

The
SHORT WAVE
Magazine

21-

VOL. XIII

JULY, 1955 *Cost*

NUMBER 5



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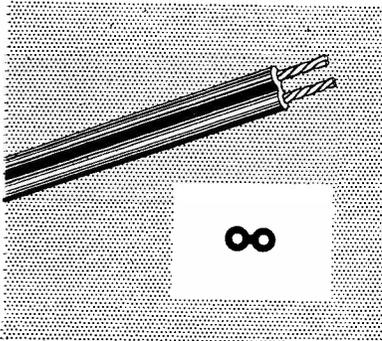
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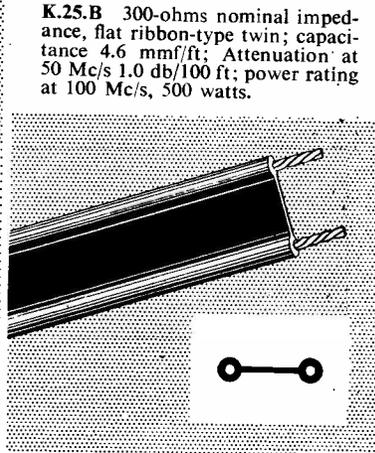
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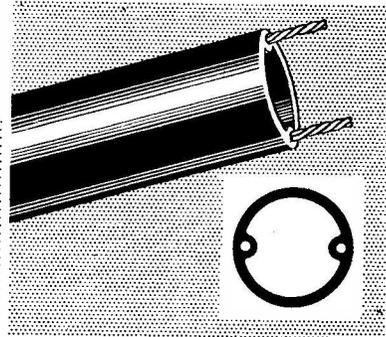
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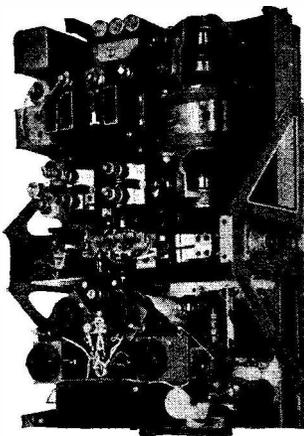


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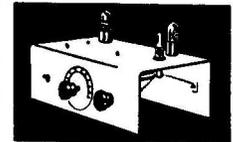
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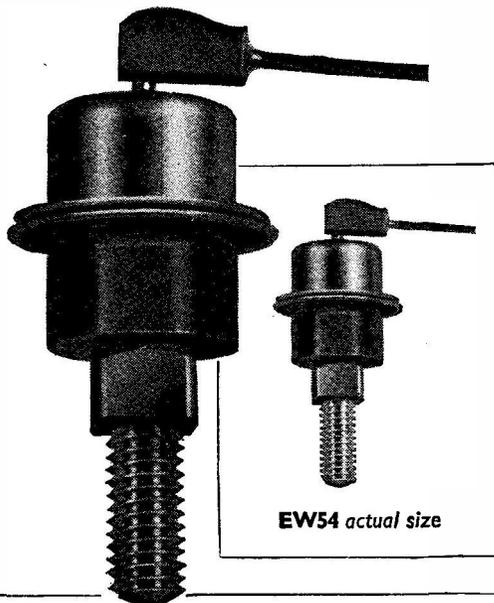
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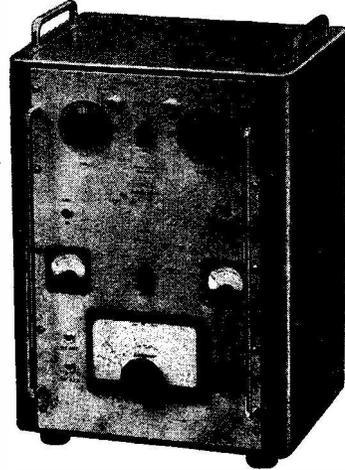
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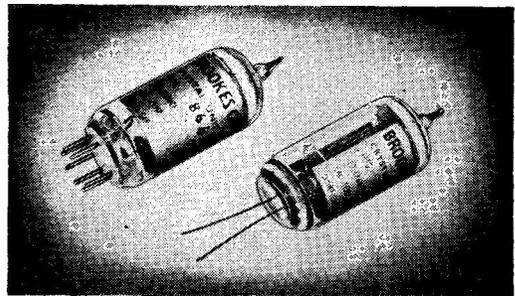
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The SHORT-WAVE Magazine

E D I T O R I A L

Mobile Ever since the Post Office brought mobile operation within the orbit of Amateur Radio in this country, there has been a steady increase in the number of cars fitted for transmission and reception on our bands while actually on the move. As has so often happened in the past, this new activity is being found to be of great interest, calling for ingenuity and technical resource of the kind which always appeals to the keen radio amateur.

There are many ways in which an installation can be designed for mobile working, and many different types of vehicle in which it can be fitted—from the smoothly-engineered job built into a high-priced sports saloon or smart estate car, to the bread-board lash-up accommodated on the back seat of a grunting old ten-horse buggy, bought as “rough, but a good runner.” Whatever the vehicle, there are numerous practical problems to be solved: The band to use, type of receiver and transmitter, power supply, suppression, change-over, aerial arrangement and full control in safety under traffic conditions on the road—as well as whether the installation is to be built in as a permanent fixture, or made removable.

At present, amateur mobile operation is mainly on our 160 and 2 metre bands (which in themselves pose quite different problems of major design) with a certain amount of M activity on 80 metres and a few rather clever band-switched outfits capable of covering several of the HF channels.

Many of these stations are intended to be PM , in the sense that they can be operated either strictly M while actually on the move, or P at a fixed site for field-day and similar activities, in the latter case with an aerial system beyond what can be carried on a moving car. Whatever the intention, it would seem that there should now be a clear differentiation between P and M working, under such conditions. A station signing “mobile” should, surely, be on a public road with the wheels turning and, if temporarily stationary, should in any case be working into the mobile aerial system as normally carried on the car when on the move. Under all other conditions—using its fitted gear, but with the car parked and a specially erected aerial—the station should sign P .

Thus, it can be seen that by making the aerial system the deciding factor, a fair definition of “mobile operation” can be obtained.

Austin Fobyl
G6FO.

Modifying the B2 Transmitter Unit

EXTENDING RANGE AND
IMPROVING OPERATING
EFFICIENCY

T. HOLBERT (VS6CQ)

The B2 transmitter/receiver assembly will not need much introduction; it is a well-known "surplus" item, in use throughout the world. Most B2 transmitter units are operated as they stand, without modification or embellishment. This article shows that much can be done to make it even more effective on the transmitter side.—Editor.

THERE are large numbers of B2 Tx/Rx rigs still on the air. These excellent wartime portable equipments have given an outstanding account of themselves in all parts of the world. But like almost every such item of surplus equipment used on our bands, there is room for improvement, both in performance and in frequency range.

The modifications discussed here give increased usefulness to an already useful transmitter. It is hoped to give details of modifications to the receiver section, at present in hand, in a future article.

Stability

The Tritet crystal oscillator is not particularly stable and does not key well. It has a reputation for being hard on crystals, caution being necessary to avoid over-running and subsequent burn out.

The circuit shown in Fig. 1 has better stability, is easy on crystals, and keys well direct in the cathode lead. There is little or no difference in drive.

Rewiring necessary can be done without removing the front panel of the transmitter, provided the "Crystal Fundamental" switch is left in position. The coils and wiring associated with the switch must be removed.

Table of Values

Fig. 1. Crystal Oscillator Modification

C1 = 15 $\mu\mu\text{F}$	R2 = 100,000 ohms, 1-w.
C2 = 45 $\mu\mu\text{F}$	RFC = 2.5 mH RF choke
C3, C4,	V1 = Crystal oscillator
R1 = As Existing	

Drive

Approximately 2 mA of grid current is correct for the 6L6 PA ("5" on the upper scale of the test meter). On the LF ranges there is decidedly too much drive available, resulting in unnecessary harmonic output from the PA. The HF ranges, on the other hand, may be found to be lacking drive, and some method of regulating these conditions is obviously desirable.

Fig. 1 shows the new screen grid circuit of the crystal oscillator. The existing 20,000-ohm resistor must be removed, and the 100,000-ohm potentiometer then acts as a drive control; it is fitted in place of the "Crystal Fundamental" switch.

If sufficient drive is still not available on the HF ranges, remove the EL32 valve and fit a 6V6. The only wiring alteration needed is to run the lead from the crystal socket through the chassis to pin 5 of the valve base. (On B2 sets using a 7C5 this will not be required.)

It is realised that more drive could be obtained by improving the LC ratio of the crystal oscillator anode tuned circuit. However, lack of screening makes the circuit rather touchy, and attempts in this direction have invariably resulted in uncontrollable parasitic oscillation. It was therefore considered better to leave well alone, and accept the poor LC ratio, rather than attempt to re-arrange the physical layout.

Frequency Coverage

In the original, three amateur bands are available, but it is an easy matter to rewind the crystal oscillator anode coils so that all bands 10 to 160 metres can be used at the turn of a switch.

The range 1.8-22 mc can be covered with the PA as a straight amplifier, but 28-30 mc must be obtained by doubling in the PA from the

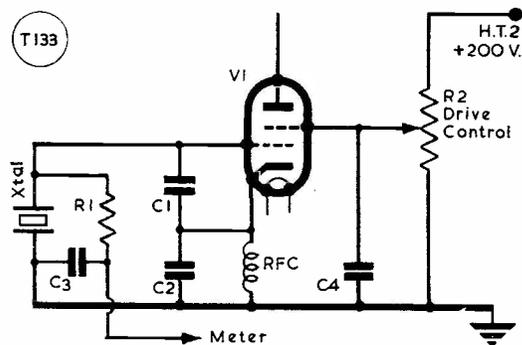


Fig. 1. The improved crystal oscillator circuit for the B2 transmitter, as suggested by VS6CQ. R2 is the variable drive control and all values are given in the table.

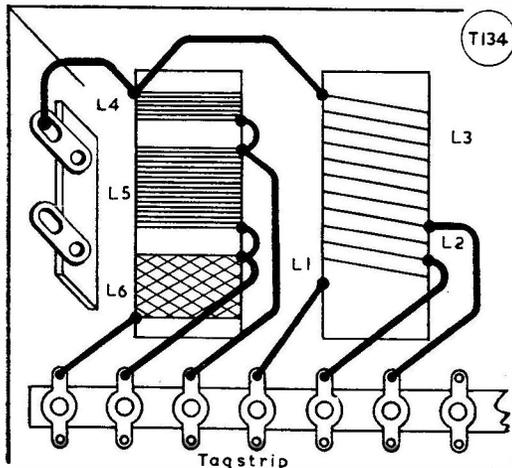


Fig. 2. Rewinding of the CO coils, as carried out by VS6CQ and explained in his article.

COIL DATA. Fig. 2.

- L1, L2, L3 = 12 turns 18 SWG enam., spaced wire diameter, L1 tapped 1½ turns, L2 tapped 3 turns. L1 covers 24-30 mc ; L2 17-22 mc ; L3 12-16 mc.
- L4 = 16 turns 40 SWG close-wound, covering 6-9 mc.
- L5 = 45 turns 40 SWG close-wound, covering 3-5 mc.
- L6 = 50 turns 40 SWG pile-wound, covering 1.7-2.2 mc.

14 mc drive ; this is necessary due to lack of drive when quadrupling from 7 mc crystals. It may be possible to operate straight when trebling from 9 mc or doubling from 14 mc crystals, but these frequencies are not readily available. The circuitry for straight operation is included and may be used if sufficient drive can be found.

The pair of coils in the CO anode circuit are located under the chassis. They must be removed and rewound as illustrated in Fig. 2. The accompanying table gives winding details, and the frequency coverage to be expected as a result of the modification.

The unused PA coil L3A-L3B should now be rewound for the 160-metre band. A new PA coil will have to be constructed for 21-28

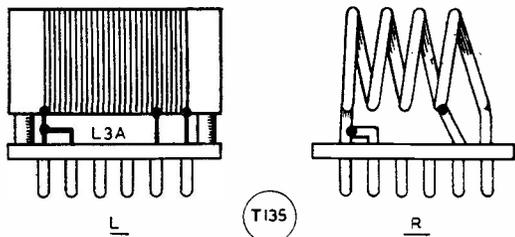


Fig. 3. The rewound PA coils for the B2 transmitter, as used by VS6CQ. The assembly marked (L) is coil L3A-L3B, rewound with 50 turns of 30 SWG enamelled wire, tapped at the 40th turn ; it then covers 1.7 to 2.2 mc approximately. At (R) is the coil assembly L5A-L5B which is made 4 turns, of 16 SWG, self-supporting, and tapped at the 1st turn ; it then covers 20-30 mc.

mc ; details of these coils are given in Fig. 3.

Performance

The 6L6 PA is notoriously a poor performer on frequencies above about 10 mc, and considerably increased performance can be obtained by using a more suitable PA valve. The Mullard QV04-7 (CV510) and American 2E26 have both been tried with success, and give much better efficiency on the 14, 21 and 28 mc bands. This modification is really worth while, even if the frequency range has not been extended.

An attempt to improve the LC ratio of the PA tank circuit proved unsuccessful due to the inevitable uncontrollable parasitic oscillation.

Modulation

It has been found that there is just enough reserve in the power supply to provide for a small screen modulator unit. The circuit of this is given in Fig. 4. Power connections are made to the tag strip under the chassis of the transmitter.

Keying

If break-in is not required no alteration is needed, but the keying characteristic will be improved by addition of the filter shown in Fig. 5.

Where break-in is needed, the crystal oscill-

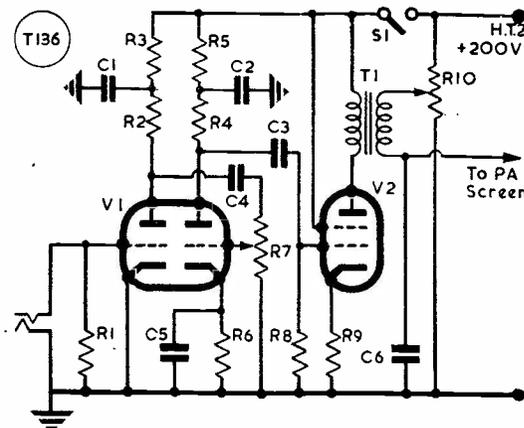


Fig. 4. In his B2 transmitter, VS6CQ is using screen modulation, this being the modulator unit. All values are given in the table and notes on the arrangement appear in the text.

Table of Values

Fig. 4. Screen Modulator for the B2

- C1, C2 = 40 µF, 150v.
- C3, C4 = .01 µF
- C5 = 25 µF, 50v.
- C6 = .005 µF
- R1 = 2.2 megohm
- R2 R4 = 220,000 ohms
- R3, R5 = 20,000 ohms
- R6 = 2,200 ohms
- R7 = 500,000 ohms, incorporating S1
- R8 = 470,000 ohms
- R9 = 470 ohms
- R10 = 100,000 ohms, 2-w.
- T1 = 1 : 3 ratio xfmr
- V1 = 6SL7
- V2 = 6K6

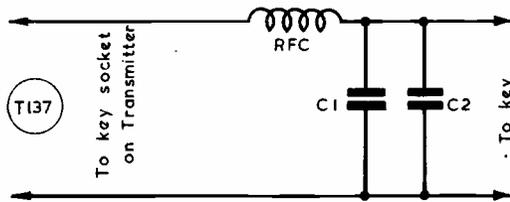


Fig. 5. A keying filter considerably improves the CW characteristic of the B2 transmitter; here, VS6CQ uses: C1, .01 μ F; C2, 2 μ F; and a 2.5 mH RF choke.

tor can be keyed in the cathode with success, but probably the best method is to relay-key the entire HT2 (200-volt) line. This will break the anode and screen of the oscillator, and the screen of the PA, ensuring complete silence on key-up. A conventional filter in the keying leads gives a good characteristic.

Semi-VFO Operation

A useful dodge for operators handicapped by lack of crystals is shown in Fig. 6. Shifts of 15 kc can be obtained with good stability

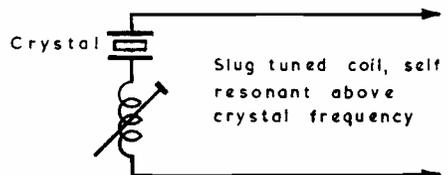


Fig. 6. Another interesting modification to the crystal-controlled B2 transmitter. By this simple arrangement, the frequency can be shifted about 15 kc, but to LF only.

when using 7 mc crystals. Note that the slug-tuned coil must be self-resonant at a frequency *above* that of the crystal in use, and must approach near to resonance with the crystal

Table of Values

Fig. 7A, B. Suitable Power Supply for the B2

- C1, C2 = 16 μ F, 350v.
- C3, C4 = 16 μ F, 350v.
- L1, L2 = 20H chokes
- R1, R2 = 50,000 ohms, 5-w.
- R3 = 500 ohms
- T1 = Rx type mains xformer, secondary:
- 250-0-250v., 80 mA,
- 6.3v. and 5.0v.
- T2 = 6.3v.
- V1, V2 = 6X5
- V3 = 5Z4
- W1 = Full-wave rectifier bank

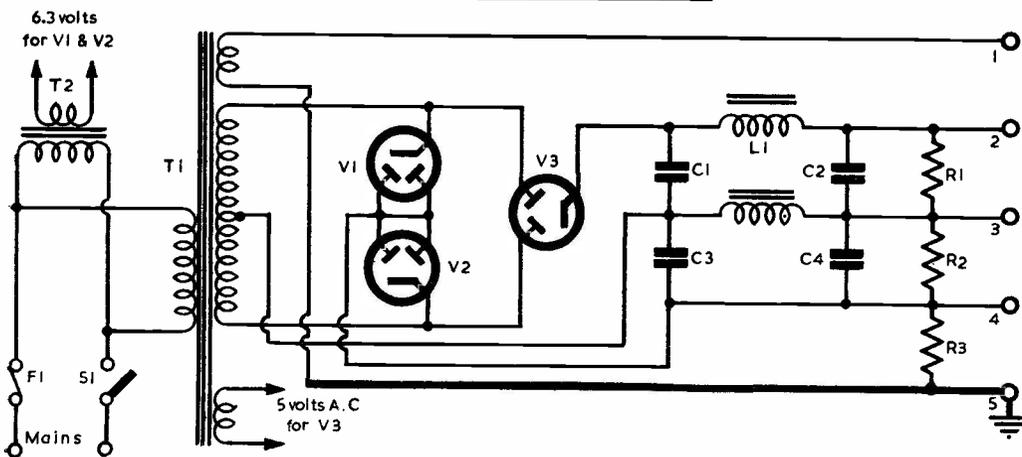
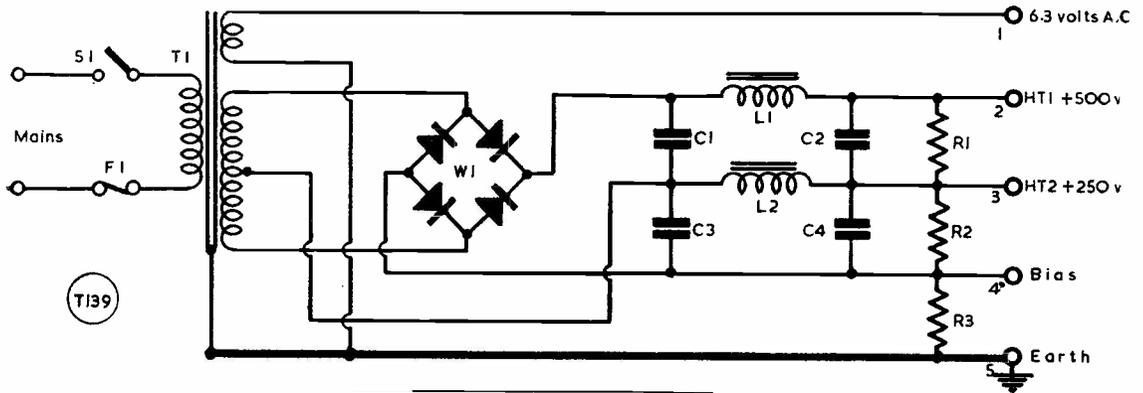


Fig. 7. Suitable power supply units for the B2 transmitter, for which values are given in the table.

as the slug is screwed in. The shift obtained is to LF of the original crystal frequency.

Power Supply

It is understood that a number of B2 transmitters are out of operation due to power supply unit failures, so it may be of help to despairing owners to look at Figs. 7A and 7B, which give details of suitable alternatives.

Inputs in the region of 30 watts can be obtained on all bands. For 160-metre operation, a 10,000-ohm 10 watt resistor in the HT1 (400-volt) lead of the transmitter should be inserted, and will reduce the input to the legal 10 watts.

With the modulator in use, the PA screen volts can be adjusted to control the PA input on CW and Phone.

Design for a UHF Beam

PRACTICAL T-FED SLOT FOR 25 CENTIMETRES—AND A UHF FIELD STRENGTH INDICATOR

A. G. WOOD (G5RZ)

This interesting and important article is the outcome of a long programme of practical work on the 25-cm band, carried out by our well-known contributor as a continuation of his recent offering on UHF oscillators. It describes in detail (and for the first time in the Amateur Radio field) a radiating system which not only has excellent characteristics but is also easy to build from the data given here. The T-Fed Slot as discussed in this article has already proved itself, for it is the aerial system actually used by G5RZ in his successful communication tests, on the 1250 mc band, with G3CGQ over a normal point-to-point path of 10½ miles. An additional, and very essential, item also described with all necessary details is a Field Strength Indicator for checking aerial performance at these frequencies. In view of the practical simplicity of the G5RZ version of this

FSI, it could well be adopted as a convenient standard against which all amateur UHF radiating systems could be compared. That is to say, since this FSI is easily repeatable by any UHF worker, field patterns of other aerial systems could be referred to it and the efficiency of UHF transmitter and beam systems stated in terms of meter readings obtained at, say, a standard separation of 25 feet. Thus, a particular transmitter and beam system giving, for example, a 95 μ A deflection in the standard FSI would be known to be superior to a system at some other station capable of producing only a 25 μ A reading; provided the separation and the construction of the target FSI were the same in both cases, the results would be strictly comparable in terms of radiating efficiency, irrespective of power used and the type of beam employed.—Editor.

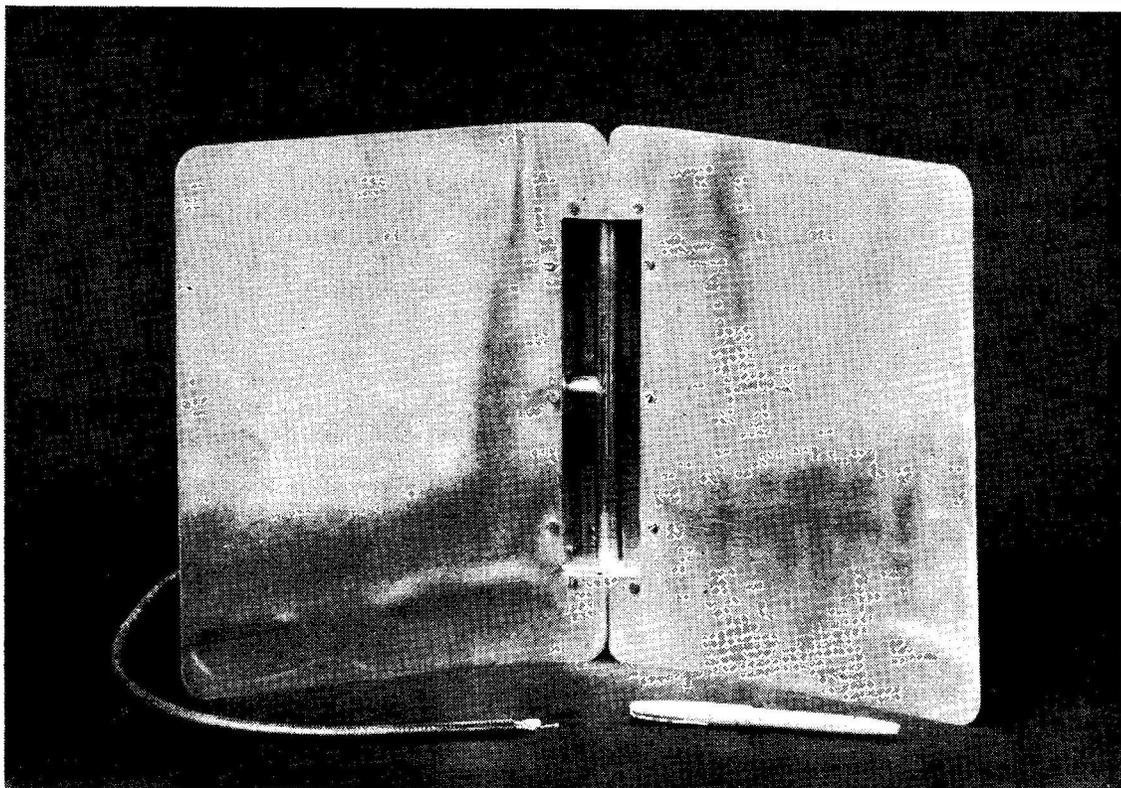
thought seem to exist. One view, very firmly held, is that the maximum amount of radiated power should be concentrated into the narrowest possible beam in order that reasonable communication distances may be achieved at these frequencies. This is without doubt the principle which is adopted in commercial applications where contact has to be maintained between two fixed points—a UHF link, in fact—but the writer at present holds the view that for amateur purposes this may be a double-edged weapon in that it might prevent an otherwise possible contact from being established.

Pros and Cons

At these frequencies it should be within the realm of amateur capabilities to construct a 5 ft. dipole-fed paraboloid reflector having a beam width of about 10° and a power gain in the region of 500. But in the first place such devices are very frequency sensitive and as self-excited oscillators are most likely to be employed at the present stage of development, there may well be severe mis-matches which would result in an effective gain which is very

IT is believed that the recent article by the writer on the construction of a 25-centimetre transmitter, which appeared in the February-March issues of *Short Wave Magazine*, has had the desired effect of stimulating a considerable amount of back-room activity—no doubt, the results of these various endeavours will before long come to the surface.

In the meantime, one of the most interesting problems in connection with the general subject lies in the matter of aerial design for the UHF bands, and in this respect two schools of



The T-fed Slot complete, as designed and constructed by G5RZ, and used to transmit a 25-centimetre signal to G3CGQ, a distance of 10½ miles. Though the Slot is vertical, the polarisation is horizontal. The wings of the reflector ("ground screen") are set at 110°, determined experimentally, for maximum forward gain, as shown in one of the polar diagrams. The whole assembly, which is approximately 18 ins. wide by 11 ins. deep, is mounted on top of the 25 cm oscillator to keep feeder losses to the minimum. The piece of feeder shown is the length actually used.

much less than the theoretical maximum. Secondly, problems are bound to arise in the correct orientation of the beams between two co-operating stations and an error of only half-a-degree might well make the difference between a QSO and "nothing heard."

The writer, therefore, is inclined to the view that there is much to be said for a broad-band aerial with a fairly substantial beam width—at least so far as the transmitting end is concerned—since an aerial of this type is far easier to adjust and there is, in consequence, less likelihood of power being wasted in feeder losses.

This point, in fact, was borne out in rather a marked manner during some recent trials when both transmitter and receiver were using ten-element stacks with plane reflectors. It was found that a half-wave screwdriver connected to the receiver input gave substantially the same results as the ten-stack!

Largely as a result of these cogitations, therefore, the writer decided to suspend, temporarily, plans which were on foot for the

construction of a paraboloid and to try out an aerial of a different type which seemed to offer the advantages sought, *i.e.*, reasonable gain with good beam width. This is known as the T-fed Slot.

Broadly speaking, it consists of a wave-guide closed at one end, containing a compensating bar fed at its centre by co-axial cable, the open end of the wave-guide being terminated in a ground screen of suitable dimensions. It is stated¹¹ that such a device, correctly proportioned, will exhibit a standing-wave ratio of better than 2:1 over an operating range of several hundred megacycles at the frequency (1250 mc) in which we are interested; have a characteristic impedance of 66 ohms (which is a very close match to 72-ohm feeder); and will produce a radiation pattern having a beam width of about 158° in the plane of polarisation and about 70° in the natural plane. It should be noted that with Slot aerials the plane of polarisation is at *right-angles* to the longer of two slot dimensions, so that it is necessary to position the "letter-box" vertically in the

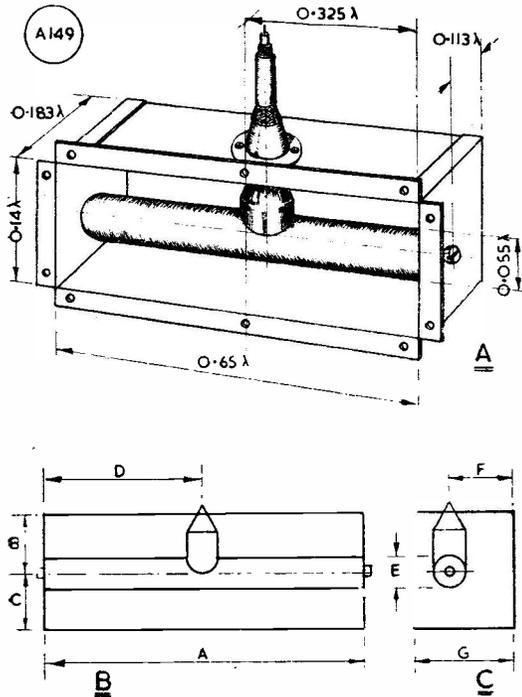


Fig. 1. (A) shows general construction of the T-fed Slot, with dimensions referred to (B) and (C). The reflector wings (or "ground screen") are bolted to the flanges of the Slot, as indicated by the holes. For an aerial to operate effectively on 1250 mc, it is essential to follow these dimensions closely, which give ample frequency coverage within the 25-centimetre band. (See Table).

ground screen in order to produce the desired horizontal polarisation.

Constructional Data—25 Cm T-Fed Slot

Fig. 1 shows side and front elevations, the dimensions chosen being designed to give a cut-off frequency in the region of 900 mc and an operating range from 1150 mc to 1400 mc.

The wave guide section is made from aluminium sheet and comprises three pieces, the main body cut to the dimensions shown in Fig. 2 and bent to shape after making provision for the feeder, and two end pieces prepared in accordance with Fig. 3.

The T-bar may consist either of tubing or solid metal, the writer utilised solid brass rod which was turned down in the lathe to the correct dimensions and subsequently burnished. Holes are drilled at each end and tapped 4 BA, suitable screws being used to bolt the bar in position inside the wave guide box when this is eventually assembled.

The T-feed likewise consists of solid brass rod turned down to the same diameter at its widest part and then tapered off, almost to a point, at the feed end. The apex of this cone is drilled and tapped 6 BA to accommodate

TABLE OF SIZES
T-FED SLOT FOR 25 CENTIMETRES

Dimension	In Terms of	
	Centimetres	Wavelength
A	17.00	0.65
B	1.82	0.07
C	1.82	0.07
D	8.50	0.325
E	1.43	0.055
F	3.03	0.113
G	4.85	0.183

Note: By working from the data in Col. 3, a similar system could be designed for any other UHF/VHF band on which the dimensions are manageable, e.g. 430 mc, for which dimension A would be 45.5 cm approximately.

the centre wire of the co-ax cable. The base of the T-feed is then filed down with a half-round file to fit the contour of the bar and finally sweated into position. Sweating and not soldering is necessary, due to the relatively large mass of metal. The length of the taper is not in the least critical, but the apex of the cone should project about 1/4-in. through the guide box when all is assembled. [over

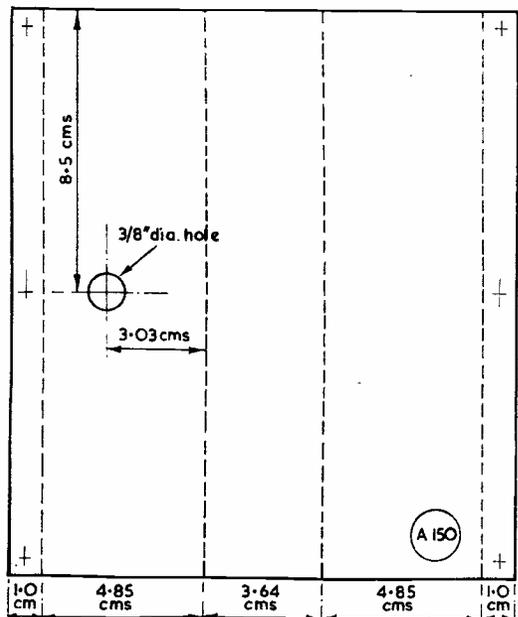


Fig. 2. Dimensions of the wave-guide section, or Slot. All measurements, except the feeder hole, are given in centimetres.

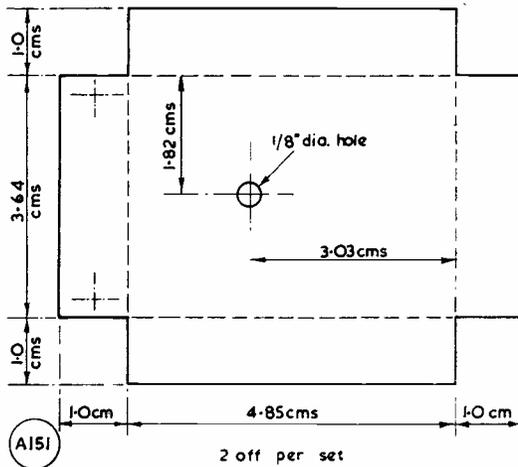


Fig. 3. End pieces for the wave-guide; refer to the dimensioned sketches in Fig. 1. Two of these are required and construction is in aluminium sheet, with sizes given here in centimetres.

Attachment of the co-ax feeder is accomplished by making up a fitment which can best be described as a "witch's hat." This consists of a brass "brim" of suitable diameter with a concentric hole cut to match exactly the hole in the guide, and three or four holes to accommodate the holding down bolts. It is very desirable to make sure that no projecting edges are left where the cone passes through and the inside edge of the guide should be rounded off with a file so that the RF flows smoothly out of the cone and into the guide. The "crown" of the hat is likewise made from a semi-circular segment of brass sheet, bent into the form of a cone and soldered up at the joint and on to the "brim."

The co-ax feeder is prepared and connected as follows: A length of the outer insulated covering is cut away and the braided sheath

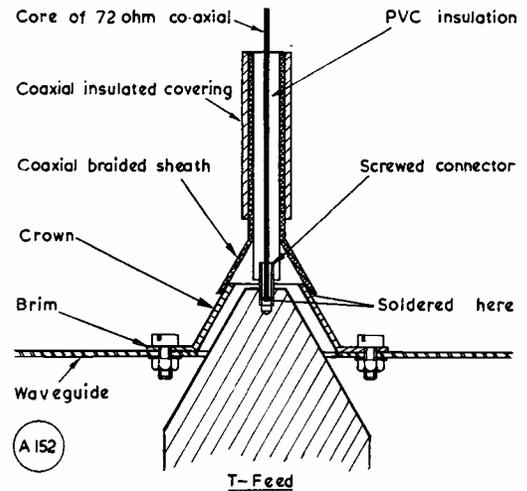
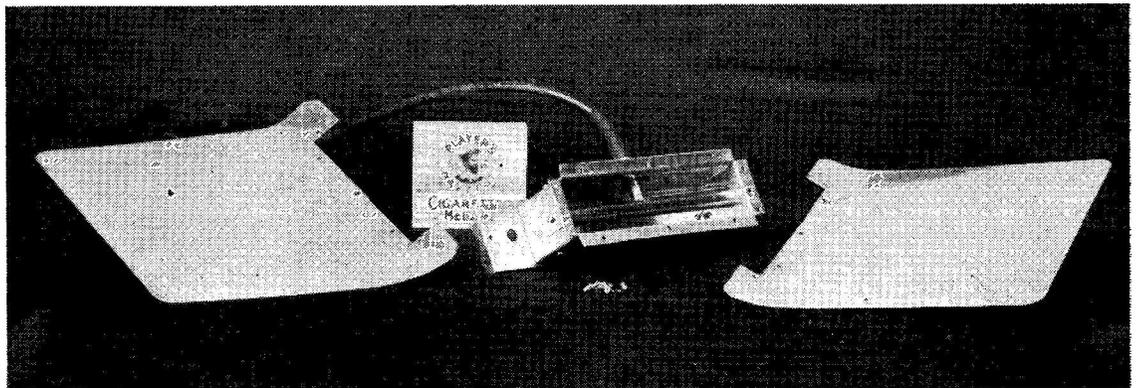


Fig. 4. Cut-away view of the feed assembly, as described in the text — and see Fig. 1A.

carefully pushed back to expose about one inch of the PVC covering. A short 6 BA bolt, after having its head removed, is drilled lengthwise with a small diameter drill; a suitable length of inner cable is exposed by cutting away the PVC covering and the inner cable is threaded through the bolt. If the latter is now heated and pressed against the PVC the latter will soften and the bolt can be imbedded a short distance. Finally, the wire is soldered on to the bolt and the surplus cut off. The prepared end of the cable is now pushed into the hole in the crown of the hat, care being taken to see that the bolt projects far enough to reach the apex of the T-feed cone, and the braided sheath is then worked down and over the outside of the crown, and well soldered into position. The cable is then attached by



This photograph shows how the reflector wings are fitted to the wave-guide, the dimensions of which must be accurately followed (see drawings) for optimum performance in the 25-centimetre band. Construction is quite simple, is in sheet aluminium throughout except for a piece of brass rod, and the model as illustrated mounts directly on the transmitter assembly by means of the bracket at the left-hand end of the Slot.

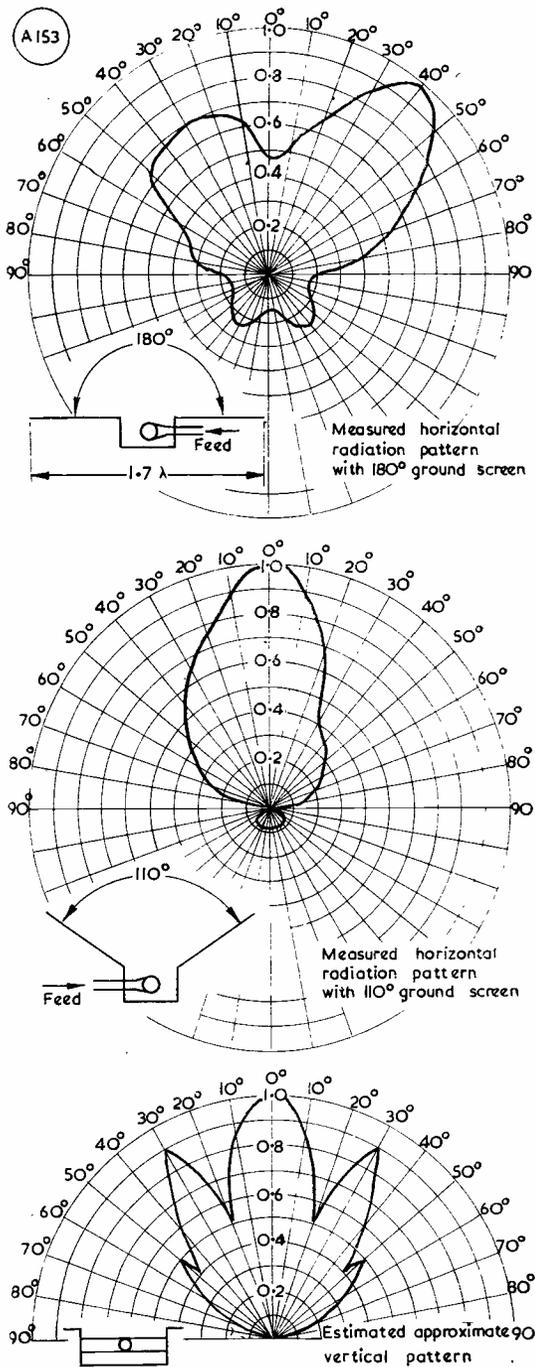
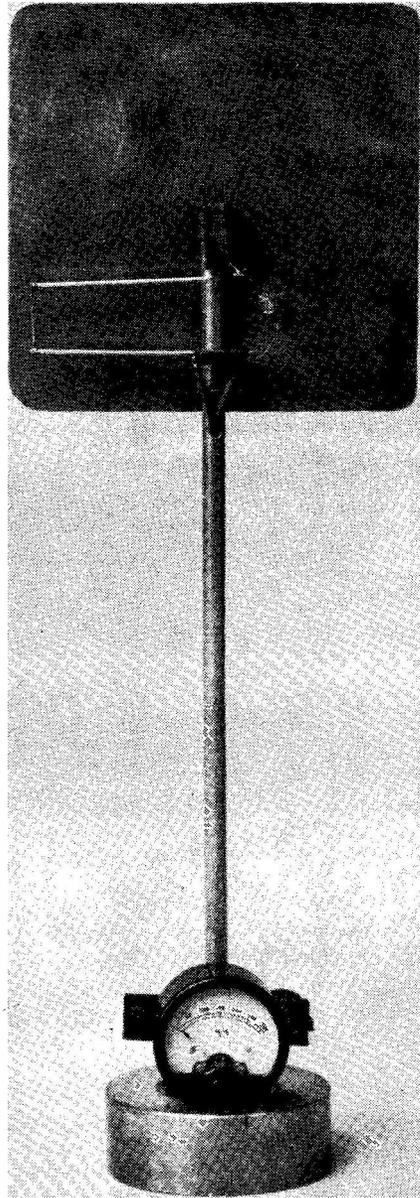


Fig. 5. Polar diagrams obtained by the author under practical conditions, with the aerial assembly as shown in the photograph, energized by the 25-centimetre oscillator described by G5RZ in the February-March issues of "Short Wave Magazine." The measurements were taken on the Field Strength Indicator, also described here, and the best result obtained with the "ground screen" wings set at 110°—see text. The lower diagram should be viewed with the bottom edge vertical.



Rear view of the UHF Field Strength Indicator designed by G5RZ, of which full details are given in the text, with a dimensioned electro-mechanical drawing. The "tuned choke" is the wire loop; this dispenses with a load resistor and increases sensitivity to a useful degree. For convenience in taking readings, the microammeter is so fitted that it swivels on the dural mounting tube. The base is an odd piece of heavy brass casting.

rotating feeder and hat complete, thus screwing the bolt into the apex of the T-feed cone, and retained in place by fitting and tightening up

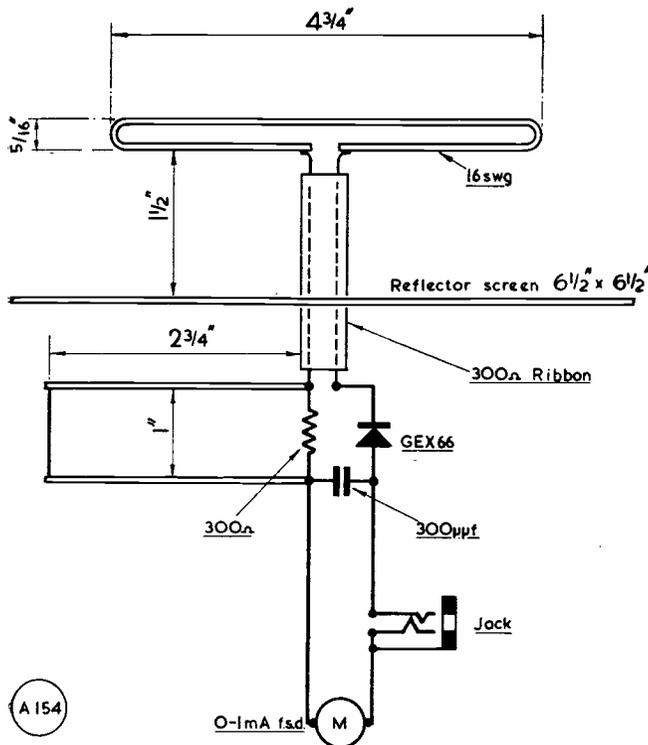


Fig. 6. Layout and construction of the field strength indicating device, designed by GSRZ and used to obtain the polar diagrams given in his article. The "tuned choke" consists of two 2 3/4 in. lengths of 20 SWG, one inch apart, bridged at the far end. The 300-ohm resistor marked is removed when this choke, which gives about a 25% improvement in sensitivity, is fitted.

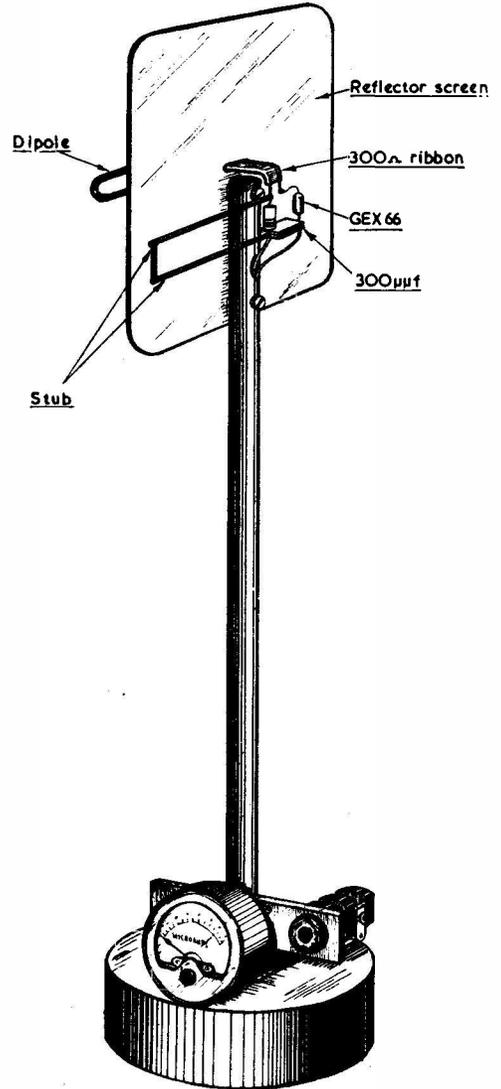
the holding-down bolts passing through the rim of the hat and the guide.

Fig. 4 gives a cut-away view of the whole assembly in order to clarify matters. It can be seen that the transition of the RF from the confines of the co-ax cable to the open space of the wave guide is effected with the minimum of discontinuity.

Setting Up and Adjustment

An aerial built in accordance with this description and to the dimensions shown, was fitted to an aluminium "ground screen" or reflector having a width of approximately 1.7 wavelength (45 cm). Tests were then conducted with the device excited by the concentric-line 1250 mc oscillator described by the writer in the February/March issues of the *Magazine*, in order to determine the radiation pattern in the horizontal plane, i.e., in the plane of polarisation.

A circular turntable of suitable diameter was cut from plywood and marked off in steps of 10° around its edge, the turntable being fixed to the lid of an old packing case to serve as



a stable baseboard and upon which it was free to revolve. The transmitter and aerial complete were then mounted thereon and the whole set up in the open air well away from any possible reflecting surfaces and at a height of about five wavelengths above ground. The measuring device was likewise set up, as a target, at a distance of some ten wavelengths away and at the same height as the centre of the radiator.

Field Strength Indicator

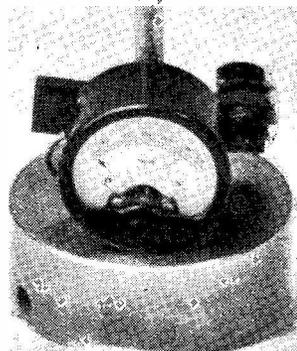
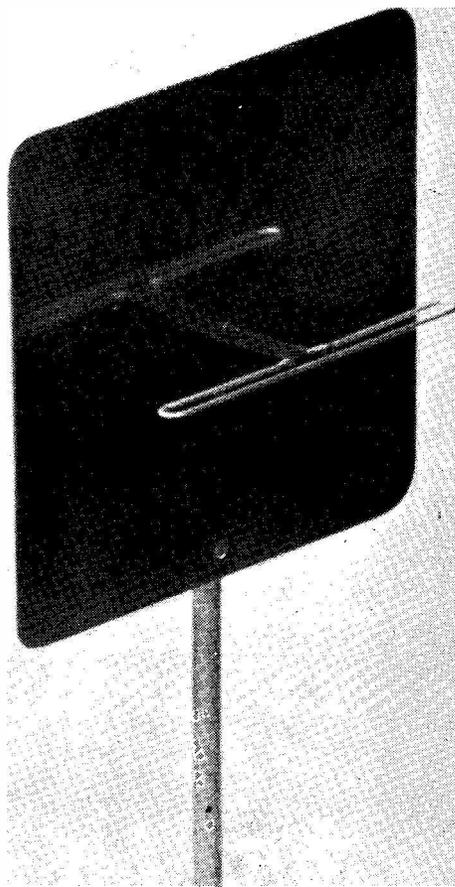
The measuring apparatus deserves a few words of explanation. As it is absolutely essential for experiments at these frequencies it is fully illustrated here. It consists of a folded

Front view of the UHF Field Strength Indicator described by G5RZ. It stands 19 ins. high overall, is sensitive, stable and convenient to handle. It forms the target for assessing the various types of UHF aerial arrays with which experimental work on the 25-centimetre band is now in hand. As suggested by this photograph, the reflector backing the folded dipole is polished aluminium. Full constructional details are given in the article.

horizontal dipole fed by a short length of 300-ohm flat ribbon; this ribbon passes straight through the centre of a square sheet of aluminium serving as a plane reflector, which in turn is bolted to a 14 in. length of $\frac{3}{8}$ in. dural tube, the lower end of this being screwed into a suitable weighted baseplate. Immediately behind the reflector one end of the 300-ohm ribbon is connected to a crystal diode and the other end to a 300-ohm resistor (or, for maximum sensitivity, to a tuned choke). The output from this network is bridged with a 300 μF mica condenser and fed *via* a hole in the dural tube down to the base of the instrument. A 500 μA or 1 mA meter is bolted to a strip of bakelite by means of its own terminals in such a manner that it is free to revolve around the bottom end of the dural tube; the strip of bakelite also carries a close-circuit jack into which a pair of high resistance headphones may be plugged for more distant observations. The output leads are taken up through the base of the instrument and suitably connected.

This form of construction makes a very neat job and the meter can be swung into any convenient position to face the observer when readings require to be taken. Two crystal diodes have been tried; the GEX33 will give quite good readings, but the GEX66 is vastly superior. Reverting to the tuned choke as a substitute for the 300-ohm load resistor, this was constructed by soldering two 3 in. lengths of 20 SWG tinned copper wire to either end of the resistor in the form of a stub, the spacing between them being one inch.

With the transmitter running and the measuring instrument placed so that the meter was reading about half-scale a shorting bar was then fitted to the ends of the stub remote from the resistor and gradually moved inwards until maximum meter reading was obtained. The shorting bar was then soldered into that position and the surplus ends, as well as the 300-ohm resistor, snipped off with wire cutters. The optimum length of this stub in the writer's case was $2\frac{3}{4}$ ins. and showed an improvement of about 25% above the reading obtained with the load resistor alone. The general construction and finished appearance of this Field Strength Indicator can be seen from the photographs and drawing.



over

Performance Tests

With the transmitter and FSI set up as previously described and with power on, readings were then taken in steps of 10° and potted in the form of polar diagrams—these are reproduced herewith. It will be seen that with a 180° "ground screen" or reflector there are two main lobes with considerable distortion present on one lobe.

The "ground screen" was then bent forward to produce a form of corner reflector and at an angle of 110° the second and far more favourable pattern resulted. There is still evidence of slight distortion in the pattern, but as this occurs at the wider angles it does not seem to be of a serious nature.

It is of interest to note that the falling off in radiation occurs on the side opposite to the T-feed connection and there seems to be little doubt that this is the explanation. It would be interesting to compare the patterns obtained were the feeder to be brought in at the rear instead of to one side of the waveguide.

However, the pattern obtained with the 110° angled reflector is clearly a very satisfactory

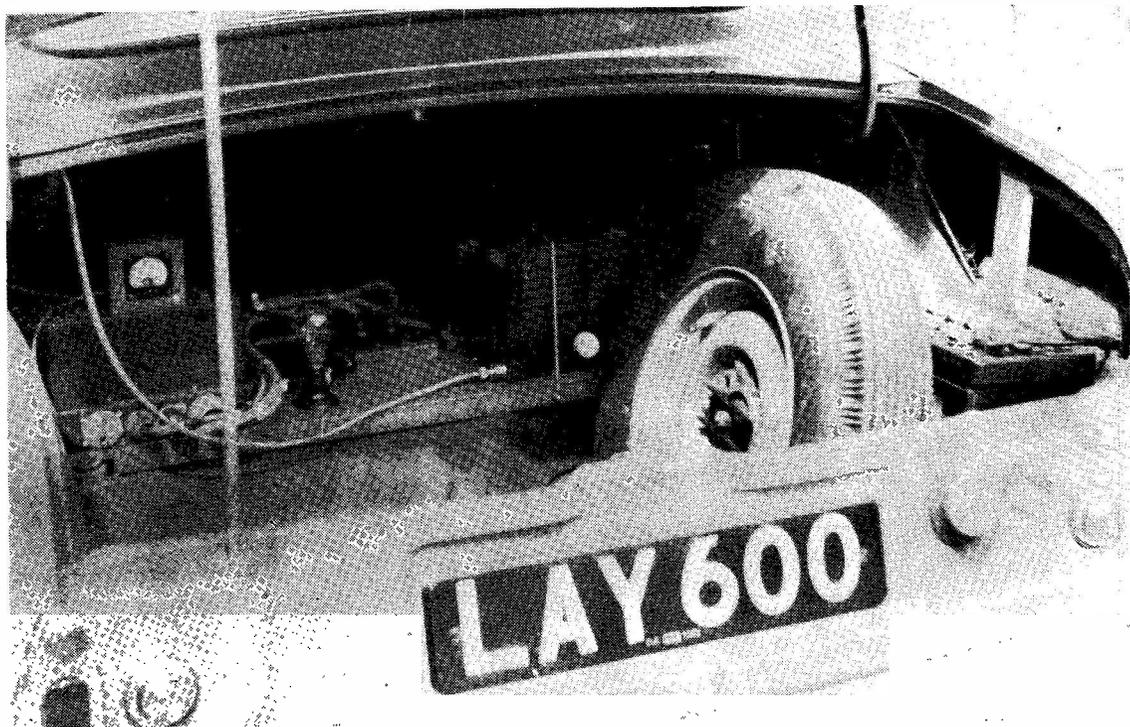
one, and it should be noted that the back-to-front ratio is also considerably improved.

With regard to the vertical pattern, so far it has not been possible to measure this, and only an approximation has been obtained; a drawing of this estimation is also given. It is probable that the secondary lobes which are present could be reduced and the main horizontal lobe accentuated if the vertical dimensions of the ground screen were to be extended somewhat and perhaps also bent forward slightly.

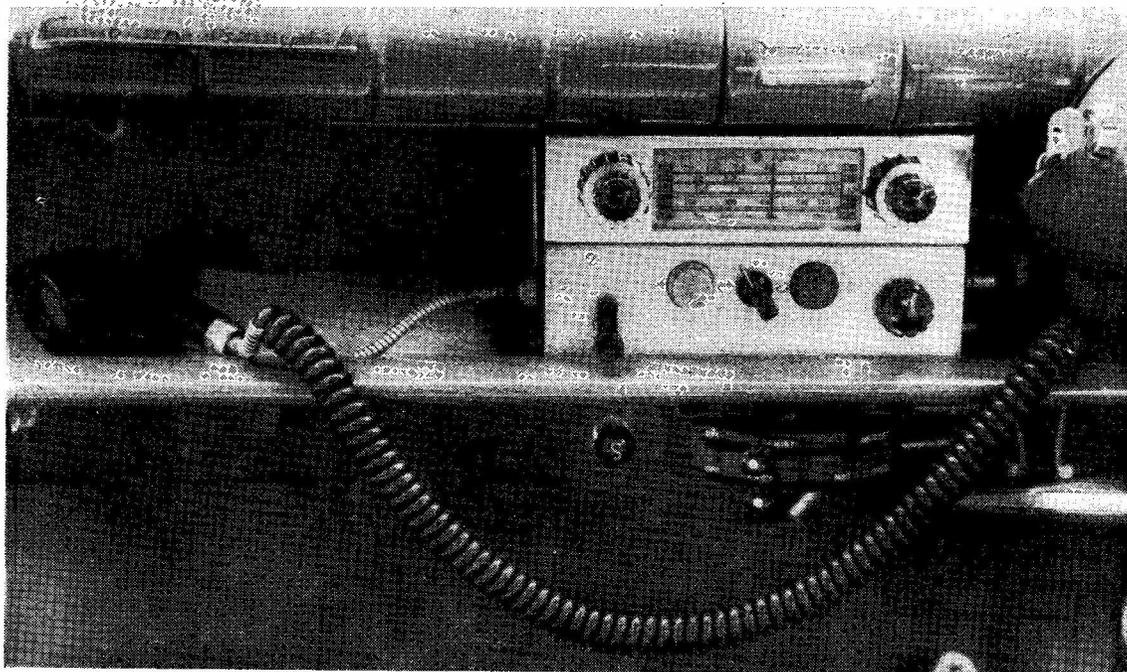
This aerial has successfully put a signal into G3CGQ's station at Luton over a $10\frac{1}{2}$ -mile path (as reported on p. 201 of "VHF Bands" in the June issue). Although it has not been possible to measure the SWR this radiator loads up far better than any other UHF type yet tried, as is evidenced by a considerable reduction in grid current in the oscillator.

REFERENCE

"Very High Frequency Techniques," Vol. 1, Section 7, "Slot Antennae" by A. Dorne & D. Lazarus. Published by McGraw Hill.



The installation in the boot. Construction is in unit form with plug-socket interconnection and the VFO is tuned from the driving position by means of a 14-ft. length of Bowden cable. Change-over is by relay, with receiver muting; aerial is a centre-loaded whip.



Operating position in G3ATL's Ford "Consul" showing the Pye P59CR receiver, modified for the 20, 80 and 160 metre amateur bands. The installation operates "press-to-talk," with over-ride control switching at the transmitter position in the boot.

MOBILE INSTALLATION FOR THE LF BANDS

COMMUNICATION FROM
A CONSUL

D. I. WIGGANS (G3ATL)

DURING the last six months mobile contacts have been made on the 160- and 80-metre amateur bands from "Consul" LAY-600, using the installation shown in the photographs.

The transmitter is SCR-274N apparatus, modified; the major alterations have been to the control section of this equipment so that the transmitter can be operated from the driving position in the car. This entailed the making and fitting of a suitable control panel, which is mounted under the Pye P59CR receiver seen in one of the photographs. This receiver has itself been modified to cover the 160-, 80- and 20-metre bands; the original 19-, 25- and 31-metre SW broadcast band coils and condensers were removed, and suitable coils made up to cover the required amateur bands. This has resulted in a very neat and efficient arrangement, meeting all the immediate needs for mobile operation; on "transmit" the receiver is muted, the relays for this and the aerial change-over being in the control box.

Change-over control is by "press-to-talk" at the driving position, with additional switching on the transmitter itself, so that it can be run up for test and aerial adjustment with the driver out of his seat. VFO control ("netting") is obtained by means of a 14-foot Bowden cable operated from the driver's control panel.

The aerial is a centre-loaded whip which can be resonated in any of the bands covered; its mounting butt can be seen to the left of the number plate in the rear-view photograph; this also shows how compact the transmitter section can be made using the SCR-274N equipment.

Some Results

Very encouraging results have been obtained on the installation as pictured here. One mobile-to-fixed station contact was with GM3IWU, near Glasgow, when G3ATL/M was in the neighbourhood of Kibworth, Leicester; this was on 80 metres, and the G3ATL/M signals were given as RS-58.

On May 1st, a Sunday, G8RY accompanied G3ATL/M as operator; running north up the A6, and tuned for the 160-metre band, contacts were made with several stations in the Derby and Nottingham areas. Near Matlock, G5CP/M came up calling CQ and responded to the reply from G3ATL/M; this resulted in the two mobiles homing on each other, culminating in a personal QSO in the vicinity of Culver, near Bakewell, Derbyshire.

DX COMMENTARY

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

WE are pleased to chronicle a pretty lively month. Activity seems to have been high on all bands. DX has not been too scarce, QRM from Europe is noticeably falling off at certain times of day, and everything promises well for the future.

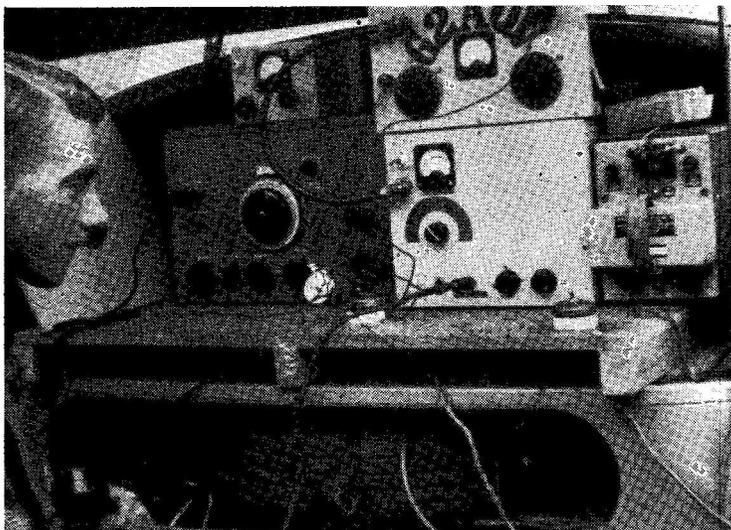
Maybe the old saying that Anticipation is better than Realisation (translation: "After you've got what you want, you don't want it") has something in it, and we feel that it is a good thing to be sitting on the slope of a rising curve, rather than enjoying the peak and waiting for the slide down the other side.

Our particular curve should be rising for three or four years at least, and we foresee a great increase in the traffic problems on our bands. However, more stations will be chasing more DX, not less, so things will sort themselves out. Already, we imagine that a band occupancy check would reveal at least a 50 per cent. increase on the last year's figures.

Even *Ten* is showing some returns, and in the tropics it is giving quite good DX results. Africa and South America are making mutual contacts all the time. In these latitudes, though, it seems that one can often hear both parties without being able to raise either of them!

The DX on 21 mc

Just at present, the 21 mc band is one of the most interesting, with new countries showing up every week-end and scores mounting apace. Note that the leader on the ladder (GW3AHN) has now reached the total of 125.



G2AQP/P

CALLS HEARD, WORKED and QSL'd

VS6CQ (Hong Kong) lists the following as *regularly* heard out there: CR9AH, XZ2OM, KA2's (numerous), JA1, 3, 4, 5, 6, and Ø, and KR6AB. (Stand back, there!)

DL2RO (Hamburg) finds that the peak days on the band are 21 to 28 days apart. May 22 was especially good, with JA stations roaring in from 0900 to 1200 GMT. JA1CJ, 1CR and 3CH were outstanding signals, and all three reported that Europeans were pouring in there. Others the same day were OA4C, CR6AI, CR7AH, MP4BBL, KP4JE, ZD6RM, ZE3JO and numerous W's. HA's and LZ's are now at large on the band, and working all comers. UA9KDL is also around, but works only Russians and the satellites.

GW3AHN (Cardiff) found new ones in FM7WQ, HR1LW, MP4KAC, PZ1RM and ZD9AC—all on phone, as well as HA5BU, JA3AH and YN1AA on CW. Other phone contacts included

TI3LA, VP6's, VP9's, HC's, CO2CY, FQ8AR and numerous better-known ones, with CW yielding PJ2AN, LU8EE, ZD6RM, FF8AJ and W's.

GM3JDR (Caithness) raised KP4JE, LU's, PY's and UQ2AN as well as many Europeans. On occasions conditions have been such that he has found the band full of G's working W's and VE's whom he could not hear at all. It shows what difference a few degrees of latitude will make.

G6VC (Northfleet) has been on 21 mc a good deal, working W's and Europeans, but hopes to have a much better skywire up soon. G3CO (London, S.E.14) comments on the short skip during the afternoons, and has heard phone QSO's between VQ4 and YI, and similar things, sometimes at great strength and sometimes fading right out as conditions changed quickly.

G5VT (Bishops Stortford) approves of the fact that we call

this band *Fourteen*, in spite of the many "CQ Fifteen" calls heard—and he even found an 11 calling "CQ Sixteen" on one occasion!

Ten-Metre Topics

For the first time for many moons (or should we say sun-spots?) we are able to devote a short section to activities on *Ten*. It hasn't attracted many clients as yet—but it will!

GW3AHN, as one might expect, has been wheeling them in. On phone, during the month, he worked LU, CX, CN2, OQ5, FA, ZB1 and Europeans; others heard but not worked were VQ2, ZS3, ZS6 and ZD3; OQ5 and DL were also raised on CW.

GM3JDR, on CW, netted DL, DM, HB, G and LU. He finds, though, that stations often fade out before a QSO is completed. G3IAD (Wakefield) caught a short-skip opening and raised DL, HB, OE and OK, all with S8-9 each way.

G3IDG (London, S.W.12) worked GM3JDR and heard EI5C, CX2CF, FA3OA, KT1UX, LU3AAT and VQ4AQ. On May 15 he logged 14 countries on the band; he also tells us that G3CAS worked VQ2NS and CX5CV, and that G5UX heard a CN8.

D. Moore, an SWL in Lowestoft, logged five LU's, some at S9+, a CX and numerous Europeans and others. LU3AAT was heard at terrific strength on *Ten* every day for a week.

DX on Twenty

At last one can truthfully say that *Twenty* is frequently open for the entire twenty-four hours. The W's often persist until well after midnight, and the West Coast stations are in force in the early hours. During the intervening period, anything may show up. Those who spend these weird hours on the air are usually well rewarded by choice DX pieces.

On the rare occasions when G6QB stayed up after midnight, the following were heard or worked on *Twenty*: MP4JO, ET2XX, VU2NR, VQ6LQ, CR4AF, VR2AR (all before 0300). After 0600 the following: VR2BZ, YJ1DL, ZM6AS, KJ6BG, KW6BB,

Many of them would not have been found at all, but for hordes of W's calling them; and then they were only just identified in between the howls of the wolf pack.

A character signing YA6GAL may possibly be the genuine article, if W6GAL is in Afghanistan at this time. At present, no news. Likewise, there seems to be a certain FW8AA in much demand by the VK's, but we have doubts about him at present.

GM3JDR, on CW, has raised JA6AA and 6AO, KH6ER and 6IJ, ZD6RM, VP5DC (Turks), KG1JB, KL7's, lots of KA's, FB8BR and EL2P—in fact, his full list looks like the call-book.

G5VT worked KC6CG, which, he says, has been run by two operators, both named "Ed." The first used to QSL, but the second doesn't appear so good. Although 'VT gave him his first European QSO, no card has yet arrived. He adds that ZM6AT was a good signal during the latter part of April.

GM2DBX (Methilhill) collected VS5CT on phone, despite the "Greek Chorus." DL2RO reminds us that KC6's are now in two groups, East and West Carolines, lined up as separate countries. The former have KC6U . . . call-signs. 'RO also says that VQ9NZK will

open up from Seychelles in July, and that BV1US in Formosa is all right.

G3IGW (Halifax) made WAC in 90 minutes on June 7, with VK4YP as his very first VK; he has also worked W6 and JA in the afternoons and heard OA8B, FY7YF, PX1AR and YA6GAL. G2TA (Bushey Heath) says he is "completely DX-happy" in his new QTH, from which he has already raised HP1EH, VP5BM, HC1ES, EA0AB, KR6LJ, VQ6LQ, W4BKS/KL7. He puts in one of the rare good words for "handles"—frequent use of them helps to keep the other fellow identified during heavy QRM, making sure that you don't spend too long listening to someone else.

G3IAD (Wakefield), who has received his DUF since last reporting, had a good morning on June 5, when he raised YN1AA, KH6GF, 6WU and 6DQ straight off. Other DX included ZD6RM, VS1's and 2's, JA's and KA's, YS10, OY7ML, AP2U, VP8BD, PJ2CJ, CR4AL and some VU's.

Other Bands

G3JHH (Hounslow) says that *Eighty* seems to be passing through a phase of extreme QSB by day and very good conditions at night. He has been getting well round Europe with his 15 watts, as far



In the February issue we published a picture of Tan bin Hussain as an SWL; here is his station as VS2DW, a call actually held since 1952. Incidentally, he is the only native-born Malay in the world holding an amateur licence. As can be seen, he has a fine array of gear, including a modified BC-610E with a BC-221 as VFO, an HRO-7 receiver with Radiovision pre-selector and a 100 kc calibrator. Activity at present is almost exclusively DX-chasing on 80 metres, a most difficult band to operate in Malaya, and VS2DW remarks that he "spends more time tickling bug than gripping mike"

as OH and an SM8/MM. He also heard some activity from TF, but the rabble covered it up and he

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G5JM	96	97
G2NJ	95	96
GM3EFS	94	94
G3HIS	94	94
GM3OM	93	95
G16YW	93	93
G3JEL	92	94
G5LH	92	92
G6VC	91	92
G3JEQ	90	90
G3HIW	89	92
G3CO	88	90
G2AOL	87	91
G5JU	87	87
G2AYG	83	84
G3EUK	82	88
G3BRL	78	79
G3JHH	77	77
G3FTV	73	81
G3IGW	72	82
G3DO	71	72
G3GYR	69	70
G3JKO	68	79
G3HZM	63	68
G2HAW	61	70
G2HKU	61	62
G3JBK	60	71
G3FMZ	60	68
G5FA	60	66
G3FAS	58	71
GM3JNW	58	68
G3JZJ	57	69
G3JJG	50	67
G8CO	49	64
G3KEP	48	67
G3FTV/A	47	65
G3DGN	47	60
G3JAM	47	60
G2CZU	46	47
G3FNV	38	61
G3IAD	38	59
GM3JZK	38	41
G3JZG	33	49
G3JYV	33	48
E18J	31	47
G3HQT	30	36
G3JVK	24	39
G3HQT	20	29

didn't even get a call-sign. Talking of call-signs, what do you make of "CH8BD," reported by K. Shephard from BAOR 10? Apparently the op. said he was in Germany. GM3JDR found IT1TAI for a new WAE point on 3.6 mc (IT's still don't count as a new country, but they score for WAE).

G3JZL (Market Drayton) worked his first W's on *Forty*, and heard PY5, 6 and 9 instead of the usual welter of Europeans, so that band is also changing. G3JJG (London, S.W.16) made one of his rare visits to *Forty* and collected LX1DO (who gave him "RST 499"!)

Mobile Note

G3FYZ/M from Blackpool and G2DHV/M from London, S.E.13, claim to have made the first mobile vessel-to-vessel contact on inland waters! This took place on May 18 at St. Olaves, Suffolk, on the River Waveney. The frequency was 7.1 mc.

Top Band Topics

We are in considerable trouble for suggesting that Lundy Island might make the century possible! We had the total figure of 98 in mind, and thought that the addition of the Scillies would bring this up to 99; however, the Scillies were already included in the figure of 98—so that figure remains the maximum at present. It is made up of 41 English counties (including London and the Scillies); 33 Scottish; 13 Welsh; 6 Northern Ireland; 4 Channel Islands; and the Isle of Man. Apologies for the confusion; we hope all is now clear and that it is not necessary to publish a full list, which would take up a lot of space.

GC3DVC/P, Sark

GC2CNC and GC2FMV were on the island over June 8-21 inclusive, using the simplest possible gear for 160-metre working—an 0-V-1 receiver, and a small battery CO-PA transmitter (IT4-3Q5) running 0.8 of a watt input. CW only. With this QRP outfit, they gave contacts to many a keen WABC operator, whose thanks they well deserve; it was an enterprising effort, and we hope

they also enjoyed a good holiday! In a quick note to catch this issue, GC2CNC promises full details of the expedition in due course.

G5JM (Buckhurst Hill) registers the terrific total of 97, with 96 confirmed. He, like so many others, was delighted to hear GC3DVC/P come up from Sark. JM, commenting on the ON4IC reported last month, says he had a phone contact with "ON4KC" some time back, and he seemed genuine enough, but no QSL has arrived. Conditions on 160 metres remain very good, with ranges of 500 to 600 miles after dark all through the year, it seems.

G2AOL (Oxford) is back on the band, with a new shack and new equipment to be installed when time permits. He is one of the select few who have worked over 90 counties. G3JJG (London, S.W.16) raised the Sark expedition, as well as several new Welsh counties during the Whitsun holiday. G3CO (London, S.E.14) is on the 90 mark, and wants to thank G3IWF for his portable efforts in GW. He tells us that G5PP is taking a holiday in Scotland, so look for some of the rarer GM counties between July 9 and July 22.

GM3JZK writes from G-land, having recently added an "X" to his YL! He hopes to be on again soon. G3HIW (Ilford) makes it 92, thanks to the Sark effort, and confirms the above information on GM5PP/P. GM3DOD (Renfrew) collects his WABC, having started on the band only last November. G3JEL (London, N.7) reaches the dizzy height of 94 worked (92 confirmed), and would like some activity from Alderney now! Others that would be interesting are Bute, Nairn or Ayrshire.

G2NJ (Peterborough) rightly suggests that the only way to make the Century would be to include both Lundy and the Isle of Jethou (GC)!

G3DGN (New Barnet) collected Moray and Anglesey, but is still short of Cumberland—his last English county. GM3EFS (Alexandria) reports that GM3AUD is in Ross and Cromarty, not Inverness. G3JJZ (London, S.E.6) hopes to be more active for a while until he goes into the R.A.F. for three

years (even then he hopes to get to Locking!) He is now the proud possessor of WABC. G3JHH (Hounslow) raised DL2PA for his first over there. The DL was running two watts, but his signals were 599. OK2BEK was also collected.

G3JAM (Woodford Green, Essex) writes that "he has at last managed to work 60C on Top Band," and sends a list of confirmed and unconfirmed contacts; he wants some 13 QSL's to make up the required total. Many stations have, of course, worked 60 or more counties on 160 metres—but few can have done it with a 132,000-volt Grid feeder within 80 feet of the aerial; this, says G3JAM, "does make things very tricky." Think of the noise level!

As a change from all this GD_X, we have a note from G5JU (Birmingham) to say that he heard WIBB on May 1, peaking at 569 around 0445. 'JU was unable to raise him, and didn't hear anything else on the band at the time.

The Overseas Mail

We have to acknowledge receipt of the "Malayan Amateurs' Newsletter," published by the M.A.R.T.S.; and, lest you should imagine this to be a broadsheet, we hasten to add that it runs to some 46 pages and weighs roughly 8 oz.! The current issue contains a complete "Call Book" of VS1, VS2, VS4, ZC2, ZC3 and ZC5 amateurs, test reports, propagation forecasts and technical articles of all kinds. It also gives details of the "Worked All Malaya" Certificate, available to those who have worked a VS1 and six VS2's, all in different States or Settlements chosen from Selangor, Johore, Kedah, Penang & P.W., Malacca, Perak, Negri Sembilan, Pahang, Kelantan, Trengganu and Perlis. QSL cards and coupons to cover their return should be sent to Box 600, Penang, Malaya.

VS1FK is active on 21 mc, where he has been having frequent QSO's with VP6 *via* the western path. Not much is heard from G except on Sundays, when the QRM is troublesome.

ZB1EB (G3IJU) is running about six watts to a 20-metre ground-plane, and collecting the



G3DGN, New Barnet, Herts., on since 1948, at one time operated VS7IT. The station is at present located in the living space of a 5-room caravan adjoining Hadley Woods. Equipped for most bands, activity is mainly on One-Sixty — and evidently G3DGN "takes it on a typewriter."

DX with it, but he hopes to be on all bands with at least 50 watts before long. VS6CQ reports a great improvement in conditions, and says he is hearing the "smaller voices" again, a good example being DL1ED with 5 watts, on 21 mc. Europe is being received, long way round, at 0700 GMT—something that has not happened more than five times in the past three years. He tells us that there is plenty of 21-mc activity out there (weekdays and all) and that CR9AH is on CW and phone, mostly week-ends. The LF bands have deteriorated, although Europe still struggles through on 7 and even 3.5 mc. (As a matter of interest, London Regional on 908 kc is often heard around dawn!) VS6CQ returns to England and becomes G3DXJ again in November.

VS2DB (Kuala Lumpur) reports that ZC3AC is QRT for the present. Also that ZC5SS (Sandakan) is active on Twenty phone, after a year's absence. The only signal that 'DB heard from the

U.K. during May was that from GM3DHD. He asks that all ex-VS1's and VS2's should forward their present address to P.O. Box 600, Penang, as undeliverable cards are held for many of them.

DX Strays

The following items come from numerous sources, including the Bulletins of the West Gulf DX Club, Southern California DX Club, Northern California DX Club, KV4AA and many other readers and correspondents. Some are only rumours, others are definite pieces of news of forthcoming events, and some are past reports, included in case they should interest those who have heard or worked the stations in question.

ZD9AD will be in operation from Gough Island (some 250 miles S.E. of Tristan da Cunha) for a period of about four months during the winter. The operator will be G3HPM, and he plans working on all bands, *including 160 metres*. G7DW/MM (see last

month) has now been licensed in the British Virgin Islands with the call VP2DB, and hopes to put VP2DB/MM on the air from all sorts of places during a round-the-world tour. A large U.S. manufacturer of radio equipment is reported to be interested in sponsoring the project, which may last as long as two years.

FU8AA is to be active soon . . . EA9DC is said to be on again from Ifni . . . VR6AC has been up on phone, using a Vee-beam pointing North-East . . . VK4IC, also phone, is on Willis Island, Coral Sea.

VS5CT is expected to leave Brunei and become VS4CT for about four months, after which he will operate ZC5CT for another three or four months. BV1US is genuine, in Formosa. ZC3AC is reported to be on 14074 kc, Fridays at 1500 GMT. ZC2PJ showed up on Cocos-Keeling, 7 mc, and returns to Ceylon in August, but hopes to "interest his relief in the rig." VP5BM and 5DC are both on from Turks and Caicos Islands. Frequencies said to be 14010, 14050 and 14080 kc.

HI8WF has been having a burst of operation, CW on 14018 kc. KJ6BG is a new one on Johnston Island—said to be on 14030 kc from 0230 GMT onwards. VP1FL has been doling out many contacts around mid-day, 14060.

YJ1AA (phone) is not regarded as genuine . . . VQ5FS is EI9G

and will be there for three years. His aerial is sixteen half-waves in phase! . . . XW8AB is in Laos, and genuine . . . VS4CT is now on from Sarawak, and has worked W's . . . AC3PT and AC5SQ sked VS1CZ daily, 1215 GMT, 14114 kc.

KC6ZB and 6ZC should be on by early July, from Yap Island. YJ1DL, New Hebrides, is genuine, and is ex-VK2DE and ZC3AB. VR2BZ has retired from the R.N.Z.A.F. and taken a Government job at Nadi Airport, so no more prospect of expeditions to ZM7. But he may be on from VR5.

FO8AK is now on Rapa Island, replacing FO8AD . . . VQ8CB (Chagos) is on 14014 kc as well as his usual frequency of 14103, both CW.

MP4JO is under cover but promises QSL's and is worth working, as he will be a new one for many. ZD8AA may still be found around 14003 kc, but will disappear if a pile-up starts.

Back from Exile

Naturally, we were all delighted to hear of the release of Bob Ford, ex-AC4RF, after his long imprisonment by the Chinese Communists. He is reported to be recuperating rapidly in Hong Kong, and already there are rumours that he plans to operate as a VS6 before coming home! (See SHORT WAVE MAGAZINE, December 1954, p.559, for a

comment on his case.)

Connecting up with the previous paragraph is the news that ON4QX/AC4 has actually been on the air from Tibet (*not* Nepal). ON4QX himself has worked them from his home station, and is said to be flying out there for two weeks' operation during July. A signal from Nepal is possible but not likely, as no authority has yet been granted.

The International DX Contest

Dates and times for this annual event are now to hand, and are as follows: Phone Sections, October 22-24, 0200 GMT; CW Sections, October 29-31, 0200 GMT. Usual sub-divisions of one-operator or multi-operator stations, and Single-Band or All-Band operation. Rules as usual, the score being made up from contact points on all bands, multiplied by the sum of the different Zones and Countries worked on all bands. For single-band entries, naturally this becomes contacts on that one band multiplied by different Zones-plus-Countries worked on that band.

Contacts between different Continents score 3 points, between different countries on the same Continent, 1 point, and between stations in the same country, *no* points, but the multiplier is allowed.

Miscellany

Last month's appeal for a modern definition of DX, and for some new Q signals, brought an interesting crop of replies. The CQ for a quick reply has been given as "CQ/QK" (Quickie), or "CQQ" (same meaning) by quite a number of readers, as has "CQC" (Chew the rag). We might possibly get these adopted in time.

The definition of DX produced "Distance Xtraordinary (for the band in use)" from G2ZZ (London, E.6). G3CO thinks that one of our bright mathematical contributors might work out a formula to define it, as it is a function of a constant (location) and three variables (power, aerial efficiency and conditions on the appropriate band). We agree, but unfortunately "rarity" enters into it, since, to many people, ZS1 is not DX, but ZS9 is.

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

Station	Points	Countries					Station	Points	Countries						
		3.5 mc	7 mc	14 mc	21 mc	28 mc			3.5 mc	7 mc	14 mc	21 mc	28 mc		
DL7AA	678	96	159	219	100	104	222	G2BW	368	24	57	144	100	43	165
G6QB	602	52	108	222	85	135	236	W6AM	339	13	32	253	32	4	253
G5BZ	579	63	113	228	110	65	231	G8KU	335	22	50	160	28	75	168
G2VD	511	48	94	180	90	109	189	ZB1KQ	284	6	34	118	64	62	139
G4ZU	504	12	45	212	115	120	216	G8VG	280	36	76	124	18	26	141
G3FXB	492	67	121	181	77	46	187	G3IAD	265	41	88	122	9	5	147
G2WW	488	23	70	190	98	107	198	GM3JDR	211	39	36	101	34	1	108
G2BJY	466	48	78	141	83	116	181	GM3EFS	189	22	39	96	12	20	105
G3DO	462	24	46	201	84	107	223	G2DHV	172	19	25	110	6	12	113
G2YS	405	59	77	144	79	46	160	G3HEV	43	8	19	14	1	1	26
GM2DBX (Phone)	374	33	31	157	72	81	168	GM3DOD	35	2	8	19	5	1	19

GC3GS (Jersey) has this in mind when he says "DX means any station that is specially desired and difficult to contact." He adds that GC on 40-metre phone would be a specially rare piece of DX, because there is no one there doing it (except himself). So he has a scarcity value of his own! Incidentally, on that band he has now had over 20,000 contacts, nearly all on phone; apart from the 1940-45 period, he has not missed a *single day* since 1937. His best and most interesting QSO has been with VK3AAL, who comes of an old Jersey family.

Operating Notes

G3HAL (Bletchley) opens an old wound when he says that most G operators seem to need a series of articles on common-sense and efficient operating. He was struck by the contrast between the recent G and OK field days (which happened to take place on the same day) and found the OK's clearing their contacts at two to three times the speed of the G's, without going in for such time-wasters as calling QRZ? five times and signing three times on the end of a contact in which full calls had been given. As he says, when the entire QSO consists of an RST code and initial group, to sign three times at the beginning and end thereof is rather top-heavy. And it doesn't arise from special concern over the licence regulations, because several of the G's omitted the prefix, anyway!

Late Flashes

The following are very much condensed, having been received at (or after) the very last minute. VS4CT is definitely on from Sarawak—QSL Box 600, Penang. . . . W6GAL knows nothing about this YA6GAL, but W6NZK now seems to come into the picture somewhere . . . AC3SQ is now

AC5SQ in Bhutan . . . KP6AK (Palmyra) active again . . . W6VUP and a party are hoping to put French and Dutch St. Martin on the air . . . PX1OP will be HB9OP in Andorra . . . MIC (San Marino) will be on the first week in August, operated by I1BDV and I1ZCR . . .

ZK1AB has been in New Zealand, but returns to Cook Is. in July . . . "ZC6AA" was finally DF'ed somewhere round the Gulf of Mexico . . . LB9IC reported to be on Andoy Island . . . KC6UZ active from Eastern Carolines, usually phone, 14240 kc or thereabouts.

European (WAE) DX Contest

Here's *another* new contest to fit into a couple of week-ends. It is the first "WAEDC" and is sponsored by the DARC, the German Amateur Radio Club. Times are as follows: 0001 GMT, September 17 to 2359 GMT, September 18 (CW) and the same, September 24-25 (Phone).

QSO's will be between stations in Europe and stations outside Europe. Six-figure serial numbers (RST and a serial starting from 001) for CW and five figures (RS and serial) for phone.

Country multiplier, for European stations, includes all W, VE, PY, CE, ZS, VK and ZL call areas. For non-European stations the multiplier includes Shetlands, Orkneys and Hebrides, LA, OH and SM stations in the Arctic Zone, Bornholm Is., DL7 (West Berlin), DM and SM1.

There is an extra section for message handling (QTC traffic); the rules in full are too voluminous to reproduce here, but are obtainable from, and are being extensively circulated by: DARC, DX Bureau, Fuch sienweg 51, Berlin - Rudow, Germany.

21 mc MARATHON

(Starting July 1, 1952)

STATION	COUNTRIES
GW3AHN	125
VQ4RF	124
VQ4RF (Phone)	123
G4ZU	115
G4ZU (Phone)	110
G5BZ	110
DL2RO	106
G3HCU (Phone)	102
GW3AHN (Phone)	98
G3TR (Phone)	98
G2WW	98
G6QB	85
G3DO	84
G2BJY	83
G2VD	80
ZS2AT	80
G2YS	79
GM2DBX	78
G3FXB	77
GM2DBX (Phone)	72
G3CMH	71
G3CMH (Phone)	68
ZB1KQ	64
5A2CA (Phone)	60

However, the foregoing notes give you enough data on which to participate.

That clears the hook for this month, and it only remains to say that next month's deadline is **first post on Friday, July 15**. (For overseas readers, the following one is *August 19*). Address everything, as usual, to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Meanwhile, 73 and give an ear to 21 and 28 mc.

NEW VK DX AWARD

On lines similar to our WABC ("Worked All British Counties") and WNACA ("Worked North American Call Areas") Awards, instituted some years ago, the Wireless Institute of Australia now offers the WAVKCA ("Worked All VK Call Areas") certificate. There are 24 Australian territories under the VK1-VK9 prefix series, and the requirement is a total of 21 QSL cards confirming two-way contacts, as follows: VK1, one; VK2, three; VK3, three;

VK4, three; VK5, three; VK6, three; VK7, three; VK8, one; and VK9, one. The date from which QSO's can be counted for this certificate is January 1st, 1946, and claims for WAVKCA must be sent direct to: Awards Manager, W.I.A., Box 2611W, G.P.O., Melbourne, Australia, with sufficient IRC's for return postage. We shall be interested to hear from G operators who qualify for the WAVKCA certificate.

DX COMMUNICATION FORECASTS

CHARTS FOR AUGUST 1955

R. NAISMITH, M.I.E.E.

It is of some importance to the user of radio forecasts to know something of the principles upon which they are based. Comparisons are sometimes made with weather forecasting, but these are seldom satisfactory and may lead to wrong ideas on the subject. For example, it is seldom possible to make a reasonably accurate forecast of the weather a month or more in advance; yet for radio forecasting, this is a comparatively short period. On the other hand, while the Meteorological Office may provide reasonably accurate forecasts of approaching storm conditions a day ahead, the corresponding short-term radio forecast of the storm conditions affecting radio communication is unlikely to achieve any great accuracy.

Marked differences also occur in regard to the areas involved. In the weather case, local conditions are most important, whereas in radio communication it may be conditions which exist some thousands of miles from the user which are important. There are a great many other differences, some of which may be well known to the reader. The subject of radio forecasting has, in fact, developed as a completely independent subject and has borrowed little, if anything, from the subject of weather forecasting.

In radio forecasting the greatest importance is attached to studies of the daily and seasonal varia-

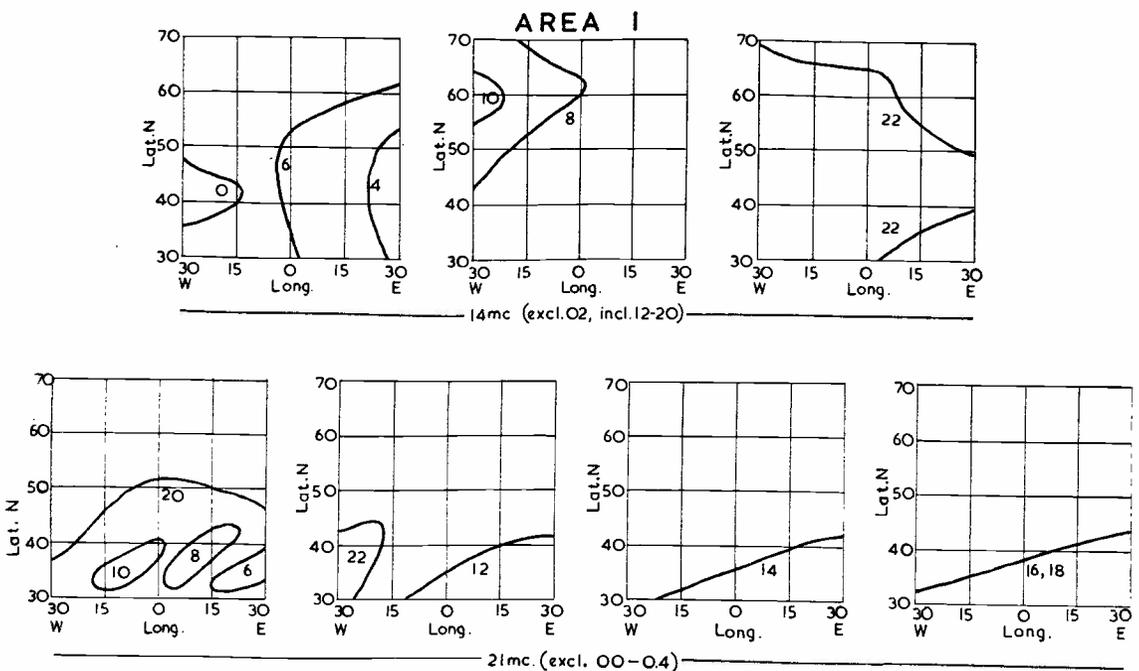
tions and the trends of these over the years. It is well known that these trends differ from place to place over the world, and they also differ over the years because of the variation in the activity of the sun as denoted by the eleven-year sunspot cycle.

These requirements limit the ability of any organisation to produce basic forecasts, and the latter are therefore produced by less than half-a-dozen centres, in various parts of the world. These centres rely on the interchange of measurements which are made at special observatories, either under their own control or operated by a university or some other suitable authority. The International Scientific Radio Union tries to co-ordinate the over-all plan and encourage the erection of observatories in key positions.

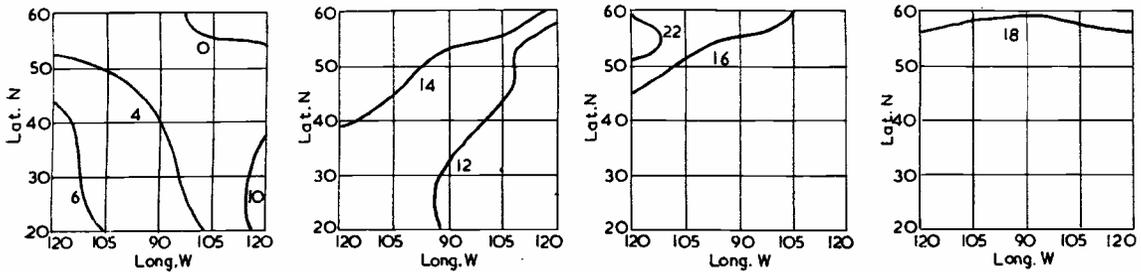
The Ionospheric Observatory

These special observatories make regular observations on the reflecting regions of the upper atmosphere, from which are deduced the heights, thickness, reflecting properties and so on, of the various layers. There are now about a hundred "Ionospheric Observatories" making regular *hourly* measurements. The first of these began, as part of the Radio Research Station at Slough, in 1929, and a complete series of measurements has been maintained there during the intervening 26 years. Since radio forecasting depends to such an extent upon studies of past trends in the condition of the layers, it will readily be seen that the Slough record is one of the most valuable available.

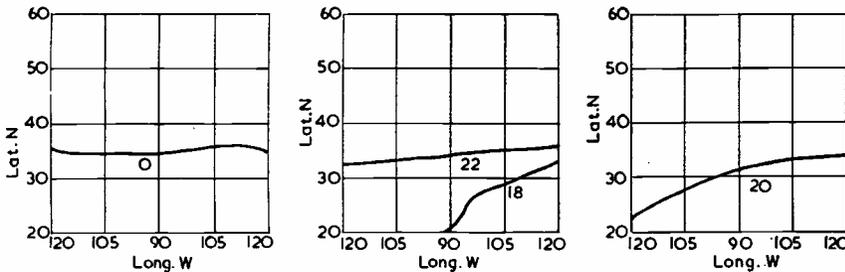
General forecasts of radio conditions include the possible use of the three regions—E, F1, and F2. Regions E and F1 are only of limited use for long-



AREA 2

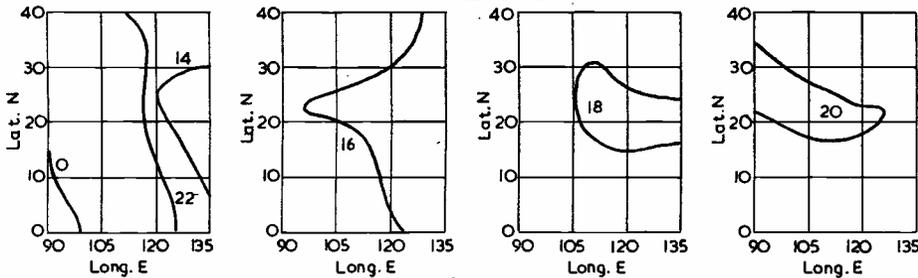


14 mc. (incl. 20, excl. 02, 08)

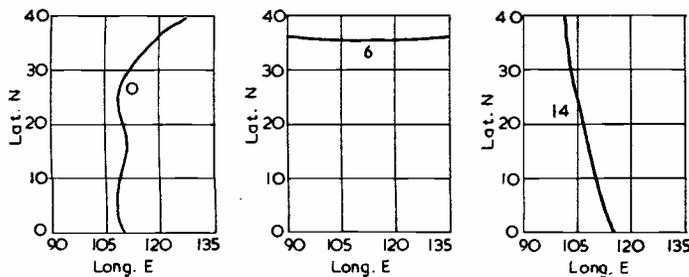


21 mc. (excl. 02-16)

AREA 3



14 mc. (incl. 04-12, excl. 02)



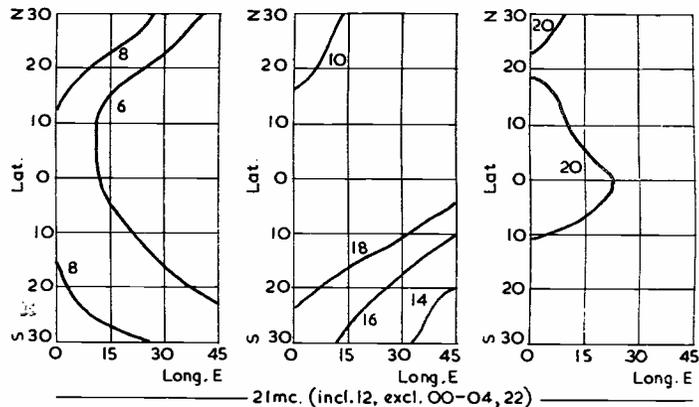
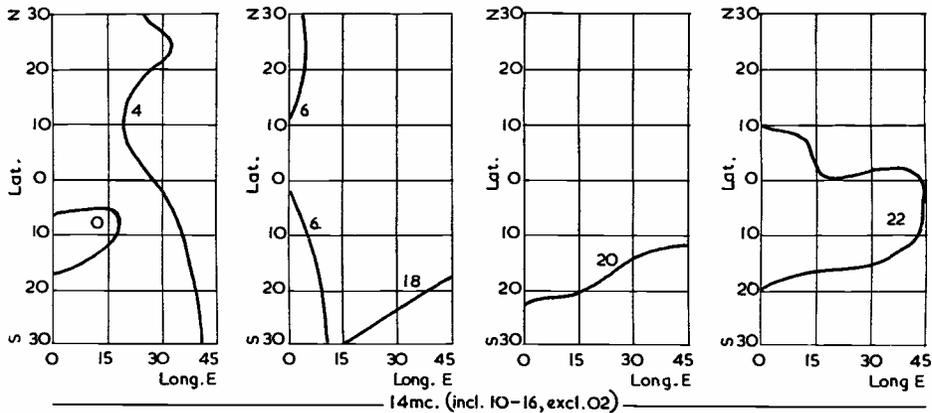
21 mc. (incl. 08-12, excl. 02, 04, 16-22)

distance radio communication, and their availability is further limited to the daylight hours. It is the F2 region which is responsible for practically all the regular long-distance radio communication. The present series of charts published in SHORT WAVE MAGAZINE are based on conditions likely to prevail in the F2 region.

The observations from which the ionospheric measurements are deduced are obtained by measuring the virtual height of reflection over the whole of the available radio spectrum. In order to simplify the interpretation, the observations are confined to a portion of the ionosphere immediately over the observatory.

[over

AREA 5



It is now universal practice to make the virtual height measurements by the pulse method, whereby the time interval occupied by a radio pulse echoed back from the layer is compared with the time interval between successive cycles from a crystal-controlled frequency standard. (Some may recognise this as one of the principles on which radar was developed!) The comparison with the frequency standard only provides a true height measurement if the radio wave travels with the velocity of light over its whole path, and, as this is practically never the case, we generally refer to the measurement as one of "virtual" height. The true height can be deduced, but it is seldom necessary in forecasting work. The operation of measuring the virtual height over the whole radio spectrum on which echoes are observed from overhead—which is generally completed in under five minutes—enables factors to be determined which directly relate this zero distance measurement to one at any other distance. For example, in the case of the forecasts

given in SHORT WAVE MAGAZINE, the values stated for Area 1 for the position of Slough should be the product of this factor for the 1250-mile "Control Point," giving the highest frequency which will be returned from the F2 region at Slough. It will, of course, refer to the *average* value for all days in the month; in this case, August.

This emphasises an important feature of radio forecasting which could be an embarrassment to the forecaster. However far the forecast is made in advance, it can eventually be checked directly against the values which are subsequently measured and the error determined quantitatively for the position of all the different observatories. This may, at first sight, seem a highly satisfactory method of checking the forecasts and, as far as it goes, that is so. Unfortunately, even with a hundred observatories, the area of the ionosphere which is measured is about one-millionth of the total. It is for this reason that there is so much scope for reliable information on

*Readers using the information in
"DX Communication Forecasts" are asked to report their results*

radio communication on frequencies consistently higher than the forecast values.

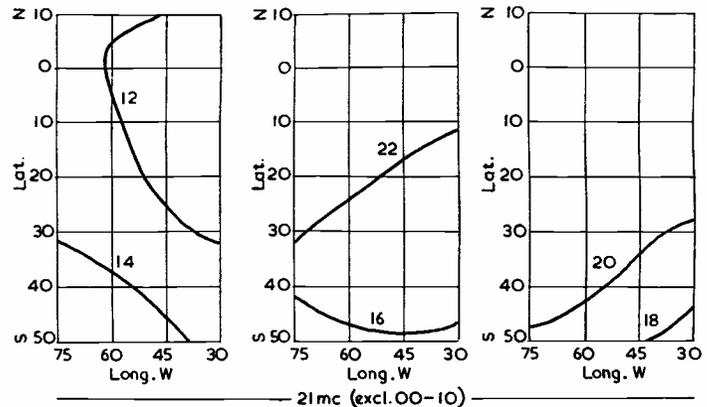
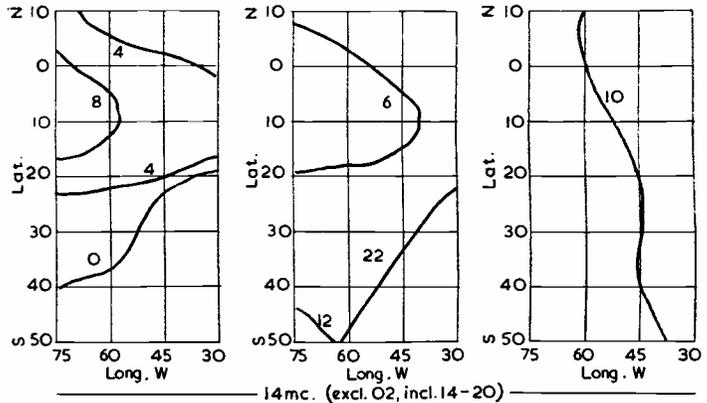
* * * *

(Editorial Note: The method of using the forecasts given here was explained in detail on pp.82-84 of the April 1955 issue of *SHORT WAVE MAGAZINE*, to which reference can be made by those following this series. The Areas covered by the charts are defined in the Table on p.82 of the April issue, from which it will be seen that, approximately, Area 1 is Europe; Area 2, North America; Area 3, the Far East; Area 4, Australia and New Zealand; Area 5, Africa; and Area 6, South America.

The Areas are also related to the DX Zones they cover—thus, Area 4 (VK and ZL) includes Zones 29, 30 and 32. In addition, exact geographical limits, in terms of Lat. and Long., are given to enable these Areas to be plotted on our standard DX Zone Map. To make the best use of the Forecasts and to appreciate the full significance of this method of DX forecasting, the *SHORT WAVE MAGAZINE DX Zone Map* is almost essential, though it is intended to illustrate how the forecasts can be interpreted by those who do not possess a Zone Map.

It would be of great interest to us, and very helpful to our contributor, to hear from readers who are making full use of these forecasts, and of the results they are obtaining.)

AREA 6



HONOURS and AWARDS

In Her Majesty's Birthday Honours List, published on June 9, the following distinctions were conferred in the field of electronics: Harold Bishop, Esq., Director of Technical Services, BBC, the dignity of knighthood. The honour of *C.B.E.* went to: H. K. Grey, Esq., Head of the Communications Dept., Foreign Office; and to F. N. Sutherland, Esq., General Manager, Marconi's Wireless Telegraph Co., Ltd. The *M.B.E.* was awarded to: Lt./Cdr. A. Birnie, R.N.V.(W)R., in charge of the Royal Navy scheme for an Amateur Radio reserve; H. W. Cox, of Electrical & Musical Industries, Ltd., project engineer for the development of radar devices for the R.A.F.; H. D. McD. Ellis, Engineering Designs Dept., BBC; and R. L. Gillham, signals officer, Air Navigational Services, Ministry of Transport.

RADIATION DETECTED from JUPITER

The recent articles on Radio Astronomy by Professor Lovell (see *SHORT WAVE MAGAZINE*, April-May 1955) are given a new emphasis by the recent announcement that Dr. B. E. Burk, of the Carnegie Institute, Washington, D.C., has detected radio waves emanating from a localised source on the planet

Jupiter. The Carnegie Institute's radio telescope consists of an array of aerials and reflectors covering 90 acres. The radiation from Jupiter was found on 22 mc, just HF of our 14-metre band; it takes the form of short bursts of noise, of about one-second duration, and can be heard, on the average, on one day in three. Arising from this, some earlier Australian records have been re-examined and it has been found that noise-bursts of the same character were also obtained on 18 mc (16 metres). However, observations at Cambridge, made at much higher frequencies, show no such effect. The inference is, therefore, that radiation from Jupiter is on about 14-16 metres, that the origin is a point on the surface of the planet, and that appearance of the noise is connected with its rotation, since Jupiter has a day of just under ten hours. Jupiter is the largest planet in our system, with a volume over a thousand times that of the Earth.

BC LICENCES in EIRE

The number of broadcast receiving licences in issue in Eire at the end of last April was 434,149. More than 200,000 receivers are, however, thought to be unlicensed. The fee of 17s. 6d. is said to be the lowest in Europe.

MISSIONS FOR WABC

THE G3IGW EXPEDITIONS TO GI AND GM

M. G. WHITAKER (G3IGW)

Many readers, and all Top Band DX operators, will know that in September and during last Easter G3IGW gave 160-metre contacts from several of the "rare" counties of Scotland and Northern Ireland. Operating 1A, he undertook these journeys entirely on his own initiative, with one or two chosen companions in their early twenties, all with an adventurous enthusiasm for Amateur Radio. That, apart from the contacts they made and the pleasure they gave to many 160-metre operators, their journeys were both stimulating and interesting is amply proved by G3IGW's own account of their experiences.—EDITOR.

FOLLOWING is a brief account of the writer's last two trips as G13IGW/A and as GM3IGW/A. Written words are a poor way to express all the interest, the excitement and all the hopes and fears which result from successfully planning and completing these missions. It is great fun to be the wanted DX station just for a few hours in the year, and herewith is a glimpse of what this expeditioning has entailed.

Many readers will remember the G13IGW/A trip last autumn. With G3JML, after weeks of preparation and correspondence, we caught the night boat from Heysham on September 20, armed with an Eddystone 750, a small 160-metre transmitter, a bug key and side-swiper, a c/o switch, aerial wire, a screwdriver and our personal luggage. The gear never left us except for short periods in railway luggage offices. We had no car and relied on train, boat, 'bus and Shanks's pony. This, of course, was the hard way of doing things, but as any expeditionist will confirm, the more obstacles that are surmounted, the greater the satisfaction when the ultimate result has been attained.

In GI we were spoilt with generosity and kindness. In Londonderry, G13HXH loaned us a caravan in his grounds, where we slept and from which we operated. We stayed two nights in each place and passed on next to Omagh in Co. Tyrone, where we operated from a guest-house on the outskirts of the town. So far we had not been blessed with very good weather and, unfortunately, poorish radio conditions. However, we were thoroughly enjoying ourselves, living quite inexpensively and yet feeding well, as any visitor to Ireland does! Next move was to Enniskillen in Co. Fermanagh. Here we met with SWL Taylor, who loaned us a radio room in his house on the outskirts of the town. We slept in a nearby hotel. Cecil entertained us royally, and his son also took an interest in our activities. Enniskillen is a delightful place, peaceful and picturesquely set among lakeland district; in fact, there appears to be more water than land, the town itself being built

on an island. Radio conditions improved and we had our best aerial out, 180ft. long and 40ft. high; OK and HB9 were worked, and also GC2CNC/TTX for his first GI QSO.

Some of the Incidents

That is a brief outline only, but Jim and I have many memories. It was our first visit to GI and it was exciting from the start. I met Jim at Leeds City station and we boarded the Heysham train. It was rather chilly, and we were both hoping that nothing had been left and that nothing would go wrong. We could carry no spares, and if we had had trouble with, say, a receiver valve, there was always the possibility we could not buy an immediate replacement. However, we journeyed under a lucky star. Having boarded the boat, we really felt to be under way, and within 15 minutes we had been invited into the radio cabin by the "sparks." After admiring the latest gear, we tuned around 160 metres; unfortunately, there was an S9 level of QRN from the dock side and only G3IUH was logged. We did have visions of returning later and seeing what a CQ from GX3IGW/MM would bring back!

We only had a peep at Belfast before going by train to Derry. Here, after a weary uphill walk (with gear), we located our caravan and set up our stall. We were delighted to receive a well-timed visit from G13CVH whilst we were planning the aerial layout. That evening we looked round the graceful city of Derry. We decided on rather a small place for a meal. We ordered mixed grills and hoped for the best; we were amazed at the feast put before us. The centre portion was a large helping of steak, which was surrounded by a most appetising selection of almost everything one can serve from the frying-pan. We never paid much above 3s. for our complete meals, and from this happy start we never went hungry.

The following morning we took a 'bus into Mull, which is the first village inside the EI border in Co. Donegal. It was interesting going through the English and Irish Customs—our first experience of this. We bought the permitted quantity of duty-free cigarettes and tinned salmon and posted some EI postcards back home. It was a very warm and sunny morning, and before walking back across the border from what really felt like a different country, G3JML took a photograph of an Irish peasant who posed for him as he drew water from the village pump. We had tea with G13CVH and his charming XYL.

At Omagh, which is only a small town, we didn't find much to interest us. We both remember adopting a particular restaurant there, and more especially the young redhead who, in turn, adopted us. Actually, we concluded long before the end of our stay that Ireland is a very fine place for a young man to live! In Omagh we had the only case of BCI ever encountered. An old radio set at the guest house was used once a week to listen to Wilfred Pickles in "Have a Go." Fortunately, the pi-coupler output circuit in the Tx produces maximum RF output at two different settings; one gave us this BCI, the other left us clear. In three minutes we were



G3JML (left) with G3IGW, taken near Enniskillen, when they were signing GI3IGW for Co. Fermanagh. The story of their trip is told in the accompanying article.

once again airborne and attacking the waiting queue.

Our main memory of Co. Tyrone is probably our visit to that grand old gentleman of Amateur Radio, G13JP; he must be the oldest active Irish amateur. He lives at a place called Fintona (pronounced "Fintnar"), which is approached in a remarkable way: At Omagh you pay a fare to Fintona, and the steam train takes you to Fintona Junction. From there you travel the remaining mile to Fintona by horse train!

Next day we arrived in Enniskillen and, as mentioned, our friend SWL Taylor really entertained us in fine style. With out better aerial and much-improved conditions, the next two evenings saw us really knocking them off on 160 metres.

Too soon we had to go QRT and make for Belfast, homeward bound. However, we had two hours to spare in Belfast, and contact was made with G16YW. He met us and took us to the Technical College, where we spent a short while with his colleagues, G13HFT, G13ML, and G13GQA—all grand chaps. G16YW kindly drove us to the docks, where we said a rather sad farewell to that good country.

The Scottish Tour

As winter began to fade away, so our thoughts turned seriously to a GM expedition. This time we were a trio, with G3JML and an SWL companion. At first we were only going to cover Selkirk and East Lothian. However, on the discovery that we all had Easter Tuesday clear, it was decided to add Kinross to the list. The writer again undertook to plan the trip, and correspondence was started with Town Clerks and hotel proprietors. When a suitable QTH is located, a letter is written to confirm whether (a) There is an AC supply; (b) There are supports around to which an aerial can be thrown; (c) That

an upstairs room is available; (d) That the hotel is reasonably well located; and (e) It is explained that we are setting up some Amateur Radio equipment temporarily for "competitive purposes," to represent the rare county. Since the GI trip, the writer had acquired a 1946 Morris 8, and thus the whole of the travelling was done in comparative luxury.

We set off at 6 a.m. on Easter Saturday, and six hours later we pulled in at Selkirk, having averaged over 30 m.p.h. on amazingly quiet roads. By 3 p.m. we had lunched and got everything set up; on flicking out "Test" just once we were amazed and pleased to work G3KEP (Bingley, Yorks.) with an S8 report. However, we went QRT till later and looked up GM5FT in Selkirk; that was not difficult, as his three-element 21 mc beam is very prominent; John is a fine chap and is the possessor of what one thinks must be an ideal combination—a radio shop and an off-licence store! Our hotel on the outskirts of the town was ideally located, and, with over 300ft. of wire out and good radio conditions, GM3IGW/A just couldn't go wrong.

Next day we had a comparatively short run to North Berwick, East Lothian. We had an early visit from GM3JNW, of Alloa, who was taking a short holiday; he witnessed some of the proceedings later on. Our hotel was on the sea front, but away from any QRN. Radio conditions were not quite so good, and, with only 200ft. of aerial, we noticed a reduction in QRK. However, the QSO's came fast and plenty.

We had quite a rush the following morning, as we had arranged to lunch in Alloa. An hour's delay in crossing the river by ferry near the Forth Bridge was no help. Anyway, we eventually reached Rumbling Bridge in Kinross-shire, and set up the rig and aerial in double-quick time; G3JML and our SWL assistant always looked after the radiating system, and once again we got over 300ft. out. Conditions were better again and all went well. On the GM trip we had made 396 QSO's in three days. Next day we journeyed home, tired but content!

In conclusion, it might seem that the GM trip was not as eventful as the GI venture. It was



The "horse train" which is the mode of local transport at Fintona, Co. Tyrone. One of the several curiosities encountered by G3IGW/G3JML during their tour of GI counties for Top Band WABC enthusiasts.

certainly expediting the comfortable way, but this time it was none the less hectic as, with only stopping one night in each place, we had the daily task of setting up and stripping down a complete amateur station. Everything had to be carefully wrapped to prevent damage in the car. We would like to thank the Top Band fraternity for their keen

co-operation on these trips. One feels some of the HF band DX types could learn a lot.

One cannot describe on paper the complete satisfaction which comes upon the successful completion of these WABC missions, and to other would-be tourists the writer says — Have a Go, because the pleasure obtained cannot be equalled.

XYL ON THE AIR

HOW IT HAPPENED

STELLA FISH (G3IYL)

Sensible YL's and understanding XYL's know that they can never really wear a good ham from Amateur Radio. Mrs. Stella Fish found that the best thing to do was to become an amateur in her own right. So we commend this interesting little story to the attention of all YL's and XYL's, hoping that they will profit thereby!—

EDITOR.

IT all began with QSL cards and Ohm's Law. Of course, I knew what "CQ" and "DX" signified—one could not be married to an amateur and not know that—but it was the extent of my radioese until I examined the QSL cards that arrived for the OM. These were so varied in style and colour that I became really interested in them and, almost without realising it, my vocabulary was gradually increasing and things like "QTH" and "QRM" were no longer mysteries.

It was about this time that I happened to see a copy of the R.A.E. examination paper and, to my surprise, I found that Ohm's Law (which I had encountered in my student days) came into Amateur Radio. My next move, of course, was to read up the syllabus and find out what was entailed in the way of study for the R.A.E. Within a week or two I had enrolled at the local evening school—despite the restraining efforts of the school secretary, who felt that I was putting my name down for the wrong class!

On the first evening I slipped into the back seat, hoping that our lecturer would not object to the one lone female amongst his 40 students. Here I was most agreeably surprised. These classes proved to be delightful. Combined with the serious side of the lectures was the completely informal atmosphere which is one of the charms of any Amateur Radio gathering, when people are brought together by a common interest.

One of the highlights of these classes was the transport provided by one of the other students. The van had plenty of space and an engine that ran like a dream, but backing into the limited parking space always seemed to present some degree of difficulty. This was finally understood when we were informed that the van had started life as a hearse.

Taking the Exam.

Well, classes finished, the exam. date came round,

and eventually came the joyful news that I'd made the grade and was now half-way towards that much-coveted "ticket." Now for Morse. Here, I must pay tribute to G2BRH, affectionately known as "Junko," who coached me for three hours every week for nearly three months, and then I went for the Morse test. Once again I made the grade, and immediately applied for a call-sign, which was granted.

The great day came to make my debut on the air. Horror of horrors! I had stage fright to such a marked degree that I was afraid to put out my call. However, the OM came to my rescue and the wonderful thing happened—I made my first contact. I need hardly say that this was done at a careful 6 w.p.m. with frantic requests to my husband, "What do I say next?"

As I became more proficient, I began to take stock of my surroundings and decided that if there were to be two amateurs in my house, one of whom was myself, the time had come to provide a comfortable shack. All sorts of ideas were examined and rejected for various reasons, until I decided that, as Amateur Radio was an all-weather hobby, there was only one sensible place for this shack—the dining room. Up came the carpet (which went back later), the dining room suite was disposed of, the work bench fitted up, shelving put in for the spares and junk, and the operating gear installed. Remembering that contests sometimes involve long sessions, an all-night fire was the final addition—except for the small gate-leg table which was also accommodated, for, after all, one must eat!

This arrangement has proved highly satisfactory, and if, on odd occasions, folk who are not radio-minded have to eat with us in the shack, they seem to tolerate it reasonably well.

My main interest at the moment is 20 metres CW, running 150 watts to a folded dipole. Receivers are CR100 and S.640.

Finally, with YL's and XYL's in mind, let me exhort them to develop some interest in Amateur Radio. It's grand fun, it's lovely to be enjoying the same hobby as one's husband, and after three years I'm still very proud to sign G3IYL.

AMERICAN SUBSCRIPTION SERVICE

Since the note appearing on p.183 of the June issue, we have been informed that the annual subscription for *CQ* has been increased to 44s. The cost of *QST* is 36s. Orders or subscription renewals for these publications can be accepted by us in sterling, delivery being direct from the American publishers.

THOSE who were about the VHF bands during the Whitsun period will know what happened and what the opportunities were; those who were not on will probably have, by now, a pretty good idea of what they missed; and those who (like your A.J.D.) were away or for other reasons were unable to get on the air at all have, no doubt, consoled themselves (like your A.J.D.!) with the reflection that having observed the weather conditions, they at least knew what was likely to happen.

Though the many reports on the clip this month discuss, almost without exception, "the Whitsun week-end" — which, for some people, means anything from Thursday to Wednesday! — the development actually started as early as the evening of Wednesday, May 26, when French and German TV was being received in Dublin. Indeed, it was the behaviour of TV screens generally that alerted many people. Varying somewhat in extent and intensity, the reflecting layers lasted for the next seven days, propagation conditions not reverting to normal until about the Thursday after Whitsun.

On this occasion, the development was such as to bring north-east Scotland within the area of operations—so much so, that one of the most interesting call-worked lists we have ever published is that appearing this month from GM2FHH, Aberdeen. He succeeded in raising no less than 15 different Continental stations, in DJ/DL, ON and PA, all during the late evenings of May 29-31, which was the peak period. This is an outstanding result in the way of EDX; GM2FHH will have the congratulations of all VHF operators, as well as their good wishes for further opportunities to add to his "countries worked" total, now five—for he also succeeded with several G's, besides hearing G5TZ (Isle of Wight), in itself a remarkable piece of GDX of more than 450 miles. This is actually about 70 miles further than Den Helder on the Dutch coast, the nearest point in Conti-

VHF BANDS

A. J. DEVON

Whitsun EDX Opening—

GM2FHH Works the Continent—

Wide DX Coverage & High
European Activity—

Portable/Mobile Notes & News—

VHF Results in Kenya—

Individual Station Reports—

ental Europe to Aberdeen, and across an all-sea path.

In terms of distance, the best of GM2FHH's contacts appears to be that with DL9LU (Buckeburg, Nr. Minden), which we make 550 miles. The GM/DL "First" also falls to GM2FHH, by virtue of his QSO with DJ1XX (Osnabruck) at 2310 on May 29.

Features of the Development

It is clear from the reports and the met. situation that the May 29-31 opening did not extend either to the central areas of Scotland, to EI/GI or, in England, as far as the West Country. Though GM3EGW in Dunfermline, 88 miles south-west of Aberdeen, worked ON4BZ, the Glasgow and Edinburgh groups report that, for them, no real opening developed at all. Nor, apparently, were the Scandinavian countries covered.

Continental penetration across southern England is reported only

as far west as G3JGY (Malvern) who worked PE1PL and heard several other PA's and DL4QL. G2ADZ (Woolacombe, N. Devon) was on all the time and could hear the G's in QSO with the Continentals, but no European signals were reaching him. G3FIH (Bath) heard a nice batch of F's—see Activity Report—but similarly he could not find the more easterly Europeans being worked freely from the London area.

On the other hand, stations in London and the Home Counties, south-east England and East Anglia found the band full of EDX and were working Europeans in DJ/DL, ON and PA thick and fast; G's up the East Coast, in particular, had an absolute field day—see the call-worked lists from G2FJR (Sutton Bridge, Lincs.) and G5BD in Mablethorpe. Arthur of G5BD, in his report, estimates that about one hundred stations other than G's were available, more than any one operator could get round in the time! However, G5BD worked 41 of them and G2FJR accounted for 28. G2CZS (Chelmsford) had the surprise of his life when six PA's came back to a single CQ call!

An interesting appearance was that of OZ7SP, worked by, among others, G5TZ, G5YV and G6TA. The French stations had a share in the opening but have not been extensively reported much beyond southern England.

From the foregoing, it is evident that the main axis of the development was, roughly, on the line north-east Scotland to Central Germany, with enough overlap just to touch Denmark and to bring in the greater part of England.

Some of the Doings

As Vernon of G5MR (Hythe, Kent) is one to point out, Whitsun did not provide the only spell of good conditions during the month, though for that particular period they could be categorised as excellent. June 16-18 were also good days, when it was warm and humid, with a high glass and marked cloud-stratification effects apparent during the late after-

noons. Anyway, G5MR was getting G3GJZ (Newmarket) on the 16th and G6AG/M in Worcs. on the 18th; could they have been raised, both would have been new all-time counties for him. However, Vernon remarks that he did have his "little share of the DX" during the great Whitsun break, with DL3VJ worked on phone, S7 both ways. A very interesting comment from him is that a statistical check shows that over January 1 to May 31 this year he worked more new stations on the two-metre band than during the same period in any previous year, even including 1953, when we had those exceptional conditions in March; this seems entirely to substantiate the statement, often made in "VHF Bands," that neither activity nor conditions are as bad as they are sometimes made out to be.

G3HBW, now in a new bungalow at Bushey Heath, Herts., is at present doing it all with an *indoor* 3-ele flat top—with what results, can be seen in the Activity Report; this shows contacts (during the Whitsun spell) with DL3YB, 589/569 at 450 miles. G3BW (Whitehaven, Cumb.) at 250 miles, and G2FO (Stockton-on-Tees, Co. Durham) at 210 miles, stations which, says Arnold, he never at any time succeeded in working from the old Wembley site, in four years there with well-matched beams and everything on the top line; further than this, on 70 cm G2XV, a weak and chancey signal audible only under good conditions in Wembley, has become a reliable semi-local, always S7-8 at Bushey Heath, about 8 miles north of the old QTH. G3HBW is now working his way up the Tables again, with 17C for the Annual from the new location.

Over Whitsun, G3JZG (Willenhall, Staffs.) heard ON4BZ and PE1PL with deep QSB and though not succeeding with either of them, managed two more counties for the ladder. G3JKO (Nottingham University) received his first Continentals on two metres on June 1—he could not be on for Whitsun—in the shape of ON4BZ (the old reliable Guy, who has given so many G's their

TWO-METRE ACTIVITY REPORT

(Lists of stations heard and worked are requested for this section, set out in the form shown below, with call signs in alphabetical and numerical order).

GM2FHH, Aberdeen.

WORKED: DJ1XX, DL1KM, 3FR, 3VJ, 3YH, 9BD, 9LU, 9MI, 9MK, 9QV, G2BDQ, 5BD, 5YV, GM3EGW, 3FGJ, 3FYB, ON4BZ, PA0BX, 0HA, 0WO, PE1PL.
HEARD: G5TZ. (May 29 to 31 only).

G3JGY, Malvern, Worcs.

WORKED: G2AK, 2AK/M, 2COP, 2CVD, 2CVD/M, 2DCI, 2DVD, 2FWW, 2HJC, 2HIF, 2HIF/P, 2JZ, 2NV, 2RD, 2YM, 3BJQ, 3CCH, 3CKQ, 3CRH, 3DO, 3DJQ, 3DJX, 3DKF, 3EJO, 3EPW, 3FRY, 3GBJ, 3GWB, 3GZM, 3HAZ, 3HCU, 3HHY, 3HTY, 3IER, 3IT, 3IOO, 3IUG, 3IVF, 3KEQ, 3LP, 3NL, 3WV, 3YZ, 4SA, 5ML, 5ML/P, 6OX, 6TA, 6WF, 6XY, 6YU, 8BP, PE1PL.
HEARD: DL4QL, G2DRA, 2HDZ, 2MV, 3FED, 3FGT, 3GBR, 3GNJ/P, 3GNP/P, 3ION/P, 3JJW, 3JKO, 3KFD, 5YV, 6AG, ON4BZ, PA0DSW, 0FB, 0LDG. (April 1st to June 1st).

G5BD, Mablethorpe, Lincs.

WORKED: DJ1VW, 1XT, 1ZE, DL1KM, 1MI, 3FR, 3QH, 3VJ, 3YH, 6SV, 9ARA, 9BD, 9LT, 9LU, 9MK, 9MZ, 9QN, 9QV, 9SM, 8FKF, 9JY, GC3EBK, GM2FHH, ON4HN, 4TW, P0AGJ, 0BN, 0BX, 0DSW, 0EL, 0ES, 0FB, 0FP, 0FS, 0GER, 0IKS, 0JOB, 0LBS, 0PWZ, 0VLM, 0WAR, 0WI, 0YZ. (May 29 to June 2).

G3XC/P, Nr. Newbury, Berks.

WORKED: G3FAN, 3FIH, 3GNJ/P, 3IRA, 4SA, 6OU.
HEARD: F3LP. (May 30 only).

GW3XC/P, Nr. Abergavenny, Mon.

WORKED: G2AIW, 2DSP, 2YB, 3FIH, 3FIH/P, 3GNJ, 3GOP, 3IER, 3YZ, 4SA, 6TA.
HEARD: G6AG, 8KW. (May 31 only).

G3XC/P, G3XC/M, Wolverhampton, Staffs.

WORKED: G2AK, 2DCI, 3FJR, 3CRH, 3EPW, 3HAZ, 3IUD, 6FK, 6SN, 6TA, 8VP, 6W3GWA. (June 1 to 5 only).

G3XC/P, Rutland.

WORKED: G2AIW, 2CVD/M, 2HCG, 3CKQ, 3DO, 3FW, 3IIT, 6CW, 6TA, 6YU. (June 2 only).

SWL, Brentwood, Essex.

HEARD: G2AIW, 2BDP, 2BMS, 2CVD/M, 2DIO, 2DVD, 2FTS, 2HDY, 2HDZ, 3AEX, 3ANB, 3BI, 3BSU, 3CLW, 3CNF, 3VO, 3DGI, 3DJS, 3EES/A, 3FAN, 3FNL, 3FQS, 3FUL, 3FYV, 3GDF, 3GDR, 3GGJ, 3GNJ, 3GHO, 3GOZ, 3GSE, 3HBW, 3HCU, 3HXS, 3IES, 3IGT, 3IT, 3ION, 3IUL, 4AJ, 4GT, 4JJ/P, 4PS, 4SA, 5BM/P,

5KH, 5KW/P, 5TZ, 6AG/M, 6LL, 6NB, 6OX, 6TA, 6WU, 8AL, 8HX, 8KW/P, 8RW, 8UG/A, 8UQ/P, GW3XC/P, ON4BZ, 4DW, 4HN, PA0FP, 0IKS. (May 16 to June 1).

G2ADZ, Woolacombe, N. Devon.

WORKED: EI4E, F9JY, G2AIW, 2BAT, 2CBR, 2CVD/M, 2XV, 3CCH, 3CQC, 3GPT, 3HAZ, 3HSD, 3IOO, 3JGJ, 3MU, 3YZ, 5BM, 5ML, 5TZ, 5YV, 6NB, 6OX, 8DA, GC2FZC, GW2ACW, 2DUR, 3EJM, 8SU.
HEARD: F8MW, G2BMZ, 3AUS, 3BOC/P, 3BW, 3FIH, 3GNJ, 3GVF, 3IRS, 3IUD, 3WV, 4GR, 4SA, 5JU. (May 7 to June 17).

SWL, Erith, Kent.

HEARD: DJ1VK, 1XX, DL1MI, 6SV, 9BD, 9QV, DZ2NT, F9LD, G3GGJ, 3JKO, 5BD, 5YV, 6WA, ON4BZ, 4DE, 4DW, 4HN, 4ZK, OZ7SP, PA0AGV, 0ARX, 0BN, 0BX, 0EL, 0DSW, 0FB, 0FC, 0FK, 0FS, 0GER, 0GJG, 0MU, 0NO, 0LBS, 0VLM, 0WAR, 0WO, 0OGG, PE1PL. (May 28-31 only).

GW3GWA, Wrexham, Denbs.

WORKED: G2BVW, 2FJR, 2HGR, 2HOP, 2YB, 2YM, 3BW, 3CCH, 3EPW, 3ENY, 3FMI, 3FYY, 3IOO, 3ISA, 3IWI, 3JPI, 3JZG, 3XC/P, 5TZ, 5YV, 6CW, 6XM, 8BP, 8UQ/P.
HEARD: EI2W, G2FO, 2MV, 3HSD, 3KEQ, 3KFP, 5BD, 6NB, 6OX, 6TA. (May 12 to June 17).

SWL, London, S.W.18.

HEARD: DJ1XX, DL1FF, 3IMI, 3VJ, 6OR, 9MK, G2AIW, 2BDP, 2DIO, 2FTS, 2HCG, 2HDY, 2HDZ, 2MV, 2RD, 2XV, 2YB, 3AEX, 3AST, 3BDN, 3BSU, 3CLW, 3DGI, 3EYV, 3FAN, 3FIH, 3FNL, 3FQS, 3FPV, 3FUL, 3FYY, 3FZL, 3GDR, 3GNJ/P, 3GOZ, 3GSE, 3GSM, 3HBW, 3HCU, 3IGT, 3IRA, 3IUL, 3JJH, 3KEQ, 3MI, 3XC/P, 4AJ, 4GT, 4KD, 4SA, 5DS, 5KW, 5KW/M, 5UM, 5YH, 5TZ, 6AG/M, 6NB, 6OX, 6TA, 6XH, 8KW, 8KW/P, 8SK, 8UG/A, 8UQ/P, ON4BZ, 4DW, 4OZ, PA0AGJ, 0BN, 0FP, 0GER, 0HRX, 0IKS, 0JOB, 0ST, 0UU, 0VLM, 0ZJ. (May 17 to June 11).

G2FJR, Sutton Bridge, Lincs.

WORKED: DL1KM, 1MI, 9ARA, 9BD, 9MZ, 9QN, 9QV, G2AKR, 2CBR, 2CZS, 2DJM, 2DRA, 2DVK, 2FLC, 2FO, 2HCG, 2YB, 3AZU, 3CCH, 3CKQ, 3DOV, 3DVK, 3EDH, 3FAN, 3GGJ, 3GHO, 3GPT, 3GSE, 3GSO, 3HBW, 3HXS, 3IIT, 3IIV, 3IWI, 3JZG, 3XC/P, 4JJ/P, 4PV, 5LL, 5TZ, 5YV, 6KK, 6LC, 6OX, 8AL, 8SB, ON4BZ, 4DE, 4DW, PA0AGJ, 0BN,

0BX, 0CJP, 0DSW, 0ES, 0FB, 0FC, 0GJM, 0HA, 0HAK, 0HRX, 0IKS, 0JOB, 0MU, 0NEL, 0WO.
HEARD: EI2W, GM3EGW. (May 20 to June 18).

GW5BI, Cardiff, Glam.

WORKED: G3DLU, 3FIH, 3KHA, 6OX, GW3KEN, 8SU.
HEARD: EI2W, 2ADZ, 2AIW, 2AUD, 2BMZ, 3FAN, 3GHO, 3HSD, 3IER, 3IRA, 3IRS, 3YH, 4GR, 4SA, 6AG, 6TA, 6XM. (June 8 to 19).

G3HBW, Bushey Heath, Herts.

WORKED: DL3YB, F8KF, G2CIW, 2DDD, 2FJR, 2FO, 2HCG, 3BPD, 3BW, 3CCH, 3DO, 3GJ, 3IIT, 3IOO, 3IUD, 3JKO, 3KFT, 3NT, 3VI, PA0BX, 0HA, 0UU.
HEARD: DJ1VK, DL1FF, 3FR, 3QH, 3VJ, 9MK, 9QV, F8AA, 9LD, G2BVW, 2DSP, 2FNV, 3AGS, 3BA, 3BJQ, 3CC, 3DDQ, 3EPW, 3FGT, 3GPT, 3JGY, 3JZG, 3KBL, 3BD, 5YV, 6UI, 6XM, ON4BZ, 4DE, 4DW, 4HN, 4PA, PA0BN, 0FP, 0MU, 0WO. (May 29 to June 18).

G6TA, London, S.W.16.

WORKED: DJ1VK, F9LD, G2AHY, 2AIW, 2AK/M, 2AUD, 2BBN, 2CVD/M, 2DVD, 2FNV, 2HCG, 2HCR, 2RD, 2YB, 2YM, 3AEX, 3ANB, 3BI, 3BSU, 3BUN, 3BW, 3CGQ, 3CLW, 3DA, 3DGI, 3DJX, 3DO, 3DQO, 3FAN, 3FIH, 3FMI, 3FNL, 3FQS, 3FSD/M, 3FUH, 3FYY, 3GHO, 3GJ, 3GNJ/P, 3GOP/P, 3GOZ, 3GPT, 3GSE, 3GSM, 3GSO, 3GVF, 3GZJ, 3HCU, 3IKW, 3INU, 3IRA, 3ISA, 3ITF, 3IUL, 3IWI, 3JFR, 3JGY, 3JZG, 3KHA, 3VI, 3XC/P, 4IJ, 4SA, 5DS, 5KW, 5LK, 5TZ, 5UM, 5VN, 5YH, 6JK/P, 6KK, 6OX, 6SG, 6WU/P, 6XM, 6YU, 8AL, 8PX, 8KW, 8RW, 8UG/A, 8VN, GW3XC/P, ON4BZ, 4DW, 4ZK, OZ7SP, PE1PL. (May 18 to June 18).

G3JZG, Willenhall, Staffs.

WORKED: G2YM, 2ANS, 2CVD/M, 2DIO/P, 2FJR, 3BA, 3CCH, 3CKQ, 3ENY, 3EPW, 3FMI, 3FTN, 3GBJ/A, 3KBL, 3KFD, 5ML, 6TA, 8VN, GW3GWA.
HEARD: G2HI, 3FRY, 3ISA, 3KEQ, 5BD, 5TZ, 8KW, ON4BZ, PE1PL.

G3JKO, Beeston, Notts.

WORKED: G2ANL, 2BVW, 2FJR, 2FNV, 3BJQ, 3BDP, 3CCH, 3DJX, 3DMU, 3DVK/P, 3FZL, 3GXC, 3GHU, 3GSO, 3GVF, 3HBW, 3KEQ, 4SA, 5YV, 6AG, 6NB.

HEARD: G2BBN, 2CVD/M, 2FZU, 2HCG, 2HGR, 2HOP, 2HIF/P, 2MV, 2WJ, 3DA, 3DQO, 3EJL, 3EOH, 3EPW, 3FTS, 3FUW, 3GHO, 3GPT, 3GQR, 3HXS, 3ISA, 3ITF, 3JGY, 3JNY, 3JZG, 3JZN, 5TZ, 6AG/M, 6LI, 6OX, 6TA, 8BP, 8UQ/P, GM2FHH,

GW3GWA, 3XC/P, ON4BZ, PA0FC, 0GER, 0HA, 0WO, 0YZ. (May 29 to June 3 only).

G2CZS, Chelmsford, Essex.
 WORKED: DL3QH, G2FJR, 3BPD, 3CVO, 3EMU, 3IIT, PA0FB, 0JOB, 0VLM, PE1PL. (May 22 to June 3).

G3JHM, Worthing, Sussex.
 WORKED: F8AA, G2DDD, 2DSP, 2DVD, 2UN, 3FAN, 3FEX, 3FRG, 3FRG/P, 3GDR, 3GHO, 3HCU, 3HWJ, 3JEP, 3JM, 3JVY, 6OX, 6RH, GC3EBK, ON4PA.
 HEARD: F3LP, 8KP, 9LD, 9TV, G2AIW, 2BMZ, 2FTS, 2HCG, 2NM, 2TP, 3IAM, 3ION, 6AG, 6NB, 8IL, ON4HN. (May 24 to June 19).

G3CKQ, Rugby, Warks.
 WORKED: G2BVW, 2COP,

2CVD/M, 2FJR, 2HCG/M, 2HGR, 3XC/P, 3BQ, 3CWW, 3DJM, 3DKF, 3EJO, 3EPW, 3FUW, 3IEY, 3IVF, 3JGY, 3JZG, 3KBL, 5ML, 5SK, 6YU, 6YU/M, 8VN.
 HEARD: G2AK, 2ATK, 2FNI, 2FNW, 2FWW, 2HCG, 2HOP, 3BA, 3BW, 3GB, 3BPD, 3CCH, 3DBP, 3DQO, 3ENY, 3FAN, 3FGT, 3GIJ, 3GJX, 3GNJ, 3GPT, 3GVK, 3HAZ, 3HXS, 3IIT, 3IOO, 3IUD, 3KFD, 5TZ, 5YV, 6AG/P, 6TA, 6XM, GW3GWA. (Month to June 18).

G3DLU, Weston-Super-Mare, Som.
 WORKED: G2BMZ, 3FIH, 3HSD, 3HXZ, 3IER, 6AG, 6OX, 8DA.
 HEARD: G2HOP, 3CCH, 3GPT, 3KHA, 5BM, 5TZ, 6NB, GW3KEN. (May 8 to June 17).

G3FIH, Bath, Somerset.
 WORKED: G2ADZ, 2BAT, 2BMZ, 2HIF/P (on Mendip Hills), 3DLU, 3EES, 3EPW, 3FKO, 3GGJ, 3GMN/P (on Cotswolds), 3GNJ/P (on Mendip Hills), 3GJJ, 3GOP/M (Portsmouth Hill), 3GOP/P (5 miles N.W. Salisbury) 3GOP/P (Pepperbox Hill, near Salisbury), 3HSD, 3HXZ, 3IER, 3IOO, 3IRA, 3IRA/A (near Andover), 3IRA, 3ITF, 3KHA, 3MU, 3XC/P (6 miles S.W. Newbury) 3YH, 5BM, 5ML, 6OX, 6TA, 8DA, 8KW/P (on Mendip Hills), 8UQ/P (3 miles S.W. Wendoover), GC2FZC, 3EBK, GW3KEN, 3XC/P (near Abergavenny), 8UH.
 HEARD: F3LP, 8GH, 8MW, 9JY, 9QE, 9RL, G2UN, 2AIW, 2DSP, 2DVD, 3CCH, 3FAN, 3FMI, 3GVC, 3LP, 4SA, 4DS, 5TZ, 5YV, 6CW, 6NB, GW8SU. (May 20 to June 19).

the many stations also wanting a QSO. GW3GWA is still outside his own Zone, being well HF, but this merely lends point to his argument; at any rate, his contention is that he does better when conditions are not so good, as then people tend to tune the whole band, and search more carefully. However, the evenings of May 24, 25, 31 and June 10 brought him a number of new stations worked, with EI2W heard for the first time; in fact, GW3GWA never expected to do anything with EI, GD or GI, as from him they lie in a direction in which there is much very high ground.

GW5BI (Cardiff) is back on two metres again, with a pair of Slots at a height of 32ft. — and very pleased with results so far. EI2W and G6XM (York) having been heard for the first time ever. GW8UH, also Cardiff, with three Slots at wavelength spacing, 42ft. high, has heard, and been heard by, PE1PL.

G3DLU is once more at his home QTH at Weston-s-Mare, with a 4/4 Yagi, 5/8th-wave spacing, fed with low impedance line, at a height of 48ft.; he says the 829 PA "loads beautifully to 80 watts into this lot, with only 400 volts HT." G3DLU has heard, for the first time, G3GPT (Southport, Lancs.) and G3CCH (Scunthorpe, Lincs.),

first taste of EDX) and five PA's. G3DBP, the University call, has not been heard much due to "pressure of examination" and G3JKO himself has spent more time listening than transmitting. There is a reason for this—their 70-watt transmitter paralyses an ancient O-V-1 BC receiver used by the neighbour by whose grace G3DBP is allowed to function! When G3DBP, with G3JKO operating, was working G2FJR recently, said neighbour decided time was up so far as QRM was concerned, and pulled the main switch, which put G3DBP off the air in the middle of the QSO! (We relate this just as G3JKO reports it in his letter.) Incidentally, another bit of jugglery involving G3DBP is that they cannot transmit CW, as such; they key by modulating the steady carrier with a 400-cycle note, which produces quite a nice noise in the shape of a tone signal (BFO out), but has elicited some rather left-handed reports when taken as CW (BFO in) at the receiving end. G2CZS (Chelmsford) did not allow house decoration to keep him off the two-metre air during Whitsun; DL3QH (Nr. Hamburg) was his best QSO, with PE1PL and several PA's also worked. G3JHM (Worthing) found conditions excellent for the Whitsun session but was unable actually to work many stations because his operating is confined to CW; however, pleasant contacts for him were ON4PA in

Ghent on May 30 and GC3EBK on the 31st. G3JHM/G3GDR run a cross-band 144/430 mc schedule; the latter station is in Watford, north of London, and the path is a very severe one for either band, yet they are normally audible to one another; on June 5, conditions for the 70 cm band were particularly good, G3GDR being 579 and readable on phone. Conditions are being studied with a view to presenting a long-term report on 430 mc propagation over their 58-mile path.

In view of the regular appearance of EI4E (Killarney), G2ADZ is much surprised at the lack of signals from any other EI station; he has at last worked into the London area (G6OX) but is still very puzzled as to why it is that during a typical session he can have contacts with EI4E (235 miles, 599), G3GPT (190 miles, 579) and GC2FZC (140 miles, 579), and perhaps have a word with some of the GW's, without hearing or working anyone else! Nevertheless, by steady application, G2ADZ is building up his totals and, as the Activity Report shows, was getting around the G's during the period ending June 17.

GW3GWA (Wrexham, Denbs.) is a bit unhappy about the Zone Plan, because he feels that when conditions are good and the band is open, DX operators tune from the LF end; finding plenty to work, they never get round to tuning sufficiently QLH to meet

TWO METRES	
COUNTRIES WORKED	
Starting Figure, 8	
15	G4MW (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, ON, OZ, PA, SM).
	G6NB (DL, EI, F, G, GC, GD, GI, GM, GW, HB, LA, ON, OZ, PA, SM).
14	G3GHO, G5BD, G5YV, G8OU, ON4BZ
13	G3BLP, G3CCH, G6XX
12	G2FJR, G2HDZ, G2HIF, G2XV, G3WW, G6LI, G6RH
11	G2AJ, G3ABA, G3IOO, G4RO, G4SA, G5UD
10	EI2W, G2FQP, G3BK, G3EHY, G3FAN, G3GH1, G3HAZ, G5DS, G5MA, G8IC, GW5MQ
9	G2AHP, G3BNC, G3FLJ, G3WS, G6XM, PA0FB.
8	G2XC, G3GBO, G3GSE, G3HCU, G3VM, G5BM, G5BY, G5ML, G5MR, G8SB, GM3EGW

**TWO METRES
ALL-TIME COUNTIES WORKED
LIST**

Starting Figure, 14
From Fixed QTH Only

Worked	Station
71	G5YV
68	G3BW
64	G6NR
62	EI2W (209), G3BLP (630), G5BD
59	G3EHY, G4SA
58	G3CCH (295), G8OU
57	G2FJR, G2O1 (349), G8SB
56	G3GHO
55	G2HIF, G3WW, G5BM, GWSMQ
54	G3IUD (201)
53	G2AJ (519), G2HDZ (416), G3FAN, G4CI
52	G2NH, G3IOO, G5DS (571) G6XX, GW2ADZ
50	G3ABA
49	G5MA
47	G5WP
46	G3HAZ (315) G4HT (476), G5BY, G5ML (280), G6YU (205)
45	G2XC, G5JU, G6XM (356)
44	G3BK, G8DA
43	G2AHP (500), G3BA, G3COJ, G4RO, G5DF
42	G3FIH, G3GSE (424)
41	G2DVD, G2FQP, G3DO, G3DMU, G6CI (184), G6TA (422)
40	G3BNC, G3CGQ, G3HWJ, G8KL
39	G2IQ, G3GBO (434), G3HBW, G3VM, G8IL (325)
38	G2FCL (234), G3APY, G3WS (183)
37	G2DDD, G2FNW, G2FZU (180), G3DLU
36	G2DCI (155), G2HOP, G3BJQ (161), G3CXD, G6CB (312), G8IP
35	G3FZL, G3FYY (235), G3HCU (224)
34	G3BKQ, G3IER (128), G5MR (269), G8IC
33	G2CZS (209), G3HHY (125)
32	G2FVD, G8QY, G8VN (151), G8VR
31	G3HXO, G5RP
30	G3FRY G3GOP (208), G3GVF (129), G3IIT, G3IRA, G5NF, GM3DIQ, GM3EGW, GW8UH
29	G3AGS, G3AKU, G3FIJ (194)
28	G8DL, G3EBK, GM3BDA
27	G3DAH, G3ISA (160), G6GR, G13GQB, GW3GWA
26	G3AEP, G3CFR (125), G3SM (211), G4LX, G4MR (189)
25	G3JMA, G5SK, G6PJ
24	G3CVO (190), G3FD, G3FXG, G3FXR
23	G3CWW (260), G5PY
22	G3AGR (135), G3ASG (150), G3BPM, G3HIL, G3JHM (113), G3YH
21	G2AOL (110), G3DVQ, G3IWI, G6XY
20	G3DLU*, G3EYV, G3HSD, G3IOE
19	G3FEX (118), G3GCX, G5LQ (176)
18	G3CKQ, G3DBP, G3JGY, G8NM, GC2CNC
16	G3FRE, G5AM
15	G2BRR, G2DRA, G3EGG, G3IWA
14	G2DHV, G3CYY

both at S9; using the 807 modulator unit incorporating a speech clipper, as described in the November, 1953, issue of SHORT WAVE MAGAZINE, he is getting very satisfactory phone reports; a 589 CW signal gives RS-58 telephony.

Apart from his results already mentioned, G5BD worked two F's on May 30, and on the 31st had his first-ever QSO with GC, in the person of GC3EBK; all this has helped him up the Tables.

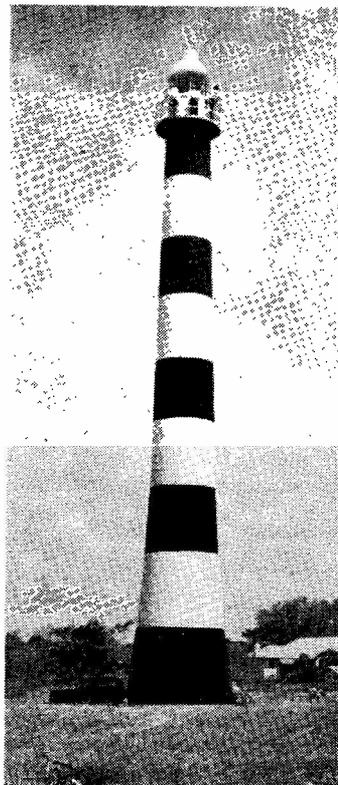
Use of VFO's

Among those who missed the Whitsun party was G6TA (London, S.W.16) who, nevertheless, was on for the two following evenings, May 30-31, when he worked a few Continentals and then a number of new stations in the Midlands and North. With two additional counties for the Annual, G6TA needs only one more to make 40C worked since September 1st, 1954, which is his present ambition. He hopes, and so do we, that the prevailing interest in VHF VFO's is not going to mean that every time a DX station calls "CQ QLH" all the VFO brigade will pile up on 144.01 mc. As we have repeatedly said, and as most two-metre operators appear to agree, there is nothing whatever against the idea of using a (good) VHF VFO *within one's own Zone*. The danger of irresponsible and unfair manoeuvring with VFO's is obvious; the last thing any of us on two metres wants is the cut-throat behaviour which is a well-known feature of DX-chasing on the HF communication bands. What is certain is that if indiscriminate VFO'ing under EDX conditions does start on two metres then it will not be long before we shall be involved in the same turmoil as now exists in, say, the CW areas of the 3.5 and 14 mc bands.

Since all agree that this would be most undesirable, it is up to everyone to use a VHF VFO with

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

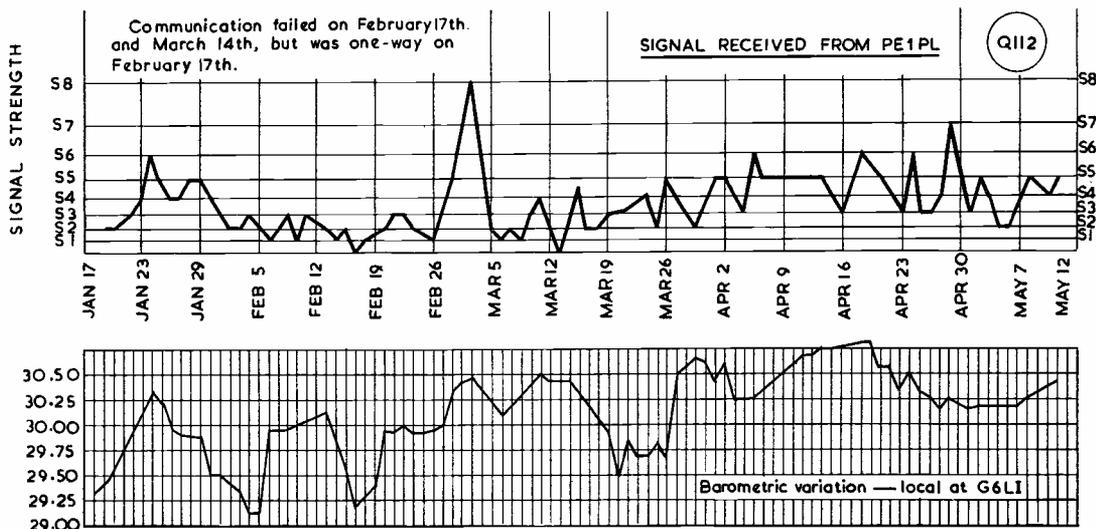
* New QTH



Mombasa Lighthouse, from which VQ4AA received two-metre signals from VQ4VL at 280 miles. The aerial used was a 6-element wide-spaced Yagi. This is the first result in the nature of VHF DX on the Continent of Africa.

discretion and due regard not only to the Zone Plan, but also to the rights, interests and convenience of others. Above all, we want to encourage all EDX operators to realise that our two-metre band is fully populated in the sense that stations can be found spread out over the whole area of the band. If anyone has any counter arguments, we shall be glad not only to hear them, but also to ventilate them in this space for the information of all interested.

G3FIH (Bath) moves up in the Tables and found some quite good spells of GD conditions. G2HDZ (Pinner, Middx.) writes to report "slight progress" and remarks that he has never before heard the band so full of Continentals as over the Whitsun weekend; G2HDZ also mentions hearing one or two G's calling an OH (not worked by anyone,



Graphical representation of the results of the G6LI/PE1PL schedule, referred to on p. 206 of June "VHF Bands." The period covered is January 17 to May 14, and the trend of events is clearly indicated by this diagram. Taking the whole period October-May, the schedule was kept on 219 days with only two failures. The distance G6LI/PE1PL, across an all-sea path, is 200 miles.

apparently) and we wonder whether the operators concerned mistook OZ7SP for an OH call. No claim to have heard or worked an OH, which would be an all-time new country on Two, has been received from anybody.

Portable-Mobile Activity and Equipment

Up North, G2HCJ (Warrington) is a keen exponent of /M working — he is often operating mobile in the Merseyside area, visits other parts of the country as well, and recently had a few days, on the mobile air, in the Birmingham district. From about July 11, G2HCJ expects to be backwards and forwards between Scotland and Cheshire for a couple of months or so, and will be on /P or /M nearly every day—he says he will visit as many counties as possible and will also "use a certain high spot on the Dumfries-Lanark border at weekends." The G2HCJ/P/M equipment consists of a modified SCR-522, with CC converter into a Command receiver tuning 4-6 mc 1F, fitted with the noise limiter from the *Mobile Handbook*—by far the most effective NL he has tried, says G2HCJ. The /P aerial is a 3/3/3/3, or a simple 3-ele flat top, and for actual mobile work he uses two

crossed folded dipoles fed at 90° "which far out-perform whips, ground planes or coaxial types." Indeed, from Merseyside G2HCJ has worked G4SA, G5YV, G6NB, G6WF and G6XX while really mobile, i.e. wheels turning normally, not from a car park. Some mobile-to-mobile contacts have also been made with locals G3AUC, G3AYT and G3DA. Schemes in hand for the G2HCJ /M installation include a gyroscopically-controlled beam, to keep it on a particular heading irrespective of the direction in which the car may be travelling. If G2HCJ is successful with this, it will certainly be quite a thing!

G4JJ/P (Barnsley) reports that he set up "one-night stands" near Luton, Dorking, London and Uppingham (Rutland) during May 23-26, but was disappointed at the activity when at the latter camp; though conditions were good only four stations were worked and two others heard; G5TZ was an S9+ and GM3EGW was identified but could not be raised.

In this month's Activity Report, and in the correspondence generally, there are more than several references to G3XC/P (Slough), whose equipment is permanently fitted in his car. The receiver is a 10-valve job in 13 stages, double conversion crystal controlled, using 12v. miniatures throughout,

with two RF amplifiers at signal frequency, and tuning 24-26 mc in the ganged 1st IF-2nd mixer-2nd oscillator section, with 2nd IF at 465 kc through two IF stages. The G3XC/P transmitter is 12AT7 24-72 mc, 12AU7 144-144 mc doubler-buffer, into an 832 PA, modulated by a 12AX7 in zero bias Class-B, with EF91-EF91 speech amplifier-driver, heaters series connected.

Some of the results obtained by G3XC/P are given in his list in the Activity Report. And very interesting they are, showing that the gear as outlined here — built specifically for the purpose, to operate as a permanent portable station off the 12-volt car battery — is giving very good results. G3XC says he will QSL all contacts "for cards received" and remarks that /P under these conditions is just as thrilling and as interesting as working VK or ZL on the HF bands.

Another interesting two-metre portable receiver is that designed and built by G2HIF (Wantage, Berks.). It is a 14-valve double superhet, complete with AVC, NL, BFO and S-meter, all on a 8½ in. by 5½ in. chassis! This, with the transmitter and control box, is mounted on a tray which is arranged to clip over the front seats of his Austin A40, permitting truly luxurious operation

from the comfort of the rear seats; by a system of cords, the 4-ele knock-down Yagi, on its 15ft. sectional mast clipped to the rear bumper, can be rotated from inside the car; so come blow or shine, G2HIF can operate /P at any time, and it only takes 5 minutes to get on the air from arrival at the site.

Your A.J.D. would say that if the foregoing paragraphs do not prove the ingenuity, adaptability and resource of the British VHF operator in the field of portable-mobile activity, he would be glad to be led to what does!

The SWL Offering

For SWL Drybrough (Coventry) the highlight of the month was hearing ON4BZ at 9.0 a.m. on Whit-Monday; though in his screened direction, Guy was an S7 signal and so, says SWL Drybrough "must have been laying down a colossal field strength"; the total of stations heard here is now 150 in 29 counties and four countries. SWL Cox of London, S.W.18 also had a good month and, having run up a 4-ele all-metal Yagi at 31ft., is getting much improved signals from all directions; he is also trying a Slot system—and he asks, as we all do, for more activity between 1800 and 2000 GMT. Incidentally, the Continentals in his heard-list were all received between 2027 May 29 and 0230 May 30, GMT.

SWL Juleff (Erith, Kent) is back again, and has in hand a 4/4/4/4 which he hopes will improve matters a bit—our SWL's certainly have the right ideas! During the Whitsun opening, SWL Juleff noticed that several Continentals, notably DL6SV and OZ7SP, had to call for quite a time before any G's answered, in spite of the fact that (in Erith) they were both very strong signals. He asks for an explanation of the absence of the F's, only one being heard by him the whole week-end; the answer is that, as implied earlier in this piece, the development did not quite take in France and probably the only F's affected would be those north of Paris and east of the Cherbourg

peninsula. The reflecting "ceiling" can, in fact, be thought of as lozenge-shaped, with the major axis roughly NW/SE across the North Sea. This is, of course, the loosest possible definition, but perhaps serves to illustrate the point.

SWL Ball is now at Shenfield, Essex, and finds reception conditions considerably altered; signals from the London area and south are blocked off by high ground, but northerly stations are very much better than at the old QTH. His heard-list is actually the last from there and SWL Ball feels it constitutes "a very nice haul."

More Station Reports

G2DHV (London, S.E.13) now has an ON4BZ two-metre converter working well and, on one evening (June 18), heard 25 G stations—some, like G3GPT and G6XM, at very useful distances. G2FJR (Sutton Bridge) who did so well during the Whitsun break, gives Whit-Sunday as the best day, and makes strides in the Tables. G3CKQ (Rugby) found it a "brighter month" and also moves forward. G3CCH (Scunthorpe) now has a total of 295S worked and goes to 39C in the Annual.

G3JGY (Malvern) has moved and says that all he has got settled in with is the VHF gear! G3DO (Sutton Coldfield) was glad to work G3XC/P in Rutland for an all-time new county, and goes up in both Tables. G3FYY (London, N.W.2) raised GW3GWA for Denbighshire as an all-time new one, and also reports a contact with G2BMZ (Torquay), in a difficult direction for him.

VHF DX in Kenya

In a very interesting letter, VQ4AA describes the two-metre tests between himself and VQ4VL over the Mombasa-Nairobi path of 280 miles. With the help of VQ4FZW, the receiving equipment — consisting of VQ4AA's cascode converter, an S.750 receiver and a 6-ele Yagi — was installed in the lamp-room of the Mombasa Lighthouse, putting the beam about 200 ft. a.s.l. At the transmitting end, VQ4VL, with

TWO METRES

COUNTIES WORKED SINCE SEPTEMBER 1, 1954

Starting Figure, 14
From Home QTH only

Worked	Station
40	G5YV
39	G3CCH, G3GHO, G6TA
38	G2FJR
34	G5MA
30	G3DO, G3FIH
29	G3BJQ, G3FYY, G3WW
27	G2CZS
26	G5DS
25	G8VN
24	G2CZS, G5JU
23	G2DVD
22	G2ADZ, G3IIT
21	G3IER
20	G2AHP, G2HDZ, G3DVQ, G3HWJ, G3IRA
19	G3CKQ, G3HHD, G3ITF, G5BM, G5MR, GW3GWA
18	G3DBP, G3JZG
17	G3HBW
14	G3EGG, GM3DIQ

Note: This Annual Counties Worked Table opened on September 1st, 1954 and will run for the twelve months to August 31, 1955. All operators who work 14 or more Counties on Two Metres are eligible for entry in the Table. The first list sent should give stations worked for the counties claimed; thereafter, additional claims need show only counties worked as they accrue. QSL cards are not required for entry in this table.

a 16-ele stack at 5,700 ft. a.s.l., was running 60 watts in an 829B. During the 24-hour period of the tests, VQ4VL was heard on phone by VQ4AA at Mombasa on four separate occasions. Thus has the VHF ice been broken out there though, as VQ4AA explains, two-way contacts on 144 mc are regularly being made over short distances, mainly in the Nairobi area, between the half-dozen or so VQ4's equipped for the band. All are using stabilised gear, with beam systems and inputs up to 60 watts.

VQ4AA himself, who lives in a railway coach and travels all over the East African Railways in the course of his work, is now equipped for two-metre operation in addition to the HF band gear which has made his callsign

known throughout the world. He says that much more interest is being taken in the possibilities of VHF in Kenya, where previously most VQ4's felt that it would be useless becoming operational on two metres. Actually, knowing something of the country and its climate, your A.J.D. would say that not only are many VQ4's well placed in terms of height above sea-level (and therefore should find it possible to work longer distances more reliably than we can in this country) but also that the weather should develop DX conditions more frequently, and for longer periods, than it does in the relative bleakness of Northern Europe.

It is for these reasons that, in this space last month, it was suggested that "the VQ4 clan... will soon be covering great ranges and finding how much interest the two-metre band holds for them." So we shall be looking forward to hearing more of their activities and results from VQ4AA, VQ4BP, VQ4CH, VQ4EV, VQ4SS and VQ4VL.

This and That

Several correspondents picked up that point we made here last

time about parasitic radiators, and we gather that various installations are being planned, with two under test. Obviously there are site difficulties in many cases where the idea might be most useful; the best "layout" will usually be a bi-directional stack on somebody's roof, or up a high tree, on a hill within half-a-mile or so of the transmitting beam; having surveyed a site, the only other requirement is that there should be an absolutely clear path between the beam at the station end and the parasitic array. Naturally, we shall be very interested indeed to hear from those who apply the idea, for which it is impossible to give specific details because each case is an individual one.

On 25 centimetres, a new problem — minor, but nevertheless important and very interesting — has obtruded itself. This is the matter of a "frequency standard." It will be well remembered by all old timers on the VHF bands that one of the very earliest difficulties on five metres (before the War) was finding the band; and then, having found the band, making sure that "your 58 mc was the same as my 5

metres." In other words, using SEO gear, it was easily possible for one local group, all happily together, to be working to a standard slightly different from that of another, with the result that the two groups could not make contact because they were not tuning the same frequency area, and weeks were wasted in fruitless schedule keeping. These difficulties were only resolved by making a physical check — somebody had to take train or car and go over — so that everyone could be brought on to the same standard. This meant tuning their super-regenerative receivers and SEO transmitters to a wavemeter indication which all accepted as the standard — it might even then have been wrong in terms of frequency, but at least everybody was together!

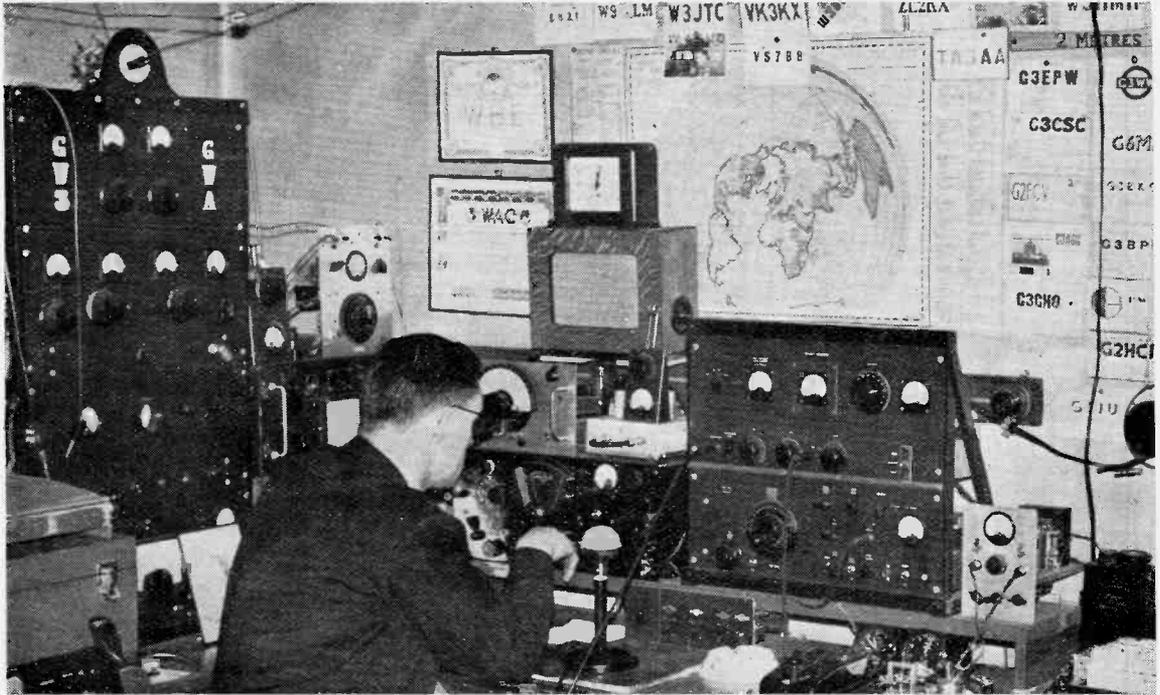
This is exactly the problem now being tackled on 25 centimetres. On that band, the gear at present in use is mainly SEO — and even those lordly ones who are tripling or quintupling from CC drivers had better check that they have picked out the right harmonic! (Where the drive frequency is known for certain, this is easily done by means of Lecher lines, but in any event should not be taken for granted.)

There is 25 cm experimental work going forward in London, Leighton Buzzard, Luton and Northampton. So far as we know, the only frequency standard agreed is that between G2HCG (Northampton), G3CGQ (Luton) and G5RZ (Leighton Buzzard), these three having met for a physical check — see "VHF Bands," p.93, April issue. Arising from this, G2HCG has constructed a wavemeter which is being copied by G5RZ, who will then re-check with G2HCG and pass the findings to G3CGQ/G3FUL in Luton.

The pressure of events this time has been so great that space is running out. But before signing may A.J.D. draw your attention once again to the HB expedition to Mt. Rigi during July 29-August 7 (for schedule see p.205 June "VHF Bands"); to the Manchester VHF meeting in Sep-



VQ4AA in the lamp-room of the Mombasa Lighthouse, with the cascade converter on which he received two-metre signals from VQ4VL, Nairobi, at 280 miles. The main receiver was an Eddystone S.750 (possibly the first time an Eddystone receiver has actually been used in a lighthouse!)



The neat outfit at GW3GWA, Wrexham, who is equipped for all bands from 3.5 to 144 mc. The main receiver is a BC-348 and to the immediate right of this in the photograph is the two-metre equipment, in rack form: Above, the 25w. transmitter and, below, a G2IQ-type converter; standing on the BC-348, to the right, is a CC converter. The beam for two metres is a 4-element Yagi and gear is in hand for Seventycems.

tember (see pp.206-207, June) and to the fact that we show Countries Worked again this month because there have been movements in that Table — possibly, this may remind other readers to make their claims if they had

good luck with the Continentals during Whitsun. The qualifying standard is 8 countries worked on two metres, all-time.

Finally—

While the Editor polishes his dome and says he cannot possibly

get it all in, the dead-line for next month is **Monday, July 18**, without a peradventure, and the address: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Phew!

GERMAN RADIO EXHIBITION

This will be held at Dusseldorf during August 26 to September 4, and will be devoted not only to complete equipments in the radio, television and communications fields, but also to the products of a large number of German component manufacturers. In Germany, firms in the components market number more than 150, with a total combined turnover, last year, of £20 million.

IMPROVED MULLARD PRECISION OSCILLATOR

A new version of the Mullard Precision Oscillator, a high stability VFO, is now available. Improvements have been made in mechanical stability, and resetting accuracy. A fine tuning scale has been incorporated, and also a new temperature control system.

The Mullard Precision Oscillator, which covers the frequency range 2-5 mc in two bands, has a frequency stability over 24-hour periods of 30 parts in a million (0.003%). Its principal application is as a drive for short-wave transmitters requiring accurate

frequency control to meet "Atlantic City" standards without resort to crystals.

PREMIUMS for TECHNICAL WRITERS

We shall shortly be making an announcement of great interest to all contributors and would-be contributors to *SHORT WAVE MAGAZINE*. Briefly, to encourage the flow of up-to-date technical material, particularly in the constructional field, during the next 12 months cash premiums up to 25 guineas will be awarded to contributors whose work, published in this *Magazine*, is considered to be of exceptional merit. The actual amount will depend upon the value of the material as regards reader interest and practical application in the field of Amateur Radio. All technical articles received for Editorial consideration after the appearance of this notice will be reviewed for premium awards, which will be in addition to the payment normally made for contributed material.

AMATEUR RADIO

PART IV

For The Beginner

GENERAL PURPOSE POWER PACK

By A. A. Mawse

I UNDERTOOK this month to go into the important question of power supplies—and it is important, because it is one of the easiest things over which to come unstuck. It is also very closely bound up with considerations of safety.

When designing an amateur station it is a good thing to start along the right lines from the very beginning or else development is apt to become somewhat haphazard and untidy. As the vast majority of people are on an electricity service fed from the National Grid system, they will receive their supply in the form of alternating current of 50 cycles periodicity and at a (nominal!) pressure of 240 volts single phase. So the remarks following apply only to this system.

Mains Layout

Ideally, the mains should be brought into the operating room with all wiring enclosed in earthed conduit and connected direct to a double-pole isolator switch, and thence, *via* your sub-fuses, to a convenient number (say three) of standard 5-amp. 3-point outlet sockets suitably disposed along the bench. Figure 1 shows a lay-out based on this suggestion, from which it will be seen that, with the isolator open, all gear which may be connected to the sockets will be completely dead. This switch should be fixed in a position where it can be thrown easily and without delay, and its position and function should be made known to other responsible members of the household. At the same time, it should be out of the reach of young children, and in this connection a good plan is to include one of the older type 2-pin 5-amp. sockets in the live side of the line—shown as P1 in Fig. 1. If, then, a two-pin plug is prepared with the pins connected together internally, this can be kept hidden or else carried around in your pocket, and nothing will work until it is plugged-in to P1 to complete the circuit.

Another safety measure is the inclusion of the 15-watt indicator lamp, which can be red in colour. This will light when the power is on at the mains, but it should be remembered that this is not infallible, because sooner or later the lamp will reach the end of its useful life and burn out. It does, however, serve to discipline you into a safety habit. If it is alight, then "danger—don't touch" is the motto; if it is not alight, then "why not?" should be the question. As you probably know already, single-phase mains supplies consist of two wires—one known as live or L, and the other as neutral or N—and whilst no great harm would result if the neutral side went down to earth, there would definitely be fireworks if this happened to the live lead.

All sub-switches and single-line fuses must be placed in the live lead.

A moment's thought will show that, if neutral were chosen, a switch could be opened or a fuse blow and still the apparatus would be live to ground. For this reason, three-point plugs are desirable, since it is then impossible to reverse polarity by reversing the direction of connection. Finally, before getting off the subject of safety, all equipment should be bonded to earth, and power equipment should have its own circuits separately fused suitably for its own protection. To those who, after reading these remarks, are inclined to think I am being unduly fussy, I can only say that you are a long time dead, and if you come to regard anything over 100 volts as potentially lethal and act always with discretion and deliberation, it will not be because of Amateur Radio if you do not live to enjoy the company of your grandchildren!

Power Pack Requirements

Unfortunately, as one cannot forecast your own particular trend of development in Amateur Radio, it is neither possible nor practicable to design a kind of "super power station" which will cater for your needs for all time. But it is possible to suggest a design which will be adequate for your more immediate requirements and which, moreover, will still find its use in some lesser capacity when eventually you begin to think in terms of full licensed power on phone. It is very little more costly, if at all, to

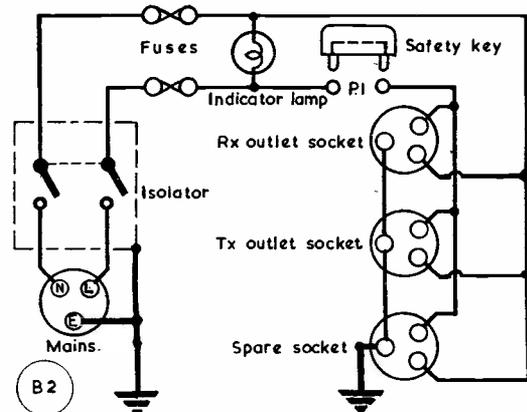


Fig. 1. Layout of the mains connections for the Beginner's Station. The "safety key," shown as P1, is a bridged two-pin plug, without which power cannot be obtained even if the isolator switch is made. This plug should be a loose fitting, and always withdrawn when the equipment is being serviced or otherwise handled. If it is kept in the owner's pocket when the gear is not in use, no "unauthorised person" can switch on the equipment!

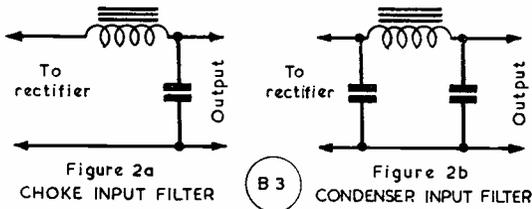


Fig. 2. Connections for the smoothing circuit, discussed and explained in the text.

build reasonably substantially in the first instance, and you will reap the benefit of such foresight in a number of ways. There is a wide range of transmitting valves which will operate satisfactorily at plate voltages in the region of 400-500v., and only ordinary precautions with regard to insulation and so on need be taken within this range.

Mains Transformer

There are a number of makes available at reasonable prices within this range. I secured one giving 400-0-400 volts on the high tension side; 5 volts at 4 amps. centre tapped for the rectifier heater or filament; and two 6.3-volt outlets for heaters—one at 5 amps. centre-tapped and the other at 3 amps. I almost forgot to mention that the high-tension winding is rated at 150 m/amps., which will therefore provide a useful output of about 50-60 watts. I don't suggest that you must have an exact replica of this transformer, but try to get as close as possible and, in any case, avoid a lower rating than 150 mA.

Filter Design

The output from a full-wave rectifier circuit consists of DC impulses of twice the supply

frequency, and, before this can be utilised, means must be provided to produce a reasonably smoothed DC output. For ordinary CW work, a ripple percentage of 5% can be considered as satisfactory, but where a variable frequency oscillator (VFO) and/or radio-telephony is contemplated, this figure must be reduced to 0.25% or better in order to produce an absolutely hum-free carrier. Smoothing can take two forms: choke input, as shown in Fig. 2A or condenser input, as shown in Fig. 2B. The former method is generally employed for high-voltage power rectifier circuits and where exceptionally good voltage regulation is desired, but the final output is only about 0.9 of the r.m.s. voltage at the transformer output. In the case in question, therefore, with 400 volts AC, the output would only be about 360 volts DC. For outputs of 500 and under, condenser input is generally used, and the final output

Table of Values

General Purpose Power Pack with List of Parts

- T1 = Mains Transformer—see text
- V1 = 5U4G Rectifier valve
- V2 = VR/105/30 stabilizer valve
- V3 = VR/150/30 stabilizer valve
- L1 = Smoothing choke 25H 110 ohms
- C1 = 4 μF oil filled condenser *minimum* rating 600 volts working
- C2 = 4 μF oil filled condenser *minimum* rating 600 volts working
- R1 = 6,000-ohm 10-watt wire-wound resistor
- R2 = 100,000-ohm 1-watt carbon resistor
- S1 = Single pole "on-off" 250 volt 1 amp toggle switch
- LP1 = Indicator lamp 6.5 volt MES with Bulgin type D.240 fitting (or similar)
- F1 = 1A cartridge fuse (Bulgin type F.126 with holder type F.55)
- F2 = 4.5v. or 3.5v. 0.3A MES with Bulgin type F.5 insulated lamp-holder (or similar)

Additional Material

- One chassis 2½in. x 8in. x 12in., or similar
- Five chassis mounting International Octal valveholders
- Eight terminals with insulated heads, bushes and washers

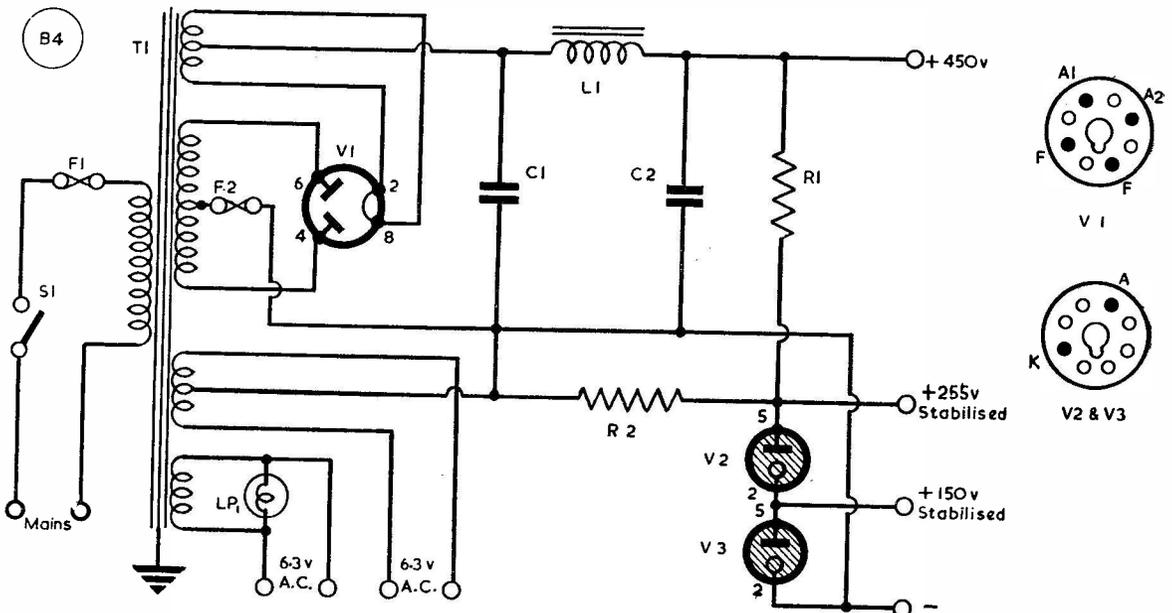
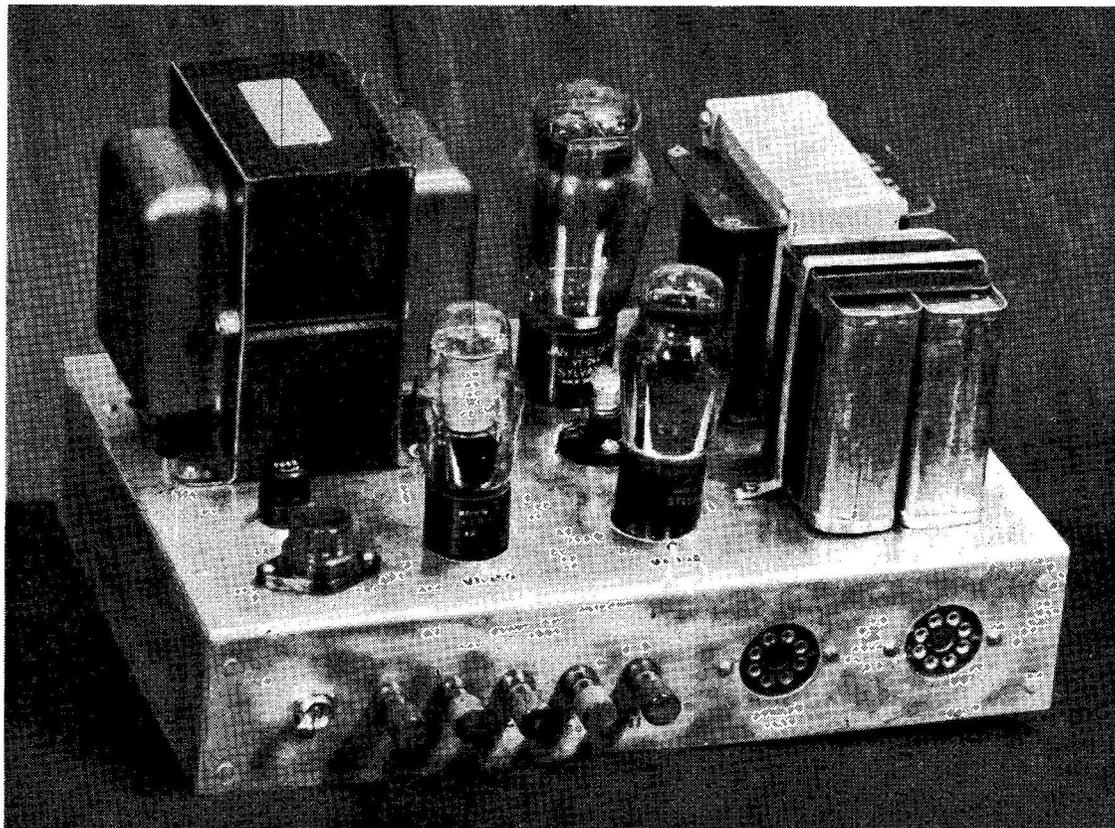


Fig. 3. Circuit complete of the Beginner's Power Pack, which provides HT and LT outputs sufficient for all the equipments to be described in this series. Constructional details are discussed in the text, and all values and parts required given in the table.



The Beginner's Power Pack described in the article. It gives outputs, HT and LT, stabilised and otherwise, which will be found to meet all requirements up to a 25-watt VFO controlled CW transmitter, together with heater supplies. It is fused on both input and output sides; the on-off switch is in the mains L side; a warning "power on" lamp is also provided. Take-off of power is either from the octal sockets or, when used for testing or running auxiliary gear, off the insulated terminals. The rectifier valve is behind and the two stabilisers (V2, V3 in Fig. 3) in front; the HT fuse bulb can be seen behind the right-hand stabiliser. The general form of construction shown makes the unit absolutely safe; there are no "HT ends" that can be touched. The Power Pack as illustrated here has already given many hours of service and is running the Beginner's transmitter to be described later in this series.

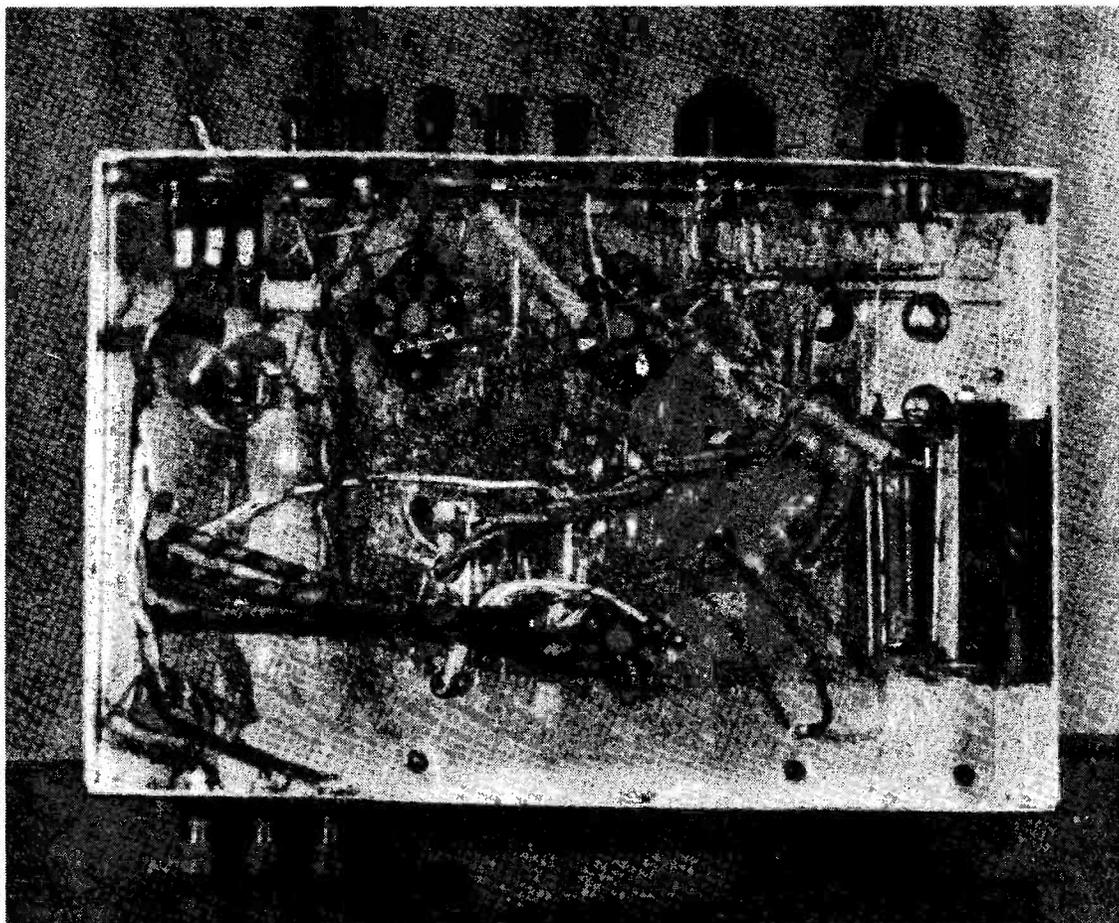
(with the same 400 volts AC in) would be between 450 and 500 volts, depending upon the load; this form of smoothing has been employed here. The smoothing choke value is not critical—something between 10 and 25 Henrys will do, so long as it has low ohmic resistance and that due regard is paid to the size of the two condensers C1 and C2. A rough guide to aim at is to see that the product of C1, C2 and L total not less than 400 in order to reduce the ripple percentage to somewhere in the region of 0.25% on full load. I have used a 25H choke with a DC resistance of 110 ohms and two 4 μ F condensers, but 10H and 8 μ F and 5 μ F would produce the same result.

The 5U4G valve used as a rectifier is readily obtainable on the surplus market; it has a 5-volt filament and is comfortably under-run with this set-up, besides being no dearer than lower-rated valves.

Stabilized Outputs

One does not always require the full 450-volt output, especially as the pack will be needed to feed several circuits and also ancillary equipment apart from its main function. It is therefore a good

idea to provide for one or two lower-powered and lower-voltage outputs, and this can be achieved by making use of gas-filled voltage stabilizer valves of the VR type. These valves are mostly designed to pass a maximum 40 mA and will continue to operate and to provide close control of voltage down to about 5 or 10 mA of load. They must be fed from the HT line *via* a dropping resistor of such value that the current flow is limited to a maximum of 40 mA, and this resistor must be capable of dissipating the energy lost in it. Two or more such stabilizer valves can be connected in series to give a number of controlled outputs, always providing that there is sufficient margin between the sum of their rated voltages and the line voltage to enable ionisation to commence when the power is switched on. This figure is about 30%. In the design under discussion I selected the VR 150/30 and VR 105/30 run in series to provide additional outputs at 150 and 255 volts. The total combined load from these tapping points should not exceed 30-35 mA or else control will be lost and the lower of the two valves should be the more lightly loaded of the two. This



General arrangement underneath the Beginner's Power Pack, showing wiring. As explained in the article, this layout need not be exactly followed, a power pack being the one item of equipment in which the constructor can follow his own inclinations. But at all times due regard must be paid to safety and if the design as shown here is adopted — it is as convenient as any other — there need be no fears on that score.

output provides adequate power for running any ancillary equipment that may be required and for the variable frequency oscillator, which will eventually be described in these pages. The calculations for arriving at the correct value and rating of the dropping resistor are as shown in the formula.

$$R = \frac{E_m - E_s \times 1000}{I}$$

R = resistance value in ohms
 E_m = unloaded peak output volts
 E_s = max. stabilized voltage
 I = current in mA (usually 40)

In the present arrangement, taking E_m as 500 and E_s as 255 volts, this works out at a little over 6000 ohms. Since 245 volts are dropped across the resistor at 40 mA, this is equivalent to a wattage rating of 9.8 watts, so that a 10-watt resistor will be required. Two 3000 ohm 5-watt resistors in series will serve equally well if these are more readily obtainable.

Bleeding

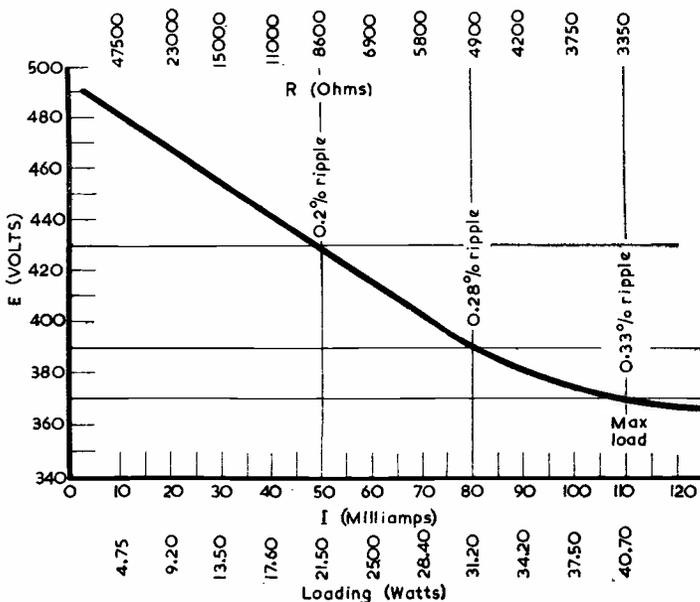
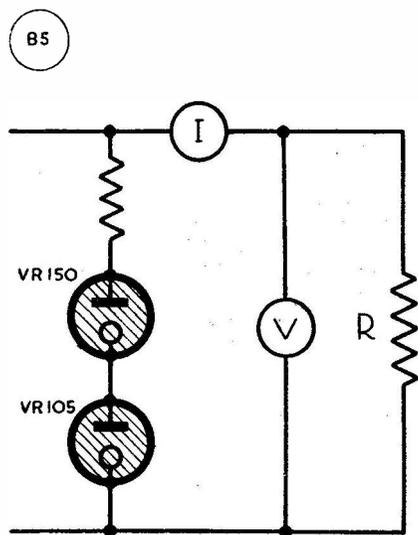
Good quality high-capacity condensers have a

tendency, by their inherent goodness, to hold their charge for quite a while if no load is attached, and thus can cause dangerous and unexpected shocks to the unthinking operator. For this reason, it is a good practice to "bleed the pack" by fitting a fairly high value resistor across the output terminals; this will enable any charge to leak away quickly when power is switched off, and yet will only consume very little energy when the unit is in operation.

If you will study the complete wiring diagram of this power pack, which is given in Fig. 3, you will see that such a bleeder of 100,000 ohms is connected across the two stabilizer valves. When power is switched off, the peak output voltage is instantly reduced to the safer value of 255 volts when the stabilizer valves cease to ionise and the bleeder then rapidly completes the discharging action.

Fusing

Again referring to Fig. 3, you will see that both mains input and HT output are fused. The main



This useful graph, taken on the Power Pack as illustrated, shows the output voltage at different loadings. The load resistance and wattage at these loadings are also given, with the ripple percentage as the load is increased. Note that the stabilisers are connected and drawing an additional 40 mA, so that the maximum output load on the HT tap should not exceed 110 mA, to keep within the (150 mA) rating of the particular transformer used.

fuse should be rated to blow at about 1 amp., and the HT fuse in the centre-tap negative return consists of a 3.5 or 4.5 flashlamp bulb rated at 0.3 amp. This will also serve as a warning if you start overloading the output, since it will light up as the load is increased and will blow instantly in the event of a dead short, thus providing protection to the rectifier valve and transformer windings.

General Layout

I have purposely left this until the last because a power pack is about the only piece of radio equipment in which one has *carte blanche*. Collect all the parts; lay them out on the bench and arrange them to your own satisfaction and taste; then calculate the size of the chassis you need. I built on a standard 2½ in. x 8 in. x 12 in. shell, but it could have been condensed to 8 in. x 10 in. From the two photographs, you will see the layout I have chosen, and that all wiring is below decks—an added safety factor, incidentally. Watch the insulation where leads carrying high voltage pass through the chassis, and use rubber grommets where necessary to prevent chafing of the insulation. The warning red indicator lamp is another safety precaution and consumes very little current from one of the heater supplies. You will see that one of the heater circuits is not connected to earth. This is deliberate, since there are occasions when a floating heater is desirable, but this is not important and, in general, it is better practice to earth one heater or the centre tap, if one is provided.

Output and Input Arrangements

Output of the three HT and main heater supplies.

as well as the earth return, are taken from two octal valve sockets, wired in parallel; in addition, the secondary heater supply and the two low-voltage HT points are also taken to terminals for use with ancillary or experimental equipment. Mains input is at the rear to three terminals, one being earthed to the chassis, and thence, by three-core cable, to the 3-point power socket on the bench.

The graph shows the outputs obtained, on artificial loads (for test purposes), with the power pack exactly as described and illustrated here. It is in regular use, is safe and handy, and is running the gear yet to be described in this series. When you have this power pack, or something like it, built up, you can do your own tests on it, using the DC Test Meter discussed in detail in the last issue. (Incidentally, in the caption at the foot of p.198, June, for "F1, F2" read, of course, S1, S2 to correspond with the Table of Values.)

Next month we shall be embarking upon an interesting and essential piece of test equipment which will help enormously in the building of the actual transmitter.

* * * *

If you are learning Morse by the method suggested in Part I of this series, in the April issue, you should be about ready to start sending. To this end, possess yourself of a good Morse key and a high-note buzzer (or build a simple audio oscillator), and next month we can discuss the art and practice of Morse transmission.

The term "a good key" deserves some further consideration, and not only in relation to its cost. The key you learn on should be the instrument you

will use throughout your CW life, in actual operation over the air; thus, it will become one of your most valuable possessions. So choose it with care. At this stage, go for the straight key, or "pump-handle"; avoid the exotic types you read about, like bugs, side-swipers, semi-automatics, imitation Vibroplex and electronic keys. You can experiment with these when you have become a good hand on a straight key and know all about how properly-sent Morse should sound.

For you, "a good key" is one which suits your hand, with a comfortable flanged knob, a shortish arm free of side-play, clean contacts facing squarely and, most important of all, ample adjustment. Two adjustments are essential: the width of the gap, and the tension of the spring. The gap adjustment should be variable from fully closed (when you should not be able to see any daylight across the contacts) to a maximum of about 1/8th of an inch. Pin-head contacts are an abomination, and should be avoided. The tension should be continuously variable from floppy to tight by means of a *fine* screw. At all settings and with any gap, the key should work accurately. Keys with what are known as back contacts—a pair of contacts which always close in the key-up, or main-contacts-open, position—are useful in some amateur applications, but in the ordinary way are not a requirement; another refinement in the same category is a shorting switch.

The general construction of the key should be substantial in relation to its size, and in some designs the mounting is heavy enough to keep it stable on the operating bench without needing to be fixed down. If it is to be screwed to the table, the construction should be such that this can be done without distortion of the mechanism; some keys are so lightly built that screwing them down puts the contacts out of square.

All this means that you ought, for your own ultimate satisfaction, choose your key with the utmost care and with due regard to the considerations mentioned. You may easily find what you want for a few shillings—a high-priced key is not necessarily a good one—but when you do find what you feel to be a good key, its price should be the last consideration. A final word of warning—some of the Service types sold as "surplus" do not satisfy all the requirements given here because they were designed for use under specially onerous conditions, such as violent motion, which demanded the use of a wide gap with a tight spring. To send good, fast, clean Morse for long spells without fatigue, most operators find a fairly close gap with a fine adjustment of tension to be absolutely essential. The actual settings are, of course, a matter of individual preference. It is no use even trying to send good Morse on a key with which you are uncomfortable, or which cannot be adjusted to the "weight" which suits you.

THE 39th PHYSICAL SOCIETY EXHIBITION

BRIEF REVIEW OF SOME NEW DEVICES

THE Annual Exhibition took place this year in the New Hall of the Royal Horticultural Society; each successive year seems to bring more and more visitors, and there is no doubt as to the popularity of this event.

Among items of particular interest, G.E.C. were showing a Bismuth-Telluride *p-n* junction which, with a current of 7 amps., produces a temperature difference of 40°C by the Peltier effect. It was shown to be able to produce small quantities of ice. Being the most convincing demonstration of the Peltier Effect yet given, it is unlikely to have any large-scale practical use in the foreseeable future, although the device could be used in, say, a dew-point hygrometer. Also on the stand were some prototype junction diodes with high-power ratings. In a bridge circuit four of these were feeding DC into a load consisting of an ordinary fire element! The advantage of these over the selenium and copper oxide types is the smaller size and greater efficiency.

The new EW59 junction transistor, recently announced by G.E.C., is primarily intended for LF applications, e.g. deaf aids, but has been designed to give a good HF performance. It was shown in a 465 kc amplifier giving a gain of 20 dB. The circuit was set up to prove the importance of the extrinsic

base resistance (it has a very low value in the EW59) on the frequency performance of junction transistors by switching an additional resistor in series with the base and measuring the loss of gain. Also, a test set was devised to show the measurement of junction capacity and extrinsic base resistance.

Some New Devices

Standard Telephones also demonstrated some semi-conductor devices. A *p-n* silicon diode was used to show the Zener effect. The high reverse resistance of the diode breaks down at a voltage determined by the quality of the silicon. Thereafter, the diode behaves as a short and very small increase in volts produces a large current. The demonstration showed the diode cutting the tops of a 60-volt sawtooth at 36 volts. The device is potentially a competitor of the gas-discharge voltage stabilisers. It will, of course, be very much smaller, and it may prove a handy voltage reference source which can be wired directly into the circuit (like a germanium diode, in fact).

Two amusing toys were on view. A normal-looking telephone sat on a perspex table, but there were no wires to it, nor was there any cord to the handset. On picking up the handset a dialling tone was obtained. By dialling "STC" one was connected to a gentleman who discoursed on the advantages of transistors, while any other number brought a steady tone. The telephone base contained a 420 kc transistor transmitter (TTX) switched on by raising the handset and operated by the pulsing sequence from the dial. Under the table, a closed box of tricks contained a receiver, relays and a tape recorder

feeding a transmitter on 1.65 mc, all using valves. The handset contained a transistorised receiver on the latter frequency. The other toy was a form of musical box. A pulse went round and round a delay line of eight point-contact stages, each switching HT in turn to eight transistor oscillators tuned through an octave. The oscillators fed a 100 mW output stage driving a loud-speaker. The eight-note sequence produced a melodious sound from the speaker. Three different note sequences were obtainable.

Valve Without Vacuum

One of the most interesting stands was that of D. M. Tombs, of the Electrical Engineering Department of Imperial College: A corona triode, looking like a vast spark gap with a large spherical polished copper anode, a needle point (corona discharge) cathode and, surrounding the point, a ring (grid) to control the discharge. *N.B.*: All in air—no vacuum or glasswork! The characteristics were: $g=25 \mu\text{A}$ per kV, $R_a=200$ Mohms, $\mu=5$. A variable anode load resistance, to show voltage amplification, consisted of two needles separated by a variable length air path.

A loud-speaker was shown which had *no moving parts*. No mechanical resonances being possible, the response appears smooth from the highest audible note to zero frequency. *Yes*, a steady wind, strong enough to blow out a candle, could be produced by the appropriate DC voltage! The principle used is

that of the "electric wind" caused by a discharge from a point in air. A matrix of such points on either side of a wire mesh across the speaker opening produces a movement of air in either direction according to the polarity of the applied voltage. The very high voltage output is provided by an HL20 with 16 kV on the plate. An ideal valve for this application is not made.

It is impossible to do justice in a short space to all 139 exhibitors and their thousand or so exhibits. There were mass spectrometers and micro-wave components, calorimeters and cameras, Geiger counters and gyros, scintillation counters and stop clocks. It is impossible in one day to see more than a small proportion of the exhibits. One criticism, if it may be allowed, is the lack of any differentiation between a stand showing a beautiful balance reading to 1/10 mgm and something new, such as a corona triode or Peltier cooling junction. Often the large chromed and crackled, metered and multivalved pieces of apparatus doing fairly routine jobs on a large scale tend to overshadow something new and original. Your correspondent may be unjust, but he feels that the demonstrator of these vast and expensive instruments (they cost thousands) tends to be more of a salesman than a scientist. Could we not have a trade show and conversazione side by side instead of intermingled?

J.M.O.

REPORT of the RADIO RESEARCH BOARD

This very useful, and most interesting, 48 pp. reference work discusses the activities of the Radio Research Board for the year 1954. Some of the headings are "Forecasting of Radio Transmission Conditions," "The Ionosphere and Radio Wave Propagation," "D/F at High Frequencies," and "Propagation at VHF and UHF." The present chairman of the Board is Sir Noel Ashbridge, and the Director of Radio Research is Dr. R. L. Smith-Rose, C.B.E., D.Sc., Ph.D. *Report of the Radio Research Board, 1954*, published for the Department of Scientific and Industrial Research by H.M. Stationery Office, price 2s. 8d., post free.

RADIO CONTROL on FRENCH RAILWAYS

The French are, quite rightly, very proud of the performance of their electric locomotive BB-9003 which, hauling a four-coach train without a driver, reached a speed, under radio control, of 74 m.p.h. on April 18 over a stretch of track between Paris and Le Mans. Control of BB-9003 for the test was actually effected from a diesel rail-car running alongside on a parallel track, control orders being passed on 300 mc to a sub-station on 160 mc, which in turn passed them to the locomotive. As starting and acceleration up to maximum speed are automatic on most modern types of electric locos. of the S.N.C.F., for the trial only two remote control motions were necessary—braking, and current supply (regulation) to the traction motors. The French are careful to explain that the application of the system is not

so much driverless trains as safety control at the much higher operating speeds now being aimed for on the French State Railways; BB-9004, a sister of the engine used in the radio tests, recently set a new world speed rail record of 205 m.p.h. It is also of interest to note that the French already have, on their main-line trains, a radio-telephone system whereby passengers can be connected to any telephone subscriber in Europe while the train is in motion. VHF radio is also used extensively in marshalling operations and general train control.

PYE MARINE COMMUNICATION RECEIVER

Now available is the Pye "Consol," a marine receiver with many attractive features. Designed specially for yachtsmen and small boat owners, it is a rugged, self-contained set covering the Trawler Band as well as medium- and long-wave broadcasting; it can also be used to give navigational aid by the Consol MF beacon system, now well established as a means of navigational assistance. The use of Consol requires no fitting other than the receiver itself, and a position can be worked out in a few minutes by reference to the special Consol charts which, supplied in sections, cover Northern European waters. Frequency coverage of this new Pye marine receiver is 150-349 kc, 530-1600 kc and 1520-3800 kc. The power supply requirement is 12v. or 24v. DC (from the ship's battery) and the nett price is 30 guineas. Suppliers are Pye Marine, Oulton Works, Lowestoft (Tel.: *Oulton Broad 425-6*) with maintenance depots in London, Bristol, Newcastle, Liverpool, Cardiff, Glasgow and Southampton.

NEW QTH's

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

DL2WI, 4013597, Cpl. Dufton. W. E., 9 Appleby Walk, A.M.Q., H.Q.(U), 2nd T.A.F., B.A.O.R.I.
EI4AB, C. Connolly, 22 Michael Street, Waterford, Co. Waterford, Eire.
EI5AB, B. Cantwell, 104 Sycamore Avenue, Rathbane, Co. Limerick, Eire.
EI8AB, D. Murphy, 15 Cook Street, Cork City, Eire.
G2HMK, T. G. Brown, 48 The Green, Thirsk, Yorkshire.
G3AG, F. Inchley (*ex-G6IN*), 11 Carnwath Road, Sutton Coldfield, Warks. (Tel.: *SUT 4642*).
G3FBB, C. G. Lovekin, 145 John Amery Drive, Manor Estate, Stafford, Staffs.
G3HHM, F. J. S. Chandler (*ex-DL2PD*), 15 Hanson Grove, Sheldon, Birmingham, 26. (Tel.: *SHE 2980*).
G3ILT, J. R. Williams, 59 Warren Road, Banstead, Surrey.
G3ILU, R. J. Trottman, 1 Broomwood Road, Battersea, London, S.W.11.
G13KDR, J. A. Stringer, 28 The Green, Holywood, Co. Down.
G3KDV, R. Coleman, 16a Castor Close, Brixham, S. Devon.
G3KEV, M. C. Hamilton, R.A.F. Station, Compton Bassett, nr. Calne, Wilts.
G3KFD, D. J. Billingham, 4a Norfolk Road, Wollaston, nr. Stourbridge, Worcs.
G3KFP, A. R. T. Olds, Rondo, Gweal-an-Top, Redruth, Cornwall.
G3KFX, J. Bays (*ex-DL2XK*), Heathville, Tattingsstone, nr. Ipswich, Suffolk.
G3KGC, R. J. B. Morgan, 11 Sussex Ring, North Finchley, London, N.12.
GW3KGD, P. H. Rich, 25 Stranraer Road, Pennar, Pembrokeshire.
G3KGE, A. Skene-Smith (*VK2SS*), 45 Plymouth Road, Buckfastleigh, Devon.
GM3KGI, W. Bruce, 36 Wellington Street, Prestwick, Ayrshire.

G3KGM, D. MacLennan (*ex-VS6CT*), 33 Sweet Briar Grove, Edmonton, London, N.9.
G3KGM/A, D. MacLennan, Glenmeanie, Dundonnell, by Garve, Ross-shire.
G3KGN, A. Edwards, 20 The Fairway, Leigh-on-Sea, Essex.
G3KGU, M. McBrayne, 252 Hamlet Court Road, Westcliff-on-Sea, Essex.
G3KGV, K. A. Bates, 8 Grange Crescent, Southwick, Sunderland, Co. Durham.
G3KGW, J. D. Smith, 46 Queen's Road, Cheadle Hulme, Cheshire. (Tel.: *Hulme Hall 294*).
G3KGX, B. H. Lawrence, 33 Sweet Briar Grove, Edmonton, London, N.9.
G3KHE, G. E. Hayes, 8 Woodlands Road, Birmingham, 11. (Tel.: *SOU 0019*).
G3KHK, D. Connolly, Church Road, Mundesley - on - Sea, Norwich, Norfolk.
G3KII, D. Lively, 46 Laleham Road, Catford, London, S.E.6.

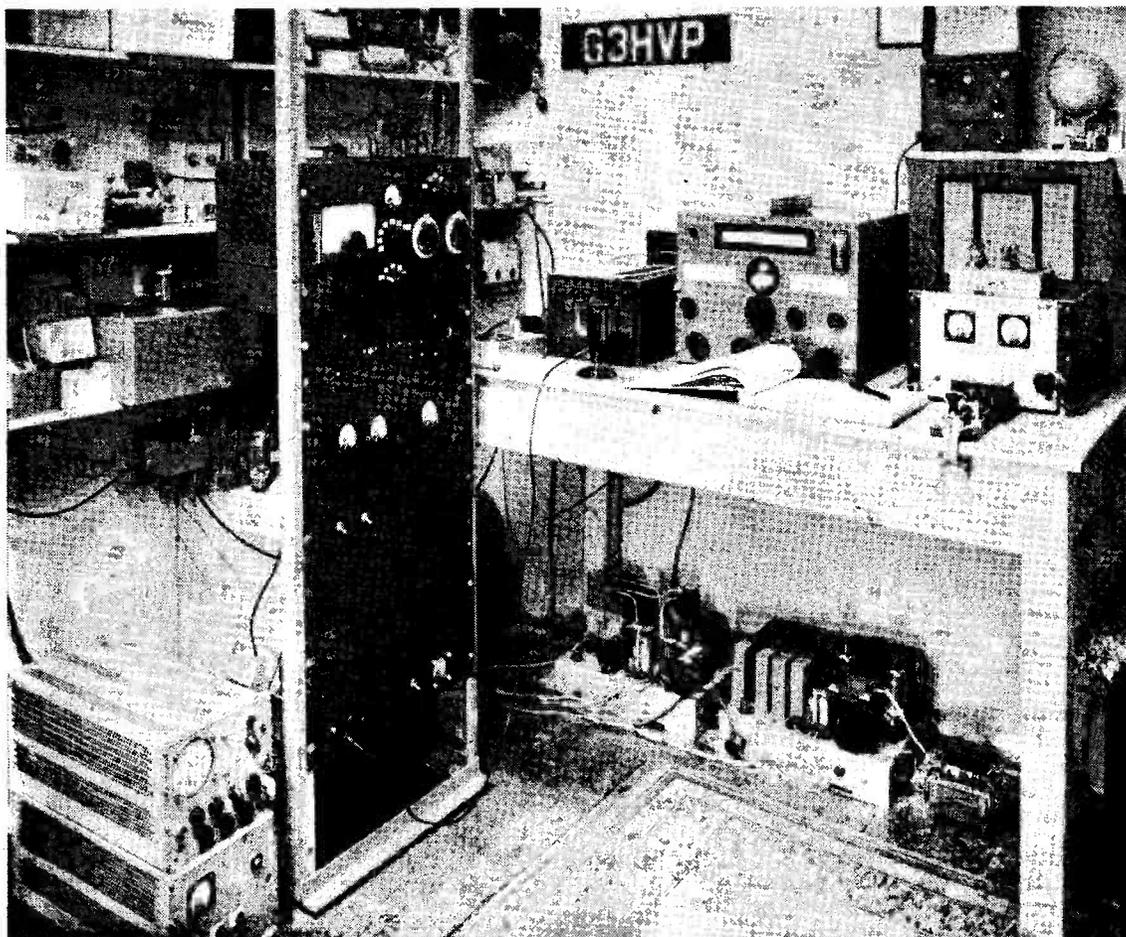
CHANGE OF ADDRESS

G2AVW, R. W. Britton, 2 West Gordon Terrace, Stakeford, Choppington, Northumberland.
G2BNZ, D. Markland, 29 Rumworth Street, Bolton, Lancs.
G2DYY, W. C. Longman, Broomfield House, Westgate, Cleckheaton, Yorkshire.
G2HLU, Dr. H. Owen, Ventoria, 31 Beechwood Avenue, Woodley, Reading, Berks.
G2TA, R. C. Ray, Wintons End, Springfield, Bushey Heath, Herts. (Tel.: *BUS 1762*).
G2WW, D. J. Beattie, 47 Wash Lane, Clacton-on-Sea, Essex.
G3ABK, F. Burns, 35 Edge Fold Road, Walkden, Manchester, Lancs.
G3AOT, T. Pattinson, 15 Glen Terrace, Washington Station, Washington, Co. Durham.

G3BRK, Aquila Amateur Radio Club, I.E.M.E. Ministry of Supply, Bickley, Kent. (*Hon. Sec.: G3HRC*).
G3CIZ, S. D. Matthews, Oakwood, Belgrave Street, Ossett, Yorkshire.
G3DAH, W/Cdr. A. H. Dormer, Officers' Mess, R.A.F. Station, Medmenham, Marlow, Bucks. (Tel.: *Marlow 710*).
G3EEW, F. J. Heasman, 196 Clarendon Place, Dover, Kent.
G3EPG, M. N. Fletcher, Beechcroft, Park Avenue, Cheadle, Stoke-on-Trent, Staffs.
G3FIU, W. B. Gray (*ex-GM3FIU*), 31 Watts Lane, Hillmorton, Rugby, Warks.
G3GWX, L. P. Jones (*ex-GW3GWX*), 535 Coventry Road, Small Heath, Birmingham, 10.
G3HQP, L. Christian, 107 Elwill Way, Park Langley, Beckenham, Kent.
G3IEX, D. J. Roper, 21 A.M.Q., Alderton, R.A.F. Station, Bawdsey, nr. Woodbridge, Suffolk.
G3JJG, G. F. Gearing, 127 Lamma Avenue, Mitcham, Surrey.
GW3JKE, G. W. Thomas, Holmfield, Main Road, Tonteg, Pontypridd, Glam.
G3JLA, A. E. Latham, 138 Broadwater Crescent, Marymead, Stevenage, Herts.
G3KAY, 4010943, Sgt. Lang, R. J., Sergeants' Mess, R.A.F. Merryfield, Ilton, nr. Ilminster, Somerset.
G3KX, W. T. Gould, 11 Ottawa Road, Weston-s-Mare, Somerset.
G3KX/A, W. T. Gould, 3 Spring Vale, Locking Road East, Weston-s-Mare, Somerset.
G4FN, C. T. Wakeman, Broadwater House, Southend-on-Sea, Essex.
G5HO, T. L. Franklin, Vine Cottage, Betts Lane, Upper Nazeing, Waltham Abbey, Essex. (Tel.: *Nazeing 3221*).

The Other Man's Station

G3HVP



THIS month we see G3HVP, the station of F. E. Goddard at 108 Brookfield, Glossop, Derbyshire, who was first licensed in October 1951. At that time, the gear consisted essentially of a T.1154/R.1155 outfit, operation being on 80-metre CW.

About the middle of 1954 a rebuild was commenced, with the interesting result shown in our photograph. At the top of the rack on the left is an 807 TVI-proofed transmitter to the G5RV design, running 150 watts on CW and 120w. on phone, into 75 ohms on all bands 10 to 80 metres. Also carried on the rack are panels for the control circuits and modulator units; the speech amplifier valve sequence is 6AC7 cathode coupled into a 6SN7, into a 6N7 phase-splitter, followed by push-pull 6V6's; the modulator proper is transformer coupled (two being used back-to-back) in the screens of a pair of 807's in zero bias Class-B. Low level speech clipping and filtering is incorporated, using a 6SL7.

Behind the rack, on the wall, is the aerial c/o relay, and on the floor are the 12-volt DC supply for relay operation and the 1300v. 400 mA main HT unit for the transmitter and its modulator. At the operating position, the main item is the CR-100 receiver, accompanied by a two-metre converter, a Class-D wavemeter, the control switching, a QSL card index and a general purpose power supply unit for bench and test work.

The aerial installation consists of a 126ft. coax-fed dipole for G working on 80 metres, and a 20-metre ground plane on the chimney stack. Experimental and constructional work in hand includes UHF oscillators, a low-pass filter for the main transmitter, and a complete rebuild of the two-metre installation.

G3HVP remarks that "no midnight oil is burned and most time is spent at the bench, with occasional appearances for a chat, or a chase after whatever DX presents itself." And very nice, too!

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Dead-line for August Issue : JULY 15)

THE portables are out, the DF hunts are on, the inter-Club field days are being organised—but the sad fact remains that the average Club is unmistakably in its off-season and cannot offer enough attractions to hold its members together during the summer.

We are unable to suggest a remedy for this, and we do not even admit that one is necessary. A short break for any hobby is quite likely to act as a tonic, and we feel that most Clubs could not pursue their healthy, indoor winter existence if they maintained a tight programme of activity all through the summer.

Some of the old-established bodies with a large membership are able to manage it, but the average Club (if there is such a thing, but we know what we mean) is probably better for a rest. After all, the congregation of fifteen or twenty members in a little café is a cosy affair in the winter, but hardly likely to attract all of them to every meeting in the summer.

The following survey of activities shows how many of them do manage to keep going.

Barnsley are paying a visit, on July 8, to Brooks Motors, Barugh Green, and on July 22 they have a talk on Mobile Operation, by G3GAH. **Bradford** plans no activity through the holiday season except informal meetings on July 26 and August 23.

Clifton have a Junk Sale on July 8, a Constructional Evening and Ragchew on the 15th, and a Transmitting Field Day on the 24th. The latter event will be held near Farnborough, Kent, when a number of members will be setting up portables. Normal meetings are at the clubroom at 225 New Cross Road, London, S.E.15.

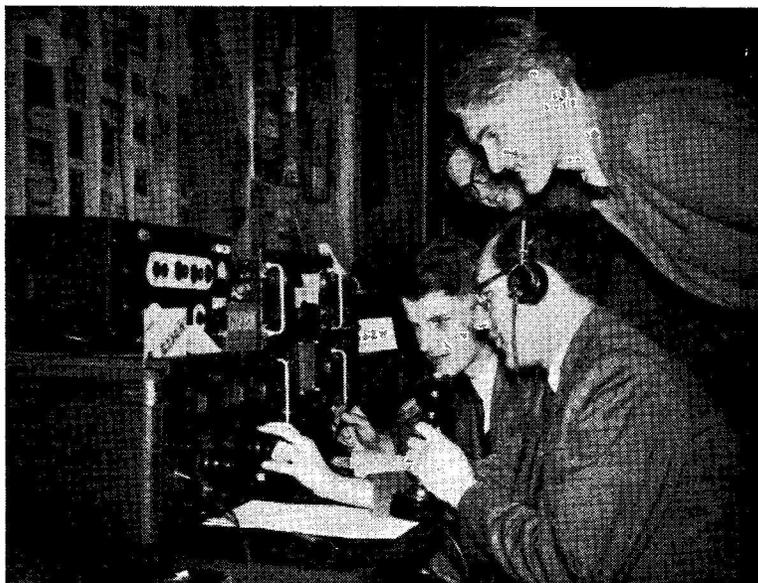
Coventry have marked down July 18 for an "Informal Night Out"—it sounds intriguing, and we should like to hear more! On August 7 their Two-metre Field Day takes place. **Lancaster** recently held their AGM, and the Secretary reported on the part played in the recent Hobbies Exhibition at Morecambe. Note the change of secretary (new

QTH in panel).

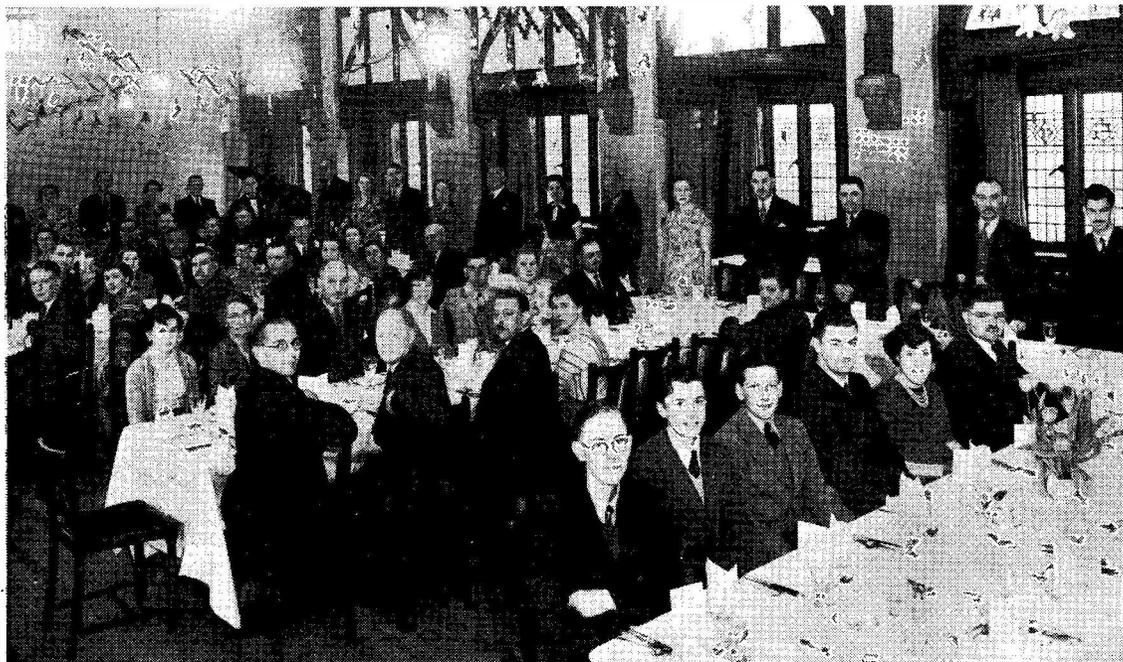
Forthcoming events for **Midland** are a lecture on Transistors (Mr. J. Missen, G.E.C. Research Laboratory) on July 19, and lecturettes on various subjects, by selected members, on August 16. **Mitcham** have changed their meeting place to "The Canons," Madeira Road, Mitcham, and there, on July 15, G2FKZ will be talking on VHF Techniques; there will be no meetings during August, the next being on September 2. **Norwich** have fixed a meeting for July 22 (at The Golden Lion, St. John's Maddermarket), when Mr. R. Williamson will lecture on Hi-Fi Equipment, and give a demonstration.

Purley are taking part in a Summer Fair on July 23, and they intend to run a complete station, exhibition of members' equipment, and a tape recorder. A member has also devised a novel puzzle at which members of the public can try their hand. The location is the Rotary Field, Purley.

The **QRP Society**, which has now appointed G3IDG as hon. press officer, is running a Portable Amateur Radio Equipment Contest. The object is



The Radio Society of Harrow put G3EFX/A on at the recent Wembley Model Engineering Exhibition. Among the pieces on the stand were some test meters, marked in Braille, made by their sightless member G3HAO. In this view, G3FBN is at the microphone.



Scene at the annual dinner of the Wirral Amateur Radio Society, Moreton, Wirral, in April. Eighty members and guests were present. The Club has a long record of activity, is a consistent performer in MCC, the "Magazine Club Contest," and has gained an honourable place in the Contest on more than one occasion.

to increase interest in the construction and use of low-powered portable gear. The contest is open to all, the closing date being September 30. Full details from the Hon. Sec.

Final meeting of the season for **Spenn Valley** takes place on July 13, and is an Open Meeting. **Stoke-on-Trent** report a very successful Field Day at Whitsun, when they operated on 160, 80 and 2 metres. On the latter band some walkie-talkies were tested out and proved to have a range of about two miles. Meetings at the Club Hq. continue every Thursday night.

Sutton and Cheam meet on July 19 at the Harrow Inn, Cheam Village, when their Chairman, G4DH, will lecture on "Something Topical." Details of the programme for the coming season are now available from the Hon. Sec.

Torquay make a special request that visitors to the town during the summer should get in touch with the Hon. Sec., G3GDW, or with G3JD at 46 Dower Road, Torquay. **Wirral** recently held a highly successful Annual Dinner, which was attended by about 80 members and their ladies, together with a number of visitors from local Clubs. Meetings continue on the first and third Wednesday at the YMCA, Whetstone Lane, Birkenhead. Visitors and SWL's will be warmly welcomed.

The **Worthing** Bucket-and-Spade Party has now become almost a traditional event, and it will be held this year on July 17. The venue is the Kiosk at the West End of Beach House Park, almost on the beach. The event will be going on all day, although

the official welcome takes place at 3 p.m. **Grafton** held another of their Annual Field Days on June 11-12, when two stations were set up on Hampstead Heath. Many interesting contacts were made on four bands, but the big discovery of the week-end is said to be the new cook!

Harrow meet on July 8 for a Practical Evening (and again on July 22); on July 15 there is to be a Brains Trust. At **Scarborough**, G3DQ/M is active on 1910 kc on the journey to and from club meetings every Thursday evening; club members are worked, but calls from other stations, and SWL reports, will be welcomed.

Slight confusion at **Nottingham**, where we have the Nottingham and District Amateur Radio Society and also the Amateur Radio Club of Nottingham. The former meets at the Sherwood Community Centre on July 15, when G5QZ will discuss Aerials; the latter meets every Monday at Woodthorpe House, Sherwood.

Nottingham University Radio Society is also fully active, with a constantly changing membership. Visits have been paid to the G.P.O. station at Rugby, and to the local Rediffusion centre. The Club Tx, G3DBP, is active on 160, 80 and 2 metres. At the beginning of next session the society will be putting

Deadline for next month's reports is **Friday, July 15**. They should be addressed to "Club Secretary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1.

on a stall at the University Pre-Sessional Conference, with G3DBP/A operating on phone. This, it is hoped, will show students something of Amateur Radio, and attract new members to the society.

Surrey report an attendance of 40 members and visitors to hear Mr. **Bettridge** (G.E.C.) on Transistors—in spite of travelling difficulties during June. On July 12, four talks will cover the subjects of GDO's, 70 cm, SSB Exciters and Band-pass Crystal Filters. All will be given by members.

At **Leeds**, the AGM was held on June 15, when G3JMG was elected honorary secretary, with a strong committee and officers; the first meeting of their new session will be on September 28.

The **Bournemouth** Amateur Radio Society is a very active body; they will have G3FVU/P out near Blandford for the next two-metre field day, on July 2/3, operated by five members, using the gear of G2HIF. The group now consists of 13 licensed members and 7 SWL's, for whom G3HLW sends slow Morse on 1880 kc each evening at 1930 BST. Meetings are at the Cricketers' Arms, Windham Road, first Friday of every month, 7.30 p.m.; summer visitors to Bournemouth are naturally very welcome. In addition, the club operates the "Bournemouth Sunday School," their Top Band net, on 1880 kc every Sunday afternoon, 1400-1600 BST.

Slade have a talk booked, for July 22, on "Two-Metre Mobile Equipment," by G2ATK/M, the well-known exponent of that art. Other lecturers include G2AK, G3AYJ, G3HKC and G3JZF. **Southend** and District Radio Society had an invitation meeting on July 8, at which the new Mullard film, "The Manufacture of Radio Valves," was shown, followed by a technical discussion on the use of valves.

FREQUENCY-MODULATION DEMONSTRATION at the SCIENCE MUSEUM

The new VHF/FM service of the BBC, officially inaugurated on May 2, has brought the benefits of high-quality interference-free reception to many listeners in the South-Eastern Counties. In order to demonstrate the advantages of the system to the public, the reasons for its introduction, and the circumstances in which it is of the greatest value, a special demonstration has been arranged at the Science Museum and will remain open for about three months. Comparative recordings will be given and the operation of a modern commercial FM broadcast receiver explained. The Science Museum is open on weekdays from 10 a.m. to 6 p.m., and on Sundays from 2.30 to 6 p.m., admission free.

THE MNEMOTRON

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NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

BARNLEY: P. Carbutt, G2AFV, 33 Woodstock Road, Barnsley.
 BOURNEMOUTH: J. Ashford, 119 Petersfield Road, Boscombe East, Bournemouth.
 BRADFORD: F. J. Davies, 39 Pullan Avenue, Bradford 2.
 CLIFTON: C. H. Bullivant, G3DIC, 25 St. Fillans Road, London, S.E.6.
 COVENTRY: J. H. Whitby, G3HDB, 24 Thornby Avenue, Kenilworth.
 GRAFTON: A. W. H. Wennell, G2CJN, 145 Uxendon Hill, Wembley Park, Middlesex.
 HARROW: S. C. J. Phillips, 131 Belmont Road, Harrow Weald.
 LANCASTER: B. Smalley, 8 Windermere Road, Carnforth, Lancs.
 LEEDS: J. M. Gale, G3JMG, 104 Bentley Lane, Meanwood, Leeds, 6.
 MIDLAND: D. Hall, 144 Hill Village Road, Sutton Coldfield.
 MITCHAM: D. Tilcock, G3JYV, 16 Taffey's How, Mitcham, Surrey.
 NORWICH: P. J. Gowen, 71 Links Avenue, Hellesdon, Norwich.
 NOTTINGHAM (N.D.A.R.S.): M. Dransfield, G3JKO, 1 Cavendish Crescent South, The Park, Nottingham.
 NOTTINGHAM (A.R.C.N.): N. D. Littlewood, 129 Standhill Road, Nottingham.
 NOTTINGHAM UNIVERSITY: G. Williams, The Union Room, The University, Nottingham.
 PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
 QRP SOCIETY: J. Whitehead, 92 Ryden's Avenue, Walton-on-Thames.
 SCARBOROUGH: P. Briscoe, G8KU, 31 St. John's Avenue, Scarborough.
 SLADE: C. N. Smart, 110 Woolmore Road, Erdington, Birmingham 23.
 SOUTHEND: P. C. Baldwin, 13 Inverness Avenue, Westcliff-on-Sea, Essex.
 SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, near Leeds.
 STOKE ON TRENT: A. Rowley, G3JWZ, 37 Leveson Road, Hanford, Stoke on Trent.
 SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
 SUTTON AND CHEAM: F. J. Harris, G2BOF, 143 Collingwood Road, Sutton, Surrey.
 TORBAY: L. D. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot.
 WIRRAL: A. C. Wattleworth, 17 Iris Avenue, Claughton, Birkenhead.
 WORTHING: J. F. Wells, Atickwa, 37 Salvington Gardens, Worthing.

"NEW QTH's"

As space allows, we publish under this heading the call-sign/addresses of newly-licensed amateurs and those whose addresses have changed since their appearance in the *Call Book*. Publication is only, and always, at the direct request of the individual concerned. Hence, new licensees are asked to advise us as soon as they receive their permits; changes of address should also be notified immediately. This enables the G sections of the *Radio Amateur Call Book*—the world directory of radio amateurs, of which we are sole agents for the U.K. and Europe—to be kept up-to-date. Publication in "New QTH's" in *SHORT WAVE MAGAZINE* is open to any U.K. (and Eire) licence holder, irrespective of being a subscriber to the *Magazine*, or even a reader. (In the case of our own direct subscribers, however, it does help a lot in checking our records if that fact is mentioned when sending in the notification). The main object of "New QTH's" is to keep the *Call Book* straight on G QTH's. We also accept, of course, overseas readers' addresses for the *Call Book*, but in general these are not published in "New QTH's" in *SHORT WAVE MAGAZINE* itself, due to space considerations.

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G3IDG needs CQ, January, March, April, June 1945; any Radio before November 1935; any R/9 before November 1934; any QST before August 1923. Calling CQ (de Soto). Overseas Ham magazines, old or new, any quantity.—95 Ramsden Road, London, S.W.12.

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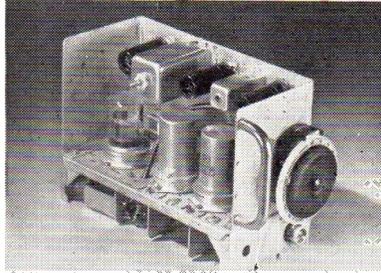
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