSU, £5 each.—Smith, 5 Tarvit Avenue, Cupar, Fife.

ALL-BAND mobile rig wanted. Would consider exchange-deal Ricoh F2·8, 1 to 1/400th. sec., new, unmarked, and/or Philips 4-track 4-speed tape recorder, six months old, cost 62 gns. Fullest information to—Box No. 2852, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: CR-100 coil pack and/or CR-100 chassis. Please write stating price to—Edge, G6GD, Bethany, Queens Walk, Rhyl, N. Wales.

MARCONI Guardian Rx, 9-valve superhet, 570 kc, IF with regen., modern B7G valves, 190 kc to 4·5 mc. Excellent for MW and LW DX, also 160 and 80 metres. Internal mains PSU and 8-inch speaker, £8. Urgently required, borrow or buy, manual for R.107.—G3NPB, Springfield, Haydon Bridge, Hexham, Northumberland.

R.107, excellent performance and appearance, only 20 hours' use, cover and circuit supplied, £11 10s. o.n.o.? Carriage extra.—Peace, 6 Briar Close, South Green, Billericay, Essex.

HALLICRAFTERS S38D, suit SWL, 550 kc-32 mc, excellent condition and appearance, manual, linecord, £16; carriage paid.—Johnson, 452 Falmer Road, Brighton, Sussex.

K.W. Geloso Converter, amateur bands, 4·6 mc output, mint, cost £23, sell £13. AR77E, good condition, excellent performance all bands 1·34 to 30 mc and MW, £19; s.a.e. details.—Box No. 2853, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: CR100, immaculate condition, NL, S-meter, xtal band edge marker and manual, etc., £25 o.n.o. secures. Prefer buyer collects.—G. E. Southgate, 55 Salisbury Road, Maidstone, Kent.

SALE: Minimitter Converter, five amateur bands (1·5 mc IF), £10.—H. King, 6 Grange Crescent, Rubery, Rednal, Birmingham.

SALE: R.107 Rx, recently acquired, FB condition, cover, leads, base, unmodified, £13 o.n.o.? Write—A3580, Littlehurst, Ridgeway, Gerrards Cross, Bucks.

SMALL ADVERTISEMENTS, READERS—*continued*

MINIMITTER Converter 3·5 to 30 mc, good condition, needs re-alignment, £5. Heathkit GDO, 350 kc to 250 mc, mint, £9. RCA TE-149 Wavemeter, good, no case, £5. "Nombrex" transistorised Sig. Gen. 220 kc to 220 mc, mint, £6 10s. "Joystick" Antenna, *de Luxe* model, £3 5s. Calibrator Type 10, needs attention, £1. Top Band VFO, stabilised, £2. 813 heater transformer, £1. Class-D Wavemeter, 230v. AC, £3. Goodmans Speaker, 12-inch, £2. "Meico" dynamic microphone, 4-inch dia., chrome, £2.—G2BTY, *(QTHR). Sonning 2198, evenings.*

G5CP offers 40w. mobile Tx, 3·5-28 mc, Geloso VFO-6146 PA, Phone/CW, less mike and power supplies; this unit has WAC/M using whip aerials; generally as described in *Short Wave Magazine,* July '57, £12. 12v. Pye car radio (transistorised), £8 10s. QQV03-20A, used, 10s. 6d. QQV06-40, 15s.—Plant, 12 Nottingham Drive, Wingerworth, Chesterfield, Derbyshire. *(Phone 4909.)*

TWO-METRE and Four-Metre cascode, crystal-controlled converters, several IF's, £6 each. R.1155B, complete with internal power supply, £8. Compact 30-watt modulator with Collins transformer, £5. Type 3000 relays, many kinds, 5s. each. Audio generator, 5 cycles to 200 kc, with attenuator and power supply, £6. All items guaranteed.—G3LGK, 21 Dale View, Ilkeston, Derbyshire.

FULL power transmitter for only half cost—150w. Minimitter "Mercury," indistinguishable from new, with all leads, microphone and key, £48. Tri-band Panda beam, unused, £7 10s. TV Signal and Pattern Generator 7·5 mc to 210 mc, as new, £3. Tiger 60 Transmitter, power supply and modulator complete, exciter and PA dismantled, in clean condition, £10. Labgear WB multiplier unit, £2 10s. Spectone 151 tape recorder, good condition, £27 10s. Delivery possible Midlands and South.—J. R. R. Baker, Clovelly, 35 St. Marks Road, Windsor, Berks.

AR88LF, 75-550 kc and 1·5-32 mc, S-meter, very nice condition, only wants seeing, £32 10s.—Box No. 2855, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Hallicrafters SX-111, little used, £75. Heathkit V7A Voltmeter, £9.—A. J. Parkes, 24 Ardgowan Road, Catford, S.E.6. *(Phone: HIT 6594 evenings.)*

SILICON Diodes 500 mA 1000 PIV, 9s. each. OC44, 45, 81D, 3s. 6d. each. OC170, 4s. OC171, 4s. 6d. each, plus p.p.—G3MAD, 70 Arnold Road, Binstead, I.o.W.

SALE: Eddystone S.640, perfect, manual, speaker, phones, £25 o.n.o.?—Bridges, 18 Methuen Avenue, Kings Lynn, Norfolk.

OFFERS for Hallicrafters BC-610 spares, pair 250TH boxed, pair 100TH, six swinging link coils, 12 tuning units (amateur frequencies). Two Potentiometers, midget relay, 6 fuses, 12 crystals, technical manual. Must sell, moving QTH; first reasonable offer accepted.—G5WO, 42 York Avenue, Wolverhampton. *(Tel: 20522.)*

EDDYSTONE 640, £16. R.109 plus spares, £4 10s. Both carriage paid.—Ken Bower, 81 Wilthorpe Road, Barnsley, Yorkshire. *(Tel: 5372.)*

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